

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
ATLANTIC SUNRISE PROJECT
PROPOSED 42" CENTRAL PENN LINE SOUTH

BEST MANAGEMENT PRACTICES
AND QUANTITIES PLAN SET

EAST CAMERON, COAL, RALPHO
TOWNSHIPS

NORTHUMBERLAND COUNTY

BMP DETAIL SUMMARY

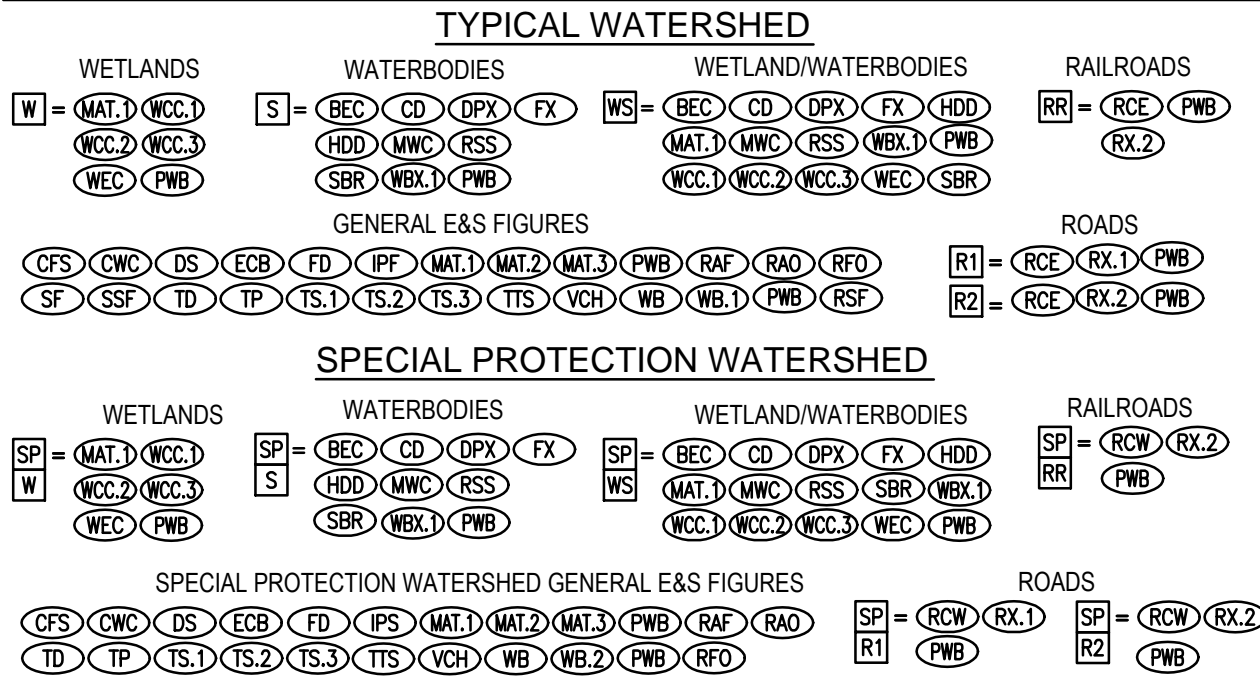
FIGURE	FIGURE TITLE	SHEET NO.
ARF	ABACT ROCK FILTER	1
BBD	BROAD BASED DIP	
BEC	BRIDGE EQUIPMENT CROSSING	
CD	COFFERDAM STREAM CROSSING	
CDM	CHECK DAM	2
CFS	COMPOST FILTER SOCK	
CS	CLEANOUT STAKE	
CST	COMPOST SOCK SEDIMENT TRAP	
CWC	CLEAN WATER CROSSING (FLUME CROSSING)	3
DPX	DAM AND PUMP STREAM CROSSING	
DS	HYDROSTATIC DEWATERING STRUCTURE	
ECB	EROSION CONTROL BLANKET	
FD	FILTER SOCK DIVERSION	4
FEN	CONSTRUCTION FENCE	
FX	FLUME STREAM CROSSING	
HDD	HORIZONTAL DIRECTIONAL DRILL	
IPF	FILTER BAG INLET PROTECTION TYPE M	5
IPS	STONE AND CONCRETE INLET PROTECTION TYPE M	
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MAT.2	TIMBER MATTING WITH FILL OVER EXISTING PIPELINES	
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RAO	RIP RAP APRON AT PIPE OUTLET WITHOUT FLARED END SECTION	
RAP	RIP RAP GRADATION	7
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RSF	REINFORCED SILT FENCE (30" HIGH)	8
RSS	RIP RAP STREAM BANK STABILIZATION	
RX.1	TRENCHED ROAD CROSSING	
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VCH	VEGETATED CHANNEL	
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WCC.1	"UNSATURATED WETLAND" INSTALLATION PROCEDURE	
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WCC.3	"INUNDATED WETLAND" INSTALLATION PROCEDURE	
WD	WATER DEFLECTOR	
WEC	WETLAND EQUIPMENT	

DETAILS THAT ARE NOT UTILIZED IN THIS COUNTY ARE STRUCK THROUGH IN THIS TABLE. THESE DETAILS ARE ALSO CROSSED OUT WITH A NOTE THAT READS "DETAILS ARE NOT UTILIZED IN THIS COUNTY" ON THEIR RESPECTIVE SHEET.

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24-1600-70-28-A/LL113_9-BMP	1-1	COVER SHEET
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E&S DETAIL GROUP LEGEND FOR PIPELINE CROSSINGS



DETAILS IN THIS LEGEND ARE NOT COMPREHENSIVE AND ONLY REFER TO BMPs RELATED TO PIPELINE CROSSINGS. ADDITIONAL BMPs ARE PROVIDED FOR ACCESS ROADS.

E&S DETAIL GROUP LEGEND IS ALSO PROVIDED ON THE PIPELINE E&S PLANS. LEGEND IS SHOWN HERE FOR COORDINATION PURPOSES.



REVISIONS				TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC			
NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.	ATLANTIC SUNRISE PROJECT
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK	PROPOSED 42" CENTRAL PENN LINE SOUTH
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK	PENNSYLVANIA BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET
2	02/04/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK	NORTHUMBERLAND COUNTY, PENNSYLVANIA
3	3/28/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	AJB	
4	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	AJB	
COVER SHEET				DRAWN BY: ELZ DATE: 05/15/15 ISSUED FOR BID: SCALE:			
				CHECKED BY: JLK DATE: 07/02/15 ISSUED FOR CONSTRUCTION: REVISION: 4			
				APPROVED BY: SMK DATE: 07/08/15 DRAWING NUMBER: 24-1600-70-28-A/LL113_9-BMP SHEET 1 OF 1			
				W.O.:			



Drawn By & Date/Time: cmastrano Nov 13, 2016 - 1:07pm
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PIPELINE BMP INSTALLATION SEQUENCE

1. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, ENVIRONMENTAL INSPECTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE 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 PRECONSTRUCTION MEETING.
2. 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.
3. HOLD PRE-CONSTRUCTION CONFERENCE WITH THE ENVIRONMENTAL INSPECTORS, LOCAL COUNTY CONSERVATION DISTRICT (CCD), PADEP, AND DESIGN ENGINEER.
4. LOCATE STAGING AREAS AND ACCESS POINTS INCLUDING CONSTRUCTION ENTRANCES. FIELD LOCATE THE LOD.
5. LOCATE, STAKE AND/OR INSTALL ORANGE CONSTRUCTION FENCE AROUND SPECIAL AREAS OF CONCERN (I.E. WETLANDS, STREAMS, CULTURAL RESOURCES..)
6. PERFORM NON-MECHANIZED TREE CUTTING WHERE REQUIRED.
7. INSTALL CONSTRUCTION ENTRANCES.
8. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL COUNTY CONSERVATION DISTRICT OR DEP AND BE FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF ANY EXCESS MATERIAL AND TO DEVELOP A PLAN THAT MEETS THE CONDITIONS OF CHAPTER 102, NPDES PERMIT CONDITIONS, AND/OR OTHER STATE AND FEDERAL REGULATIONS.
9. REMOVE BRUSH, INCLUDING STUMPS, ONLY IN AREAS NECESSARY TO EFFECTIVELY INSTALL PERIMETER SEDIMENT BARRIERS, UPSLOPE TEMPORARY FILTER SOCK DIVERSIONS AND TEMPORARY DIVERSION SWALES. LEVEL SIDE CUTS REQUIRED TO GRANT ACCESS FOR VEHICLES AND WORKERS TO SAFELY PERFORM THE INSTALLATION OF SEDIMENT BARRIERS AS SHOWN ON THE E&SC PLANS.
10. INSTALL PERIMETER CONTROLS (SEDIMENT BARRIERS). ACCESS REQUIREMENTS FOR PERIMETER CONTROLS ALONG PRIVATE DRIVES WITHIN THE LOD SHALL BE IN ACCORDANCE WITH THE LANDOWNER AGREEMENTS.
11. INSTALL PERMANENT AND TEMPORARY ACCESS ROADS AND ASSOCIATED BMPS (VEGETATED ROADSIDE DITCHES, DITCH RELIEF CULVERTS, AND RIPRAP OUTLET PROTECTION). SEE ACCESS ROAD SEQUENCE OF CONSTRUCTION FOR SPECIFIC CONSTRUCTION STEPS ASSOCIATED WITH ROAD CONSTRUCTION (PROVIDED IN SECTION 2 OF THE ESCOP-2 NOI).
12. THE COMPLIANCE MANAGER SHALL PROVIDE PADEP AT LEAST THREE DAYS' NOTICE PRIOR TO BULK EARTH DISTURBANCE AND UPON COMPLETED INSTALLATION OF PERIMETER EROSION CONTROLS.
13. HAVE SURVEY CREWS LOCATE AND RE-STAKE AS NEEDED, IF ANY STAKES ARE DAMAGED, IN ALL SPECIAL AREAS OF CONCERN (I.E., WETLANDS, STREAMS, ETC.)
14. UPON TEMPORARY CESSATION OF AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OF AN ACTIVITY WHERE THE CESSATION OF EARTH DISTURBANCE ACTIVITIES WILL EXCEED FOUR DAYS, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED, OR OTHERWISE PROTECTED FROM ACCELERATED E&SC PENDING FUTURE EARTH DISTURBANCE ACTIVITIES. FOR AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OF AN ACTIVITY TO BE CONSIDERED TEMPORARILY STABILIZED, THE DISTURBED AREAS SHALL BE COVERED WITH ONE OF THE FOLLOWING: A MINIMUM UNIFORM COVERAGE OF MULCH AND SEED, WITH A DENSITY CAPABLE OF RESISTING ACCELERATED E&SC; OR AN ACCEPTABLE E&SC BMP WHICH TEMPORARILY MINIMIZES ACCELERATED E&SC. TEMPORARY STABILIZATION WILL NOT OCCUR ON ACTIVE VEHICULAR TRAVEL WAYS WITHIN THE ROW.
15. PROCEED WITH MAJOR CLEARING AND GRUBBING.
16. BEGIN CONSTRUCTION STAKING FOR TEMPORARY GRADING.
17. INSTALL CLEAN WATER CROSSINGS, INCLUDING LINERS, RIP RAP APRON ENERGY DISSIPATERS AND FLUME CROSSINGS
18. AS THE GRUBBING OPERATION COMMENCES, INSTALL ROCK FILTERS AND WATERBARS ALONG THE ALIGNMENT.
19. STRIP AND STOCKPILE TOPSOIL; INSTALL SEDIMENT BARRIERS AROUND STOCKPILES.
20. HAUL PIPE TO RIGHT-OF-WAY. BEND, PLACE ON SUPPORTS, ALIGN, AND WELD. INSTALL STREAM AND WETLAND CROSSING BMPS (TIMBER MATTING, TIMBER MAT BRIDGES). LAY PIPE IN DITCH IMMEDIATELY AFTER INSTALLING CROSSING, RESTORE DISTURBED AREA AND INSTALL STREAMBANK STABILIZATION.
21. CLEAR, GRUB, AND CONSTRUCT STREAM AND WETLAND CROSSINGS IN ACCORDANCE WITH CHAPTER 105, SECTION 404, 401, AND RELATED PERMITS. INSTALL STREAM FLUMES, AND/OR DAM AND PUMP AS SPECIFIED IN CHAPTER 105 PERMIT DOCUMENTS FOR CROSSING OF STREAM AND WETLAND AREAS. CONTRACTOR SHALL PLACE PIPE, INSTALL TRENCH PLUGS, BACKFILL TRENCH, AND TEMPORARILY STABILIZE WITHIN 48 HOURS OF EXCAVATING TRENCH IN RESOURCE CROSSING LOCATIONS.
22. DIG TRENCH OUTSIDE OF RESOURCE CROSSINGS. CONTRACTOR SHALL PLACE PIPE, INSTALL TRENCH PLUGS, AND BACKFILL TRENCH WITHIN 30 DAYS OF EXCAVATING TRENCH.
23. PERFORM NON-DESTRUCTIVE TESTING (NDT) INSPECTION OF WELDS AND APPLY COATING TO WELD AREA.
24. INSTALL TRENCH PLUGS.
25. BACKFILL PIPE TRENCH, REPAIR PERMANENT WATERBARS, REMOVE TEMPORARY WATERBARS, RETURN TEMPORARILY GRADED AREAS TO PRE-DEVELOPMENT GRADE, REPAIR/INSTALL EROSION CONTROL BLANKET AS NEEDED, IMMEDIATELY SEED AND STABILIZE DISTURBED AREAS (SLOPES, DITCHES AND CHANNELS) AS THEY ARE RETURNED TO FINAL GRADE. REFER TO PLANTING PLANS AND RIPARIAN BUFFER PLANTINGS, AS APPLICABLE, IN THE BMP PLAN SET AND E&S NARRATIVE.
26. PERFORM HYDROSTATIC PRESSURE TEST OF PIPELINE.
27. DEWATER PIPELINE UTILIZING APPROPRIATE BMPS, COMPLETE FINAL TIE-INS, AND DRY PIPELINE.
28. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT 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.
29. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE PERMITTEE AND/OR OPERATORS SHALL CONTACT THE LOCAL CCD AND/OR PADEP FOR AN INSPECTION PRIOR TO THE REMOVAL OF THE E&SC BMPS. REMOVAL OF TEMPORARY WETLAND AND STREAM CROSSINGS, TEMPORARY BMPS INCLUDING SEDIMENT BARRIERS, TEMPORARY FILTER SOCK DIVERSION SWALES, TEMPORARY CLEAN WATER DIVERSION SWALES (AND ASSOCIATED GRADING), CLEAN WATER CROSSING OUTFALL PROTECTION AND LEVEL SPREADERS, ROCK FILTERS, AND TEMPORARY WATERBARS ALONG THE ALIGNMENT.
30. COMPLETE SITE RESTORATION AND STABILIZATION, INCLUDING SOIL AERATION, SOIL TREATMENT, SEED APPLICATION AND MULCHING IN AREAS DISTURBED BY E&SC BMP REMOVAL. INSTALL RIPARIAN BUFFER PLANTINGS PER THE RIPARIAN BUFFER PLANTING PLANS.
31. REMOVE AND PROPERLY DISPOSE OF/RECYCLE E&SC BMPS. REMOVE STAKES AND ORANGE CONSTRUCTION FENCE. REPAIR AND PERMANENTLY STABILIZE AREAS DISTURBED DURING E&SC BMP REMOVAL.

MAINTENANCE PROGRAM

THE FOLLOWING INSPECTION AND MAINTENANCE PRACTICES WILL BE USED TO MAINTAIN EROSION AND SEDIMENT CONTROLS AND STABILIZATION MEASURES. REFER TO BMP DETAILS FOR SPECIFIC OPERATION AND MAINTENANCE REQUIREMENTS.

1. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED ONCE EVERY SEVEN DAYS AND AFTER EACH RUNOFF EVENT. A WRITTEN REPORT MUST ALSO BE COMPLETED DOCUMENTING EACH INSPECTION AND, IF NECESSARY, ANY REPAIR, REPLACEMENT OR MAINTENANCE ACTIVITY.
2. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER; IF REPAIRS OR ADDITIONAL MEASURES ARE FOUND TO BE NECESSARY, THEY WILL BE INITIATED WITHIN 24 HOURS OF THE INSPECTION REPORT.
3. BUILT UP SEDIMENT WILL BE REMOVED FROM PERIMETER BMPS WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE BMP.
4. PERIMETER BMPS WILL BE INSPECTED FOR DEPTH OF SEDIMENT, DAMAGE, ETC., TO ENSURE THE MEASURE IS IN PROPER WORKING ORDER, AND THAT ANY POSTS/WOOD STAKES ARE SECURELY IN THE GROUND.
5. TEMPORARY SEDIMENT TRAPS, IF PRESENT, WILL BE INSPECTED FOR DEPTH OF SEDIMENT, AND BUILT UP SEDIMENT WILL BE REMOVED WHEN IT REACHES THE DESIGN CLEANOUT DEPTH.
6. TEMPORARY AND PERMANENT SEEDING, AND OTHER STABILIZATION MEASURES, WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
7. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION. COPIES OF THE REPORT FORMS TO BE COMPLETED BY THE INSPECTOR ARE INCLUDED IN THIS ESCP.
8. THE INSPECTOR WILL IMPLEMENT INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS THAT ARE USED ON THE SITE IN GOOD WORKING ORDER. THE INSPECTOR WILL ALSO BE TRAINED IN THE COMPLETION OF, INITIATION OF ACTIONS REQUIRED BY, AND THE FILING OF THE INSPECTION FORMS.
9. DISTURBED AREAS AND MATERIALS STORAGE AREAS WILL BE INSPECTED FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING THE STORMWATER.

