July 25, 2020

Pennsylvania Department of Environmental Protection
Regional Permit Coordination Office
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101

Attention: Rebecca M. Albert, P.G.

Re: Conemaugh River Crossing Project
Application Number: ESG836520001-00
APS ID Number: 1017977; AUTH ID Number 1317290
Incompleteness Review Response

Dear Ms. Albert:

On behalf of Texas Eastern Transmission, LP (Texas Eastern), AECOM is hereby submitting this response to your Incompleteness Review of the Erosion and Sediment Control Plan referenced above on July 10, 2020. An electronic copy of the requested information discussed below has been provided.

The **comments**/*responses* are as follows:

1. **The original copy of the NOI with original signatures is not provided. [25 Pa Code §102.6(a)(1)]**

The original copy of the NOI with original signatures has been sent to your attention via FedEx.

2. **The limit of disturbance (LOD)/ESCGP-3 permit boundary is not identified on the drawings. The permit boundary should include all workspace and E&S controls.[25 Pa Code 102.4(b)(5)(vi)]**

Revised Erosion and Sediment Control Plan and Post Construction Stormwater Management Plan drawings with the LOD clearly marked are included as an attachment to this response.

3. **Calculation worksheets are not provided for the compost filter sock and silt fence sizing. [25 Pa Code 102.4(b)(5)(viii)]**

Calculations for compost filter sock and silt fence sizing are included on the Erosion and Sediment Control Plan detail sheets included as an attachment to this response.

AECOM
715 Washington Boulevard
Williamsport, PA 17701
Tel: 570.505.1674
Fax: 570.505.1682

4. Please provide the Act 167 consistency letter. [25 Pa Code §102.8(g)(2)]

The Act 167 consistency letter is provided as an attachment to this response.

Please place these revisions in your existing copies. If you have any questions or require additional information regarding the Erosion and Sediment Control Plan, please do not hesitate to contact me at (860) 888-2249 or email eileen.banach@aecom.com.

Sincerely,

AECOM

Eileen Banach
Scientist

cc: Mr. William Brett, Texas Eastern Transmission, LP

ACT 167 CONSISTENCY LETTER

AECOM
715 Washington Boulevard
Williamsport, Pennsylvania
17701
www.aecom.com

570 505 1674 tel
570 505 1682 fax

Municipal Stormwater Management Consistency Review
Conemaugh River Crossing Project
Westmoreland County, Pennsylvania

Stormwater Management Analysis
(Please check one of the following)

☐ **No** Municipal Stormwater Management Ordinance has been adopted at this time; therefore no analysis will be undertaken.

☒ The Stormwater Management Analysis of the proposed structure based on the Stormwater Management Ordinance indicated **no** adverse effects.

☐ The Stormwater Management Analysis of the proposed structure based on the Stormwater Management Ordinance indicated the following adverse effects:

Signature David A Shafer

Title V-CHAIRMAN, SECRETARY-TREAS.

Date July 9, 2020

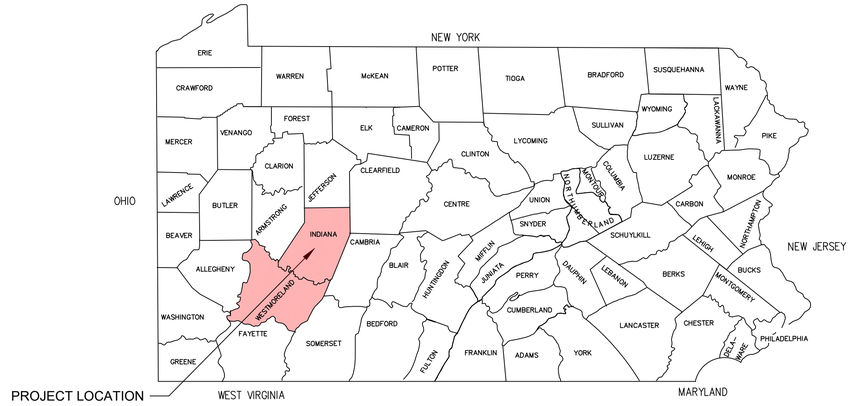
SECTION 2

EROSION AND SEDIMENT CONTROL PLAN (E&SCP)

DRAWINGS

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
DERRY TOWNSHIP, WESTMORELAND COUNTY, PENNSYLVANIA
BLACKLICK TOWNSHIP, INDIANA COUNTY, PENNSYLVANIA
MAY 2020
EROSION AND SEDIMENT CONTROL PLAN
REVISION 1 07/23/2020

EROSION AND SEDIMENT CONTROL PLAN			
SHEET	REV.	DESCRIPTION	NO.
DELM-C-8100	1	COVER SHEET	1
DELM-P-8100	0	GENERAL PERMIT NOTES	2
DELM-P-8101	1	CONSTRUCTION SEQUENCE/SEEDING MIX	3
DELM-P-8102	0	HDD PROCEDURE NOTES	4
DELM-P-8103	0	HDD PROCEDURE NOTES	5
DELM-P-8200	1	EROSION AND SEDIMENT CONTROL PLAN	6
DELM-P-8201	1	EROSION AND SEDIMENT CONTROL PLAN	7
DELM-P-8202	1	EROSION AND SEDIMENT CONTROL PLAN	8
SHEET 1 OF 3	1	EROSION AND SEDIMENT CONTROL FIGURES	9
SHEET 2 OF 3	0	EROSION AND SEDIMENT CONTROL FIGURES	10
SHEET 3 OF 3	1	EROSION AND SEDIMENT CONTROL FIGURES	11

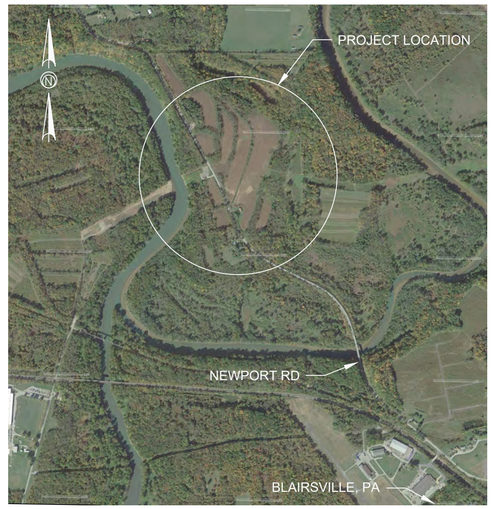


COUNTY MAP
N.T.S.

ENGINEER'S CERTIFICATION
I DO HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE EROSION AND SEDIMENT CONTROL AND POST CONSTRUCTION STORMWATER MANAGEMENT PLAN ARE TRUE AND CORRECT, REPRESENT ACTUAL FIELD CONDITIONS AND ARE IN ACCORDANCE WITH THE 25 PA CODE CHAPTERS 78 AND 102 OF THE DEPARTMENT'S RULES AND REGULATIONS. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMISSION OF FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20



Pennsylvania 811

NOT ALL UTILITIES ARE SHOWN ON THESE PLANS
THE LOCATION OF ALL UTILITIES (ABOVE OR BELOW GROUND) SHOWN ON THESE DRAWINGS ARE APPROXIMATE & WERE OBTAINED FROM USGS TOPO MAPS AND/OR UTILITY OWNERS. AUDUBON DOES NOT GUARANTEE THAT LOCATION SHOWN ON THE DRAWINGS ARE CORRECT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE LOCATIONS OF EXISTING UTILITIES (ABOVE OR BELOW GROUND) & TO NOTIFY THE RESPECTIVE UTILITY OWNERS BEFORE BEGINNING CONSTRUCTION.

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES
3 WORKING DAYS NOTICE FOR
CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE - STOP CALL
Pennsylvania One Call System Inc.
1-800-242-1776

DESIGN ONE CALL SERIAL NO.: 20151982217

APPLICANT:

ENBRIDGE

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

PREPARED BY:

audubon
Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

GENERAL PERMIT NOTES

1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN (E&SCP). A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.

2. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&SCP PREPARER, THE POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRE CONSTRUCTION MEETING.

3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.

4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.

5. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.

6. CLEARING GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&SCP BEST MANAGEMENT PRACTICE (BMPS) SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&SCP.

7. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.

8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAP(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.

9. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.

10. ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ..271.1, AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.

11. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&SCP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.

12. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.

13. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.

14. VEHICLES AND EQUIPMENT MAY ONLY ENTER THE WORKSITE THROUGH THE DESIGNATED ACCESS ROADS FOR THE PROJECT.

15. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&SCP BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.

16. A LOG SHOWING DATES THAT E&SCP BMPS WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND BE MADE AVAILABLE TO REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.

17. SEDIMENT TRACKED ONTO PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEPT INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.

18. ALL SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.

19. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES- 6 TO 12 INCHES ON COMPACTED SOILS-PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.

20. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

21. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.

22. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.

23. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.

24. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.

25. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION OF SUBSURFACE DRAIN OR OTHER APPROVED METHOD.

26. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.

27. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.

28. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF THE RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.

29. E&SCP BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.

30. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&SCP BMPS.

31. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPS SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.

32. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.

RECYCLING/DISPOSAL OF MATERIALS:

THE CONSTRUCTION CONTRACTOR SHALL REMOVE FROM THIS SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS, SEDIMENTS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ. THE CONSTRUCTION CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THIS SITE.

THE CONSTRUCTION CONTRACTOR WILL IMPLEMENT THE PROPER MEASURES FOR DISPOSAL AND RECYCLING OF MATERIALS ASSOCIATED WITH OR FROM THE PROJECT SITE IN ACCORDANCE WITH DEP REGULATIONS. CONSTRUCTION WASTES INCLUDE, BUT ARE NOT LIMITED TO, EXCESS SOIL MATERIALS AND BUILDING MATERIALS THAT COULD ADVERSELY IMPACT WATER QUALITY.

THE CONSTRUCTION CONTRACTOR WILL INSPECT THE PROJECT AREA WEEKLY AND PROPERLY DISPOSE OF ALL CONSTRUCTION WASTES. MEASURES WILL BE PLANNED AND IMPLEMENTED FOR HOUSEKEEPING MATERIALS MANAGEMENT AND LITTER CONTROL. WHEREVER POSSIBLE, RE-USEABLE WASTES WILL BE SEGREGATED FROM OTHER WASTE AND STORED SEPARATELY FOR RECYCLING.

IF AN OFF-SITE LOCATION IS USED FOR BORROW OR DISPOSAL, THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING ADEQUATE E&SCP CONTROL PLAN(S) AND SUBMITTING THE PLAN(S) TO DEP FOR APPROVAL PRIOR TO COMMENCEMENT OF SAID WORK.

REMEDIAL ACTIONS IF SEED AND MULCH ARE WASHED AWAY OR IF THE SEED MIX IS NOT GROWING:

1. THE AFFECTED AREA WILL BE LIMED, FERTILIZED, RE-SEEDED AND MULCHED AS NEEDED.
2. EROSION PROTECTION MATTING OR NETTING WILL BE APPLIED AS NEEDED.
3. STEPS 1 AND 2 WILL BE REPEATED AS NEEDED UNTIL A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ACHIEVED.

GENERAL NOTES:

1. ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR AND SHALL CONFORM TO THOSE SHOWN ON THE MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS.

2. LOCATION OF PHYSICAL FEATURES AND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL VERIFY LOCATION OF FEATURES IN FIELD AND SHALL NOTIFY COMPANY OF DISCREPANCIES AFFECTING CONSTRUCTION.

3. PLUS AND MINUS ELEVATIONS ARE REFERENCED FROM FINISHED GRADE ELEVATION.

4. CONTRACTOR SHALL ENSURE THAT ALL STRUCTURES, EQUIPMENT, AND OTHER FACILITIES ARE ADEQUATELY SUPPORTED DURING CONSTRUCTION IN ORDER TO PREVENT EXCESSIVE DEFLECTIONS, STRESSES, OR SETTLEMENT.

5. COMPANY APPROVAL IS REQUIRED FOR ALL MODIFICATIONS ASSOCIATED WITH THE EXISTING GRADES, EQUIPMENT, STEEL, PIPING, OR OTHER IN-PLACE FACILITIES.

6. IN ACCORDANCE WITH PA ACT 187 OF 1996, CONTRACTOR SHALL NOTIFY UTILITIES PRIOR TO CONSTRUCTION USING PA ONE CALL, 1-800-242-1776.

7. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SURVEY AND SUB-SURFACE INVESTIGATION REPORT BEFORE BEGINNING CONSTRUCTION.

8. SET PIPING AND FOUNDATIONS AT ELEVATIONS SHOWN, OR ON FIRM UNDISTURBED MATERIAL OF DESIGN BEARING CAPACITY, WHICHEVER IS LOWER. COMPANY SHALL VERIFY THAT EACH FOOTING PLACED IS BEARING ON ADEQUATE MATERIALS.

9. PRIOR TO ANY EARTHWORK OR OTHER CONSTRUCTION ACTIVITY, CONTRACTOR SHALL VERIFY THAT EROSION CONTROL MEASURES AND STORMWATER MANAGEMENT FACILITIES ARE IN PLACE. CONTRACTOR SHALL ADVISE COMPANY OF DEFICIENT EROSION CONTROL MEASURES.

10. ALL WORK SHALL BE CONDUCTED WITHIN THE BOUNDARIES AUTHORIZED IN THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) PERMIT DOCUMENTS AND AS AGREED WITH LAND OWNER. VERIFY WHICH PUBLIC ROADS MAY BE UTILIZED FOR SITE ACCESS.

11. PRIOR TO OPENING TRENCH, ENSURE ALL MATERIAL, INCLUDING SCREENING MATERIAL, IS ON SITE AND AVAILABLE FOR USE.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056
07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION
		1	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)

REFERENCE DRAWINGS | REVISIONS | ITEM NO. | MATERIALS | QTY

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

DRAWN BY	ENGINEERING APPROVALS				
	BID		CONSTRUCTION		
LGF		04/29/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL GENERAL PERMIT NOTES

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: N/A | DWG. DELM-P-8100 | REV. 0

GENERAL NOTES:

1. THIS PLAN SET CONTAINS ALL INFORMATION FOR THE EROSION AND SEDIMENT CONTROL PLAN (E&SCP). THIS IS A PERMIT DOCUMENT ONLY. ADDITIONAL PLANS AND DOCUMENTATION ARE REQUIRED FOR CONSTRUCTION OF THE PROPOSED DEVELOPMENT.

2. FULL SIZE SHEETS OF THIS PLAN SET MAY BE PRINTED OUT ON 22-INCHx34-INCH SHEETS. ALL SCALES PRINTED OUT ON 11-INCHx17-INCH SHEETS ARE SCALED BY 1/2 (E.G., 1-INCH=100 IS EQUIVALENT TO 1-INCH=200 FEET WHEN THESE PLAN SETS ARE PRINTED ON 11-INCHx17-INCH).

3. IN THE EVENT ANY ADVERSE GEOTECHNICAL CONDITIONS ARE OBSERVED, THE ENGINEER SHOULD BE CONTACTED IMMEDIATELY. SUCH CONDITIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, EXCESSIVE SEEPAGE, SLOUGHING OF MATERIAL, EXCESSIVELY WET MATERIAL, EXCESSIVE SETTLEMENT OF COMPACTED LAYERS, EXCESSIVE SOIL CRACKING, AND/OR MOVEMENT OF COMPACTED EARTHEN MATERIAL.

REFERENCE (ALL SHEETS):

1. SOILS INFORMATION FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY (CURRENT).

2. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NAVD1988.

3. ALL NORTHING AND EASTING COORDINATES SHOWN IN PENNSYLVANIA STATE PLANE NORTH NAD83.

CONSTRUCTION SEQUENCE:

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

1. AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OWNER AND/OR OPERATOR SHALL NOTIFY THE PADEP BY EITHER TELEPHONE OR CERTIFIED MAIL OF THE INTENT TO COMMENCE EARTH DISTURBANCE ACTIVITIES. ATTENDANCE AT A PRE-CONSTRUCTION CONFERENCE IS REQUIRED UPON REQUEST OF THE PADEP.

2. AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.

3. INSTALL ROCK CONSTRUCTION ENTRANCE.

4. INSTALL COMPOST FILTER SOCK DOWNSLOPE OF ANY PROPOSED DISTURBED/EXCAVATED AREA AND STOCKPILES. INSTALL ANY UPSLOPE DIVERSION DITCHES, COLLECTION CHANNELS, DIVERSION BERMS, SEDIMENT TRAPS AND ASSOCIATED RIPRAP APRONS.

5. PERFORM CLEARING AND GRUBBING TO THOSE AREAS DESCRIBED IN EACH STAGE OF WORK. STOCKPILE TOPSOIL AS SHOWN AND INSTALL COMPOST FILTER SOCKS DOWNSLOPE OF STOCKPILES.

6. PERFORM GRADING ACTIVITIES, INCLUDING THE PCSM INFILTRATION BERM, DETAILED BY PROPOSED GRADING, NOTES, AND DETAILS SHOWN ON THE PLAN DRAWINGS. AS PER PROJECT SPECIFICATIONS, ADDITIONAL TEMPORARY PLACEMENT OF COMPOST FILTER SOCK MAY BE NECESSARY AT THE CONTRACTOR'S DISCRETION SHOULD ACCELERATED EROSION BE ENCOUNTERED DURING GRADING ACTIVITIES.

7. CONSTRUCT FACILITIES ACCORDING TO SPECIFICATIONS WITHIN THESE PLAN SHEETS INCLUDING ALL STABILIZATION MEASURES.

8. PLACE TOPSOIL IN ALL AREAS TO BE VEGETATED.

9. APPLY SEED AND MULCH TO DISTURBED AREAS AS SPECIFIED AND IN ACCORDANCE WITH THIS PLAN.

10. ANY TEMPORARY MEASURES (SUCH AS THE ROCK CONSTRUCTION ENTRANCE, COMPOST FILTER SOCK, COLLECTION CHANNEL, RIPRAP APRONS, ETC.) INSTALLED BY CONTRACTOR DURING GRADING, SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

11. ONCE ACTIVITIES ARE COMPLETED AND ALL CONTRIBUTING AREAS ARE STABILIZED, MAINTAIN POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) BEST MANAGEMENT PRACTICE (BMP'S) DETAILED BY THE PCSM NOTES, AND DETAILS SHOWN ON THE E&SCP AND ALSO INCLUDED IN THE PCSM PLAN.

*NOTE: CONSTRUCTION ACTIVITIES MAY BE PERFORMED CONCURRENTLY OR ON PARALLEL PATHS WHERE APPROPRIATE, PROVIDED THAT ADEQUATE METHODS OF EROSION AND SEDIMENT CONTROL ARE IMPLEMENTED.

SEED MIX RECOMMENDATIONS: "NORTHERN ZONE"

GENERALLY DEFINED AS AREAS NORTH OF THE NORTHERN BORDERS OF ARKANSAS AND TENNESSEE.

UPLAND AREAS

LIME	4.0 TONS/ACRE
FERTILIZER	1000 LBS./ACRE (10-20-20)
MULCH (WHEAT STRAW)	3.0 TONS/ACRE

UPLAND SEED MIX	75 LBS./ACRE PURE LIVE SEED (PLS)
KENTUCKY BLUEGRASS	20%
RED FESCUE '	20%
KENTUCKY 31 TALL FESCUE '	15%
REDTOP	10%
PERENNIAL RYEGRASS	20%
WHITE CLOVER	5%
BIRDSFOOT TREFOIL (MINIMUM 20% HARD SEED)	10%

' FESCUE MUST BE ENDOPHYTE-FREE.

PASTURE MIX	20 LBS./ACRE PLS
(FOR USE ONLY IN DISTURBED PASTURE AREAS WITH LANDOWNER'S PERMISSION.)	
KENTUCKY BLUEGRASS	31%
MEDIUM RED CLOVER	26%
NORCEN TREFOIL	17%
POLY PERENNIAL RYE	26%

RECOMMENDED SEEDING DATES
(FOR THE ESTABLISHMENT OF TEMPORARY OR PERMANENT VEGETATION.)
SPRING: MARCH 15 - MAY 30
FALL: AUGUST 1 - OCTOBER 15

WINTER STABILIZATION

IF RESTORATION DOES NOT OCCUR PRIOR TO OCTOBER 15, SEED THE CONSTRUCTION ROW WITH 1.5 BUSHELS PER ACRE OF WINTER RYE OR SIMILAR VARIETY OF RYE AS REQUESTED BY THE LANDOWNER. MULCH THE CONSTRUCTION ROW AT 3.0 TONS PER ACRE WITH WHEAT STRAW, INCLUDING AREAS ADJACENT TO STREAMS AND WETLAND CROSSINGS. SEED SEGREGATED TOPSOIL PILES WITH WINTER RYE AND MULCH AT A RATE OF 3.0 TONS PER ACRE.

WETLAND AREAS DO NOT USE LIME OR FERTILIZER !!!

DO NOT USE FERTILIZER, LIME, OR MULCH WITHIN WETLANDS UNLESS REQUIRED IN WRITING BY THE APPROPRIATE FEDERAL OR STATE AGENCY (AS IDENTIFIED IN THE CLEARANCE PACKAGE/PERMIT BOOK). MULCH CONSISTS OF WEED-FREE STRAW, WOOD FIBER HYDROMULCH OR SOME FUNCTIONAL EQUIVALENT AS APPROVED BY THE EI AND CHIEF INSPECTOR. WHEN USED, APPLY MULCH (WHEAT STRAW) AT A RATE OF 3.0 TONS/ACRE.

