ARCADIS Design & Consultancy for natural and built assets

Columbia Gas Transmission, LLC., a TransCanada Company

JOINT FEDERAL/STATE APPLICATION FOR THE ALTERATION OF ANY FLOODPLAIN, WATERWAY, TIDAL OR NONTIDAL WETLAND IN MARYLAND

Eastern Panhandle Expansion Project

March 2017

JOINT FEDERAL/STATE APPLICATION FOR THE ALTERATION OF ANY FLOODPLAIN, WATERWAY, TIDAL OR NONTIDAL WETLAND IN MARYLAND

Eastern Panhandle Expansion Project

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Our Ref.:

CPGL00EP.0001

Date:

March 2017

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Attachment 1

Joint Federal State Permit Form
and Checklist

WA

JOINT FEDERAL/STATE APPLICATION FOR THE ALTERATION OF ANY FLOODPLAIN, WATERWAY, TIDAL OR NONTIDAL WETLAND IN MARYLAND

Sean-m1

FOR AGENCY USE ONLY

Application Number _____ **Date Determined Complete** _____ Paul-m2

Date Received by State _____ **Date(s) Returned** _____

Date Received by Corps _____ _____

Type of State permit needed _____ **Date of Field Review** _____

Type of Corps permit needed _____ **Agency Performed Field Review** _____

++

- Please submit 1 original and 6 copies of this form, required maps and plans to the Wetlands and Waterways Program as noted on the last page of this form.
- Any application which is not completed in full or is accompanied by poor quality drawings may be considered incomplete and result in a time delay to the applicant.

Please check one of the following: 17-WT-3099 PAID #750

RESUBMITTAL: ____ **APPLICATION AMENDMENT:** ____ **MODIFICATION TO AN EXISTING PERMIT:** ____

JURISDICTIONAL DETERMINATION ONLY ____ **APPLYING FOR AUTHORIZATION** X

PREVIOUSLY ASSIGNED NUMBER (RESUBMITTALS AND AMENDMENTS) _____

DATE _____

CatA

1. **APPLICANT INFORMATION:** A 154343 201760592 Eastern Panhandle Expansion Project

APPLICANT NAME:

A. Name: Wade Abbott B. Daytime Telephone: (713) 386-3302

C. Company: Columbia Gas Transmission, LLC. D. Email Address: clifford_abbott@transcanada.com

E. Address: 5151 San Felipe, Suite 2400

F. City: Houston State: TX Zip: 77056

AGENT/ENGINEER INFORMATION:

A. Name: Allen Long, PE B. Daytime Telephone: (724) 742-9180

C. Company: Arcadis U.S., Inc. D. Email Address: Allen.long@arcadis.com

E. Address: 6040 Wallace Road Extension, Suite 300

F. City: Wexford State: PA Zip: 15090

ENVIRONMENTAL CONSULTANT:

A. Name: Dan Ley B. Daytime Telephone: (724) 934-9537

C. Company: Arcadis U.S., Inc. D. Email Address: daniel.ley@arcadis.com

E. Address: 6040 Wallace Road Extension, Suite 300

F. City: Wexford State: PA Zip: 15090

CONTRACTOR (If known): _____

A. Name: _____ B. Daytime Telephone: _____

C. Company: _____ D. Email Address: _____

E. Address: _____

F. City: _____ State: _____ Zip: _____

RECEIVED
MAR 23 2017
WATER MANAGEMENT ADMIN
REGULATORY SERVICES COORD

PRINCIPAL CONTACT:

A. Name: Dan Ley B. Daytime Telephone: (724) 934-9537

C. Company: Arcadis U.S., Inc. D. Email Address: daniel.ley@arcadis.com

E. Address: 6040 Wallace Road Extension, Suite 300

F. City: Wexford State: PA Zip: 15090

NEL

2. PROJECT DESCRIPTION

a. GIVE WRITTEN DESCRIPTION OF PROJECT:

Please See Attachment 4

Has any portion of the project been completed? ____ Yes __X__ No If yes, explain ____

Is this a residential subdivision or commercial development? ____ Yes __X__ No

If yes, total number of acres on property ____ acres

b. ACTIVITY: Check all activities that are proposed in the wetland, waterway, floodplain, and nontidal wetland buffer as appropriate.

A. ____ filling
B. ____ dredging
C. __X__ excavating
D. ____ flooding or impounding water
E. ____ draining
F. __X__ grading
G. __X__ removing or destroying vegetation
H. ____ building structures

Area for item(s) checked: Wetland 2,600 (sq. ft.) Buffer (Nontidal Wetland Only) 8,345 (sq. ft.)

Expanded Buffer (Nontidal Wetland Only) ____ (sq. ft.)

Area of stream impact 2,683 (sq. ft.)

Length of stream affected 269 (linear feet)

c. TYPE OF PROJECTS: Project Dimensions

For each activity, give overall length and width (in feet), in columns 1 and 2. For multiple activities, give total area of disturbance in square feet in column 3. For activities in tidal waters, give maximum distance channelward (in feet) in column 4. For dam or small ponds, give average depth (in feet) for the completed project in column 5. Give the volume of fill or dredged material in column 6.

		Length (Ft.) 1	Width (Ft.) 2	Area Sq. Ft. 3	Maximum/Average Channelward Encroachment 4		Pond Depth 5	Volume of fill/dredge material (cubic yards) below MHW or OHW 6
A. ____	Bulkhead							
B. ____	Revetment							
C. ____	Vegetative Stabilization							
D. ____	Gabions							
E. ____	Groins							
F. ____	Jetties							
G. ____	Boat Ramp							
H. ____	Pier							
I. ____	Breakwater							
J. ____	Repair & Maintenance							
K. ____	Road Crossing							
L. __X__	Utility Line			3,598				
M. ____	Outfall Construction							
N. ____	Small Pond							
O. ____	Dam							
P. ____	Lot Fill							
Q. ____	Building Structures							
R. __X__	Culvert			685				
S. __X__	Bridge			999				
T. ____	Stream Channelization							
U. ____	Parking Area							
V. ____	Dredging							

1. ____ New 2. ____ Maintenance 3. ____ Hydraulic 4. ____ Mechanical

W. ____ Other (explain) ____

d. PROJECT PURPOSE: Give brief written description of the project purpose:

Please See Attachment 4

3. PROJECT LOCATION:

a. LOCATION INFORMATION:

A. County: Washington B. City: Hancock C. Name of waterway or closest waterway: Potomac River

D. State stream use class designation: Use I-P: Water Contact Recreation, and Protection of Aquatic Life

E. Site Address or Location: Project begins north of I-68 in Fulton County Pennsylvania

F. Directions from nearest intersection of two state roads: Directions from I-70 to the start of the project are provided in Attachment 3.

G. Is your project located in the Chesapeake Bay Critical Area (generally within 1,000 feet of tidal waters or tidal wetlands)?: ____ Yes X No

H. County Book Map Coordinates (Alexandria Drafting Co.); Excluding Garrett and Somerset Counties: Map: Washington Letter: 3B Number: 7 (to the nearest tenth)

I. FEMA Floodplain Map Panel Number (if known): 54065C0065E

J. 1. N39°41'55.573" latitude 2. W78°12'28.287" longitude

b. ACTIVITY LOCATION: Check one or more of the following as appropriate for the type of wetland/waterway where you are proposing an activity:

A. ____ Tidal Waters
B. ____ Tidal Wetlands
C. ____ Special Aquatic Site (e.g., mudflat, vegetated shallows)
D. X Nontidal Wetland
E. X 25-foot buffer (nontidal wetlands only)
F. ____ 100-foot buffer (nontidal wetland of special State concern)
G. X In stream channel
1. ____ Tidal 2. X Nontidal
H. X 100-year floodplain (outside stream channel)
I. ____ River, lake, pond
J. ____ Other (Explain)

c. LAND USE:

A. Current Use of Parcel Is: 1. ____ Agriculture: Has SCS designated project site as a prior converted cropland? ____ Yes X No 2. X Wooded 3. ____ Marsh/Swamp 4. X Developed 5. X Other Pasture land

B. Present Zoning Is: 1. ____ Residential 2. ____ Commercial/Industrial 3. ____ Agriculture 4. ____ Marina 5. X Other

C. Project complies with current zoning X Yes ____ No

THE FOLLOWING INFORMATION IS REQUIRED BY THE STATE (blocks 4-7):

4. REDUCTION OF IMPACTS: Explain measures taken or considered to avoid or minimize wetland losses in F. Also check Items A-E if any of these apply to your project.

A. X Reduced the area of disturbance
B. ____ Reduced size/scope of project
C. X Relocated structures
D. ____ Redesigned project

E. X Other Horizontal Directional (HDD) drill beneath the Potomac River and several other streams and roads

F. Explanation HDD proposed to reduce impacts to the Potomac River, several streams and National Park Service Lands

Describe reasons why impacts were not avoided or reduced in Q. Also check Items G-P that apply to your project.

G. _____ Cost
H. _____ Extensive wetlands on site
I. _____ Engineering/design constraints
J. _____ Other natural features
K. _____ Parcel size
L. _____ Other regulatory requirement
M. X Failure to accomplish project purpose
N. _____ Safety/public welfare issue
O. _____ Inadequate zoning
P. _____ Other _____

Q. Description See details provided in the Alternatives Analysis in Attachment 9

5. LETTER OF EXEMPTION: If you are applying for a letter of exemption for activities in nontidal wetlands and/or their buffers, explain why the project qualifies:

A. _____ No significant plant or wildlife value and wetland impact
1. _____ Less than 5,000 square feet
2. _____ In an isolated nontidal wetland less than 1 acre in size
B. _____ Repair existing structure/fill
C. _____ Mitigation Project
D. _____ Utility Line
1. _____ Overhead
2. _____ Underground
E. Other (explain) _____

F. X Check here if you are **not** applying for a letter of exemption.

IF YOU ARE APPLYING FOR A LETTER OF EXEMPTION, PROCEED TO BLOCK 11

6. ALTERNATIVE SITE ANALYSIS: Explain why other sites that were considered for this project were rejected in M. Also check any items in D-L if they apply to your project. **(If you are applying for a letter of exemption, do not complete this block):**

A. _____ 1 site
B. X 2 - 4 sites
C. _____ 5 or more sites

Alternative sites were rejected/not considered for the following reason(s):

D. X Cost
E. _____ Lack of availability
F. X Failure to meet project purpose
G. _____ Located outside general/market area
H. X Greater wetlands impact
I. _____ Water dependency
J. _____ Inadequate zoning
K. X Engineering/design constraints
L. _____ Other _____

M. Explanation: See Alternatives Analysis provided as Attachment 9

7. PUBLIC NEED: Describe the public need or benefits that the project will provide in F. Also check Items in A-E that apply to your project. **(If you are applying for a letter of exemption, do not complete this block):**

A. X Economic
B. _____ Safety
C. _____ Health/welfare
D. _____ Does not provide public benefits
E. _____ Other _____

F. Description _____

8. OTHER APPROVALS NEEDED/GRANTED:

A. Agency	B. Date Sought	C. Decision 1. Granted	2. Denied	D. Decision Date	E. Other Status
FERC	March 15				Under Review
Washington County Soil Conservation District E&S Approval	TBD				
Washington County Soil Conservation District Forest Conservation Plan Review	TBD				

9. MITIGATION PLAN: Please provide the following information:

a. Description of a monetary compensation proposal, if applicable (for **state requirements** only). Attach another sheet if necessary. NA

b. Give a brief description of the proposed mitigation project.

c. Describe why you selected your proposed mitigation site, including what other areas were considered and why they were rejected.

d. Describe how the mitigation site will be protected in the future.

10. HAVE ADJACENT PROPERTY OWNERS BEEN NOTIFIED?: A. X Yes B. _____ No

Provide names and mailing addresses below (Use separate sheet, if necessary):

a. Can be provided upon request b. _____ c. _____

11. HISTORIC PROPERTIES: Is your project located in the vicinity of historic properties? (For example: structures over 50 years old, archeological sites, shell mounds, Indian or Colonial artifacts). Provide any supplemental information in Section 13.

A. X Yes B. _____ No C. _____ Unknown

12. **ADDITIONAL INFORMATION:** Use this space for detailed responses to any of the previous items. Attach another sheet if necessary:

Consultation is ongoing with Maryland Historic Trust to resolve these issues.

Check box if data is enclosed for any one or more of the following (see checklist for required information):

A.	X	Soil borings	D.	X	Field surveys
B.	X	Wetland data sheets	E.	X	Alternate site analysis
C.	X	Photographs	F.		Market analysis
G.	X	Site plan			
H.	X	Avoidance and minimization analysis			

I. _____ Other (explain) _____

CERTIFICATION:

I hereby designate and authorize the agent named above to act on my behalf in the processing of this application and to furnish any information that is requested. I certify that the information on this form and on the attached plans and specifications is true and accurate to the best of my knowledge and belief. I understand that any of the agencies involved in authorizing the proposed works may request information in addition to that set forth herein as may be deemed appropriate in considering this proposal. I certify that all Waters of the United States have been identified and delineated on site, and that all jurisdictional wetlands have been delineated in accordance with the Corps of Engineers Wetlands Delineation Manual (Wetlands Research Program Technical Report Y-87-1). I grant permission to the agencies responsible for authorization of this work, or their duly authorized representative, to enter the project site for inspection purposes during working hours. I will abide by the conditions of the permit or license if issued and will not begin work without the appropriate authorization. I also certify that the proposed works are consistent with Maryland's Coastal Zone Management Plan. I understand that none of the information contained in the application form is confidential and that I may request that additional required information be considered confidential under applicable laws. I further understand that failure of the landowner to sign the application will result in the application being deemed incomplete.

LANDOWNER MUST SIGN: Farial C Lowe DATE: 3/14/17 3/14/17

WHERE TO MAIL APPLICATION

Maryland Department of the Environment
Water Management Administration
Regulatory Services Coordination Office
1800 Washington Boulevard, Suite 430
Baltimore, Maryland 21230
Telephone: (410) 537-3762
1-800-876-0200

BEFORE YOU MAIL... DON'T FORGET...

- **SIGN AND DATE THE APPLICATION. THE LANDOWNER MUST SIGN.**
- **SEVEN (7) COPIES OF ALL DOCUMENTS (APPLICATION, PLANS, MAPS, REPORTS, ETC.) MUST BE RECEIVED TO BEGIN OUR REVIEW.**
- **INCLUDE FIVE COPIES OF A VICINITY MAP (LOCATION MAP) WITH THE PROJECT SITE PINPOINTED.**
- **SEND AN APPLICATION FEE OF $750 ALONG WITH A COPY OF THE FIRST PAGE OF THE APPLICATION TO MARYLAND DEPARTMENT OF THE ENVIRONMENT, P.O. BOX 2057, BALTIMORE, MD 21203-2057. PLEASE REFER TO OUR WEBSITE *http://www.mde.maryland.gov* FOR FURTHER INSTRUCTIONS.**

Wetlands and Waterways Program:
Checklist for Floodplain, Waterway, Tidal or Nontidal Wetland Applications

- ☐ Processing Fee Enclosed
- ☐ Exempt from Processing Fee

[X] Applicant's name, mailing address, telephone number, email address and fax number

[X] Authorized agent's (or primary contact and other contact) names, mailing addresses, telephone numbers, email addresses and fax numbers

[ ] Any existing authorization numbers or previously assigned numbers

[X] General description of project purpose and proposed activity. Provided in Attachment 2

[X] The name of the city or town, waterbody, and county where the project is located

[X] Clear directions to project site Provided in Attachment 3

[X] Latitude and longitude from a central location within the project limits

Wetland, Waterway/Stream, Buffer, Floodplain Description

[X] Itemized calculation of all permanent and temporary wetland, stream, buffer, floodplain impacts

[X] A delineation report of the area of all wetlands and buffers on the site and associated wetland data sheets. The report map should include the location of all streams, 100-year floodplains?, open water and other surface waters on the site the limits of Chesapeake Bay Resource Protection Areas (RPAs), Wetland types should be noted according to their Cowardin (USFWS-National Wetlands Inventory) classification or similar terminology. Provided in Attachment 5

[X] Description of How Impacts were Avoided or Reduced Provided in Attachment 9

[ ] Mitigation Proposal, if applicable

Plans

[X] A detailed vicinity map of the project area, including the project boundary. The map should identify the project site, property boundaries, and adjacent property owners Provided in Attachments 2 and 7

[X] Plans showing distance of all proposed structures to all contiguous property lines and any appropriate County or State property line building restriction setbacks, right-of-ways and/or easements Provided in Attachment 7

[X] A plan view depicting existing and proposed conditions and structures. All plan view sketches should include, but are not limited to: north arrow; existing and proposed contours and/or grades; limit of surface water areas; ebb and flow direction of all water bodies (e.g., streams, tidal waters); applicant name and address; all horizontal dimensions of all proposed structures and impacts, existing conditions of the project site which includes all existing structures at or near the project site including neighbors; existing areas of wetland vegetation or mapped wetlands and buffers; the project boundary and a boundary demarcating the limits of disturbance. A section view showing existing and proposed conditions and structures. Provided in Attachment 7

[X] A description of construction access and methodology and a proposed construction schedule, with an estimated completion date Provided in Attachments 4 and 7

[X] Description of stabilization for temporary impacts Provided in Attachment 7

ALL Tidal Projects

[ ] Plans on 8.5" x 11" paper; Plans are to be legible and not cluttered; usable written scale no smaller than 1" = 100', Dimensions of proposed structures must be represented.

[ ] Plan views should include Mean High Water Line (MHWL) and Mean Low Water Line (MLWL; referenced to 0.0'). *If MHWL or MLWL are to be altered during construction the proposed MHWL and MLWL should also be labeled*

[ ] Plan views should include water depths marked as either contours or spot depths that extend across the width of the waterway.

[ ] Plan view should include the maximum channelward extent beyond mean high water of all proposed structures and impacts

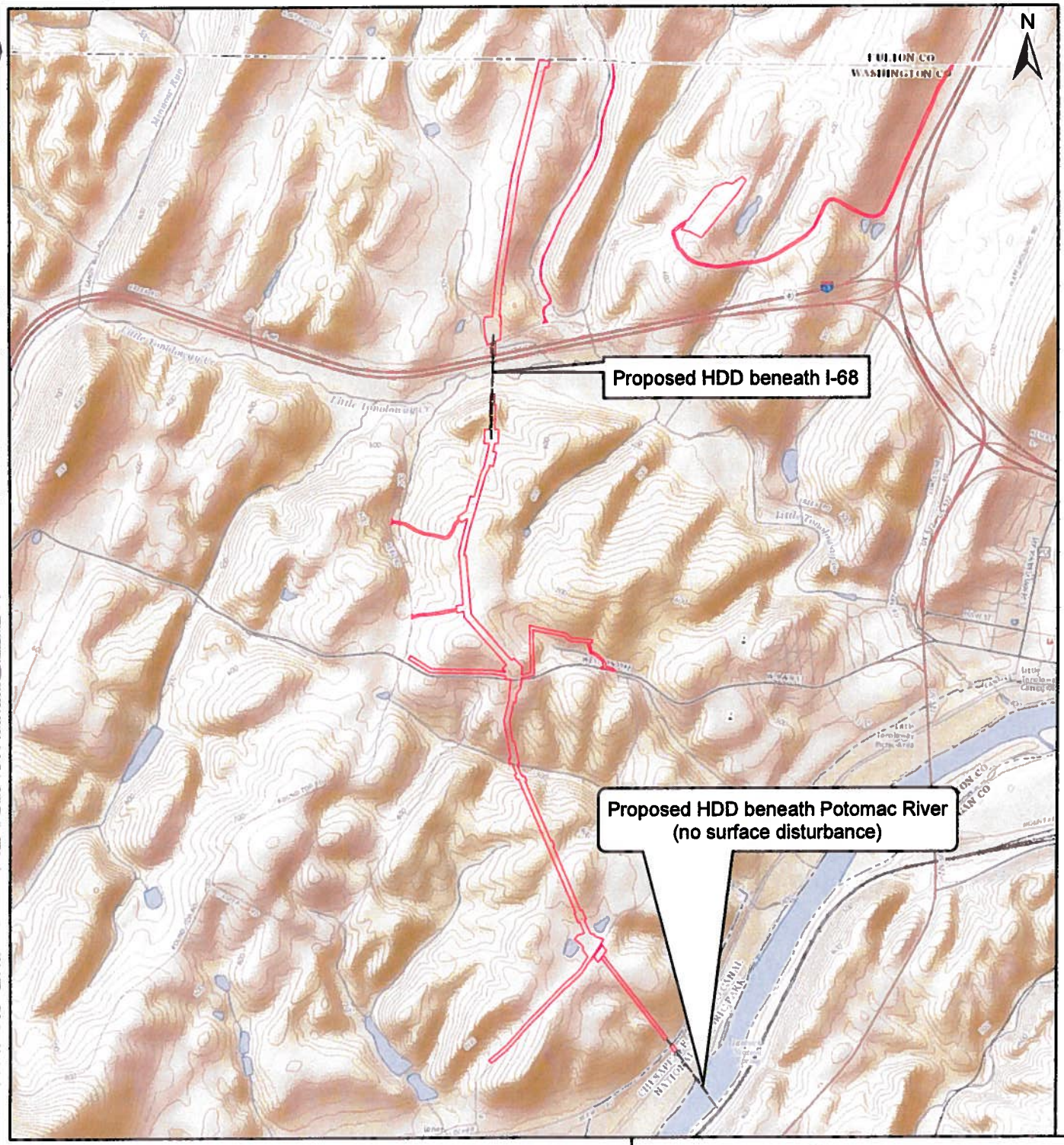
[ ] Plan view should include the distance across the waterway, perpendicular to the proposed worksite, to the opposite shoreline and maximum fetch for the project worksite; *include multiple bearings and/or summer-winter wind direction if possible*

[ ] Dredge material management plan (*for dredging projects only*) including type of dredging, location of dredged material placement site, handling and transport method for dredge material, the dimensions and detailed design of the proposed dredged material placement site including a plan and cross section drawing of dewatering area (*if proposed*), maximum volume of dredged material, and an acceptance letter from the operator of the dredged material placement site.

[X] **ALL Non-Tidal Projects**: Large-sized impacts map (at a scale no smaller than 1" = 200'); use match lines if the entire site cannot fit on one sheet at this scale Provided in Attachment 7

Attachment 2

Site Location Map



Legend

0 750 1,500 3,000 Feet

LIMITS OF DISTURBANCE

HORIZONTAL DIRECTIONAL DRILLING (HDD)

1 inch = 2,000 feet

Notes:
1) Project located within USGS 7.5 Minute Series Topographic Map, Hancock Quadrangle WestVirginia - Maryland

Columbia Gas Transmission, LLC., a TransCanada Company
Eastern Panhandle Expansion Project
Washington, Maryland

Project Location Map

ARCADIS Design & Consultancy for natural and built assets

Figure 1

Attachment 3

Directions to the Site

Google Maps

I-70, US-40 & Dwight D Eisenhower Hwy, Hancock, MD 21750 to 5024 Creek Rd, Hancock, MD 21750

Drive 2.9 miles, 7 min

Imagery ©2017 Google, Map data ©2017 Google 2000 ft

I-70

US-40 & Dwight D Eisenhower Hwy, Hancock, MD 21750

1. Head northwest on Exit 1B toward US-522 S

0.5 mi

2. Merge onto US-522 S

187 ft

3. Take the exit toward MD-144/Hancock

0.1 mi

4. Turn right onto Limestone Rd

0.1 mi

5. Turn left onto Creek Rd

1.3 mi

6. Turn right
   - Entering Pennsylvania
   - Destination will be on the left

0.8 mi

5024 Creek Rd

Hancock, MD 21750

Attachment 4

Project Description and Purpose

Project Description and Purpose

Columbia Gas Transmission, LLC (Columbia), a TransCanada Company, is proposing to construct an approximately 3.37-mile new 8-inch diameter natural gas transmission pipeline equipped with a launcher/receiver at each end of the proposed pipeline. The Project is located within three counties and states (Fulton County, Pennsylvania; Washington County, Maryland; and Morgan County, West Virginia). The Project will originate the existing Columbia 1804 and 10240 pipelines in Fulton County, Pennsylvania. The Project continues south through Washington County, Maryland and terminates in Morgan County, West Virginia.

The Project will involve the construction and operation the following facilities:

- approximately 3.37 miles of new greenfield 8-inch diameter pipeline, (approximately 3.06 miles in Maryland)
- three main line valves (MLV) (Pennsylvania, Maryland and West Virginia), and
- two new tie-in assemblies (Pennsylvania and West Virginia)
- cathodic protection anode bed (Maryland)
- temporary and permanent access roads (Pennsylvania, Maryland and West Virginia)
- contractor staging area (Maryland)

Wetland and Stream Impacts

The limits of disturbance (LOD) for the project will temporarily impact one wetland and six streams. Table 1 provided in **Attachment 8** summarizes the wetlands, wetland buffers, streams and FEMA 100-year floodplains impacted by the proposed project. Please note that two sections of the pipeline will be installed using Horizontal Directional Drill (HDD) technology, including the Little Tonoloway Creek and the Potomac River. During a pre-application meeting October 13, 2016 with Maryland Department of the Environment (MDE) staff, it was confirmed that the underground crossing of an aquatic resource via HDD technology does not require a permit. As such, the aquatic resources crossed using HDD technology are not accounted for in this permit application. Plan and profile drawings of the HDDs and an HDD Contingency Plan are provided in **Attachment 10**. Please note that tree clearing is proposed along portions of the HDD within the LOD. In these areas, stream and wetland crossings are proposed to provide access during tree clearing activities. Impacts associated with these temporary road crossings are included in this permit application.

The proposed project will result in the temporary conversion of one palustrine forested (PSS) wetland (W6) to a palustrine emergent (PEM) wetland. The PEM portion of this wetland is located within the permanent project right-of-way (ROW). Upon completion of construction this wetland will be restored to preconstruction conditions. The PSS portion of this wetland is located within the temporary workspace needed for pipeline construction. Upon completion of construction the PSS portion of wetland W6 located within the temporary workspace will be allowed to naturally revegetate through the existing shrub root stock. As such, wetland mitigation is not proposed for this project.

Purpose and Need

The Project is intended to increase supply options and system reliability, thereby greatly reducing the risk of interruptions to Columbia's markets. Columbia is seeking authorization to construct a new 8-inch diameter pipeline and associated appurtenant facilities with an aggregate and approximate capacity of 47,500 dekatherms per day. The Project will provide firm transportation service with receipts from Texas Eastern Transmission's Marietta interconnect in Lancaster County, PA to a proposed point of deliver meter station in Columbia's Market Area 25 located in Morgan County, WV. The Project directly meets the market demand growth the Columbia system continues to experience and benefits both projected and existing shippers by creating an additional point of delivery and providing operational flexibility.

Project Schedule

Columbia plans to start construction in March 2018. The proposed in-service date for the project is November 2018.

Attachment 5

Aquatic Resource Delineation Report

ARCADIS Design & Consultancy for natural and built assets

Columbia Gas Transmission, LLC, A TransCanada Company

AQUATIC RESOURCE DELINEATION REPORT

Eastern Panhandle Expansion Project

Washington County, Maryland

March 2017

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1 INTRODUCTION

This report presents the results of the aquatic resource delineation conducted by Arcadis U.S. Inc. (Arcadis) for Columbia Gas Transmission, LLC., A TransCanada Company (TCO) Eastern Panhandle Expansion Project. TCO is proposing to construct approximately 4 miles of new eight-inch natural gas transmission pipeline and associated above ground facilities within a new right-of-way (ROW) that spans 3 states (Fulton County, Pennsylvania (PA); Washington County, Maryland (MD); and Morgan County, West Virginia (WV)). While the project crosses 3 states, the majority of the project is located within Maryland. **Please note, this report only addresses the portion of the project within Washington County, MD.**

Arcadis conducted the delineation to determine the extent of waters of the United States, which includes wetlands and other aquatic resources under the jurisdiction of the U.S. Army Corps of Engineers (Corps), and other aquatic resources under the jurisdiction of the Maryland Department of the Environment (MDE). The field work was conducted on August 15th,, 16th , October 24th through October 26th and December 14th , 2016.

Surveys have not been conducted on the portion of the study area where it crosses the National Parks Service (NPS) lands along the northern bank of the Potomac River (see Figures in **Appendix A**). When survey access is granted this area will be delineated.

The portion of the project in Maryland begins in an open field at the Maryland/Pennsylvania state line. It extends south across Interstate 68 (I-68), through several forested and residential properties, across the Chesapeake and Ohio (C&O) Canal, across the Potomac River to the Maryland/West Virginia state line on the southeastern bank of the Potomac River.

The aquatic resource delineation study area is depicted on the figures in **Appendix A**. As shown on the Hancock Quadrangle U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps the approximate beginning and end of the Project study area in Maryland are located at the following coordinates (North American Datum of 1983)

Begin Pipeline Construction Maryland: N 39°43'20.9263", W 78°12'23.9056

End Pipeline Construction Maryland: N 39°40'54.3060", W 78°11'49.2200"

The landforms within the study area generally consist of hill slopes, terraces, and floodplains.

Appendix A includes figures depicting the study area on USGS topographic mapping, Natural Resources Conservation Service (NRCS) county soils maps, National Wetlands Inventory (NWI) wetland maps, and the survey of the wetland delineation. Project area photographs are included in **Appendix B**. **Appendix C** contains lists of the plant species observed within the study area. Corps Wetland Determination Data Forms are provided as **Appendix D**.

2 METHODOLOGY

The project is located within the Central and Eastern Mountain subregion corresponding to Land Resource Region (LRR) S (Corps, 2012). As such, the delineation was conducted in accordance with the

Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Corps, 2012) (Supplement). The Supplement is intended to be utilized in association with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987) (Manual).

The Corps and the EPA jointly define wetlands as:

> ...those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Environmental Laboratory, 1987).

From this regulatory definition, a three-parameter approach to identify and delineate wetlands was developed by the Corps. This approach dictates that, except for atypical and disturbed situations, wetlands contain hydrophytic vegetation, hydric soils, and wetland hydrology.

A vegetation inventory (**Appendix C**) was compiled and comparisons of different vegetative communities were made using simple qualitative means. The National Wetlands Plant List (NWPL) (Lichvar, et. al., 2014) was reviewed to determine the presence or absence of vegetative communities indicative of wetlands.

The soils were then analyzed for indicators of wetland conditions. A hand auger was used to obtain samples of the upper soil horizons to determine if hydric soils were present with the project area. Munsell® Soil Color Charts (Gretag Macbeth 2000) were used to assign standard notations to the samples. All of the soil cores were moist, or moistened with a spray bottle prior to analysis in order to assure accurate color readings. In addition to the soils criteria established in the Corps Manual and Supplements, criteria defined in Field Indicators of Hydric Soils in the United States, Version 7.0 (USDA-NRCS, 2010) were used.

Field-verified soils were compared to NRCS published soil mapping units (**Appendix A**, Figure 2). Soil mapping units can represent a kind of soil, a combination of soils, or miscellaneous land types. Due to limitations imposed by the small scale of the soil survey maps, it is not unusual for wetlands to be delineated within areas not mapped as hydric (wetland) soils, and areas mapped as hydric soils often are not wetlands. This concept is emphasized on the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey website by the following statement:

> Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. Enlarged maps do not show small areas of contrasting soils that could have been shown at a more detailed scale.

After plant communities and soils were identified, the presence, potential presence, or absence of wetland hydrology was determined for final definition of the upland and wetland boundaries. Hydrology is often the least exact of the three parameters used in defining wetlands. Some indicators of wetland hydrology include drainage patterns, sediment deposition, watermarks, visual observation of saturation and/or inundation, and plant adaptations.

Aquatic resources such as streams were identified and delineated based on the hydrologic regime (perennial or intermittent flow), presence of well-defined beds and banks, flow indicators such as sediment sorting and scouring, and indications of ordinary high water marks. In all instances where a

wetland abutted a stream, the outer wetland boundaries were established, as well as the boundary between the stream and the wetland.

The delineated wetlands and streams were classified in accordance with the methodology outlined in The Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979). Wetland Determination Data Forms developed by the Corps for the Supplement were completed at representative areas along the wetland and upland boundary. In addition, data forms were completed within areas that were not associated with wetlands to help describe these areas. These forms are included in **Appendix D**.

3 STUDY AREA SOILS

The NRCS has mapped the Project's study area with twenty-five (25) soil mapping units (**Appendix A**, Figure 2). Two (2) of the soils are listed as hydric soils. Hydric soils are defined as soils formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, July 13, 1994). Hydric soil indicators are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds. The presence of hydrogen sulfide gas is a strong indicator of hydric soil in certain wetland habitats. In areas where soils are formed from parent material with low iron and manganese concentrations, features related to accumulations of organic carbon are typically used to determine hydric soils. The mapping units identified within the study area are listed in Table 3.1, below.

Table 3.1 – Soils Mapped in the Study Area

Soil Map Unit Symbol	Soil Map Unit Name	Hydric Classification
Washington County, Maryland		
At	Atkins Silt loam	Yes
CkB	Clearbrook channery silt loam, 0 to 8 percent slopes	No
Co	Combs fine sandy loam	No
DoB	Downsville gravelly loam, 3 to 8 percent slopes	No
DoC	Downsville gravelly loam, 3 to 8 percent slopes	No
Ft	Funkstown silt loam	No
HbC	Hagerstown silty clay loam, 8 to 15 percent slopes, very rocky	No
KcC	Klinesville-Calvin channery loams, 8 to 15 percent slopes	No
KcF	Klinesville-Calvin channery loams, 25 to 65 percent slopes	No
Ln	Lindside silt loam	No
Me	Melvin silt loam	Yes

Table 3.1 – Soils Mapped in the Study Area

MgB	Monongahela silt loam, 3 to 8 percent	No
MgC	Monongahela silt loam, 8 to 15 percent slopes	No
MhB	Monangahela gravelly loam, 3 to 8 percent slopes	No
MhC	Monongahela gravelly loam, 8 to 15 percent slopes	No
MsD	Murrill gravelly loam, 15 to 25 percent slopes	No
NoB	Nollville channery silt loam, 3 to 8 percent slopes	No
OrF	Opequon-Rock outcrop complex, 25 to 65 percent slopes	No
Pn	Pope fine sandy loam	No
Qa	Quarry, limestone	No
SsA	Swanpond-Funkstown silt loams, 0 to 3 percent slopes	No
WuB	Wurno-Nollville channery silt loams, 3 to 8 percent slopes	No
WuC	Wurno-Nollville channery silt loams, 8 to 15 percent slopes	No
WuD	Wurno-Nollville channery silt loams, 15 to 25 percent slopes	No
WuE	Wurno-Nollville channery silt loams, 25 to 45 percent slopes	No

4 STUDY AREA DRAINAGE

The portion of the Study Area located in Maryland is within the Upper Potomac River Area Sub-Basin 02-14-05.

Per the Maryland Code of Maryland Regulations (COMAR) 26.08.02 Stream Designations for the sub-basin of the Study Area have been assigned the following designation:

- Upper Potomac River Area – Use I-P Water Contact Recreation, and Protection of Aquatic Life

This designated use is applicable to the Potomac River and all Maryland tributaries except those specifically designated as Use III-P or Use IV-P. Details of the above classification of the water bodies within the Maryland portion of the Study Area may be viewed within the COMAR.

http://wwww.mde.state.md.us/assets/document/sedimentstormwater/Appnd_D9.pdf

5 WETLANDS AND STREAMS

A total of twenty nine (29) aquatic resources (10 wetlands and 19 streams) were identified within the Study Area. All of the resources discussed in this section are included on Figure 4 in **Appendix A**.

The wetlands and streams were classified in accordance with the methodology outlined in *The Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). The wetlands were within the "Palustrine" System and the streams were classed within the "Riverine" System. In all instances where a wetland abutted a stream, the outer wetland boundaries were established, as well as the boundary between the stream and the wetland.

The general characteristics of the classes of aquatic resources are described in sections 5.1 (wetlands) and 5.2 (streams). Details of each delineated resource are included in section 5.3, as well as on the Wetland Determination Data Forms in **Appendix D**.

Portions of a single wetland or stream may be delineated several times at different locations within the delineation corridor. To ensure proper impact assessment, each occurrence is counted as a separate aquatic resource.

5.1 Palustrine System

The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, emergent vascular plants, emergent mosses or lichens, and tidal wetlands where the salinity is below 0.5%. Study area wetlands within this system included the following types.

Palustrine Emergent Persistent (PEM1) – These wetlands are dominated by herbaceous plants that normally remain standing at least until the beginning of the next growing season. Portions of resource W5 and W6 contained components of PEM1 wetlands.

Palustrine Emergent Non-Persistent (PEM2) – These wetlands are dominated by herbaceous plants that fall to the surface of the substrate or below the water surface at the end of the growing season. Resource W1 contained components of PEM2 wetlands.

Palustrine Forested (PFO1) – Forested wetlands are characterized by woody vegetation that is six meters tall or taller. In the Project area, forested wetlands dominated by broad-leaved deciduous trees (PFO1) were identified and delineated. Resources W1 and W6 contained portions of PFO wetlands.

Palustrine Open Water (POW) – Generally permanently flooded areas with unknown bottom substrate types and less than 30 percent vegetative cover. Resources W3, W7, W8, W9, and W10 were categorized as POW wetlands.

Palustrine Scrub Shrub (PSS1) – Wetlands dominated by vegetation consisting of woody species less than 20 feet tall. Typical species found in these wetlands would consist of broad-leaved deciduous species such as willows or dogwoods. Resource W6 contained a portion of PSS wetland.

5.2 Riverine System

The Riverine System includes non-vegetated freshwater habitats that are contained within a channel. The channel, by definition, may be naturally or artificially created, periodically or continuously contains moving water, and/or forms a connecting link between two bodies of standing water. Upland islands or Palustrine wetlands within stream channels are not included, by definition, in the Riverine system. The "Riverine" resources within the Project area were of the following types.

Riverine, Lower Perennial (R2) – This class of streams has relatively low gradients resulting in low water velocity. Water flows in these streams year round. The substrate typically consists of silt, sand, and occasional gravel. Resource S3 and S10 would fall within this class.