A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN(S) WILL BE AVAILABLE ON THE SITE AT ALL TIMES.

ONCE ANY EROSION CONTROL MEASURES ARE INSTALLED, THE MAINTENANCE AND INSPECTION PROCEDURES ABOVE SHALL BEGIN. THE CONTRACTOR SHOULD BE AWARE THAT THE INSPECTION FORMS BECOME AN INTEGRAL PART OF THE ESCP AND SHALL BE MADE READILY AVAILABLE TO THE GOVERNMENT INSPECTION OFFICIALS, THE PROJECT OWNER'S ENGINEER, AND THE PROJECT OWNER FOR REVIEW UPON REQUEST DURING VISITS TO THE PROJECT SITE.

INSPECTORS SHOULD BE KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICE OF EROSION AND SEDIMENT CONTROLS AND POSSESS THE SKILLS TO ASSESS CONDITIONS AT THE CONSTRUCTION SITE THAT COULD IMPACT STORMWATER QUALITY AND TO ASSESS THE EFFECTIVENESS OF ANY SEDIMENT AND EROSION CONTROL MEASURES SELECTED TO CONTROL THE QUALITY OF STORMWATER DISCHARGES FROM THE CONSTRUCTION SITE. THEY SHOULD ALSO HAVE READ AND UNDERSTOOD ALL PORTIONS OF THIS ESCP, INCLUDING THE ESCOP-2.

THE INDIVIDUAL(S) RESPONSIBLE FOR POST-STORM AND STORM EVENT BMP INSPECTIONS, AND THE QUALIFIED PERSON(S) ASSIGNED RESPONSIBILITY TO ENSURE FULL COMPLIANCE WITH THE PERMITS AND IMPLEMENTATION OF ALL ELEMENTS OF THE ESCP, INCLUDING THE PREPARATION OF THE ANNUAL COMPLIANCE EVALUATION AND THE ELIMINATION OF ALL UNAUTHORIZED DISCHARGES ARE:

NAME: _____

PHONE NUMBER: _____ EMERGENCY PHONE #: _____

COMPANY: _____

RESPONSIBILITIES: _____

NAME: _____

PHONE NUMBER: _____ EMERGENCY PHONE #: _____

COMPANY: _____

RESPONSIBILITIES: _____

TEMPORARY AND PERMANENT STABILIZATION

1. TEMPORARY STABILIZATION

TEMPORARY SEEDING WITH STRAW MULCH COVER FOR INTERIM STABILIZATION IS A TYPE OF BMP THAT CAN USUALLY BE PROVIDED WHERE THE EARTH DISTURBANCE ACTIVITY TEMPORARILY CEASES (I.E. 4 DAYS OR MORE) UNLESS DIRECTED BY THE PROJECT OWNER, PADEP, OR CONSERVATION DISTRICT.

THE INSTALLATION OF AN EROSION CONTROL BLANKET OR APPLICATION OF STRAW MULCH UPON SEEDED AREAS ARE BOTH CONSIDERED TO BE PERMANENT STABILIZATION BMPS TO PROTECT THE SEEDBED UNTIL VEGETATION IS ESTABLISHED.
2. PERMANENT STABILIZATION

UPON COMPLETION OF ANY EARTH DISTURBANCE ACTIVITY, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED, OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION.

EROSION & SEDIMENTATION CONTROLS SHALL BE LEFT IN PLACE UNTIL SUCH TIME AS THE DISTURBED AREAS HAVE PERMANENT STABILIZATION. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT 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.
3. STABILIZATION DURING NON-GROWING SEASONS

WHEN UTILITY CONSTRUCTION MUST BE DONE AND IS COMPLETED DURING A NON-GROWING SEASON, INTERIM STABILIZATION BMPS MUST BE IMPLEMENTED AND ADEQUATELY MAINTAINED. THE APPLICATION OF STRAW MULCH AT THE RATE OF 3.0 TONS PER ACRE IS REQUIRED. THE BMPS SHOULD BE INSPECTED WEEKLY (UNLESS SNOW COVERED) AND AFTER EACH RUNOFF EVENT TO IDENTIFY AREAS THAT BECOME BARE.

BARE AREAS SHOULD BE COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET. ALL TEMPORARY EROSION AND SEDIMENT POLLUTION CONTROLS MUST BE MAINTAINED UNTIL PERMANENT VEGETATION IS ESTABLISHED.
4. WHERE REQUIRED, STRAW MULCH MUST BE APPLIED AT A MINIMUM OF 3.0 TONS PER ACRE.
5. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT FINELY CHOPPED OR BROKEN.
6. PRIOR TO ANY SEEDING, LIME, OR FERTILIZATION APPLICATION, A SOIL TEST SHALL BE PERFORMED TO DETERMINE THE pH FACTOR. ADDITIONAL LIME AND FERTILIZER MAY BE REQUIRED, NO LIME OR FERTILIZERS SHALL BE USED IN WETLAND AREAS.
7. LIME, FERTILIZE, SEED, AND MULCH DISTURBED AREAS PER THE EROSION AND SEDIMENT CONTROL PLANS. IN AREAS OF STEEP SLOPES OR OBVIOUS AREAS WHERE POTENTIAL EROSION MAY OCCUR, AND EROSION CONTROL MAT OR FLEXIBLE GROWTH MEDIUM (FGM) SHALL BE USED. FGM SHALL BE APPLIED PER MANUFACTURER SPECIFICATIONS. NO LIME OR FERTILIZERS SHALL BE USED IN WETLAND OR STREAM AREAS.
8. WATERBARS WITHIN AGRICULTURAL OR RESIDENTIAL AREAS SHALL BE USED AS TEMPORARY FEATURES. WATERBARS MAY BE REMOVED WHEN THE TRIBUTARY DRAINAGE AREA IS AT LEAST 70% STABILIZED WITH PERENNIAL VEGETATION AS PER PA CHAPTER 102.22.

PIPELINE WORK SEQUENCE IN WETLANDS

FOR WORK IN WETLANDS, THE FOLLOWING STEPS SHALL BE INSERTED IN THE GENERAL PIPELINE CONSTRUCTION SEQUENCE ABOVE:

1. INSTALL ORANGE FLAGGING AROUND PERIMETER OF WETLAND AND SEDIMENT BARRIERS ALONG THE **LIMITS OF DISTURBANCE**.
2. LOCATE STAGING AREAS AT LEAST 50 FEET FROM THE EDGE OF THE WETLAND.
3. INSTALL SEDIMENT BARRIERS DOWN SLOPE OF THESE AREAS.
4. INSTALL CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS.
5. MATS, PADS, OR SIMILAR DEVICES SHALL BE USED DURING THE CROSSINGS OF WETLANDS. ORIGINAL GRADES THROUGH WETLANDS MUST BE RESTORED AFTER TRENCHING AND BACKFILLING. ANY EXCESS FILL MATERIALS MUST BE REMOVED FROM THE WETLAND AND NOT SPREAD ON-SITE.
6. SOIL EXCAVATED FROM WETLAND AREAS SHALL BE CAREFULLY REMOVED WITH THE ROOTS INTACT. THIS SOIL SHOULD BE PLACED IN A SEPARATE STOCKPILE TO BE REUSED DURING THE WETLAND SURFACE RESTITUTION.
7. DEWATER WORK AREA; WATER FROM THE EXCAVATION SHALL BE PUMPED TO A SEDIMENT TRAP OR A FILTER BAG.
8. INSTALL PIPE.
9. INSTALL TRENCH PLUGS IN WETLAND AREAS PER THE E&S PLAN TO PREVENT THE TRENCH FROM DRAINING THE WETLAND OR CHANGING ITS MICROHYDROLOGY.
10. BACKFILL PIPE TRENCH. BACKFILL THE TOP 12-INCHES OF THE EXCAVATED TRENCH WITH THE STOCKPILED WETLAND SOIL TO MATCH ORIGINAL SURFACE GRADES.
11. COMPACT BACKFILL AND GRADE THE SURFACE OF THE TRENCH AREA TO ALLOW FOR POSITIVE DRAINAGE TO SOIL E&SCS AND TO PREPARE DISTURBED AREAS FOR PERMANENT TRENCH RESTORATION.
12. MAINTAIN ALL E&SC DEVICES UNTIL SITE WORK IS COMPLETE AND A MINIMUM UNIFORM 70 PERCENT PERENNIAL VEGETATIVE COVER IS ESTABLISHED.
13. REMOVE ALL SOIL AND E&SC MEASURES UPON ESTABLISHMENT OF A MINIMUM UNIFORM 70 PERCENT PERENNIAL VEGETATIVE COVER OVER THE DISTURBED AREA. REGRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE SOIL E&SCS.

PIPELINE WORK SEQUENCE AT STREAM CROSSINGS

FOR STREAM CROSSINGS, THE FOLLOWING STEPS SHALL BE INSERTED IN THE GENERAL PIPELINE CONSTRUCTION SEQUENCE ABOVE:

1. AFTER INSTALLATION OF SEDIMENTATION BMPS, INSTALL BYPASS HOSE, PUMP, OR COFFERDAM AS DESCRIBED IN STREAM CROSSING DETAILS AROUND THE WORK AREA.
2. DEWATER WORK AREA. WATER FROM THE EXCAVATION SHALL BE PUMPED TO A SEDIMENT FILTER BAG. WHERE POSSIBLE, EXCAVATION SHALL BE FROM THE TOP OF THE STREAM BANK.
3. STABILIZE CHANNEL EXCAVATION AND STREAM BANKS PRIOR TO REDIRECTING STREAM FLOW WITHIN 24 HOURS OF CROSSING BEING DONE FOR ALL STREAMS SMALLER THAN 10 FEET AND 48 HOURS FOR STREAMS LARGER THAN 10 FEET WIDE.
4. REMOVE BYPASS HOSE, PUMP, AND TEMPORARY DAM AS NEEDED.

ACCESS ROAD BMP INSTALLATION SEQUENCE



REFER TO SPECIFIC ACCESS ROAD CONSTRUCTION SEQUENCE NOTES INCLUDED IN THE ACCESS ROAD E&S PLAN SETS UNDER SEPARATE COVER.

ACID-PRODUCING SOILS AND BEDROCK CONTROL PLAN

THE FOLLOWING ACID PRODUCING SOILS CONTROL PLAN WAS DEVELOPED TO IDENTIFY BMPS AND PROCEDURES FOR MINIMIZING THE POTENTIAL FOR POLLUTION ASSOCIATED WITH THE DISTURBANCE OF THE AREAS WITHIN THE PROPOSED RIGHT-OF-WAY THAT CONTAIN ACID-PRODUCING SOILS WITH A pH LESS THAN 4.0.

ACID-PRODUCING SOILS AND BEDROCK CONTROL PLAN:

1. CONTRACTOR SHALL LIMIT THE EXCAVATION AREA AND EXPOSURE TIME WHEN HIGH ACID-PRODUCING SOILS ARE ENCOUNTERED. LOCATIONS WHERE ACIDIC SOILS ARE ANTICIPATED TO BE PRESENT ALONG THE PIPELINE CORRIDOR ARE PROVIDED IN THE COUNTY-SPECIFIC TABLE INCLUDED AT THE END OF THIS PLAN SET.
2. CONTRACTOR SHALL SEPARATELY STORE TOPSOIL STRIPPED FROM THE SITE AWAY FROM TEMPORARILY STOCKPILED HIGH ACID-PRODUCING SOILS AND BEDROCK'S.
3. CONTRACTOR SHALL STOCKPILE HIGH ACID-PRODUCING SOILS AND BEDROCK MATERIAL ON LEVEL GROUND TO MINIMIZE ITS MOVEMENT, ESPECIALLY WHEN THESE MATERIALS HAVE A HIGH CLAY CONTENT.
4. CONTRACTOR SHALL COVER TEMPORARILY STOCKPILED HIGH ACID-PRODUCING SOIL AND BEDROCK MATERIAL TO BE EXPOSED MORE THAN 7 DAYS WITH PROPERLY ANCHORED, HEAVY-GRATE SHEETS OF POLYETHYLENE, WHERE POSSIBLE. IF NOT POSSIBLE, STOCKPILES SHALL BE COVERED WITH A MINIMUM OF THREE TO SIX INCHES OF WOOD CHIPS TO MINIMIZE EROSION OF THE STOCKPILE. IN ADDITION, THE CONTRACTOR SHALL INSTALL SILT FENCE AT THE TOE OF THE STOCKPILE SLOPE TO CONTAIN MOVEMENT OF MATERIAL. CONTRACTOR SHALL NOT APPLY TOPSOIL TO THE HIGH ACID-PRODUCING SOIL OR BEDROCK STOCKPILES TO PREVENT TOPSOIL CONTAMINATION.
5. CONTRACTOR SHALL ULTIMATELY DISPOSE OF HIGH ACID-PRODUCING SOILS OR BEDROCK WITH A pH OF FOUR OR LESS, OR CONTAINING IRON SULFIDE (INCLUDING BORROW FROM CUTS) BY PLACING THE MATERIAL COMBINED WITH LIMESTONE AT THE RATE OF 6 TONS PER ACRE (OR 275 POUNDS PER 1,000 SQUARE FEET OF SURFACE AREA) AND COVERING THE MIXTURE WITH A MINIMUM OF 12 INCHES OF SETTLED SOILS WITH A PH OF FIVE OR MORE EXCEPT AS FOLLOWS:
 - A. IN THE AREAS WHERE TREES OR SHRUBS ARE TO BE PLANTED, THE CONTRACTOR SHALL COVER THE LIMESTONE/SOIL MIXTURE WITH A MINIMUM OF 24 INCHES OF SOILS WITH A PH OF FIVE OR MORE.
 - B. CONTRACTOR SHALL NOT LOCATE ANY DISPOSAL AREA WITHIN 24 INCHES OF ANY SURFACE OF A SLOPE OR BANK, SUCH AS BERMS, STREAM BANKS, DITCHES, AND OTHER SURFACE WATERS TO PREVENT POTENTIAL LATERAL LEACHING DAMAGES.
6. AT THE END OF EACH DAY, CONTRACTOR SHALL CLEAN ALL EQUIPMENT USED TO HANDLE HIGH ACID-PRODUCING SOILS OR BEDROCK TO PREVENT SPREADING OF HIGH-ACID MATERIALS TO OTHER PARTS OF THE PROPOSED RIGHT-OF-WAY, INTO STREAMS, OR STORMWATER CONVEYANCES, AND TO PROTECT MACHINERY FROM ACCELERATED CORROSION.
7. CONTRACTOR SHALL PROVIDE AND INSTALL NON-VEGETATIVE EROSION CONTROLS (STONE TRACKING PADS, STRATEGICALLY-PLACE LIMESTONE CHECK DAMS, SILT FENCES, WOOD CHIPS) TO LIMIT THE MOVEMENT OF HIGH ACID-PRODUCING SOILS FROM, AROUND, OR OFF OF THE PROPOSED RIGHT-OF-WAY.
8. FOLLOWING THE BURIAL OR REMOVAL OF HIGH ACID-PRODUCING SOILS AND BEDROCK, TOP SOILING, AND SEEDING OF THE PROPOSED RIGHT-OF-WAY, TRANSCO SHALL MONITOR THE SITE FOR APPROXIMATELY SIX TO 12 MONTHS TO ASSURE THERE IS ADEQUATE STABILIZATION AND THAT NO HIGH-ACID SOIL OR BEDROCK PROBLEMS EMERGE. CONTRACTOR SHALL CORRECT ANY PROBLEMS THAT ARE DISCOVERED WITHIN THIS TIME PERIOD.
9. IF PROBLEMS OCCUR WHERE HIGH ACID-PRODUCING SOILS OR BEDROCK HAVE BEEN PLACED OR BURIED, THE APPLICANT SHALL MONITOR THESE AREAS FOR AT LEAST TWO YEARS TO ASSURE THERE IS NO MIGRATION OF POTENTIAL ACID LEACHATE.

 SUZANNE KING REG NO. PE 082757 	REVISIONS							TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT PENNSYLVANIA BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
	NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.				
	0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK				
	1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK				
	2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK				
							GENERAL NOTES				
DRAWN BY:		ELZ	DATE:	05/15/15	ISSUED FOR BID:			SCALE:			
CHECKED BY:		JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:			REVISION:			
APPROVED BY:		SMK	DATE:	07/08/15	DRAWING NUMBER:			ASR-BMP-GN			
W.O.:								SHEET 2 OF 3			



RIP RAP GRADATION, FILTER BLANKET, & MAXIMUM VELOCITIES

Riprap Gradation, Filter Blanket Requirements, Maximum Velocities						
Percent Passing (Square Openings)						
Class, Size NO. Rock Size (Inches)	R-8	R-7	R-6	R-5	R-4	R-3
42	100					
30		100				
24	15-50		100			
18		15-50		100		
15	0-15					
12		0-15	15-50		100	
9				15-50		
6			0-15		15-50	100
4				0-15		
3					0-15	15-50
2						0-15
Nominal Placement Thickness (Inches)	63	45	36	27	18	9
Filter Stone ¹ V _{max} (ft/sec)	AASHTO #1	AASHTO #1	AASHTO #1	AASHTO #3	AASHTO #3	AASHTO #57
	17.0	14.5	13.0	11.5	9.0	6.5

Adapted from PennDOT Pub. 408, Section 703.2(c), Table C

ADAPTED FROM PENNDOT PUB. 408, SECTION 703.2 (c), TABLE C.