WETLAND SEED MIX

ANNUAL RYEGRASS	40 LBS./ACRE PLS

COMPOST FILTER SOCK SIZING TABLE

FILTER SOCK ID	DRAWING NUMBER	SLOPE	UPSLOPE LENGTH	SOCK DIAMETER
		[%]	[FT]	[IN]
FS-1	DELM-P-8200	1%	270	12
FS-2	DELM-P-8200	1%	80	12
FS-3	DELM-P-8200	1%	160	12
FS-4	DELM-P-8200	1%	150	12
FS-5	DELM-P-8200	7%	80	12
FS-6	DELM-P-8201	23%	150	24
FS-7	DELM-P-8202	1%	170	12
FS-8	DELM-P-8202	2%	80	12

*SPACING BASED ON FIGURE 4.2 OF PA E&S CONTROL MANUAL, MARCH 2012

SILT FENCE SIZING TABLE

SILT FENCE ID	DRAWING NUMBER	SLOPE	UPSLOPE LENGTH	SILT FENCE TYPE	COMMENT
		[%]	[FT]		
SF-1	DELM-P-8200	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-2	DELM-P-8200	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-3	DELM-P-8201	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-4	DELM-P-8201	7%	75	STANDARD	UPSLOPE AREA CONTROLLED WITH SLOPE BREAKER AND FILTERSOCK
SF-5	DELM-P-8201	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-6	DELM-P-8201	5%	100	STANDARD	PERIMETER WORKSPACE BARRIER
	DELM-P-8202				
SF-7	DELM-P-8201	5%	100	STANDARD	PERIMETER WORKSPACE BARRIER
	DELM-P-8202				
SF-8	DELM-P-8202	9%	30	STANDARD	EDGE OF EXISTING GRAVEL ROAD
SF-9	DELM-P-8202	2%	120	STANDARD	
SF-10	DELM-P-8202	1%	95	STANDARD	
SF-11	DELM-P-8202	1%	60	STANDARD	
SF-12	DELM-P-8202	1%	100	STANDARD	UPDSLOPE AREA CONTROLLED WITH FILTERSOCK
SF-13	DELM-P-8202	5%	55	STANDARD	

*SPACING BASED ON FIGURE 4.4 OF PA E&S CONTROL MANUAL, MARCH 2012

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	MATERIALS	QTY
		1	LGF	RG	ISSUED FOR APPROVAL (07/23/2020)			
		0	LGF	RG	ISSUED FOR APPROVAL (05/15/2020)			
REFERENCE DRAWINGS		REVISIONS						

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

DRAWN BY	ENGINEERING APPROVALS BID		CONSTRUCTION	
LGF		04/29/20		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
CONSTRUCTION SEQUENCE/SEEDING
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

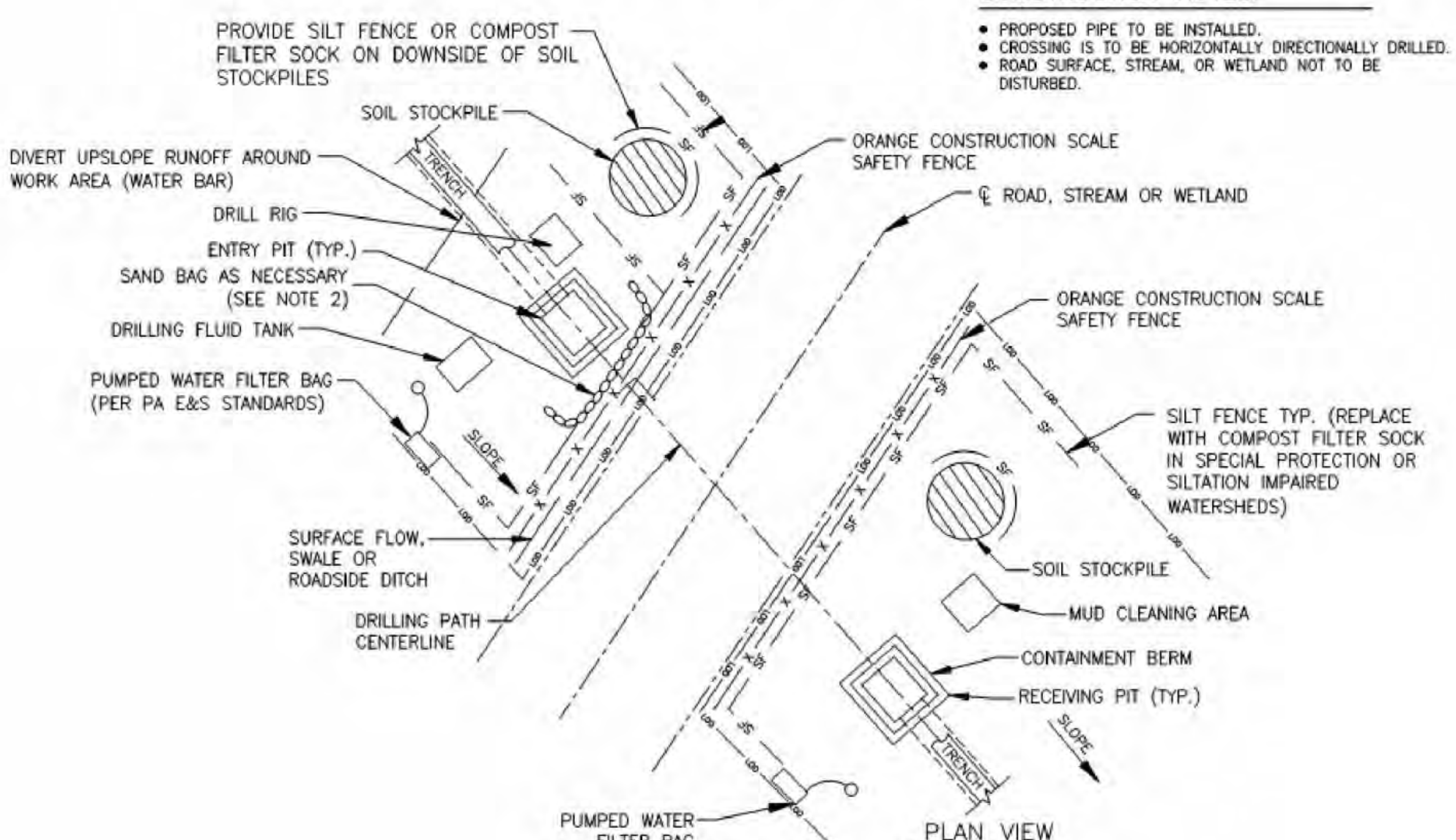
YEAR: 2020 | W.B.S. | SCALE: N/A | DWG. DELM-P-8101 | REV. 1

S.#

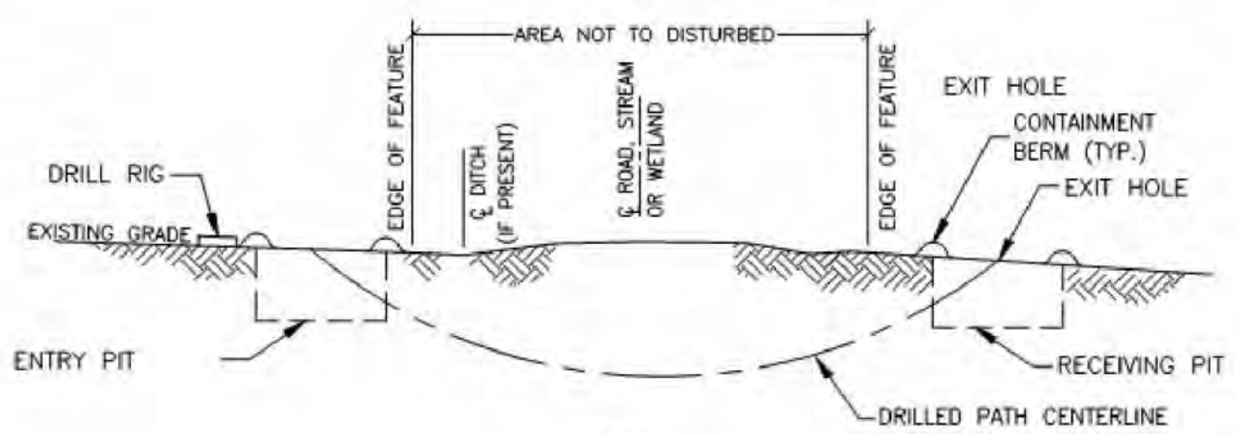
HORIZONTAL DIRECTIONAL DRILLING

CONSTRUCTION NOTES:

- PROPOSED PIPE TO BE INSTALLED.
- CROSSING IS TO BE HORIZONTALLY DIRECTIONALLY DRILLED.
- ROAD SURFACE, STREAM, OR WETLAND NOT TO BE DISTURBED.



PLAN VIEW
NOT TO SCALE



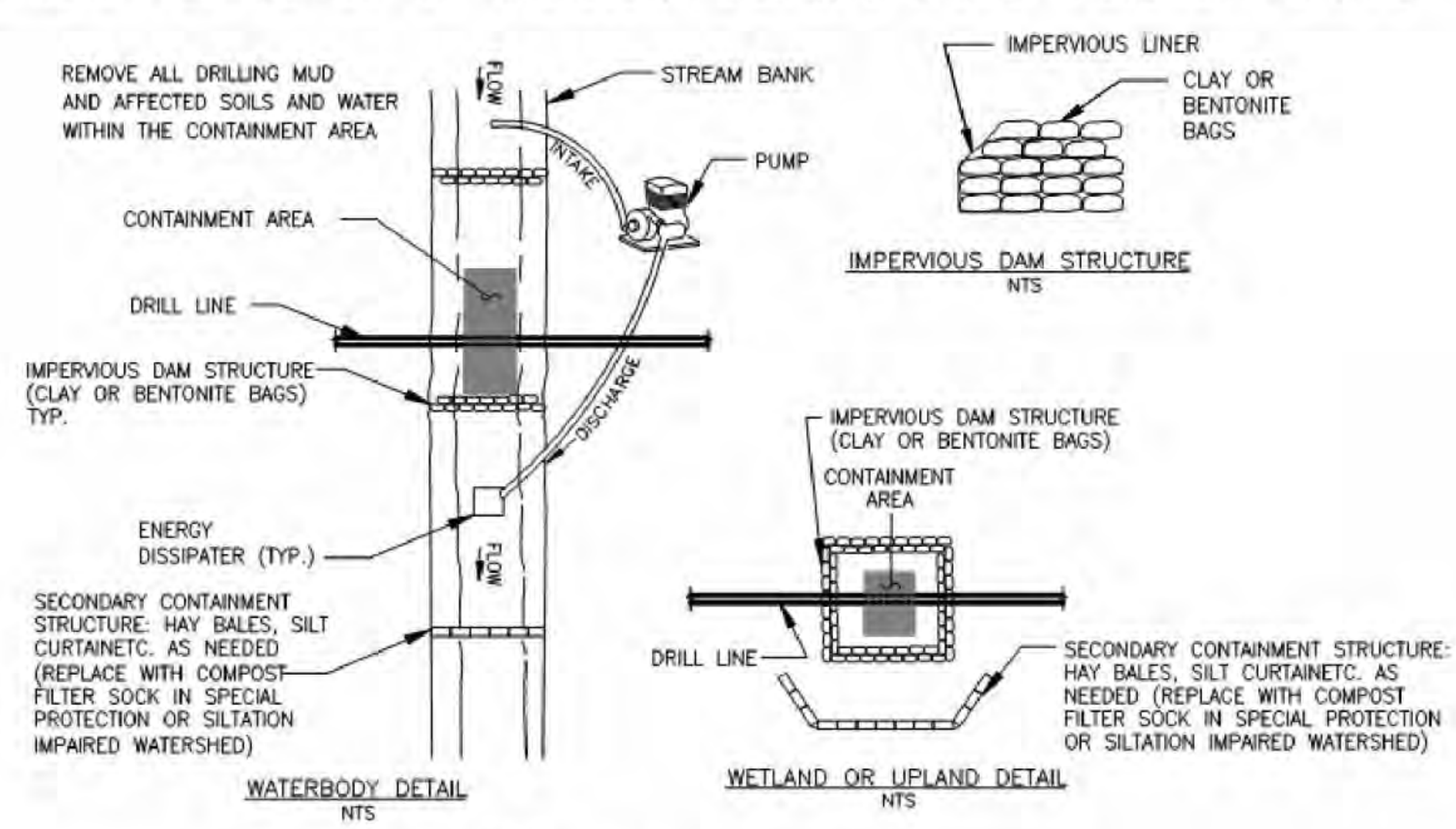
SECTION
N.T.S.

HDD GENERAL NOTES:

1. TEMPORARY PIPE CULVERT 12" MINIMUM DIAMETER NOT REQUIRED IF SWALE/DITCH IS RESTORED THE SAME DAY THAT IT IS DISTURBED OR IF NO SWALE/DITCH IS PRESENT.
2. RUNOFF FROM ROADWAY DITCHES OR SURFACE FEATURES MUST BE DIVERTED AROUND ENTRY EXIT PITS (SAND BAG, DIKE, ETC.) OR OVER PITS (PIPE CULVERT WITH SAND BAGS TO CHANNELIZE FLOW).
3. INSTALL ROCK CONSTRUCTION ENTRANCES PER THE PLANS.
4. THE CONTRACTOR WILL AVOID PLACING BORE PITS WITHIN WETLANDS UNLESS ALL OTHER OPTIONS ARE EXHAUSTED. IF NO OTHER OPTION IS AVAILABLE THE BORE PITS WILL BE PERMITTED AS DISTURBANCE AND WETLAND IMPACTS UNDER CHAPTER 102 AND 105. ALL STOCKPILES, MUD CLEANING AREAS, AND OTHER WORK NOT REQUIRED WITHIN THE BORE PIT VICINITY WILL BE LOCATED AT LEAST 10 FEET AWAY FROM ALL WETLANDS.

(1) HDD

CONTINGENCY PLAN DETAILS FOR WATERBODY, WETLAND, & UPLAND INADVERTENT RETURNS



(2) CONTINGENCY PLAN DETAILS

PIPELINE HDD PROCEDURE

THE CONSTRUCTION OF THE PROJECT WILL INVOLVE THE USE OF THE HORIZONTAL DIRECTIONAL DRILLING ("HDD") INSTALLATION TECHNIQUE FOR AVOIDING ENVIRONMENTALLY SENSITIVE RESOURCES OR OBSTRUCTIONS THAT OCCUR ALONG THE PROJECT PIPELINE ROUTE. THIS BEST DRILLING PRACTICE PLAN ("PLAN") HAS BEEN DEVELOPED TO MINIMIZE OR QUICKLY RESOLVE POSSIBLE INADVERTENT EFFECTS BY IDENTIFYING APPROPRIATE CORRECTIVE ACTIONS FOR VARIOUS POTENTIAL SCENARIOS THAT MAY BE ENCOUNTERED DURING HDD OPERATIONS. THE PURPOSE OF THIS DOCUMENT IS TO PROVIDE A DESCRIPTION OF PROPOSED HDD WORK ACTIVITIES, THE HDD WORKING PROCEDURES, AND MONITORING FOR INADVERTENT RETURNS DURING HDD ACTIVITIES ON THE PROJECT. THE FOLLOWING SECTIONS OF THIS PLAN PROVIDE THE PROCESSES TO BE IMPLEMENTED IN THE CASE OF INADVERTENT RETURNS OR RETURNS OF DRILLING FLUID DURING HDD ACTIVITIES.

DESCRIPTION OF WORK

THE HDD METHOD REQUIRES ESTABLISHING STAGING AREAS AT BOTH ENDS OF THE PROPOSED CROSSING, TYPICALLY KNOWN AS THE ENTRY AND EXIT POINTS, OR WORKSPACES. THE PROCESS COMMENCES WITH THE DRILLING OF A PILOT HOLE ALONG A PREDETERMINED PATH BENEATH THE OBSTRUCTION, WETLAND OR WATERBODY. ONCE THE PILOT HOLE HAS BEEN COMPLETED, THE DRILLED HOLE IS ENLARGED WITH ONE OR MORE PASSES OF A REAMER UNTIL THE DIAMETER OF THE HOLE IS ADEQUATE TO COMPLETE THE PULL-BACK (INSTALLATION) OF THE PIPELINE. ONCE THE REAMING PASS(S) ARE COMPLETED, PREFABRICATED PIPE SEGMENTS ARE THEN PULLED THROUGH THE HOLE TO COMPLETE THE INSTALLATION. ADDITIONAL WELDING TO JOIN THE PREFABRICATED SEGMENTS MAY BE REQUIRED DURING THE PULLBACK PROCESS. WHILE THE HDD METHOD IS A COMMONLY USED, PROVEN TECHNOLOGY, THERE IS THE POTENTIAL FOR UNINTENDED EFFECTS THAT COULD OCCUR AS A RESULT OF THE DRILLING.

DRILLING FLUIDS

THE HDD PROCESS USES ENGINEERED DRILLING FLUIDS TO FACILITATE MANY OF THE HDD OPERATIONS. DRILLING FLUID IS A SLURRY COMPOSED PRIMARILY OF WATER AND BENTONITE CLAY (TYPICALLY 95 PERCENT WATER). BENTONITE (SODIUM MONTMORILLONITE) IS NATURALLY OCCURRING CLAY, USUALLY MINED IN WYOMING, WHICH IS EXTREMELY HYDROPHILIC AND CAN ABSORB UP TO TEN TIMES ITS WEIGHT IN WATER. BENTONITE IS NOT CONSIDERED A HAZARDOUS MATERIAL, AS DEFINED BY THE ENVIRONMENTAL PROTECTION AGENCY. IT IS NON-TOXIC TO THE AQUATIC ENVIRONMENT. THE COMPOSITION OF THE DRILLING FLUIDS AND ITS ENGINEERING PROPERTIES ARE TESTED TO ENSURE THEIR SUITABILITY FOR THE GIVEN SUBSURFACE CONDITIONS ENCOUNTERED ALONG THE ALIGNMENT AND AT EACH INDIVIDUAL HDD LOCATION.

THE SLURRY IS DESIGNED TO:

- STABILIZE THE HOLE AGAINST COLLAPSE;
- LUBRICATE, COOL, AND CLEAN THE CUTTERS;
- TRANSPORT CUTTINGS BY SUSPENSION AND FLOW TO ENTRY AND EXIT POINTS; AND REDUCE SOIL FRICTION AND REQUIRED PULL LOADS DURING PILOT HOLE, REAMING, AND CARRIER PIPE INSTALLATION.

DEPENDING ON SUBSURFACE CONDITIONS ENCOUNTERED, CERTAIN LOST CIRCULATION MATERIALS (LCMS) AND SPECIAL POLYMERS MAY ALSO BE INTRODUCED IN THE DRILLING FLUID MIXTURE. LOST CIRCULATION MATERIALS MAY BE USED DURING INADVERTENT RETURN EVENTS AND/OR IN CERTAIN CASES WHEN DRILLING FLUID CIRCULATION SEEMS TO BE DIMINISHING. IN THE EVENT THAT EXISTING FLOW PATHS (FAULTS, FRACTURES, VOIDS, ETC.) INTERSECT THE HDD PATH, LCMS MAY BE USED IN AN ATTEMPT TO SEAL AROUND THE BOREHOLE AND PREVENT DRILLING FLUID FROM ESCAPING INTO THE FORMATION AND ALLOW FOR THE REESTABLISHMENT OF DRILLING FLUID RETURNS TO THE ENTRY AND/OR EXIT PITS. MANY TYPES OF LCMS ARE AVAILABLE FOR USE DURING HDD OPERATIONS THAT ARE INERT AND ENVIRONMENTALLY BENIGN.

ENBRIDGE IS IN THE EARLY PHASES OF SELECTING PIPELINE AND HDD CONSTRUCTION CONTRACTORS. THEREFORE, AT THIS TIME, ENBRIDGE IS UNABLE TO IDENTIFY THE SPECIFIC LCMS AND POLYMERS THAT MAY BE USED ON THE PROJECT. FOR EXAMPLE, DRILLING FLUID ADDITIVES THAT MAY BE USED IN CLAY WILL NOT LIKELY BE BENEFICIAL IN ROCK. CONSIDERATION IS ALSO GIVEN TO THE VARYING GEOLOGICAL FORMATION THE PROJECT TRAVERSE.

AFTER HDD CONTRACTOR SELECTION IS COMPLETED AND PRIOR TO THE START OF CONSTRUCTION, THE HDD CONTRACTORS WILL BE REQUIRED TO SUBMIT A LIST OF DRILLING FLUID ADDITIVES (E.G., POLYMERS, LCM, ETC.) PROPOSED FOR USE ON THE PROJECT TO ENBRIDGE FOR REVIEW AND APPROVAL. ENBRIDGE WILL EVALUATE THE CONTRACTOR'S LIST OF PROPOSED POLYMERS, DETERMINE WHICH OF THE PROPOSED PRODUCTS WILL BE AUTHORIZED FOR PROJECT USE AND PROVIDE THAT LIST TO REGULATORY AUTHORITIES STAFF. ENBRIDGE WILL INITIALLY DETERMINE THE PRODUCTS TO BE AUTHORIZED FOR PROJECT USE BASED ON COMPLIANCE WITH NSF 60 STANDARDS. NSF 60 IS A STANDARD THAT ESTABLISHES HEALTH AND SAFETY CRITERIA FOR THE CHEMICAL TREATMENT OF DRINKING WATER AND CONSEQUENTLY, DRINKING WATER WELL DEVELOPMENT ("NSF/ANSI STANDARD 60"). IN ADDITION TO NSF 60 CRITERIA, ANY OTHER APPLICABLE FEDERAL OR STATE REQUIREMENTS WILL ALSO BE CONSIDERED DURING THE REVIEW PROCESS. AFTER THIS PROCESS HAS BEEN COMPLETED, ENBRIDGE WILL SUBMIT TO REGULATORY AUTHORITIES A LIST OF SPECIFIC ADDITIVES PLANNED TO BE USED ON THE PROJECT.

IN LIEU OF SPECIFIC POLYMER IDENTIFICATION, AT THIS TIME, ENBRIDGE OFFERS THE FOLLOWING INFORMATION ON CATEGORIES OF POLYMERS THAT MAY BE USED DURING HDD OPERATIONS:

- BOREHOLE STABILIZERS/VISCOSIFERS: POLYMERS USED TO INCREASE VISCOSITY AND GEL STRENGTH OF WATER/BENTONITE DRILLING FLUIDS.
- LOST CIRCULATION MATERIALS: CAN BE POLYMERS BUT SOMETIMES OTHER BIO-DEGRADABLE MATERIALS ARE USED AS LCMS (I.E. WALNUT SHELLS, PAPER ETC.)

MOST DRILLING FLUIDS, DRILLING FLUID ADDITIVES AND POLYMERS USED IN THE HDD INDUSTRY ARE NSF 60 COMPLIANT, AS THESE PRODUCTS ARE USED THERE WILL BE NO EFFECTS ON WATER QUALITY.

HDD WORKING PROCEDURES

PRIOR TO STARTING ANY HDD DRILLING THE HI AND EI WILL VERIFY THAT ALL ENVIRONMENTAL CONTROLS ARE IN PLACE.

THERE WILL BE THE POTENTIAL FOR INADVERTENT RETURNS OR LOSS OF DRILLING FLUIDS FROM THE BORED HOLE. HOWEVER, DRILLING FLUIDS THAT ARE RETURNED WILL LIKELY CONTAIN A LOWER CONCENTRATION OF BENTONITE WHEN THEY SURFACE BECAUSE THAT MIXTURE MAY BE FILTERED AND SOMEWHAT DILUTED AS IT PASSES THROUGH EXISTING SEDIMENTS OF VARIOUS TYPES.