Riverine, Upper Perennial (R3) – This class of streams has relatively high gradients resulting in high water velocity. Water flows in these streams year round. The substrate is typically rock, cobble and gravel, with occasional patches of sand. Resource S1, S1A, S1B, S1C, S1D, S1E, S2, S6, S7, and S8 would fall within this class.

Ephemeral (R6) – This class of streams includes those that carry only stormwater in direct response to precipitation with water flowing only during and shortly after large precipitation events. The stream may or may not have a well-defined channel, and the aquatic bed is above the water table, and stormwater runoff is the primary source of water. Resources S4, S5, and S9 were characterized as ephemeral.

5.3 Delineated Aquatic Resources Descriptions

The aquatic resources identified and delineated within the project area are described below. The extent of these resources delineated, within the proximity of the study area, is depicted on Figure 4 included in **Appendix A**.

5.3.1 Streams

Resource S1/S1A/S1B/S1C/S1D/S1E (R3)

Resource S1 is perennial stream that meanders several times within the Maryland portion of the Study Area adjacent to Permanent Access Road 1 (PAR-1) leading to a metering and regulating station (MR-1). These areas where S1 is present within the study area were given distinctions varying from S1 (S1, S1A, S1B, S1C, S1D and S1E). The portion of S1 noted as S1 flows beneath an existing road beneath a bridge. The top of bank width of S1 is approximately 3 feet wide. The bank height is approximately 2.5 feet. The substrate consists of cobble and silt. Approximately 1-2 inches of flow was observed at the time of the delineation.

Resource S2 (R3)

Resource S2 is a perennial stream that appears on the USGS map as a blue-line stream. The stream channel follows a course parallel to the study area north of Creek Rd, and then enters the study area south of Creek Rd. S2 flows in a west to east direction. This resource is an un-named tributary (UNT) to Little Tonoloway Creek. The bank to bank width averages approximately 10 feet. Substrate consists primarily of silt and cobble. The portion south of the Creek Rd bridge appears to have been altered, likely during the construction of the interstate. S2 featured isolated pools of water during the field visit on August 16, 2016.

Resource S3 (R2)

Resource S3 is a USGS named perennial stream, Little Tonoloway Creek. S3 is found south of I-68 and flows west to east across the study area. The bank to bank width measures approximately 30 feet. Substrate within S3 consists primarily of silt, gravel, and bedrock. During field visits on August 17, 2016 flow at a depth of 6 inches was observed. Areas of pooling were observed exceeding those depths.

Resource S4 (R6)

Resource S4 is an ephemeral stream that originates within a drainage swale and flows primarily in a northwest to southwest direction. The stream maintains its course adjacent to the study area and at one point crosses the proposed pipeline centerline. During multiple field visits no flow was observed within the stream. The substrate within the channel consists of gravel, sand, and silt.

Resource S5 (R6)

Resource S5 is an ephemeral stream located outside of the study area. The stream develops within a drainage swale and continues its course, flowing away from the project in a north to south direction. The substrate within the channel consists of silt, sand, and leaf litter.

Resource S6 (R3)

Resource S6 is a perennial stream found within a valley. The stream flows from west to east, crossing the study area. During multiple field visits flow was observed within the channel at a depth of approximately 3 inches. Macroinvertebrates were also observed within the channel during a short rock flip survey. The substrate within the channel consists of cobble, gravel, sand and silt.

Resource S7 (R3)

Resource S7 is a perennial stream found along a proposed location for the sacrificial anode bed. S7 is a portion of stream located upstream of S2. Provided the appearance and reappearance of the stream within the study area, separate designations of the stream were made using S2 and S7. The stream flows from north to south across the study area. S7 contains a substrate of limestone cobble, silt, and sand. During field activities, flow was observed at a depth of approximately 3 inches. S7 measures approximately 12 feet from bank to bank with an OHWM of approximately 8 feet.

Resource S8/S8A/S8B/S8C/S8D (R3)

Resource S8 is a perennial stream found within a valley bottom adjacent to Reel Road. S8 meanders several times within the Study Area adjacent to the road. These areas where S8 is present within the study area were given distinctions varying from S8 (S8, S8A, S8B, S8C and S8D). The stream flows from south to north adjacent to Reel Rd, an existing paved road to be used as access. Stream section S8 flows beneath Reel Road within a 1- inch steel culvert from west to east. Stream section S8B crosses the Study Area of proposed permanent access road PAR-2 within a steel culvert. At this crossing S8 measures approximately 15 feet wide from bank to bank and features a distinguished OHWM of approximately 6 feet wide. Flow was observed during multiple field visits at a depth of 2 to 4 inches. The substrate within S8 consists of cobble, gravel, clay, and silt. Stream section S8D also passes through a steel culvert at the location of a farm lane entrance. Here the stream measures approximately 3 feet from bank to bank and features an OHWM of approximately 2 feet in width.

Resource S9 (R6)

Resource S9 is an ephemeral stream originating at a stormwater culvert outflow extending from beneath Reel Road. S9 flows east where it merges with a continued portion of S8 beyond the boundary of the Study Area. The substrate features small boulders, cobble, and gravel. No flow was observed during field activities.

Resource S10 (R2)

Resource S10 is the Potomac River, a perennial stream. The Potomac River flows through five (5) states which include Maryland, Pennsylvania, Virginia, Washington DC, and West Virginia. The mouth of the Potomac is at the Chesapeake Bay. At the crossing of the study area the Potomac River flows in a south to north direction. The Maryland/West Virginia state line is located on the southeastern bank of the Potomac River and therefore, the Potomac River is completely located in Maryland.

5.3.2 Wetlands

Resource W1 (PEM2)

Resource W1 is a PEM wetland situated along the banks of stream S1B. Located on the terrace of the stream, W1 receives hydrology from ground water and during periods of high flow. The dominate vegetation includes *Leersia oryzoides* and *Phalaris arundinacea*. Additional information on W1 can be found on Data Sheets SP-W1 and SP-W1-UPL.

Resource W2 & W2A (PFO1)

Resource W2 is a PFO wetland situated within a swale leading towards the banks of resource S3. W2 is in the floodplain of this perennial stream (Little Tonoloway Creek) and is located within a depression featuring a drainage swale. Hydrological indicators included saturation and oxidized rhizospheres. The dominate vegetation includes *Salix nigra* and *Agrimonia parviflora*. Despite the absence of surface water, a small culvert appears to provide hydrological connectivity between the designated resources W2 and W2A. W2A continues along the edges of a distinguishable swale. Additional information on W2 & W2A can be found on Data Sheets SP-W2 and SP-S3-UPL.

Resource W3 (POW)

Resource W3 is a POW located within a cattle farm and is adjacent to resource S6. This feature appears to be man-made and is located at the toe of slope of a pasture field. Cattle are allowed access to this POW; however, fencing encompasses the outer edge of this resource. W3 is approximately 50 feet in width and 100 feet in length.

Resource W5 (PEM1)

Resource W5 is a PEM wetland that is found on the northern edge, abutting resource W3 within the pasture. The emergence from a spring provides hydrology to this wetland. This wetland depicts hydrological indicators such as saturation and drainage patterns. Soils within this wetland are saturated from 4 – 18 inches. Dominant vegetation within this wetland are *Salix nigra* and *Cyperus esculentes*. Additional information on W5 can be found on Data Sheets SP-W5 and SP-W5-UPL.

Resource W6 (PEM1/PSS1/PFO1)

Resource W6 is a large PEM/PSS/PFO wetland that feeds into resource W7, located to the east of this resource. Dominant vegetation found throughout this wetland is *Phalaris arundinacea* and *Salix nigra*. A swale is present running through the middle of the wetland, in a west to east orientation. The eastern and western portions of the wetland feature predominately emergent vegetation. The central portion of the wetland features woody vegetation located primarily along the banks of the identified swale. Hydrological indicators such as saturation and oxidized rhizopsheres on living roots were documented. Soils depicted a depleted matrix and were silty clay in texture. Additional information on W6 can be found on Data Sheets SP-W6 and SP-W6-UPL.

Resource W7 (POW)

Resource W7 is a POW located east of resource W6 which drains into and recharges this open water resource. Its approximate length and width are 200 feet by 100 feet. W7 is located adjacent to Locher Rd.

Resource W8 (POW)

Resource W8 is a POW located west of resource W6. W8 appears to be isolated with no drainages or swales leading towards this pond. While clearly manmade, it is unclear whether W8 is spring fed or a result of precipitation collection.

Resource W9 (POW)

Resource W9 is a POW located north of S6. W9 appears to be a manmade feature and is located within a pasture on the western edge of this portion of the Study Area. It is unclear whether W9 is spring fed or a result of precipitation collection.

Resource W10 (POW)

Resource W10 is a POW located on the eastern outer edge of the Study Area. This POW is located on a hill slope in a pasture. Its approximate length and width is 200 feet by 100 feet. It appears that this pond is man-made, though it is undetermined if the feature is spring fed or the result of precipitation collection. Livestock within this pasture have unlimited access to this feature.

5.3.3 Uplands

The remaining portion of the Project's study area was located within upland vegetative communities. Much of the land use identified throughout the region ranged from open land to forest/woodland tracts. A wide array of plant species was observed throughout the field investigations and a complete list is included in **Appendix C.**

6 CONCLUSIONS

A total of twenty nine (29) aquatic resources (10 wetlands and 19 streams) were identified within the Study Area. The delineated aquatic resources within the Project area are located within the Potomac

River Basin. All wetlands were within the Palustrine System, and the streams were within the Riverine System, per Cowardin et al. (1979).

Surveys have not been conducted on the portion of the study area where it crosses the National Parks Service (NPS) lands along the northern bank of the Potomac River (see Figures in **Appendix A**). When survey access is granted this area will be delineated.

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APPENDIX A

Figures

Figure 1 USGS Topographic Map

Figure 2 USDA Soils Map

Figure 3 NWI Map

Figure 4 Surveyed Wetlands and Streams Map

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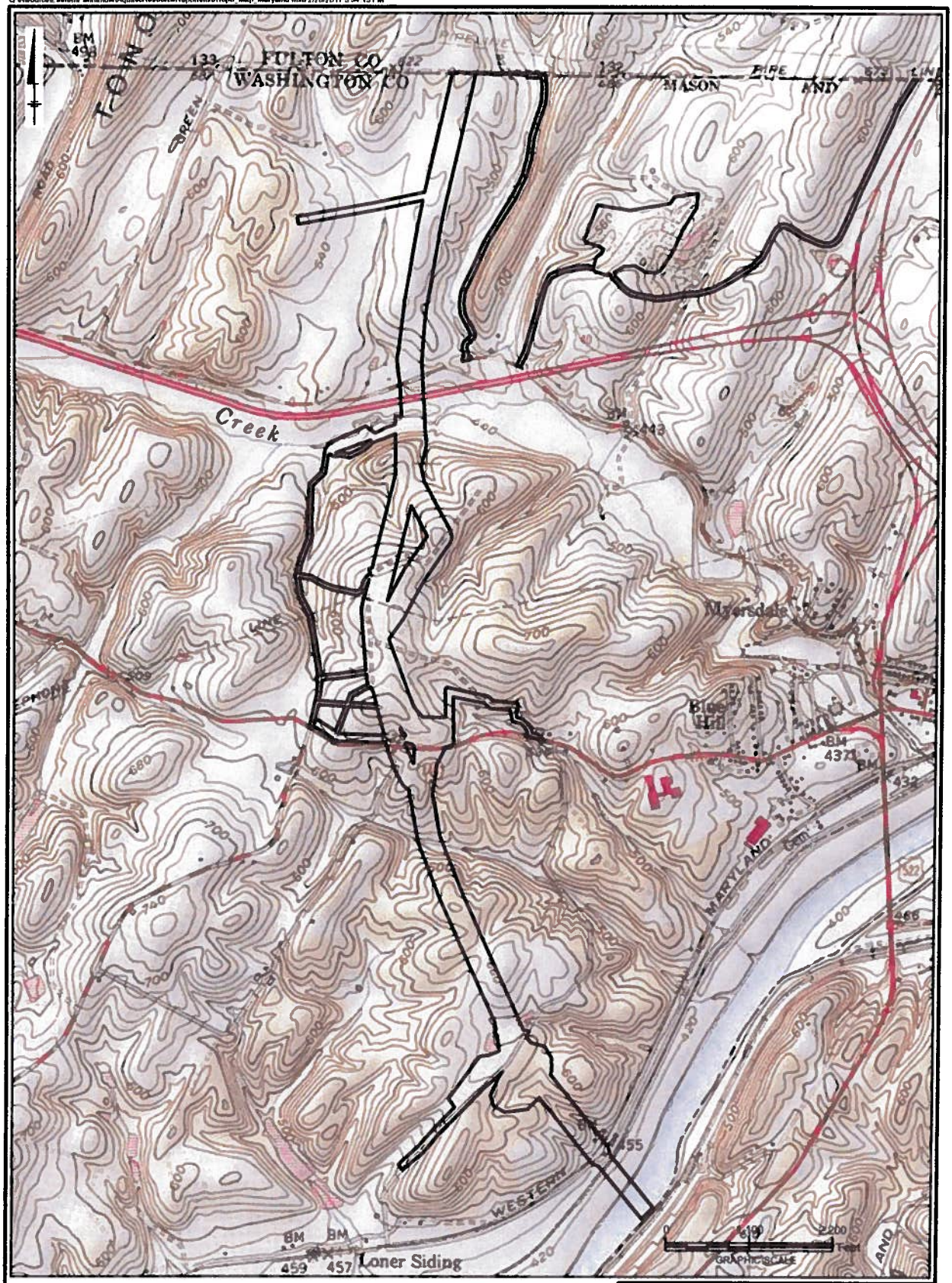

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COLUMBIA GAS TRANSMISSION, LLC.
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EASTERN PANHANDLE EXPANSION

MARYLAND AQUATIC RESOURCE DELINEATION

USGS TOPOGRAPHIC MAP

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FIGURE
1

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NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NRCS SOIL DATA OBTAINED FROM THE GEOSPATIAL DATA GATEWAY.

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MARYLAND AQUATIC RESOURCE DELINEATION

NRCS SOIL CLASS BOUNDARIES

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2-1

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NOTES:
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MARYLAND AQUATIC RESOURCE DELINEATION

NRCS SOIL CLASS BOUNDARIES

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FIGURE 2-2

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- SOIL CLASS BOUNDARY
- ENVIRONMENTAL SURVEY CORRIDOR

NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NRCS SOIL DATA OBTAINED FROM THE GEOSPATIAL DATA GATEWAY.

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MARYLAND AQUATIC RESOURCE DELINEATION

NRCS SOIL CLASS BOUNDARIES

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FIGURE
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- SOIL CLASS BOUNDARY
- ENVIRONMENTAL SURVEY CORRIDOR

NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NRCS SOIL DATA OBTAINED FROM THE GEOSPATIAL DATA GATEWAY.

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EASTERN PANHANDLE EXPANSION
MARYLAND AQUATIC RESOURCE DELINEATION

NRCS SOIL CLASS BOUNDARIES

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FIGURE 2-4

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LEGEND:
NWI WETLAND
ENVIRONMENTAL SURVEY CORRIDOR

NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NWI WETLAND DATA OBTAINED FROM THE US FISH & WILDLIFE SERVICE.

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EASTERN PANHANDLE EXPANSION
MARYLAND AQUATIC RESOURCE DELINEATION

NWI WETLANDS

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NWI WETLAND
ENVIRONMENTAL SURVEY CORRIDOR

NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NWI WETLAND DATA OBTAINED FROM THE US FISH & WILDLIFE SERVICE.

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EASTERN PANHANDLE EXPANSION
MARYLAND AQUATIC RESOURCE DELINEATION

NWI WETLANDS

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FIGURE
3-2

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NWI WETLAND
ENVIRONMENTAL SURVEY CORRIDOR

NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NWI WETLAND DATA OBTAINED FROM THE US FISH & WILDLIFE SERVICE.

COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY (TCO)
EASTERN PANHANDLE EXPANSION
MARYLAND AQUATIC RESOURCE DELINEATION

NWI WETLANDS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3-3

City: syr Div/Group: lm/dv Created By: jaymo repp Last Saved By: jrepp
Project (Project #)
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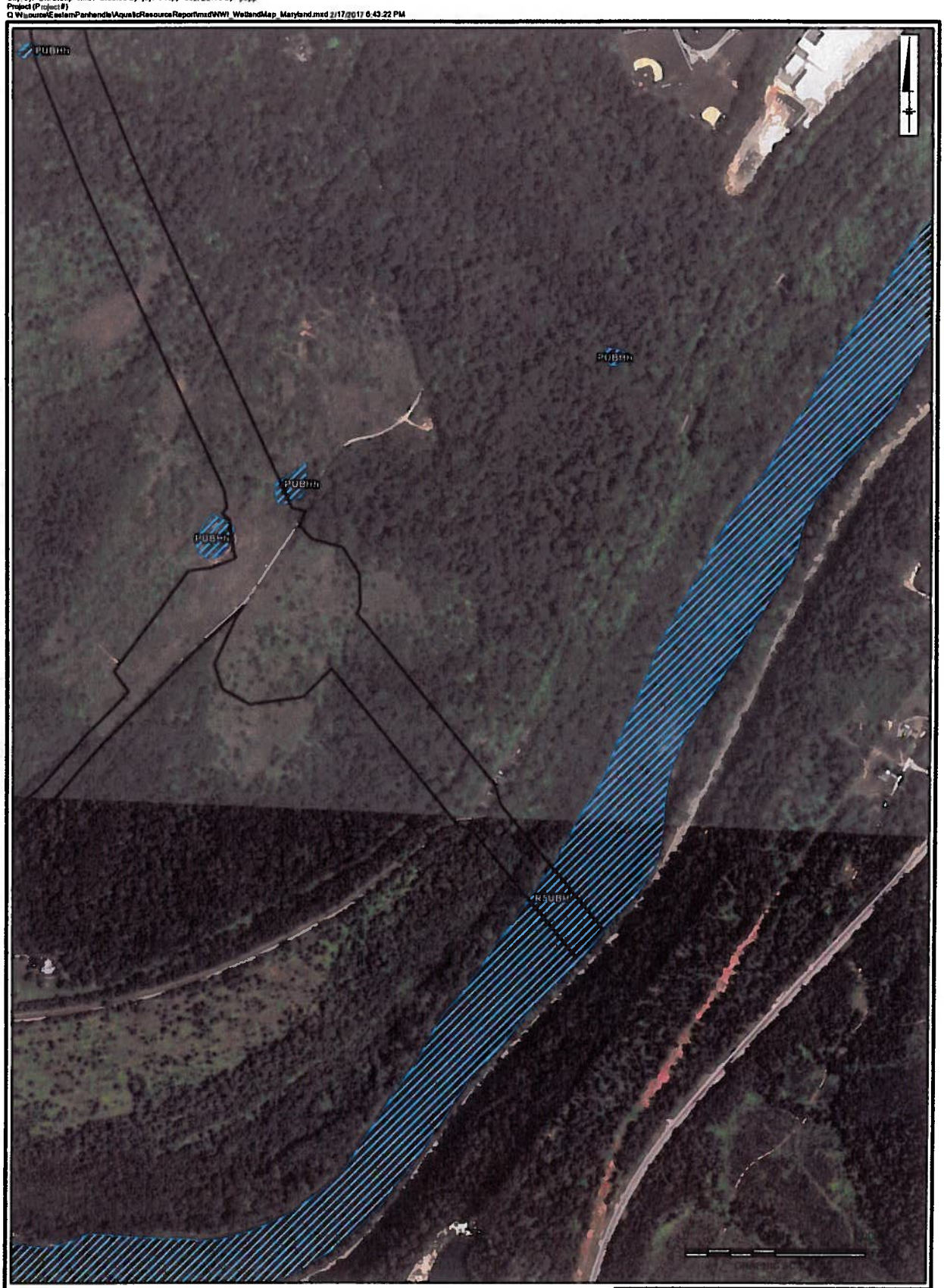


LEGEND:
NWI WETLAND
ENVIRONMENTAL SURVEY CORRIDOR

NOTES:
1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. NWI WETLAND DATA OBTAINED FROM THE US FISH & WILDLIFE SERVICE.

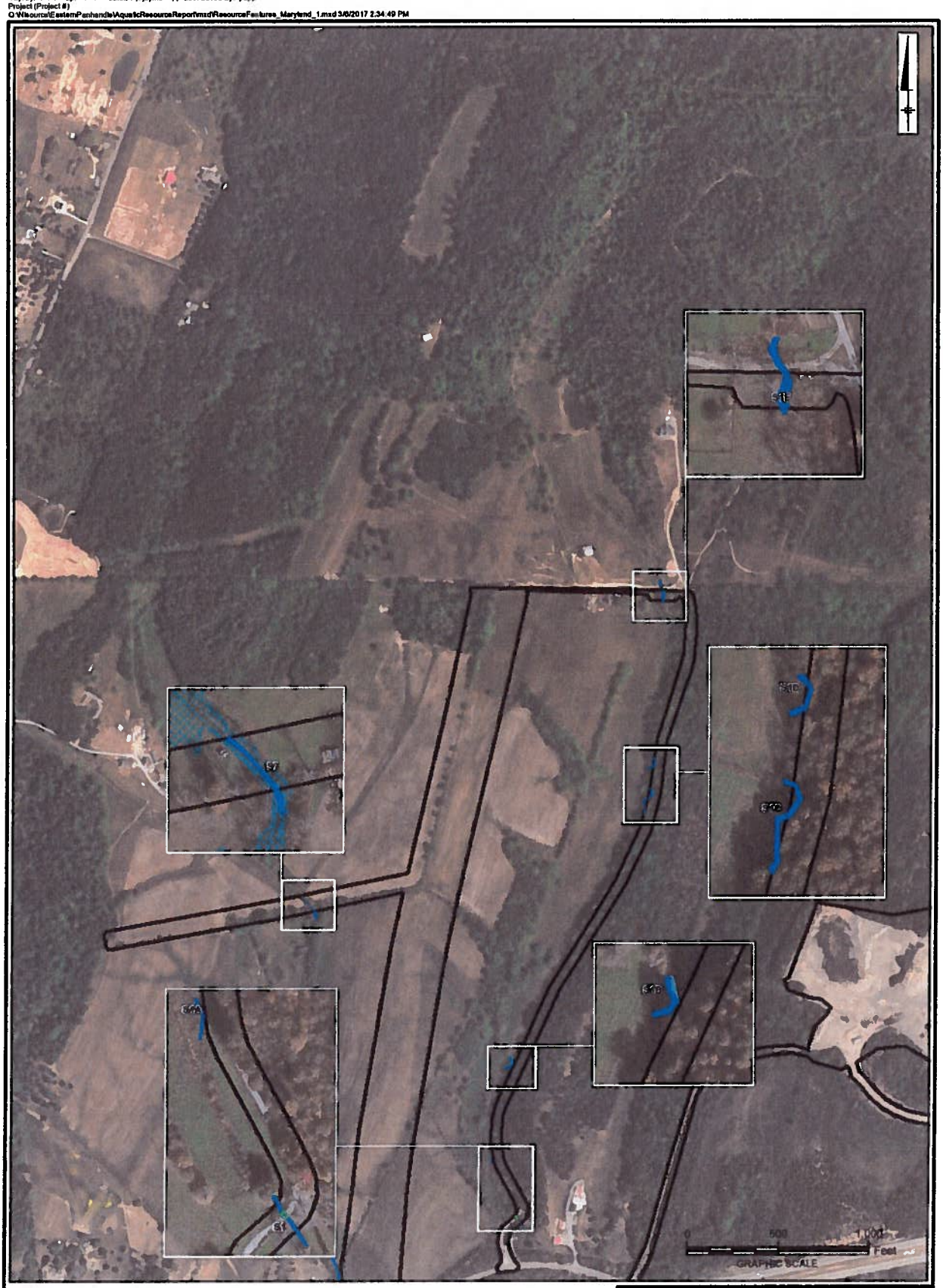
COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY (TCO)
EASTERN PANHANDLE EXPANSION
MARYLAND AQUATIC RESOURCE DELINEATION

NWI WETLANDS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3-4

City: syr Div/Group: lm/dv Created By: jayme rapp Last Saved By: jrapp
Project (Project #)
Q:\Resource\EasternPanhandle\AquaticResourceReport\mxd\ResourceFeatures_Maryland_1.mxd 3/0/2017 2:34:49 PM



LEGEND:
- ENVIRONMENTAL SURVEY CORRIDOR
- CULVERTED STREAM SECTION
- SURVEYED STREAM
- FEMA 100-YEAR FLOODPLAIN

SURVEYED WETLAND TYPE:
- PEM
- PFO
- POW

NOTE: 1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY (TCO)
EASTERN PANHANDLE EXPANSION

MARYLAND AQUATIC RESOURCE DELINEATION

SURVEYED STREAMS AND WETLANDS

ARCADIS

FIGURE 4-1

City: xyz Div/Group: lm/div Created By: jaymo rapp Last Saved By: jrapp
Project (Project #)
Q:\Resource\Eastern\Panhandle\AquaticResourceReport\mxd\ResourceFeatures_Maryland_2.mxd 2/28/2017 3:00:13 PM

LEGEND:
- ENVIRONMENTAL SURVEY CORRIDOR
- CULVERTED STREAM SECTION
- SURVEYED STREAM

SURVEYED WETLAND TYPE:
- PEM
- PFO
- POW

NOTE: 1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

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A TRANSCANADA COMPANY (TCO)
EASTERN PANHANDLE EXPANSION

MARYLAND AQUATIC RESOURCE DELINEATION

SURVEYED STREAMS AND WETLANDS

ARCADIS

FIGURE
4-2

City: ayt Div/Group: lm/tv Created By: jayme rapp Last Saved By: jrapp
Project (Project #)
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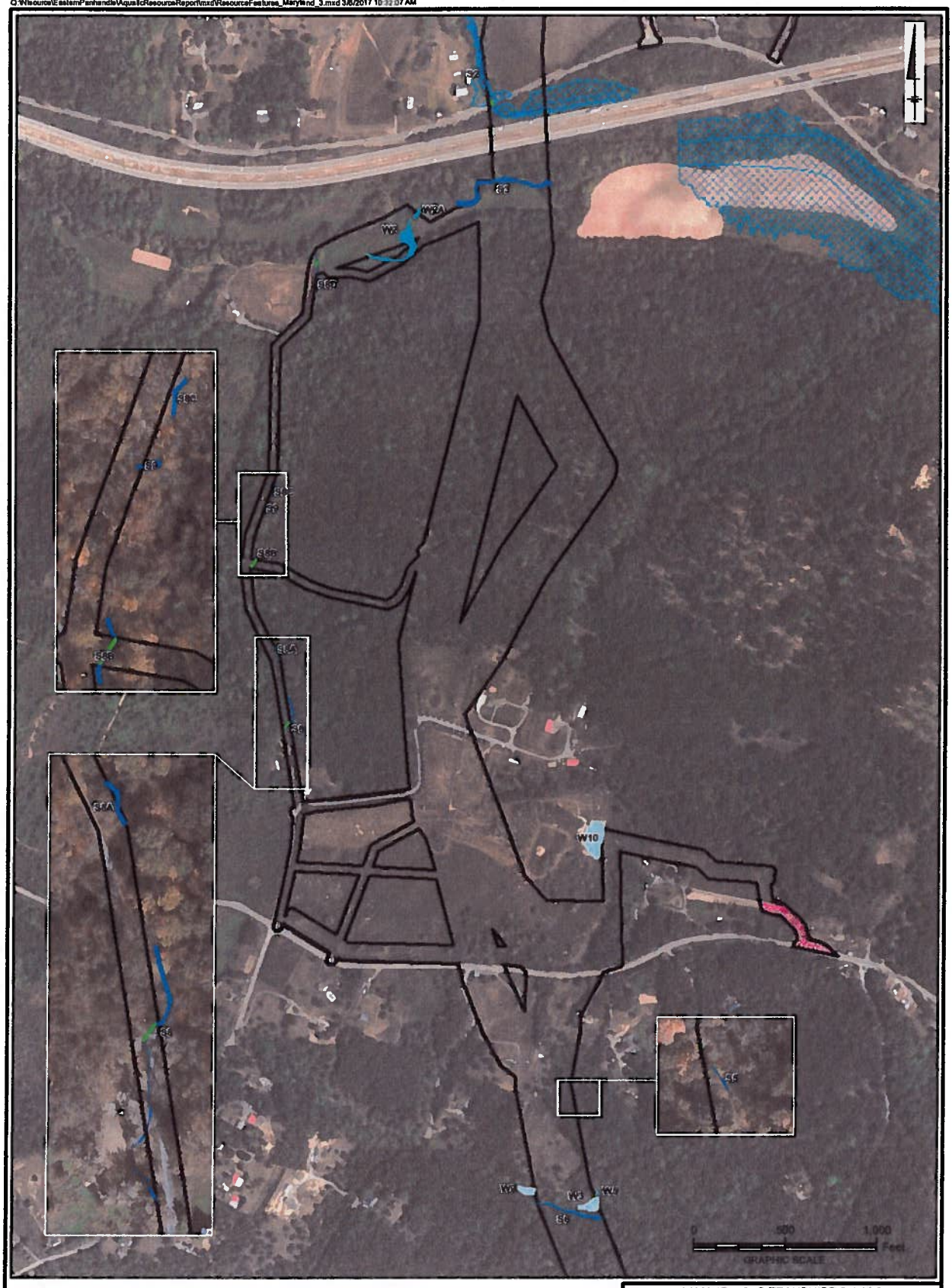


LEGEND:

- ENVIRONMENTAL SURVEY CORRIDOR
- CULVERTED STREAM SECTION
- SURVEYED STREAM
- SURVEYED WETLAND TYPE:
  - PEM
  - PFO
  - POW
- FEMA 100-YEAR FLOODPLAIN
- AREA TO BE SURVEYED IN THE 2017 GROWING SEASON

NOTE: 1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY (TCO)
EASTERN PANHANDLE EXPANSION

MARYLAND AQUATIC RESOURCE DELINEATION

SURVEYED STREAMS AND WETLANDS

ARCADIS

FIGURE
4-3

City: syr Div/Group: lm/dv Created By: jayme.rapp Last Saved By: jrapp
Project (Project #)
O:\Resource\Eastern Panhandle\Aquatic Resource Report\mxd\ResourceFeatures_Maryland_4.mxd 3/8/2017 2:02:35 PM

LEGEND:

- ENVIRONMENTAL SURVEY CORRIDOR
- CULVERTED STREAM SECTION
- SURVEYED STREAM

SURVEYED WETLAND TYPE:

- PEM
- PFO
- POW
- PSS

- FEMA 100-YEAR FLOODPLAIN
- AREA TO BE SURVEYED IN THE 2017 GROWING SEASON

NOTE: 1. AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY (TCO)
EASTERN PANHANDLE EXPANSION

MARYLAND AQUATIC RESOURCE DELINEATION

SURVEYED STREAMS AND WETLANDS

ARCADIS

FIGURE
4-4

APPENDIX B

Photographs

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 1

Date:
August 15, 2016

Description:
View of resource S1 facing upstream.

Location:
Facing northwest.

Photo: 2

Date:
August 15, 2016

Description:
View of resource S1 facing downstream

Location:
Facing southeast.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 3

Date:
August 15, 2016

Description:
View of resource S1A facing upstream.

Location:
Facing northeast.

Photo: 4

Date:
August 15, 2016

Description:
View of resource S1A facing downstream.

Location:
Facing southwest.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 5

Date:
August 15, 2016

Description:
View of resource S1B facing upstream.

Location:
Facing northwest.

Photo: 6

Date:
August 15, 2016

Description:
View of resource S1B facing downstream.

Location:
Facing southeast.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 7

Date:
August 15, 2016

Description:
View of resource S1C facing upstream.

Location:
Facing north.

Photo: 8

Date:
August 15, 2016

Description:
View of resource S1C facing downstream.

Location:
Facing west.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 9

Date:
August 15, 2016

Description:
View of resource S1D facing upstream.

Location:
Facing north.

Photo: 10

Date:
August 15, 2016

Description:
View of resource S1D facing downstream.

Location:
Facing south.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

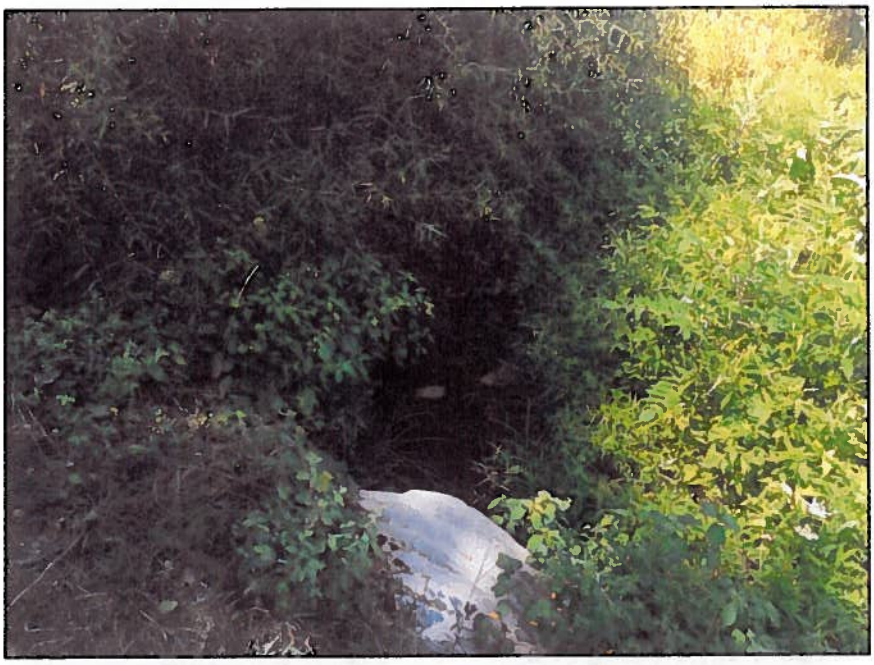


Photo: 11

Date:
August 15, 2016

Description:
View of resource S1E facing upstream.

Location:
Facing north.

Photo: 12

Date:
August 15, 2016

Description:
View of resource S1E facing downstream.

Location:
Facing south.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 13

Date:
August 16, 2016

Description:
View of resource S2 facing upstream

Location:
Facing north.

Photo: 14

Date:
August 16, 2016

Description:
View of resource S2 facing downstream.

Location:
Facing east.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 15

Date:
August 16, 2016

Description:
View of resource S3 facing upstream.

Location:
Facing east.

Photo: 16

Date:
August 16, 2016

Description:
View of resource S3 facing downstream.

Location:
Facing west.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 17

Date:
August 16, 2016

Description:
View of resource S4 facing upstream.

Location:
Facing northwest.

Photo: 18

Date:
August 16, 2016

Description:
View of resource S4 facing downstream.

Location:
Facing southeast.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 19

Date:
October 25, 2016

Description:
View of resource S5 looking upstream.

Location:
Facing north.

Photo: 20

Date:
October 25, 2016

Description:
View of resource S5 looking downstream.

Location:
Facing south.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 21

Date:
October 25, 2016

Description:
View of resource S6 looking upstream.

Location:
Facing northwest.

Photo: 22

Date:
October 25, 2016

Description:
View of resource S6 looking downstream.

Location:
Facing southeast.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 23

Date:
December 14, 2016

Description:
View of resource S7 facing upstream.

Location:
Facing north.

Photo: 24

Date:
December 14, 2016

Description:
View of resource S7 facing downstream.

Location:
Facing south.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 25

Date:
October 26, 2016

Description:
View of resource S8 looking upstream.

Location:
Facing south.

Photo: 26

Date:
October 26, 2016

Description:
View of resource S8 looking downstream.

Location:
Facing north.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 27

Date:
October 26, 2016

Description:
View of resource S8A facing upstream.

Location:
Facing south.

Photo: 28

Date:
October 26, 2016

Description:
View of resource S8A facing downstream.

Location:
Facing north.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 29

Date:
October 26, 2016

Description:
View of resource S8C facing upstream.

Location:
Facing south.

Photo: 30

Date:
October 26, 2016

Description:
View of resource S8C facing downstream.

Location:
Facing north.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 31

Date:
October 26, 2016

Description:
View of resource S8D looking upstream.

Location:
Facing south.

Photo: 32

Date:
October 26, 2016

Description:
View of resource S8D looking downstream.

Location:
Facing north.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 33

Date:
December 5, 2016

Description:
View of resource S8E facing upstream.

Location:
Facing south.

Photo: 34

Date:
December 5, 2016

Description:
View of resource S8E facing downstream.

Location:
Facing north.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 35

Date:
October 26, 2016

Description:
View of resource S9 facing upstream.

Location:
Facing west.

Photo: 36

Date:
October 26, 2016

Description:
View of resource S9 facing downstream.

Location:
Facing east.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 37

Date:
December 5, 2016

Description:
View of resource S10 facing upstream.

Location:
Facing west.

Photo: 38

Date:
December 5, 2016

Description:
View of resource S10 facing downstream.

Location:
Facing east.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 39

Date:
August 15, 2016

Description:
View of resource W1.

Location:
Facing southeast.

Photo: 40

Date:
August 15, 2016

Description:
View of resource W1.

Location:
Facing southeast.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 41

Date:
October 26, 2016

Description:
View of resource W2.

Location:
Facing northeast.

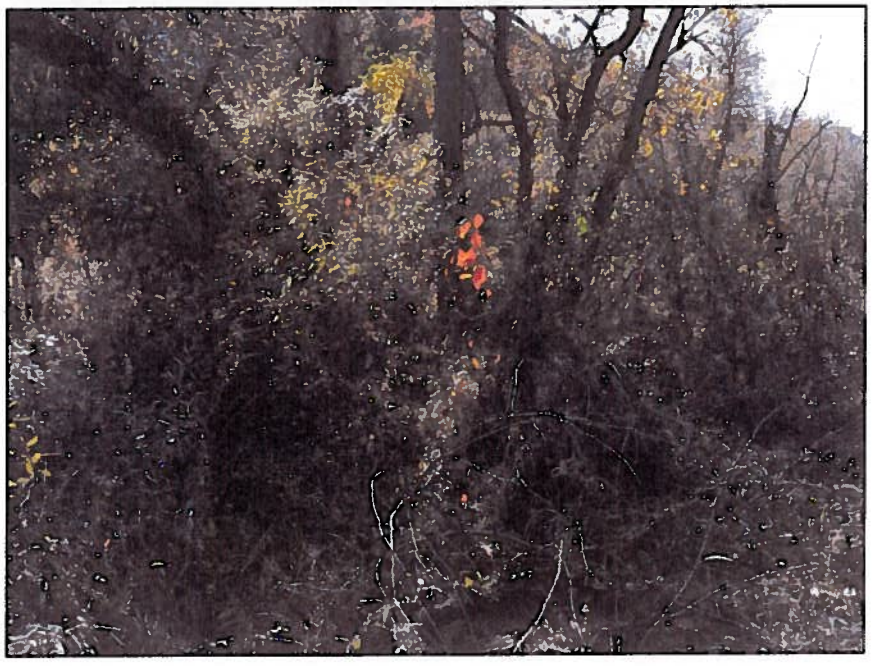


Photo: 42

Date:
October 26, 2016

Description:
View of resource W2A.