1. THIS IS A GENERAL STANDARD. SOIL CONDITIONS AT EACH SITE SHOULD BE ANALYZED TO DETERMINE ACTUAL FILTER SIZE. A SUITABLE WOVEN OR NON-WOVEN GEOTEXTILE UNDERLAYMENT, USED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, MAY BE SUBSTITUTED FOR THE FILTER STONE FOR GRADIENTS < 10%.

LIMING AND FERTILIZER RATES

Soil Amendment	Permanent Seeding Application Rate			Notes
	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yd.	
Agricultural lime	6 tons	240 lb.	2,480 lb.	Or as per soil test; may not be required in agricultural fields
10-10-20 fertilizer	1,000 lb.	25 lb.	210 lb.	Or as per soil test; may not be required in agricultural fields
Temporary Seeding Application Rate				
Agricultural lime	1 ton	40 lb.	410 lb.	Typically not required for topsoil stockpiles
10-10-10 fertilizer	500 lb.	12.5 lb.	100 lb.	Typically not required for topsoil stockpiles

PA DEP TABLE 11.2

1. NO LIME AND/OR FERTILIZER MAY BE APPLIED IN WETLANDS.

SLOPE SEED MIX

Common Name	Scientific Name	# PLS/ acre	PLS/ sq ft	% of Mix
Big Bluestem	<i>Andropogon gerardii</i>	2	6	10
Little Bluestem	<i>Schizachyrium scoparium</i>	1	6	10
Switchgrass	<i>Panicum virgatum</i>	1.3	12	20
Timothy	<i>Phleum pratense</i>	0.4	12	20
Virginia Wildrye	<i>Elymus virginicus</i>	4.4	7.5	13
Deertongue	<i>Dichanthelium clandestinum</i>	0.7	6	10
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.1	3	5
White Clover	<i>Trifolium repens</i>	0.2	3	5
Oxeye Sunflower	<i>Helioopsis helianthoides</i>	0.6	1.5	3
Partridge Pea	<i>Chamaecrista fasciculata</i>	1.1	1.5	3
Purple Coneflower	<i>Echinacea purpurea</i>	0.6	1.5	3
Total	--	12.3	60	100

NOTES:

1. PLS IS ROUNDED TO THE NEAREST TENTH OF A POUND.
2. PLS = PURE LIVE SEED

ROW SEED MIX

Common Name	Scientific Name	# PLS/ acre ¹	PLS/sq ft	% of Mix
Red Top	<i>Agrostis gigantea</i>	0.1	12.0	20
Timothy	<i>Phleum prantense</i>	0.4	12.0	20
Tall Fescue	<i>Festuca arundinacea</i>	1.7	9.0	15
Annual Rygrass	<i>Lolium perenne</i> multiflorum	1.7	9.0	15
Italian Ryegrass	<i>Festulium</i>	1.7	9.0	15
Alsike Clover	<i>Trifolium hybridum</i>	0.2	3.0	5
White Clover	<i>Trifolium repens</i>	0.2	3.0	5
Ladino White Clover	<i>Trifolium repens latum</i>	0.2	3.0	5
Total	--	6.2	60.0	100

NOTES:

1. PLS IS ROUNDED TO THE NEAREST TENTH OF A POUND.
2. PLS = PURE LIVE SEED

COVER CROP SEED MIXES

Common Name	Crop Type	# PLS/ acre	PLS/ sq ft	% of Mx
Warm Season				
Pearl Millet	Grass	6.9	12.6	70
Sunn Hemp	Legume	10.5	3.6	20
Nitro Radishes	Brassicac	3.1	1.8	10
Total	--	20.5	18	100
Cool Season				
Annual ryegrass	Grass	8	35.1	65
Red Clover	Legume	3.2	13.5	25
Nitro Radishes	Brassicac	9.4	5.4	10
Total	--	20.6	54	100

NOTES:

1. PLS IS ROUNDED TO THE NEAREST TENTH OF A POUND.
2. PLS = PURE LIVE SEED

TEMPORARY SEED MIXTURE

TEMPORARY SEEDING SHALL CONSIST OF ANNUAL RYEGRASS (100 PERCENT BY WEIGHT), OR EQUIVALENT, AND SHALL BE PLACED AT THE RATE OF 5 POUNDS PER 1,000 SQUARE YARDS. TEMPORARY SEEDING SHALL BE APPLIED TO THOSE AREAS THAT ARE A POTENTIAL EROSION PROBLEM DURING CONSTRUCTION AND TO THOSE AREAS EXPOSED FOR LONGER THAN 20 CALENDAR DAYS. IF CONDITIONS DO NOT PERMIT TEMPORARY SEEDING, MULCHING SHALL BE EMPLOYED. ADDITIONALLY, NITROGEN FERTILIZER (50–50–50) @ ONE (1) TON PER ACRE, AGRICULTURAL LIME @ ONE (1) TON PER ACRE, AND STRAW MULCH @ THREE (3) TONS PER ACRE. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.

SPECIES TYPE AND SEASON OF PLANTING

Species Type and Season of Planting Cover Crops ¹	
Cool Season - Spring	March 1 to June 1
Warm Season	June 1 to August 15
Cool Season - Fall	August 15 - October 15
Permanent Crop ²	
Spring	April 20 to June 15
Late Fall (dormant)	October 10 - March 1

NOTES:

1. SEEDING DATES FOR COVER CROPS ARE BASED ON DATES REFERENCED BY CLARK, ____.

2. SEEDING DATES FOR PERMANENT CROPS ARE BASED ON DATES REFERENCED BY LANDSHOOT, 1997 AND DELONG AND BRITTINGHAM, 2002

SEED AFTER OCTOBER 10 WHEN GROUND TEMPERATURES AT A DEPTH OF 4 INCHES ARE 45 F OR LOWER AND COOLER AIR TEMPERATURES ARE FORECASTED.

DORMANT SEEDING CAN OCCUR UNTIL SOIL IS FROZEN AND ADEQUATE PENETRATION OF THE DRILL SEEDER DOES NOT OCCURE.

FACW MEADOW MIX ERNMX-122

Seeding Rate	20 lb per acre, or 1/2 lb per 1,000 sq ft
Mix Type	Wet Meadow & Wetland Sites
31.0%	Fox Sedge, PA Ectype (Carex vulpinoidea, PA Ectype)
20.0%	Virginia Wildrye, PA Ectype (Elymus virginicus, PA Ectype)
14.0%	Lurid (Shallow) Sedge, PA Ectype (Carex lurida, PA Ectype)
5.0%	Green Bulrush, PA Ectype (Scirpus atrovirens, PA Ectype)
4.0%	Blue Vervain, PA Ectype (Verbena hastata, PA Ectype)
3.5%	Wood Reedgrass, PA Ectype (Cinna arundinacea, PA Ectype)
3.0%	Soft Rush (Juncus effusus)
3.0%	Blunt Broom Sedge, PA Ectype (Carex scoparia, PA Ectype)
3.0%	Hop Sedge, PA Ectype (Carex lupulina, PA Ectype)
2.0%	Sensitive Fern (Onoclea sensibilis)
2.0%	Oxeye Sunflower, PA Ectype (Helioopsis helianthoides, PA Ectype)
1.0%	Rattlesnake Grass, PA Ectype (Glyceria canadensis, PA Ectype)
1.0%	Woolgrass, PA Ectype (Scirpus cyperinus, PA Ectype)
1.0%	Swamp Milkweed, PA Ectype (Asclepias incarnata, PA Ectype)
1.0%	New England Aster, PA Ectype (Aster novae-angliae (Symphyotrichum n.), PA Ectype)
1.0%	Flat Topped White Aster, PA Ectype (Aster umbellatus (Doellingeria umbellata), PA Ectype)
0.5%	Joe Pye Weed, PA Ectype (Eupatorium fistulosum, PA Ectype)
0.5%	Boneset, PA Ectype (Eupatorium perfoliatum, PA Ectype)
0.5%	Ditch Stonecrop, PA Ectype (Penthorum sedoides, PA Ectype)
0.5%	Narrowleaf Blue Eyed Grass (Sisyrinchium angustifolium)
0.5%	Seedbox, PA Ectype (Ludwigia alternifolia, PA Ectype)
0.5%	Great Blue Lobelia, PA Ectype (Lobelia siphilitica, PA Ectype)
0.5%	Mud Plantain (Water Plantain), PA Ectype (Alisma subcordatum (A. plantago-aquatica), PA Ectype)
0.5%	Square Stemmed Monkeyflower, PA Ectype (Mimulus ringens, PA Ectype)
0.4%	Bladder (Star) Sedge, PA Ectype (Carex intumescens, PA Ectype)
0.1%	Slender Mountainmint (Pycnanthemum tenuifolium)

RIPARIAN BUFFER MIX ERNMX-178

Seeding Rate	20 lb per acre with a cover crop at 30 lb per acre (dry sites - grain oats, Jan 1-Aug 1)
Mix Type	Riparian Sites
20.0%	Virginia Wildrye, PA Ectype (Elymus virginicus, PA Ectype)
16.0%	Indiangrass, PA Ectype (Sorghastrum nutans, PA Ectype)
15.0%	Deertongue, 'Tioga' (Panicum dandestinum (Dichanthelium c.), 'Tioga')
12.5%	Big Bluestem, 'Niagara' (Andropogon gerardi, 'Niagara')
8.0%	Switchgrass, 'Carthage', NC Ectype (Panicum virgatum, 'Carthage', NC Ectype)
5.0%	Partridge Pea, PA Ectype (Chamaecrista fasciculata (Cassia f.), PA Ectype)
4.0%	Autumn Bentgrass, PA Ectype (Agrostis perennans, PA Ectype)
4.0%	Blue Vervain, PA Ectype (Verbena hastata, PA Ectype)
3.0%	Blackeyed Susan, Coastal Plain NC Ectype (Rudbeckia hirta, Coastal Plain NC Ectype)
3.0%	Oxeye Sunflower, PA Ectype (Helioopsis helianthoides, PA Ectype)
2.3%	New England Aster, PA Ectype (Aster novae-angliae (Symphyotrichum n.), PA Ectype)
2.0%	Soft Rush (Juncus effusus)
1.0%	Boneset, PA Ectype (Eupatorium perfoliatum, PA Ectype)
1.0%	Joe Pye Weed, PA Ectype (Eupatorium fistulosum, PA Ectype)
1.0%	Blue False Indigo, Southern WV Ectype (Baptisia australis, Southern WV Ectype)
1.0%	New York Ironweed, PA Ectype (Vernonia noveboracensis, PA Ectype)
0.5%	Great Blue Lobelia, PA Ectype (Lobelia siphilitica, PA Ectype)
0.5%	Wild Bergamot, PA Ectype (Monarda fistulosa, PA Ectype)
0.2%	Grassleaf Goldenrod, PA Ectype (Euthamia graminifolia (Solidago g.), PA Ectype)

PERMANENT SEED MIXTURES COOL & WARM SEASON GRASSES

HAYFIELDS

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Orchardgrass	<i>Dactylis glomerata</i>	4.0	60.0	40
Timothy	<i>Phleum pratense</i>	2.0	60.0	40
Ladino White Clover	<i>Trifolium repens latum</i>	0.8	15.0	10
Red Clover	<i>Trifolium pratense</i>	2.4	15.0	10
Total	--	9.2	150.0	100

PASTURES

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Timothy	<i>Phleum pratense</i>	0.5	15.0	25%
Perennial Ryegrass	<i>Lolium perenne</i>	2.3	12.0	20%
Red Top	<i>Agrostis gigantea</i>	0.1	9.0	15%
Italian Ryegrass	<i>Festulolium</i>	1.7	9.0	15%
Alsike Clover	<i>Trifolium hybridum</i>	0.6	9.0	15%
Ladino White Clover	<i>Trifolium repens latum</i>	0.3	6.0	10%
Total	--	5.5	60.0	100%

SLOPING/FORESTED LAND

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Sideoats Grama	<i>Bouteloua curtipendula</i>	1.4	6.0	10%
Little Bluestem	<i>Schizachyrium scoparium</i>	1.0	6.0	10%
Switchgrass	<i>Panicum virgatum</i>	1.3	12.0	20%
Timothy	<i>Phleum pratense</i>	0.4	12.0	20%
Virginia Wildrye	<i>Elymus virginicus</i>	4.24	7.2	12%
Deertongue	<i>Dichanthelium clandestinum</i>	0.7	6.0	10%
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.1	2.4	4%
White Clover	<i>Trifolium repens</i>	0.1	2.4	4%
Oxeye Sunflower	<i>Helioipsis helianthoides</i>	0.8	1.8	3%
Partridge Pea	<i>Chamaecrista fasciculata</i>	1.7	2.4	4%
Purple Coneflower	<i>Echinacea purpurea</i>	0.7	1.8	3%
Total	--	12.3	60.0	100%

DROUGHT/ROCKY SITES

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Little Bluestem	<i>Schizachyrium scoparium</i>	1.5	9.0	15%
Timothy	<i>Phleum pratense</i>	0.3	9.0	15%
Prairie Junegrass	<i>Koeleria macrantha</i>	0.1	6.0	10%
Deertongue	<i>Dichanthelium clandestinum</i>	1.0	9.0	15%
Sideoats Grama	<i>Bouteloua curtipendula</i>	2.7	12.0	20%
Virginia Wildrye	<i>Elymus virginicus</i>	3.5	6.0	10%
Partridge Pea	<i>Chamaecrista fasciculata</i>	2.1	3.0	5%
Ladino White Clover	<i>Trifolium repens latum</i>	0.2	3.0	5%
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	0.6	3.0	5%
Total	--	12.0	60.0	100%

NON-AGRICULTURAL MEADOWS

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Virginia Wildrye	<i>Elymus virginicus</i>	5.3	9.0	15%
Little Bluestem	<i>Schizachyrium scoparium</i>	1.5	9.0	15%
Sideoats Grama	<i>Bouteloua curtipendula</i>	2.1	9.0	15%
Deertongue	<i>Dichanthelium clandestinum</i>	1.0	9.0	15%
Partridge Pea	<i>Chamaecrista fasciculata</i>	4.2	6.0	10%
Oxeye Sunflower	<i>Helioopsis helianthoides</i>	1.3	3.0	5%
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	1.2	6.0	10%
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.1	3.0	5%
Butterfly Milkweed	<i>Asclepias tuberosa</i>	5.2	6.0	10%
Total	--	21.8	60.0	100%

NATIVE NON-NATIVE FOOD PLOT MIX

Common Name	Scientific Name	PLS/acre	PLS/sq ft	% of Mix
Timothy	<i>Phleum pratense</i>	0.4	12.0	20%
Upland Bent Grass	<i>Agrostis perennans</i>	0.1	9.0	15%
Virginia Wildrye	<i>Elymus virginicus</i>	5.3	9.0	15%
White Clover	<i>Trifolium repens</i>	0.5	9.0	15%
Ladino White Clover	<i>Trifolium repens latum</i>	0.7	12.0	20%
Crimson Clover	<i>Trifolium incarnatum</i>	3.5	9.0	15%
Total	--	10.4	60.0	100%

POLLINATOR MIX (TO BE ADDED TO ANY MIX UPON LANDOWNER REQUEST)

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Butterfly Milkweed	<i>Asclepias tuberosa</i>	2.6	3.0	15%
Purple Coneflower	<i>Echinacea purpurea</i>	1.1	3.0	15%
Dense Blazing Star	<i>Liatris spicata</i>	0.7	2.0	10%
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	0.4	2.0	10%
Blackeyed Susan	<i>Rudbeckia hirta</i>	0.1	3.0	15%
Oxeye Sunflower	<i>Helioopsis</i>	1.3	3.0	15%
Wild Bergamot	<i>Monarda fistulosa</i>	0.1	2.0	10%
Hoary Mountainmint	<i>Pycnanthemum</i>	0.0	2.0	10%
Total	--	6.3	20.0	100%

BRASSICA MIX

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Bonar (Rape)	<i>Brassica napus</i>	2.7	6.6	33%
Turnip	<i>Brassica rapa</i>	12.9	6.6	33%
Nitro Radish	<i>Raphanus</i>	11.8	6.8	34%
Total	--	27.4	20.0	100%