INADVERTENT RETURNS MAY OCCUR AS A RESULT OF ROCK FRACTURES, LOW DENSITY/LOW STRENGTH SOILS, AND UNCONSOLIDATED GEOLOGY, WHICH WERE NOT FORESEEN DURING THE DESIGN PHASE. INADVERTENT RETURNS ARE READILY DETECTED AT THE SURFACE AS SEEPAGE (POOLING OF DRILLING MUD AT THE SURFACE) OR A LOSS OF CIRCULATION OF THE DRILLING FLUID. WHEN THE OPERATOR OBSERVES A LOSS OF DRILLING FLUID RETURNING, IT IS AN INDICATOR THAT SEEPAGE MAY BE OCCURRING. PRIOR TO THE START OF DRILLING OPERATIONS, SITE-SPECIFIC HDD PROCEDURES WILL BE REVIEWED WITH THE HDD CONTRACTOR. AT A MINIMUM, THE HDD PROCEDURES WILL ADDRESS THE FOLLOWING:

MONITORING ANNULAR PRESSURE

INADVERTENT RETURNS MAY OCCUR WHEN THE PRESSURE OF THE DRILLING FLUID IN THE BORED HOLE EXCEEDS THE LIMITING STRENGTH OF THE SOILS. EACH PILOT HOLE WILL INCORPORATE "PRESSURE WHILE DRILLING" (PWD) INSTRUMENTATION. THE PWD TOOL MEASURES THE FLUID PRESSURE NEAR THE DRILL BIT. PRESSURES MAY INCREASE WHEN THERE IS AN OBSTRUCTION TO ANNULAR FLOW SOMEWHERE BETWEEN THE BIT AND THE ENTRY AT GROUND SURFACE. IF PRESSURES RISE OR SPIKE, THE DRILLER CAN INITIATE REMEDIAL ACTIONS (SEE BELOW) PRIOR TO SEEING ANY INADVERTENT RETURN AT THE SURFACE.

RETURN CIRCULATION

ONCE IT IS INDICATED TO THE DRILLER THAT DRILLING FLUID CIRCULATION IS DISSIPATING OR THAT A RETURN HAS OCCURRED, THE DRILLER HAS THE FOLLOWING OPTIONS (OR ANY COMBINATION OF THESE OPTIONS):

- DECREASE PUMP PRESSURE;
- DECREASE PENETRATION RATE;
- RETRACT THE DRILL STRING A DISTANCE TO RESTORE CIRCULATION ("SWAB" THE HOLE);
- INTRODUCE ADDITIONAL DRILLING FLUID FLOW ALONG THE HOLE USING "WEEPER" SUBS; AND
- INTRODUCE LOST CIRCULATION ADDITIVES TO THE DRILLED HOLE.

INADVERTENT RETURNS AT ACCESSIBLE LOCATIONS

IF INADVERTENT RETURNS ARE OBSERVED ON THE GROUND SURFACE ALONG PORTIONS IN THE ALIGNMENT THAT ARE ACCESSIBLE, CONTAINMENT AND RECOVERY OPERATIONS WILL BE COMPLETED IN ACCORDANCE WITH THE PROCEDURES DISCUSSED IN THIS PLAN. ONCE THE INADVERTENT RETURN IS CONTAINED, DRILLING OPERATION WILL RESUME.

INADVERTENT RETURNS AT IN-ACCESSIBLE LOCATIONS

IF INADVERTENT RETURNS ARE OBSERVED ON THE GROUND SURFACE ALONG PORTIONS OF THE ALIGNMENT THAT ARE INACCESSIBLE; THE FOLLOWING PROCEDURES WILL BE FOLLOWED:

- CONTRACTOR WILL ENSURE ALL REASONABLE MEASURES WITHIN THE LIMITATIONS OF CURRENT TECHNOLOGY HAVE BEEN TAKEN TO RE-ESTABLISH CIRCULATION; AND
- CONTINUE DRILLING UTILIZING A MINIMAL AMOUNT OF DRILLING FLUID AS REQUIRED TO PENETRATE THE FORMATION OR TO MAINTAIN A SUCCESSFUL CARRIER PIPE PULL BACK.

MONITORING AND REPORTING OF INADVERTENT RETURNS

THE ACTIONS IN THIS PLAN ARE TO BE IMPLEMENTED BY THE FOLLOWING PERSONNEL:

HDD INSPECTOR

ENBRIDGE WILL DESIGNATE A HDD INSPECTOR (HI) FOR THE PROJECT. THE HI WILL HAVE OVERALL AUTHORITY FOR CONSTRUCTION ACTIVITIES THAT OCCUR ON THEIR DESIGNATED HDD OF THE PROJECT. THE HDD INSPECTORS WILL REPORT TO A CHEF INSPECTOR (CI) THAT IS IN CHARGE OF THE OVERALL PROJECT. THE HI HAS THE TOTAL RESPONSIBILITY TO VERIFY THAT ALL HDD PROCEDURES ARE FOLLOWED. IF ANY HDD PROCEDURE IS NOT BEING FOLLOWED THE HDD WILL BE STOPPED AND THE CI WILL BE NOTIFIED. THE PROCEDURE WILL BE REVIEWED AGAIN WITH THE HDD CONTRACTORS MANAGEMENT TEAM TO MAKE SURE THAT ALL PROCEDURES ARE BEING FOLLOWED.

ENVIRONMENTAL INSPECTOR

ONE ENVIRONMENTAL INSPECTOR (EI) WILL BE DESIGNATED BY ENBRIDGE TO EACH SPREAD. THE EI WILL HAVE PEER STATUS WITH ALL OTHER CRAFT INSPECTORS AND WILL REPORT DIRECTLY TO THE CI WHO HAS OVERALL AUTHORITY. THE EI, ALONG WITH ALL OTHER INSPECTORS AND INSPECTION PERSONNEL, WILL HAVE THE AUTHORITY TO STOP ACTIVITIES THAT VIOLATE THE ENVIRONMENTAL CONDITIONS OF THE REGULATORY AUTHORITIES CERTIFICATE (IF APPLICABLE), OTHER FEDERAL AND STATE PERMITS, OR LANDOWNER REQUIREMENTS AND TO ORDER CORRECTIVE ACTION.

HDD SUPERINTENDENT

THE HDD SUPERINTENDENT IS THE SENIOR ON-SITE REPRESENTATIVE OF THE HDD CONTRACTOR. THE HDD SUPERINTENDENT HAS OVERALL RESPONSIBILITY FOR IMPLEMENTING THIS PLAN ON BEHALF OF THE HDD CONTRACTOR. THE HDD SUPERINTENDENT WILL BE FAMILIAR WITH THE ASPECTS OF THE DRILLING ACTIVITY, THE CONTENTS OF THE PLAN AND THE CONDITIONS OF APPROVAL UNDER WHICH THE ACTIVITY IS PERMITTED TO TAKE PLACE. THE HDD SUPERINTENDENT WILL MAKE AVAILABLE A COPY OF THIS PLAN AND THE CONDITIONS OF APPROVAL UNDER WHICH THE ACTIVITY IS PERMITTED TO TAKE PLACE. THE HDD SUPERINTENDENT WILL MAKE AVAILABLE A COPY OF THIS PLAN TO THE APPROPRIATE CONSTRUCTION PERSONNEL. THE HDD SUPERINTENDENT WILL ENSURE THAT WORKERS ARE PROPERLY TRAINED AND FAMILIAR WITH THE NECESSARY PROCEDURES FOR RESPONSE TO AN INADVERTENT RETURN.

HDD OPERATOR

THE HDD OPERATOR IS THE HDD CONTRACTOR'S DRILLER OPERATING THE DRILLING RIG AND MUD PUMPS. THE HDD OPERATOR IS RESPONSIBLE FOR MONITORING CIRCULATION BACK TO THE ENTRY AND EXIT LOCATIONS. IN THE EVENT OF LOSS OF CIRCULATION, THE HDD OPERATOR MUST COMMUNICATE THE EVENT TO THE HDD SUPERINTENDENT AND HDD CONTRACTOR FIELD CREWS. THE HDD OPERATOR IS RESPONSIBLE FOR STOPPAGE OR CHANGES TO THE DRILLING PROGRAM IN THE EVENT OF OBSERVED INADVERTENT RETURNS.

HDD CONTRACTOR PERSONNEL

DURING HDD INSTALLATION, FIELD CREWS WILL BE RESPONSIBLE FOR MONITORING THE HDD ALIGNMENT ALONG WITH ENBRIDGE'S FIELD REPRESENTATIVE(S). FIELD CREWS, IN COORDINATION WITH THE EI, ARE RESPONSIBLE FOR TIMELY NOTIFICATIONS AND RESPONSES TO OBSERVED RETURNS TO THE CI AND APPROPRIATE AGENCIES, IN ACCORDANCE WITH THIS PLAN. THE EI AND CI ULTIMATELY MUST APPROVE THE ACTION PLAN FOR MITIGATING THE RETURN. THE HDD CONTRACTOR WILL HAVE PERSONNEL THAT IS ASSIGNED TO MONITOR THE HDD PATH. THEIR RESPONSIBILITY IS TO MONITOR THE HDD PATH DURING THE HDD PROCESS UNTIL THE PIPE IS PULLED INTO THE HDD HOLE. THERE WILL BE GOOD RADIO COMMUNICATION WITH THE HDD OPERATOR AND THE GROUND PERSONNEL ON THE HDD PATH. IF ANY INADVERTENT RELEASES IS DISCOVERED THE HDD WILL BE STOPPED UNTIL THE RELEASE IS CONTAINED AND ENBRIDGE GIVES THE HDD CONTRACTOR PERMISSION TO START THE HDD PROCESS WORK AGAIN.

TRAINING

PRIOR TO DRILLING, THE HDD SUPERINTENDENT, HI, AND THE EI WILL VERIFY THAT THE HDD OPERATOR AND FIELD CREW RECEIVE THE FOLLOWING SITE-SPECIFIC TRAINING, BUT NOT LIMITED TO:

- PRIOR TO THE START OF THE HDD EACH PERSON INVOLVED WITH THE HDD WILL BE REQUIRED TO GO THROUGH TRAINING, THIS TRAINING WILL DISCUSS THE HDD PROCEDURES INCLUDING ANY INADVERTENT RETURNS REPORTING;
- PROJECT SPECIFIC SAFETY AND ENVIRONMENTAL TRAINING;
- REVIEW PROVISION OF THIS PLAN AND SITE-SPECIFIC PERMIT REQUIREMENTS;
- REVIEW LOCATION OF SENSITIVE ENVIRONMENTAL RESOURCES AT THE SITE;
- REVIEW DRILLING PROCEDURES FOR RETURN PREVENTION;
- REVIEW THE SITE-SPECIFIC MONITORING REQUIREMENTS;
- REVIEW THE LOCATION AND OPERATION OF RETURN CONTROL EQUIPMENT AND MATERIAL; AND
- REVIEW PROTOCOLS FOR REPORTING OBSERVED INADVERTENT RETURNS.

MONITORING & REPORTING

THE HDD ALIGNMENT WILL BE "WALKED" AND OBSERVED FOR INADVERTENT RETURNS AT LEAST FOUR TIMES PER SHIFT. EACH INSPECTION WILL BE NOTED IN THE HDD CONTRACTOR'S DAILY REPORT AND THE ENBRIDGE CHECK LIST. THIS PROCESS WILL BE EVALUATED FOR EACH DRILL. SOME HDD WILL REQUIRE MORE WALKED AND OBSERVED PROCESS. THE TIMING FOR THE INSPECTION WALKS WILL BE AGREED TO BY THE HDD CONTRACTOR AND ENBRIDGE HI BEFORE THE HDD STARTS. THE TIMING WILL BE RECORDED IN BOTH THE DAILY LOGS FOR BOTH HDD CONTRACTOR AND ENBRIDGE HI.

IF THE HDD OPERATOR OBSERVES A LOSS OF CIRCULATION, THE OPERATOR WILL NOTIFY THE HDD SUPERINTENDENT, HI AND FIELD CREWS OF THE EVENT AND APPROXIMATE POSITION OF THE CUTTING HEAD. WHERE PRACTICAL, A MEMBER OF THE FIELD CREW WILL VISUALLY INSPECT THE GROUND SURFACE NEAR THE POSITION OF THE CUTTING HEAD, SURFACE WATER, WELLS, AND MAPPED SPRINGS WITHIN 2,000 FEET OF THE HDD SITE WILL ALSO BE VISUALLY INSPECTED.

TYPICALLY, INADVERTENT RETURNS ARE MOST OFTEN DETECTED IN THE AREA NEAR THE ENTRY OR EXIT POINTS (APPROXIMATELY 200-FEET) OF THE DRILL ALIGNMENT WHERE THE HDD PATH IS AT SHALLOW DEPTHS, ABOVE BEDROCK, AND IN PERMEABLE/POROUS SOILS. IN THESE OCCURRENCES THE HDD SUPERINTENDENT, EI, AND CI WILL DETERMINE AN ESTIMATED VOLUME AND THE BEST METHODS FOR CONTAINMENT.

IF AN INADVERTENT RETURN IS OBSERVED SOMEWHERE BEYOND:

- FIELD CREW WILL NOTIFY (VIA HAND-HELD RADIO OR CELL PHONE) THE HDD OPERATOR AND CI.
- THE HDD OPERATOR WILL TEMPORARILY CEASE PUMPING OF THE DRILLING FLUID AND NOTIFY THE HDD SUPERINTENDENT AND CI. THE HDD SUPERINTENDENT WILL ASSESS THE DRILLING PARAMETERS (DEPTH, TYPE OF FORMATION, FLUID FLOW RATE, AND DRILLING FLUID CHARACTERISTICS) AND PROPOSE APPROPRIATE CHANGES.
- THE HI WILL NOTIFY AND COORDINATE A RESPONSE WITH THE EI. THEY WILL ALSO ASSESS THE POTENTIAL OF THE RETURN TO REACH ADJACENT WATERBODIES, WETLANDS, OR OTHER TYPES OF INFRASTRUCTURE (E.G., WELLS).
- THE EI, IN COORDINATION WITH THE HDD SUPERINTENDENT AND HI WILL DETERMINE WHEN DRILLING OPERATIONS CAN RESUME. THE DRILLING PROCESS WILL NOT BE ALLOWED TO RESUME UNTIL AN ENBRIDGE REPRESENTATIVE APPROVES THE HDD DRILLING TO RESUME.
- THE ENBRIDGE REPRESENTATIVE WILL NOTIFY REGULATORY AUTHORITIES AND THE APPROPRIATE PERMITTING AUTHORITIES AS NECESSARY OF THE EVENT AND PROPOSED RESPONSE AND PROVIDE REQUIRED DOCUMENTATION WITHIN 24 HOURS.
- THE CI WILL PREPARE A REPORT THAT SUMMARIZES THE INCIDENT.

RESPONSE TO INADVERTENT RETURNS

THE HDD SUPERINTENDENT, EI, AND HI WILL COORDINATE INSTALLATION OF APPROPRIATE CONTAINMENT STRUCTURES. SITE TOPOGRAPHY IN CONJUNCTION WITH ACCESS FOR PERSONNEL AND EQUIPMENT TO THE RETURN SITE ARE MAJOR FACTORS IN DETERMINING THE METHODS USED FOR CONTAINMENT AND DISPOSAL. TYPICALLY, CONTAINMENT IS ACHIEVED BY EXCAVATING A SMALL SUMP PIT (APPROXIMATELY 5-CUBIC YARDS) AT THE SITE OF THE RETURN AND/OR SURROUNDING THE RETURN WITH FILTER SOCK AND/OR SAND BAGS. ONCE CONTAINED, THE DRILLING FLUID IS EITHER TRANSPORTED BACK TO THE HDD DRILLING RIG OR TO A DISPOSAL SITE.

THE HDD CONTRACTOR WILL HAVE ON-SITE, PRIOR TO THE DRILLING, AN APPROPRIATE INVENTORY OF MATERIALS AND EQUIPMENT TO CONTAIN INADVERTENT RETURNS. THIS EQUIPMENT WILL BE ON STAND BY FOR THE ENTIRETY OF THE DRILLING PROCESS. THE MATERIAL AND EQUIPMENT WILL INCLUDE, BUT NOT BE LIMITED TO:

- COMPOST FILTER SOCK (12-INCH TO 36-INCH IN ADDITION TO THE PERIMETER CONTROLS SHOWN ON THE DRAWINGS)
- SAND BAGS
- HAND TOOLS (SHOVELS, RAKES, ETC.)
- PUMPS AND HOSES (THREE, 3-INCH TRASH PUMPS WITH 300 FEET OF DISCHARGE HOSES AT EACH HDD LOCATION)
- PUMPED WATER FILTER BAGS
- VACUUM TRUCK(S) (60 BBL OR GREATER CAPACITY)
- BACKHOE
- EQUIPMENT MATS
- AQUA BARRIERS/TURBIDITY CURTAINS
- PERMANENT SEEDING RESTORATION (PER E&S PLAN)

THE SITE-SPECIFIC RESPONSE WILL FOLLOW THE GUIDELINES PROVIDED IN THE FOLLOWING SECTIONS.

UPLAND LOCATIONS

- EVALUATE THE AMOUNT OF RETURNS TO DETERMINE IF CONTAINMENT STRUCTURES ARE WARRANTED AND IF THEY WILL EFFECTIVELY CONTAIN THE RETURN.
- PROMPTLY IMPLEMENT APPROPRIATE CONTAINMENT MEASURES AS NEEDED TO CONTAIN AND RECOVER THE SLURRY.
- IF THE RETURN IS WITHIN 100-FEET OF A WETLAND OR WATERBODY, COMPOST FILTER SOCK WILL BE INSTALLED BETWEEN THE RETURN SITE AND THE WETLAND OR WATERBODY.
- IF THE RETURN CANNOT BE CONTAINED, THEN THE OPERATOR MUST SUSPEND DRILLING OPERATIONS UNTIL APPROPRIATE CONTAINMENT IS IN PLACE.
- REMOVE THE FLUIDS USING EITHER A VACUUM TRUCK OR BY PUMPING TO A LOCATION WHERE A VACUUM TRUCK IS ACCESSIBLE.
- RESTORE UPLAND AREA WITH PERMANENT SEEDING, MULCH AND SOIL SUPPLEMENTS PER THE APPROVED E&SCP.

WETLAND AND MINOR WATERBODY LOCATIONS

- EVALUATE THE AMOUNT OF RETURN TO DETERMINE IF CONTAINMENT STRUCTURES ARE WARRANTED AND IF THEY WILL EFFECTIVELY CONTAIN THE RETURN.
- PROMPTLY IMPLEMENT APPROPRIATE CONTAINMENT MEASURES TO CONTAIN AND RECOVER THE SLURRY, EFFORTS TO CONTAIN AND RECOVER SLURRY IN WETLANDS OR STREAM MAY RESULT IN FURTHER DISTURBANCE BY EQUIPMENT AND PERSONNEL, AND POSSIBLY OFFSET THE BENEFIT GAINED IN REMOVING THE SLURRY.
- IF THE RETURN CANNOT BE CONTROLLED OR CONTAINED, IMMEDIATELY SUSPEND DRILLING OPERATIONS UNTIL APPROPRIATE CONTROLS CAN BE IMPLEMENTED AND THE ASSESSMENT OF THE IMPACT TO THE WETLAND IS COMPLETED BY THE EI AND THE GOVERNING AGENCY. DRILLING MAY COMMENCE WHEN APPROVED MEASURES ARE IN PLACE AND INSPECTED BY THE EI. THE ENBRIDGE CONSTRUCTION MANAGER MUST APPROVE THE HDD DRILLING TO RESUME.

MAJOR WATERBODY LOCATIONS

ENBRIDGE'S PROPOSED HDD IS BEING DESIGNED TO MINIMIZE THE POTENTIAL FOR INADVERTENT RETURNS. ENBRIDGE'S CONTRACTOR(S) MAY ALSO EMPLOY THE TECHNIQUES DESCRIBED BELOW TO REDUCE THE POSSIBILITY OF INADVERTENT RETURNS.

SURFACE CASING

IF DEEMED NECESSARY, SURFACE CASING MAY BE INSTALLED IN CERTAIN INSTANCES. SURFACE CASING PROVIDES A CONDUIT TO ALOW DRILLING FLUIDS TO RETURN FROM THE DRILL PATH BACK TO THE SURFACE. ADDITIONALLY, SURFACE CASING HELPS ISOLATE THE DRILL PATH FROM THE REGIONS OF UNSTABLE OVERBURDEN MATERIAL.

INTERSECT METHOD

ENBRIDGE'S CONTRACTOR'(S) MAY DRILL SOME OF THE PILOT HOLES FROM BOTH SIDES OF THE CROSSING AND PERFORM AN INTERSECT NEAR A PREDETERMINED POINT, USUALLY NEAR THE MIDDLE OF THE CROSSING. THE INTERSECT METHOD IS WIDELY USED IN LONG, LARGE DIAMETER HDDS. THE INTERSECT METHOD REDUCES THE LENGTH THAT MUST BE DRILLED FROM EACH END AND THEREBY DECREASES THE DISTANCE THAT DRILLING FLUIDS NEED TO BE PUMPED IN ORDER TO RETURN TO SURFACE AT THE ENTRY/EXIT POINTS. UTILIZATION OF THIS METHOD IS PARTICULARLY ADVANTAGEOUS IN LONGER CROSSINGS BECAUSE THE REDUCED DISTANCE THAT DRILLING FLUID MUST BE PUMPED SUBSEQUENTLY DECREASES THE FLUID PRESSURE REQUIRED FOR THE DRILLING FLUID TO TRAVEL BACK TO THE ENTRY/EXIT POINTS

IN THE EVENT OF AN INADVERTENT RETURN IN A FLOWING WATERDODY, THE FOLLOWING APPROACH WILL GENERALLY BE FOLLOWED AFTER THE INADVERTENT RETURN HAS BEEN ISOLATED AND THE FLOW HAS STOPPED. DUE TO THE UNPREDICTABLE NATURE OF THE LOCATIONS AND ENVIRONMENT IN WHICH INADVERTENT RETURNS MAY APPEAR, THE DESCRIPTION CANNOT ENCOMPASS ALL POSSIBLE APPROACHES TO CLEAN-UP UNDER ALL CONDITIONS. AGENCY STAFF AND OTHER EXPERTS WILL BE CONSULTED TO EXTENT PRACTICABLE IN THE DEVELOPMENT OF REMEDIAL CLEAN-UP TECHNIQUES, AS REQUIRED.