Location:
Facing southwest.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 43

Date:
August 16, 2016

Description:
View of resource W3.

Location:
Facing east.

Photo: 44

Date:
October 25, 2016

Description:
View of resource W5.

Location:
Facing south.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 45

Date:
October 25, 2016

Description:
View of resource W6.

Location:
Facing south.

Photo: 46

Date:
October 26, 2016

Description:
View of resource W7.

Location:
Facing east.

Project Photographs

Columbia Gas Transmission, LLC.
Eastern Panhandle Project

Photo: 47

Date:
October 26, 2016

Description:
View of resource W8.

Location:
Facing north.

Photo: 48

Date:
October 26, 2016

Description:
View of resource W10.

Location:
Facing northwest.

APPENDIX C

Vegetation List

Vegetation Observed On Site

Scientific Name	Common Name	Indicator Status[1]
Sedges, Rushes and Grasses		
Bromus arvensis	Field Brome	FACU
Carex spp.	Sedge Spp.	OBL
Cyperus esculentus	Yellow Nutsedge	FACW
Dichanthelium clandestinum	Deer Tongue	FAC
Festuca rubra	Red Fescue	FACU
Glyceria striata	Fowl Manna Grass	OBL
Juncus effusus	Common Rush	FACW
Microstegium vimineum	Japanese Stiltgrass	FAC
Phalaris arundinacea	Reed Canary Grass	FACW
Poa annua	Annual Blue Grass	FACU
Poa pratensis	Kentucky Blue Grass	FACU
Scirpus atrovirens	Green Bulrush	FACW
Forbs		
Amphicarpa bracteata	American Hogpeanut	FACW
Agrimonia parviflora	Harvestlice	FACW
Boehmeria cylindrica	Smallspike False Nettle	FACW
Cichorium intypbus	Chicory	FACU
Coronilla varia	Crown vetch	NI
Daucus carota	Queen Annes's Lace	FACU
Euthamia graminifolia	Flat-Top Goldentop	FACW
Impatiens capensis	Spotted Touch-Me-Not	FACW
Laportea canadensis	Canadian Woodnettle	FAC
Onoclea sensibilis	Sensitive Fern	FACW
Persicaria maculosa	Spotted Lady's Thumb	FACW
Rumex crispus	Curly Dock	FAC
Solidago gigantea	Giant goldenrod	FACW
Typha latifolia	Narrow leaved Cat-tail	OBL
Verbesina alternifolia	Wingstem	FAC
Viola sororia	Common Blue Violet	FAC
Viloa spp.	Violet Spp.	FAC
Trees, Shrubs, and Woody Vines		
Acer saccharinum	Silver Maple	FACW

Vegetation Observed On Site

Elaeagnus umbellata	Autumn Olive	NI
Juglans nigra	Black Walnut	FACU
Juniperus virginiana	Eastern Red Cedar	FACU
Lonicera spp.	Honeysuckle	FAC
Platanus occidentalis	Sycamore	FACW
Prunus serotina	Black Cherry	FACU
Robinia pseudoacacia	Black Locust	FACU
Rubus phoenicolasius	Wine Raspberry	FACU
Rosa multiflora	Multiflora Rose	FACU
Salix nigra	Black Willow	OBL

1. See key to indicator statuses after this table.

Key to Indicator Statuses

OBL: Obligate Wetland, occur almost always (estimated probability >99%) under natural conditions in wetlands.
FACW: Facultative Wetland, usually occur in wetlands (estimated probability 67%-99%), but occasionally found in nonwetlands.
FAC: Facultative, equally likely to occur in wetlands or nonwetlands (estimated probability 34%-66%).
FACU: Facultative Upland, usually occur in nonwetlands (estimated probability 67%-99%), but occasionally found in wetlands (estimated probability 1%-33%).
UPL: Obligate Upland, occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in nonwetlands in the region specified.
NA: Not Applicable, either a plant that was not identified to species level, or is not a vascular plant, or is a parasitic plant.
NI: No Indicator, little or no information available to assign status.
NL: Not Listed, not found on the National Wetlands Plant List
Source: National Wetlands Plant List (NWPL) (Lichvar, 2014)

APPENDIX D

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Eastern Panhandle City/County: Hancock/ Washington Sampling Date: 8/15/16

Applicant/Owner: Columbia Gas Transmission State: MD Sampling Point: SP-W1

Investigator(s): Jon Podeszek, Dan Ley Section, Township, Range:

Landform (hillslope, terrace, etc.): riverine Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR or MLRA): LRRS Lat: 39.715360 Long: -78.206245 Datum: WGS84

Soil Map Unit Name: KcC- Klinesville-Calvin channery loams, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ✓, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

located along banks of stream on bend
-on flat/terrace of stream bank

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 0-10

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

receives hydrology from stream

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP-W1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Amphicarpa bracteata	45	YES	FACW
2. Scirpus atrovirens	40	YES	FACW
3. Solidago gigantea	35	YES	FACW
4. Microstegium vimineum	15	NO	FAC
5. Verbesina alternifolia	10	NO	FAC
6. Typha latifolia	5	NO	OBL
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	150	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	120	x 2 =	240
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		320 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: SP-W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10yr 4/2	100					silt loam	
3-10	10yr 4/2	95	7.5yr 6/8	5	C	PL	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Eastern Panhandle City/County: Hancock/ Washington Sampling Date: 8/15/16

Applicant/Owner: Columbia Gas Transmission State: MD Sampling Point: SP-W1-UPL

Investigator(s): Jon Podeszek, Dan Ley Section, Township, Range: _____

Landform (hillslope, terrace, etc.): riverine Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR or MLRA): LRRS Lat: 39.715384 Long: -78.206190 Datum: WGS84

Soil Map Unit Name: KcC- Klinesville-Calvin channery loams, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

located on terrace adjacent to stream and resource W1
-area appears to be periodically mowed/maintained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP-W1-UPL

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra	35	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	35 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Elaeagnus umbellata	30	YES	NI
2. Rhus typhina	5	NO	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	35 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Daucus carota	15	YES	FACU
2. Verbesina alternifolia	10	YES	FAC
3. Leucanthemum vulgare	10	YES	FACU
4. Symphyotrichum lateriflorum	5	NO	FACW
5. Agrimonia parviflora	2	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	42 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	7	x 2 =	14
FAC species	10	x 3 =	30
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	82 (A)		304 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-W1-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10yr 4/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Eastern Panhandle City/County: Hancock/ Washington Sampling Date: 8/16/16

Applicant/Owner: Columbia Gas Transmission State: MD Sampling Point: SP-W2

Investigator(s): Jon Podeszek, Dan Ley Section, Township, Range: _____

Landform (hillslope, terrace, etc.): riverine Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR or MLRA): LRRS Lat: 39.709284 Long: -78.210883 Datum: WGS84

Soil Map Unit Name: MhB- Monongahela gravelly loam, 3 to 8 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

located along swale directed towards resource S3

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0-12

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP-W2

Tree Stratum (Plot size: 20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	60	YES	OBL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Salix nigra	20	YES	OBL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Agrimonia parviflora	50	YES	FACW
2. Boehmeria cylindrica	15	YES	FACW
3. Euthamia graminifolia	15	YES	FACW
4. Amphicarpa bracteata	12	NO	FACW
5. Verbesina alternifolia	10	NO	FAC
6. Impatiens capensis	10	NO	FACW
7. Glyceria striata	7	NO	OBL
8. Carex spp.	5	NO	OBL
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	124	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	92	x 1 =	92
FACW species	102	x 2 =	204
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	204 (A)		326 (B)

Prevalence Index = B/A = 1.6

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-W2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10yr 3/2	90	7.5yr 4/6	10	C	PL	silt loam	
2-5	10yr 4/1	90	7.5yr 4/6	10	C	PL		
5-12	2.5y 5/2	90	7.5yr 4/6	10	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Easterm Panhandle Project City/County: Hancock/Washington Sampling Date: 10/25/16

Applicant/Owner: Columbia Pipeline Group State: MD Sampling Point: SP-W5

Investigator(s): Larry Budinsky, Jon Podeszek, Dan Ley Section, Township, Range: Hancock

Landform (hillslope, terrace, etc.): 1st Terrace Local relief (concave, convex, none): Concave Slope (%): 3%

Subregion (LRR or MLRA): LRR N Lat: 39.694923 Long: -78.206930 Datum: NAD 83

Soil Map Unit Name: WuD- Wurno-Nollville channery silt loams, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

-Wetland along fringe of seep near pond.
-Spring box exhibiting recharge for wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 4-18

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

-Soils saturated from 4-18 inches.
-No surface water present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-W5

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Salix nigra	5	YES	OBL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Cyperus esculentes	50	YES	FACW
2. Juncus effusus	5	NO	FACW
3. Rumex crispus	10	NO	FAC
4. Dichanthelium clandestinum	20	YES	FAC
5. Viola sororia	10	NO	FAC
6. Persicaria maculosa	20	YES	FACW
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	115	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	75	x 2 =	150
FAC species	40	x 3 =	120
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	120 (A)		275 (B)

Prevalence Index = B/A = 2.29

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-W5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					Silt	Gravel throughout soil
6-18	10YR3/1	90	10YR6/6	10	C	M	Silt	Gravel throughout soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ✓ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Easterm Panhandle Project City/County: Hancock/Washington Sampling Date: 10/25/16

Applicant/Owner: Columbia Pipeline Group State: MD Sampling Point: SP-W5–UP

Investigator(s): Larry Budinsky, Jon Podeszek, Dan Ley Section, Township, Range: Hancock

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 25%

Subregion (LRR or MLRA): LRR N Lat: 39.695024 Long: -78.207078 Datum: NAD 83

Soil Map Unit Name: WuD- Wurno-Nollville channery silt loams, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

-Upland hillslope.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

-Upland hillslope in field.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP-W5--UPL

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	20	YES	FACU
2. Juglans nigra	20	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Elaeagnus umbellata	10	YES	NI
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	10	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Dichanthelium clandestinum	40	YES	FAC
2. Rubus phoenicolasius	20	NO	FACU
3. Festuca rubra	20	NO	FACU
4. Daucus carota	20	NO	UPL
5. Poa pratensis	40	YES	FACU
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	140	= Total Cover	

Woody Vine Stratum (Plot size: 30)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	120	x 4 =	480
UPL species	20	x 5 =	100
Column Totals:	180 (A)		700 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-W5–UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/4	100					Silt	
10								Refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Refusal

Depth (inches): 10 inches

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

-Refusal at 1 inch.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Easterm Panhandle Project City/County: Hancock/Washington Sampling Date: 10/25/16

Applicant/Owner: Columbia Pipeline Group State: MD Sampling Point: W6

Investigator(s): Larry Budinsky, Jon Podeszek, Dan Ley Section, Township, Range: Hancock

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 3%

Subregion (LRR or MLRA): LRR N Lat: 39.688477 Long: -78.204174 Datum: NAD 83

Soil Map Unit Name: CkB- Clearbrook channery silt loam, 0 to 8 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

-Saturation present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 3-18

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

-Saturation present at 3 inches.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W6

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	20	YES	OBL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	20	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Salix nigra	5	YES	OBL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	5	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Onoclea sensibilis	20	NO	FACW
2. Phalaris arundinacea	70	YES	FACW
3. Typha latifolia	20	NO	OBL
4. Agrimonia parviflora	10	NO	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	120	= Total Cover	

Woody Vine Stratum (Plot size: 30)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	145 (A)		245 (B)

Prevalence Index = B/A = 1.69

Hydrophytic Vegetation Indicators:

- ✓ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	80	10YR5/6	20	C	M	Silt Clay	
3-18	10YR3/3	70	10YR6/6	30	C	M	Silt Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ✓ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Easterm Panhandle Project City/County: Hancock/Washington Sampling Date: 10/25/16

Applicant/Owner: Columbia Pipeline Group State: MD Sampling Point: W6-UPL

Investigator(s): Larry Budinsky, Jon Podeszek, Dan Ley Section, Township, Range: Hancock

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3%

Subregion (LRR or MLRA): LRR N Lat: 39.688577 Long: -78.204602 Datum: NAD 83

Soil Map Unit Name: CkB- Clearbrook channery silt loams, 0 to 8 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

-Upland hillslope.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

-No hydrology present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W6-UPL

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Robinia pseudoacacia	10	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Robinia pseudoacacia	10	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	10	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	120	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	120	= Total Cover	

Woody Vine Stratum (Plot size: 30)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	120	x 2 =	240
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	140 (A)		320 (B)

Prevalence Index = B/A = 2.29

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W6-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/5	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ____ No ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Eastern Panhandle City/County: Hancock/ Washington Sampling Date: 8/15/16

Applicant/Owner: Columbia Gas Transmission State: MD Sampling Point: SP-S3-UPL

Investigator(s): Jon Podeszek, Dan Ley Section, Township, Range: _____

Landform (hillslope, terrace, etc.): riverine Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR or MLRA): LRRS Lat: 39.710178 Long: -78.208479 Datum: WGS84

Soil Map Unit Name: Ln- Lindside silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

located on terrace/ floodplain adjacent to stream and resource S3

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP-S3-UPL

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra	55	YES	FACU
2. Platanus occidentalis	40	YES	FACW
3. Acer saccharinum	15	NO	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	110	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. Rosa multiflora	20	YES	NI
2. Lonicera spp.	5	YES	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	25	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Verbesina alternifolia	55	YES	FAC
2. Rosa multiflora	15	NO	FACU
3. Microstegium vimineum	10	NO	FAC
4. Laportea canadensis	5	NO	FAC
5. Agrimonia parviflora	2	NO	FACW
6. Dichanthelium clandestinum	2	NO	FAC
7. Viola spp.	5	NO	FAC
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	94	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	57	x 2 =	114
FAC species	82	x 3 =	246
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	209 (A)		640 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-S3-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10yr 4/3	100					silt loam	
3-12	10yr 4/4	100					sitly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Attachment 6

Copy of Permit Fee Check

219136

ARCADIS for natural and built assets

630 Plaza Drive, Suite 600 • Highlands Ranch Colorado 80129
Tel 720/344-3500 • Fax 720/344-3535

Bank of America, N.A.
70-2328/719 IL

CHECK DATE
March 7, 2017

PAY Seven Hundred Fifty and 00/100

AMOUNT
$750.00

TO MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
REGULATORY SERVICES COORDINATION OFFICE
1800 WASHINGTON BOULEVARD, SUITE 430
BALTIMORE, MD 21230

ARCADIS

MP

VOID AFTER 90 DAYS

Security Check feature included Details on back

⑈219136⑈ ⑆071923284⑆ 876503044 2⑈

EMILY BUSINESS FORMS 800 392 6018 VISION

ARCADIS for natural and built assets

630 Plaza Drive, Suite 600 • Highlands Ranch, Colorado 80129 Tel 720/344-3500 • Fax 720/344-3535

219136

Check Date: 3/7/2017

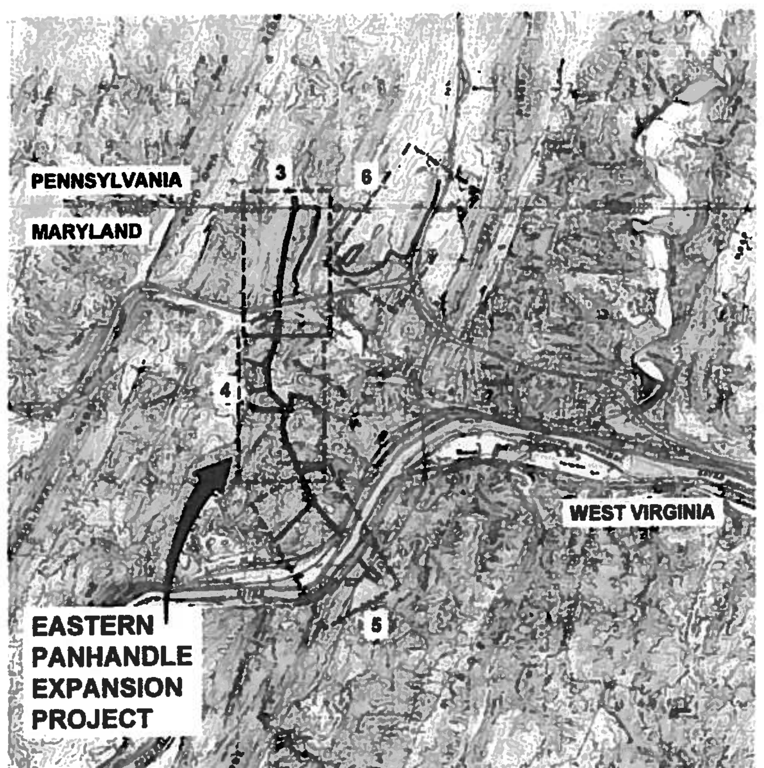
Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
03062017	3/6/2017	2283228	$750.00			$750.00
MARYLAND DEPARTMENT OF THE		TOTAL	$750.00			$750.00
204 - AP DISB (CHECKS) - 6		0003011				

Attachment 7

Plans

EROSION AND SEDIMENT CONTROL PLAN
EASTERN PANHANDLE EXPANSION PROJECT

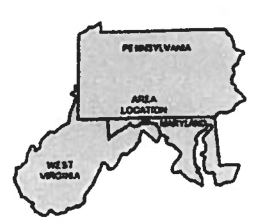
WASHINGTON COUNTY, MARYLAND



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE, HANCOCK, MD - WV - PA, 1996

LOCATION MAP

0 4000' 8000
GRAPHIC SCALE



MARCH 2017

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

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

(Seal: STATE OF MARYLAND, PROFESSIONAL ENGINEER, No. 34852) 3/13/17

KEY CONTACTS:

OWNER:
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY
5151 SAN FELIPE, SUITE 2400
HOUSTON, TX 77056
TELEPHONE: 713.386.3302
CONTACT: WADE ABBOTT

ENGINEERING FIRM:
ARCADIS U.S., INC.
6041 WALLACE ROAD EXTENSION, SUITE 300
WEXFORD, PA 15090
TELEPHONE: 724.934.9562
CONTACT: ALLEN LONG, P.E.

MARYLAND ONE-CALL
TELEPHONE: 811 OR 1.800.257.7777

INDEX TO DRAWINGS

COVER SHEET
1. GENERAL NOTES
2. GENERAL NOTES AND LEGEND
3. OVERALL SITE PLAN (STA 0+00 TO 59+00)
4. OVERALL SITE PLAN (STA 59+00 TO 126+00)
5. OVERALL SITE PLAN (STA 126+00 TO 177+74)
6. OVERALL SITE PLAN (CONTRACTOR STAGING AREA AND TEMPORARY ACCESS ROAD TAR-1)
7. SITE PLAN (STA. 0+00 TO 6+50)
8. SITE PLAN (6+50 TO 16+00)
9. SITE PLAN (16+00 TO 25+50)
10. SITE PLAN (25+50 TO 34+50)
11. SITE PLAN (34+50 TO 44+00)
12. SITE PLAN (44+00 TO 53+50)
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14. SITE PLAN (69+00 TO 78+00)
15. SITE PLAN (78+00 TO 88+00)
16. SITE PLAN (88+00 TO 105+00)
17. SITE PLAN (CATHODIC PROTECTION ANODE GROUNDBED AT STA 94+00)
18. SITE PLAN (CATHODIC PROTECTION ANODE GROUNDBED AT STA 94+25)
19. SITE PLAN (STA 105+00 TO 120+50)
20. SITE PLAN (STA. 120+50 TO 136+00)
21. SITE PLAN (136+00 TO 151+50)
22. SITE PLAN (CATHODIC PROTECTION ANODE GROUNDBED AT STA 136+00)
23. SITE PLAN (STA 151+50 TO 167+00)
24. SITE PLAN (STA 167+00 TO 177+74)
25. SITE PLAN (CONTRACTOR STAGING AREA AND TEMPORARY ACCESS ROAD TAR-1)
26. SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)
27. SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)
28. SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)
29. SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)
30. PROPOSED STREAMS S1E AND S1 CULVERT REPLACEMENTS PLANS AND PROFILES
31. PROPOSED STREAM CROSSING S2 AND STREAM S8B CULVERT REPLACEMENT AND PLANS AND PROFILES
32. PROPOSED STREAM CROSSINGS S2 AND S4 AND WETLAND CROSSING W6 PLANS AND PROFILES
33. MISCELLANEOUS DETAILS
34. MISCELLANEOUS DETAILS
35. MISCELLANEOUS DETAILS
36. MISCELLANEOUS DETAILS
37. MISCELLANEOUS DETAILS

PURPOSE:

THE PURPOSE OF THIS EROSION AND SEDIMENT CONTROL PLAN (ESCP) IS TO ENSURE COMPLIANCE WITH THE RULES AND REGULATIONS OF THE WASHINGTON COUNTY SOIL CONSERVATION DISTRICT (WSCD), THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE), AND THE CODE OF MARYLAND REGULATIONS (COMAR), 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 EASTERN PANHANDLE EXPANSION (EPE) PROJECT CONSTRUCTION ACTIVITIES ARE ANTICIPATED TO BEGIN IN 2018. 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 WSCD.

CONSTRUCTION PREPARATION ACTIVITIES:

1. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE MARYLAND ONE CALL SYSTEM, INC. AT 1-800-257-7777 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. AT LEAST 5 DAYS PRIOR TO COMMENCING ANY WORK IN CONJUNCTION WITH THE APPROVED FINAL ESCP, THE WSCD SHALL BE NOTIFIED.
3. PRIOR TO THE START OF CONSTRUCTION, A REQUEST FOR A PRE-CONSTRUCTION MEETING MUST BE MADE TO THE WSCD.
4. SURVEY AND STAKEOUT 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.
5. MARK OR FENCE FOR PROTECTION WETLAND BOUNDARIES AND OTHER ENVIRONMENTALLY SENSITIVE AREAS.
6. MOBILIZE CREW, FACILITIES, EQUIPMENT, AND MATERIALS REQUIRED TO COMPLETE THE WORK.
7. INSTALL 50-FOOT LONG ROCK CONSTRUCTION ENTRANCES WHERE LOCATED ON THE ESCP DRAWINGS. TIRE WASH RACKS WILL BE INSTALLED IF REQUIRED TO CONTROL THE TRACKING OF SEDIMENT ONTO PAVED ROADWAYS.
8. INSTALL SILT FENCE AND INTERCEPTOR DIVERSIONS AT THE LOCATIONS SHOWN ON THE ESCP DRAWINGS AND DOWNGRADIENT OF EARTH DISTURBANCE ACTIVITIES WHERE NECESSARY/APPROPRIATE.
9. NOTIFY THE WSCD FOLLOWING INSTALLATION OF EROSION AND SEDIMENT CONTROLS.
10. 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.
11. 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.
12. 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 ROCK 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 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.
5. INSTALL SILT FENCING AND WEIGHTED SEDIMENT FILTER TUBES AT THE ENDS OF THE TEMPORARY BRIDGE CROSSINGS AS INDICATED ON THE ESCP DRAWINGS.
6. 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.
7. 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.
8. DEWATER THE PROPOSED TRENCH ALIGNMENT THROUGH THE STREAM BY PUMPING THE WATER TO A PUMP FILTER BAG LOCATED A MINIMUM OF 50 FEET FROM THE TOP OF THE STREAM BANK IN A WELL-VEGETATED AREA.
9. EXCAVATE THE PIPELINE TRENCH TO A DEPTH THAT WILL ALLOW FOR THE REQUIRED MINIMUM COVER TO BE PLACED OVER THE PIPELINE AFTER BACKFILLING.
10. 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.
11. INSTALL THE PIPELINE WITHIN THE TRENCH AND INSTALL TRENCH PLUGS AT EITHER SIDE OF THE STREAM CHANNEL AS INDICATED ON THE ESCP DRAWINGS.
12. BACKFILL THE TRENCH WITH SPOIL MATERIAL AND RETURN ALL STREAMBANKS TO PRE-CONSTRUCTION CONTOURS.
13. REMOVE THE UPSTREAM AND DOWNSTREAM SANDBAG DIVERSION DAMS AND BYPASS PUMP INTAKES, PUMP, AND ENERGY DISSIPATER.
14. APPLY PERMANENT SEEDING TO DISTURBED RIPARIAN AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON THIS SHEET.
15. REMOVE TEMPORARY BRIDGE STREAM CROSSING AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF WORK ACTIVITIES REQUIRING THE CROSSING.
16. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
17. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

PIPELINE INSTALLATION – HORIZONTAL DIRECTION DRILL LOCATIONS:

1. VERIFY EROSION AND SEDIMENT CONTROLS HAVE BEEN INSTALLED IN ACCORDANCE WITH THESE DRAWINGS AND TO THE SATISFACTION OF THE ENVIRONMENTAL INSPECTOR.
2. PERFORM EXCAVATION WHERE NECESSARY TO DRILL THE PILOT HOLE ALONG THE PRE-DETERMINED ALIGNMENT WITH A CONTINUOUS STRING STEEL DRILL ROD.
3. ATTACH A BACK REAMER TO THE STEEL DRILL ROD WHEN THE BORE HEAD AND ROD EMERGE ON THE OPPOSITE SIDE OF THE CROSSING.
4. 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.
5. INJECT DRILLING MUD (E.G., FLUID BENTONITE CLAY) INTO THE BORE DURING CUTTING AND REAMING TO STABILIZE THE HOLE AND REMOVE SOIL CUTTINGS.
6. PULL THE ENTIRE PIPELINE LENGTH IN ONE SEGMENT BACK THROUGH THE DRILLING MUD ALONG THE REAMED-HOLE PATHWAY.
6. BACKFILL THE EXCAVATION 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).
7. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
8. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

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 WSCD.
2. REMOVAL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES UPON APPROVAL OF WSCD.
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 WSCD AT THE FOLLOWING STAGES OF THE PROJECT, UNLESS OTHERWISE DIRECTED BY WSCD 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. MDE AND OTHER 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 (WSCD) SHALL BE NOTIFIED OF ANY SUBSTANTIVE CHANGES TO THE APPROVED ESCP PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY (WSCD) 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 ENSITE USA DATED JANUARY 25, 2017.
2. FEATURE DATA WITHIN THE PROJECT AREA IS BASED UPON GPS SURVEY PROVIDED BY ENSITE USA ON JANUARY 23, 2017 AND DIGITIZED INFORMATION OBTAINED FROM GOOGLE EARTH AERIAL IMAGERY.
3. EXISTING CONTOURS ARE SHOWN AT A 2-FOOT CONTOUR INTERVAL.
4. AERIAL IMAGERY OBTAINED FROM ENSITE USA ON JANUARY 25, 2017.
5. PRELIMINARY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOODPLAIN BOUNDARY INFORMATION DATED AUGUST 14, 2013 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)
   d. WOULD BE ACCEPTABLE.
   e. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
   f. 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.

OWNER'S/DEVELOPER'S CERTIFICATION

WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATION OF ATTENDANCE AT A MARYLAND DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE THE BEGINNING OF THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY STATE OF MARYLAND, DEPARTMENT OF THE ENVIRONMENT, COMPLIANCE INSPECTORS.

DATE ____________ 716-386-3302 PHONE NUMBER

OWNER/DEVELOPER SIGNATURE

5151 SAN FELIPE, SUITE 2400, HOUSTON, TX 77056
ADDRESS

WADE ABBOTT, NATURAL RESOURCES PERMITTING PRINCIPAL
PRINTED NAME AND TITLE

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN OF EROSION & SEDIMENT CONTROL AND/OR POND DESIGN IS/ARE IN ACCORDANCE WITH THE 2011 STANDARDS AND SPECIFICATIONS AND ANY OTHER LOCAL OR STATE REQUIREMENTS. ANY STORMWATER STRUCTURES ARE DESIGNED IN ACCORDANCE WITH THE GARRETT COUNTY STORMWATER MANAGEMENT ORDINANCE AND ACCEPTED STANDARDS OF ENGINEERING PRACTICE.

3/13/17 DATE — 724-934-9562 PHONE NUMBER

DESIGNER'S SIGNATURE

34862 MD REGISTRATION NUMBER — ALLEN R. LONG PRINTED NAME

P.E. R.L.S. R.L.A. (CIRCLE)

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 348862, EXPIRATION DATE: 08-13-2017.

SIGNATURE ____________ 3/13/17 DATE

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

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

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — ALLEN R. LONG — No. 34862 — PROFESSIONAL ENGINEER — 3/13/17

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

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

GENERAL NOTES

ARCADIS Project No. CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel 724 742 9180

1

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 / MOUNTABLE BERMS	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 AND EROSION AT THE DISCHARGE POINT AND INSTALL MEASURES TO PREVENT FURTHER EROSION. IMMEDIATELY REPAIR LEAKS OR DAMAGES TO THE IMPERVIOUS DAM.

SUMMARY OF QUANTITIES

DESCRIPTION	QUANTITY	UNIT
PROJECT/DISTURBED AREA	52.9	ACRES
PIPELINE LENGTH	17,774	LINEAR FEET
SILT FENCE	10,700	LINEAR FEET
SUPER SILT FENCE	8,800	LINEAR FEET
STABILIZED CONSTRUCTION ENTRANCE (SCE)	16	EACH
SCE WITH WASH RACK	AS REQUIRED FOR SEDIMENT REMOVAL	
STONE PER SCE	15	CUBIC YARDS
GEOTEXTILE UNDERLAYMENT PER SCE	750	SQUARE FEET
INTERCEPTOR DIVERSIONS	59	EACH
TRENCH PLUGS	18	EACH
SOIL STABILIZATION MATTING	130,000	SQUARE FEET
TEMPORARY ACCESS BRIDGE	3	EACH
TIMBER MATS FOR WETLAND CROSSING	60	LINEAR FEET
WEIGHTED SEDIMENT FILTER TUBE	12	LOCATIONS
DAM AND PUMP BYPASS STREAM CROSSING	4	EACH
MOUNTABLE BERMS	10	EACH
HORIZONTAL DIRECTION DRILLING ENTRY/EXIT	2	EACH
TEMPORARY SEEDING (SOIL STOCKPILES)	2.6	ACRES
PERMANENT SEEDING (WETLAND SEED MIX)	0.1	ACRES
PERMANENT SEEDING (RESIDENTIAL AREAS)	1.7	ACRES
PERMANENT SEEDING (UTILITY RIGHT-OF-WAY)	51.1	ACRES

LEGEND:

- APPROXIMATE STATE BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY
- EXISTING BUILDING
- EXISTING ELEVATION CONTOUR (990)
- EXISTING FENCE LINE
- EXISTING ROAD
- EXISTING GRAVEL ROAD
- AQUATIC RESOURCE (I.E. STREAM OR WETLAND) ID (S8, W1)
- EXISTING STREAM
- STREAM FLOW DIRECTION
- EXISTING WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING L10240, L1804, AND L138 GAS TRANSMISSION LINES
- PROPOSED 8"ø EPE GAS TRANSMISSION LINE (60+00)
- PROPOSED 8"ø EPE GAS TRANSMISSION LINE MILEPOST MARKER (M 0.0)
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING UNDERGROUND CABLE LINE
- EXISTING CULVERT
- EXISTING WATER WELL
- EXISTING POWER POLE
- EXISTING GUY WIRE ANCHOR
- EXISTING RAILROAD
- FEMA FLOODPLAIN BOUNDARY
- EXISTING TREELINE
- LIMIT OF DISTURBANCE (LOD)
- PROPOSED HDD ENTRY/EXIT LOCATION
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- INTERCEPTOR DIVERSION (ID) (1/34)
- TRENCH PLUG (TP) (2/34)
- SILT FENCE (SF) (3/33)
- SUPER SILT FENCE (SSF) (4/33)
- DAM AND PUMP BYPASS (P) (4/35)
- FILTER BAG (FB) (3/34)
- TEMPORARY ACCESS BRIDGE (2/35)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/33) (2/33)
- SOIL STABILIZATION MATTING (1/35)
- WETLAND CROSSING (1/36)
- WEIGHTED SEDIMENT FILTER TUBE (2/36)
- MOUNTABLE BERM (4/36)
- X/X — DETAIL REFERENCE NUMBER / DRAWING REFERENCE NUMBER

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: R.OBERLANDER L.FORAKER LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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XREFS: CPGL00EP-X00

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

No	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No: MD 34862
State: MD | Date Signed: | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — ALLEN R. LONG — No. 34862 — PROFESSIONAL ENGINEER — 3/13/17

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

COLUMBIA GAS TRANSMISSION, LLC A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

GENERAL NOTES AND LEGEND

ARCADIS Project No: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9180

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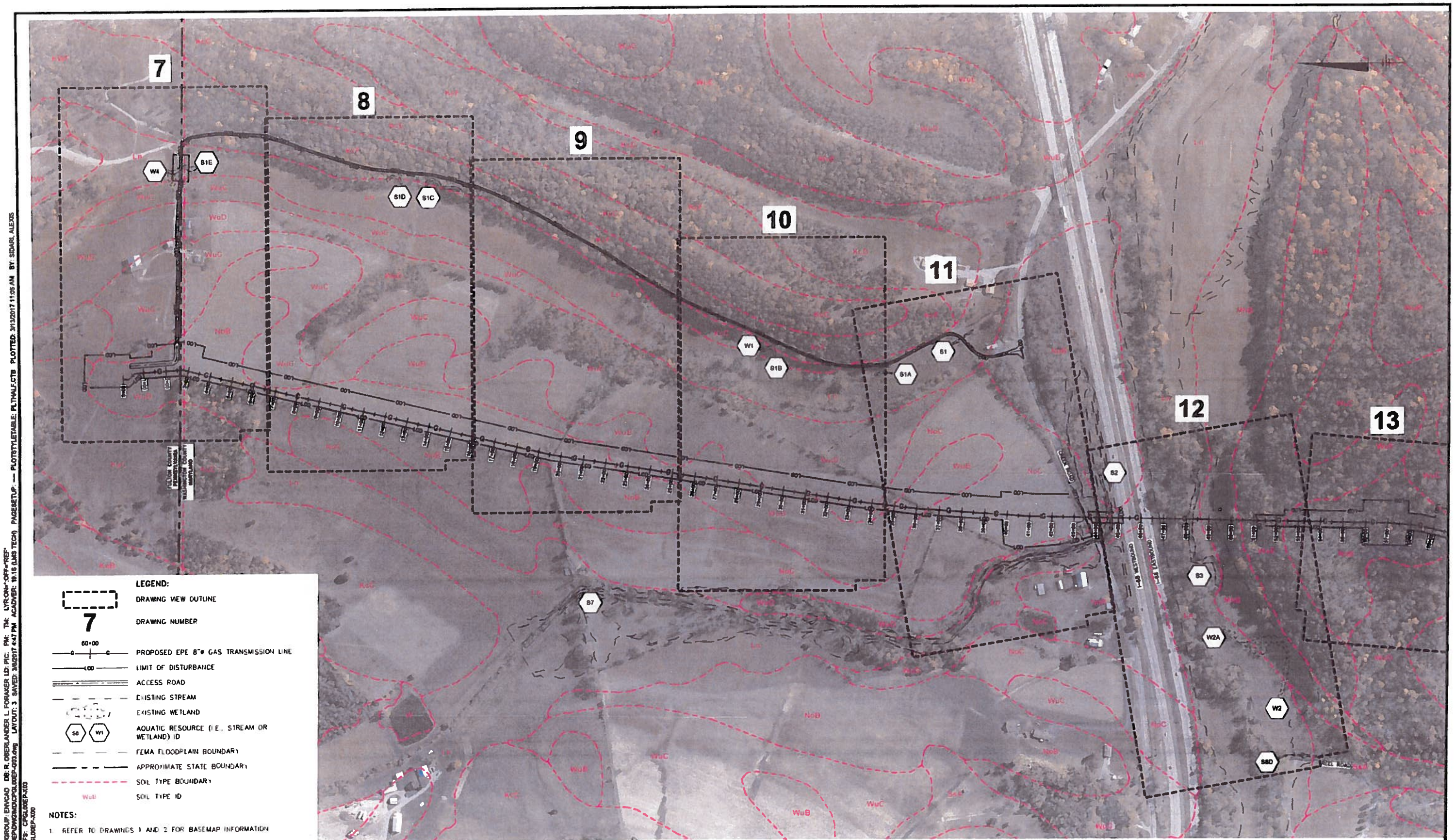

LEGEND:

- DRAWING VIEW OUTLINE
- 7 — DRAWING NUMBER
- 60+00 — PROPOSED EPE 8"ø GAS TRANSMISSION LINE
- LOD — LIMIT OF DISTURBANCE
- ACCESS ROAD
- EXISTING STREAM
- EXISTING WETLAND
- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- FEMA FLOODPLAIN BOUNDARY
- APPROXIMATE STATE BOUNDARY
- SOIL TYPE BOUNDARY
- WuB — SOIL TYPE ID

NOTES:

1. REFER TO DRAWINGS 1 AND 2 FOR BASEMAP INFORMATION

200' 0 200' 400'
1"=200'

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

No	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG		
Professional Engineer's No.: MD 34882		
State: MD	Date Signed:	Project Mgr: JD
Designed by: ALS	Drawn by: ALS	Checked by: ARL

STATE OF MARYLAND — ALLEN RAY LONG — No. 34882 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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

EASTERN PANHANDLE EXPANSION PROJECT

OVERALL SITE PLAN - STA. 0+00 TO 59+00

ARCADIS Project No: CPGL00EP.0001.0006A	
Date: MARCH 2017	
ARCADIS 6041 Wallace Road Extension Suite 300 Wexford, PA 15090 Tel: 724.742.9180	3