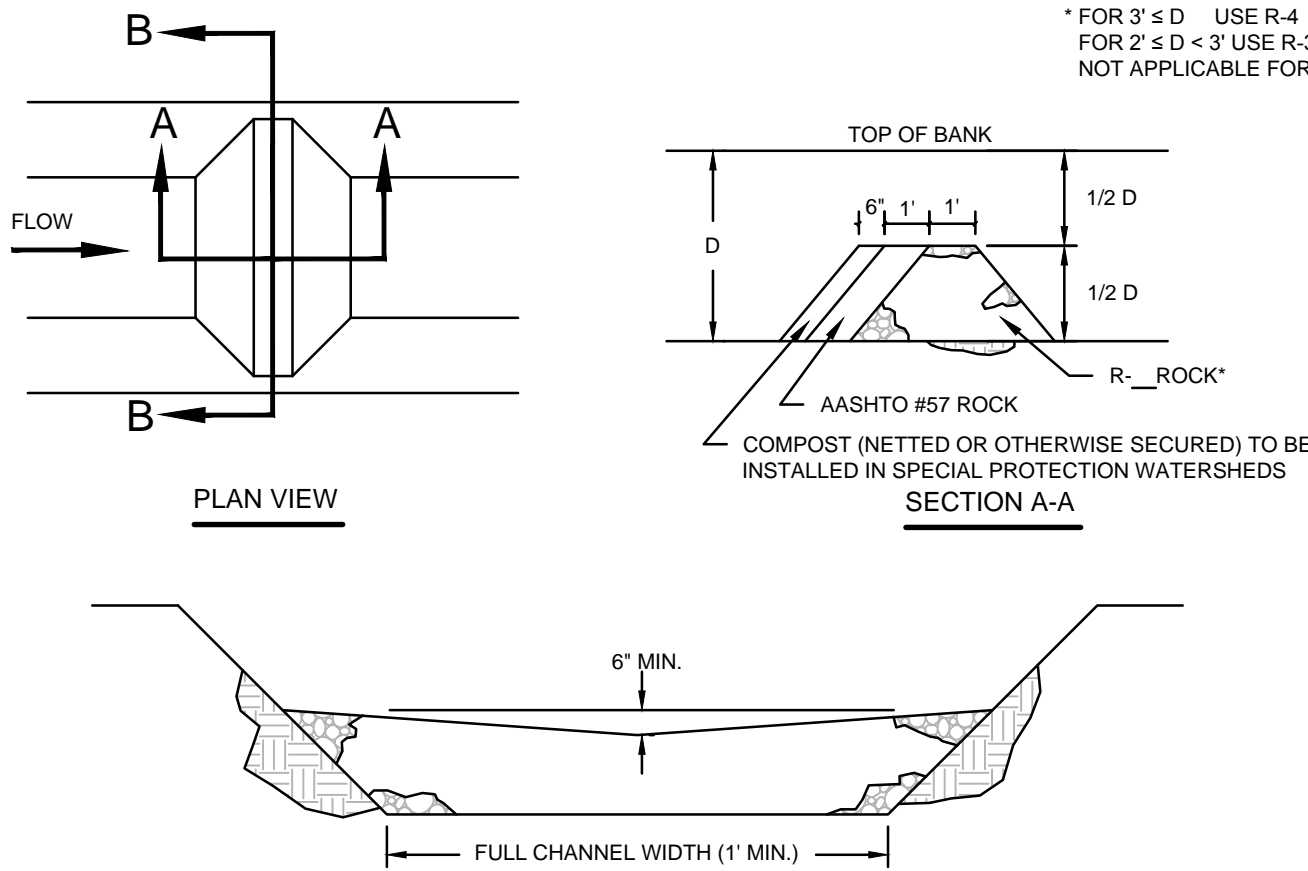
MULCH

1. MULCHES SHOULD BE APPLIED AT THE RATES SHOWN IN TABLE 11.6
2. STRAW AND HAY MULCH SHOULD BE ANCHORED OR TACKIFIED IMMEDIATELY AFTER APPLICATION TO PREVENT BEING WINDBLOWN. A TRACTOR-DRAWN IMPLEMENT MAY BE USED TO "CRIMP" THE STRAW OR HAY INTO THE SOIL – ABOUT 3 INCHES. THIS METHOD SHOULD BE LIMITED TO SLOPES NO STEEPER THAN 3H:1V. THE MACHINERY SHOULD BE OPERATED ON THE CONTOUR. CRIMPING OF HAY OR STRAW BY RUNNING OVER IT WITH TRACKED MACHINERY IS NOT RECOMMENDED.
3. POLYMERIC AND GUM TACKIFIERS MIXED AND APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS MAY BE USED TO TACK MULCH. AVOID APPLICATION DURING RAIN AND ON WINDY DAYS. A 24-HOUR CURING PERIOD AND A SOIL TEMPERATURE HIGHER THAN 45°F ARE TYPICALLY REQUIRED. APPLICATION SHOULD GENERALLY BE HEAVIEST AT EDGES OF SEEDED AREAS AND AT CRESTS OF RIDGES AND BANKS TO PREVENT LOSS BY WIND. THE REMAINDER OF THE AREA SHOULD HAVE BINDER APPLIED UNIFORMLY. BINDERS MAY BE APPLIED AFTER MULCH IS SPREAD OR SPRAYED INTO THE MULCH AS IT IS BEING BLOWN ONTO THE SOIL. APPLYING STRAW AND BINDER TOGETHER IS GENERALLY MORE EFFECTIVE.
4. SYNTHETIC BINDERS, OR CHEMICAL BINDERS, MAY BE USED AS RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH PROVIDED SUFFICIENT DOCUMENTATION IS PROVIDED TO SHOW THEY ARE NON-TOXIC TO NATIVE PLANT AND ANIMAL SPECIES.
5. MULCH ON SLOPES 8% OR STEEPER SHOULD BE HELD IN PLACE WITH NETTING. LIGHTWEIGHT PLASTIC, FIBER, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. SHREDDED PAPER HYDROMULCH SHOULD NOT BE USED ON SLOPES STEEPER THAN 5%. WOOD FIBER HYDROMULCH MAY BE APPLIED ON STEEPER SLOPES PROVIDED A TACKIFIER IS USED. THE APPLICATION RATE FOR ANY HYDROMULCH SHOULD BE 2,000 LB/ACRE AT A MINIMUM.
7. HYDRAULICALLY APPLIED BLANKETS CAN BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. THEY MAKE USE OF A CROSS-LINKED HYDROCOLLOID TACKIFIER TO BOND THERMALLY PROCESSED WOOD FIBERS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS. IN ANY CASE, MANUFACTURER'S RECOMMENDATIONS SHOULD BE FOLLOWED. SHOULD NOT BE USED IN AREAS OF CONCENTRATED FLOW (E.G. SWALES).
8. NO MULCH MAY BE APPLIED IN WETLANDS.

TABLE 11.6				
MULCH APPLICATION RATES				
MULCH TYPE	APPLICATION RATE (MIN.)			NOTES
	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YD.	
STRAW	3 TONS	140 LB.	1,240 LB.	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
WOOD CHIPS	4–6 TONS	185–275 LB.	1,650–2,500 LB.	MAY PREVENT GERMINATION OF GRASSES AND LEGUMES
HYDRO– MULCH	1 TON	47 LB.	415 LB.	SEE LIMITATIONS ABOVE
HYDRAULICALLY APPLIED BLANKETS	3,000 LB.	N/A	N/A	SLOPES UP TO 3H:1V
	4,000 LB.	N/A	N/A	SLOPES STEEPER THAN 3H:1V

OPERATIONS AND MAINTENANCE PROGRAM PERMANENT STORMWATER FACILITIES

THE PERMIT APPLICANT SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF PERMANENT STORMWATER FACILITIES LOCATED ON THE SUBJECT PROPERTIES. PERMANENT MAINTENANCE OF THE STORM SYSTEM AFTER ACCEPTANCE WILL PRIM



ROCK FILTER NO.	LOCATION	D (FT.)	RIPRAP SIZE
ALL	ACCESS ROADS AS NECESSARY	2	R-3

- NOTES:
- SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF THE FILTER.
 - IMMEDIATELY UPON STABILIZATION OF EACH CHANNEL, INSTALLER SHALL REMOVE ACCUMULATED SEDIMENT, REMOVE ROCK FILTER, AND STABILIZE DISTURBED AREAS.
 - IN SPECIAL PROTECTION WATERSHEDS, HQ OR EV, THE ANTIDEGRADATION BEST AVAILABLE COMBINATION OF TECHNOLOGIES (ABACT) ROCK FILTER WITH THE 6" LAYER OF COMPOST ANCHORED ON TOP OF THE UPSLOPE SIDE OF THE AASHTO #57 STONE SHALL BE USED. IN NON-SPECIAL PROTECTION WATERSHEDS, THE COMPOST LAYER MAY BE OMITTED.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(ARF) ABACT ROCK FILTER

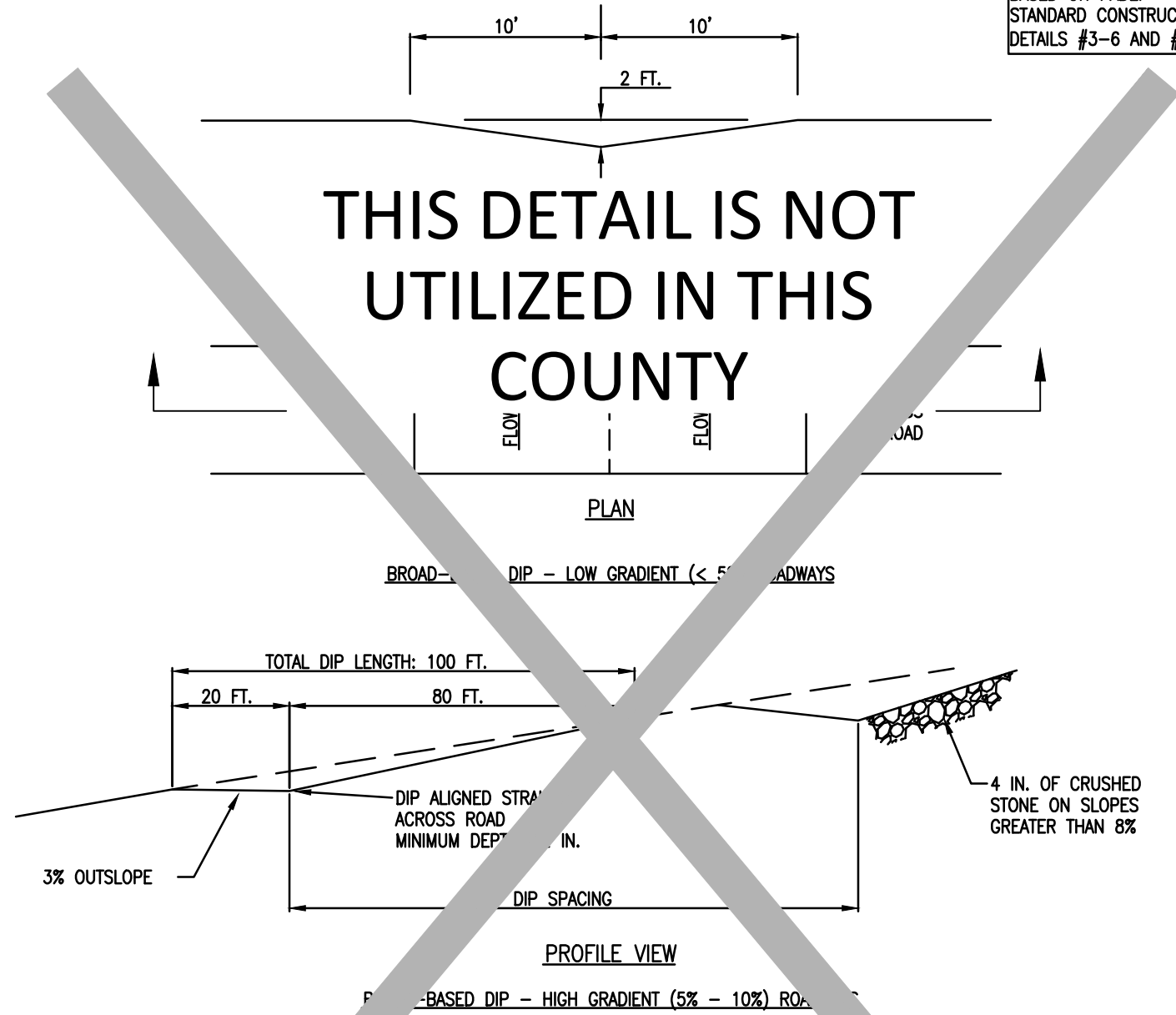
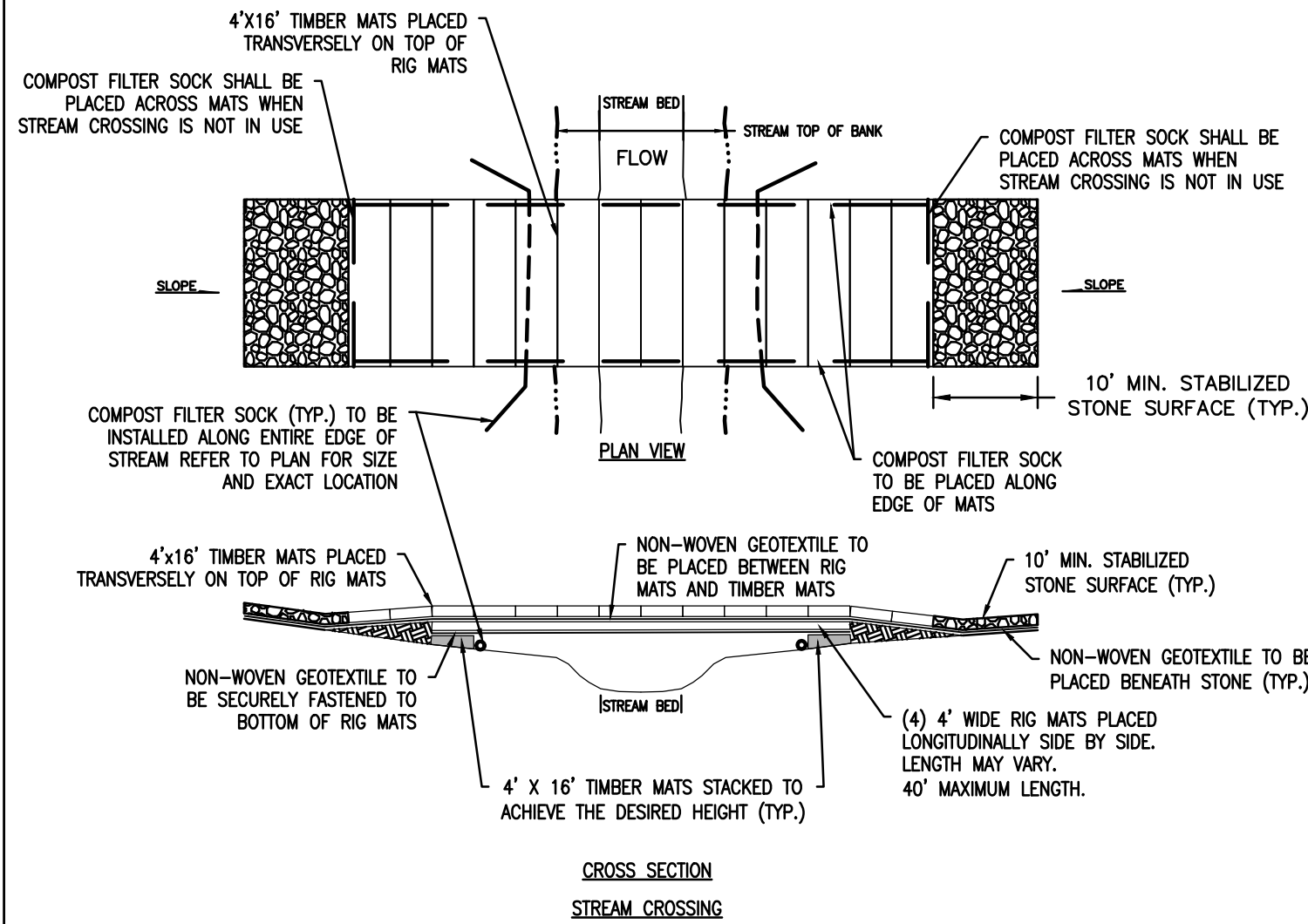


TABLE 3.2 - MAXIMUM SPACING OF BROAD-BASED DIPS

PERCENT SPACING BETWEEN BROAD-BASED DIPS (FT)	MAXIMUM SPACING (FT)
1	300
2	235
4	200
5	180
6	165
7	155
8	145
9	135
10	140