THE FOLLOWING ARE STANDARD RESPONSE TECHNIQUES THAT MAY BE APPLIED:

- IF THE BENTONITE MATERIAL FLOWS OVERLAND PRIOR TO ENTERING THE WATERBODY, INSTALLATION OF COMPOST FILTER SOCK OR SANDBAG DAMS AT THE POINT OF ENTRY WILL BE USED TO REDUCE OR STOP THE FLOW; IF THE VENT IS DIRECTLY INTO THE WATERBODY, OTHER MEANS TO ISOLATE THE VENT SITE FROM THE FLOWING WATERBODY WILL BE USED.
- USING A VACUUM TRUCK OR PUMP(S), WITH A SUFFICIENT HOSE, PERSONNEL WILL REMOVE THE BENTONITE, WORKING FROM DOWNSTREAM TO UPSTREAM, TO ALLOW MAXIMUM VISIBILITY. HAND TOOLS MAY BE USED TO SCARIFY THE SEDIMENTS AND ENSURE REMOVAL TO THE MAXIMUM EXTENT PRACTICABLE.
- IF PUMPS ARE USED, DISCHARGED WATER SHALL BE TO AN IMPERMEABLE STRUCTURE OR TO FILTERING DEVICES SUCH AS A COMPOST FILTER SOCK SUMP OR PUMPED WATER FILTER BAGS.
- IF NECESSARY, WATER MAY BE DIVERTED USING TEMPORARY BARRIERS TO ISOLATE THE IMPACT AREA. ONLY A PORTION OF THE STREAM WILL BE DIVERTED TO MINIMIZE DEWATERING IMPACTS. WATER WILL BE ABLE TO PASS THROUGH THE SITE IN ITS NATURAL CONDITION.
- IF IT IS IMPRACTABLE TO REMOVE THE DRILL FLUID FROM THE SURFACE WATER, A CLEAR WRITTEN EXPLANATION WILL BE SUBMITTED TO THE APPLICABLE REGULATORY AGENCIES.
- ANY DISTURBED SOILS WILL BE STABILIZED IMMEDIATELY WITH EROSION CONTROL MATTING, SEEDING AND SOIL SUPPLEMENTS, OR RIPRAP, DEPENDING ON THE SITE CONDITIONS.
- EXPOSED SOILS WILL HAVE TEMPORARY EROSION CONTROL MEASURE ESTABLISHED AS SOON AS PRACTICAL WITH PERMANENT EROSION CONTROLS ESTABLISHED AS SOON AS POSSIBLE AS DESCRIBED IN THE PROJECT E&SCP.
- DISTURBANCE OF VEGETATION WILL BE KEPT TO MINIMUM AND ALL DISTURBED VEGETATION WILL BE RESTORED.

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07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	MATERIALS	QTY
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		0	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)			
REFERENCE DRAWINGS		REVISIONS						

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ENGINEERING APPROVALS					
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LGF		04/29/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL HDD PROCEDURE NOTES

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
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YEAR: 2020	W.B.S.	SCALE: N/A	DWG. DELM-P-8102	REV. 0

PIPELINE HDD PROCEDURE (CONTINUED)

CLEAN UP

AFTER COMPLETION OF THE HDD INSTALLATION, THE CI AND THE HDD SUPERINTENDENT WILL DEVELOP SITE-SPECIFIC CLEAN-UP MEASURES FOR APPROVAL BY THE EI. POTENTIAL FOR SECONDARY IMPACT FROM THE CLEAN-UP PROCESS WILL BE EVALUATED, AS WELL AS THE BENEFITS OF CLEAN-UP ACTIVITIES.

THE FOLLOWING MEASURES MAY BE USED:

- DRILLING MUD MAY BE CLEANED UP BY HAND USING HAND SHOVELS, BUCKETS AND SOFT BRISTLED BROOMS MINIMIZING DAMAGE TO EXISTING VEGETATION.
- FRESH WATER WASHES MAY BE EMPLOYED IF DEEMED BENEFICIAL AND FEASIBLE.
- CONTAINMENT STRUCTURES WILL BE PUMPED OUT AND THE GROUND SURFACE SCRAPED TO BARE TOPSOIL MINIMIZING LOSS OF TOPSOIL OR DAMAGE TO ADJACENT VEGETATION.
- THE RECOVERED DRILLING FLUID WILL BE RECYCLED OR DISPOSED OF AT AN APPROVED UPLAND LOCATION OR DISPOSAL FACILITY. RECOVERED DRILLING FLUID WILL NOT BE DISPOSED OF IN STREAMS OR STORM DRAINS.
- ALL CONTAINMENT STRUCTURES WILL BE REMOVED.
- RECOVERED MATERIALS WILL BE COLLECTED IN CONTAINERS FOR TEMPORARY STORAGE PRIOR TO REMOVAL FROM THE SITE.

HDD CONTINGENCY PLANS

IN THE UNLIKELY EVENT THE HDD CROSSING CANNOT BE COMPLETED ON THE FIRST ATTEMPT, THE APPROVED CONSTRUCTION WORKSPACE AND RIGHTS OF WAY ARE SUFFICIENT TO ALLOW MULTIPLE ATTEMPTS TO INSTALL THE HDD. ANY ABANDONED HDD BORE HOLES WILL BE FILLED WITH GROUT IN THEIR ENTIRETY. IN MOST CASES, SEVERAL ATTEMPTS CAN BE MADE WITHIN THE PERMITTED WORKSPACE BY SLIGHTLY MODIFYING THE HDD GEOMETRY TO ADJUST EITHER THE DEPTH OF THE DRILL PROFILE AND/OR THE HORIZONTAL ALIGNMENT. ADJUSTMENTS IN THE ALIGNMENT AND PROFILE DEPTH CAN, OFTEN TIMES, MINIMIZE CONTACT WITH OR COMPLETELY AVOID LOCALIZED PROBLEMATIC FORMATIONAL ZONES.

IF PROBLEMS PERSIST ALONG THE ORIGINAL DRILL ALIGNMENT, INCLUDING AT ALTERNATE DEPTHS FROM THE FIRST ATTEMPT, THE HDD RIG CAN BE OFFSET LEFT OR RIGHT AND A SECOND PILOT HOLE CAN BE INITIATED ALONG A NEW ALIGNMENT DESIGNED WITH DATA COLLECTED DURING THE FIRST ATTEMPT. THE DRILLING DATA COLLECTED ALONG WITH THE FIRST ALIGNMENT WILL BE UTILIZED TO CREATE A NEW DESIGN THAT WILL, TO THE EXTENT PRACTICAL, MINIMIZE CONTACT WITH PROBLEMATIC FORMATIONAL ZONES ENCOUNTERED DURING THE INITIAL ATTEMPT. IF A FIRST ATTEMPT ALONG THE NEW ALIGNMENT IS NOT SUCCESSFUL, AS DESCRIBED ABOVE, SEVERAL ATTEMPTS CAN BE MADE AT VARIOUS DEPTHS ALONG THE NEW ALIGNMENT.

IF ALL ATTEMPTS FAIL ALONG THIS NEW ALIGNMENT, THE HDD RIG AND EQUIPMENT CAN AGAIN BE MOVED LEFT OR RIGHT WITHIN THE WORKSPACE AND A THIRD NEW PILOT HOLE INITIATED ALONG A NEW DESIGN ALIGNMENT THAT MINIMIZES CONTACT WITH PROBLEMATIC FORMATIONAL ZONES ENCOUNTERED ALONG BOTH THE INITIAL AND SECONDARY ATTEMPTS. IF A FIRST ATTEMPT AT THIS LOCATION ALSO PROVES UNSUCCESSFUL, AS DESCRIBED ABOVE, SEVERAL ATTEMPTS CAN BE MADE AT VARIOUS DEPTHS ALONG THIS ALIGNMENT. IN SUMMARY, THE CONSTRUCTION WORKSPACE CONTAINS SUFFICIENT ROOM TO ALLOW NUMEROUS HDD ATTEMPTS; THEREFORE THESE TECHNIQUES CAN BE UTILIZED UNTIL EITHER THE HDD IS SUCCESSFULLY INSTALLED OR ALL POSSIBILITIES OF A SUCCESSFUL HDD INSTALLATION HAVE BEEN EXHAUSTED.

IN THE VERY UNLIKELY EVENT THAT AN HDD CANNOT BE SUCCESSFULLY INSTALLED, THE METHODS PRESENTED BELOW AND THE ASSOCIATED REQUIRED ACTIVITIES CAN BE CONSIDERED AS POTENTIAL OPTIONS.

REROUTE PIPELINE TO ATTEMPT HDD AT AN ALTERNATE LOCATION OUTSIDE OF THE PROPOSED PIPELINE CONSTRUCTION ROW

- PIPELINE ALIGNMENT WILL BE ALTERED AND A NEW HDD CROSSING WILL BE DESIGNED AT A LOCATION THAT POTENTIALLY WILL POSE LESSER INSTALLATION CHALLENGES.
- THE PROPOSED CHANGE IN LOCATION WILL BE SELECTED VIA DESKTOP ANALYSIS USING EXISTING AERIAL PHOTOGRAPHY AND OTHER AVAILABLE DATA.
- SURVEY PERMISSION WILL BE REQUIRED BEFORE THE REQUIRED CIVIL, ENVIRONMENTAL AND CULTURAL SURVEYS CAN BE PERFORMED. ONCE SURVEY PERMISSION HAS BEEN OBTAINED AND THE AREA IS DETERMINED TO BE ACCEPTABLE FROM A CULTURAL AND ENVIRONMENTAL PERSPECTIVE, GEOTECHNICAL AND GEOPHYSICAL INVESTIGATIONS WILL BE INITIATED TO SUPPORT DESIGN OF A HDD AT THE NEW LOCATION.
- APPROVAL FROM REGULATORY AUTHORITIES, USACE AND STATE AGENCIES WILL BE REQUIRED BEFORE THE HDD IS ATTEMPTED AT THE NEW LOCATION.

OPEN CUT CROSSING;

- THIS METHOD INVOLVES THE EXCAVATION OF A TRENCH THROUGH THE WETLAND OR STREAM.
- ADDITIONAL ARMORING OF THE PIPE IN THE RIVER BOTTOM COULD BE REQUIRED TO PROTECT THE INTEGRITY OF THE PIPE.
- EQUIPMENT WOULD HAVE TO WORK IN THE WETLAND OR STREAMS AND STATE MANDATED TURBIDITY LIMITS WOULD APPLY.
- APPROVALS FROM REGULATORY AUTHORITIES, USACE AND STATE AGENCIES WILL BE REQUIRED BEFORE THE CONSTRUCTION BEGINS.
- THIS TYPE OF CROSSING WOULD ALSO ONLY BE CONSIDERED AS LAST RESORT IN THE CASE WHEN ALL OTHER ALTERNATIVES PROVE TO BE UNFEASIBLE.

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07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION
		1	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)

REFERENCE DRAWINGS | REVISIONS | ITEM NO. | MATERIALS | QTY

IC #

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CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL HDD PROCEDURE NOTES

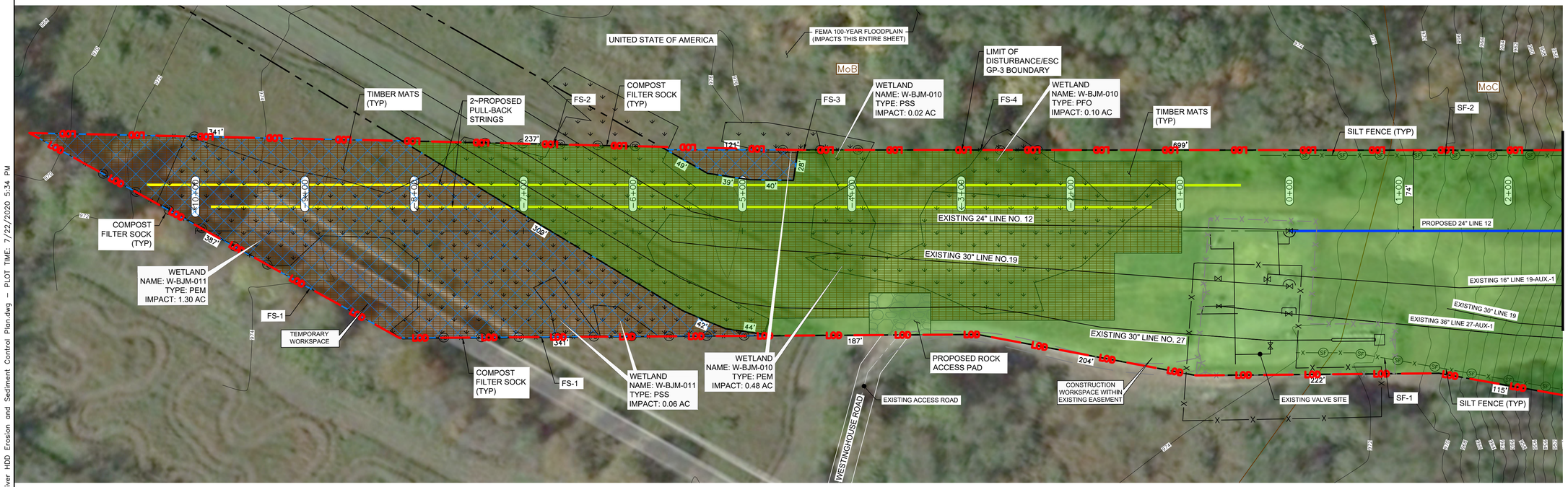
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: N/A | DWG. DELM-P-8103 | REV. 0

DERRY TOWNSHIP,
WESTMORELAND COUNTY,
PENNSYLVANIA



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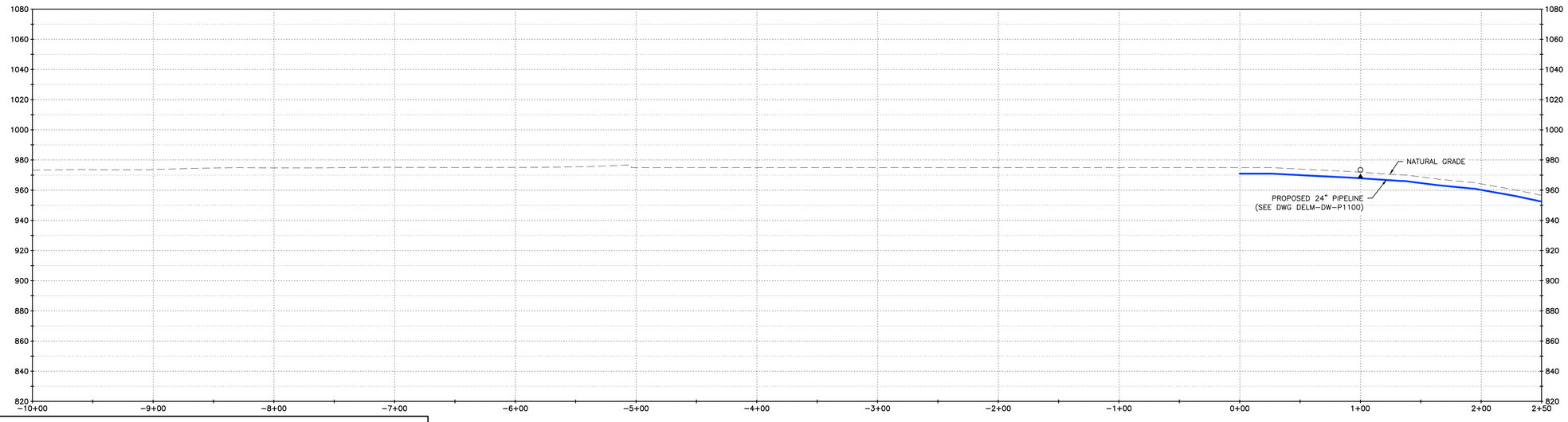
LAND USE | PASTURE



SOIL TYPE LEGEND

MoA	MONOGAHELA SILT LOAM (0 TO 3 PERCENT SLOPES)
MoB	MONOGAHELA SILT LOAM (3 TO 8 PERCENT SLOPES)
MoC	MONOGAHELA SILT LOAM (8 TO 15 PERCENT SLOPES)
GoF	GILPIN-ROCK OUTCROP COMPLEX (45 TO 100 PERCENT SLOPES)
AhB	ALLEGHENY SILT LOAM (3 TO 8 PERCENT SLOPES)
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W	WATER

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- EXISTING CONTOURS
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- COUNTY LINE
- ASSUMED FLOODWAY (50 FEET)
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REV	DSN	CK	DESCRIPTION	
1	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
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CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL PLAN
LOC. WESTMORELAND & INDIANA COUNTY, PA

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DERRY TOWNSHIP,
WESTMORELAND COUNTY,
PENNSYLVANIA

BLACKLICK TOWNSHIP,
INDIANA COUNTY,
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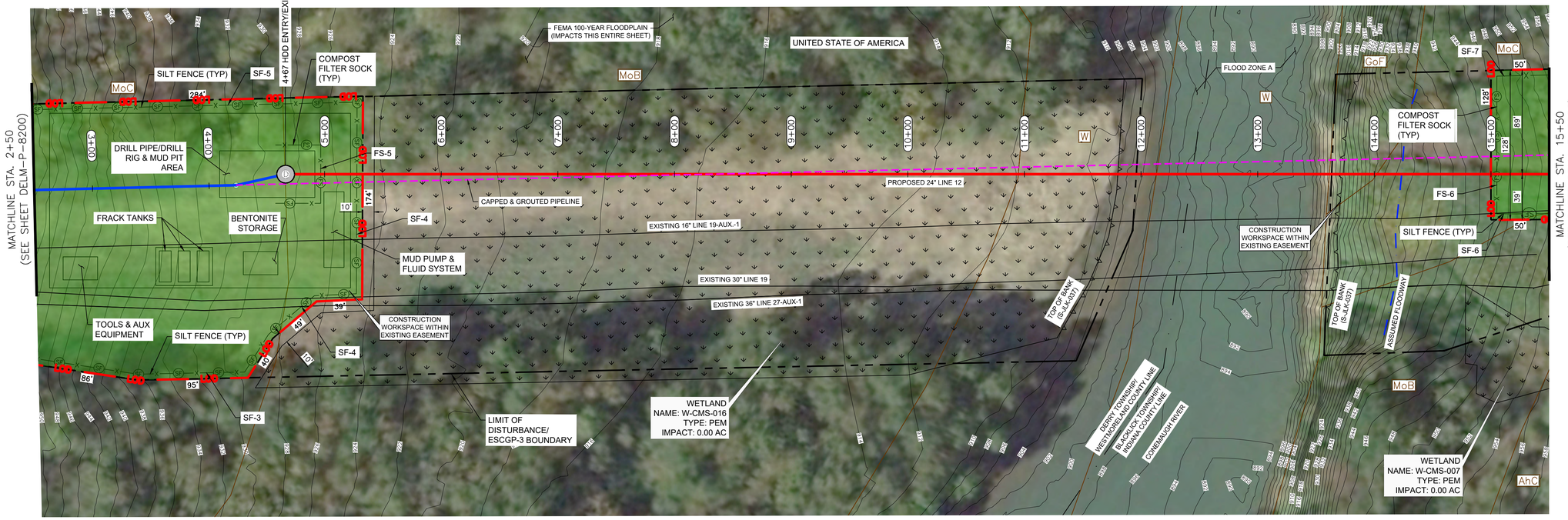
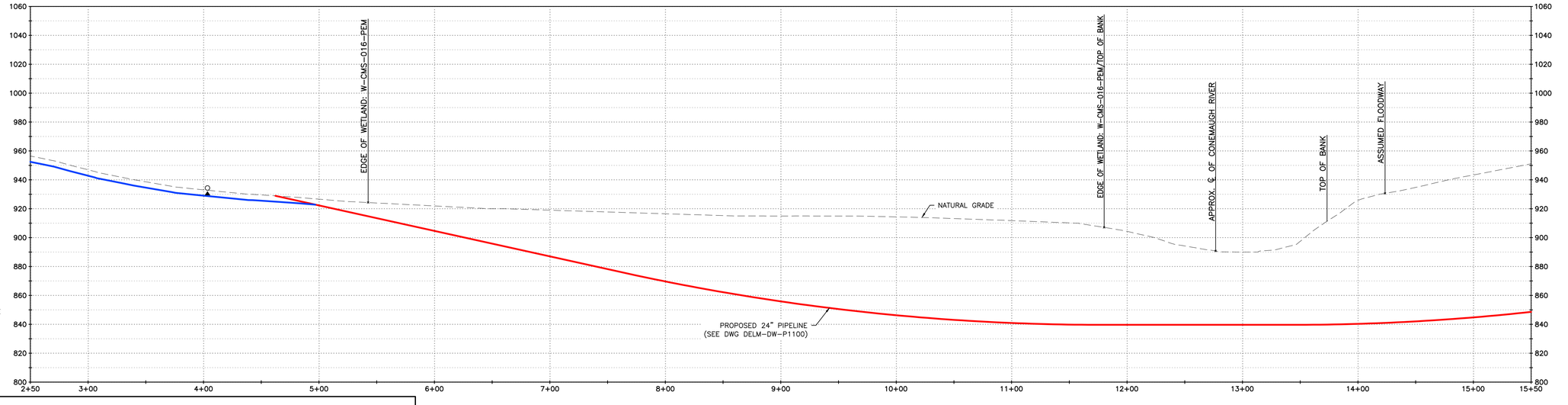


GRAPHIC SCALE
50' 25' 0' 50'

LAND USE	PASTURE	OPEN WATER	PASTURE



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2	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
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			REVISIONS	