CITY: SYRACUSE, NY DIVGROUP: ENVCAD DB: R. OBERLANDER LD: FIC: PM: TM: LYR:ON=*;OFF=*REF* O:\CAD\ACAD\Proj\CPGL00EP\DWG\MDCPGL00EP-0003.dwg LAYOUT: 3 SAVED: 3/6/2017 4:47 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTHALF.CTB PLOTTED: 3/13/2017 11:05 AM BY: SIDARI, ALEXIS
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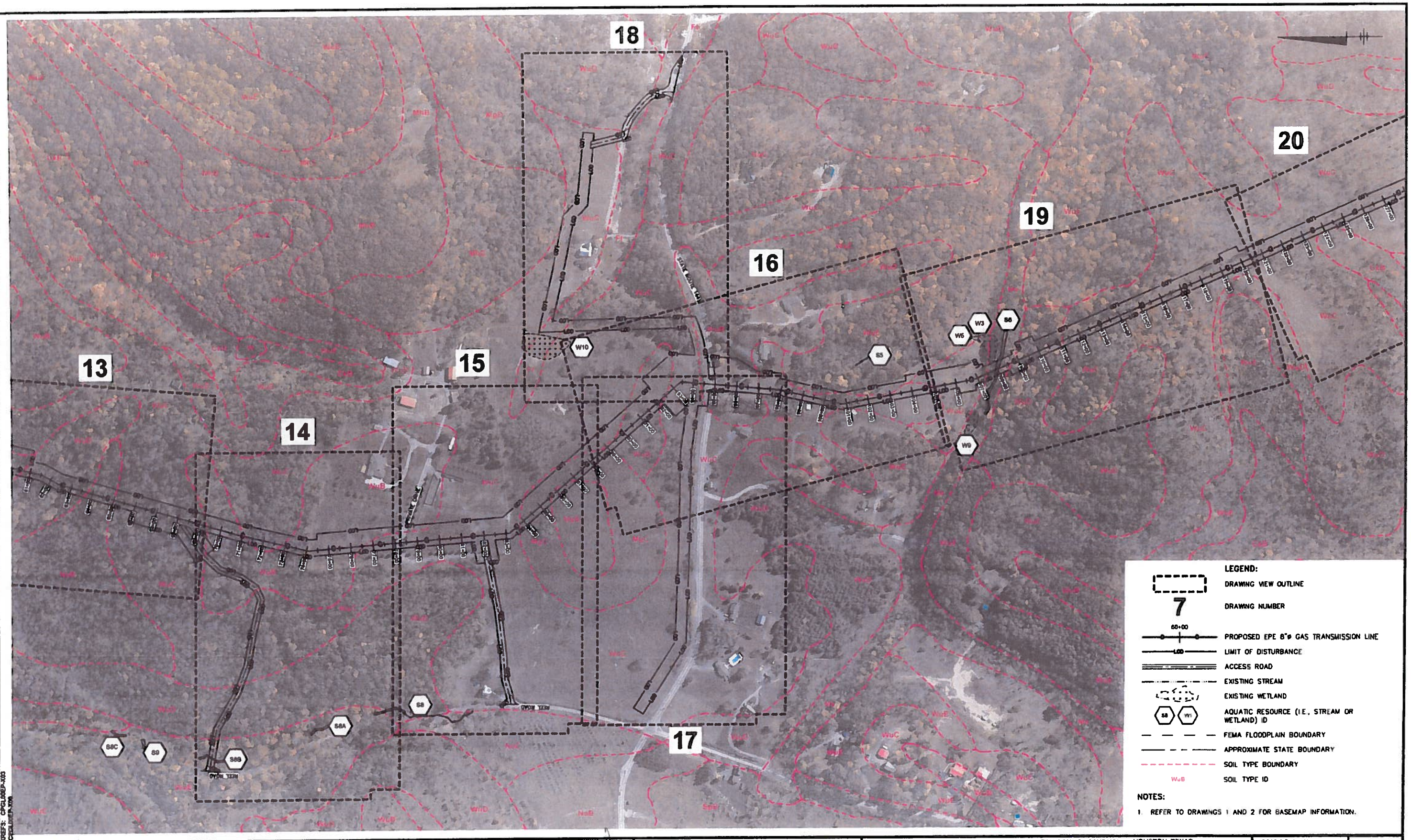

LEGEND:

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No	Date	Revisions	By	Chd

Professional Engineer's Name		
ALLEN R. LONG		
Professional Engineer's No		
MD 34862		
State	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND — ALLEN R. LONG — NO. 34862 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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

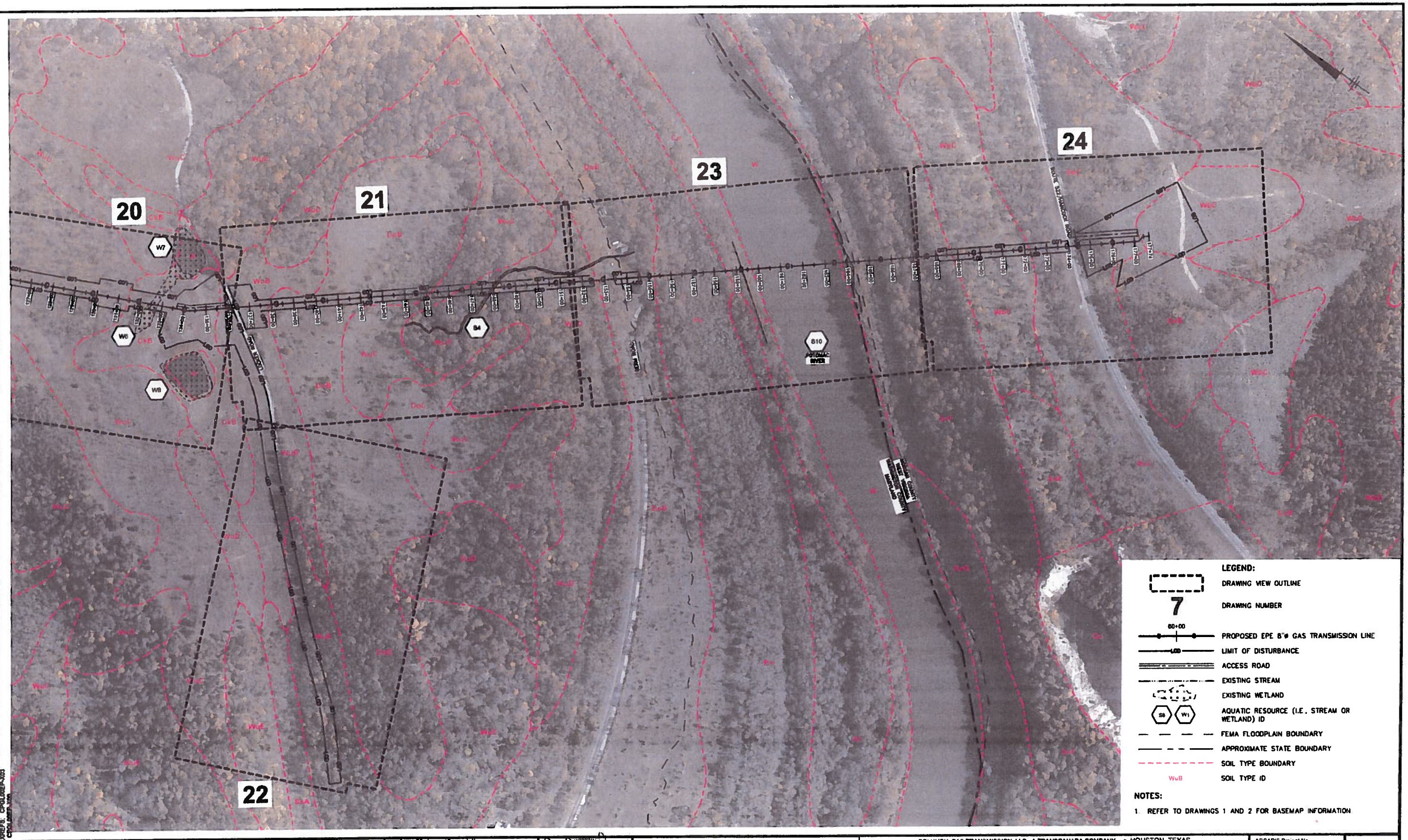
EASTERN PANHANDLE EXPANSION PROJECT

OVERALL SITE PLAN - STA. 59+00 TO 126+00

ARCADIS Project No	CPGL00EP.0001.0008A
Date	MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford PA 15090
Tel: 724.742.9180

4



LEGEND:

- DRAWING VIEW OUTLINE
- 7 — DRAWING NUMBER
- 60+00 — PROPOSED EPE 8"ø GAS TRANSMISSION LINE
- LOD — LIMIT OF DISTURBANCE
- ACCESS ROAD
- EXISTING STREAM
- EXISTING WETLAND
- AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
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- APPROXIMATE STATE BOUNDARY
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NOTES:

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200' 0 200' 400'
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No	Date	Revisions	By	Chd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No: MD 34882

State	Date Signed	Project Mgr
MD		JD
Designed by: ALS	Drawn by: ALS	Checked by: ARL

STATE OF MARYLAND — ALLEN ROBERT LONG — No. 34882 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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

EASTERN PANHANDLE EXPANSION PROJECT

OVERALL SITE PLAN - STA. 126+00 TO 177+74

ARCADIS Project No: CPGLODEP.0001.0009A
Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford PA 15090
Tel: 724.742.9100

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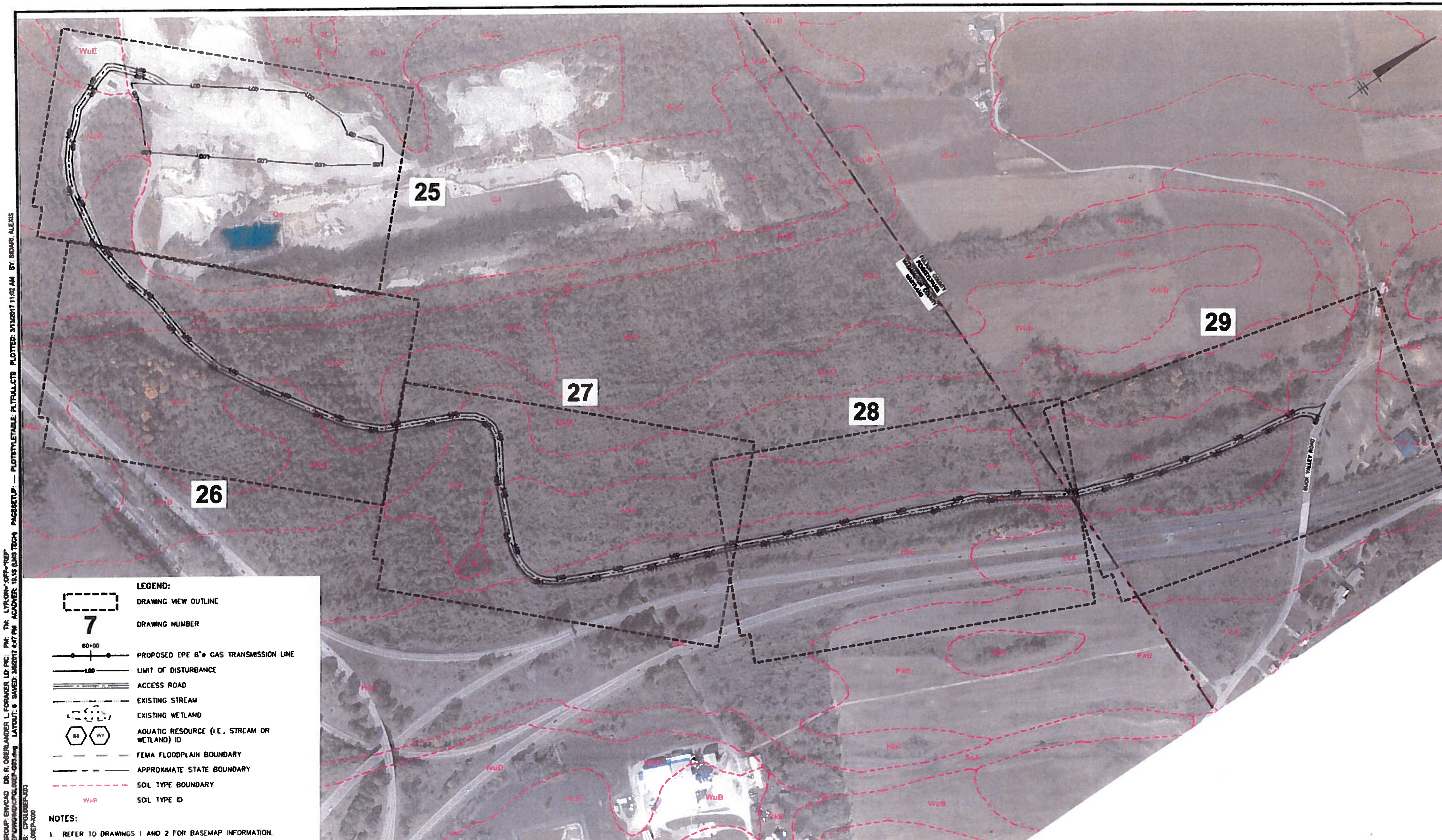

LEGEND:

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- 7 — DRAWING NUMBER
- PROPOSED EPE 8"⌀ GAS TRANSMISSION LINE
- LIMIT OF DISTURBANCE
- ACCESS ROAD
- EXISTING STREAM
- EXISTING WETLAND
- AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- FEMA FLOODPLAIN BOUNDARY
- APPROXIMATE STATE BOUNDARY
- SOIL TYPE BOUNDARY
- WuB — SOIL TYPE ID

NOTES:

1. REFER TO DRAWINGS 1 AND 2 FOR BASEMAP INFORMATION.

1" = 200' (scale bar: 200' 0 200' 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: ALLEN R. LONG
Professional Engineer's No: MD 34862

State	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND — ALLEN R. LONG — No. 34862 — PROFESSIONAL ENGINEER

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

OVERALL SITE PLAN - CONTRACTOR STAGING AREA AND TEMPORARY ACCESS ROAD TAR-1

ARCADIS Project No: CPGL00EP.0001.0006A
Date: MARCH 2017
ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel. 724.742.9180

6

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: R. OBERLANDER L. FORAKER LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
G:\CADD\ACAD\Proj\CPGL00EP\DWG\MEK\CPGL00EP-G03.dwg LAYOUT: 6 SAVED: 3/8/2017 4:47 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/13/2017 11:02 AM BY: SIDARI, ALEXIS
XREFS: CPGL00EP-X03 CPGL00EP-X00

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TEMPORARY EARTH DISTURBANCE IN PENNSYLVANIA WILL BE CONDUCTED UNDER A SEPARATE EROSION AND SEDIMENT CONTROL PLAN REVIEW. ONLY WORK IN MARYLAND IS INCORPORATED WITHIN THIS PLAN.
3. SILT FENCE HAS BEEN PROPOSED AROUND THE PERIMETER OF AQUATIC RESOURCES (I.E., WETLANDS/STREAMS) PER FERC REGULATIONS, UNDERSTANDING THAT THE CONTROLS DO NOT FOLLOW THE ELEVATION CONTOURS IN ALL LOCATIONS.
4. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
5. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
6. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
8. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
9. THE PORTION OF EXISTING ACCESS ROAD PAR-1 FROM APPROXIMATELY STATION 0+00 TO 12+00 IS AN EXISTING DIRT FARM ROAD THAT WILL BE IMPROVED WITH THE PLACEMENT OF STONE. THE REMAINING PORTION OF EXISTING ACCESS ROAD PAR-1 IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

EXISTING 24" CPG LINE 10240 ROW
EXISTING 24" CPG LINE 10240
EXISTING 20" CPG LINE 1804
EXISTING 20" CPG LINE 1804 ROW
MAINLINE VALVE AND TIE-IN ASSEMBLY AREA
3/33 SILT FENCE (TYP.)
PROPOSED EPE 8" PIPELINE
EXISTING CPG LINE 138
PERMANENT GRAVEL ACCESS ROAD PAR-1 TO BE IMPROVED (SEE NOTE 9) 2/37
4/36 MOUNTABLE BERM (TYP.)
FULTON COUNTY PENNSYLVANIA
WASHINGTON COUNTY MARYLAND
3/33 SILT FENCE
APPROXIMATE TRENCH LIMITS
1/34 INTERCEPTOR DIVERSION (TYP.)
LARRY A. & VICKY L. ROLLINS
EXISTING BUILDING
EXISTING WATER WELL
EXISTING BUILDING
HEATHER & JAMES W. TRAIL
4/35 DAM AND PUMP BYPASS
2/36 WEIGHTED SEDIMENT FILTER TUBE (TYP.)
W4
S1E
BEGIN ACCESS ROAD IMPROVEMENTS (SEE NOTE 9)
FULTON COUNTY PENNSYLVANIA
WASHINGTON COUNTY MARYLAND
EXISTING CULVERTS TO BE REPLACED
APPROXIMATE CENTERLINE OF EXISTING ACCESS ROAD PAR-1 (WILL NOT BE IMPROVED)
REFER TO DRAWING 30 FOR PLAN AND PROFILE
RONALD GOLDEN

FOR CONTINUATION SEE DRAWING 8

XREFS: CPGL006EP-X00, CPGL006EP-X01, CPGL006EP-X02

1" = 50' (50' 0 50' 100')

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

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34882

Drawn by	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND — ALLEN RICHARD LONG — No. 34882 — PROFESSIONAL ENGINEER

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

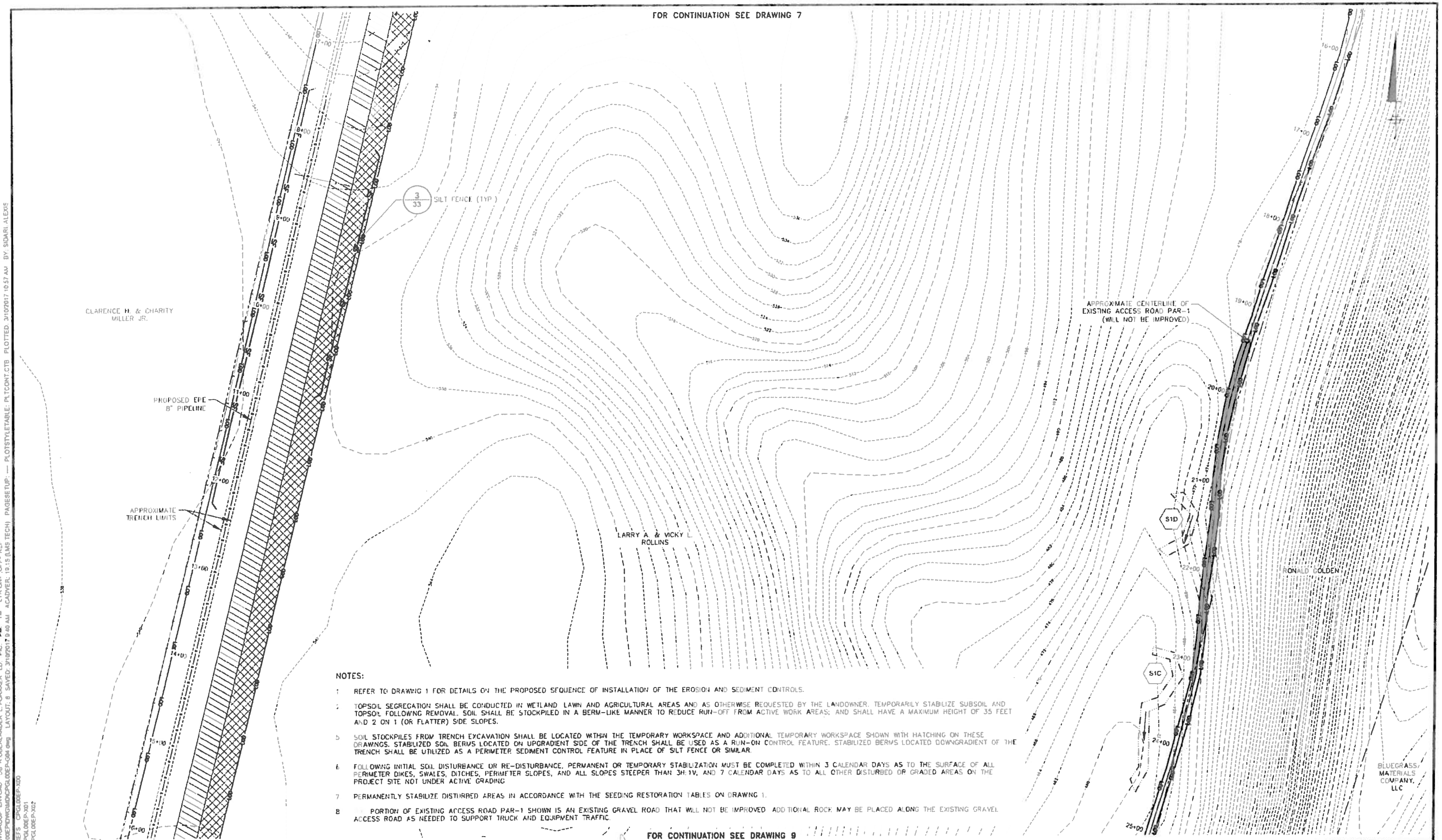
COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 0+00 TO 6+50)

ARCADIS Project No.: CPGL006EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724 742 6180

7

FOR CONTINUATION SEE DRAWING 7



NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
5. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
6. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
7. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
8. A PORTION OF EXISTING ACCESS ROAD PAR-1 SHOWN IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

FOR CONTINUATION SEE DRAWING 9

1"=50' (50' 0 50' 100')

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

No.	Date	Revisions	By	Chkd

Professional Engineer's Name		
ALLEN R. LONG		
Professional Engineer's No.		
MD 34862		
State	Date Signed	Project Mgr.
MD		JD
Designed by	Drawn By	Checked By
ALS	ALS	ARL

STATE OF MARYLAND ALLEN R. LONG NO. 34862 PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC

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

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 6+50 TO 16+00)

ARCADIS Project No.	CPGL006P.0001.D008A
Date	MARCH 2017
ARCADIS	6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9...fax:

8

FOR CONTINUATION SEE DRAWING B

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS AND SHALL HAVE A MAXIMUM HEIGHT OF [illegible] FEET AND A [illegible] (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
5. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
6. THE PORTION OF EXISTING ACCESS ROAD PAR-1 SHOWN IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

CLARENCE H. & CHARITY MILLER JR.

LARRY A. & VICKY L. ROLLINS

APPROXIMATE TRENCH LIMITS

PROPOSED EPE 8" PIPELINE

3/33 SILT FENCE

APPROXIMATE CENTERLINE OF EXISTING ACCESS ROAD PAR-1 (WILL NOT BE IMPROVED)

RONALD GOLDEN

MICHAEL H. & CHARLOTTE HOFFMAN

FOR CONTINUATION SEE DRAWING 10

CITY SYRACUSE NY DIV/GROUP ENVCAD DB R OBERLANDER L FORAKER I.D: PIC PM TM- LYR:ON=*;OFF=*REF* G:\CADD\ACADP\rg\CPGL006EP\DWG\MD\CPGL006EP-GD4.dwg LAYOUT 9 SAVED 3/10/2017 9:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP — PLOTSTYLETABLE: PLTCONT.CTB PLOTTED 3/10/2017 10:57 AM BY: SIDARI ALEXIS

XREFS: CPGL006P-X00
CPGL006P-X01
CPGL006P-X02

50' 0 50' 100'
1"=50'

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

No	Date	Revisions	By	Lkd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed: [illegible] | Project Mgr.: [illegible]
Designed: A.S | Drawn: A.S | Checked: ARL

STATE OF MARYLAND ALLEN ROBERT LONG No. 34862 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC

COLUMBIA GAS TRANSMISSION, LLC A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 16+00 TO 25+50)

ARCADIS Project No.: CPGL006EP.0001.0008A
Date: MARCH 2017
ARCADIS
6041 Wilkinson Road Extension
Suite 200
Westerville, Ohio 43082
Tel: 614.895.3743

9

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS, AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
5. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
6. THE PORTION OF EXISTING ACCESS ROAD PAR-1 SHOWN IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

FOR CONTINUATION SEE DRAWING 9

FOR CONTINUATION SEE DRAWING 11

1"=50' (50' 0 50' 100')

THIS BAR REPRESENTS ONE INCH (2.0") ON ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.

No	Date	Revisions	By	Chk

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34802

Date	Date Signed	Project Mgr
MD		JD
Designed By	Drawn By	Checked By
ALS	ALS	ARL

STATE OF MARYLAND — ALLEN RANDOLPH LONG — No. 34802 — PROFESSIONAL ENGINEER

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 25+50 TO 34+50)

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS: 6041 Wallace Road Extension, Suite 300, Westerville, OH 43082, Tel: 740.742.9180

10

CITY: SYRACUSE, NY DIV/GROUP: ENV/CAD DB: R.OBERLANDER L: F.FORAKER LO: PIC: PM: TM: LYR:ON=*;OFF=*REF* G:\CAD\ACAD\Proj\CPGL00EP\WO\MD\CPGL00EP-004.dwg LAYOUT: 10 SAVED: 3/10/2017 9:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 3/10/2017 10:57 AM BY: SIDARI, ALEXIS
XREFS: CPGL00EP-X00 CPGL00EP-X01 CPGL00EP-X02

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
5. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
6. THE PORTION OF EXISTING ACCESS ROAD PAR-1 SHOWN IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.
7. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY. EQUIPMENT ACCESS TO THESE AREAS WILL BE REQUIRED.
8. ACTUAL LOCATIONS OF STABILIZED CONSTRUCTION ENTRANCES MAY BE ADJUSTED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION.

FOR CONTINUATION SEE DRAWING 10

FOR CONTINUATION SEE DRAWING 12

1"=50' 0 50 100'

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

No.	Date	Revisions	By	Chk

Professional Engineer's Name: ALLEN R. LONG		
Professional Engineer's No.: MD 34682		
State: MD	Date Signed:	Project Mgr: JD
Designed By: ALS	Drawn By: ALS	Checked By: ARL

STATE OF MARYLAND — NO. 34682 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S. INC

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 34+50 TO 44+00)

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9180

11

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
5. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
6. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY. EQUIPMENT ACCESS TO THESE AREAS WILL BE REQUIRED.

FOR CONTINUATION SEE DRAWING 11

CREEK ROAD
FEMA FLOODPLAIN BOUNDARY
SILT FENCE (TYP.) 3/33
2/35 TEMPORARY ACCESS BRIDGE
S2
2/36 WEIGHTED SEDIMENT FILTER TUBE (TYP.)
I-68 WESTBOUND
EXISTING CONCRETE STORM DRAIN
REFER TO DRAWING 31 FOR PLAN AND PROFILE
EXISTING UNDERGROUND FIBER OPTIC LINE
I-68 EASTBOUND
FEMA FLOODPLAIN BOUNDARY
PROPOSED EPE 8" PIPELINE (HDD; SEE NOTE 6)
25-FOOT NON-TIDAL WETLAND BUFFER
RONNIE R. ZIMMERMAN
S3
LITTLE TONOLOWAY CREEK
RONNIE R. ZIMMERMAN
W2A
W2
25-FOOT NON-TIDAL WETLAND BUFFER
EXISTING CULVERT
S8D
REEL ROAD
FEMA FLOODPLAIN BOUNDARY
SOIL STABILIZATION MATTING 1/35
1/34 INTERCEPTOR DIVERSION (TYP.)
4/33 SUPER SILT FENCE
TOWN OF HANCOCK
JOHN COHILL

FOR CONTINUATION SEE DRAWING 13

CITY SYRACUSE NY DIV/GROUP ENVCAD DB R OBERLANDER L: FORAKER LD: PIC: PM: TM: LYR:ON=*;OFF=*REF* G:\CADDACAD\Proj\CPGL00EP\DWSMD\CPGL00EP-G04.dwg LAYOUT 12 SAVED: 3/10/2017 9:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: - PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 3/10/2017 10:58 AM BY: SIDARI, ALEXIS
XREFS: CPGL00EP-X00 CPGL00EP-X01 CPGL00EP-X02

1" = 50' (50 0 50' 100')

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

No.	Date	Revision	By	Chkd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34882

State	Date Signed	Project Mgr.
MD		JD
Designed by: ALS	Drawn by: ALS	Checked by: ARL

STATE OF MARYLAND ALLEN RICHARD LONG No. 34882 PROFESSIONAL ENGINEER

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

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 44+00 TO 53+50)

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS 6041 Wallace Road Extension Suite 300 Wexford, PA 15090 Tel: 724.742.9180

12

FOR CONTINUATION SEE DRAWING 12

-- FOR CONTINUATION SEE DRAWING 14

APPROXIMATE TRENCH LIMITS

HDD EXIT

PROPOSED ERIE 8" PIPELINE

4/33 SUPER SILT FENCE (TYP.)

1/34 INTERCEPTOR DIVERSION (TYP.)

2/34 TRENCH PLUG

SOIL STABILIZATION MATTING (SEE NOTE 7) 1/35

SILT FENCE (TYP.) 3/33

GRAVEL ACCESS ROAD PAR-2 TO BE IMPROVED (SEE NOTE 8) 2/37

JOHN COHILL

JOHN COHILL

JOHN COHILL

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS, AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
5. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
6. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY. EQUIPMENT ACCESS TO THESE AREAS WILL BE REQUIRED.
7. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V.
8. PROPOSED PERMANENT ACCESS ROAD PAR-2 IS AN EXISTING FARM ROAD THAT WILL BE STABILIZED WITH STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC.

1" = 50' (50' 0 50' 100')

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

No.	Date	Revisions	By	Chd

Professional Engineer's Name		
ALLEN R. LONG		
Professional Engineer's No.		
MD 34862		
Drawn by: MD	Date Signed:	Project Mgr: JD
Designed by: ALS	Drawn by: ALS	Checked by: ARL

STATE OF MARYLAND ALLEN R. LONG No. 34862 PROFESSIONAL ENGINEER 3/14/17

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 53+50 TO 69+00)

ARCADIS Project No: CPGL00EP.0001.0008A

Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel: 724.742.9180

13

FOR CONTINUATION SEE DRAWING 13

REEL ROAD

S8B

S8A

REFER TO DRAWING 31 FOR PLAN AND PROFILE

EXISTING CULVERT TO BE REPLACED

1/33 STABILIZED CONSTRUCTION ENTRANCE

4/36 MOUNTABLE BERM (TYP.)

2/37 PERMANENT GRAVEL ACCESS ROAD PAR-2 TO BE IMPROVED (SEE NOTE 7)

1/34 INTERCEPTOR DIVERSION

EXISTING OVERHEAD UTILITY LINE

JOHN COHILL

PROPOSED EPE 8" PIPELINE

APPROXIMATE TRENCH LIMITS

WILLIAM E. & DOROTHY E. DUGAN

DOROTHY E. DUGAN

SUPER SILT FENCE 4/33

EXISTING BUILDING

74+00

75+00

76+00

77+00

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
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6. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
7. PROPOSED PERMANENT ACCESS ROAD PAR-2 WILL BE IMPROVED BY GRADING AND STABILIZED WITH STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC.

FOR CONTINUATION SEE DRAWING 15

50' 0 50' 100'
1"=50'

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

No	Date	Revisions	By	Chd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No: MD 34862

State	Date Signed	Project Mgr
MD		JD
Designed by: ALS	Drawn By: ALS	Checked by: ARL

STATE OF MARYLAND — ALLEN R. LONG — No. 34862 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S. INC

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 69+00 TO 78+00)

ARCADIS Project No: CPGL00EP 0001 0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724 742 9180

14

FOR CONTINUATION SEE DRAWING 14

EXISTING CULVERT
EXISTING CULVERT
EXISTING CULVERT
PRIVATE DRIVE
PRIVATE DRIVE
78+00
79+00
80+00
81+00
82+00
83+00
84+00
85+00
86+00
87+00
88+00
APPROXIMATE TRENCH LIMITS
SEPTIC FIELD
EXISTING BUILDING
EXISTING BUILDING
DOROTHY E. DUGAN
WILLIAM E. & DOROTHY E. DUGAN
88
REEL ROAD
EXISTING BUILDING
FAIRVIEW ORCHARDS LANDBESITZ, INC.
4/36 MOUNTABLE BERM (TYP.)
PERMANENT GRAVEL ACCESS ROAD PAR-3 TO BE IMPROVED (SEE NOTE 7)
1/33 STABILIZED CONSTRUCTION ENTRANCE
INTERCEPTOR DIVERSION 1/34
TRENCH PLUG 2/34
FAIRVIEW ORCHARDS LANDBESITZ, INC.
PROPOSED EPE 8" P.PELINE
4/33 SUPER SILT FENCE (TYP.)
FAIRVIEW ORCHARDS LANDBESITZ, INC.
FAIRVIEW ORCHARDS LANDBESITZ, INC.

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
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7. PROPOSED PERMANENT ACCESS ROAD PAR-2 IS AN EXISTING GRAVEL ROAD THAT WILL BE STABILIZED WITH ADDITIONAL STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC.

FOR CONTINUATION SEE DRAWING 16

50 0 50' 100'
1"=50'

THIS BAR REPRESENTS 1 INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE.

No.	Date	Revisions	By	Chk

Professional Engineer's Name	ALLEN R. LONG
Professional Engineer's No.	MD 34862
State	MD
Date Signed	
Project Mgr	JD
Designed by	ALS
Drawn by	ALS
Checked by	ARL

STATE OF MARYLAND ALLEN R. LONG NO. 34862 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 78+00 TO 88+00)

ARCADIS Project No: CPGLOOEP.0001.0008A
Date: MARCH 2017
ARCADIS 6041 Wallace Road Extension Suite 300 Wexford, PA 15090 Tel: 724 742 0180

15

CITY: SYRACUSE_NY DIV/GROUP: ENVCAD DB: R.OBERLANDER L.E.RAKER LD: PIC: PM: TM: LYR:ON=*;OFF=*REF* G:\CADD\CADFile\CPGLOOEP\DWG\MXD\CPGLOOEP-0004.dwg LAYOUT: 15 SAVED: 3/10/2017 9:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 3/10/2017 10:50 AM BY: SIDARI, ALEXIS
XREFS: CPGLOOEP-X00
CPGLOOEP-X01
CPGLOOEP-X02

FOR CONTINUATION SEE DRAWING 15
FOR CONTINUATION SEE DRAWING 19
25-FOOT NON-TIDAL WETLAND BUFFER
JOHN COHILL
SOIL STABILIZATION MATTING (SEE NOTE 5)
1
35
PROPOSED CATHODIC PROTECTION RECTIFIER AND ANODE GROUNDBED
FAIRVIEW ORCHARDS LANDBESITZ, INC.
SILT FENCE (TYP.)
3
33
ELECTRIC UTILITY POLE TO BE RELOCATED
STATE ROUTE 14
STATE ROUTE 144
MERIDITH A. CLARK
EXISTING BUILDING
EXISTING WATER WELL
DONALD D. & KENDRA K. TRAIL
SEPTIC FIELD
JOHN BISHOP JR.
INTERCEPTOR DIVERSION (TYP.)
1
34
APPROXIMATE TRENCH LIMITS
PROPOSED EPE 8" PIPELINE
STABILIZED CONSTRUCTION ENTRANCE (TYP.)
1
33
SUPER SILT FENCE (TYP.)
4
33
55
CHARLES R. & KAREN J. CONLEY
PROPOSED CATHODIC PROTECTION RECTIFIER AND ANODE GROUNDBED
STEVEN R. & FAYE E. CONLEY
SHED
TRENCH PLUG
2
34
DAVID E. MANNING

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
5. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V.
6. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
7. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
8. ACTUAL LOCATIONS OF STABILIZED CONSTRUCTION ENTRANCES MAY BE ADJUSTED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION.

FOR CONTINUATION SEE DRAWING 17

1" = 50' — 50' 0 50' 100'

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: ALLEN R. LONG
Professional Engineer's No.: MD 34862

State	Date Signed	Project Mgr.
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND — ALLEN R. LONG — No. 34862 — PROFESSIONAL ENGINEER

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 88+00 TO 105+00)

ARCADIS Project No.: CPGL00EP.0001.0008A

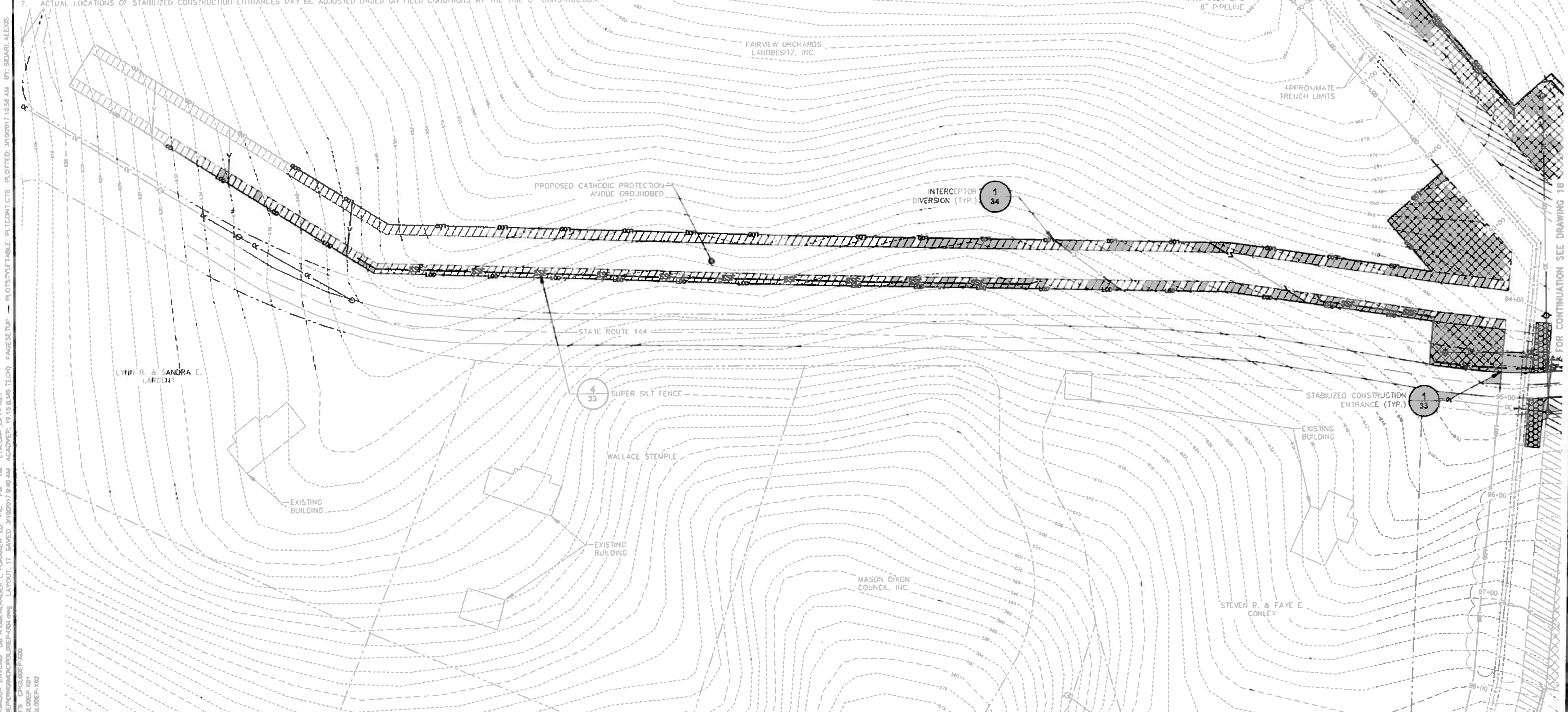
Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel. 724 742 9180

16

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLANDS, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
5. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
6. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
7. ACTUAL LOCATIONS OF STABILIZED CONSTRUCTION ENTRANCES MAY BE ADJUSTED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION.