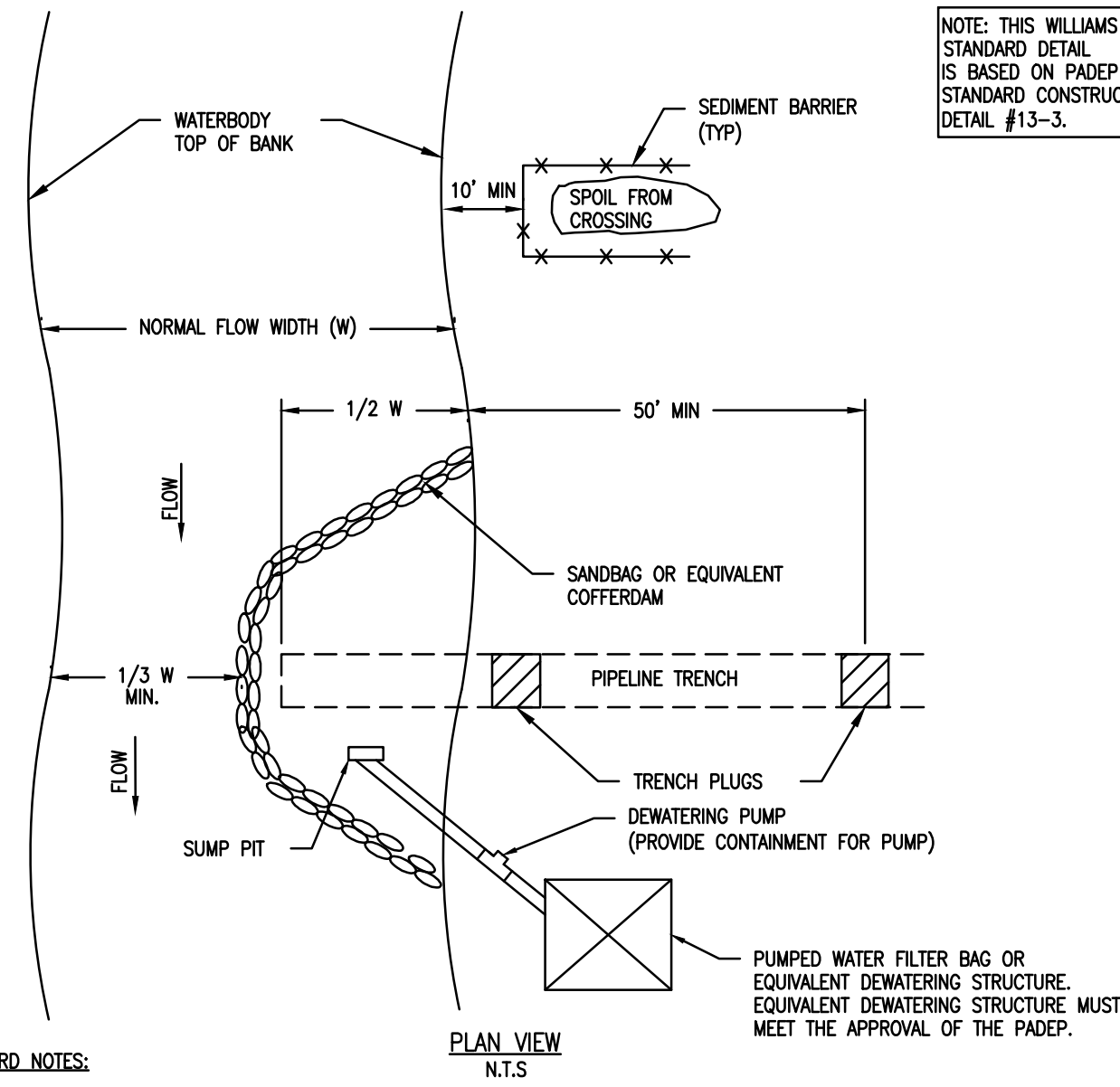
- NOTES:
- BROAD-BASED DIPS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN AND AT THE LOCATIONS SHOWN IN THE PLAN DRAWINGS.
 - DIPS SHALL BE ORIENTED SO AS TO DISCHARGE TO THE LOW SIDE OF THE ROADWAY.
 - DIPS SHALL BE INSPECTED DAILY. DAMAGED OR NON-FUNCTIONING DIPS SHALL BE REPAIRED AT THE END OF THE WORKDAY.
 - MAXIMUM SPACING OF BROAD-BASED DIPS SHALL BE AS SHOWN IN TABLE 3.2.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(BBD) BROAD-BASED DIP



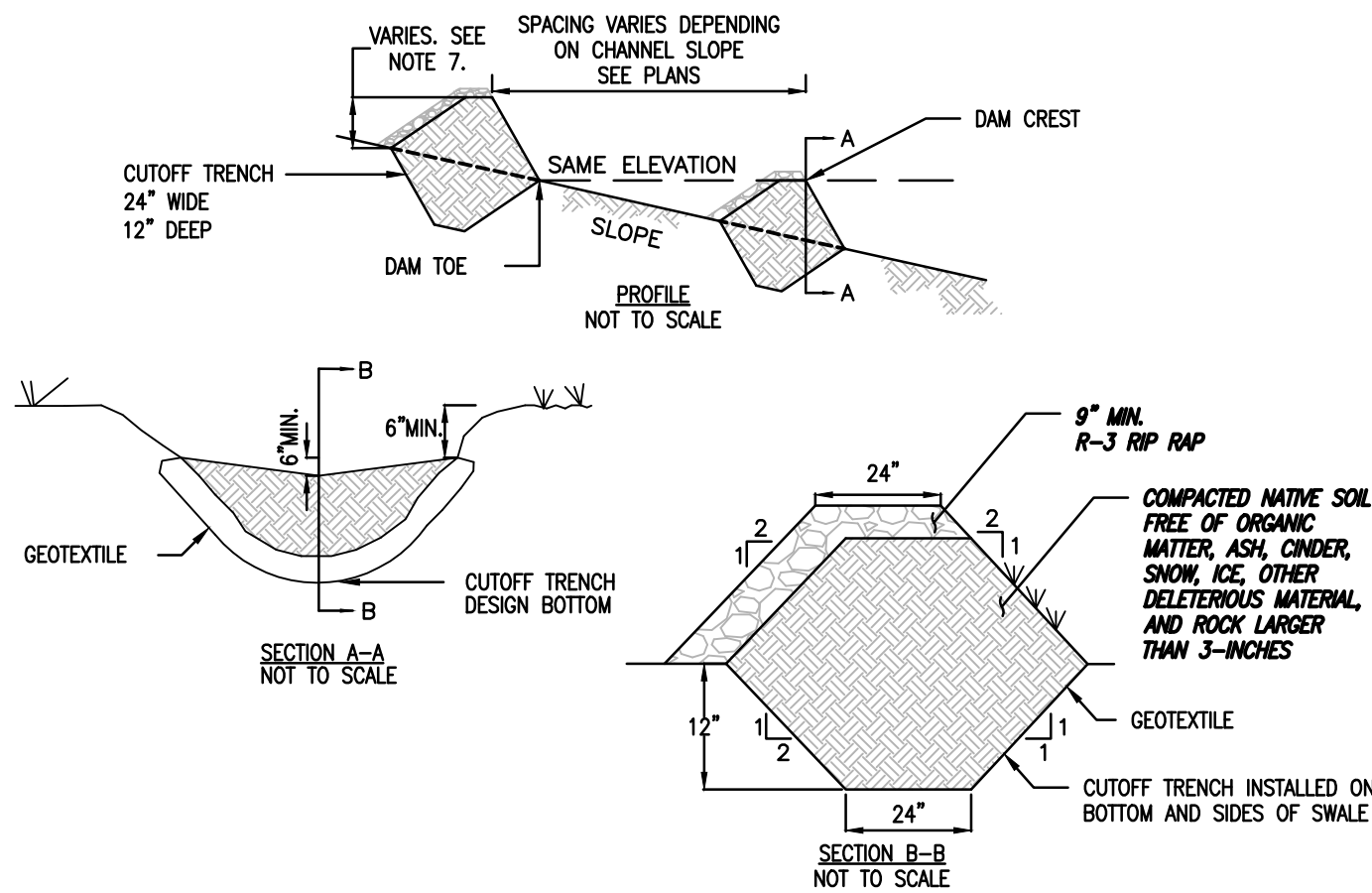
- NOTES:
- ALL STONE SURFACES ASSOCIATED WITH TEMPORARY EQUIPMENT CROSSINGS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
 - ANY SEDIMENT TRACKED ONTO THE TIMBER MATS SHALL BE IMMEDIATELY REMOVED AND EVENLY DISPERSED UPSLOPE OF A PROPERLY FUNCTIONING COMPOST FILTER SOCK.
 - THE CONTRACTOR HAS THE OPTION TO INSTALL A PIPE OR JERSEY BARRIER (IF NEEDED) OUTSIDE OF BASE FLOW OF STREAM CHANNEL FOR ADDITIONAL SUPPORT.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(BEC) BRIDGE EQUIPMENT CROSSING



- PADEP STANDARD NOTES:
- GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF TOP-OF-BANK UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION.
 - TRENCH PLUG SHALL BE INSTALLED WITHIN THE TRENCH ON BOTH SIDES OF THE WATERBODY CHANNEL.
 - WATER ACCUMULATING WITHIN THE WORK AREA SHALL BE PUMPED TO A PUMPED WATER FILTER BAG OR SEDIMENT TRAP PRIOR TO DISCHARGING INTO ANY SURFACE WATER.
 - HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF WATERBODY BANK.
 - ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM THE WATERBODY CROSSING AREA.
 - ALL DISTURBED AREAS WITHIN 50 FEET OF TOP-OF-BANK SHALL BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR WATERBODIES OR 48 HOURS OF INITIAL DISTURBANCE FOR INTERMEDIATE WATERBODIES UNLESS OTHERWISE AUTHORIZED.
- WILLIAMS STANDARD NOTES:
- APPROPRIATE WATERBODY BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
 - THE WATERBODY CROSSING WILL GENERALLY BE COMPLETED IN 2 STAGES. THE DETAIL DEPICTS STAGE 1. STAGE 2 WILL GENERALLY BE COMPLETED USING THE SAME CONFIGURATION FROM THE OPPOSITE BANK.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(CD) COFFERDAM STREAM CROSSING