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BLACKLICK TOWNSHIP,
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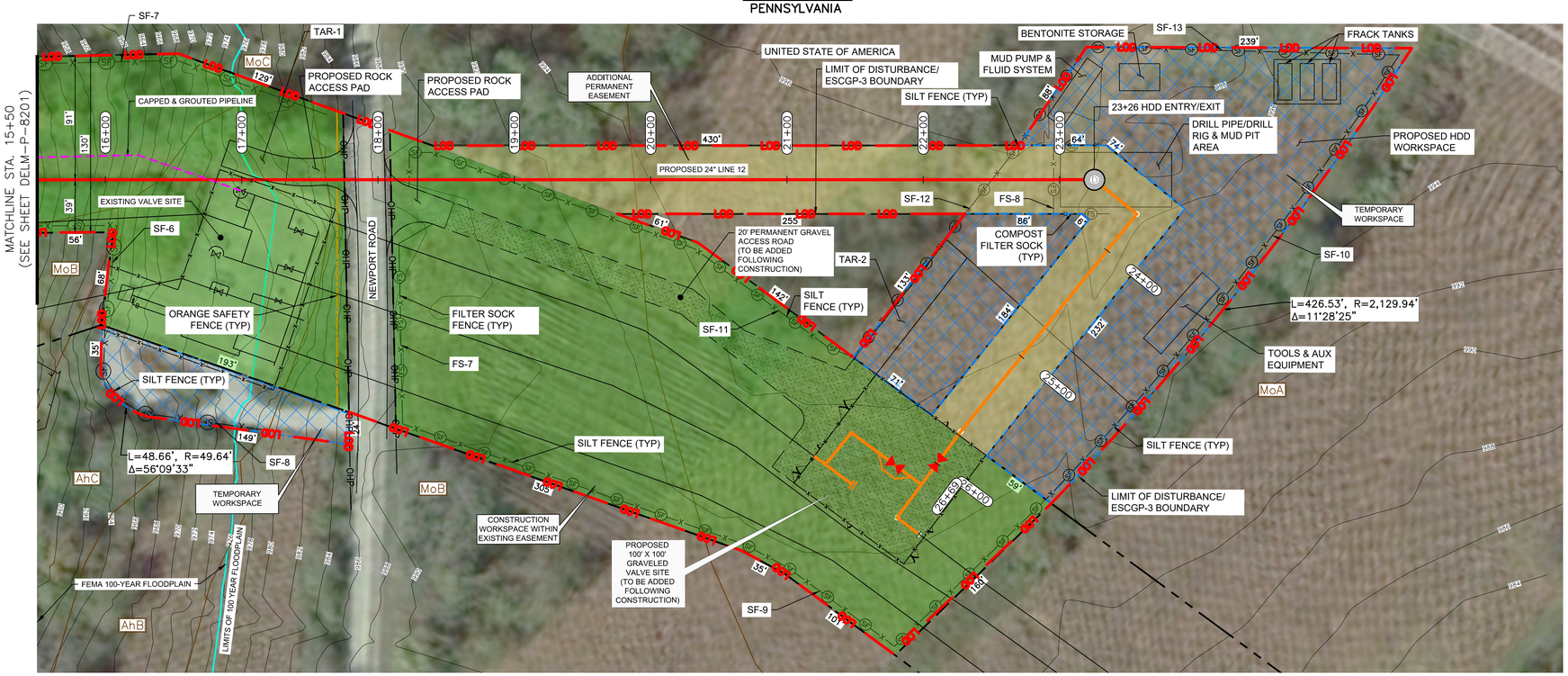
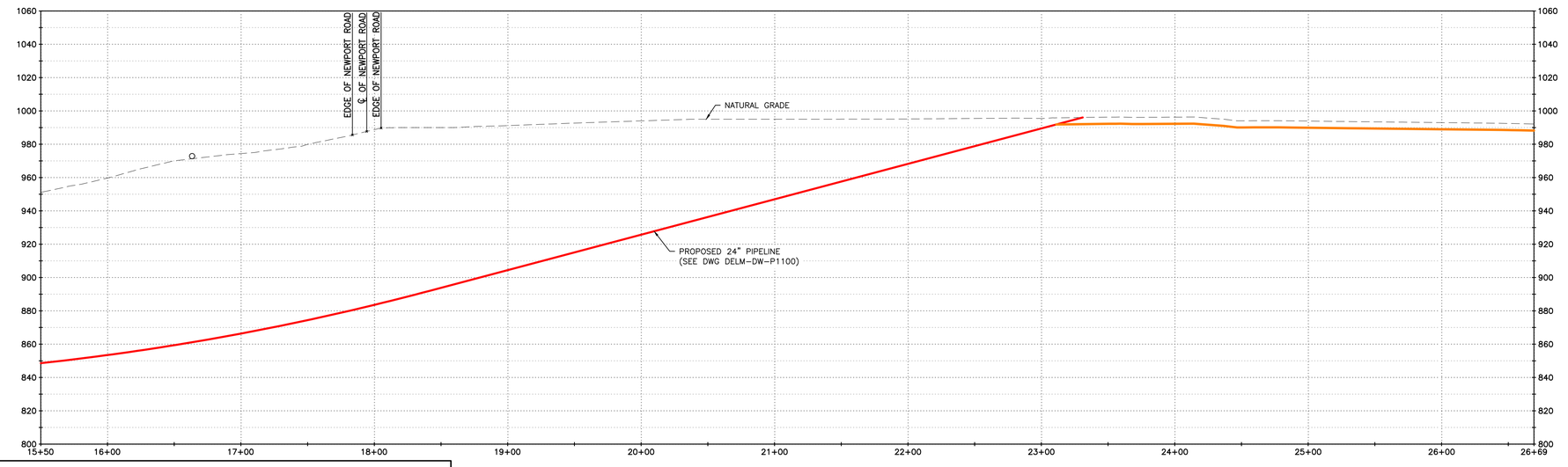
PENNSYLVANIA



LAND USE		PASTURE	ROW	PASTURE	



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- PROPOSED TRENCH BREAKER
- PROPOSED ORANGE SAFETY FENCE
- PROPOSED TIMBER MAT
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED STONE CONSTRUCTION ENTRANCE
- SOIL TYPE BOUNDARY AND SOIL BOUNDARY
- LAND USE TYPE BOUNDARY AND LAND USE BOUNDARY
- ADDITIONAL PERMANENT EASEMENT
- CONSTRUCTION WORKSPACE WITHIN EXISTING EASEMENT
- TEMPORARY WORKSPACE
- DRILL TARGET
- VALVE

REV	DSN	CK	DESCRIPTION	
			REVISIONS	
1	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
0	LGF	RG	ISSUED FOR APPROVAL	(05/28/2020)

audubon Field Solutions
10205 WESTHEIMER ROAD
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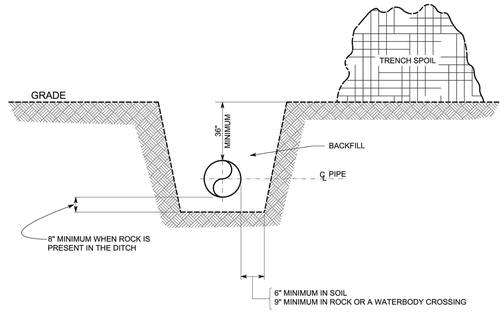
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056
COMMONWEALTH OF PENNSYLVANIA
07/23/20

DRAWN BY	ENGINEERING APPROVALS BID		CONSTRUCTION	
LGF	SIGNATURE	04/13/20 DATE	SIGNATURE	DATE
TITLE				

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL PLAN
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020	W.B.S.	SCALE: 1=50'H, 1"=40'V	DWG. DELM-P-8202	REV. 1



CROSS-SECTION VIEW

NOTES:

1. ALL PRECONSTRUCTION CONTOURS WILL BE RE-ESTABLISHED UPON COMPLETION OF PIPE INSTALLATION. EXCEPT IN WETLANDS, A CROWN MAY BE LEFT TO ACCOUNT FOR DITCH SETTLING, AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
2. IN COLD WATER FISHERY STREAMS, THE TOP 12" OF THE TRENCH WILL BE BACKFILLED WITH CLEAN GRAVEL OR NATIVE COBBLES UNLESS OTHERWISE SPECIFIED BY THE PERMITTING AGENCY.

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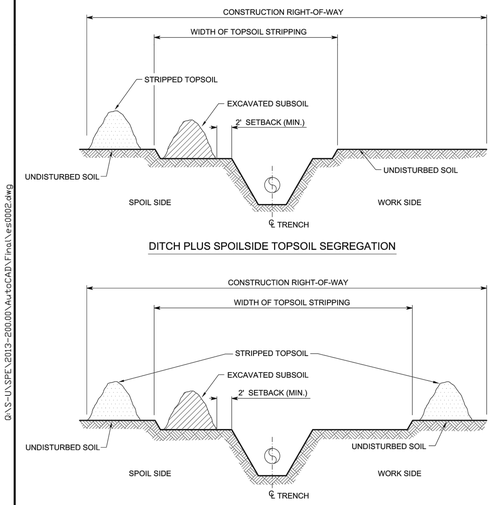
	TYPICAL TRENCH DETAIL	FIGURE CW-1
		DWG. ES-0001 REV.



DITCH PLUS SPOILSIDE TOPSOIL SEGREGATION

FULL RIGHT-OF-WAY TOPSOIL STRIPPING

NOTES:

1. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION R.O.W.
2. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.
3. MAINTAIN SEPARATION OF SALVAGED TOPSOIL AND SUBSOIL THROUGHOUT ALL CONSTRUCTION ACTIVITIES.
4. STABILIZE TOPSOIL PILES AND MINIMIZE LOSS DUE TO WATER OR WIND EROSION WITH USE OF SEDIMENT BARRIERS, MULCH, TEMPORARY SEEDING, TACKIFIERS OR FUNCTIONAL EQUIVALENTS, WHERE NECESSARY.

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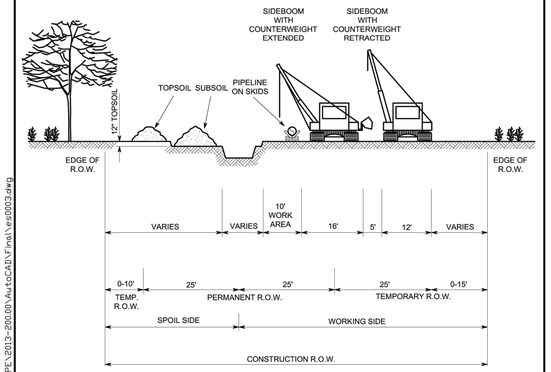
	RIGHT-OF-WAY TOPSOIL SEGREGATION TECHNIQUES	FIGURE CW-2
		DWG. ES-0002 REV.



PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	50	75
14" - 30"	35	50	85
36" - 42"	35	65	100
WETLANDS	25	50	75

NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.
2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.

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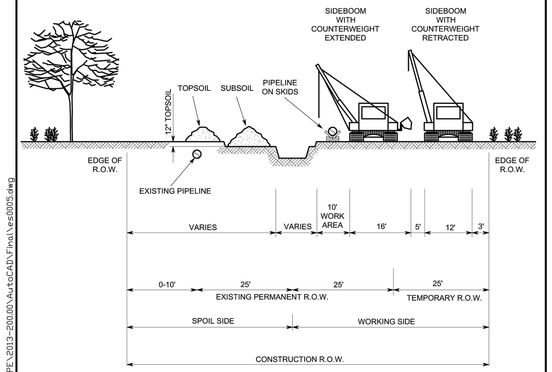
	TYPICAL CONSTRUCTION WIDTHS ACQUIRING NEW PERMANENT RIGHT-OF-WAY	FIGURE CW-3
		DWG. ES-0003 REV.



PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	50	75
14" - 30"	35	50	85
36" - 42"	35	50	85
WETLANDS	25	50	75

NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.
2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.
3. IF THE WORKING SIDE MUST BE GREATER THAN 50 FEET (i.e. TEMPORARY WORKSPACE IS GREATER THAN 25 FEET), COMPANY MUST REQUEST APPROVAL FROM THE F.E.R.C.

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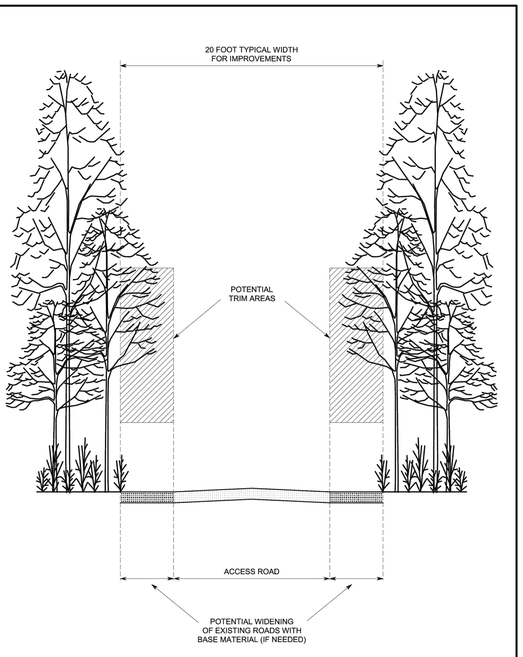
	TYPICAL CONSTRUCTION WIDTHS NOT ACQUIRING NEW PERMANENT RIGHT-OF-WAY (MULTIPLE LINE SYSTEM)	FIGURE CW-5
		DWG. ES-0005 REV.



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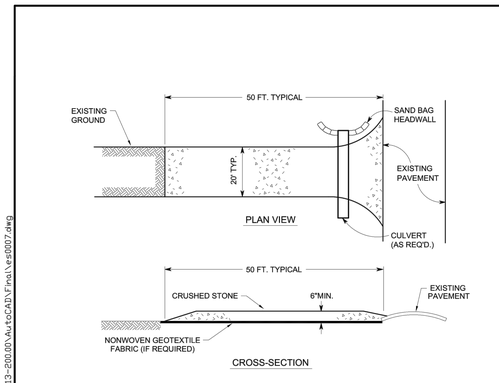
	ACCESS ROAD CROSS SECTION	FIGURE RD-1
		DWG. ES-0006 REV.



CROSS-SECTION

CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE = 4" - 6" AVG. DIAMETER
2. ALL STONE MUST BE PLACED ON NON-WOVEN GEOTEXILE FABRIC IF USED IN RESIDENTIAL OR AGRICULTURAL AREAS.
3. LENGTH = FIFTY (50) FOOT TYPICAL (IF SITE CONDITIONS ALLOW)
4. WIDTH = TWENTY (20) FOOT TYPICAL.
5. THICKNESS = SIX (6) INCHES MINIMUM.
6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A DRIVEABLE BERM OR OTHER TEMPORARY EROSION CONTROL DEVICE CAN BE USED.
7. THE ENTRANCE SHALL BE PERIODICALLY INSPECTED AND MAINTAINED IN A CONDITION THAT MINIMIZES TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS. MAINTENANCE MAY INCLUDE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE REPAIR / CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ANY SEDIMENT THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO ROADWAYS MUST BE REMOVED AS SOON AS PRACTICAL.

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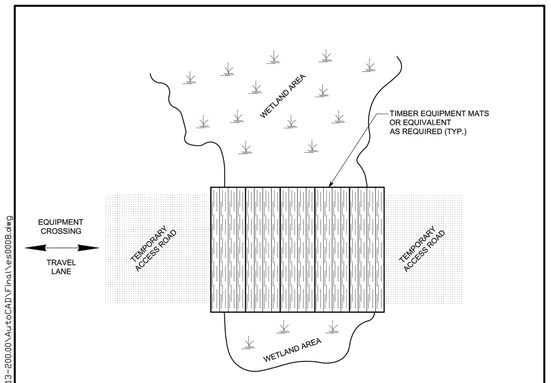
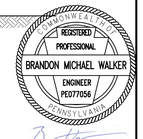
	ROCK ACCESS PAD	FIGURE RD-2
		DWG. ES-0007 REV.



NOTE:

1. SILT FENCE OR STRAW BALES MAY BE USED, AS NECESSARY, TO PREVENT SEDIMENT FROM MIGRATING OUTSIDE OF ACCESS ROAD LIMITS.



07/23/20

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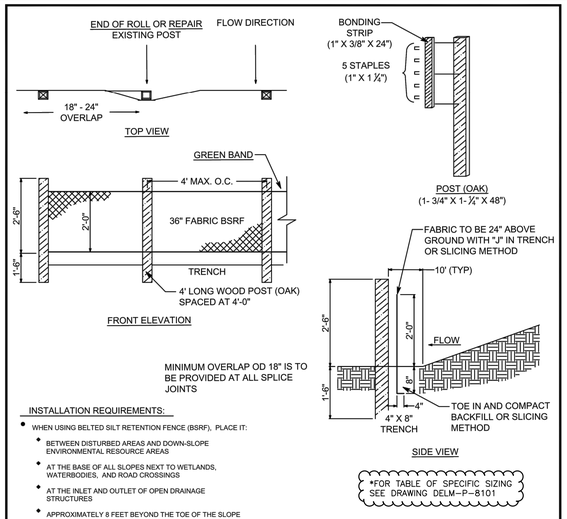
I.G. ES0008.DWG

	TYPICAL TEMPORARY ACCESS ROAD THROUGH WETLANDS	FIGURE RD-3
		DWG. ES-0008 REV.



MINIMUM OVERLAP OD 18" IS TO BE PROVIDED AT ALL SPLICE JOINTS

INSTALLATION REQUIREMENTS:

- WHEN USING BELTED SILT RETENTION FENCE (BSRF), PLACE IT:
  - BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS
  - AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATERBODIES, AND ROAD CROSSINGS
  - AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES
  - APPROXIMATELY 8 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT (IF POSSIBLE
- 4' X 1 ½" X 1 ½" WOOD (OAK) STAKES ARE PLACED AT FOUR (4') INTERVALS TO A DEPTH WHICH WILL ALLOW 24" OF FABRIC TO BE ABOVE GROUND.
- THE FABRIC IS THEN STRETCHED ALONG THE INSIDE PERIMETER OF THE STAKES, PULLED TIGHTLY AND HELD IN PLACE WITH 1" X ⅜" X 24" BONDING STRIPS ATTACHED TO THE WOOD (OAK) STAKES WITH FIVE (5) 1" X 1 ¼" STAPLES. THIS BONDS THE FABRIC AND SUPPORT SYSTEM (SCRIM) TO THE VERTICAL SUPPORT POSTS.
- THE REMAINING FABRIC IS TUCKED INTO THE TRENCH FORMING A "J" AND WHEN FILLED WITH DIRT CREATES A "GROUND BITE".
- BSRF FABRIC SHOULD BE PURCHASED IN CONTINUOUS ROLLS AND CUT TO THE LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, USE AN 18"-24" OVERLAP AS SHOWN IN THE TOP VIEW.
- THIS IS DESIGNED FOR CONTROL OF SHEET FLOW. SILT FENCE SHALL NOT BE INSTALLED ACROSS STREAMS, DITCHES, WATERWAYS , OR ANYWHERE THERE IS CONCENTRATED FLOW. SILT FENCE SHALL NOT BE PLACED AROUND STORM WATER INLETS WHICH ARE DESIGNED TO RECEIVE CONCENTRATED FLOW.

MAINTENANCE REQUIREMENTS:

- INSPECT SILT FENCE:
  - DAILY IN AREAS OF ACTIVE CONSTRUCTION
  - WEEKLY IN AREAS WITH NO CONSTRUCTION
  - WITHIN 24 HOURS FOLLOWING EACH RAINFALL EVENT OF ≥ 0.25 INCH.
- REPAIR OR REPLACE SILT FENCE AS NEEDED
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA WHEN SEDIMENT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SILT FENCE.

I.G. ES0011.DWG

	BELTED SILT RETENTION FENCE DETAIL	FIGURE EC-1
		ES-0011

REV	DSN	CK	DESCRIPTION
1	LGF	RG	ISSUED FOR CONSTRUCTION (07/23/2020)
0	LGF	RG	ISSUED FOR CONSTRUCTION (05/15/2020)

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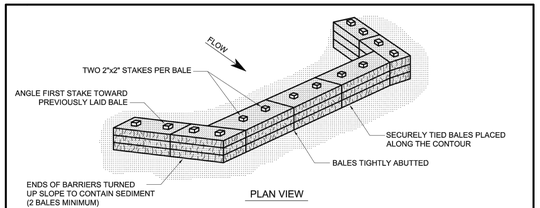
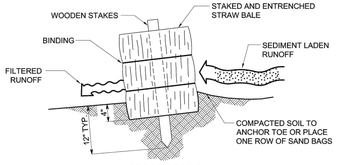
DRAWN: LGF	DATE: 04/29/20	EROSION AND SEDIMENT CONTROL FIGURES	
CHECKED: RG	DATE: 04/29/20	W.B.S. NO.	YEAR: 2020	SHEET 1 OF 3



PLAN VIEW



CROSS-SECTION

INSTALLATION REQUIREMENTS:

- WHEN USING STRAW BALES, PLACE THEM:
  - WITH THEIR ENDS TIGHTLY ABUTTING AND EMBEDDED IN THE SOIL A TYPICAL OF 4".
  - BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS.
  - AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATERBODIES, AND ROAD CROSSINGS
  - AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES.
  - APPROXIMATELY 6 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT.
- KEY IN THE BOTTOM OF THE BALE. IN AREAS WHERE IT IS NOT FEASIBLE TO TRENCH IT IN (LEDGES, ROCKY SOIL, LARGE TREE ROOTS, ETC.), USE NATIVE SOIL AS BACKFILL UP-SLOPE OF THE BALE OR PLACE ONE ROW OF SAND BAGS.
- DO NOT STAKE OR TRENCH IN PLACE STRAW BALES USED ON EQUIPMENT BRIDGES OR ON MATS ACROSS THE TRAVEL LANE.
- IF USED IN CONJUNCTION WITH SILT FENCE, BALES ARE PLACED DOWNSLOPE / UPSLOPE OF THE SILT FENCE AND DO NOT NEED TO BE TRENCHED IN.

MAINTENANCE REQUIREMENTS:

- INSPECT BALES:
  - DAILY IN AREAS OF ACTIVE CONSTRUCTION.
  - WEEKLY IN AREAS WITH NO CONSTRUCTION.
  - WITHIN 24 HOURS FOLLOWING EACH RAINFALL EVENT OF ≥ 0.5 INCH.
- REPAIR OR REPLACE BALES AS NEEDED.
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA AS NEEDED.

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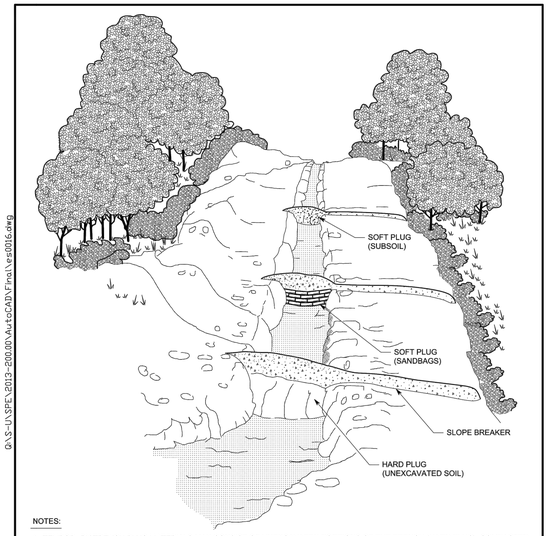
STRAW BALE DETAIL — FIGURE EC-2 — DWG. ES-0012 — REV.