XREFS: CPGL00EP-X00 CPGL00EP-X01 CPGL00EP-X02

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: R.OBERLANDER L.FORAKER LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
G:\CADD\ACAD\Proj\CPGL00EP\DWG\MD\CPGL00EP-C04.dwg LAYOUT: 17 SAVED: 3/10/2017 9:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 3/10/2017 10:58 AM BY: SIDARI, ALEXIS

0 50' 100'

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: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed: | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND · ALLEN R. LONG · No. 34862 · PROFESSIONAL ENGINEER

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

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (CATHODIC PROTECTION ANODE GROUNDBED AT STA. 94+00)

ARCADIS Project No. CPGL00EP.0001.0009A
Date: MARCH 2017
ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel: 724 742 9180

17

NOTES.

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLANDS, LAWNS AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS, AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
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7. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
8. PROPOSED TEMPORARY ACCESS ROAD TAR-2 WILL BE IMPROVED BY GRADING AND STABILIZED WITH STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES. THE ACCESS ROAD WILL BE REMOVED AND THE AREA RESTORED TO PRE-CONSTRUCTION CONDITIONS.

FOR CONTINUATION SEE DRAWING 16

FOR CONTINUATION SEE DRAWING 19

W10

25-FOOT NON-TIDAL WETLAND BUFFER

FAIRVIEW ORCHARDS LANDBESITZ, INC.

1/36 SOIL STABILIZATION MATTING (SEE NOTE 5)

PROPOSED EPE 8" PIPELINE

ELECTRIC UTILITY POLE TO BE RELOCATED

3/33 SILT FENCE (TYP.)

APPROXIMATE TRENCH LIMITS

ELECTRIC UTILITY POLE TO BE RELOCATED

94+00

95+00

MERIDITH A. CLARK

EXISTING BUILDING

PROPOSED CATHODIC PROTECTION ANODE GROUNDBED

JOHN COMILL

1/34 INTERCEPTOR DIVERSION (TYP.)

4/33 SUPER SILT FENCE (TYP.)

MOUNTABLE BERM 4/36

TEMPORARY GRAVEL ACCESS ROAD TAR 3 TO BE IMPROVED (SEE NOTE 8)

EXISTING BUILDING

AIRVIEW ORCHARDS LAN SITZ, INC

1/33 STABILIZED CONSTRUCTION ENTRANCE (TYP.)

STATE ROUTE 144

XREFS: CPGL00EP-X00, CPGL00EP-X01, CPGL00EP-X02

CITY: SYRACUSE HY DIVGROUP ENVCAD DB: ROBERLANDER L FORAKER LD: PIC: PAL: TM: LYR:ON=*;OFF=*REF* O:\CADDA\CAD\Proj\CPGL00EP\DWG\MOP\CPGL00EP-G04.dwg LAYOUT: 19 SAVED: 3/10/2017 9:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 3/10/2017 10:59 AM BY: SIDARI, ALEXIS

1"=50' 0 50' 100'

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No	Date	Revisions	By	Ckd

Professional Engineer's Name		
ALLEN R. LONG		
Professional Engineer's No		
MD 34882		
State	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND ALLEN R. LONG NO. 34882 PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

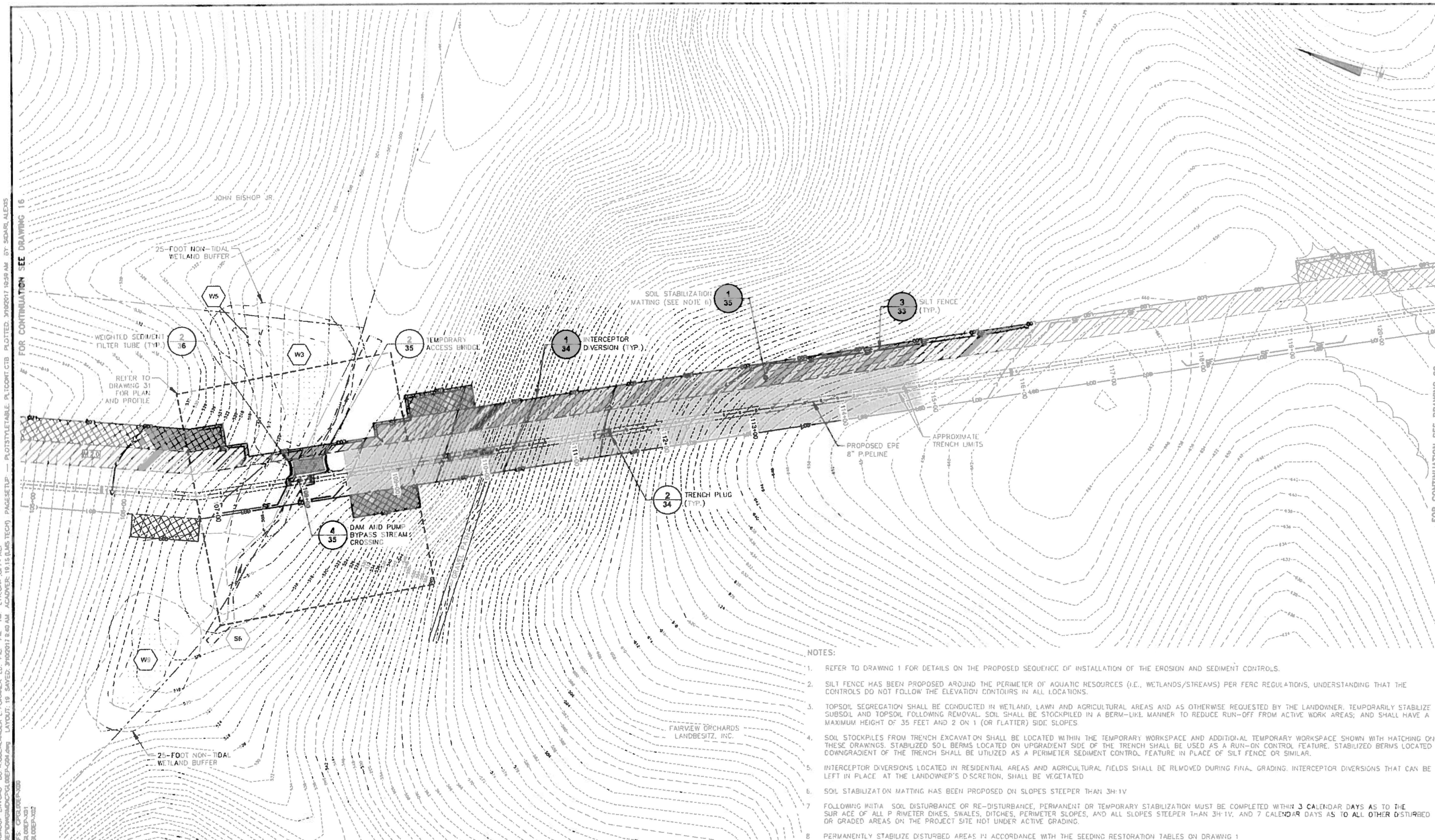
COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (CATHODIC PROTECTION ANODE GROUNDBED AT STA. 94+25)

ARCADIS Project No	CPGL00EP.0001.0008A
Date	MARCH 2017
ARCADIS	6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9160

18



NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. SILT FENCE HAS BEEN PROPOSED AROUND THE PERIMETER OF AQUATIC RESOURCES (I.E., WETLANDS/STREAMS) PER FERC REGULATIONS, UNDERSTANDING THAT THE CONTROLS DO NOT FOLLOW THE ELEVATION CONTOURS IN ALL LOCATIONS.
3. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
5. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
6. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V.
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
8. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.

Professional Engineer's Name: ALLEN R. LONG	Professional Engineer's No.: MD 34862	State: MD
Designed by: ALS	Drawn by: ALS	Checked by: ARL
Project Mgr: JD		

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

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

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 105+00 TO 120+50)

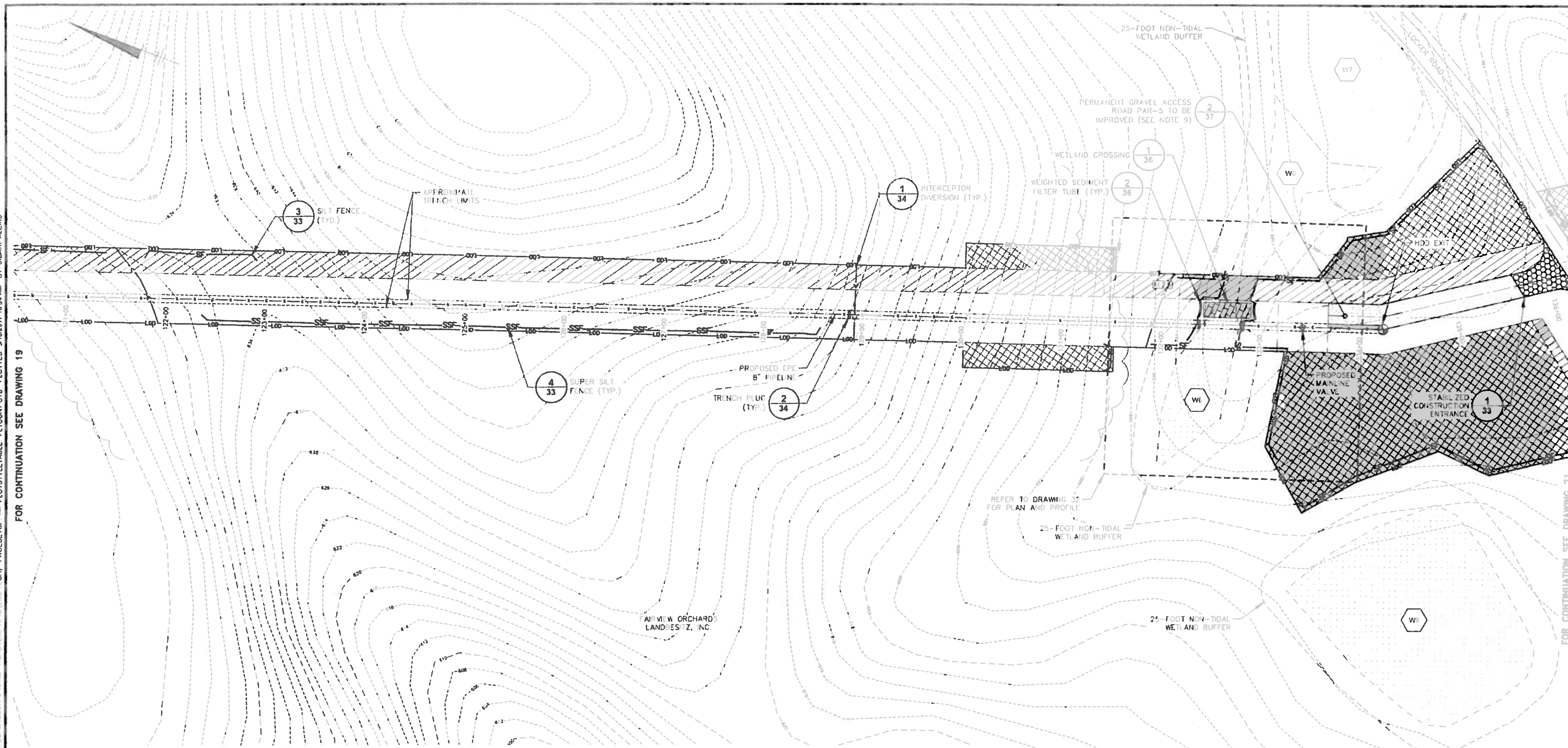
ARCADIS Project No. CPGL00EP.0001.0008A

Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel. 724.742.9180

19

FOR CONTINUATION SEE DRAWING 19



FOR CONTINUATION SEE DRAWING 21

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS
2. SILT FENCE HAS BEEN PROPOSED AROUND THE PERIMETER OF AQUATIC RESOURCES (I.E., WETLANDS/STREAMS) PER FERC REGULATIONS, UNDERSTANDING THAT THE CONTROLS DO NOT FOLLOW THE ELEVATION CONTOURS IN ALL LOCATIONS.
3. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
5. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
6. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
7. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
8. PROPOSED PERMANENT ACCESS ROAD PAR-5 WILL BE IMPROVED BY GRADING AND STABILIZED WITH STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC.

1"=50' — 50' 0 50' 100'

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: ALLEN R. LONG
Professional Engineer's No.: MD 34882
State: MD | Date Signed: | Project Mgr.: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — ALLEN R. LONG — No. 34882 — PROFESSIONAL ENGINEER

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 120+50 TO 136+00)

ARCADIS Project No. CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9180

20

FOR CONTINUATION SEE DRAWING 20

1/33 STABILIZED CONSTRUCTION ENTRANCE

1/34 INTERCEPTOR DIVERSION (TYP.)

SOIL STABILIZATION MATTING (SEE NOTE 6) 1/35

3/33 SILT FENCE (TYP.)

PROPOSED EPE 8" PIPELINE (HDD; SEE NOTE 8)

2/36 WEIGHTED SEDIMENT FILTER TUBE (TYP.)

1/36 WETLAND CROSSING

REFER TO DRAWING 32 FOR PLAN AND PROFILE

PROPOSED CATHODIC PROTECTION ANODE GROUNDBED

COOPER ROAD

VIOLAM MUNDAY

EXISTING OVERHEAD ELECTRIC LINE

RODNEY J. & FARRAH M. LONG

VINCENT E. GAVIN

FAIRVIEW ORCHARDS LANDBESITZ, INC.

FOR CONTINUATION SEE DRAWING 22

FOR CONTINUATION SEE DRAWING 23

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. SILT FENCE HAS BEEN PROPOSED AROUND THE PERIMETER OF AQUATIC RESOURCES (I.E., WETLANDS/STREAMS) PER FERC REGULATIONS, UNDERSTANDING THAT THE CONTROLS DO NOT FOLLOW THE ELEVATION CONTOURS IN ALL LOCATIONS.
3. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADJACENT TO THE TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
5. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
6. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V.
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
8. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
9. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY.
10. ACTUAL LOCATIONS OF STABILIZED CONSTRUCTION ENTRANCES MAY BE ADJUSTED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION.

50' 0 50' 100'
1"=50'

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

No.	Date	Revisions	By	Chk

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed: | Project Mgr: JD
Designed By: ALS | Drawn By: ALS | Checked By: ARL

STATE OF MARYLAND ALLEN R. LONG No. 34862 PROFESSIONAL ENGINEER

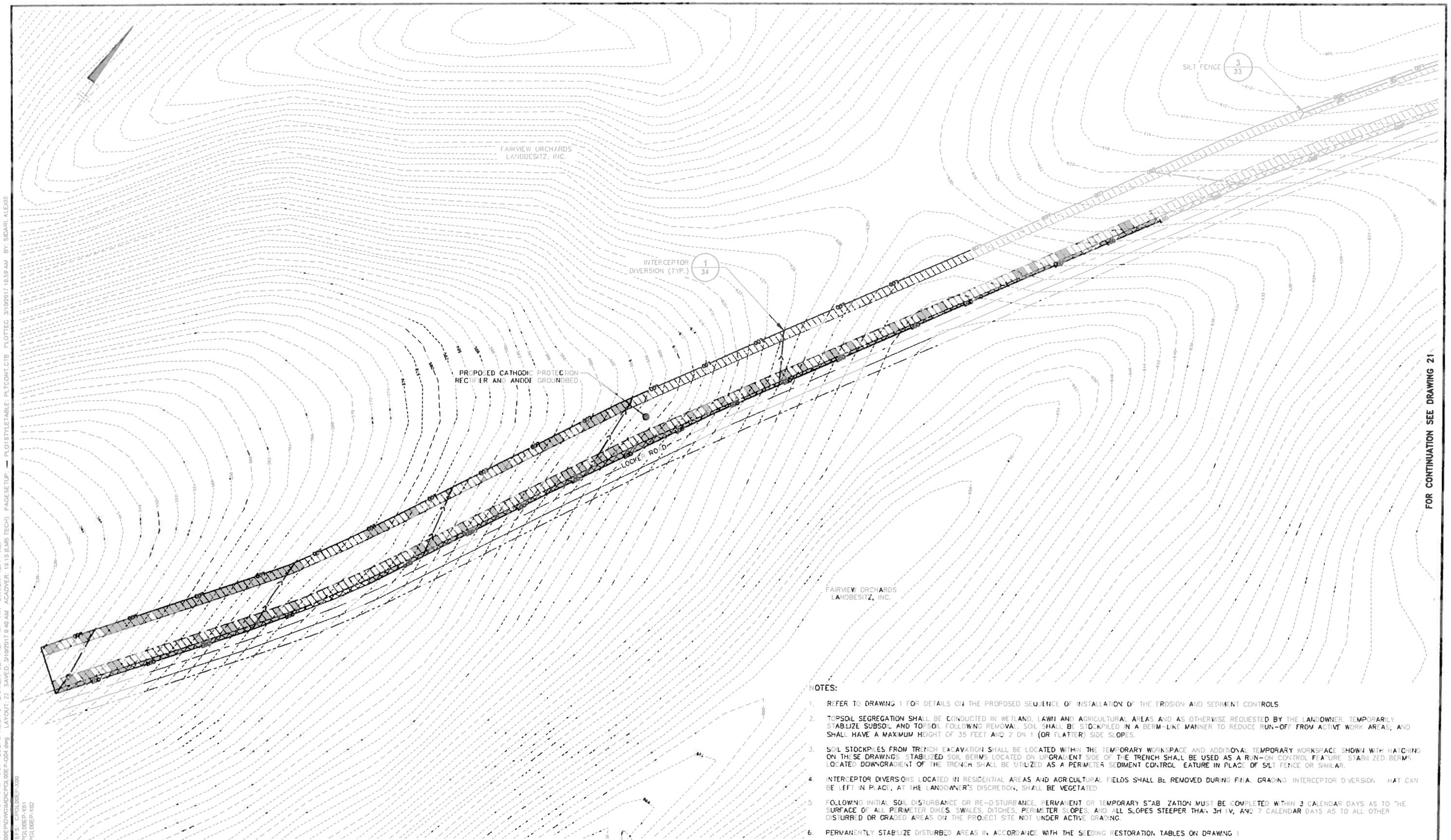
ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 136+00 TO 151+50)

ARCADIS Project No: CPGL00EP 0001 0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9160

21



NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS, AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
3. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
4. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
5. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
6. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.

0 50' 100				Professional Engineer's Name	ALLEN R. LONG		
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FURTHER REPRODUCTION SCALE				Professional Engineer's No.	MD 34862		
				State	Date Signed	Project Mgr	
				MD		JD	
No.	Date	Revisions	By	Designed by	Drawn by	Checked by	
				ALS	ALS	ARL	

STATE OF MARYLAND ALLEN R. LONG MD. 34862 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC

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

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (ANODE GROUNDBED CATHODIC PROTECTION AT STA. 136+00)

ARCADIS Project No.: CPGL00EP.0001.0008A

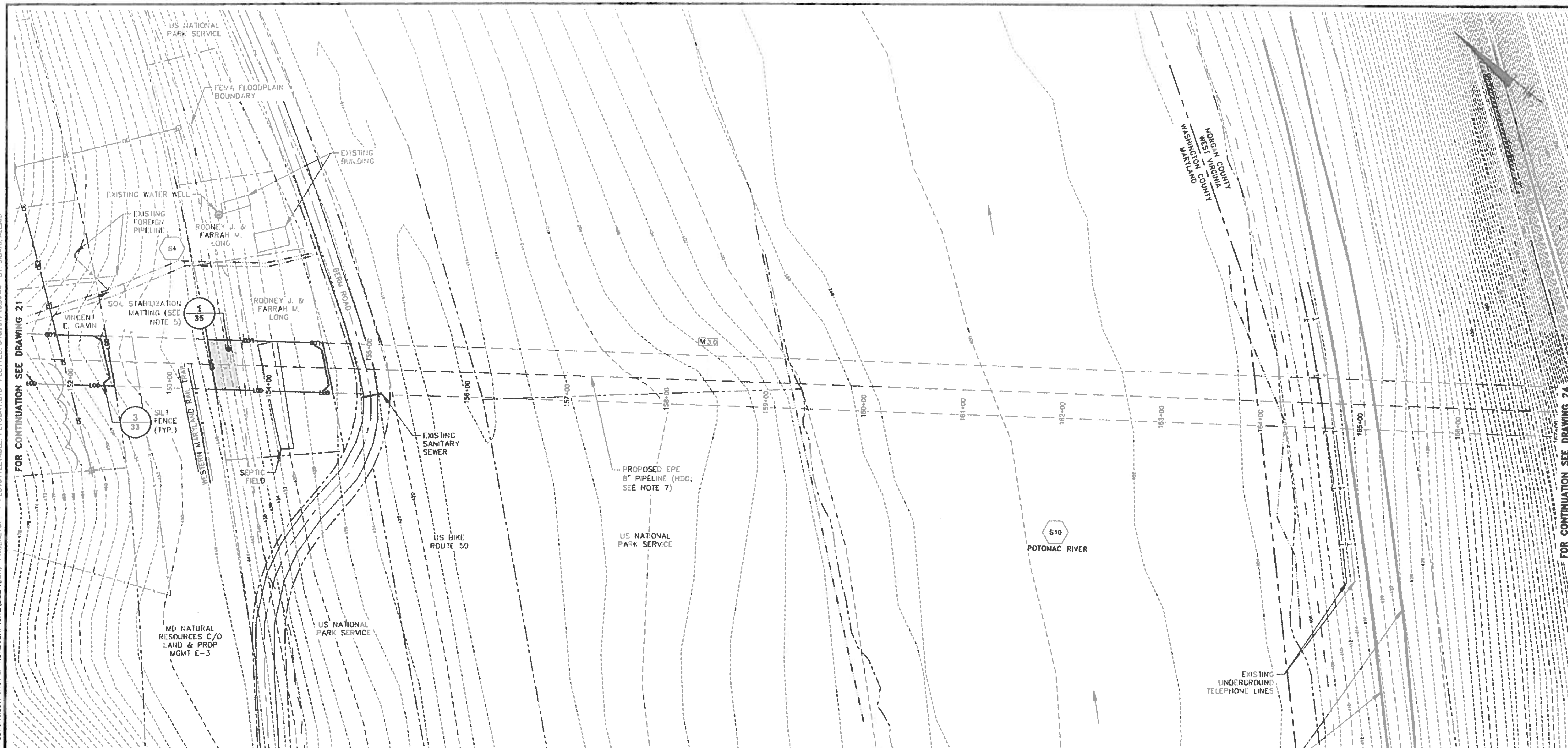
Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford PA 15090
Tel: 724.742.9180

22

XREFS: CPGL00EP-X00
CPGL00EP-X01
CPGL00EP-X02

FOR CONTINUATION SEE DRAWING 21



FOR CONTINUATION SEE DRAWING 24

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TEMPORARY EARTH DISTURBANCE IN WEST VIRGINIA WILL BE AUTHORIZED UNDER THE WV OIL AND GAS CONSTRUCTION STORMWATER GENERAL PERMIT. ONLY WORK IN MARYLAND IS INCORPORATED WITHIN THIS PLAN.
3. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS, AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
5. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V.
6. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
7. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
8. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY.

1"=50' 50' 0 50' 100'

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

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineers No.: MD 34862

State	Date Signed	Project Mgr.
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND ALLEN R. LONG No. 34862 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

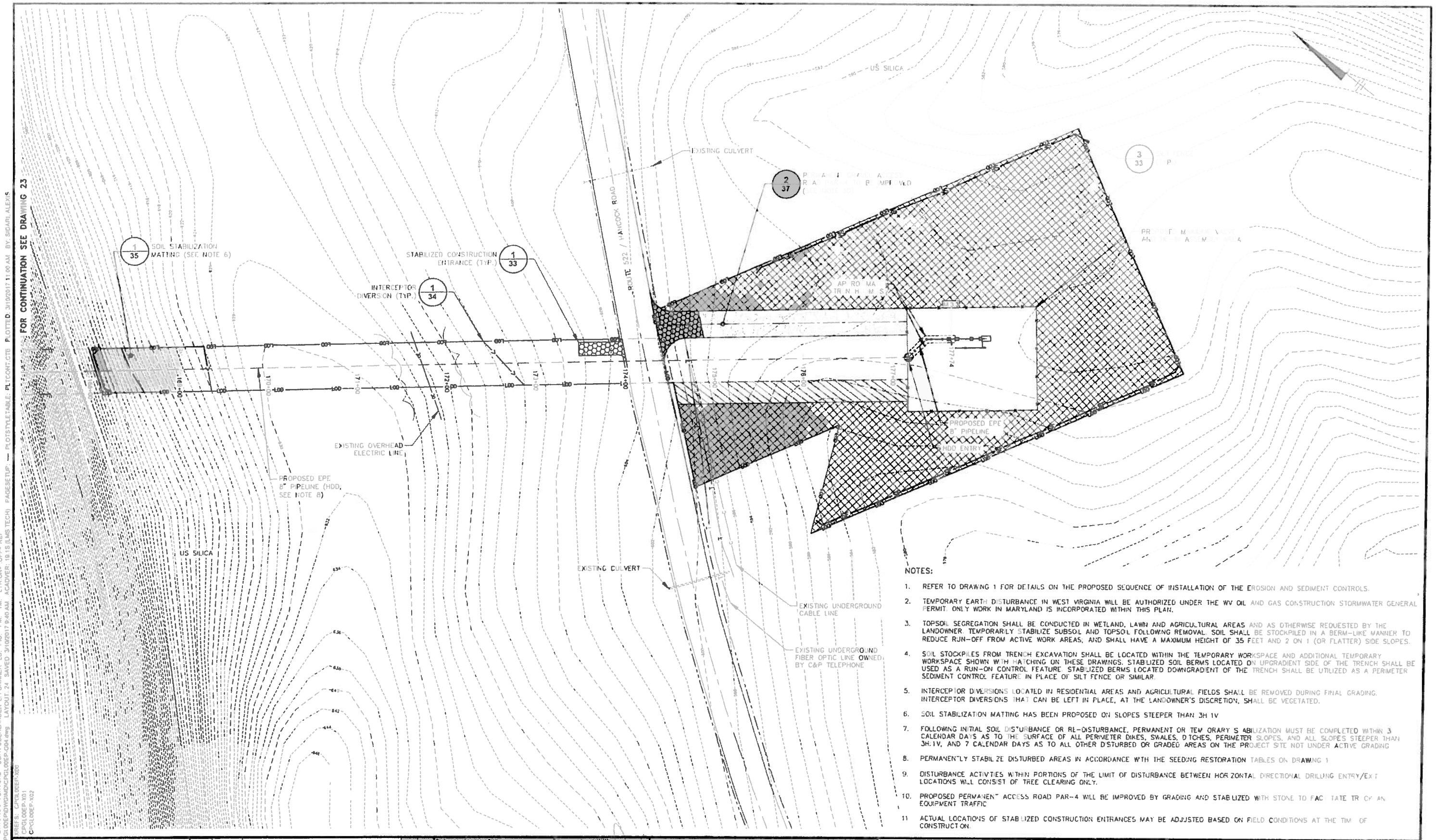
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 151+50 TO 167+00)

ARCADIS Project No. CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS

23

FOR CONTINUATION SEE DRAWING 23



NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TEMPORARY EARTH DISTURBANCE IN WEST VIRGINIA WILL BE AUTHORIZED UNDER THE WV OIL AND GAS CONSTRUCTION STORMWATER GENERAL PERMIT. ONLY WORK IN MARYLAND IS INCORPORATED WITHIN THIS PLAN.
3. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS, AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
4. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
5. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
6. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING
8. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1
9. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY.
10. PROPOSED PERMANENT ACCESS ROAD PAR-4 WILL BE IMPROVED BY GRADING AND STABILIZED WITH STONE TO FACILITATE TRAFFIC BY AN EQUIPMENT TRAFFIC
11. ACTUAL LOCATIONS OF STABILIZED CONSTRUCTION ENTRANCES MAY BE ADJUSTED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION.

50' 0 50' 100'
1"=50'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
ALLEN R. LONG		
Professional Engineer's No.		
MD 34802		
State	Date Signed	Project No.
MD		00
Designed by	Drawn by	Checked by
ALS	ALS	AR

STATE OF MARYLAND ALLEN R. LONG NO. 34802 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S. INC

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

EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (STA. 167+00 TO 177+74)

ARCADIS Project No.
CPGLODEP.0001.0008A

Date
MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel: 724.742.9160

APPROXIMATE CENTERLINE OF EXISTING GRAVEL ACCESS ROAD TAR-1 (SEE NOTE 2)

EXISTING BUILDING

EXISTING OVERHEAD UTILITY LINE

PROPOSED CONTRACTOR STAGING AREA (SEE NOTE 1)

4/33 SUPER SILT FENCE (TYP.)

BLUEGRASS MATERIALS COMPANY, LLC

BLUEGRASS MATERIALS COMPANY, LLC

FOR CONTINUATION SEE DRAWING 26

NOTES:

1. THE PROPOSED CONTRACTOR STAGING AREA IS LOCATED ON EXISTING GRAVEL SURFACES. IT IS NOT ANTICIPATED THAT USE OF THE STAGING AREA WILL RESULT IN SOIL DISTURBANCE. IF EXCESSIVE RUTTING OCCURS, THE AREA WILL BE STABILIZED WITH GEOTEXTILE AND GRAVEL FOR THE REMAINDER OF WORK. THIS AREA WILL REMAIN A GRAVEL SURFACE FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
2. PROPOSED TEMPORARY ACCESS ROAD TAR-1 IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

1" = 50'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE W/ PRODUCTION SCALE.

No.	Date	Revisions	By	Chk

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34802
State: MD | Date Signed | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — ALLEN R. LONG — NO. 34802 — PROFESSIONAL ENGINEER
3/17/17

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (CONTRACTOR STAGING AREA AND TEMPORARY ACCESS ROAD TAR-1)

ARCADIS Project No.: CPGL00EP 0001.0008A
Date: MARCH 2017
ARCADIS: 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724-742-9180

25

FOR CONTINUATION SEE DRAWING 25

BLUEGRASS MATERIALS COMPANY, LLC

BLUEGRASS MATERIALS COMPANY, LLC

BLUEGRASS MATERIALS COMPANY, LLC

BLUEGRASS MATERIALS COMPANY, LLC

APPROXIMATE CENTERLINE OF EXISTING GRAVEL ACCESS ROAD TAR-1 (SEE NOTE 1)

FOR CONTINUATION SEE DRAWING 27

NOTES:

1. PROPOSED TEMPORARY ACCESS ROAD TAR-1 IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

-50 0 50' 100'
1"=50'

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

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34807

State	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

COMMONWEALTH OF MARYLAND — ALLEN R. LONG — No. 34807 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S. INC.

COLUMBIA GAS TRANSMISSION LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)

ARCADIS Project No.: OPGL00EP.0001.000BA
Date: MARCH 2017

ARCADIS
6941 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel: 724.742.9180

26

FOR CONTINUATION SEE DRAWING 26

BLUEGRASS MATERIALS COMPANY, LLC

BLUEGRASS MATERIALS COMPANY, LLC

APPROXIMATE CENTERLINE OF EXISTING GRAVEL ACCESS ROAD TAR-1 (SEE NOTE 1)

FOR CONTINUATION SEE DRAWING 28

NOTES:

1. PROPOSED TEMPORARY ACCESS ROAD TAR-1 IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFI

0" 50" 100"

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

No.	Date	Revision	By	Chkd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34859

Date:	Date Signed:	Project Mgr:
MD		JD
Designed by:	Drawn By:	Checked by:
ALS	ALS	ARL

COMMONWEALTH OF MARYLAND ALLEN R. LONG NO. 34859 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY » HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)

ARCADIS Project No.: CPGL00EP.0001 0009A
Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel: 724.742.9160

27

FOR CONTINUATION SEE DRAWING 27

BLUEGRASS MATERIALS COMPANY, LLC

APPROXIMATE CENTERLINE OF EXISTING GRAVEL ACCESS ROAD TAR-1 (SEE NOTE 1)

MARY LOIS WHITE ET. AL.

FULTON COUNTY PENNSYLVANIA
WASHINGTON COUNTY MARYLAND

FOR CONTINUATION SEE DRAWING 29

NOTES:

1. PROPOSED TEMPORARY ACCESS ROAD TAR-1 IS AN EXISTING GRAVEL ACCESS ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO MAINTAIN ACCESS FOR TRUCK AND EQUIPMENT TRAFFIC.
2. TEMPORARY EARTH DISTURBANCE IN PENNSYLVANIA WILL BE CONSTRUCTED UNDER A SEPARATE EROSION AND SEDIMENT CONTROL PLAN REVIEW. ONLY WORK IN MARYLAND IS INCORPORATED WITH THIS PLAN.

50' 0 50' 100'
1"=50'

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

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34882

State	Date Signed	Project Mgr
MD		JD
Designed By	Drawn By	Checked By
ALS	ALS	ARL

STATE OF MARYLAND — No. 34882 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension, Suite 300
Wexford, PA 15090
Tel: 724.742.9180

28

FOR CONTINUATION SEE DRAWING 28

MARY LOIS WHITE ET. AL.

STABILIZED CONSTRUCTION ENTRANCE 1/33

APPROXIMATE CENTERLINE OF EXISTING GRAVEL ACCESS ROAD TAR-1 (SEE NOTE 1)

LAFARGE MID-ATLANTIC, LLC

EXISTING OVERHEAD UTILITY LINE

BUCK ALLEY ROAD

NOTES:

1. PROPOSED TEMPORARY ACCESS ROAD TAR-1 IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.
2. TEMPORARY EARTH DISTURBANCE IN PENNSYLVANIA WILL BE CONDUCTED UNDER A SEPARATE EROSION AND SEDIMENT CONTROL PLAN REVIEW. ONLY WORK IN MARYLAND IS INCORPORATED WITHIN THIS PLAN.