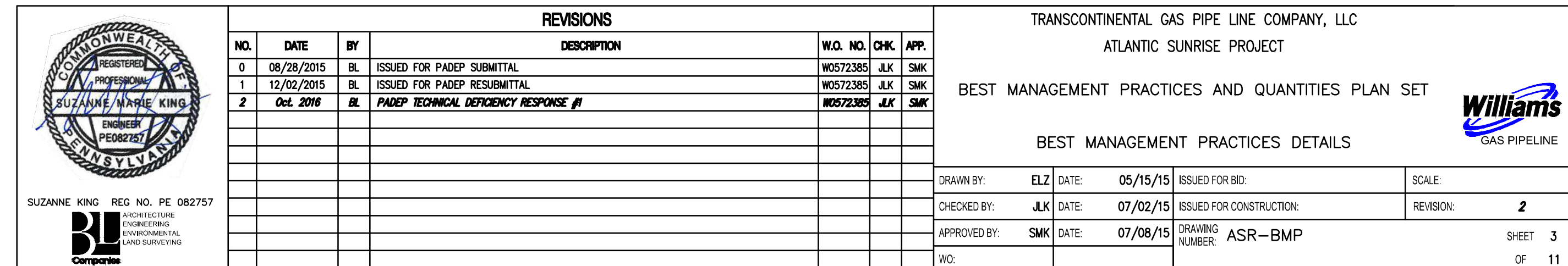
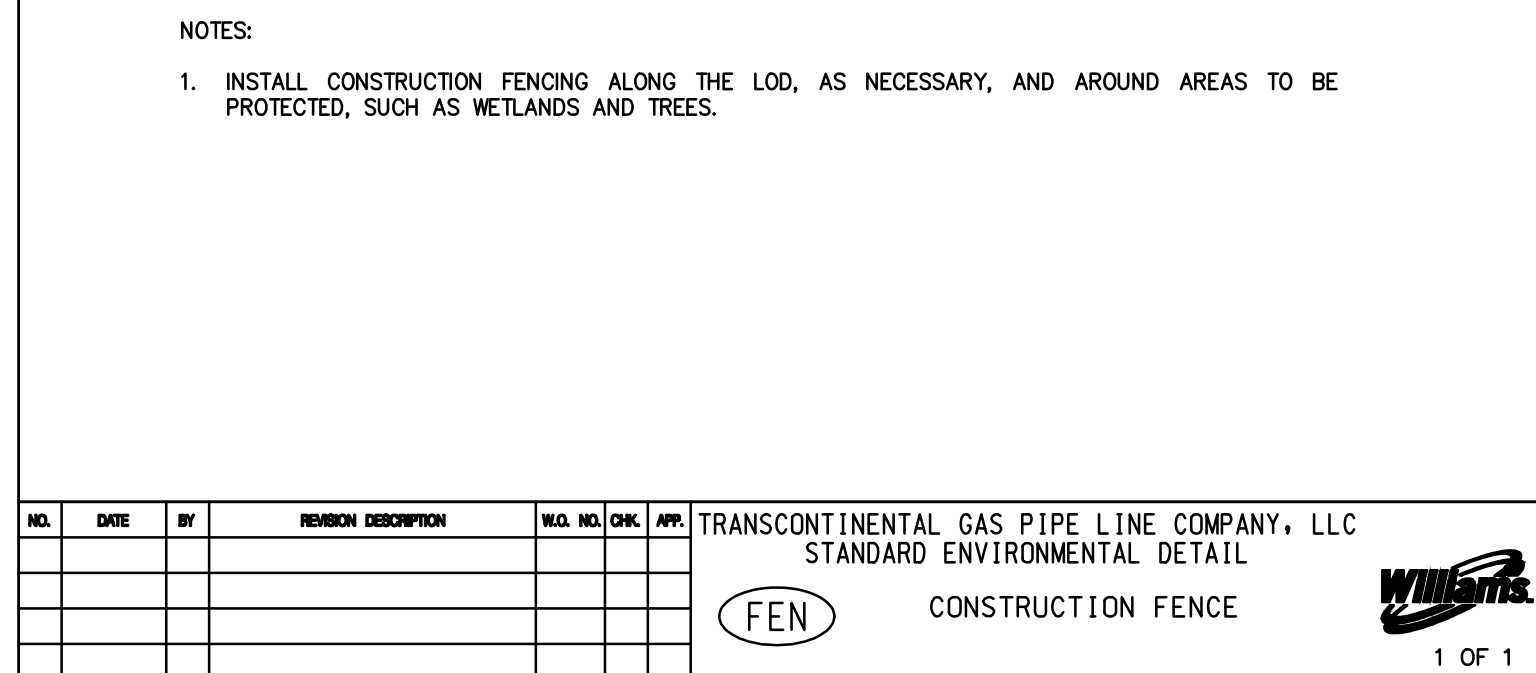
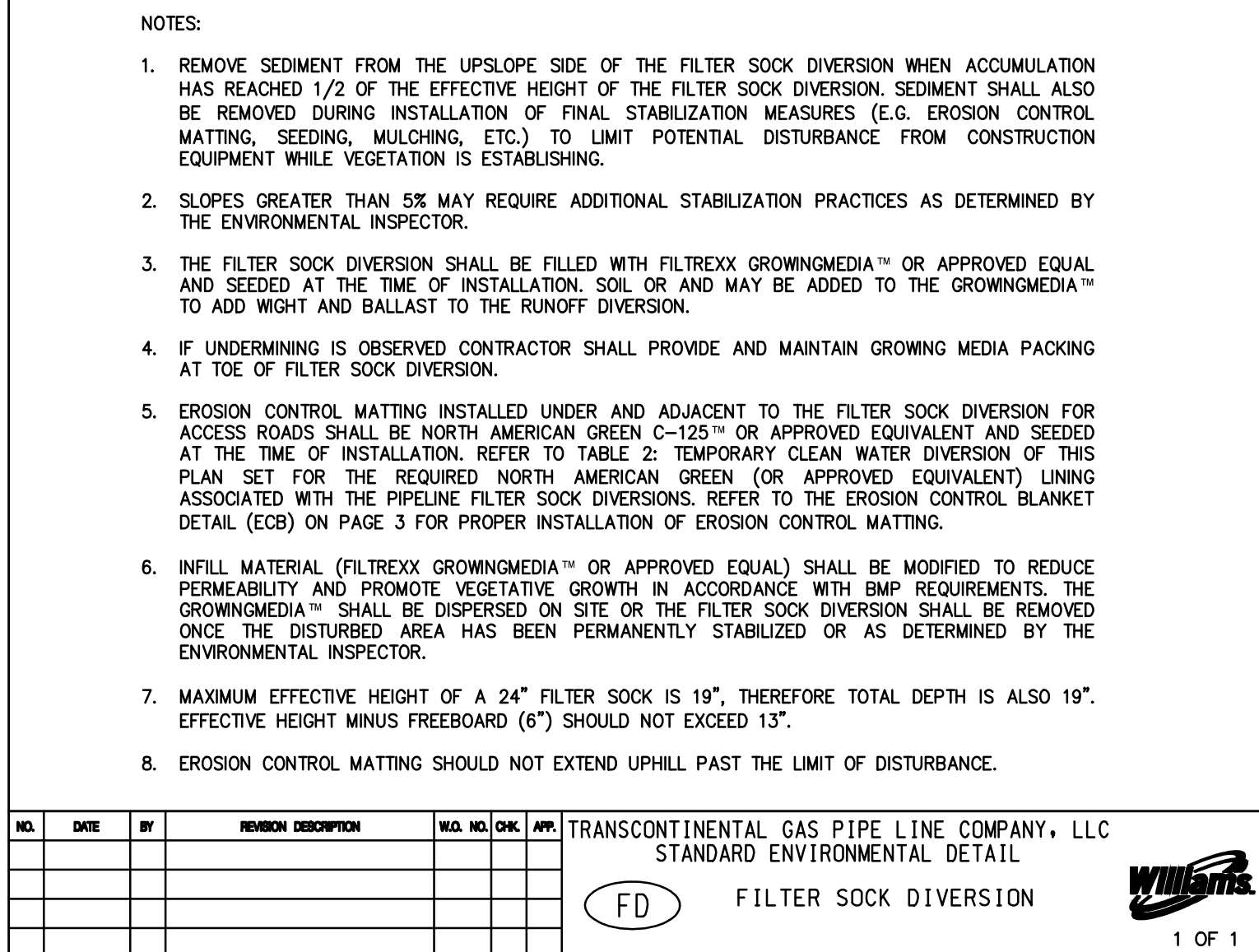
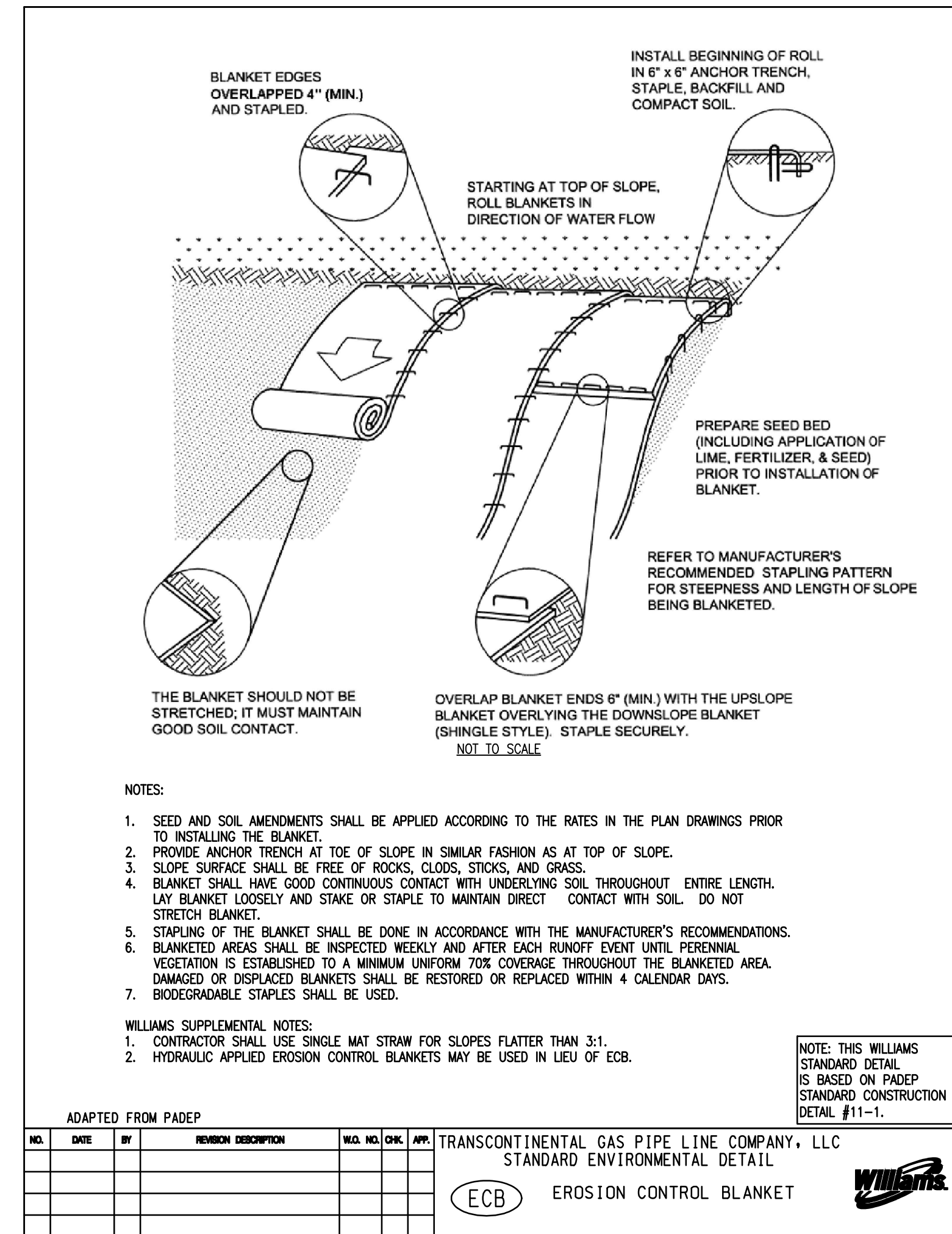
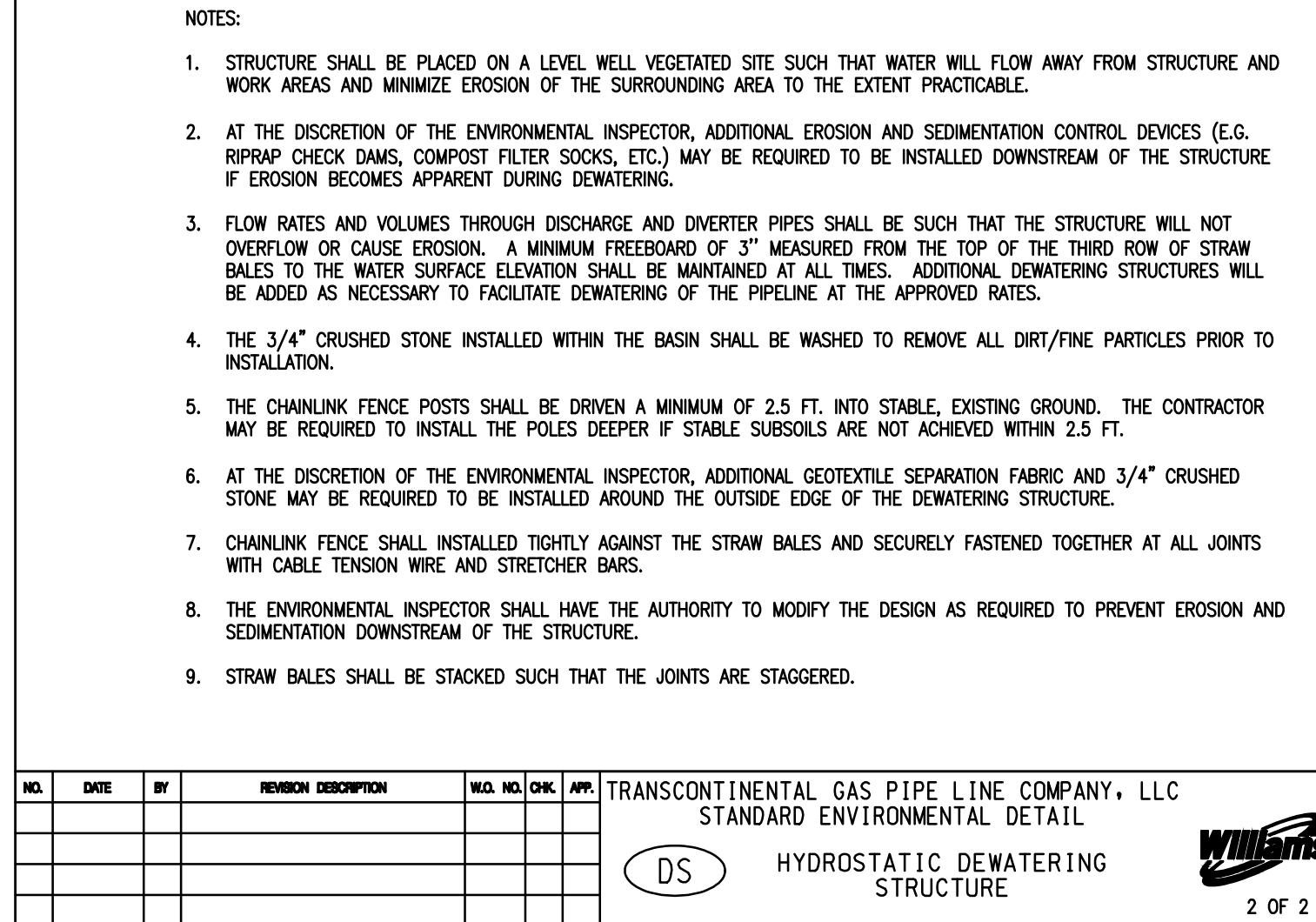
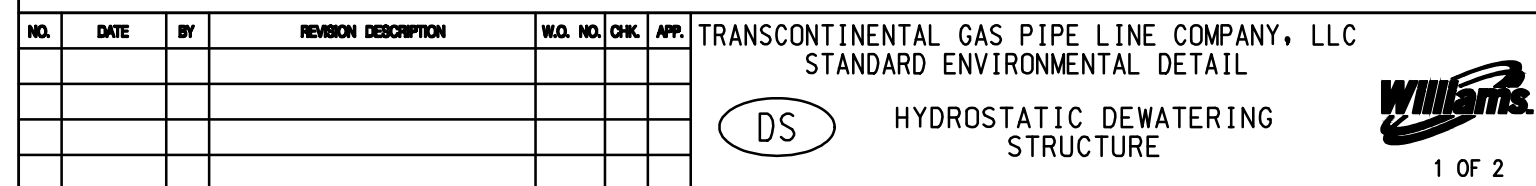
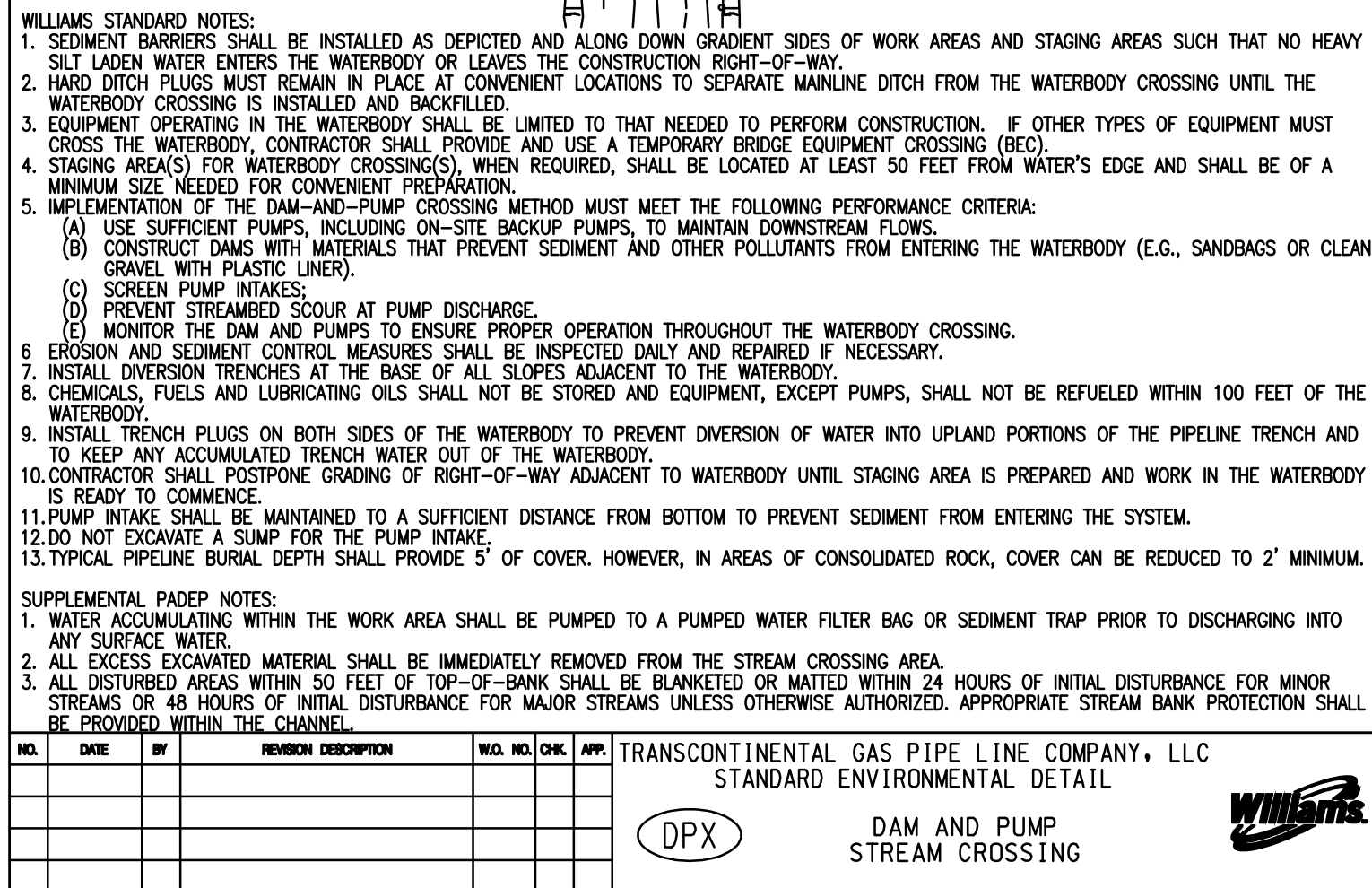
- NOTES:
- CHECK DAMS ARE APPLICABLE FOR SMALL DITCHES AND SWALES AND ARE NOT TO BE USED IN LIVE FLOWING STREAMS.
 - CHECK DAMS SHALL BE INSTALLED SUCH THAT COMPLETE COVERAGE OF THE ENTIRE WIDTH OF THE DITCH OR SWALE IS ACHIEVED.
 - SEDIMENT SHALL BE REMOVED WHEN IT ACCUMULATES TO A DEPTH OF ONE-HALF THE ORIGINAL DAM HEIGHT.
 - SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
 - INSTALL A CUTOFF TRENCH A MINIMUM OF 12 INCHES INTO THE SWALE BOTTOM AND SIDES TO PREVENT CUTTING AROUND THE DAM.
 - ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
 - THE HEIGHT OF CHECK DAMS IN SWALES ALONG ACCESS ROADS IS EQUAL TO THE DEPTH OF SWALE MINUS 6 INCHES. THE DEPTH OF SWALE IS SHOWN ON THE "SOIL EROSION CONTROL PLAN" IN THE "EROSION CONTROL AND LAYOUT PLANS FOR ACCESS ROADS" AND THE "POST CONSTRUCTION STORMWATER PLAN" IN THE "POST CONSTRUCTION STORMWATER PLAN FOR PERMANENT ACCESS ROADS" UNDER SEPARATE COVERS.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(CDM) CHECK DAM



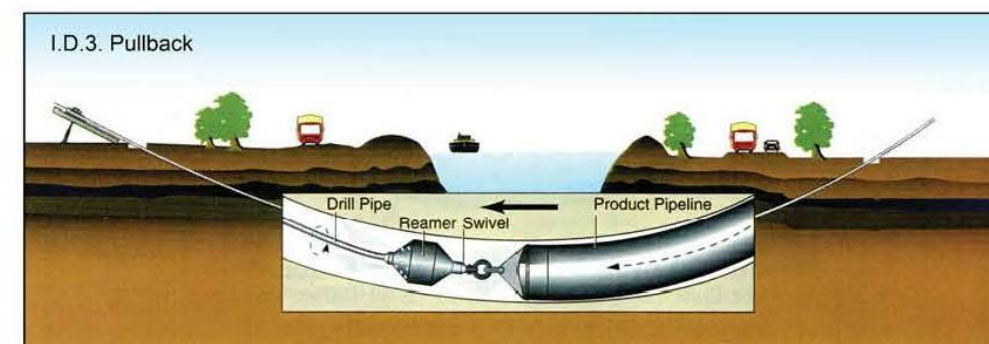
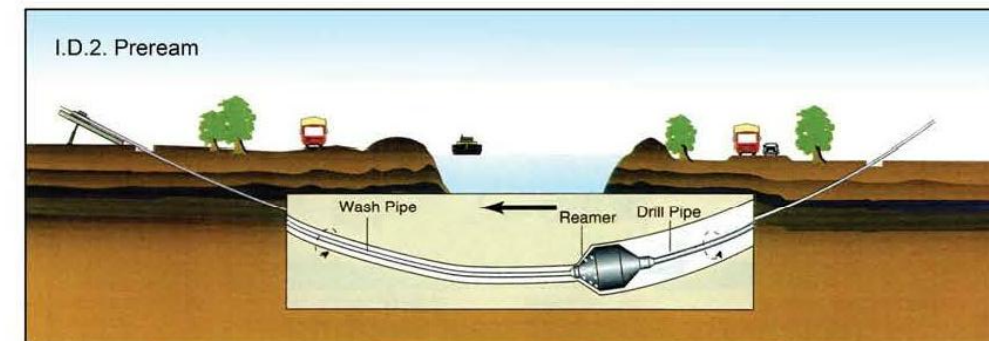
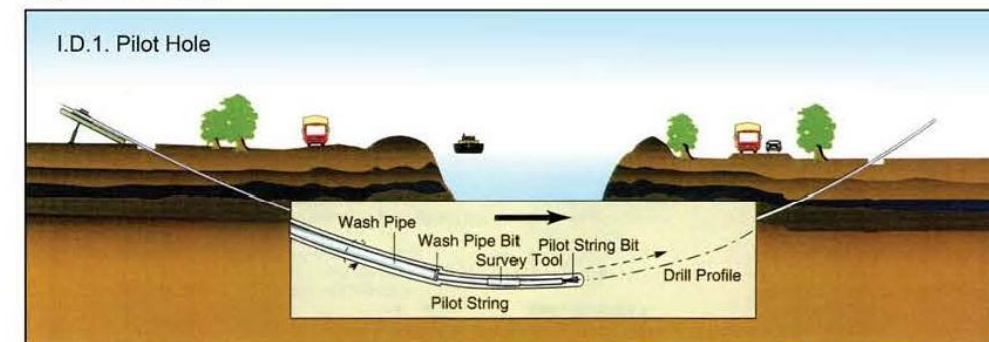
REVISIONS				W.D. NO.	CHK.	APP.
NO.	DATE	BY	DESCRIPTION	W.D. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK
2	02/04/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	AJB
3	03/28/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	AJB
4	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	AJB

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT				BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET	
BEST MANAGEMENT PRACTICES DETAILS				DRAWN BY: ELZ DATE: 05/15/15 ISSUED FOR BID: SCALE:	
				CHECKED BY: JLK DATE: 07/02/15 ISSUED FOR CONSTRUCTION: REVISION: 4	
				APPROVED BY: SMK DATE: 07/08/15 DRAWING NUMBER: ASR-BMP SHEET 1 OF 11	



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Figure 1. Technique




NO.	DATE	BY	REVISION DESCRIPTION	NO.	CHK	APP.