NOTES:

1. TEMPORARY TRENCH PLUG MATERIALS MAY CONSIST OF UNEXCAVATED PORTIONS OF THE TRENCH (HARD PLUG), COMPACTED SUBSOIL OR SANDBAGS PLACED ACROSS THE DITCH (SOFT PLUG), OR SOME FUNCTIONAL EQUIVALENT. THESE OPTIONS ARE DEPICTED ABOVE. DO NO USE TOPSOIL FOR TRENCH PLUGS.
2. POSITION TEMPORARY TRENCH PLUGS, AS NECESSARY, TO REDUCE TRENCHLINE EROSION AND MINIMIZE THE VOLUME AND VELOCITY OF TRENCH WATER FLOW AT THE BASE OF SLOPES.
3. TEMPORARY TRENCH PLUGS MAY BE USED IN CONJUNCTION WITH SLOPE BREAKERS TO DIVERT TRENCH WATER OVERFLOW AND PREVENT OVERFLOW INTO SENSITIVE RESOURCE AREAS.
4. DIVERT TRENCH OVERFLOW TO A WELL-VEGETATED OFF-R.O.W. LOCATION OR INSTALL APPROPRIATE ENERGY DISSIPATING DEVICE.
5. USE TEMPORARY TRENCH PLUGS AT WATERBODY CROSSINGS, AS NECESSARY.

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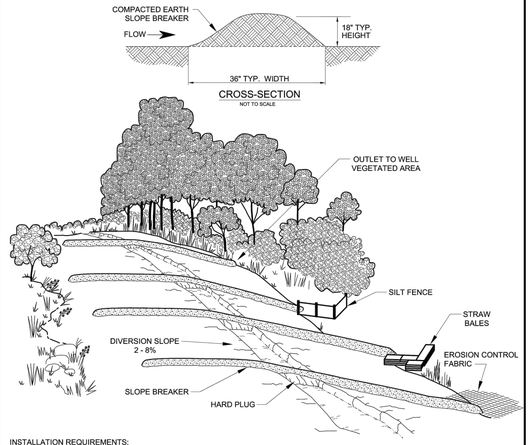
TEMPORARY TRENCH PLUG OPTIONS — FIGURE EC-6 — DWG. ES-0016 — REV.



INSTALLATION REQUIREMENTS:

- INSTALL SLOPE BREAKERS IN ALL DISTURBED AREAS AS NECESSARY TO AVOID EXCESSIVE EROSION AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS APPROVED BY THE ENVIRONMENTAL INSPECTOR (EI).
- MUST BE INSTALLED ON SLOPES GREATER THAN 5% WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY, WETLAND OR ROAD CROSSING AT THE FOLLOWING MINIMUM SPACING:

SLOPE (%)	SPACING (FT.)
5 - 15	300
> 15 - 30	200
> 30	100

- CONSTRUCT USING SAND BAGS, STAKED STRAW BALES, SILT FENCE, OR SOIL.
- INSTALL WITH A 2 - 8% OUTFALL ANGLE.
- POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS, WATERBODIES, OR OTHER SENSITIVE RESOURCES.
- FILTER RUN-OFF WATER BY CONSTRUCTING THE OUTLET IN A WELL VEGETATED STABLE AREA, OR BY USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALES, EROSION CONTROL FABRIC). IF NEEDED, THE TYPE OF ENERGY DISSIPATION DEVICE WILL DEPEND ON SITE CONDITIONS (OPTIONS ARE DEPICTED ABOVE).

MAINTENANCE REQUIREMENTS:

- INSPECT DURING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
- KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.

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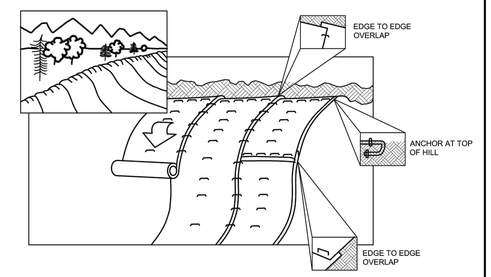
TEMPORARY SLOPE BREAKERS — FIGURE EC-7 — DWG. ES-0017 — REV.



NOTES:

1. EROSION CONTROL BLANKETS (FABRIC) SHALL BE USED AT LOCATIONS IDENTIFIED IN THE PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
2. EROSION CONTROL BLANKETS SHALL MEET THE REQUIREMENTS SPECIFIED IN THE PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
3. STAPLES SHALL BE MADE OF 11 GAUGE WIRE, U-SHAPED WITH 6" LEGS AND A 1" CROWN. STAPLES SHALL BE DRIVEN INTO THE GROUND FOR THE FULL LENGTH OF THE STAPLE LEGS.
4. BLANKETS SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS OR AS STATED BELOW:
   - EXTEND TOP OF BLANKET 3 FEET PAST THE UPPER EDGE OF THE SLOPE.
   - ANCHOR ("KEY") THE UPPER EDGE OF THE BLANKET INTO THE SLOPE USING A 6" DEEP TRENCH AND ROLL THE BLANKET DOWN THE HILL. DOUBLE STAPLE EVERY 12" BEFORE BACKFILLING AND COMPACTING TRENCH.
   - INSTALL LOOSELY ON SLOPE AND AVOID STRETCHING EROSION CONTROL BLANKETS DURING INSTALLATION.
   - BRING ROLL BACK OVER THE TOP OF THE TRENCH AND CONTINUE TO ROLL DOWN SLOPE. STAPLE EVERY 12" WHERE BLANKETS EXIT THE TRENCH AT THE TOP OF THE SLOPE.
   - WHEN BLANKETS ARE SPLICED DOWN-SLOPE TO ADJOINING BLANKETS (SLOPE OR STREAMBANK MATS), THE UPPER BLANKET SHALL BE PLACED OVER THE LOWER (SHINGLE STYLE) WITH APPROXIMATELY 6" OF OVERLAP. STAPLE THROUGH THE OVERLAPPED AREA EVERY 12".
   - OVERLAP ADJACENT BLANKETS 6". STAPLE EDGES OF BLANKETS AND CENTER EVERY 36".
5. IN LIVESTOCK AREAS WHERE EROSION CONTROL BLANKETS ARE APPLIED TO THE SLOPES, FENCING WILL BE USED IF NECESSARY TO EXCLUDE LIVESTOCK, WITH PERMISSION OF THE LANDOWNER.
6. MONITOR WASHOUTS, STAPLE INTEGRITY OR BLANKET MOVEMENT. REPLACE OR REPAIR AS NECESSARY.
7. DO NOT USE SYNTHETIC MONOFILAMENT MESH / NETTED MATERIALS IN AREAS DESIGNATED AS SENSITIVE WILDLIFE HABITAT, UNLESS THE PRODUCT IS SPECIFICALLY DESIGNED TO MINIMIZE HARM TO WILDLIFE.

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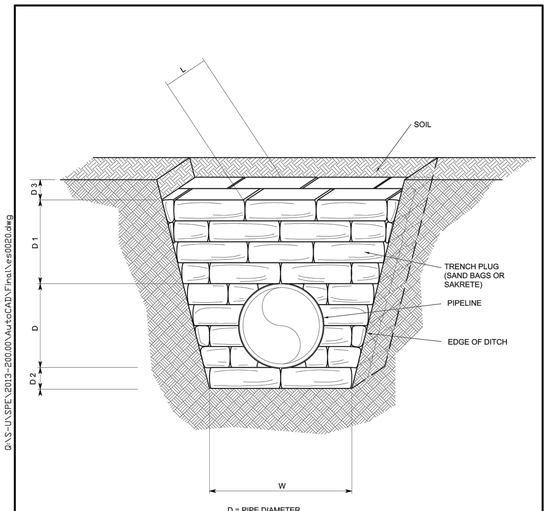
TYPICAL EROSION CONTROL BLANKETS ON SLOPES — FIGURE EC-14 — DWG. ES-0024 — REV.



D = PIPE DIAMETER
D1 = APPROXIMATELY 24"
D2 = APPROXIMATELY 6" (8" MIN. IN ROCK)
D3 = APPROXIMATELY 12"
W = D + 2 to 4 FEET
L = APPROXIMATELY 18" - 24"
D1 + D3 = 36" MINIMUM

NOTE:

1. USE OF SAKRETE SHALL REQUIRE PRIOR COMPANY APPROVAL.
2. TOPSOIL SHALL NOT BE USED TO CONSTRUCT BREAKERS.
3. DO NOT INSTALL TRENCH BREAKERS WITHIN A WETLAND.

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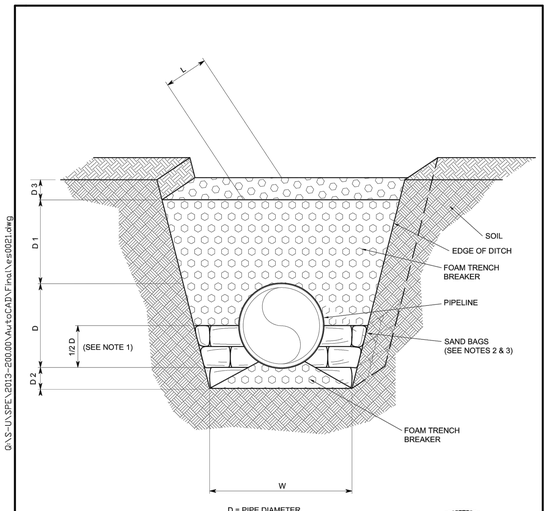
TRENCH BREAKER DETAIL (SACK) — FIGURE EC-10 — DWG. ES-0020 — REV.



D = PIPE DIAMETER
D1 = APPROXIMATELY 24"
D2 = APPROXIMATELY 6" (8" MIN. IN ROCK)
D3 = APPROXIMATELY 12"
W = D + 2 to 4 FEET.
L = APPROXIMATELY 18" - 24"
D1 + D3 = 36" MINIMUM

NOTE:

1. A MINIMUM OF TWO LAYERS OF BAGS SHALL BE INSTALLED.
2. THE ADDITION OF SAND BAGS UNDER THE FOAM WILL BE PLACED AS PRESCRIBED IN THE E&S PLAN OR AT THE DISCRETION OF THE ENVIRONMENTAL INSPECTOR (EI).
3. FOAM TRENCH BREAKERS ARE TO BE USED WITHIN UPLAND AREAS. DO NOT USE FOAM TRENCH BREAKERS AT WATERBODY OR WETLAND BOUNDARIES..

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
BRANDON MICHAEL WALKER
PE077056
07/23/20

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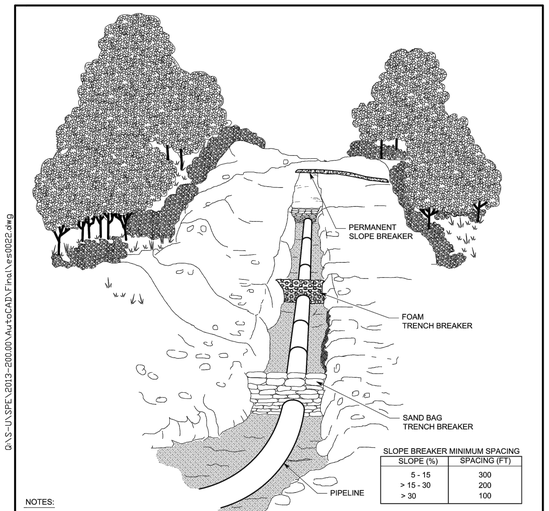
TRENCH BREAKER DETAIL (FOAM) — FIGURE EC-11 — DWG. ES-0021 — REV.



SLOPE BREAKER MINIMUM SPACING

SLOPE (%)	SPACING (FT)
5 - 15	300
> 15 - 30	200
> 30	100

NOTES:

1. PERMANENT TRENCH BREAKER MATERIALS WILL CONSIST OF SAND BAGS, POLYURETHANE FOAM OR SOME FUNCTIONAL EQUIVALENT PLACED ACROSS THE DITCH AS IDENTIFIED IN PERMIT REQUIREMENTS. DO NOT USE TOPSOIL FOR TRENCH BREAKERS. THESE OPTIONS ARE DEPICTED ABOVE.
2. PERMANENT TRENCH BREAKERS, WHICH ARE USED IN CONJUNCTION WITH SLOPE BREAKERS, SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DETERMINED IN THE FIELD BY THE ENVIRONMENTAL INSPECTOR.
3. AT A MINIMUM, INSTALL A TRENCH BREAKER AT THE BASE OF SLOPES GREATER THAN 5 PERCENT WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY OR WETLAND AND WHERE NEEDED TO AVOID DRAINING A WATERBODY OR WETLAND.
4. INSTALL TRENCH BREAKERS AT WETLAND BOUNDARIES AND/OR SEAL THE TRENCH BOTTOM AS NECESSARY TO MAINTAIN THE ORIGINAL WETLAND HYDROLOGY. DO NOT INSTALL TRENCH BREAKERS WITHIN A WETLAND.
5. IN AGRICULTURAL FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL TRENCH BREAKERS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED.

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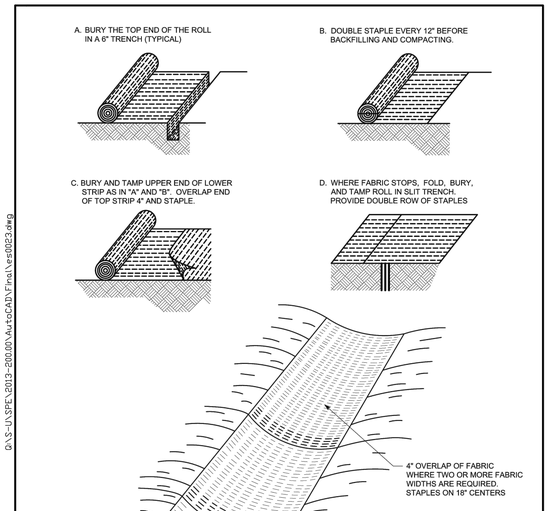
PERMANENT TRENCH BREAKER OPTIONS — FIGURE EC-12 — DWG. ES-0022 — REV.



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5/29/2014 11:06 PM
I.G. ES0023.DWG

EROSION CONTROL FABRIC INSTALLATION — FIGURE EC-13 — DWG. ES-0023 — REV.

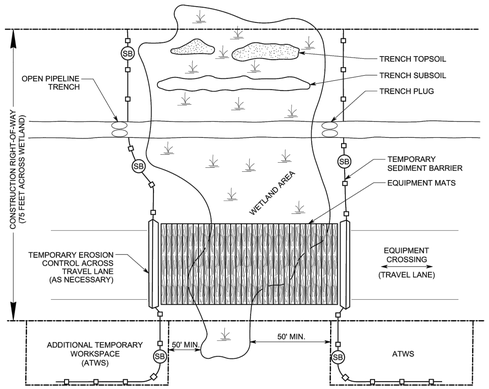
REV	DSN	CK	DESCRIPTION
1	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

DRAWN: LGF — DATE: 04/29/20
CHECKED: RG — DATE: 04/29/20

EROSION AND SEDIMENT CONTROL FIGURES
W.B.S. NO. — YEAR: 2020 — SHEET 2 OF 3

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River Xing\801_Mapping\001_Alignment\Erosion and Sediment Control Plan\Conemaugh River HDD Erosion and Sediment Control Plan SNC COVER AND NOTES.dwg - PLOT TIME: 5/26/2020 10:00 AM



NOTES:

1. IN WETLANDS, EQUIPMENT MATS OR LOW GROUND WEIGHT EQUIPMENT SHALL BE UTILIZED IN SATURATED GROUND CONDITIONS.
2. LIMIT PULLING OF TREE STUMPS AND GRADING TO DIRECTLY OVER TRENCHLINE, EXCEPT IN SITUATIONS THAT THE CHIEF INSPECTOR AND ENVIRONMENTAL INSPECTOR DETERMINE SAFETY-RELATED CONSTRUCTION CONSTRAINTS REQUIRE GRADING OR THE REMOVAL OF STUMPS FROM UNDER THE WORKING SIDE.
3. SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCHLINE IN WETLANDS, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.
4. DO NOT TRENCH THE WETLAND UNTIL THE PIPELINE IS ASSEMBLED AND READY FOR LOWERING IN.
5. CONCRETE COATING OR PIPELINE WEIGHTS OF AN APPROPRIATE TYPE, WEIGHT AND SPACING WILL BE USED AS REQUIRED. NO CONCRETE COATING ACTIVITIES WITHIN 100 FEET OF A WETLAND OR WATERBODY BOUNDARY, UNLESS THE LOCATION IS AN EXISTING INDUSTRIAL SITE DESIGNATED FOR SUCH USE.
6. INSTALL SEDIMENT BARRIERS (SB) ALONG THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY AS NECESSARY TO CONTAIN SPOIL AND SEDIMENT WITHIN THE CONSTRUCTION RIGHT-OF-WAY THROUGH WETLANDS.
7. IN THE TRAVEL LANE, SEDIMENT BARRIERS MAY CONSIST OF REMOVABLE SEDIMENT BARRIERS OR DRIVABLE BERMS.
8. AT THE BASE OF SLOPES (GREATER THAN 5 PERCENT) THAT ARE LESS THAN 50 FEET FROM A WETLAND, INSTALL AND MAINTAIN TEMPORARY SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION RIGHT-OF-WAY UNTIL REVEGETATION IS SUCCESSFUL.
9. NO FERTILIZER OR LIME SHALL BE USED WITHIN WETLANDS.
10. DEWATER THE TRENCH IN A MANNER THAT DOES NOT CAUSE EROSION OR RESULT IN SILT-LADEN WATER FLOWING INTO ANY WETLAND.

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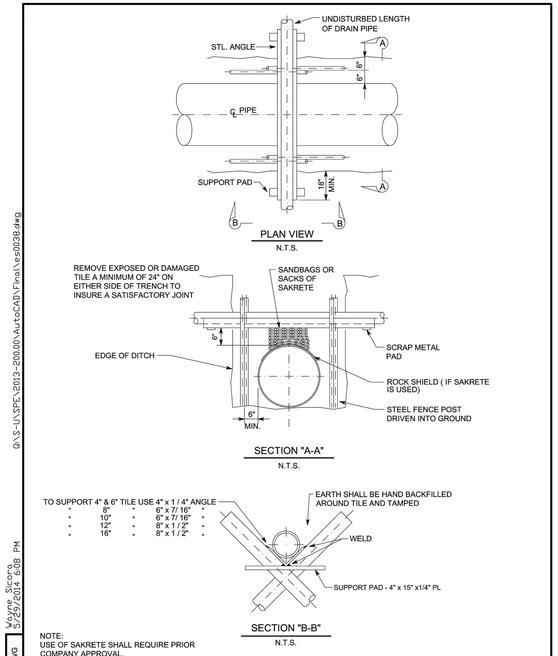
I.S.	ES0032.DWG	TYPICAL STANDARD WETLAND CROSSING	FIGURE WC-1
			DWG. ES-0032 REV.



PLAN VIEW
N.T.S.

SECTION "A-A"
N.T.S.

TO SUPPORT 4" & 6" TILE USE	4" x 1 / 4" ANGLE
8' - 10'	6" x 7/ 16"
10' - 12'	6" x 7/ 16"
12' - 16'	8" x 1 / 2"
16' -	8" x 1 / 2"

SECTION "B-B"
N.T.S.

NOTE:
USE OF SAKRETE SHALL REQUIRE PRIOR COMPANY APPROVAL.

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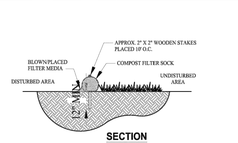
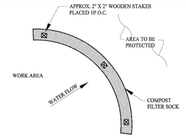
I.S.	ES0038.DWG	DRAIN TILE REPAIR PROCEDURE	FIGURE SU-1
			DWG. ES-0038 REV.



SECTION



PLAN

*FOR TABLE OF SPECIFIC SIZING SEE DRAWING DELM-P-8101

MATERIAL TYPE	3 mil HDPE	5 mil HDPE	5 mil HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY-DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/4"
TENSILE STRENGTH		26 psi	26 psi	44 psi	202 psi
ULTRAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
MINIMUM FUNCTIONAL LONGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING		HDPE BIAXIAL NET CONTINUOUSLY WOUND FUSION-WELDED JUNCTURES 3/4" x 3/4" MAX. APERTURE SIZE			
OUTER FILTRATION MESH		COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH) 3/16" MAX. APERTURE SIZE			
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.					

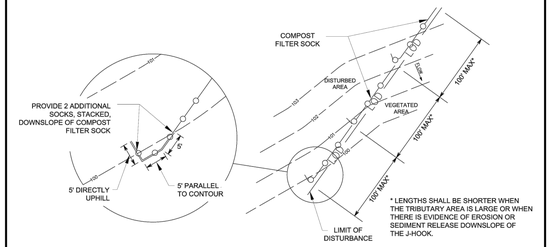
ORGANIC MATTER CONTENT	25% - 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5 - 8.5
MOISTURE CONTENT	30% - 60%
PARTICLE SIZE	30% - 50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 dS/m (mmhos/cm) MAXIMUM

*FOR TABLE OF SPECIFIC SIZING SEE DRAWING DELM-P-8101

NOTES:

1. ALL MATERIAL TO MEET MANUFACTURER SPECIFICATIONS.
2. COMPOST FILTER SOCK FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY CONSTRUCTION CONTRACTOR.
4. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT.
5. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
6. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
7. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION WITH ADDITIONAL SOCK OR ROCK FILTER.
8. BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
9. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

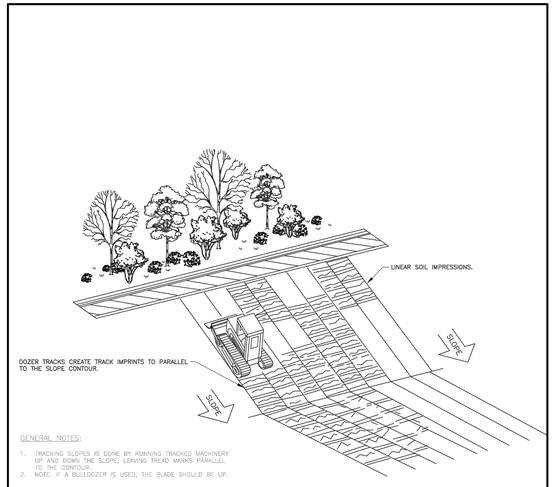
AECOM	ENBRIDGE TEXAS EASTERN TRANSMISSION, LP			
FOSTER PLAZA 6 681 ANDERSEN DRIVE, SUITE 400 PITTSBURGH, PA 15220	DATE: 7/20/2016	SCALE: NOT TO SCALE	DRAWING NO. DETAIL 7	COMPOST FILTER SOCK 2020 PENN JERSEY INTEGRITY
PREPARED BY: CDB	CHECKED BY: MDC	APPROVED BY: SG	REV. DATE: 01/14/2020	PROJECT NO. 60594173



J-HOOK SEDIMENT BARRIER CONFIGURATION
N.T.S.