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Professional Engineer's Name		
ALLEN R. LONG		
Professional Engineer's No.		
MD 34862		
Date	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALB	ALS	ARL

STATE OF MARYLAND ALLEN LONG No. 34862 PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

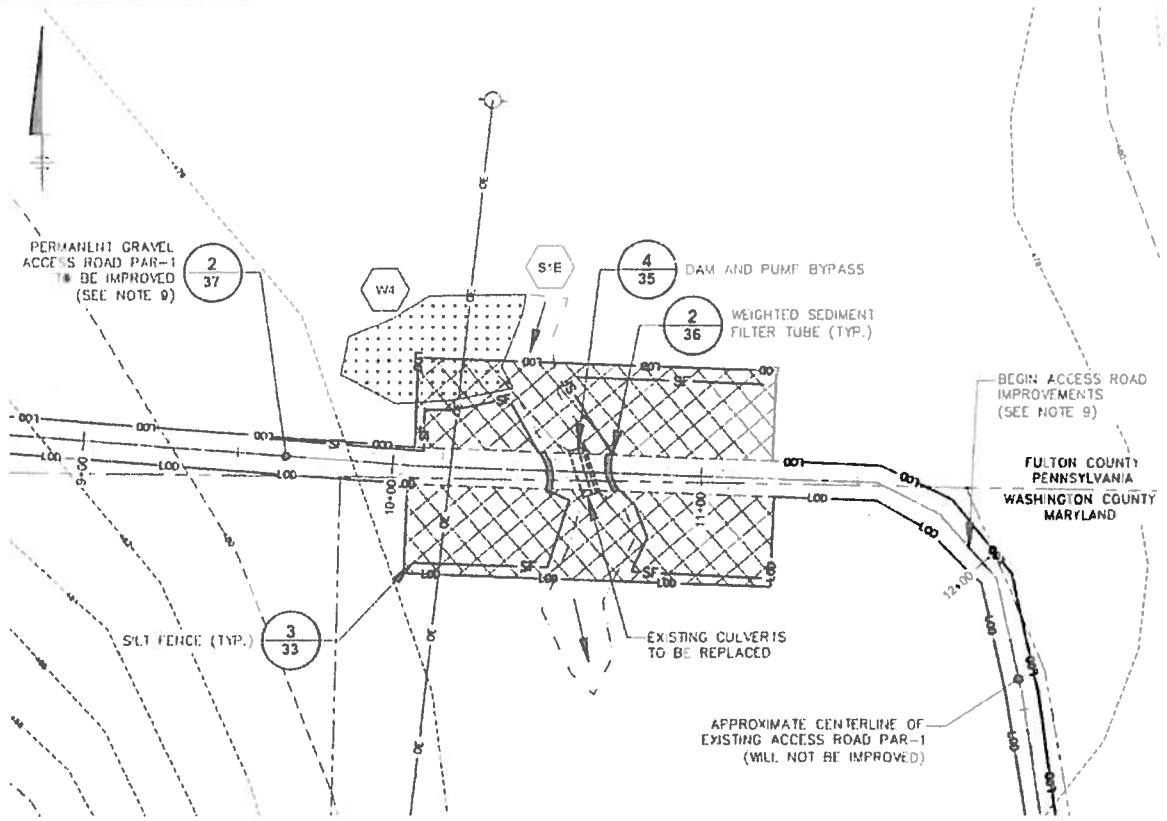
ARCADIS U.S., INC

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

SITE PLAN (TEMPORARY ACCESS ROAD TAR-1)

ARCADIS Project No.: CPGL00EP.0001.0068A
Date: MARCH 2017
ARCADIS 6041 Wallace Road Extension Suite 300 Wexford, PA 15090 tel: 724.742.6180

29



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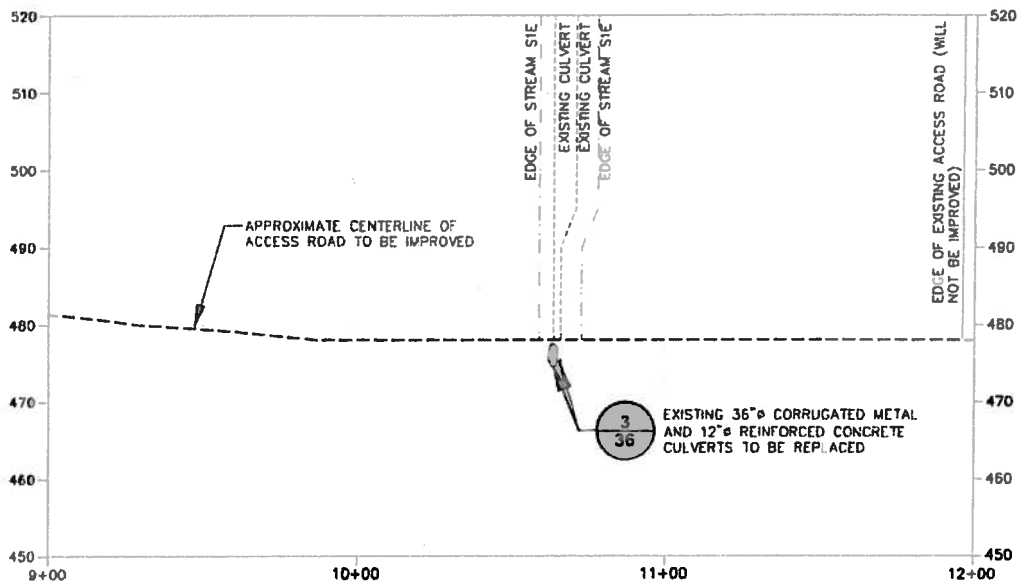
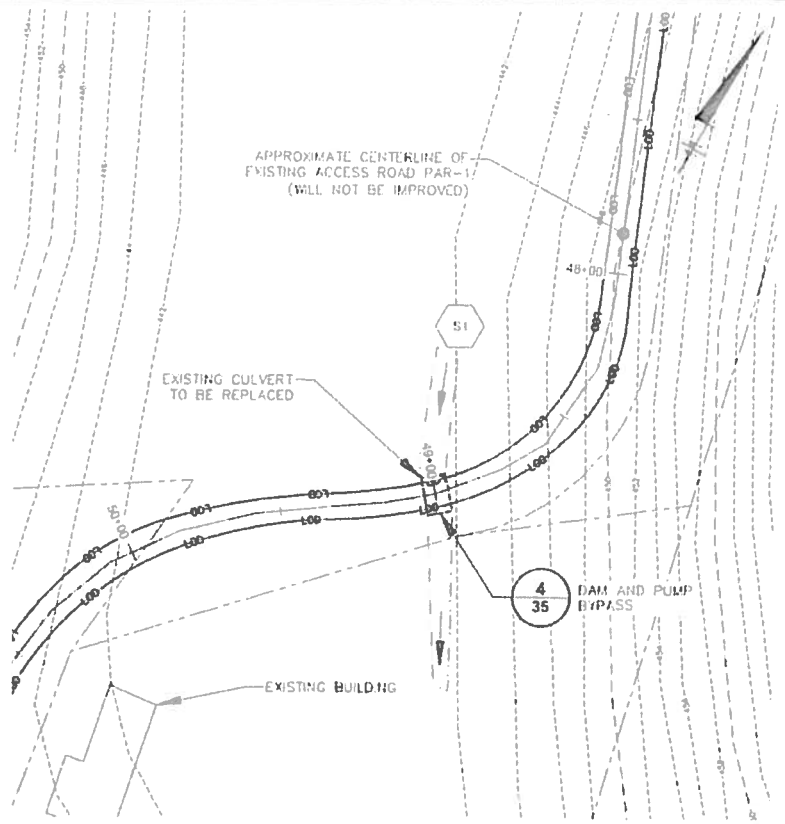


PROFILE



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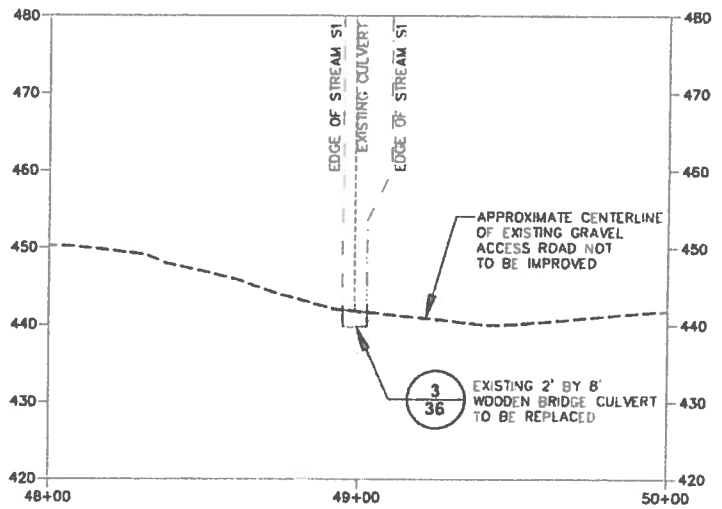

PROFILE

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TEMPORARY EARTH DISTURBANCE IN PENNSYLVANIA WILL BE CONDUCTED UNDER A SEPARATE EROSION AND SEDIMENT CONTROL PLAN REVIEW. ONLY WORK IN MARYLAND IS INCORPORATED WITHIN THIS PLAN.
3. SILT FENCE HAS BEEN PROPOSED AROUND THE PERIMETER OF AQUATIC RESOURCES (I.E., WETLANDS/STREAMS) PER FERC REGULATIONS, UNDERSTANDING THAT THE CONTROLS DO NOT FOLLOW THE ELEVATION CONTOURS IN ALL LOCATIONS.
4. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
5. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
6. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
7. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
8. THE PORTION OF EXISTING ACCESS ROAD PAR-1 FROM APPROXIMATELY STATION 0+00 TO 12+00 IS AN EXISTING DIRT FARM ROAD THAT WILL BE IMPROVED WITH THE PLACEMENT OF STONE. THE REMAINING PORTION OF EXISTING ACCESS ROAD PAR-1 IS AN EXISTING GRAVEL ROAD THAT WILL NOT BE IMPROVED. ADDITIONAL ROCK MAY BE PLACED ALONG THE EXISTING GRAVEL ACCESS ROAD AS NEEDED TO SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

AQUATIC RESOURCE CROSSINGS

RESOURCE ID	BEGINNING STATION	ENDING STATION	SIZE OF AQUATIC RESOURCE ON SITE (SF)	TEMPORARY STREAM IMPACT STREAM WIDTH – TOP OF BANK TO TOP OF BANK (FT)	TEMPORARY STREAM IMPACT CENTER LINE OF STREAM (LF)	TEMPORARY STREAM IMPACT AREA (SF)
S1E	41+27	41+42	506	19	35	505
S1	48+95	49+03	86	8	9	86

CITY: SYRACUSE; NY DIVGROUP: ENVCAD DB: A SAMIOS L.FORAKER LO: A SAMIOS PIC: PM: TM: LYR:ON=*;OFF=*REF* G:\CADD\CADProj\CPG100EP\DWG\MDC\PG100EP-005.dwg LAYOUT: 30 SAVED: 3/10/2017 12:17 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTCONT1.CTB PLOTTED: 3/13/2017 9:39 AM BY: SIDARI, ALEXIS

XREFS: CPG100EP-X00
CPG100EP-X01
CPG100EP-X02

1" = 30'

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34882
State: MD | Date Signed: | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — No. 34882 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

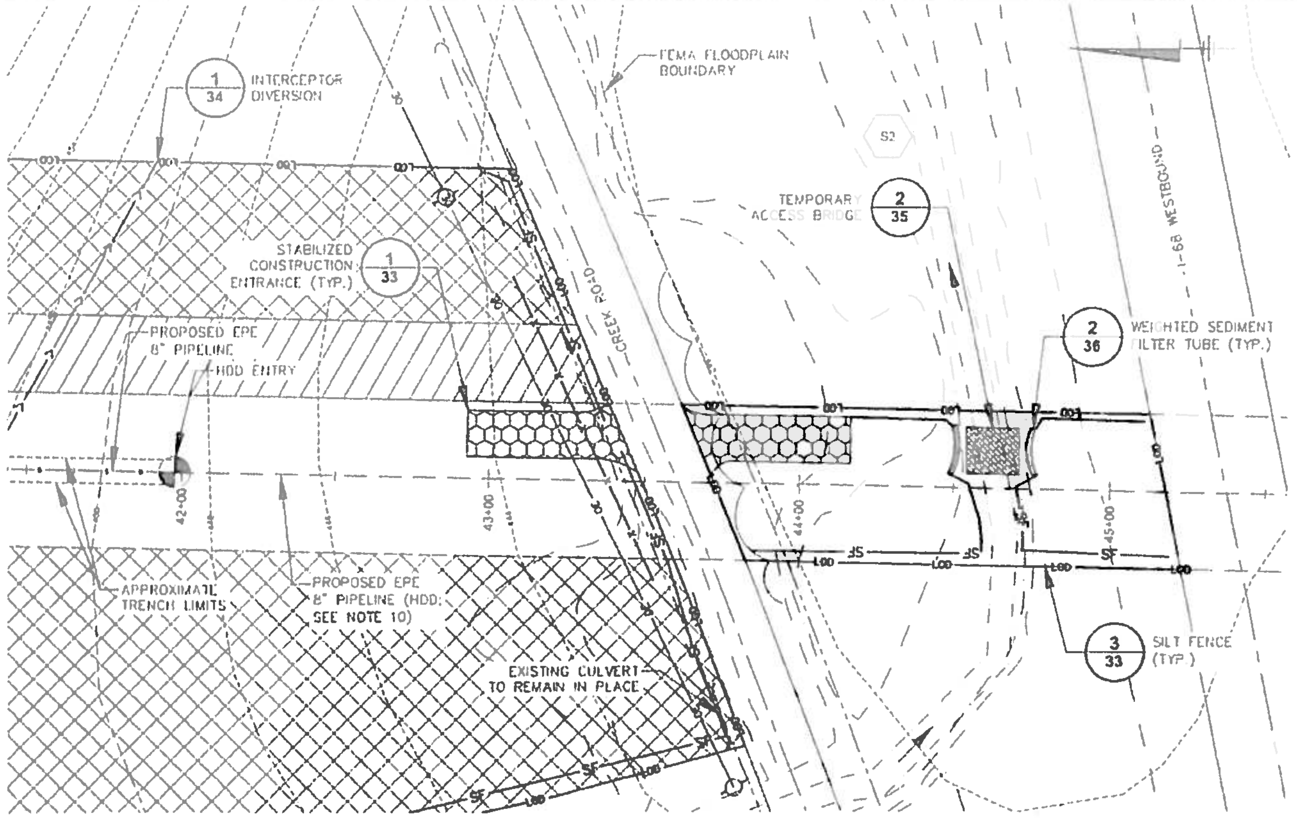
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

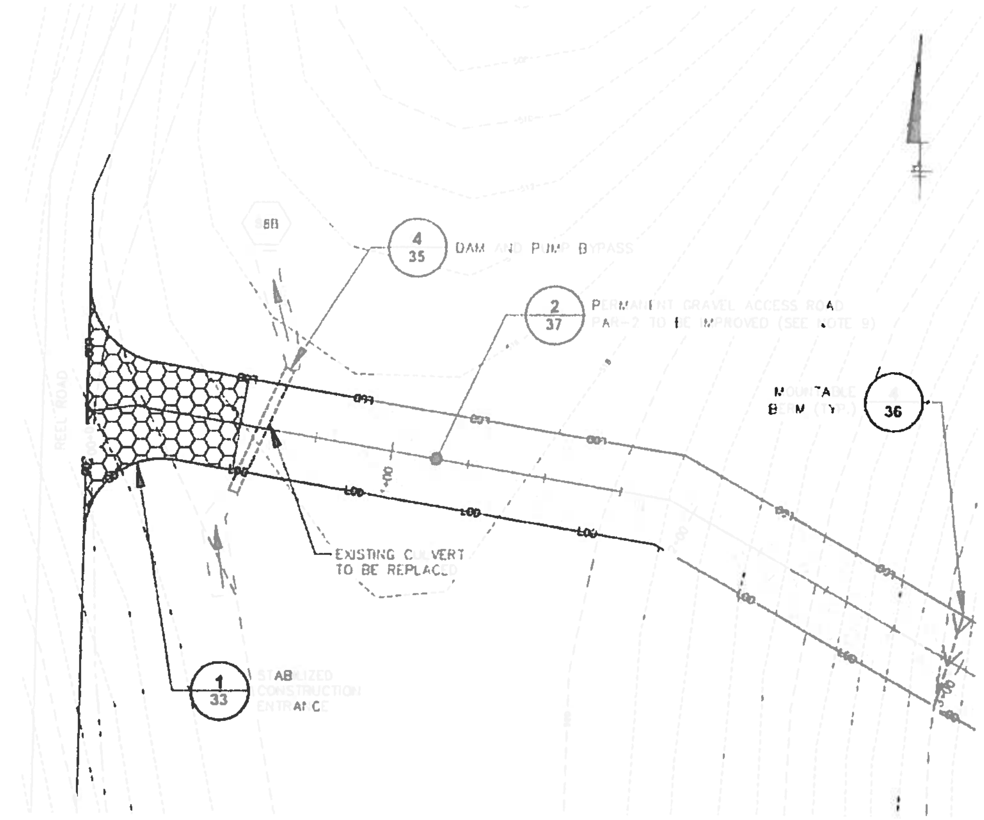
PROPOSED STREAM S1E AND S1 CULVERT REPLACEMENTS PLANS AND PROFILES

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.9180

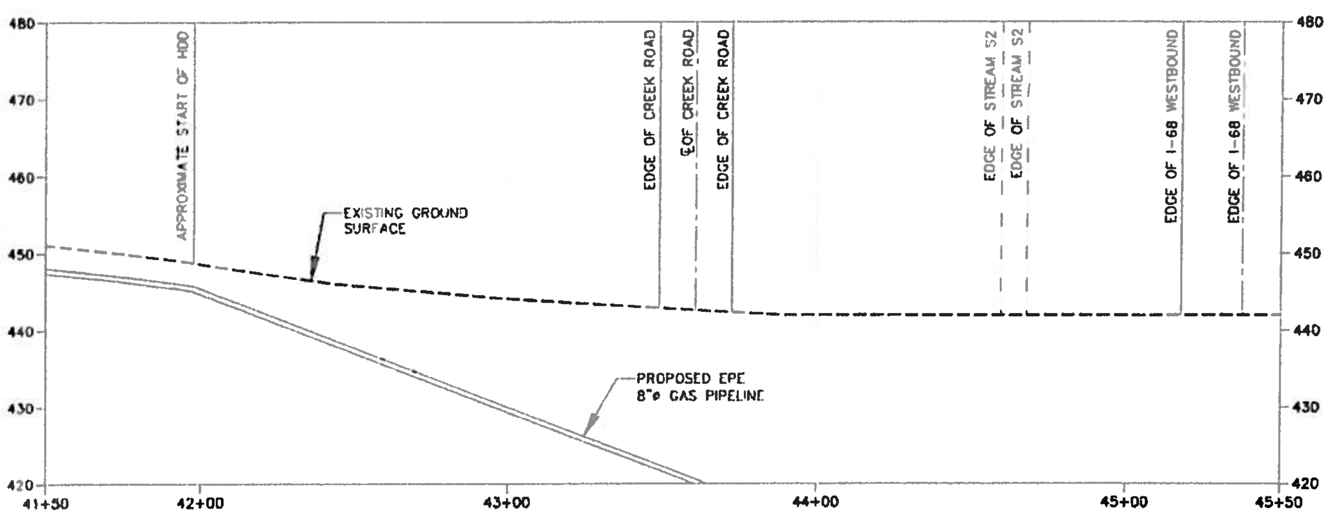
30



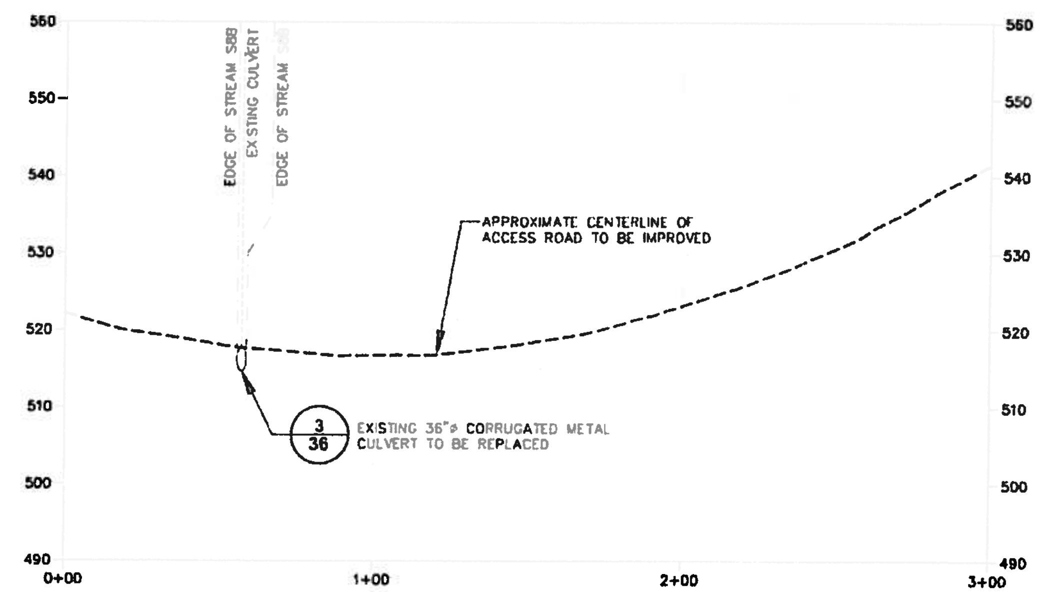
PLAN



PLAN



PROFILE



PROFILE

NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. TEMPORARY EARTH DISTURBANCE IN PENNSYLVANIA WILL BE CONDUCTED UNDER A SEPARATE EROSION AND SEDIMENT CONTROL PLAN REVIEW. ONLY WORK IN MARYLAND IS INCORPORATED WITHIN THIS PLAN.
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4. TOPSOIL SEGREGATION SHALL BE CONDUCTED IN WETLAND, LAWN AND AGRICULTURAL AREAS AND AS OTHERWISE REQUESTED BY THE LANDOWNER. TEMPORARILY STABILIZE SUBSOIL AND TOPSOIL FOLLOWING REMOVAL. SOIL SHALL BE STOCKPILED IN A BERM-LIKE MANNER TO REDUCE RUN-OFF FROM ACTIVE WORK AREAS; AND SHALL HAVE A MAXIMUM HEIGHT OF 35 FEET AND 2 ON 1 (OR FLATTER) SIDE SLOPES.
5. SOIL STOCKPILES FROM TRENCH EXCAVATION SHALL BE LOCATED WITHIN THE TEMPORARY WORKSPACE AND ADDITIONAL TEMPORARY WORKSPACE SHOWN WITH HATCHING ON THESE DRAWINGS. STABILIZED SOIL BERMS LOCATED ON UPGRADIENT SIDE OF THE TRENCH SHALL BE USED AS A RUN-ON CONTROL FEATURE. STABILIZED BERMS LOCATED DOWNGRADIENT OF THE TRENCH SHALL BE UTILIZED AS A PERIMETER SEDIMENT CONTROL FEATURE IN PLACE OF SILT FENCE OR SIMILAR.
6. INTERCEPTOR DIVERSIONS LOCATED IN RESIDENTIAL AREAS AND AGRICULTURAL FIELDS SHALL BE REMOVED DURING FINAL GRADING. INTERCEPTOR DIVERSIONS THAT CAN BE LEFT IN PLACE, AT THE LANDOWNER'S DISCRETION, SHALL BE VEGETATED.
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
8. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
9. PROPOSED PERMANENT ACCESS ROAD PAR-2 WILL BE IMPROVED BY GRADING AND STABILIZED BY STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC.
10. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY. EQUIPMENT ACCESS TO THESE AREAS WILL BE REQUIRED.

AQUATIC RESOURCE CROSSINGS

RESOURCE ID	BEGINNING STATION	ENDING STATION	SIZE OF AQUATIC RESOURCE ON SITE (SF)	TEMPORARY STREAM IMPACT STREAM WIDTH – TOP OF BANK TO TOP OF BANK (FT)	TEMPORARY STREAM IMPACT CENTER LINE OF STREAM (LF)	TEMPORARY STREAM IMPACT AREA (SF)
S2	44+60	44+68	401	8	51	401
S8B	0+56	0+59	93	3	31	93

XREFS CPGL00EP-X00
CPGL00EP-X01
CPGL00EP-X02

1"=30' 30' 0 30' 60'

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Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed: | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

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

COLUMBIA GAS TRANSMISSION, LLC, A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

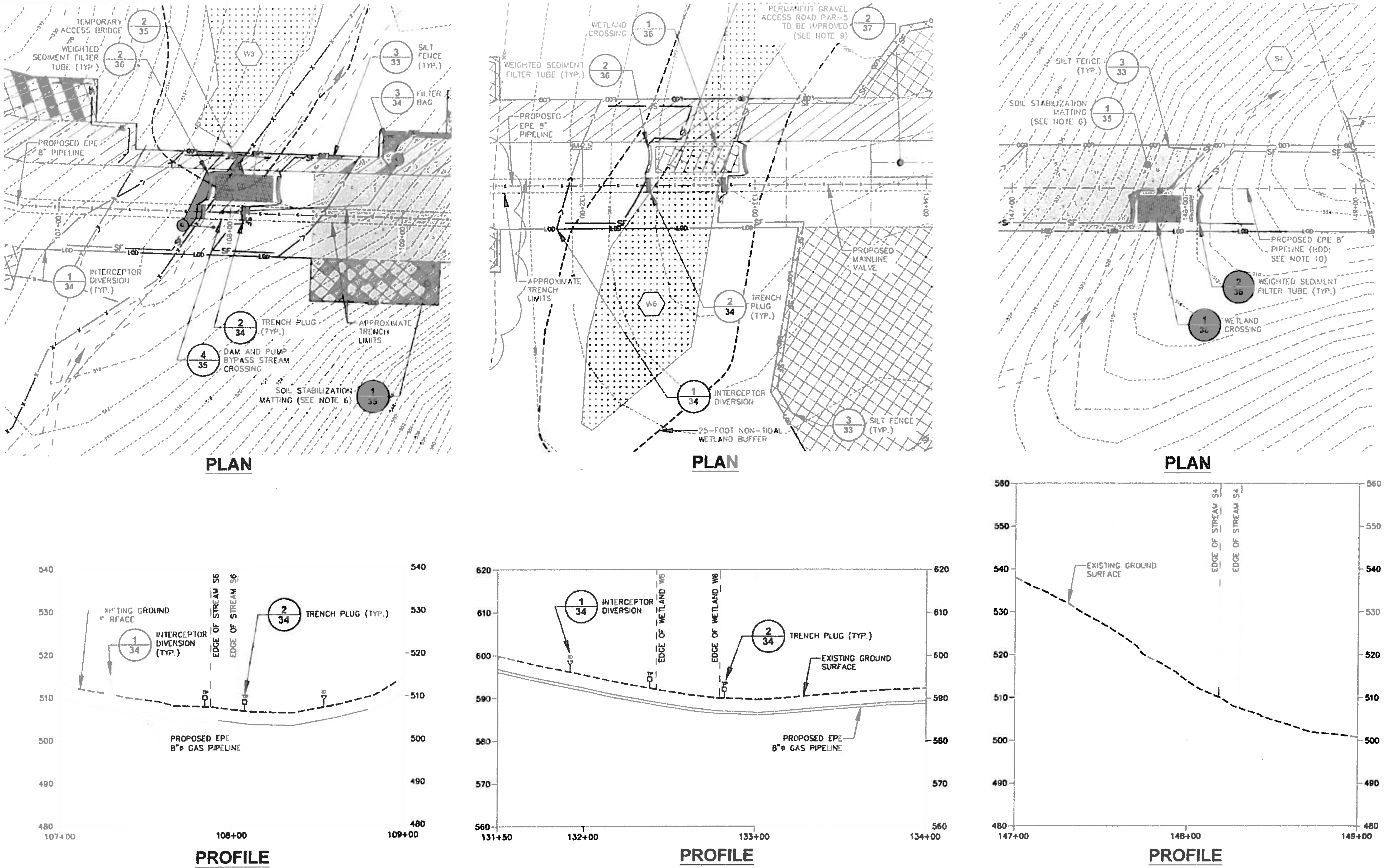
PROPOSED STREAM CROSSING S2 AND STREAM S8B CULVERT REPLACEMENT PLANS AND PROFILES

ARCADIS Project No. CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
Tel. 724 742 9180

31

CITY SYRACUSE NY DIV/GROUP ENVCAD DB A SAMIOS L FORAKER LD A SAMIOS PIC PM TM LYR ON=*;OFF=*REF* \CADD\ACAD\Proj\CPGL00EP\DWG\MDI\CPGL00EP-G05.dwg LAYOUT: 32 SAVED: 3/10/2017 12:17 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTCONT1.CTB PLOTTED: 3/13/2017 9:38 AM BY: SIDARI, ALEXIS

XREFS: CPGL00EP-X00 CPGL00EP-X01 CPGL00EP-X02



NOTES:

1. REFER TO DRAWING 1 FOR DETAILS ON THE PROPOSED SEQUENCE OF INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS.
2. SILT FENCE HAS BEEN PROPOSED AROUND THE PERIMETER OF AQUATIC RESOURCES (I.E., WETLANDS/STREAMS) PER FERC REGULATIONS, UNDERSTANDING THAT THE CONTROLS DO NOT FOLLOW THE ELEVATION CONTOURS IN ALL LOCATIONS.
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6. SOIL STABILIZATION MATTING HAS BEEN PROPOSED ON SLOPES STEEPER THAN 3H:1V.
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V, AND 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
8. PERMANENTLY STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON DRAWING 1.
9. PROPOSED PERMANENT ACCESS ROAD PAR-5 WILL BE IMPROVED BY GRADING AND STABILIZED WITH STONE TO FACILITATE TRUCK AND EQUIPMENT TRAFFIC.
10. DISTURBANCE ACTIVITIES WITHIN PORTIONS OF THE LIMIT OF DISTURBANCE BETWEEN HORIZONTAL DIRECTIONAL DRILLING ENTRY/EXIT LOCATIONS WILL CONSIST OF TREE CLEARING ONLY.
11. PROPOSED EPE 8-INCH DIAMETER PIPELINE IS NOT SHOWN ON THE PROFILE FOR STREAM S4 CROSSING, AS THE PIPELINE WILL BE INSTALLED VIA HORIZONTAL DIRECTIONAL DRILLING APPROXIMATELY 200 FEET BELOW GROUND SURFACE AT THIS STREAM CROSSING.

AQUATIC RESOURCE CROSSINGS

RESOURCE ID	BEGINNING STATION	ENDING STATION	SIZE OF AQUATIC RESOURCE ON SITE (SF)	TEMPORARY STREAM IMPACT STREAM WIDTH - TOP OF BANK TO TOP OF BANK (FT)	TEMPORARY STREAM IMPACT CENTER LINE OF STREAM (LF)	TEMPORARY STREAM IMPACT AREA (SF)	TEMPORARY WETLAND IMPACT (SF)	MDE 25-FOOT WETLAND BUFFER IMPACT (SF)
S6	107+88	108+03	998	16	77	998	N/A	N/A
W6	132+42	132+79	2,600	N/A	N/A	N/A	2,600	6,797
S4	147+94	148+06	599	9	66	599	N/A	N/A

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Professional Engineer's Name: ALLEN R. LONG
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State: MD | Date Signed: | Project Mgr.: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

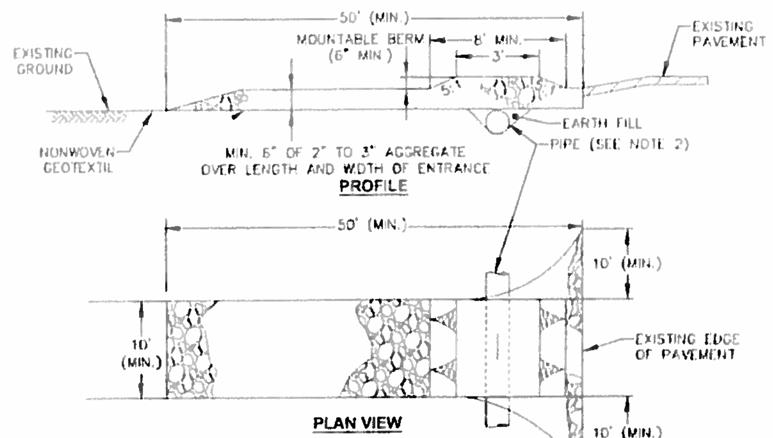
ARCADIS — Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

PROPOSED STREAM CROSSINGS S4 AND S6 AND WETLAND CROSSING W6 PLANS AND PROFILES

ARCADIS Project No. CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Ext., Suite 300, Wexford, PA 15090, Tel 724.742.9180

32

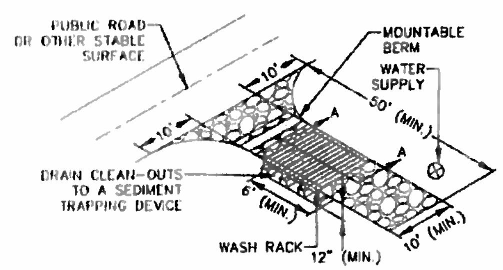


NOTES:

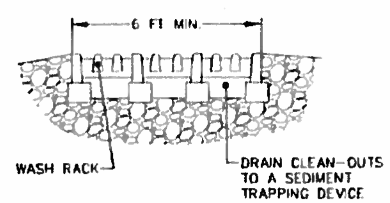
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET. USE MINIMUM WIDTH OF 10 FEET. FLARE STABILIZED CONSTRUCTION ENTRANCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
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)

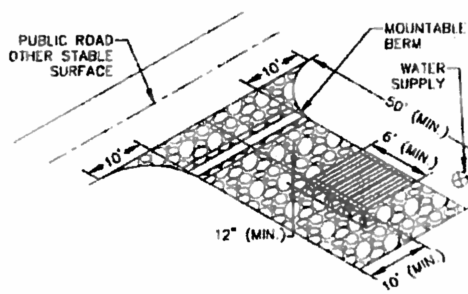
NOT TO SCALE



ISOMETRIC VIEW - WASH RACK IN SCE



SECTION A-A

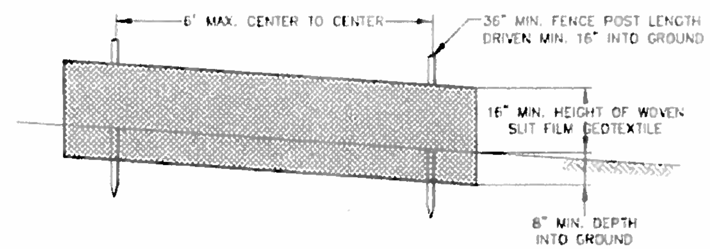


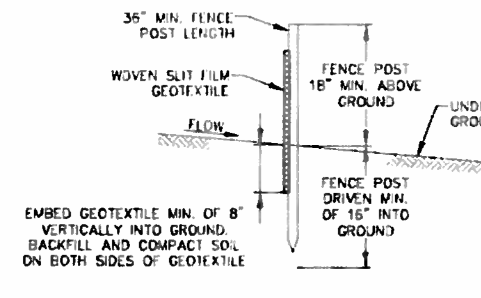
NOTES:

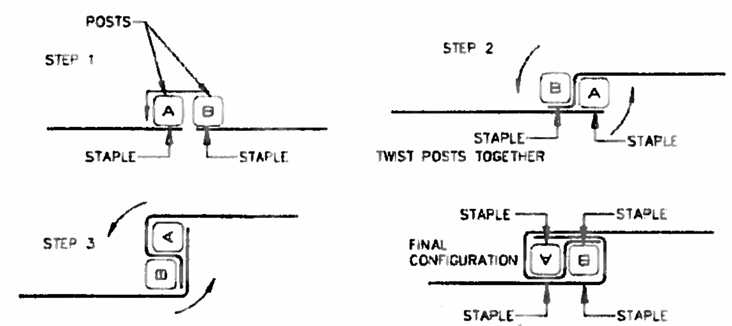
1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET BY 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL 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







JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

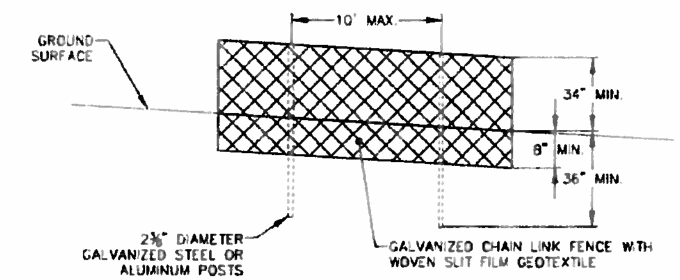
NOTES:

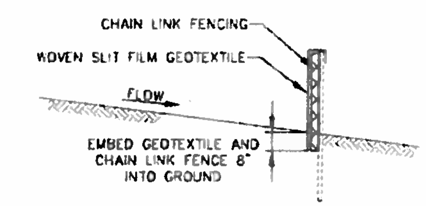
1. USE WOOD POSTS 1 3/4" BY 1 3/4" ± 1/16" (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
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

PROPERTY	TEST METHOD	GEOTEXTILE FABRICS: WOVEN SLIT FILM GEOTEXTILE (MINIMUM AVERAGE ROLL VALUE) MD	CD	WOVEN MONOFILAMENT GEOTEXTILE MD	CD	NONWOVEN GEOTEXTILE 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	





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)

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Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — No. 34862 — PROFESSIONAL ENGINEER

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

COLUMBIA GAS TRANSMISSION, LLC. A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

MISCELLANEOUS DETAILS

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel 724.742.9180

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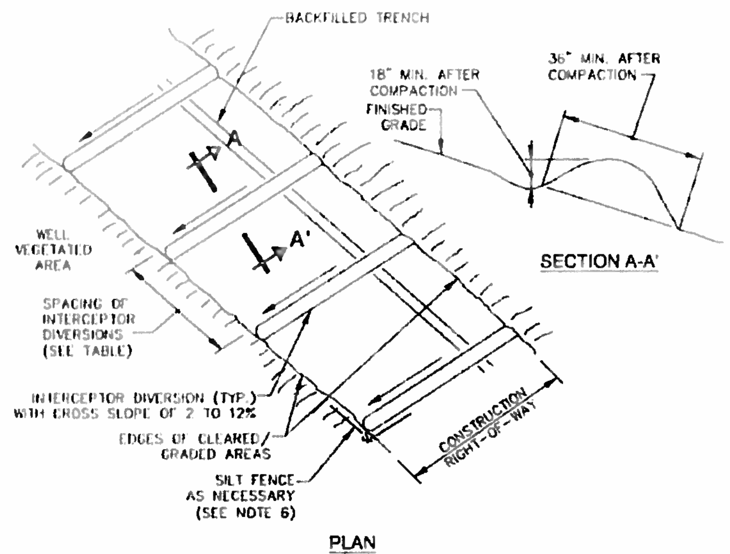


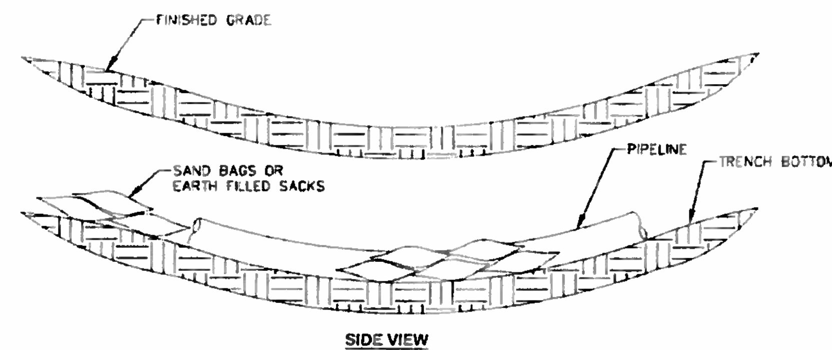
MINIMUM SPACING FOR INTERCEPTOR DIVERSIONS (SEE NOTE 1)	
PERCENT SLOPE	SPACING (FT.)
0-5	NONE
5-15	300
15-30	200
>30	100

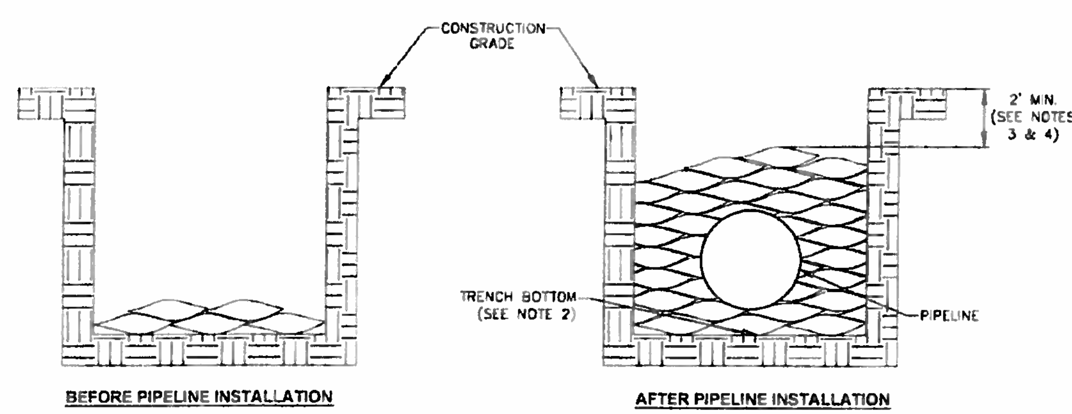
NOTES:

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. SILT FENCE 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



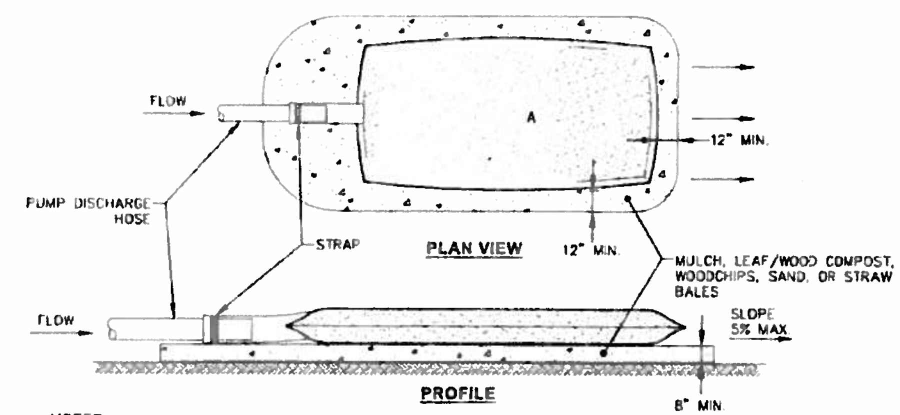


NOTES:

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



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

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Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862

State	Date Signed	Project Mgr
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 34862

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

MISCELLANEOUS DETAILS

ARCADIS Project No.: CPGL00EP.0001.0008A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel. 724 742 9180

CITY SYRACUSE, NY DIV/GROUP. ENVCAD DB A. SAMIOS L. FORAKER LD A. SAMIOS PIC PM TM LYR ON=*;OFF=*REF*
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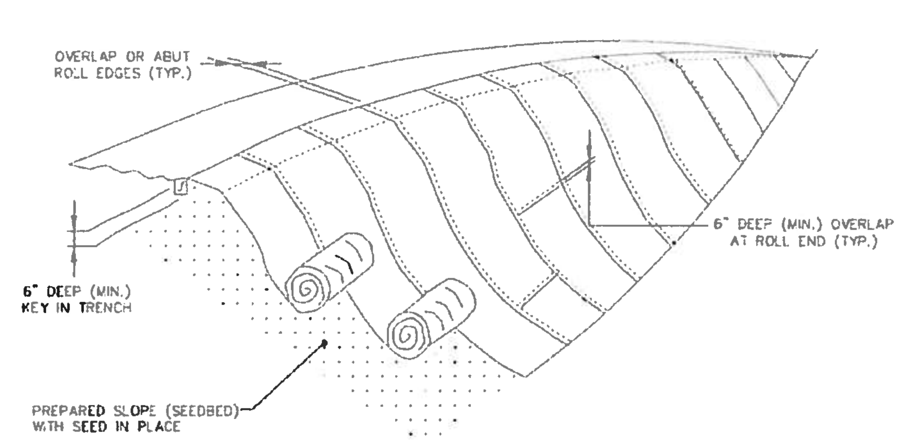
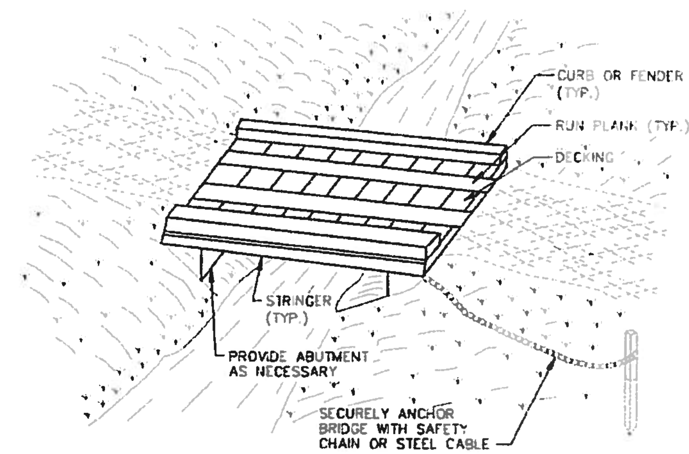


NOTES:

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. 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)

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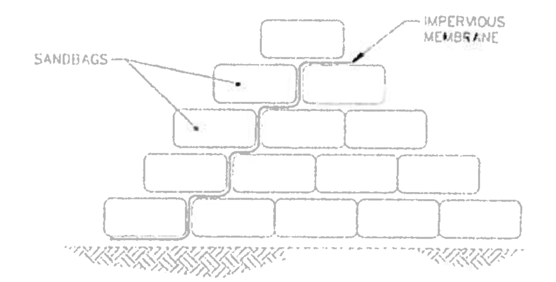
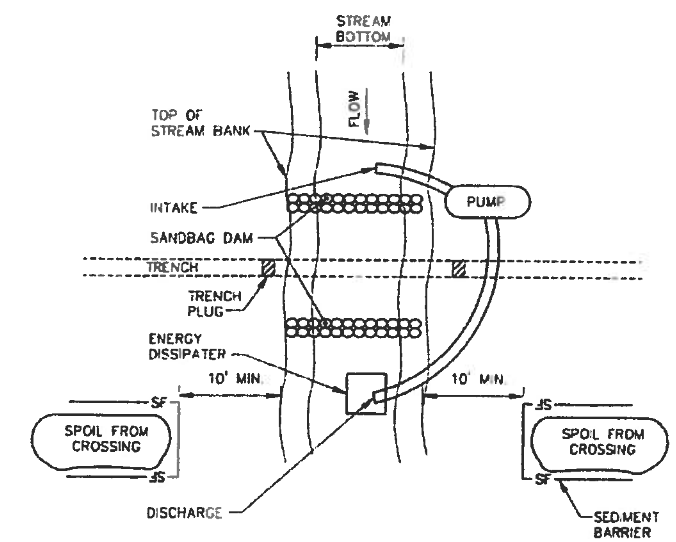


NOTES:

1. TWO BAG MINIMUM HEIGHT ABOVE NORMAL BASE FLOW.
2. A TEMPORARY COFFERDAM, AS MANUFACTURED BY AQUA-BARRIER® OR SIMILAR, MAY BE USED IN PLACE OF SANDBAG DIVERSION DAM.

SANDBAG DIVERSION DAM (3)

NOT TO SCALE



NOTES:

1. GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF THE TOP-OF-BANK UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION.
2. BYPASS PUMP INTAKE SHALL BE MAINTAINED A SUFFICIENT DISTANCE FROM THE BOTTOM TO PREVENT PUMPING OF CHANNEL BOTTOM MATERIALS.
3. TRENCH PLUGS SHALL BE INSTALLED WITHIN THE TRENCH ON BOTH SIDES OF THE STREAM CHANNEL (SEE TRENCH PLUG DETAIL).
4. WATER ACCUMULATING WITHIN THE WORK AREA SHALL BE PUMPED TO A FILTER BAG PRIOR TO DISCHARGING INTO ANY RECEIVING SURFACE WATER.
5. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF STREAM BANK.
6. ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FORM THE STREAM CROSSING AREA.
7. APPROPRIATE STREAMBANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.

DAM AND PUMP BYPASS STREAM CROSSING (4)

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Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34882

State	Date Signed	Project Mgr.
MD		JD
Designed by	Drawn by	Checked by
ALS	ALS	ARL

STATE OF MARYLAND — No. 34882 — PROFESSIONAL ENGINEER

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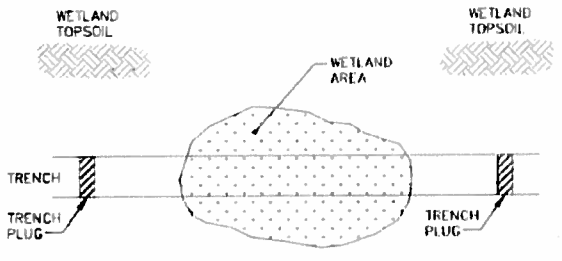
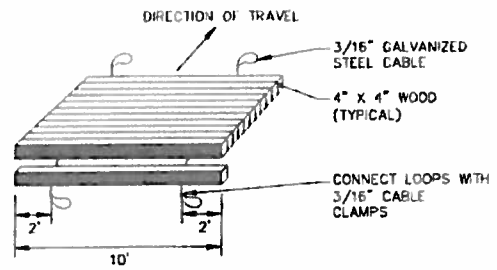


TYPICAL WETLAND CROSSING



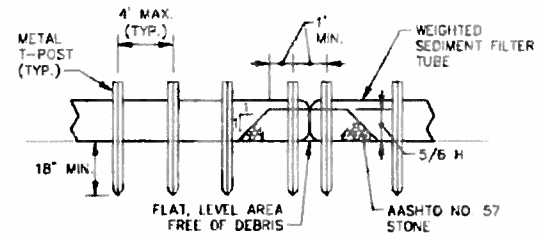
TIMBER MAT

NOTES:

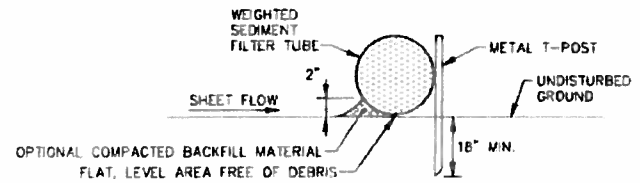
1. STAGING AREAS SHALL BE LOCATED AT LEAST 50 FEET FROM THE EDGE OF THE WETLAND.
2. SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE PLAN DRAWINGS.
3. DISTURBANCE FOR WETLAND CROSSINGS WILL BE LIMITED TO THE MINIMUM IMPACT NEEDED FOR PIPELINE INSTALLATION.
4. THE MOVEMENT OF VEHICLES ACROSS THE WETLAND 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)

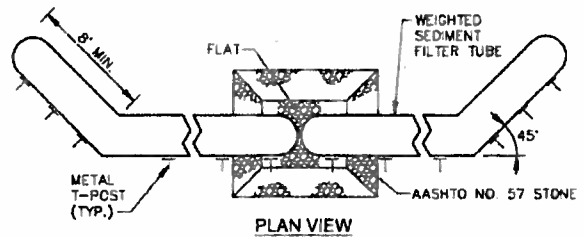
NOT TO SCALE



FRONT VIEW



SECTION VIEW



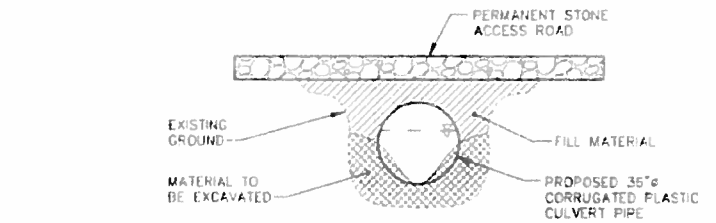
PLAN VIEW

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 LOGS 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 FILTER LOG 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 LOG 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

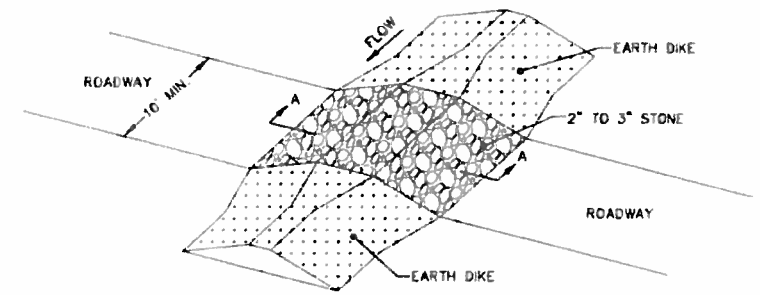


DETAIL NOTES:

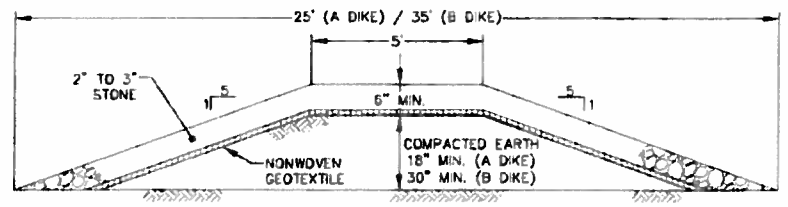
1. DEPTH OF FILL COVERING CULVERTS SHALL NOT EXCEED THE MINIMUM COVER REQUIRED BY THE CURRENT MANUFACTURER'S SPECIFICATIONS FOR THE INTENDED USE OF THE CROSSING. REMAINING CULVERT INSTALLATION DETAILS (E.G., BEDDING, ETC.) SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
2. IN-STREAM WORK IS PROHIBITED BETWEEN MARCH 1 AND JUNE 15 AS THE STREAM IS CLASSIFIED AT A USE I WATERS.
3. CULVERT 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.
4. AFTER INSTALLATION IS COMPLETE, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
5. PLACE MATERIALS IN A LOCATION AND MANNER THAT DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NON-TIDAL WETLANDS, NON-TIGAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.

PERMANENT CULVERT CROSSING (3)

NOT TO SCALE



ISOMETRIC VIEW



SECTION A-A

NOTES:

1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MOUNTABLE BERM (4)

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	Chk
1	8/22/16	PADEP COMMENT RESPONSE	KM	MBH

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No: MD 34880
State: MD | Date Signed: | Project Mgr: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

STATE OF MARYLAND — No. 34880 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

O M A GAS TRANSMISSION C A RAN CANADA COM AN • HOUSTON, TEXAS
EASTERN PANHANDL EXPANSION PRO ECT

MISCELLANEOUS DETAILS

ARCADIS Project No: CPGL00EP.0001 0008A
Date: MARCH 2017

ARCADIS
6041 Wallace Road Extension
Suite 300
Wexford, PA 15090
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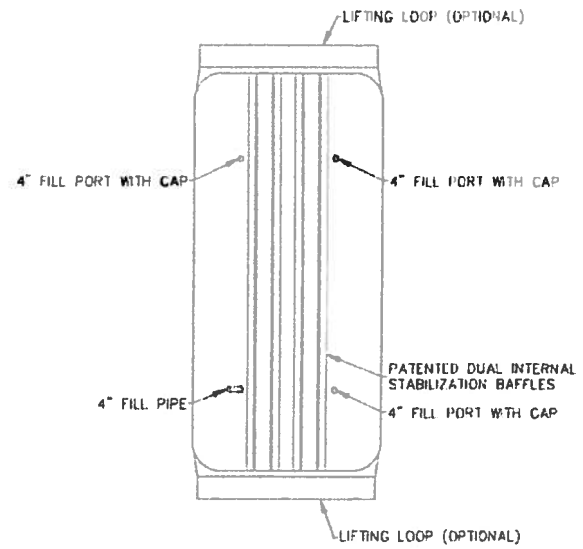
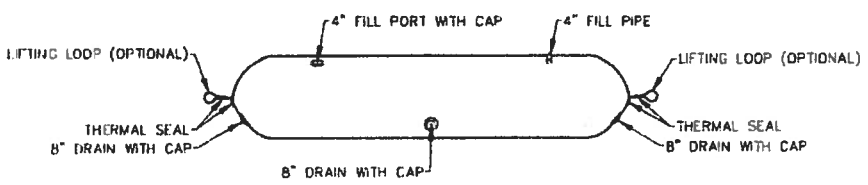
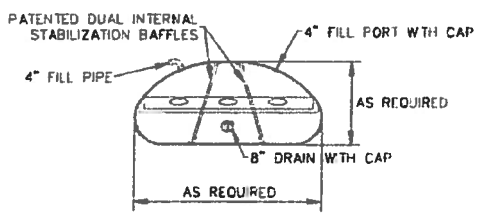
36



PLAN VIEW



FRONT VIEW



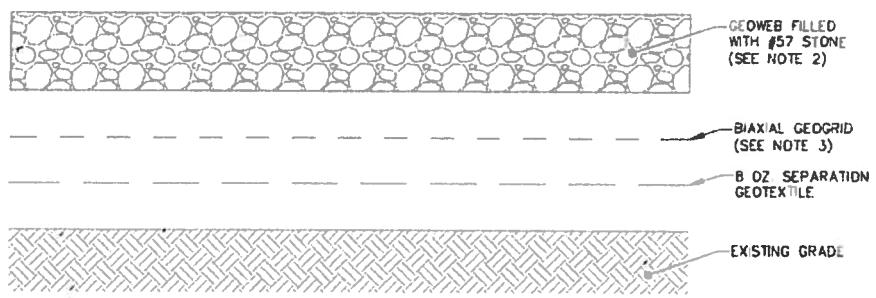
SECTION VIEW

NOTE:

1. AQUA-BARRIER® SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION GUIDELINES

AQUA-BARRIER® (1)

NOT TO SCALE



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

NOT TO SCALE

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

No.	Date	Revisions	By	Chd
1	8/22/16	PADEP COMMENT RESPONSE	KM	MBH

Professional Engineer's Name: ALLEN R. LONG
Professional Engineer's No.: MD 34862
State: MD | Date Signed: | Project Mgr.: JD
Designed by: ALS | Drawn by: ALS | Checked by: ARL

COMMONWEALTH OF MARYLAND — No. 34862 — PROFESSIONAL ENGINEER — 2017

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • HOUSTON, TEXAS
EASTERN PANHANDLE EXPANSION PROJECT

MISCELLANEOUS DETAILS

ARCADIS Project No.: CPGL00EP.0001.0006A
Date: MARCH 2017
ARCADIS, 6041 Wallace Road Extension, Suite 300, Wexford, PA 15090, Tel: 724.742.0180

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Attachment 8

Impact Table

Columbia Gas Transmissi ., a TransCanada Company
Eastern Pandhandle Expansion Project
Maryland Aquatic Resource Impacts

Waters Name	Latitude (dms nad83)	Longitude (dms nad83)	Impact Type (T/P)	Stream Impacts			Temporary FEMA 100-yr Floodplain Impact (sq ft)	Wetland Impacts		MDE 25 ft. Wetland Buffer (sq ft)	Proposed Activity	E&S Drawing Sheet
				Temporary Stream Impact (width) 1	Temporary Stream Impact (center)	Temporary Stream Impact (sq ft) 2		Temporary Wetland Impact (sq ft)	Temporary Wetland Conversion Impact (sq ft) 3			
S1	W078° 12' 21.85"	N039° 42' 46.68"	T	8	9	86	NA	NA	NA	NA	Culvert Replacement	30
S1E	W078° 12' 12.41"	N039° 43' 20.94"	T	19	35	506	NA	NA	NA	NA	Culvert Replacement	30
S2	W078° 12' 33.57"	N039° 42' 41.16"	T	8	51	401	5,861	NA	NA	NA	Temporary Road Crossing, Temporary Workspace and Tree Clearing	31
S4	W078° 12' 00.01"	N039° 41' 05.93"	T	9	66	599	NA	NA	NA	NA	Temporary Road Crossing	32
S6	W078° 12' 27.11"	N039° 41' 41.01"	T	16	77	998	NA	NA	NA	NA	Pipeline Installation	32
S10	W078° 11' 51.26"	N039° 40' 55.71"	T	NA	NA	NA	4,273	NA	NA	NA	Tree Clearing	23
S8B	W078° 12' 49.44"	N039° 42' 15.71"	T	3	31	93	NA	NA	NA	NA	Culvert Replacement	31
W3	W078° 12' 25.15"	N039° 41' 41.26"	T	NA	NA	NA	NA	NA	NA	999	Pipeline Installation	32
W6	W078° 12' 13.01"	N039° 41' 18.74"	T	NA	NA	NA	NA	1,885	715	6,797	Pipeline Installation	32
W10	W078° 12' 25.52"	N039° 42' 01.21"	T	NA	NA	NA	NA	NA	NA	549	Anode Bed Installation	18
			TOTAL	63	269	2,683	10,134	1,885	715	8,345		

Notes:

1. Stream widths vary within the project limits of disturbance. The stream width column provides stream width at the center of the propose activity.
2. The stream impact size was calculated using the polygon of the resource in AutoCAD to capture the changes in width and provide an accurate size. As such, the stream width mutiplied by the stream center may not equal the stream impact provided in the table.
3. Tree clearing is proposed within the PSS portion of wetland W6 to accommodate a temporary workspace required for construction. This will result in a temporary conversion of the PSS portion of wetland W6 to PEM. Upon completion of construction this portion of the wetland will be allowed to naturally revert back to PSS.

Attachment 9

Alternatives Analysis

Columbia Gas Transmission, LLC. (Columbia), a TransCanada company considered the results of the alternatives evaluation process to develop and refine the scope of the Project.

Columbia evaluated alternatives in the following four categories for this Project:

- No-Action Alternative
- Alternative Energy Sources
- System Alternatives
- Route Alternatives and Variations

1.1 No-Action Alternative

Under the "no-action" alternative the Project would not be constructed and the purpose and need described in Attachment 4 would not be realized. The Project is intended to increase supply options and system reliability, thereby greatly reducing the risk of interruptions to Columbia's markets. While the no-action alternative would entirely avoid potential impacts to environmental resources within the Project footprint, it would provide no ability to increase supply and source options needed to better service Columbia's customers in the region, which are already at capacity. The no-action alternative is not considered a viable option because it does not meet the current Project's purpose and need discussed in Attachment 4.

1.2 ALTERNATIVE ENERGY SOURCES

The Project is designed to provide increased capacity for the interstate transportation of natural gas from supply points in the Appalachian basin to demand areas within Columbia's service area. As discussed below, the energy alternatives identified in this report cannot meet the purpose and need of the Project, which is to provide capacity to transport developed natural gas supplies to consumption markets or intermediary delivery points, of the proposed Project. Columbia has nevertheless provided a discussion of energy alternatives for the Project per 18 Code of Federal Regulations §380.12(l)(1). The use of alternative energy sources is an option to meet some of the short-term and long-term demand for energy in the target market areas. Potential alternative energy sources to natural gas include traditional fuels, such as coal and oil, nuclear energy; and renewable energy sources, such as wind, solar, hydroelectric, biomass, and tidal and wave. Depending on the location of the identified alternative energy source, new infrastructure would be required, including transmission facilities, to connect supply and demand areas.

1.2.1 Oil and Coal

Compared to other fossil fuels, natural gas is a relatively clean and efficient fuel. The use of coal-based or petroleum energy instead of natural gas would likely result in increased emissions of pollutants, such as nitrogen oxide, sulfur dioxide, greenhouse gases (e.g., carbon dioxide), and particulate matter, each of which require costly air pollution controls to be installed. Additionally, coal-based energy creates large quantities of coal combustion byproducts (e.g., fly ash), which require environmental management and disposition. Because natural gas is a cleaner burning fuel than other fossil fuel alternatives and does not require solid waste disposal or measures related to inadvertent releases from petroleum, the

environmental impacts associated with increased use of coal or petroleum would likely exceed the impacts of the proposed Project.

When compared to average air emissions for coal-fired power generation, natural gas fired power generation produces approximately one-half as much carbon dioxide, one-third the nitrogen oxides, and one-one hundredth the sulfur oxides at the generation site. When compared to average air emissions for oil-fired power generation, natural gas-fired power generation produces approximately two-thirds the carbon dioxide, one-half the nitrogen oxides, and less than one-one hundredth the sulfur dioxides at the generation site (EPA 2017). Therefore, coal-fired and oil-fired generation provides no environmental advantage over the proposed Project.

The viability of continued use of coal as an alternative to natural gas for power generation will be diminished by the U.S. Environmental Protection Agency's (EPA) Clean Power Plan final rule aimed at reducing carbon dioxide emissions from power generating facilities. A main component of the rule is to encourage the decreased utilization of aging base load coal-fired plants and increased generation of electricity using cleaner fuel sources, including natural gas. Therefore, oil and coal are not preferred alternatives to the portion of the Project that may be supplied by Columbia's shippers to power generation customers.

In addition to environmental impacts, the use of alternative non-renewable fuel options would not meet the Project's planned in-service date of November 2018. Timelines for the modification or development of new clean coal-fired plants are extremely long and face many regulatory uncertainties. While gas-fired energy production is not without its challenges, the permitting and approval processes are relatively straightforward, and facility design and construction schedules are more predictable.

1.2.2 Nuclear

Nuclear energy development is an option that may be considered environmentally viable, especially in terms of limiting air emissions of criteria pollutants and greenhouse gasses. However, this option has drawbacks, specifically negative public perception concerning safety risks and the long-term environmental impacts associated with the disposal of radioactive waste products.

As a result, the current regulatory climate exists indicates a low probability of a new nuclear facility within the region being proposed in time to meet the Project's planned in-service date of November 2018. While the Energy Policy Act of 2005 incorporated a range of measures to support current nuclear plants and provide incentives for building new nuclear facilities, the high construction costs and long construction schedules for nuclear plants make it unlikely that a new nuclear power facility and associated new electric transmission and distribution lines could be sited and developed to provide power within the time frame of the Project's proposed in-service date.

1.2.3 Renewables

Renewable energy sources are expected to play an increasingly prominent role in meeting U.S. energy demands in the coming years. In a projection by the U.S. Energy Information Administration (EIA), total U.S. electricity generation from renewable sources (excluding conventional hydropower) will almost double from 2016 to 2040 (EIA, 2017). Nonetheless, significant long-term investment in new facilities, including transmission infrastructure, would be necessary before renewable energy could potentially satisfy a substantial portion of the projected energy demand within Columbia's service area. Even with massive investment, absent technological breakthroughs in energy storage, wind and solar are

intermittent resources and cannot yet replace around-the-clock generation resources such as gas-fired combined cycle generation.

1.2.4 Energy Conservation

Energy conservation could help alleviate some of the growing demand for energy in the U.S. State and federal energy conservation measures, as well as improving technology, will likely play an important role in slowing the growth of energy demand in the coming decades. However, it is unlikely that these measures will offset the increasing demand for natural gas. The EIA predicts that U.S. energy use per capita will decrease by approximately 8 percent through 2040, as higher efficiency standards for vehicles and appliances take effect. Nevertheless, the EIA indicates that, even with the recently enacted energy efficiency policies, total primary energy consumption, including fuels used for electricity generation, will grow by five percent from 2016 to 2040 (EIA, 2017a). To meet this demand, the EIA predicts that total domestic production of natural gas in the United States will grow from an estimated 27.5 trillion cubic feet in 2016 to 32 trillion cubic feet by 2040, and that shale gas production will make up nearly two-thirds of total U.S. production in 2040 (EIA, 2017a). The anticipated growth in natural gas production will be driven primarily by its increased use for electric power generation and industrial applications.

Conservation of energy reduces the demand for limited existing reserves of non-renewable resources. Although energy conservation measures will be important elements in addressing future energy demands, it is unlikely that such actions will be able to offset more than a fraction of anticipated demand in the foreseeable future. As a result, energy conservation alone (or in conjunction with other alternatives) is not a viable alternative because it does not preclude the need for natural gas infrastructure projects to meet the growing demand for energy.

Energy conservation or the use of alternative forms of energy would not achieve the purpose and need of the Project, which is designed to transport abundant natural gas reserves immediately available for delivery to market areas, but are presently stranded due to a lack of sufficient inter and intrastate pipeline capacity. Thus, to generate revenue from the sale of natural gas that is already available, the natural gas producers have contracted with Columbia to construct the infrastructure required to access available markets.

1.3 SYSTEM ALTERNATIVES

In addition to the Project objectives stated above, the Project will facilitate access to increased natural gas supplies within the Appalachian Basin and increase supply options ensuring that Columbia's regional customer needs and markets are met on a consistent, safe, and reliable basis. Over the years, pipelines and related infrastructure have demonstrated the safe and economical means for moving large quantities of natural gas capacity from existing systems, through the proposed pipeline projects and ultimately to the regional customer and markets for use.

No new compressor stations or upgrades to existing stations are proposed. Increasing compression would allow for a greater delivery volume without new pipeline construction; however, it would not provide an alternate means of delivery or provide the supply options needed to meet the Project purpose and need.

Columbia has existing transmission infrastructure in close proximity to the Project; therefore, the greatest overall conservation of environmental resources is attained through Columbia's proposal to take

the shortest practical route from their nearest accessible transmission line to the point of delivery (POD) with Mountaineer. Therefore, no system alternatives were evaluated.

1.4 MAJOR ROUTE ALTERNATIVES

Columbia implemented an interdisciplinary process to identify and evaluate potential routes for the Project. Routes were considered and evaluated regarding the locations of receipt and delivery points, engineering and constructability criteria, existing land use, terrain, and environmental constraints. The objective of the process was to identify the shortest possible route between major project components taking into account project needs, engineering constraints, crossings of public lands, and the potential for impacts on sensitive environmental resources.

Columbia performed a major route alternative analysis for the Project in an effort to develop the most direct route that could connect the existing Columbia system to the proposed Mountaineer system north of Berkley Springs, West Virginia. In order to meet the purpose and need of the Project, Columbia identified four major route alternatives.

Each route alternative was evaluated for environmental, constructability, and economic criteria. Columbia's analysis of route alternatives and variations (discussed in Section 10.5) used a geographic information system (GIS) and publicly available information to characterize crossings of environmental features and other constraints along the routes. Figure 10.4-1 provides an overview of the major route alternatives. Table 10.4-1 provides a comparison of major route alternatives including the proposed Route.

As presented in Figure 10.4.1 the major alternative analysis consisted of the Preferred Route, Alternative A, Alternative B and Alternative C. As the object of any routing analysis involves the avoidance or minimization of potential adverse environmental impacts and engineering constraints to the greatest extent practicable. Table 10.4-1 details that while Alternative A, B, and C meet the needs of Columbia, they would result in significant increase in environmental impacts due to the length, increased the number of wetland and waterbody crossings, residential impacts, road crossings and other engineering constraints, including significant terrain issues. While Columbia initially evaluated Alternative A, B, and C, no further analysis was completed on these Alternatives as the Preferred Route met the proposed Project need, as well as significantly minimized the potential environmental impacts and engineering constraints.

1.5 MINOR ROUTE VARIATIONS

Route variations are an evaluation to reduce impacts on specific localized features of the Preferred Route identified during the Major Route Alternative analysis. Columbia has assessed three route variations along the Preferred Route. These variations were evaluated to identify other potential routes along and across the Potomac River.

1.5.1 Route Variation A

Route Variation A represents a slight variation from the Preferred Route. From the proposed Pennsylvania interconnection at Columbia's existing 1804 and 10240 pipelines in Fulton County Pennsylvania, Route Variation C follows the same alignment as Preferred Route, however, rather than the HDD extending from the promontory above the Potomac River in an eastward alignment, Route Variation A possesses a southeasterly HDD alignment.

This slightly shifted HDD alignment allows Columbia a more efficient pipeline stringing and pull back length without bends. The geotechnical investigation conducted for the Potomac River Crossing area found that the subsurface conditions pose relativity low risk for the HDD construction and inadvertent return of drilling fluid. As discussed in Section 10.4, the Preferred Route presents the fewest environmental constraints while also offering the shortest distance between existing 1804 and 10240 pipelines and the proposed Mountaineer system. For these reasons, Columbia has incorporated Route Variation C in to the proposed Project.

Figure 10.5-1 provides an overview of the Route Variation A compared to that portion of the Preferred Route Table 10.5-1 provides a comparison of Route Variation A to the Preferred Route.

1.5.2 Route Variation B

Route Variation B represents a slight variation from the Preferred Route before the proposed alignment crosses the Potomac River. From the proposed Pennsylvania meter station along Lines 1804 and 10240, Route Variation A follows the same alignment as the Preferred Route. However, rather than commencing the HDD at the promontory above the Potomac River, Route Variation B heads northeast along ridgeline toward the Town of Hancock, crossing Route 522 before turning southeast to cross the Potomac River. Columbia would propose a HDD of the various recreational trails along the Potomac River, the C&O Canal and the Potomac River itself before emerging in an agricultural field along Airport Road in Morgan County West Virginia. From here, the Project would continue in a southeast alignment across the CSX Transportation, Inc. (CSX) yard and River Road before turning southwest to parallel Stonewall Jackson Hill and Hancock Road to the west.

Initially, Columbia thought this route variation might provide a more feasible engineering HDD of the Potomac River, as well as reduce the potential impacts to the National Park Service and C&O Canal lands by making use of an existing power line crossing of the Potomac River; however, the analysis revealed other encumbrances to the route variation. In addition to increasing the overall length of the route by 80%, the route variation brought the alignment in closer proximity to high consequence areas (HCA) including the Hancock Middle Senior High School, the Church of the Nazarene, and Fort Tonoloway State Park. Finally, the addition of three new road crossings and significant increase in forested land clearing associated with the ROW and HDD activities (stringing and pullback) precluded Columbia from any further detailed analysis of this route variation. As such this variation was not incorporated in the proposed Project.

Figure 10.5-2 provides an overview of the Route Variation B compared to that portion of the Preferred Route. Table 10.5-2 provides a comparison of Route Variation B to the Preferred Route.

1.5.3 Route Variation C

Route Variation C represents a reduction in length from Route Variation B above with Route Variation B following a similar alignment however evaluating a different crossing method of the Potomac River. As presented in the below figure, Columbia evaluated an overhead (aerial) crossing of the Potomac River and a different POD to the Mountaineer system.

The initial engineering assessment of a proposed overhead crossing consisting of collocating the pipeline along the Route 522 bridge found the constructability, safety, and reliability risks to be significant. Further, the relocated POD to Mountaineer was not in an area Mountaineer preferred, as the POD would

be located within an expanding area of residential homes. Finally, the position of the POD would place it squarely within the area known as Stonewall Jackson Hill, a landmark per the West Virginia Department of Culture and History. For these potential impacts and encumbrances, Route Variation C was not evaluated further as a viable variation.

Figure 10.5-3 provides an overview of the Route Variation C compared to that portion of the Preferred Route. Table 10.5-3 provides a comparison of Route Variation C to the Preferred Route.