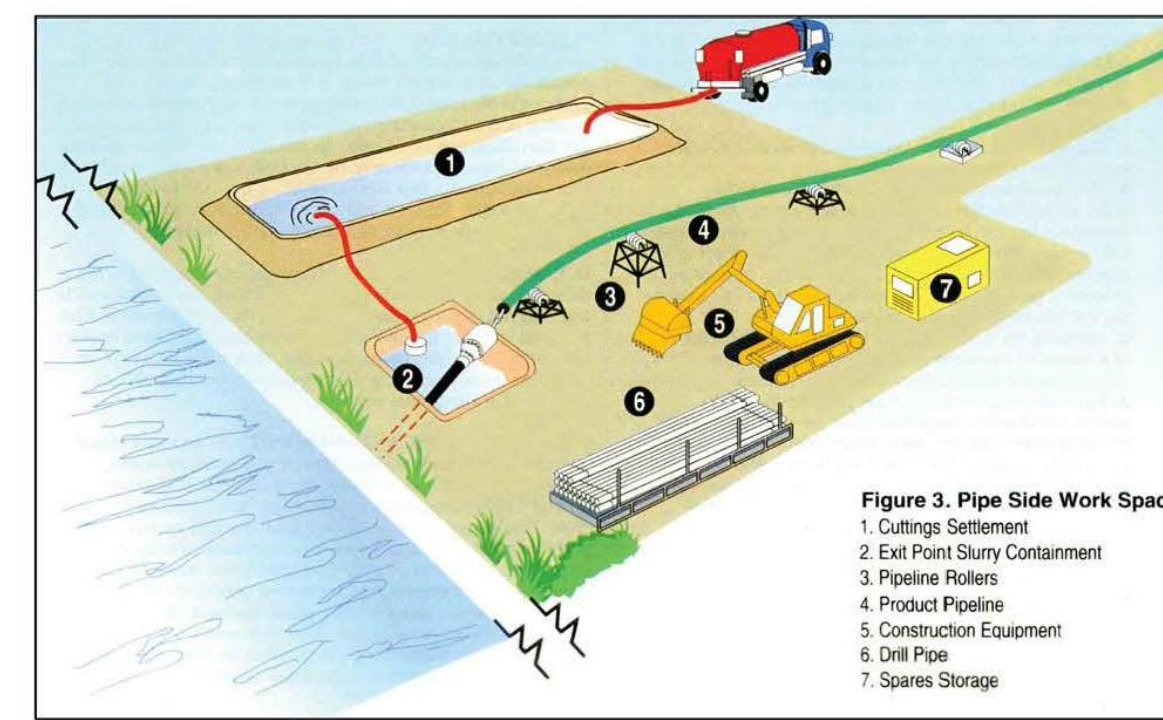
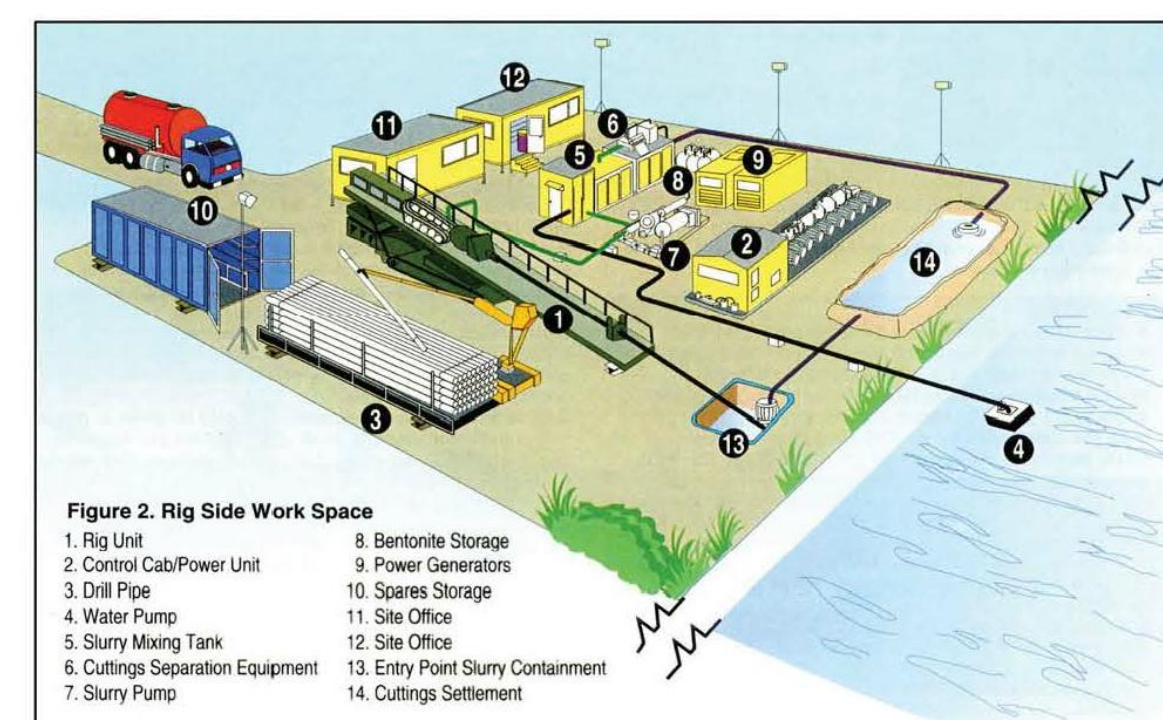
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL

HDD


HORIZONTAL DIRECTIONAL
DRILL



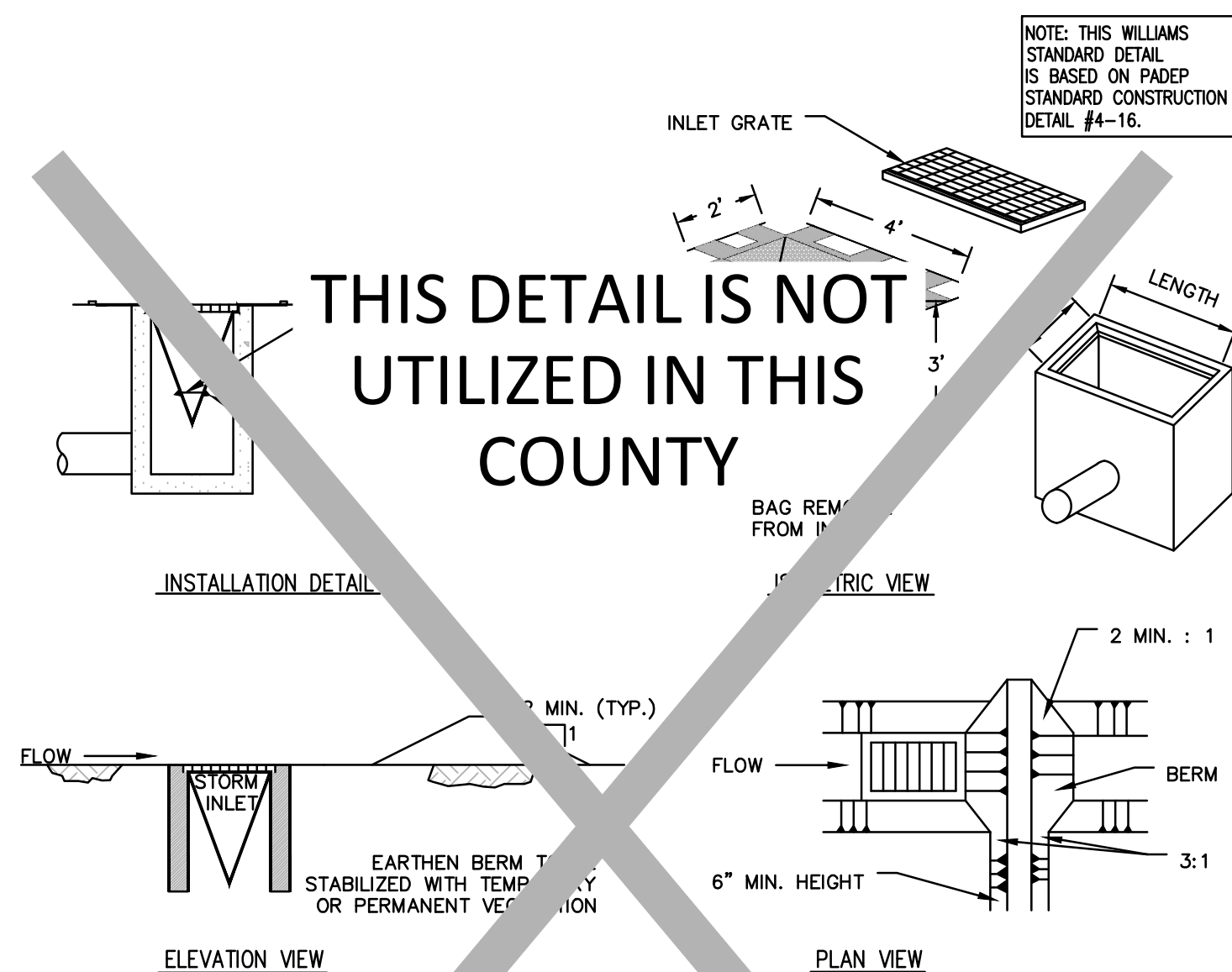
1 OF 2



NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHEK.	APP.
						TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
						(HDD) HORIZONTAL DIRECTIONAL DRILL



2 OF 2





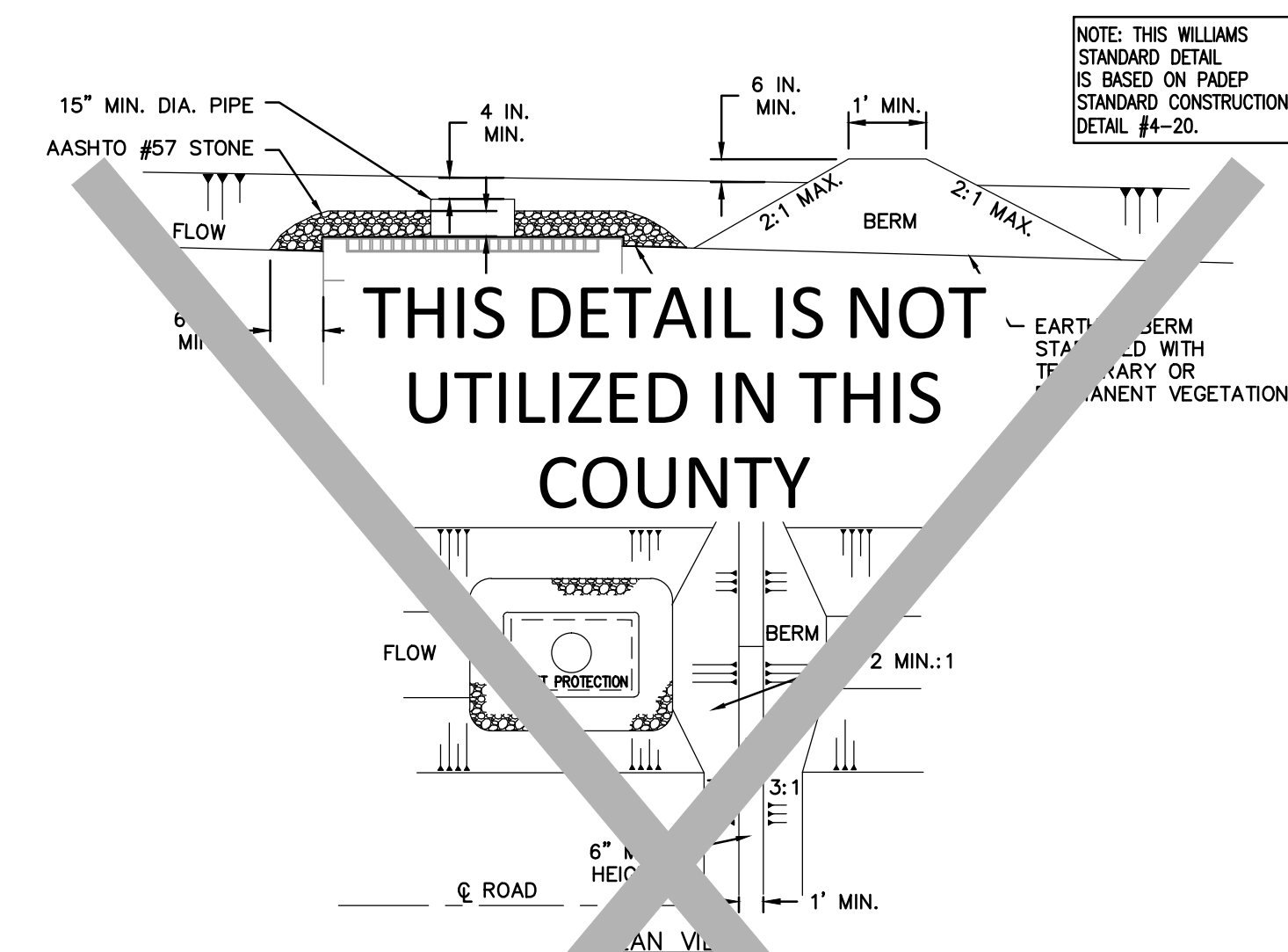
NOTES:

1. MAXIMUM DRAINAGE AREA = 1/2 Acre
2. INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN. TRAP, BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.
3. ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS MAINTAINED. ROADWAY BASE BERM SHALL BE MAINTAINED PERMANENTLY UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED. PERMANENT STABILIZATION IS COMPLETED OR REMOVED PERMANENTLY.
4. AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRASS TENSILE STRENGTH OF 120 LBS. A MINIMUM TENSILE STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING 100, 40, AND 20, sieve.
5. INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED. REPLACEMENT WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF FLOW. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR ALL ACCIDENTS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS PER ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. ALL USED BAGS ACCORDING TO THE PLAN NOTES.
6. DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

NO.	DATE	BY	REVISION DESCRIPTION	N.O.	N.D.	C.K.	A.P.P.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL


FILTER BAG INLET PROTECTION - TYPE M





NOTES


1. INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARIES TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS NOT LOCATED AT A LEAST 10 FEET FROM THE TRAP OR BASIN.
2. ROLLED EARTHEN BERM IN ROADWAY SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROLLWAY IS STONED. ROAD SUBBASE BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETE TO REMAIN PERMANENTLY.
3. STONE INLET PROTECTION BERM FOR A TYPE M INLET CAN BE USED IN ONE OF TWO MAXIMUM DRAINAGE AREA WITH 15 IN. OVERFLOW PIPE AND 4 IN. HEAD. A PERFORATED PLATE WELDED TO METAL RISER MAY BE USED TO BE SUBSTITUTED FOR THE TYPE M INLET. WELDED TO THE RISER TO BE USED IN CONJUNCTION WITH TYPE M WIRE MESH IF CALCULATIONS ARE PROVIDED TO SHOW SUFFICIENT CAPACITY OF THE INLET TO ACCEPT THE PEAK RUNOFF FOR A 2-YEAR STORM EVENT FROM THE TRIBUTARY DRAINAGE AREA. THE INLET SHALL BE AT LEAST 10 FEET FROM THE ROADWAY IF PONDED WATER COULD POSE A SAFETY HAZARD TO TRAFFIC. EARTHEN BERM SHALL BE ROLLED.
4. SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED OR LOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.
5. FLOW LINES DISCHARGING TO HQ OR EV SURFACE WATER, A 6 IN. THICK COMPOST LAYER SHALL BE PROVIDED, ANCHORED ON OUTSIDE OF STONE BERM TO STONE. COMPOST SHALL MEET THE STANDARDS IN TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

NO.	DTE	BY	REASON DESCRIPTION	NO.	CHK	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL

 STONE AND CONCRETE INLET
PROTECTION - TYPE M





SUZANNE KING REG NO. PE 082757

[illegible]

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
ATLANTIC SUNRISE PROJECT

BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET

BEST MANAGEMENT PRACTICES DETAILS

DRAWN BY:	ELZ	DATE:	05/15/15	ISSUED FOR BID:	SCALE:
CHECKED BY:	JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:	REVISION: 2
APPROVED BY:	SMK	DATE:	07/08/15	DRAWING NUMBER:	ASR-BMP
WO:					SHEET 4 OF 11



SHEET 4
OF 11

The diagram illustrates a cross-section of a geotextile underlayment system. It shows a 10 ft wide wood mat composed of multiple 4" x 4" wood members. A 3/16" galvanized steel cable is used to connect the loops of the geotextile fabric, which is placed between the wood mat and the subgrade. The cable is secured with 3/16" cable clamps. The geotextile fabric is shown with a 2 ft overlap on either side of the wood mat. The direction of travel is indicated by an arrow pointing towards the right.