* LENGTHS SHALL BE SHORTER WHEN THE TRIBUTARY AREA IS LARGE OR WHEN THERE IS EVIDENCE OF EROSION OR SEDIMENT RELEASE DOWNSLOPE OF THE J-HOOK.

I.S.	J-HOOK DETAIL	DESIGN MANAGER			E&S FIGURE
		PROJ. DIRECTOR			DWG. ES-1100 REV.
		TECH. SERVICES DIRECTOR			
			INITIALS	DATE	



GENERAL NOTES:

1. TRACKING SLOPES IS DONE BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PARALLEL TO THE CONTOUR.
2. NOTE: IF A BULLDOZER IS USED, THE BLADE SHOULD BE UP.

TRACKING SLOPE DETAIL
SCALE: N.T.S.

I.S.	TRACKING SLOPE DETAIL	DESIGN MANAGER			E&S FIGURE
		PROJ. DIRECTOR			DWG. REV.
		TECH. SERVICES DIRECTOR			
			INITIALS	DATE	

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

REV	DSN	CK	DESCRIPTION	REV	DSN	CK	DESCRIPTION
△				1	LGF	RG	ISSUED FOR CONSTRUCTION (07/23/2020)
△				0	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

DRAWN: LGF	DATE: 04/29/20	EROSION AND SEDIMENT CONTROL FIGURES		
CHECKED: RG	DATE: 04/29/20	W.B.S. NO.	YEAR: 2020	SHEET 3 OF 3

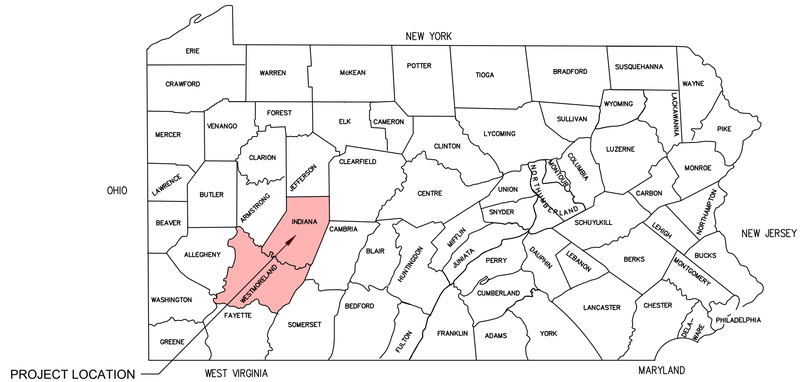
SECTION 6

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN (PCSM)

PCSM/SRP DRAWINGS

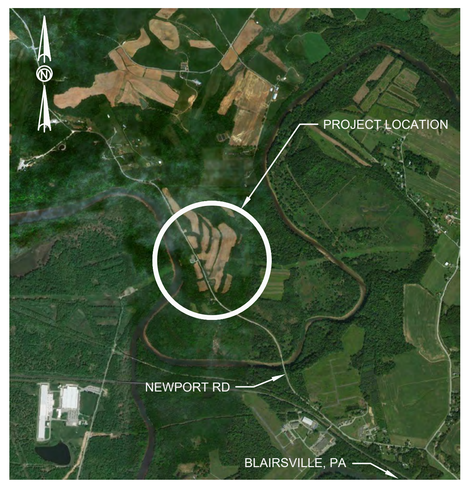
CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
DERRY TOWNSHIP, WESTMORELAND COUNTY, PENNSYLVANIA
BLACKLICK TOWNSHIP, INDIANA COUNTY, PENNSYLVANIA
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
GENERAL PERMIT APPLICATION
(ESCGP-3) MAY 2020
REVISION 1 07/23/2020

POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN			
SHEET	REV.	DESCRIPTION	NO.
PCSM-1	1	COVER SHEET	1
PCSM-2	0	GENERAL NOTES	2
PCSM-3	1	PCSM	3
PCSM-4	1	PCSM	4
PCSM-5	1	PCSM	5
PCSM-6	1	EXISTING CONDITION & SOILS MAP	6
PCSM-7	1	PCSM PLAN	7
PCSM-8	0	PCSM BMP DETAILS	8



COUNTY MAP
N.T.S.

ENGINEER'S CERTIFICATION
I DO HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE EROSION AND SEDIMENT CONTROL AND POST CONSTRUCTION STORMWATER MANAGEMENT PLAN ARE TRUE AND CORRECT, REPRESENT ACTUAL FIELD CONDITIONS AND ARE IN ACCORDANCE WITH THE 25 PA CODE CHAPTERS 78 AND 102 OF THE DEPARTMENT'S RULES AND REGULATIONS. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMISSION OF FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.



Pennsylvania 811

NOT ALL UTILITIES ARE SHOWN ON THESE PLANS.
THE LOCATION OF ALL UTILITIES (ABOVE OR BELOW GROUND) SHOWN ON THESE DRAWINGS ARE APPROXIMATE & WERE OBTAINED FROM USGS TOPO MAPS AND/OR UTILITY OWNERS. AUDUBON DOES NOT GUARANTEE THAT LOCATION SHOWN ON THE DRAWINGS ARE CORRECT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE LOCATIONS OF EXISTING UTILITIES (ABOVE OR BELOW GROUND) & TO NOTIFY THE RESPECTIVE UTILITY OWNERS BEFORE BEGINNING CONSTRUCTION.

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES
3 WORKING DAYS NOTICE FOR
CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE - STOP CALL
Pennsylvania One Call System Inc.
1-800-242-1776

DESIGN ONE CALL SERIAL NO.: 20151982217

APPLICANT:

ENBRIDGE

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

PREPARED BY:

audubon
Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River Xing\770_Engineering\200_Civil_Structural\Drawings\PCSM-1.dwg - PLOT TIME: 7/22/2020 4:46 PM

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GENERAL MAINTENANCE NOTES FOR ALL BMPs:

UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BEST MANAGEMENT PRACTICES (BMPs) MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL PLAN (E&SCP) BMPs AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING, MUST BE DONE IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPs FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPs, OR MODIFICATIONS TO THOSE INSTALLED, WILL BE REQUIRED.

SEDIMENT REMOVED FROM BMPs SHALL BE DISPOSED OF WITHIN THE LIMIT OF DISTURBANCE IN LANDSCAPE AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN STOCKPILES AREAS.

THE CHANNEL MUST BE KEPT FREE OF OBSTRUCTIONS SUCH AS FILL, FALLEN LEAVES & WOODY DEBRIS, ACCUMULATED SEDIMENT, AND CONSTRUCTION MATERIALS/WASTES WITH EXCEPTION TO OTHER REQUIRED BMPs (I.E., CHECK DAMS). CHANNELS SHOULD BE KEPT MOWED AND/OR FREE OF ALL WEEDY, BRUSHY OR WOODY GROWTH. ANY UNDERGROUND UTILITIES RUNNING ACROSS/ THROUGH THE CHANNEL(S) SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL(S) REPAIRED AND STABILIZED PER THE CHANNEL SECTION DETAIL.

ALL NECESSARY REPAIRS WILL BE MADE IMMEDIATELY.

SEEDING AND MULCHING:

1. REPAIR AND RE-SEED ANY ERODED AREAS DISTURBED BY EROSION OR SLOPE MOVEMENT IMMEDIATELY.

E&S CONTROL BMP REMOVAL:

1. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPs MUST BE REMOVED. CONTACT THE WESTMORELAND COUNTY CONSERVATION DISTRICTS PRIOR TO REMOVAL OF ANY E&SCP BMPS. AREAS DISTURBED DURING REMOVAL OF THE BMPs MUST BE STABILIZED IMMEDIATELY.

CULVERT MAINTENANCE:

1. INSPECT CULVERT FOR FLOW OBSTRUCTIONS, SCOUR AT THE INLET AND OUTLET, AND DAMAGE TO THE CULVERT.
2. FLOW OBSTRUCTIONS SHALL BE REMOVED IMMEDIATELY; SUITABLE INLET AND/OR OUTLET PROTECTION SHOULD BE PROVIDED WHERE SCOUR IS OBSERVED; AND, DAMAGED CULVERTS SHALL BE REPAIRED, OR REPLACED IMMEDIATELY.

CONSTRUCTION SEQUENCE

1. IF POSSIBLE, INSTALL INFILTRATION TRENCH DURING LATER PHASES OF SITE CONSTRUCTION TO PREVENT SEDIMENTATION AND/OR DAMAGE FROM CONSTRUCTION ACTIVITY. AFTER INSTALLATION, PREVENT SEDIMENT LADEN WATER FROM ENTERING INLETS AND PIPES.
2. INSTALL AND MAINTAIN PROPER E&SCP MEASURES DURING CONSTRUCTION.
3. EXCAVATE INFILTRATION TRENCH BOTTOM TO A UNIFORM, LEVEL UNCOMPACTED SUBGRADE FREE FROM ROCKS AND DEBRIS. DO NOT COMPACT SUBGRADE.
4. PLACE NONWOVEN GEOTEXTILE ALONG BOTTOM AND SIDES OF TRENCH. NONWOVEN GEOTEXTILE ROLLS SHOULD OVERLAP BY A MINIMUM OF 16 INCHES WITHIN THE TRENCH. FOLD BACK AND SECURE EXCESS GEOTEXTILE DURING STONE PLACEMENT.
5. INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, ETC.
6. PLACE UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS.
7. INSTALL CONTINUOUSLY PERFORATED PIPE AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS.
8. FOLD AND SECURE NONWOVEN GEOTEXTILE OVER INFILTRATION TRENCH, WITH MINIMUM OVERLAP OF 16 INCHES.
9. PLACE 6-INCH LIFT OF APPROVED TOPSOIL OVER INFILTRATION TRENCH, AS INDICATED ON PLANS.
10. SEED AND STABILIZE TOPSOIL.
11. DO NOT REMOVE INLET PROTECTION OR OTHER E&SCP MEASURES UNTIL SITE IS FULLY STABILIZED.
12. ANY SEDIMENT THAT ENTERS INLETS DURING CONSTRUCTION IS TO BE REMOVED WITHIN 24 HOURS.
13. CONSTRUCTION OF THE BMP SHALL COMMENCE AFTER UPSLOPE AREA HAS BEEN STABILIZED AND/OR PERMANENTLY REVEGETATED. BEGIN VEGETATED SWALE CONSTRUCTION ONLY WHEN THE UPGRADIENT TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE IN PLACE. VEGETATED SWALES SHOULD BE CONSTRUCTED AND STABILIZED EARLY IN THE CONSTRUCTION SCHEDULE, PREFERABLY BEFORE MASS EARTHWORK AND PAVING INCREASE THE RATE AND VOLUME OF RUNOFF. (EROSION AND SEDIMENT CONTROL METHODS SHALL ADHERE TO THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, MARCH 2000 OR LATEST EDITION.)
14. ROUGH GRADE THE VEGETATED SWALE. EQUIPMENT SHALL AVOID EXCESSIVE COMPACTION AND/OR LAND DISTURBANCE. EXCAVATING EQUIPMENT SHOULD OPERATE FROM THE SIDE OF THE SWALE AND NEVER ON THE BOTTOM. IF EXCAVATION LEADS TO SUBSTANTIAL COMPACTION OF THE SUBGRADE (WHERE AN INFILTRATION TRENCH IS NOT PROPOSED), 18 INCHES SHALL BE REMOVED AND REPLACED WITH A BLEND OF TOPSOIL AND SAND TO PROMOTE INFILTRATION AND BIOLOGICAL GROWTH. AT THE VERY LEAST, TOPSOIL SHALL BE THOROUGHLY DEEP PLOWED INTO THE SUBGRADE IN ORDER TO PENETRATE THE COMPACTED ZONE AND PROMOTE AERATION AND THE FORMATION OF MACROPORES. FOLLOWING THIS, THE AREA SHOULD BE DISKED PRIOR TO FINAL GRADING OF TOPSOIL.
15. CONSTRUCT CHECK DAMS.
16. FINE GRADE THE VEGETATED SWALE. ACCURATE GRADING IS CRUCIAL FOR SWALES. EVEN THE SMALLEST NONCONFORMITIES MAY COMPROMISE FLOW CONDITIONS.
17. SEED, VEGETATE AND INSTALL PROTECTIVE LINING AS PER APPROVED PLANS AND ACCORDING TO FINAL PLATING LIST. PLANT THE SWALE AT A TIME OF THE YEAR WHEN SUCCESSFUL ESTABLISHMENT WITHOUT IRRIGATION IS MOST LIKELY. HOWEVER, TEMPORARY IRRIGATION MAY BE NEEDED IN PERIODS OF LITTLE RAIN OR DROUGHT. VEGETATION SHOULD BE ESTABLISHED AS SOON AS POSSIBLE TO PREVENT EROSION AND SCOUR.
18. ONCE ALL TRIBUTARY AREAS ARE SUFFICIENTLY STABILIZED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROLS. IT IS VERY IMPORTANT THAT THE SWALE BE STABILIZED BEFORE RECEIVING UPLAND STORMWATER FLOW.

GENERAL NOTES:

1. THIS PLAN SET CONTAINS ALL INFORMATION FOR THE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN (PCSM PLAN). THIS IS A PERMIT DOCUMENT ONLY. ADDITIONAL PLANS AND DOCUMENTATION ARE REQUIRED FOR CONSTRUCTION OF THE PROPOSED DEVELOPMENT.
2. FULL SIZE SHEETS OF THIS PLAN SET MAY BE PRINTED OUT ON 22-INCHx34-INCH SHEETS. ALL SCALES PRINTED OUT ON 11-INCHx17-INCH SHEETS ARE SCALED BY 1/2 (E.G., 1-INCH=50 IS EQUIVALENT TO 1-INCH=100 FEET WHEN THESE PLAN SETS ARE PRINTED ON 11-INCHx17-INCH).

REFERENCE (ALL SHEETS):

1. SOILS INFORMATION FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY (CURRENT).
2. WETLAND INFORMATION FROM NATIONAL WETLAND INVENTORY AND OBSERVATIONS BASED ON WETLAND DELINEATION REPORT "WETLAND AND WATERCOURSE DELINEATION REPORT" AND WETLAND SURVEYS COMPLETED BY AECOM IN JUNE 2016, AUGUST 2016, AND MARCH 2020.
3. SURVEY TOPO DATA COMPLETED BY EADSGROUP AND PROVIDED TO AUDUBON BY ENBRIDGE ON SEPTEMBER 19, 2019.
4. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NAVD1988.
5. ALL NORTHING AND EASTING COORDINATES SHOWN IN NAD83 PENNSYLVANIA STATE PLANE SOUTH ZONE

ENVIRONMENTAL BMP MAINTENANCE:

1. ANY TEMPORARY MEASURES (SUCH AS THE ROCK CONSTRUCTION ENTRANCE, COMPOST FILTER SOCK, COLLECTION CHANNEL, RIPRAP APRONS, ETC.) INSTALLED BY CONTRACTOR DURING GRADING, SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.
2. AS PER PROJECT SPECIFICATIONS, ADDITIONAL TEMPORARY PLACEMENT OF COMPOST FILTER SOCK MAY BE NECESSARY AT THE CONTRACTOR'S DISCRETION SHOULD ACCELERATED EROSION BE ENCOUNTERED DURING GRADING ACTIVITIES.

RECYCLING/DISPOSAL OF MATERIALS:

THE CONSTRUCTION CONTRACTOR SHALL REMOVE FROM THIS SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS, SEDIMENTS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ. THE CONSTRUCTION CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THIS SITE. THE CONSTRUCTION CONTRACTOR WILL IMPLEMENT THE PROPER MEASURES FOR DISPOSAL AND RECYCLING OF MATERIALS ASSOCIATED WITH OR FROM THE PROJECT SITE IN ACCORDANCE WITH DEP REGULATIONS. CONSTRUCTION WASTES INCLUDE, BUT ARE NOT LIMITED TO, EXCESS SOIL MATERIALS AND BUILDING MATERIALS THAT COULD ADVERSELY IMPACT WATER QUALITY. THE CONSTRUCTION CONTRACTOR WILL INSPECT THE PROJECT AREA WEEKLY AND PROPERLY DISPOSE OF ALL CONSTRUCTION WASTES. MEASURES WILL BE PLANNED AND IMPLEMENTED FOR HOUSEKEEPING MATERIALS MANAGEMENT AND LITTER CONTROL. WHEREVER POSSIBLE, RE-USEABLE WASTES WILL BE SEGREGATED FROM OTHER WASTE AND STORED SEPARATELY FOR RECYCLING. IF AN OFF-SITE LOCATION IS USED FOR BORROW OR DISPOSAL, THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING ADEQUATE E&SCP AND SUBMITTING THE PLAN(S) TO DEP FOR APPROVAL PRIOR TO COMMENCEMENT OF SAID WORK.

REMEDIAL ACTIONS IF SEED AND MULCH ARE WASHED AWAY OR IF THE SEED MIX IS NOT GROWING:

1. THE AFFECTED AREA WILL BE LIMED, FERTILIZED, RE-SEEDED AND MULCHED AS NEEDED.
2. EROSION PROTECTION MATTING OR NETTING WILL BE APPLIED AS NEEDED.
3. STEPS 1 AND 2 WILL BE REPEATED AS NEEDED UNTIL A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ACHIEVED.

SWALE INFILTRATION TRENCH MAINTENANCE

1. INLETS SHOULD BE INSPECTED AND CLEANED ANNUALLY.
2. THE VEGETATION ALONG THE SURFACE OF THE INFILTRATION TRENCH SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE.
3. VEHICLES SHOULD NOT BE PARKED OR DRIVEN ON A VEGETATED INFILTRATION TRENCH, AND CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS.

SEED MIX RECOMMENDATIONS: "NORTHERN ZONE"

GENERALLY DEFINED AS AREAS NORTH OF THE NORTHERN BORDERS OF ARKANSAS AND TENNESSEE.

UPLAND AREAS

LIME	4.0 TONS/ACRE
FERTILIZER	1000 LBS./ACRE (10-20-20)
MULCH (WHEAT STRAW)	3.0 TONS/ACRE

UPLAND SEED MIX	75 LBS./ACRE PURE LIVE SEED (PLS)
KENTUCKY BLUEGRASS	20%
RED FESCUE '	20%
KENTUCKY 31 TALL FESCUE '	15%
REDTOP	10%
PERENNIAL RYEGRASS	20%
WHITE CLOVER	5%
BIRDSFOOT TREFOIL (MINIMUM 20% HARD SEED)	10%

' FESCUE MUST BE ENDOPHYTE-FREE.

PASTURE MIX (FOR USE ONLY IN DISTURBED PASTURE AREAS WITH LANDOWNER'S PERMISSION.)	20 LBS./ACRE PLS
KENTUCKY BLUEGRASS	31%
MEDIUM RED CLOVER	26%
NORCEN TREFOIL	17%
POLY PERENNIAL RYE	26%

RECOMMENDED SEEDING DATES
(FOR THE ESTABLISHMENT OF TEMPORARY OR PERMANENT VEGETATION.)
SPRING: MARCH 15 - MAY 30
FALL: AUGUST 1 - OCTOBER 15

WINTER STABILIZATION

IF RESTORATION DOES NOT OCCUR PRIOR TO OCTOBER 15, SEED THE CONSTRUCTION ROW WITH 1.5 BUSHELS PER ACRE OF WINTER RYE OR SIMILAR VARIETY OF RYE AS REQUESTED BY THE LANDOWNER. MULCH THE CONSTRUCTION ROW AT 3.0 TONS PER ACRE WITH WHEAT STRAW, INCLUDING AREAS ADJACENT TO STREAMS AND WETLAND CROSSINGS. SEED SEGREGATED TOPSOIL PILES WITH WINTER RYE AND MULCH AT A RATE OF 3.0 TONS PER ACRE.

WETLAND AREAS DO NOT USE LIME OR FERTILIZER !!!

DO NOT USE FERTILIZER, LIME, OR MULCH WITHIN WETLANDS UNLESS REQUIRED IN WRITING BY THE APPROPRIATE FEDERAL OR STATE AGENCY (AS IDENTIFIED IN THE CLEARANCE PACKAGE/PERMIT BOOK). MULCH CONSISTS OF WEED-FREE STRAW, WOOD FIBER HYDROMULCH OR SOME FUNCTIONAL EQUIVALENT AS APPROVED BY THE EI AND CHIEF INSPECTOR. WHEN USED, APPLY MULCH (WHEAT STRAW) AT A RATE OF 3.0 TONS/ACRE.