Table 10.4-1

Environmental Factors Considered for Route Alternative Analysis

Resource	Preferred Route	Route Alternative A	Route Alternative B	Route Alternative C
Total Length (mi)	3.37	8.71	10.30	14.33
Type of ROW				
New ROW (mi)	3.37	8.71	10.30	14.33
ROW Requirements				
Construction (acres)	30.60	79.20	93.64	130.31
Operation (acres)	20.40	52.80	62.43	86.87
Wetlands				
NWI Wetlands (mi)	0.00	0.004	0.14	0.00
State Wetlands (mi)	0.00	0.00	0.00	0.00
Waterbodies				
Total Number	5	17	17	20
Major River Crossing (>100ft)	1	1	1	1
Cultural Resources (no.)	0	0	0	2
National Historic Landmarks (no.)	0	0	0	0
National Register of Historic Places (no.)	1	4	2	3
Residences with 50ft (no.)	2	14	22	11
Federal Land:				
National Forests (mi)	0.00	0.00	0.00	0.00
National Parks (mi)	0.11	0.31	0.27	2.26
Indian Reservations (mi)	0.00	0.00	0.00	0.00

Table 10.5-1

Environmental Factors Considered for Route Variation A

Resource	Preferred Route (MP2.72 to MP3.23)	Route Variation A
Total Length (mi)	0.48	0.55
Type of ROW		
New ROW (mi)	0.44	0.55
ROW Requirements		
Construction (acres)	4.32	5.01
Operation (acres)	2.88	3.34
Wetlands		
NWI Wetlands (mi)	0.00	<0.01
State Wetlands (mi)	0.00	0.00
Waterbodies		
Total Number	2	1
Major River Crossing (>100ft)	1	1
Cultural Resources (no.)	0	0
National Historic Landmarks (no.)	0	0
National Register of Historic Places (no.)	0	0
Residences with 50ft (no.)	0	0
Federal Land:		
National Forests (mi)	0.00	0.00
National Parks (mi)	0.11	0.11
Indian Reservations (mi)	0.00	0.00

Table 10.5-2

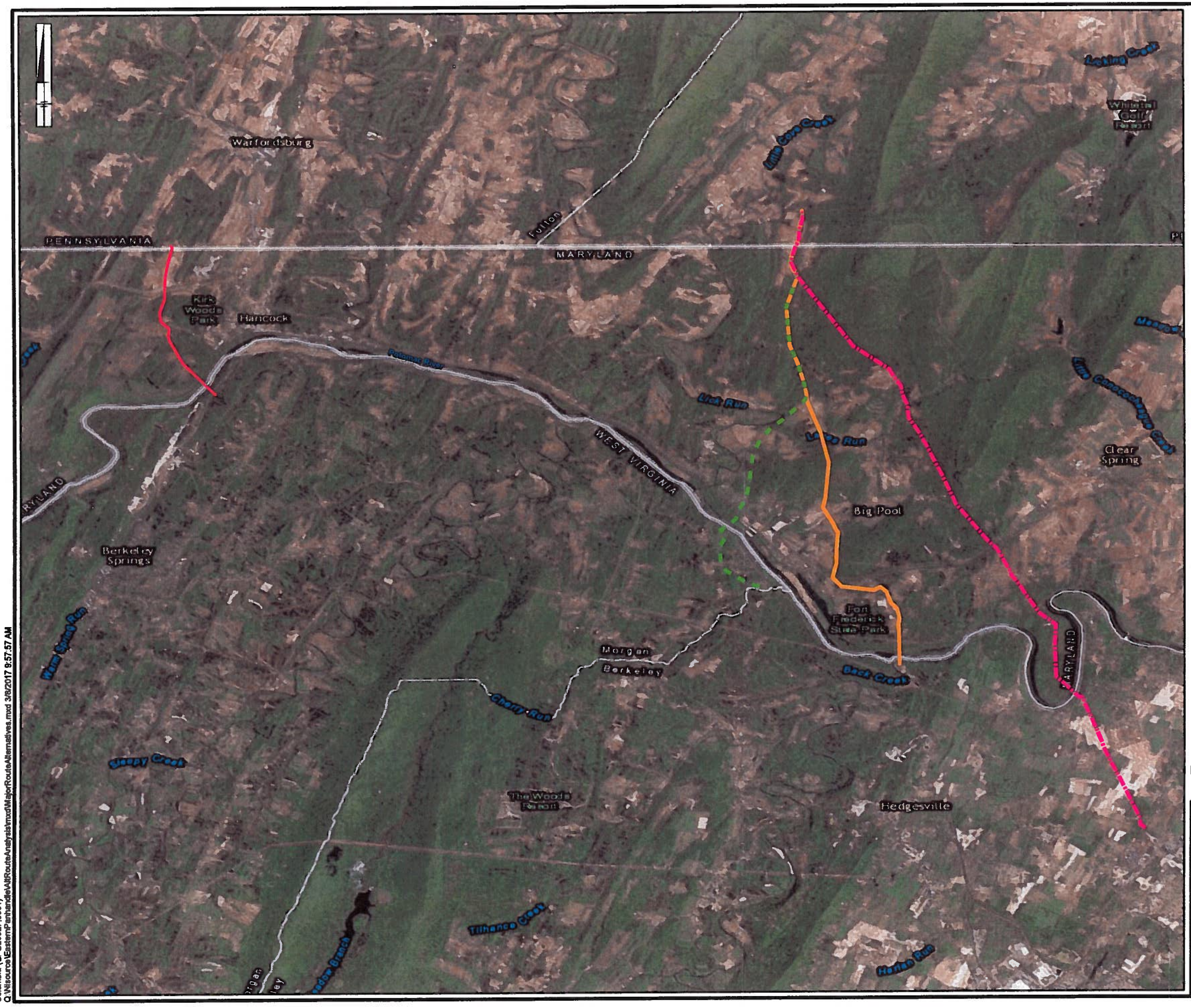
Environmental Factors Considered for Route Variation B

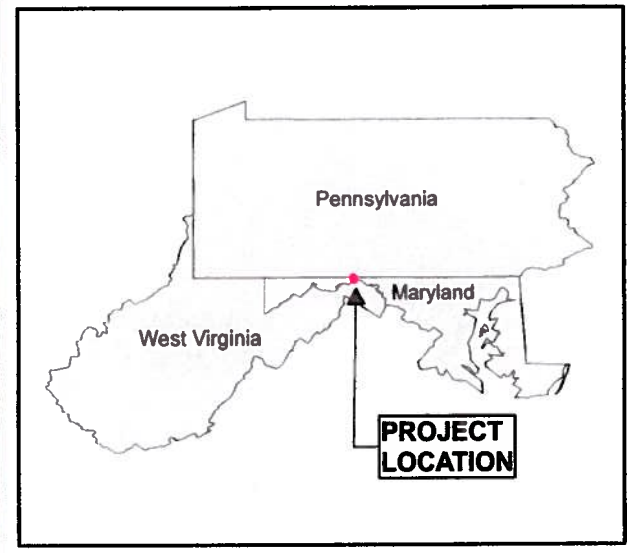
Resource	Preferred Route (MP2.59 to MP3.35)	Route Variation B
Total Length (mi)	0.76	2.93
Type of ROW		
New ROW (mi)	0.76	2.93
ROW Requirements		
Construction (acres)	6.95	26.65
Operation (acres)	4.64	17.77
Wetlands		
NWI Wetlands (mi)	0.00	0.004
State Wetlands (mi)	0.00	0.00
Waterbodies		
Total Number	2	4
Major River Crossing (>100ft)	1	1
Cultural Resources (no.)	0	0
National Historic Landmarks (no.)	0	0
National Register of Historic Places (no.)	1	2
Residences with 50ft (no.)	0	3
Federal Land:		
National Forests (mi)	0.00	0.00
National Parks (mi)	0.11	0.87
Indian Reservations (mi)	0.00	0.00

Table 10.5-3

Environmental Factors Considered for Route Variation C

Resource	Proposed Project (MP2.59 to MP3.20)	Route Variation C
Total Length (mi)	0.61	1.77
Type of ROW		
New ROW (mi)	0.61	1.77
ROW Requirements		
Construction (acres)	5.55	16.06
Operation (acres)	3.70	10.71
Wetlands		
NWI Wetlands (mi)	0.00	0.004
State Wetlands (mi)	0.00	0.00
Waterbodies		
Total Number	1	4
Major River Crossing (>100ft)	1	1
Cultural Resources (no.)	0	0
National Historic Landmarks (no.)	0	0
National Register of Historic Places (no.)	1	3
Residences with 50ft (no.)	0	1
Federal Land:		
National Forests (mi)	0.00	0.00
National Parks (mi)	0.11	0.75
Indian Reservations (mi)	0.00	0.00





LEGEND:

- PROPOSED ROUTE
- ALTERNATIVE A
- ALTERNATIVE B
- ALTERNATIVE C

0 2 4 Miles

GRAPHIC SCALE

NOTE:

1. MAY 2015 IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY
EASTERN PANHANDLE EXPANSION
APPENDIX 10B

MAJOR ROUTE ALTERNATIVES

ARCADIS Design & Consultancy for natural and built assets

FIGURE 10.4-1

City: SYR Div/Group: IM/DV Created By: J.Rapp Last Saved By: jrapp
Columbia (CPGL00EP.0001)
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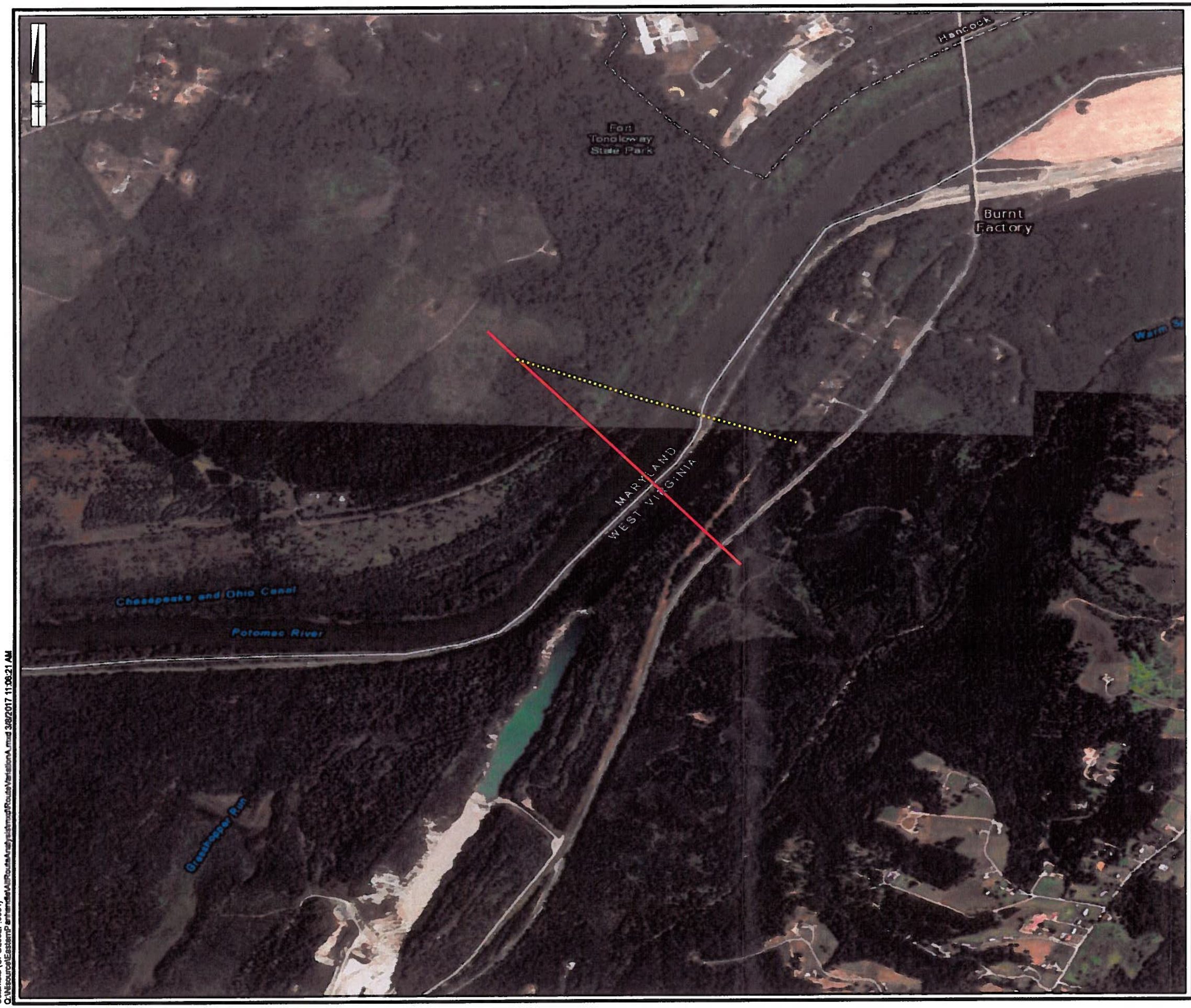
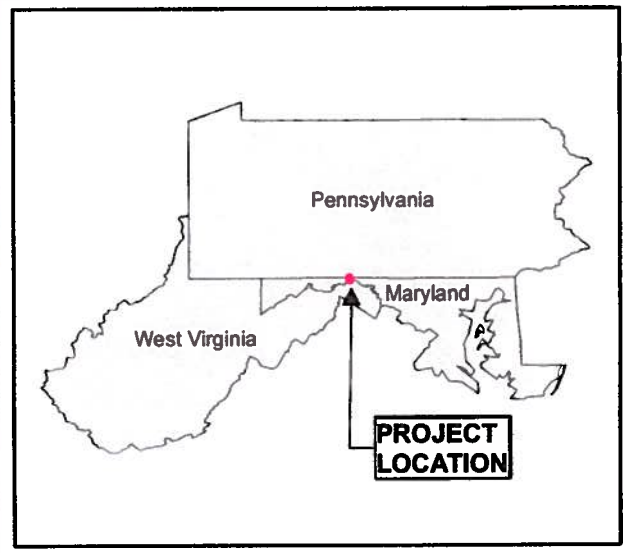




LEGEND:

PROPOSED ROUTE

ROUTE VARIATION A

0 1,200 2,400 Feet

GRAPHIC SCALE

NOTE:

1. MAY 2015 IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

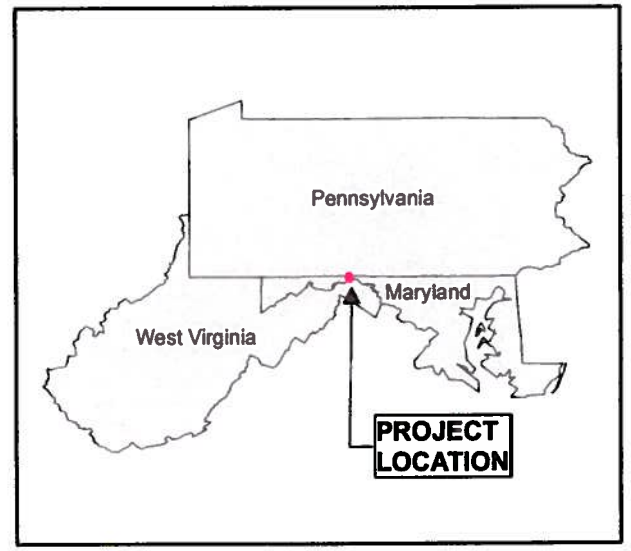
COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY
EASTERN PANHANDLE EXPANSION
APPENDIX 10B

ROUTE VARIATION A

ARCADIS Design & Consultancy for natural and built assets

FIGURE 10.5-1

City: SYR Div/Group: IM/DV Created By: J.Rapp Last Saved By: jrapp
Columbia (CPGL006EP.0001)
G:\NiSource\EasternPanhandle\AllRoute\Analysis\mxd\RouteVariationA.mxd 3/8/2017 11:08:21 AM



LEGEND:

PROPOSED ROUTE

ROUTE VARIATION B

0 1,200 2,400 Feet

GRAPHIC SCALE

NOTE:

1. MAY 2015 IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

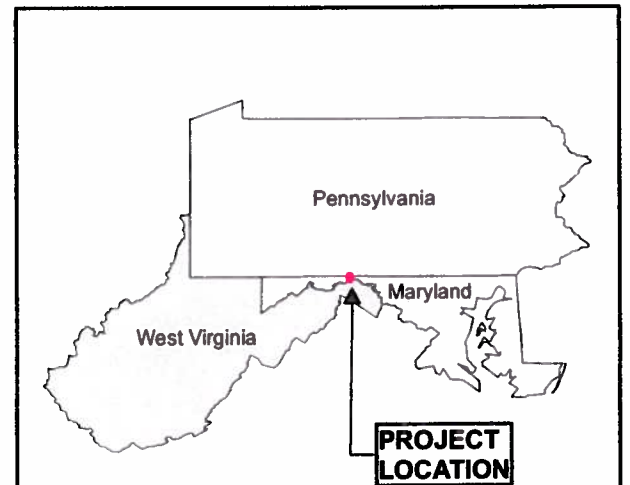
COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY
EASTERN PANHANDLE EXPANSION
APPENDIX 10B

ROUTE VARIATION B

ARCADIS Design & Consultancy for natural and built assets

FIGURE 10.5-2

City: SYR Div/Group: IM/DV Created By: J.Repp Last Saved By: jrepp
Columbia (CPGL00EP.0001)
Q:\Nisource\EasternPanhandle\AltRouteAnalysis\mxd\RouteVariationB.mxd 3/8/2017 11:13:34 AM



LEGEND:

- PROPOSED ROUTE
- ROUTE VARIATION C

0 1,200 2,400 Feet

GRAPHIC SCALE

NOTE:

1. MAY 2015 IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

COLUMBIA GAS TRANSMISSION, LLC.
A TRANSCANADA COMPANY
EASTERN PANHANDLE EXPANSION
APPENDIX 10B

ROUTE VARIATION C

ARCADIS Design & Consultancy for natural and built assets

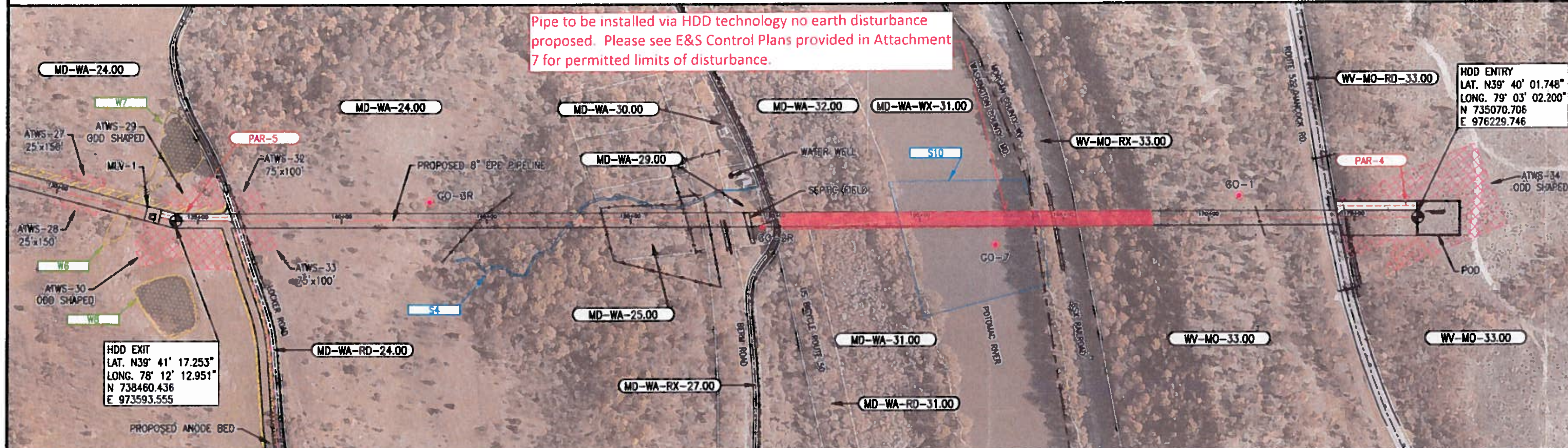
FIGURE 10.5-3

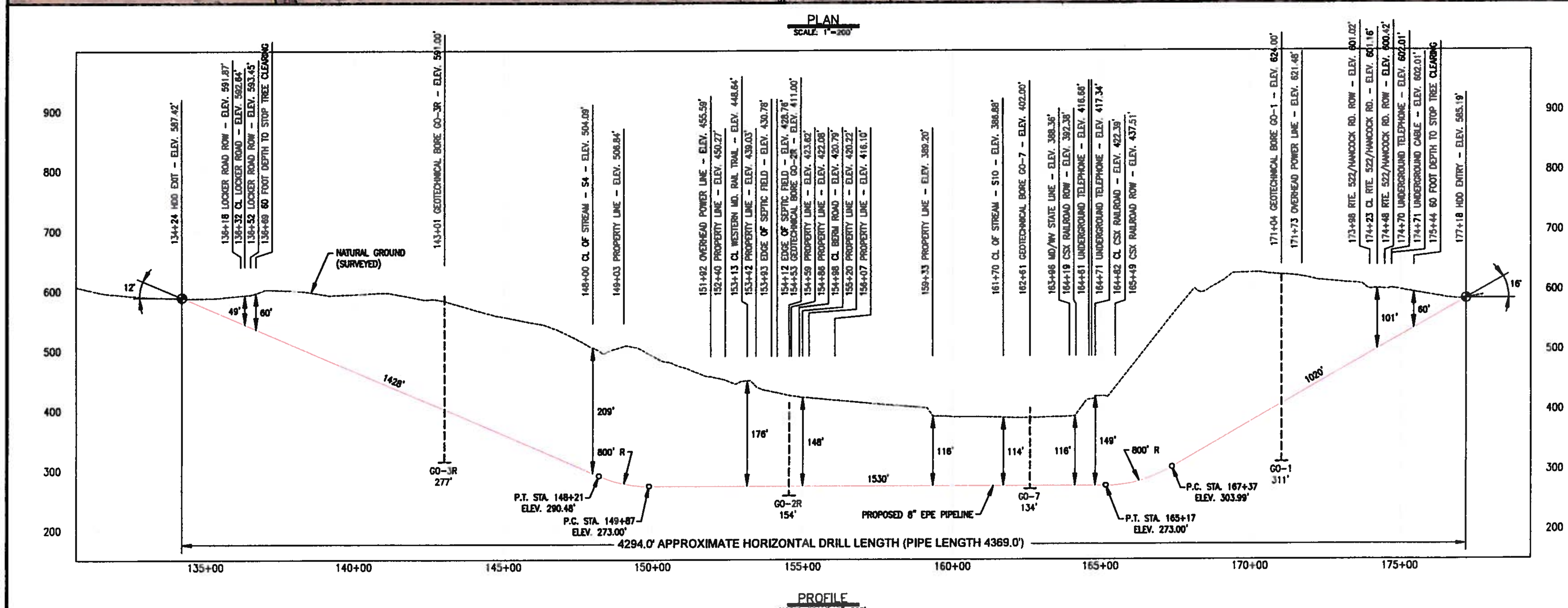
City: SYR DivGroup: IM/DV Created By: J.Rapp Last Saved By: jrapp
Columbia (CPGL00EP.0001)
Q:\Nisource\EasternPanhandle\AllRoutesAnalysis\mxd\RouteVariationC.mxd 3/8/2017 2:16:26 PM

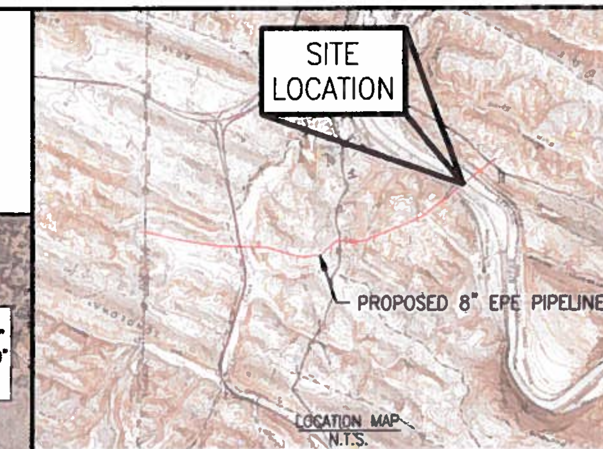
Attachment 10

Horizontal Directional Drill (HDD) Drawings and HDD Contingency Plan

WASHINGTON COUNTY, MD – MORGAN COUNTY, WV







DIRECTIONAL DRILL CONSTRUCTION NOTES:

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
2. WORK SPACE: MAXIMUM WORK SPACE LIMITS ARE DEPICTED, RESTRICT CLEARING TO THE WORK SPACE INDICATED AT THE ENTRY AND EXIT POINTS AND PRODUCT PIPE STRINGING AND FABRICATION AREA ALONG THE CONSTRUCTION RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS REQUIRES PRIOR APPROVAL FROM THE ENVIRONMENTAL INSPECTOR AND IS LIMITED TO THE AMOUNT NECESSARY TO STRING SURVEY WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
3. WATER SOURCE: DRILL WATER AND HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
4. HYDROSTATIC TEST: PRE-INSTALLATION AND POST-INSTALLATION HYDROSTATIC TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE HYDROSTATIC TEST PLAN. TEST WATER SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE TEST WATER SHALL BE DISCHARGED IN AN UPLAND AREA INTO AN EROSION CONTROL STRUCTURE AND/OR SILT FENCES, GEOTEXTILE FILTER BAG, OR COLLECTED IN A TRUCK AND HAULED TO AN APPROVED DISPOSAL SITE, UPON COMPLETION OF DEWATERING AND DRYING, A CALIPER PIG SURVEY SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. SPILL-PREVENTION: REFUELING OF ALL EQUIPMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE SPCC PLAN.
6. EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
7. INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE APPROVED CONSTRUCTION RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN AFTER THE PILOT HOLE IS COMPLETE, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO COLUMBIA FOR APPROVAL. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULLBACK.
8. DRILLING FLUID DISPOSAL: CONTRACTOR SHALL DISPOSE OF EXCESS DRILLING FLUID AS DIRECTED BY COLUMBIA'S REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS. UNDER NO CIRCUMSTANCES SHALL DRILLING FLUID BE DISPOSED OF IN WATER BODIES OR WETLANDS. ANY DRILLING FLUID WHICH INADVERTENTLY SURFACES AT POINTS OTHER THAN THE ENTRY OR EXIT POINTS SHALL BE CONTAINED AND COLLECTED TO THE EXTENT PRACTICABLE AND DISPOSED OF AS DIRECTED BY COLUMBIA'S REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS.
9. CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEEDED AS SPECIFIED IN THE CLEAN-UP AND RESTORATION REQUIREMENTS. IF THE TERRAIN ALLOWS AND ACCESS IS PERMITTED. CONTRACTOR SHALL UTILIZE LOW GROUND PRESSURE EQUIPMENT OR OTHER EQUIPMENT APPROVED BY COLUMBIA TO FACILITATE CONTAINMENT AND CLEAN-UP OF ANY INADVERTENT RETURNS THAT OCCUR DURING THE HDD INSTALLATION PROCESS.
10. GEOTECHNICAL DATA: BORE HOLES ARE OFFSET FROM THE PIPELINE CENTERLINE AS SHOWN ON THE PLAN VIEW. THE GEOTECHNICAL INFORMATION WILL BE PROVIDED TO THE CONTRACTOR.
11. CONTRACTOR IS RESPONSIBLE FOR CALLING WEST VIRGINIA & MARYLAND ONE-CALL AND LOCATING ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. IF ANY UTILITY IS LOCATED WITHIN 15 FEET OF THE DESIGNED HDD PROFILE AND ALIGNMENT, CONTRACTOR SHALL OBTAIN APPROVAL FROM COLUMBIA PRIOR TO INITIATING HDD OPERATIONS.
12. IT IS THE CONTRACTORS RESPONSIBILITY TO IDENTIFY AND PROTECT ANY FOREIGN UTILITY THAT MAY BE AFFECTED BY THE HDD OPERATIONS.
13. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER COLUMBIA'S SPECIFICATIONS, CONTRACT DOCUMENT AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.
14. WETLAND AREAS AT HDD EXIT WILL NEED TO BE MATTED.
15. MINIMUM ALLOWABLE BEND RADIUS 600'.
16. FINAL BOREHOLE DIAMETER SHALL BE 12".

LEGEND

HDD ENTRY/EXIT; FISH EXCLUSION NET; EQUIPMENT CROSSING BRIDGE; TRENCH PLUG; MATS; BORE HOLE; SILT FENCE; ABSORBENT BOOM; SAFETY BARRIER; TURBIDITY CURTAIN; WATERBAR

ISSUED FOR FERC FILING
DATE: 03/15/2017

LEGEND

MILEPOST; ROUTE; EXISTING COLUMBIA PIPELINE; FOREIGN PIPELINE; PROPOSED PERMANENT ROW; FENCE; TEMPORARY WORKSPACE; ADDITIONAL TEMPORARY WORKSPACE; ACCESS ROAD; CONTRACTOR / PIPE YARD; ACCESS ROAD NUMBER; PROPERTY TRACT NUMBER (ST-CO-001.000); WETLAND ID; WATERBODY ID; UNDERGROUND CABLE; OVERHEAD POWERLINE; WATERLINE; COUNTY BORDER; WETLAND; WATERBODY

SCALE: 1" = 200'

No.	REVISIONS	APPROVED BY	DATE
	ISSUED FOR FERC FILING		
	ISSUED FOR 50% REVIEW		
	RE-ISSUED FOR 30% REVIEW		
	RE-ISSUED FOR 30% REVIEW		
	ISSUED FOR 30% REVIEW		

DWG. NO.	REFERENCE
ALG-3	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING

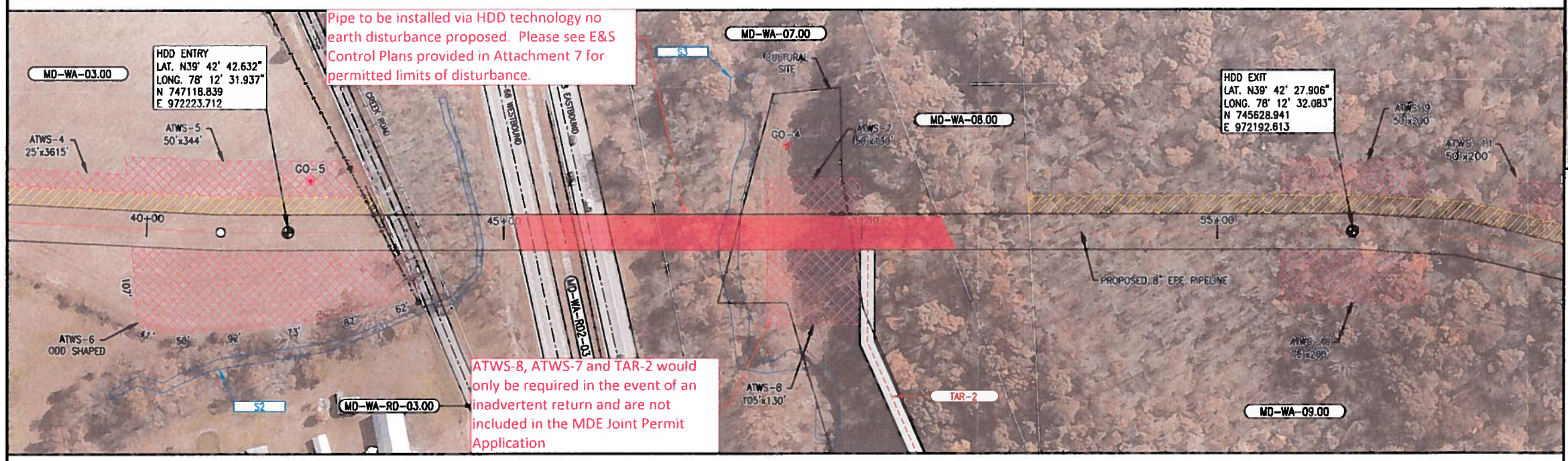
Columbia Gas Transmission

PL-10376

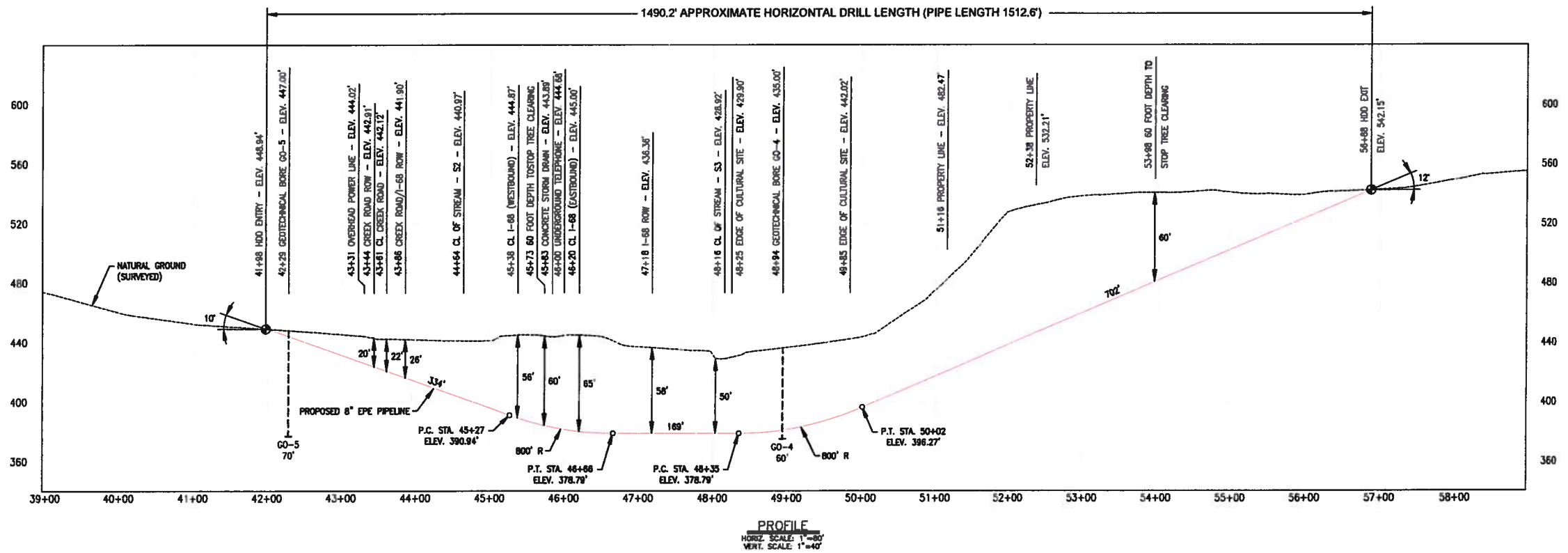
TITLE: EASTERN PANHANDLE EXPANSION
HORIZONTAL DIRECTIONAL DRILL - POTOMAC RIVER

DRAWN BY	DATE	PROJECT NUMBER	WORK ORDER NUMBER	DRAWING NUMBER	SHEET	ISSUE
CAC	09/16	23154	46920	D23154-HDD-2	1 OF 1	P5

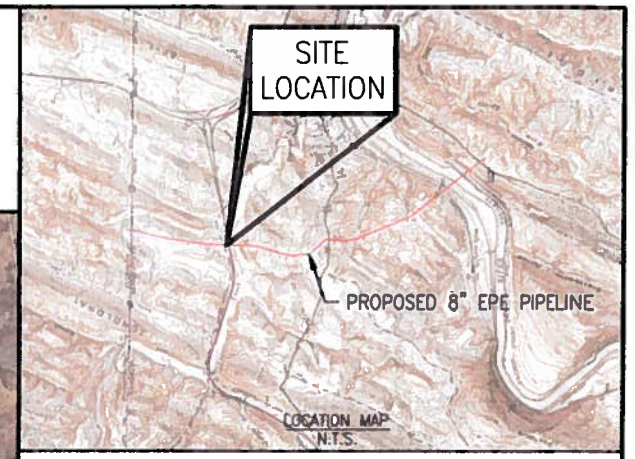
WASHINGTON COUNTY, MD



PLAN
SCALE: 1"=80'



PROFILE
HORIZ. SCALE: 1"=80'
VERT. SCALE: 1"=40'



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15. MINIMUM ALLOWABLE BEND RADIUS 600'.
16. FINAL BOREHOLE DIAMETER SHALL BE 12".

LEGEND
HDD ENTRY/EXIT
FISH EXCLUSION NET
EQUIPMENT CROSSING BRIDGE
TRENCH PLUG
MATS
BORE HOLE
SILT FENCE
ABSORBENT BOOM
SAFETY BARRIER
TURBIDITY CURTAIN
WATERBAR

ISSUED FOR FERC FILING
DATE: 03/15/2017

LEGEND
MILEPOST
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PROPOSED PERMANENT ROW
FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
CONTRACTOR / PIPE YARD
ACCESS ROAD NUMBER
PROPERTY TRACT NUMBER
WETLAND ID
WATERBODY ID
UNDERGROUND CABLE
OVERHEAD POWERLINE
WATERLINE
COUNTY BORDER
WETLAND
WATERBODY

SCALE: 1" = 80'

No.	REVISIONS	APPROVED BY	DATE
3	ISSUED FOR FERC FILING	JHS	03/15
2	ISSUED FOR 50% REVIEW	JHS	12/13
4	RE-ISSUED FOR 30% REVIEW	JHS	09/22
1	ISSUED FOR 30% REVIEW	JHS	10/16

DWG. NO.	REFERENCE
ALG-1	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
Columbia Gas Transmission

PL-10376

TITLE
EASTERN PANHANDLE EXPANSION
HORIZONTAL DIRECTIONAL DRILL - INTERSTATE 68

DRAWING BY	CAC	DATE 08/16	DRAWING NUMBER	SHEET	ISSUE
CHECKED		23154	D23154-HDD-1	1 OF 1	P5
ACAD VERSION		46820			

Columbia Pipeline Group

HORIZONTAL DIRECTIONAL DRILLING CONTINGENCY PLAN

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

1.0 INTRODUCTION

Columbia Gas Transmission, LLC, A TransCanada Company (TCO) is proposing to construct a new 3.36-mile 8-inch diameter natural gas transmission pipeline equipped with a launcher/receiver at each end of the proposed pipeline. The Eastern Panhandle Expansion (Project) will tie-in to the existing TCO 1804 and 10240 pipelines in Fulton County, Pennsylvania. The Project is located within three counties and states (Fulton County, Pennsylvania; Washington County, Maryland; and Morgan County, West Virginia).

TCO is proposing to utilize horizontal directional drilling (HDD) technique for selected crossings located along the Project. The purpose of this document is to provide guidance to eliminate or minimize adverse effects from directional drilling fluid seepage or drill failure.

2.0 INADVERTENT RETURN DETECTION

The most obvious signs of an inadvertent return are surface seepage or loss of circulation/pressure of the drilling fluid. One of the functions of the drilling fluid is to seal the hole to maintain the downhole pressure. The loss of the returning fluid is a sign that pressure is not being contained in the drill hole and surface seepage is occurring outside the hole. If there is a reduction in the quantity of drilling fluid returning to the drilling site (loss of circulation), this could be an initial indication of failure. However, minor loss of drilling fluid is normal in the drilling process. There can be instances during the drilling process when a small layer of loose sand, a small gravel layer or a small rock fracture is encountered. These occurrences will require minimal addition of drilling fluids to fill in the voids. Consequently, a minor drilling fluid loss in and of itself is not an indication of a potential inadvertent release condition. It is the loss of drilling fluid in combination with other factors, which may indicate a potential inadvertent release condition. For example, if there is a loss of drilling fluid and the return of cuttings do not show a large quantity of gravel that could indicate a loss of containment pressure within the hole.

TCO must only use firms who specialize in HDD to perform the proposed stream and wetland crossings. TCO is responsible for the supervision of the drilling contractor and retains the right to shut down operations.

TCO will provide on-site visual monitoring of the construction area during construction operations and will provide a designated environmental inspector (EI). TCO's designated EI shall walk the construction area at least every four hours during drilling operations where access is permissible to visually monitor for inadvertent releases.

2.1 GENERAL CORRECTIVE ACTION

Once an inadvertent return is detected, the drilling crew shall take immediate corrective action. The only pressure causing the inadvertent return to occur is the pressure from the drilling fluid pumps. Therefore, the most immediate direct corrective action is:

- To stop the drilling fluid pumps or decrease the pressure (by stopping the pumps or decreasing the pressure, the pressure in the hole will quickly bleed off. With no/reduced pressure in the hole, the inadvertent return will stop or decrease significantly).

- As soon as an inadvertent return is detected, the circulation of mud will only be stopped or reduced temporarily until the response process has been initiated. Once the response/ containment process (Sections 2.1.1, 2.1.2 and 2.2) has been initiated and is under control, the drilling activities will resume.

There is greater potential for an inadvertent return is 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).

2.1.1 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.

- 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.

- If necessary, the affected area will be watered down to further dissipate drilling muds that remain after mechanical efforts have been exhausted.

- 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 TCO.

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

2.1.2 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 below.

- The source/pumps will be stopped temporarily or the pressure will be decreased.
- 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 TCO's EI.
- The affected areas will be restored as closely as possible to their previous condition.
- Documentation must be made and maintained by the contractor and provided to TCO's EI.
- The Contractor must follow any special instructions from TCOs EI.

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

2.2 Response and Reporting Personnel

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

2.3 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.

2.4 Follow-Up

After the inadvertent return, has been contained, the drilling contractor and TCO will make every effort to determine the root cause of the inadvertent return. TOC 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 TCO 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 TCO.

3.0 Drill Failure

In addition to inadvertent return concerns, there is also a potential for failure of the drilling apparatus. If the drilling apparatus becomes inextricably lodged, and cannot be withdrawn without exiting the construction work limits (unless the appropriate approvals are first obtained by the TCO's Natural Resource Permitting Department), or damaging the resource(s) the directional drill was performed to protect, the apparatus and hole will be abandoned. If the hole is abandoned, it will be filled with HDD cuttings and drilling fluid. Once the abandoned hole is filled, a second attempt will be made to complete the drill. The second attempt must be performed within the confines of the approved construction work limits as shown on the Environmental Construction Drawings. The second attempt will generally be offset slightly from the original entry-hole location.