WETLAND SEED MIX

ANNUAL RYEGRASS	40 LBS./ACRE PLS

SOILS LEGEND

SYMBOL	DESCRIPTION	HSG*
MoA	MONONGAHELA SILT LOAM, 0 TO 3 PERCENT SLOPES	D
MoB	MONONGAHELA SILT LOAM, 3 TO 8 PERCENT SLOPES	D
MoC	MONONGAHELA SILT LOAM, 8 TO 15 PERCENT SLOPES	D
GoF	GILPIN-ROCK OUTCROP COMPLEX, 45 TO 100 PERCENT SLOPES	C
AhC	ALLEGHENY SILT LOAM, 8 TO 15 PERCENT SLOPES	B
AhB	ALLEGHENY SILT LOAM, 3 TO 8 PERCENT SLOPES	B

* HYDROLOGIC SOILS GROUP

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

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IG #	DWG. NO.	REFERENCE DWG.	REV	DSN	CK	DESCRIPTION
			6	BAH	NJP	ISSUED FOR APPROVAL 05/28/20

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10205 WESTHEIMER RD.
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

ENGINEERING APPROVALS

DRAWN BY:	BID		CONSTRUCTION	
ECSP				
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

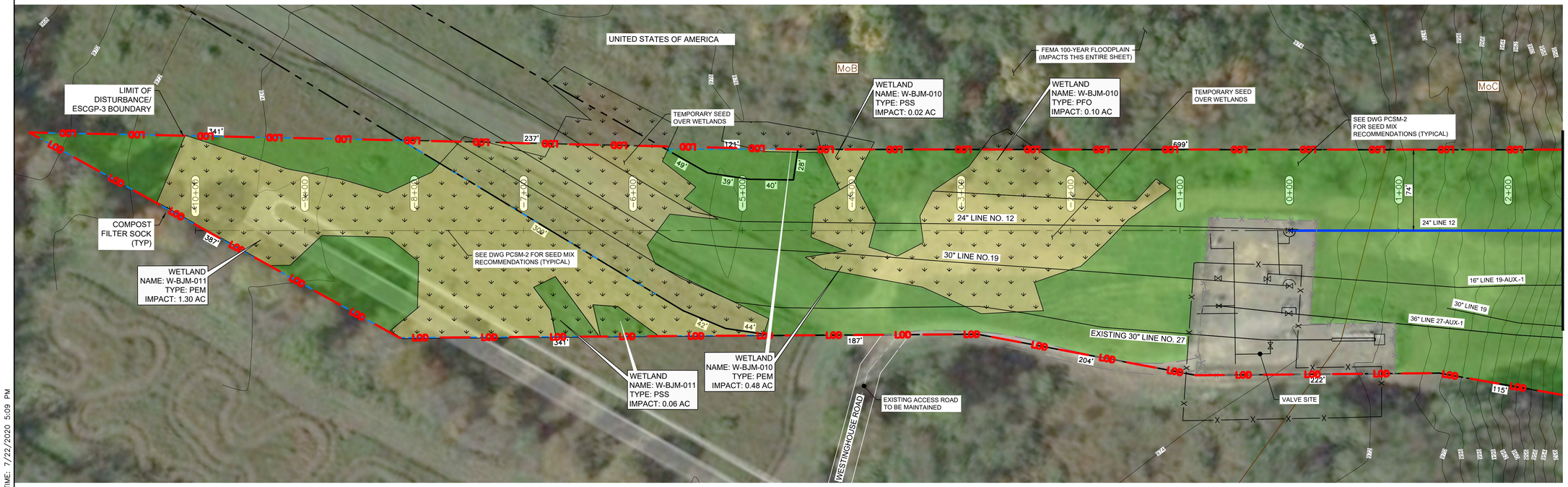
CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
PCSM BMP NOTES

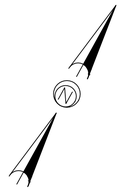
LOC. INDIANA COUNTY, PENNSYLVANIA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: AS SHOWN | DWG. PCSM-2 | REV. 0

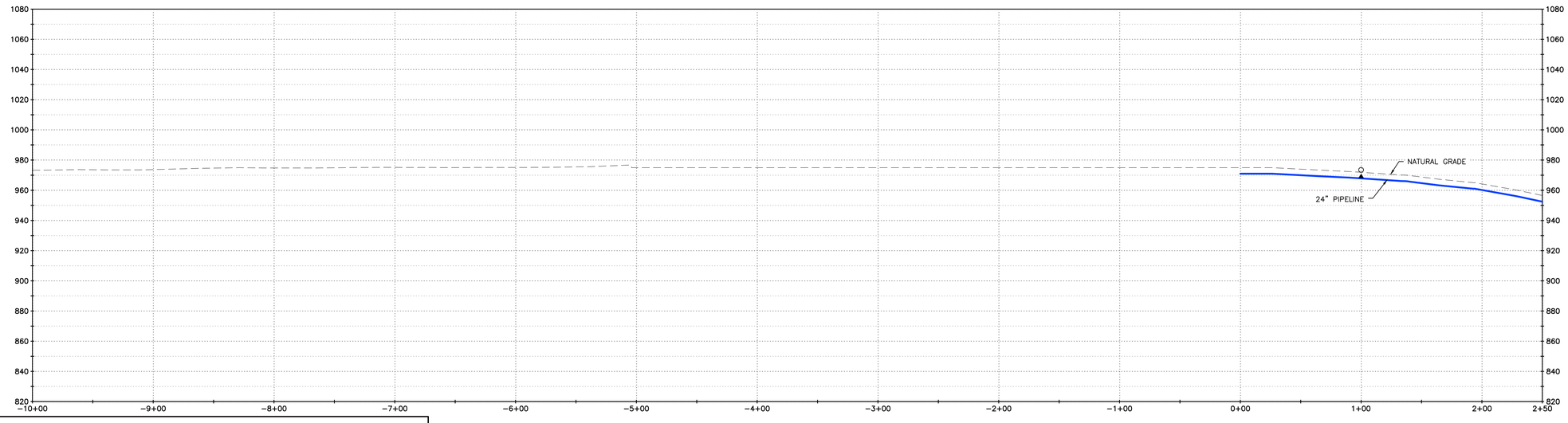
WESTMORELAND COUNTY,
PENNSYLVANIA
MUNICIPALITY: DERRY





GRAPHIC SCALE
50' 25' 0' 50'

LAND USE | PASTURE



LEGEND

- EXISTING CONTOURS
- PROPERTY LINE
- COUNTY LINE
- ASSUMED FLOODWAY (50 FEET)
- EXISTING WETLAND
- EXISTING EASEMENT
- EXISTING ACCESS ROAD
- FENCE
- FOREIGN PIPELINE
- SPECTRA PIPELINE
- OVERHEAD WIRES
- LIMIT OF DISTURBANCE/ ESCGP-3 BOUNDARY
- CAPPED & GROUTED PIPELINE
- PROPOSED PIPELINE (HDD)
- PROPOSED PIPELINE (REPLACEMENT)
- PROPOSED PIPELINE (STANDARD LAY)
- PROPOSED PULL-BACK STRING
- PROPOSED SILT FENCE (BY TYPE)
- PROPOSED COMPOST FILTER SOCK
- PROPOSED SLOPE BREAKER
- PROPOSED TRENCH BREAKER
- PROPOSED ORANGE SAFETY FENCE
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- PROPOSED EROSION CONTROL BLANKET
- PROPOSED STONE CONSTRUCTION ENTRANCE
- SOIL TYPE BOUNDARY AND SOIL BOUNDARY
- LAND USE TYPE BOUNDARY AND LAND USE BOUNDARY
- WETLAND SEEDING
- UPLAND SEEDING
- TEMPORARY WORKSPACE
- DRILL TARGET
- VALVE

REV	DSN	CK	DESCRIPTION	
2	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
1	LGF	RG	ISSUED FOR APPROVAL	(05/28/2020)
0				

REVISIONS

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	LGF		04/13/20		
TITLE		SIGNATURE	DATE	SIGNATURE	DATE

ENGINEERING APPROVALS

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
PCSM

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: 1=50'H, 1"=40'V | DWG. PCSM-3 | REV. 1

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

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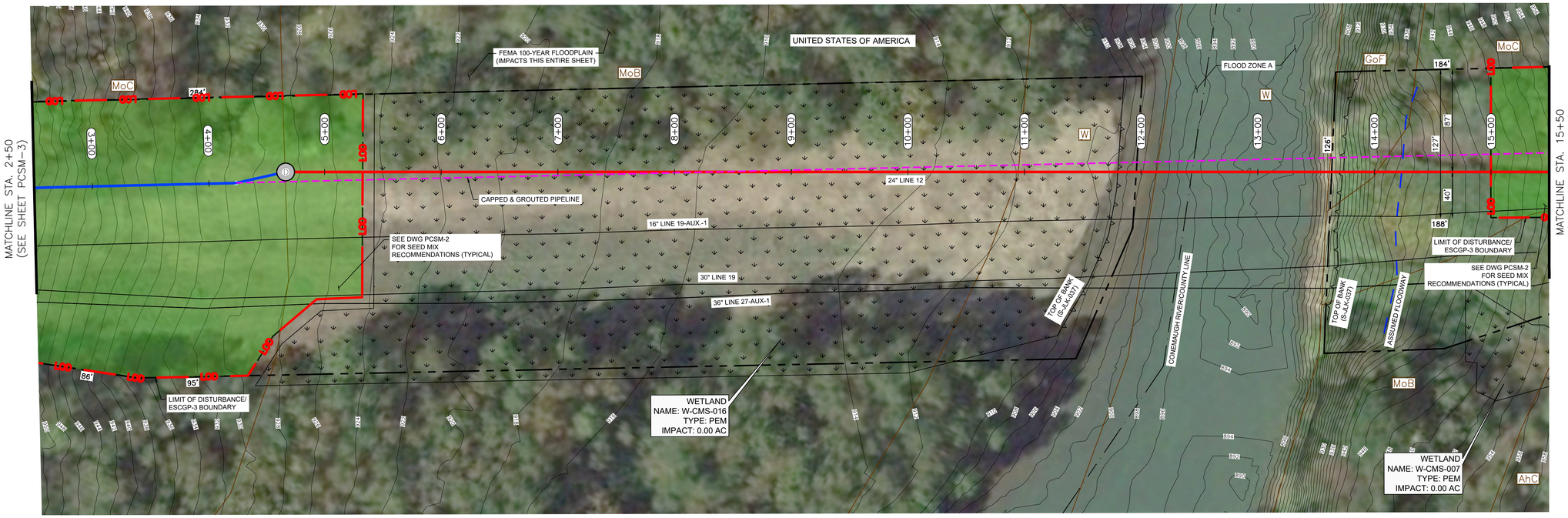
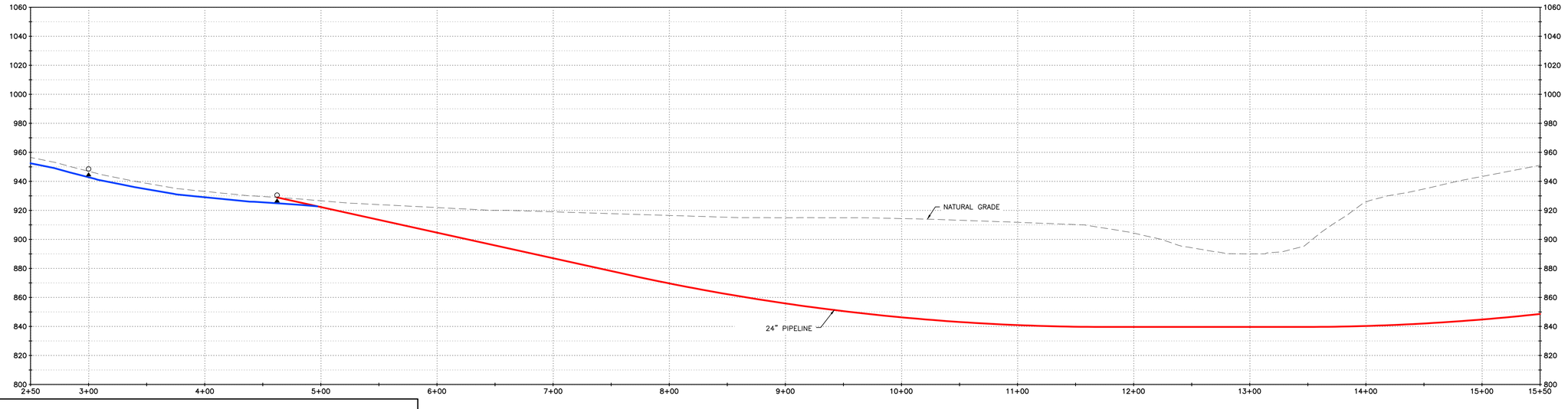
WESTMORELAND COUNTY,
PENNSYLVANIA
MUNICIPALITY: DERRY

INDIANA COUNTY,
PENNSYLVANIA
MUNICIPALITY: BLACKLICK



GRAPHIC SCALE
50' 25' 0' 50'

LAND USE		PASTURE	OPEN WATER	PASTURE	



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LGF		04/13/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
PCSM

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
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5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020	W.B.S.	SCALE: 1"=50'H, 1"=40'V	DWG. PCSM-4	REV. 1

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
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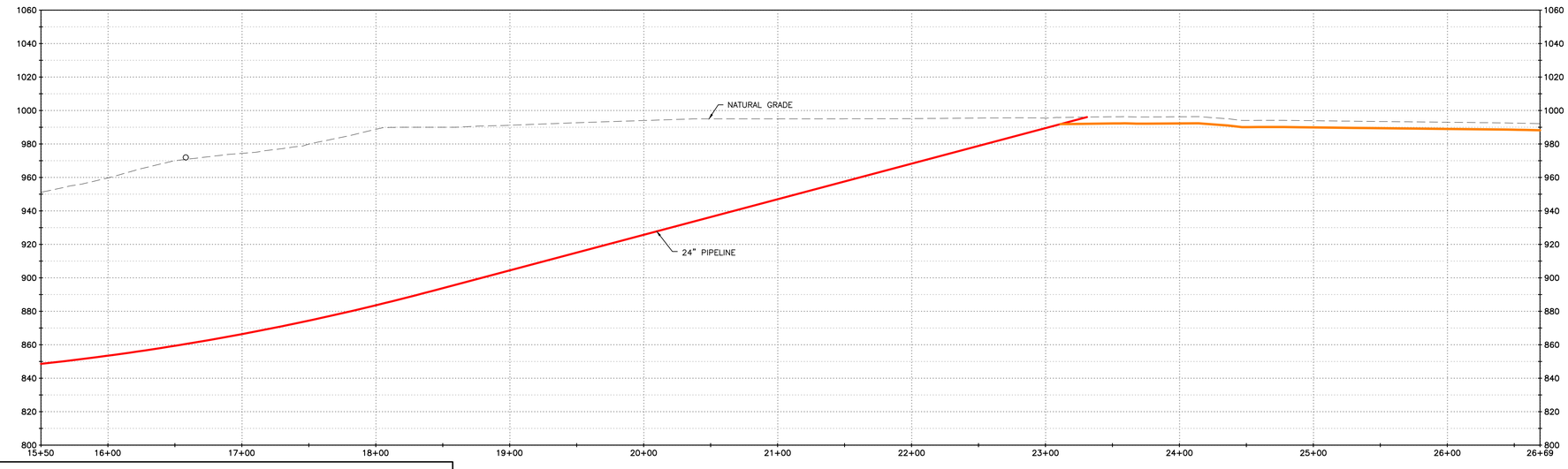
ENGINEER
PE077056

07/23/20

INDIANA COUNTY,
PENNSYLVANIA
MUNICIPALITY: BLACKLICK

GRAPHIC SCALE
50' 25' 0' 50'

LAND USE		PASTURE	ROW	PASTURE	



LEGEND

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REV	DSN	CK	DESCRIPTION	
1	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
0	LGF	RG	ISSUED FOR APPROVAL	(05/28/2020)

REVISIONS

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LGF		04/13/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
PCSM

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
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5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020	W.B.S.	SCALE: 1=50'H, 1"=40'V	DWG. PCSM-5	REV. 1

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PE077056

07/23/20

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PROPOSED SITE PLAN

SCALE: 1" = 20'

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		0	SNC	NJP	ISSUED FOR APPROVAL (05/28/20)

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ENGINEERING APPROVALS

TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE
DRAWN BY: ECSP				

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EXISTING CONDITIONS & SOILS MAP

LOC. INDIANA COUNTY, PENNSYLVANIA

YEAR: 2020 | W.B.S. | SCALE: AS SHOWN | DWG. PCSM-6 | REV. 1

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PROPOSED SITE PLAN

SCALE: 1' = 20'

LEGEND:

(red line)	IMPERVIOUS AREA
(brown line)	SOIL TYPE
(light dashed line)	EXIST CONTOUR
(dark dashed line)	PROP CONTOUR
(stippled box)	GRAVEL SURFACE

SOIL TYPE & DRAINAGE AREAS

SOIL TYPE	DESCRIPTION	AREA
MoA	SITE RUNOFF AREA	0.30 AC
MoA	ACCESS ROAD RUNOFF AREA	0.051 AC
MoB	ACCESS ROAD RUNOFF AREA	0.094 AC

DWG. NO.	REFERENCE DWG.	REV	DSN	CK	DESCRIPTION
		△			
		△			
		△			
		△			
		1	BAH	NJP	ISSUED FOR APPROVAL 07/23/2020
		0	BAH	NJP	ISSUED FOR APPROVAL 5/28/2020

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ENGINEERING APPROVALS

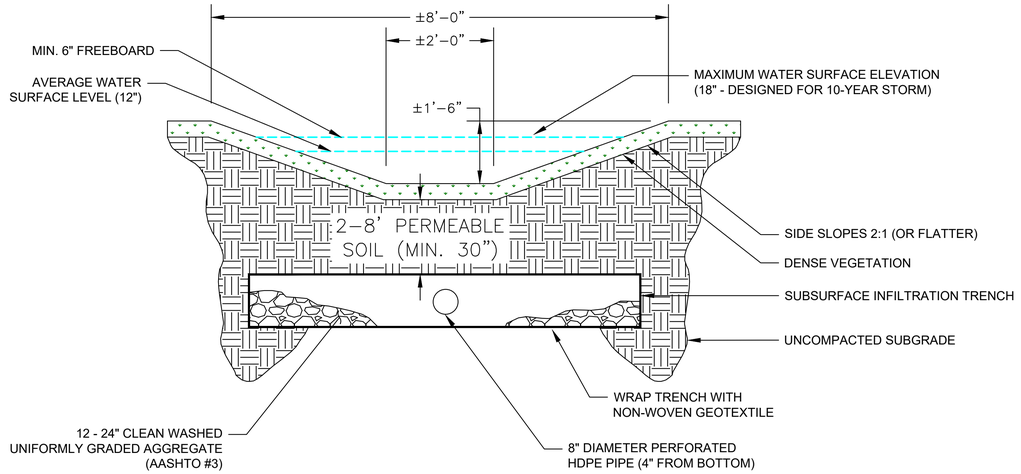
TITLE	BID SIGNATURE	DATE	CONSTRUCTION SIGNATURE	DATE
DRAWN BY:				
ECSP				

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
PCSM PLAN

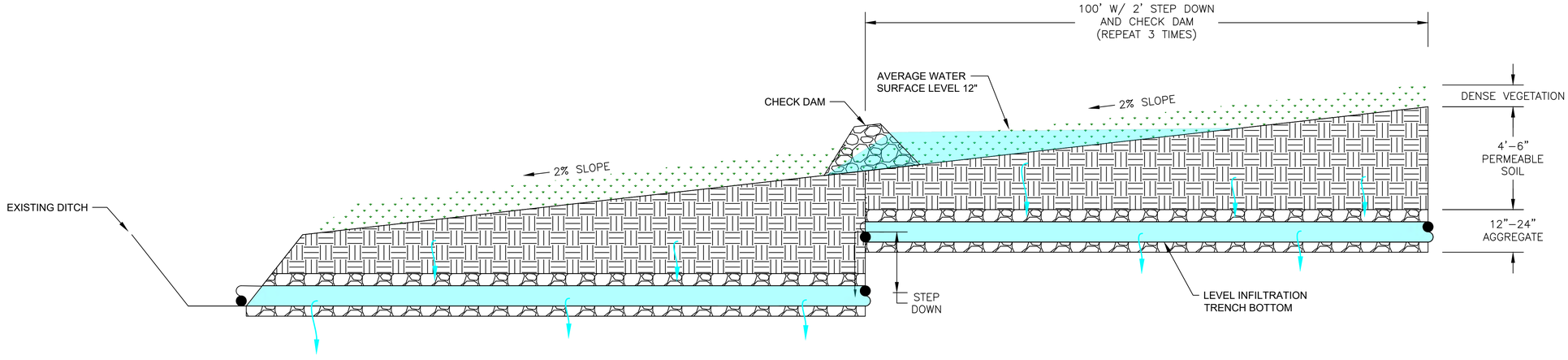
LOC. INDIANA COUNTY, PENNSYLVANIA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: AS SHOWN | DWG. PCSM-7 | REV. 1



INFILTRATION TRENCH CROSS SECTION
N.T.S.



INFILTRATION TRENCH PROFILE
N.T.S.

INFILTRATION TRENCH SPECS:

1. STONE FOR INFILTRATION TRENCHES SHALL BE 2-INCH UNIFORMLY GRADED COARSE AGGREGATE, WITH A WASH LOSS OF NO MORE THAN 0.5%, AASHTO SIZE NUMBER 3 PER AASHTO SPECIFICATIONS, PART 1, 19TH ED., 1998, OR LATER AND SHALL HAVE VOIDS 40% AS MEASURED BY ASTM-C29.
2. NON-WOVEN GEOTEXTILE SHALL CONSIST OF NEEDLED NON-WOVEN POLYPROPYLENE FIBRES AND MEET THE FOLLOWING PROPERTIES:
   A. GRAB TENSILE STRENGTH (ASTM-D4632)
   B. MULLEN BURST STRENGTH (ASTM-D3786)
   C. FLOW RATE (ASTM-D4491)
   D. UV RESISTANCE AFTER 500 HRS. (ASTM-D4355) 70%
   E. HEAT-SET OR HEAT-CALENDARED FABRICS ARE NOT PERMITTED
3. PIPE SHALL BE CONTINUOUSLY PERFORATED, SMOOTH INTERIOR, WITH A MINIMUM INSIDE DIAMETER OF 8 INCHES. HIGH-DENSITY POLYETHYLENE (HDPE) PIPE SHALL MEET AASHTO M252, TYPE S OR AASHTO M294, TYPE S.

STORMWATER STORAGE:

1. STORGAE VOLUME = 0.5 x LENGTH OF SWALE IMPOUNDMENT AREA PER CHECK DAM x DEPTH OF CHECK DAM (TOP WIDTH OF CHECK DAM + BOTTOM WIDTH OF CHECK DAM) /2

   375 FT^3 = 0.5 * 100 FT * 1.5 FT * (8 FT + 2 FT) / 2

   3 CHECK DAMS * 375 FT^3 = 1125 FT^3

2. FLOWS THROUGH A STONE CHECK-DAM ARE A FUNCTION OF STONE SIZE, FLOW DEPTH, FLOW WIDTH, AND FLOW PATH LENGTH THROUGH THE DAM. THE FOLLOWING EQUATION CAN BE USED TO ESTIMATE THE FLOW THROUGH A STONE CHECK DAM UP TO 6 FEET LONG.

   q = FLOW DEPTH^1.5 / (L/STONE DIAMETER + 2.5 + L^2)^0.5
   L = (DAM SIDE SLOPE) * (2 * DAM HEIGHT - FLOW DEPTH) = 3 FT
   q = 0.41 CFS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL BRANDON MICHAEL WALKER ENGINEER PE077056
07/23/20

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			0	BAH	NJP	ISSUED FOR APROVAL 05/28/20

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ENGINEERING APPROVALS					
DRAWN BY:	BID		CONSTRUCTION		
ECSP					
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
PCSM BMP DETAILS

ENBRIDGE

LOC. INDIANA COUNTY, PENNSYLVANIA

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: AS SHOWN | DWG. PCSM-8 | REV. 0