All wood members are 4" x 4"

3/16" galvanized steel cable

Direction of travel

Connect loops with 3/16" cable clamps

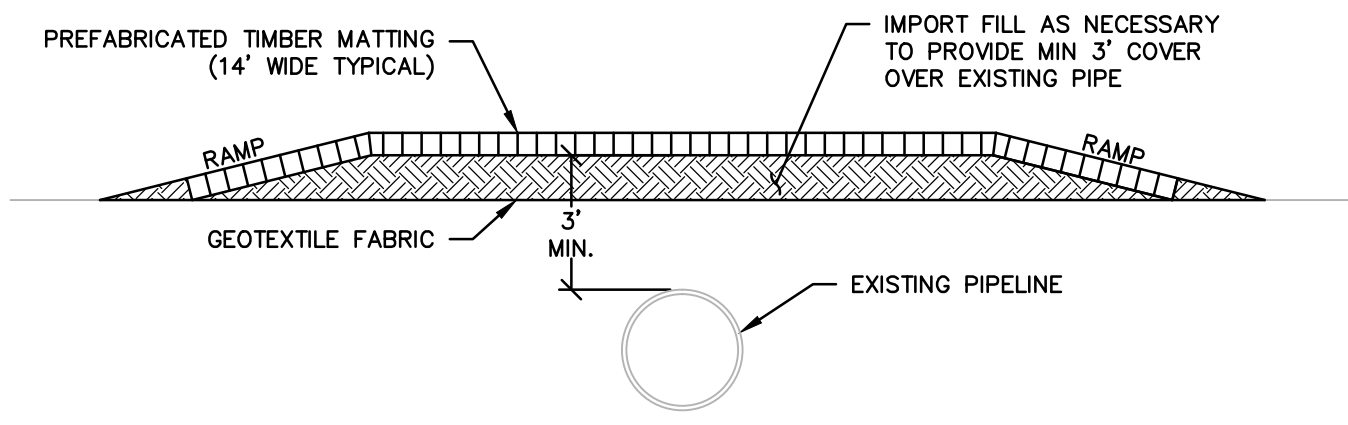
2 ft

10 ft


2 ft

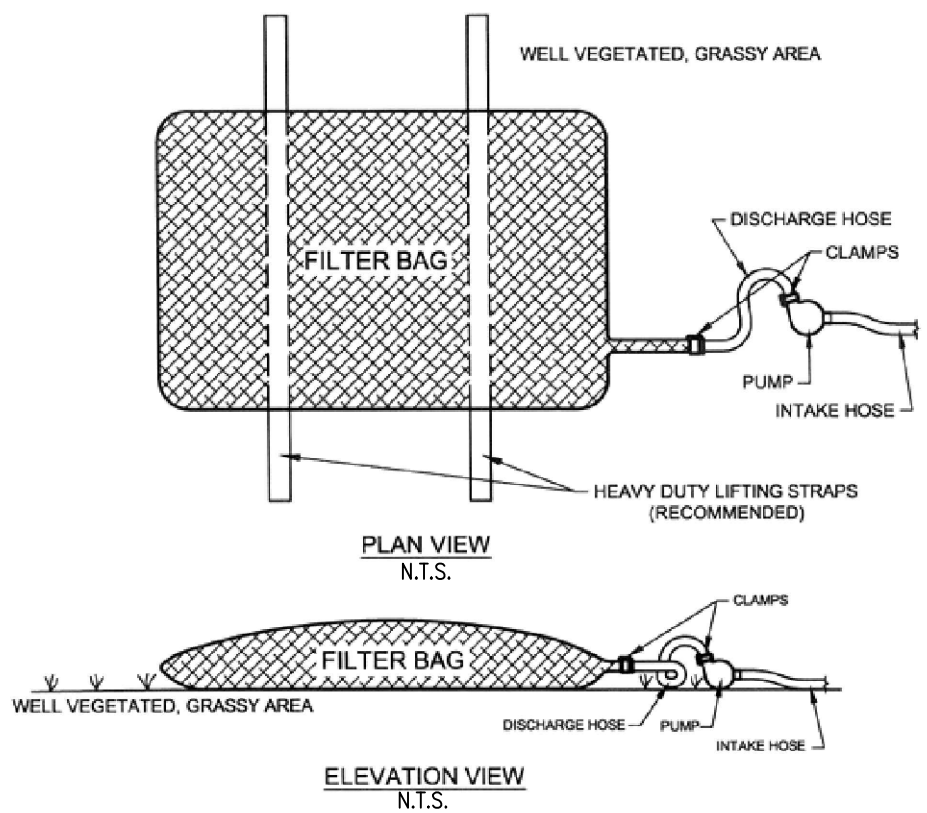
University of Minnesota FS 07009

A geotextile underlayment must be used under the wood mat.



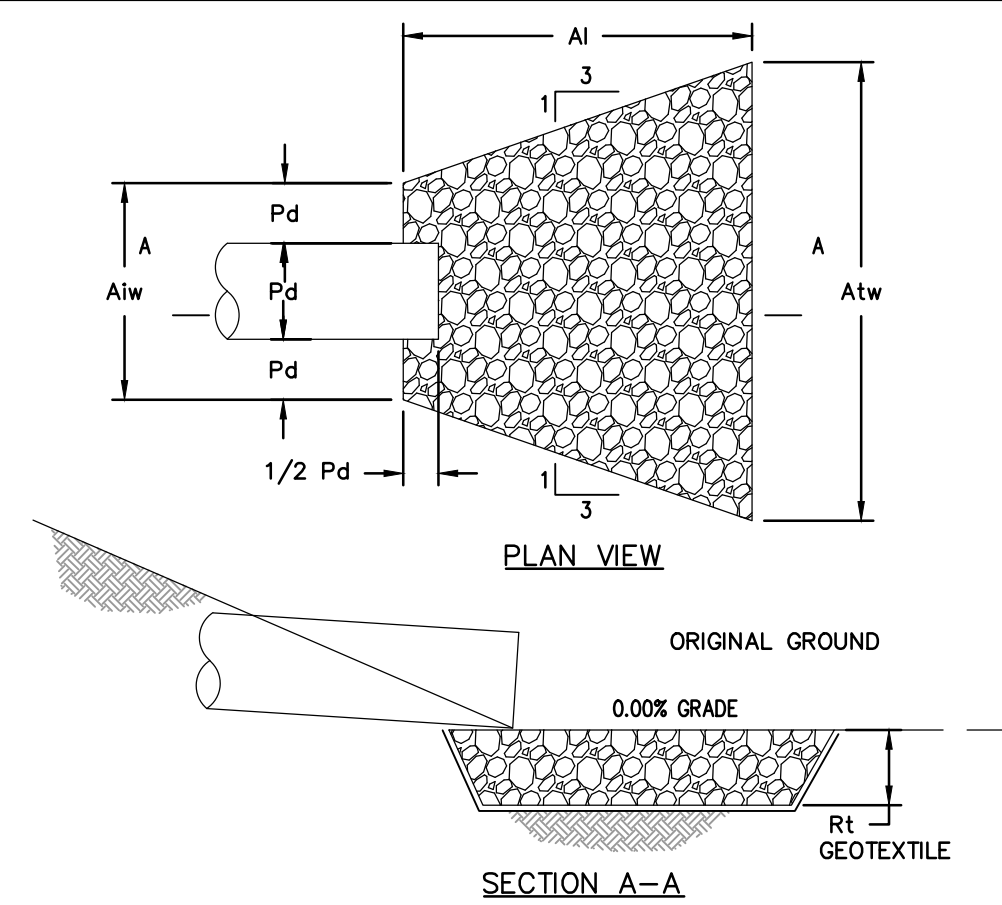
1. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE THE NUMBER OF EQUIPMENT MATS REQUIRED.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	COR.	APP.
							TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(MAT-1) TIMBER MATTING IN WETLANDS OR AT LOW POINTS
							




PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

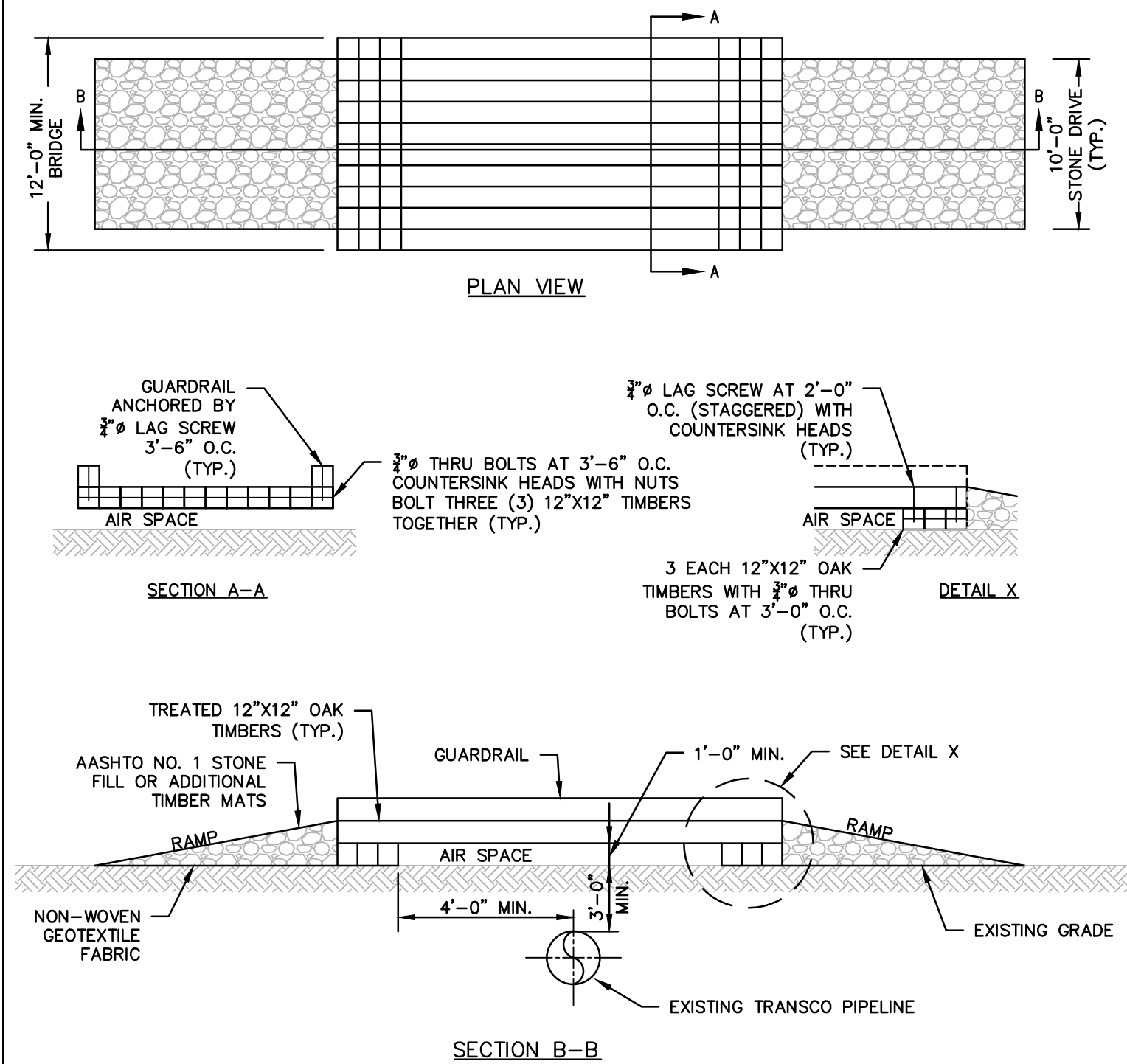
FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

[illegible]



OUTLET NO.	PIPE DIA PD (IN)	RIPRAP		APRON		
		SIZE (R--)	THICK. Rt (IN)	LENGTH Al (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH Atw (FT)
* ALL INFORMATION CAN BE FOUND ON ACCESS ROAD AND EROSION AND SEDIMENT CONTROL PLANS. REFER TO NOTES 4 AND 5 FOR DIMENSION LOCATIONS.						

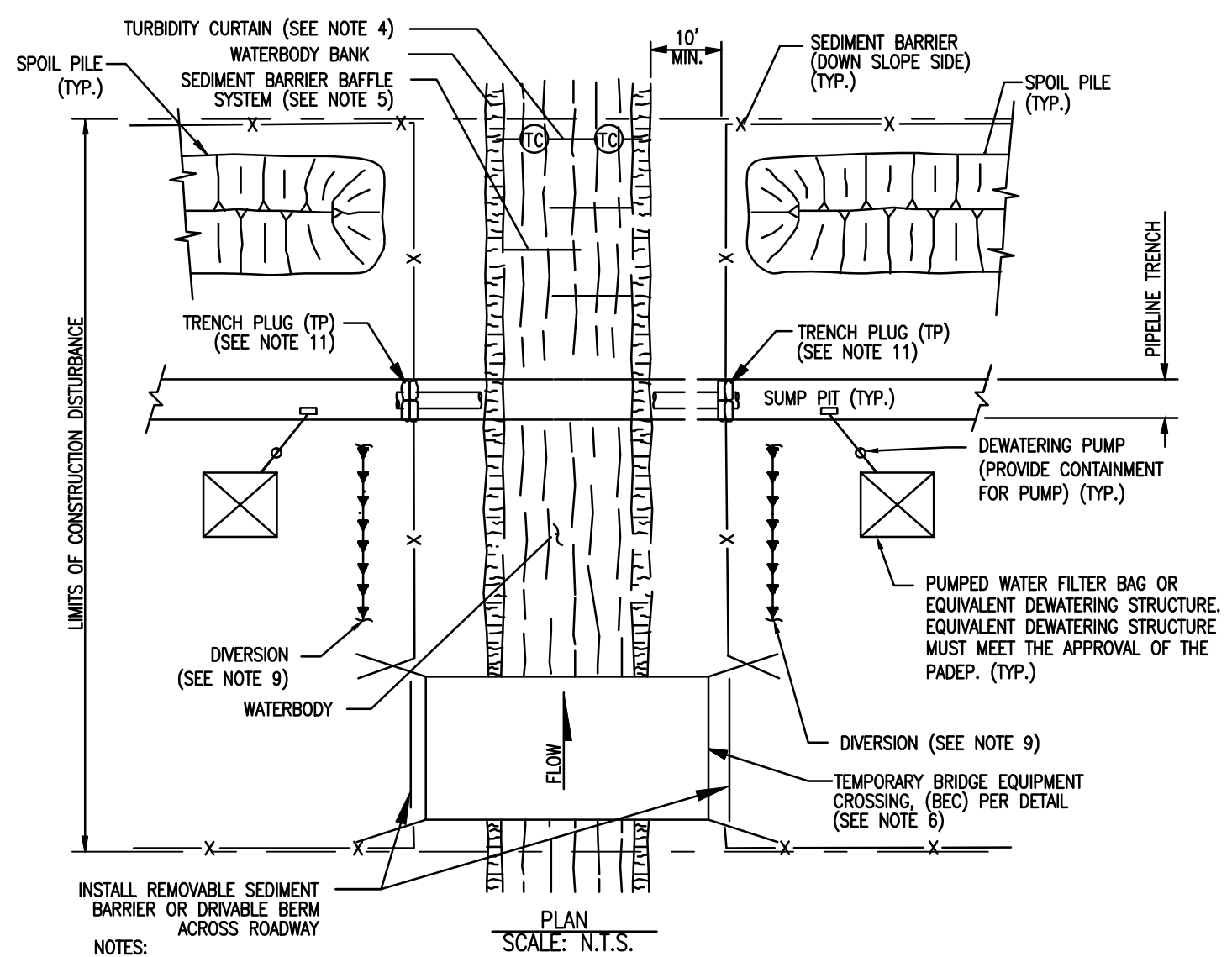
b. APRON LENGTH (Al)

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
							TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> RAD </div> RIP RAP APRON AT PIPE OUTLET WITHOUT FLARED END SECTION
							




1. IF STONE USED FOR RAMP, INSTALL 1 (ONE) LAYER OF NON-WOVEN GEOTEXTILE FABRIC PRIOR TO INSTALLING THE STONE.
2. MINIMUM WIDTH OF BRIDGE IS 12'-0" WITH A 10'-0" WIDE STONE DRIVE.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
							TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							 
							TIMBER MATTING AIR BRIDGE



1. THIS METHOD APPLIES TO MINOR WATERBODY CROSSINGS THAT ARE DEFINED AS WATERBODIES THAT ARE LESS THAN OR EQUAL TO 10 FEET AT WATER'S EDGE AT THE TIME OF CROSSING.
2. INSTALL LOG BARRIERS UPSTREAM AND DOWNSTREAM OF ANY SLOPING DOWN GRADIENT SITES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS THE WATERBODY OR LEAVES THE CROSSING RIGHT OF WAY.
3. INSTALL FILL OR PILEUPATIONS TO SEPARATE MAINLINE DITCH FROM THE WATERBODY.
4. CROSSING UNDER THE WATERBODY IS INSTALLED AND BACK FILLED.
5. INSTALL TURBIDITY CURTAINS DOWNSTREAM OF CROSSING AT EDGE OF WORK CORRIDOR IF STREAM FLOW IS CONDUCTIVE TO THE INSTALLATION.
6. IF FLOW OF WATERBODIES IS SUCH THAT TURBIDITY CURTAIN CAN NOT BE INSTALLED, THEN INSTALL DOWNSTREAM SEDIMENT TRAP AND CURTAIN.
7. EQUIPMENT OPERATING IN THE WATERBODY SHALL BE LIMITED TO THAT NEEDED TO PERFORM CONSTRUCTION. IF OTHER TYPES OF EQUIPMENT MUST CROSS THE WATERBODY, CONTRACTOR SHALL PROVIDE AND USE TEMPORARY STREAM CROSSING (BEC).
8. ALL WORK AREAS MUST BE SECURED BY CHAINS OR CABLES LOCATED AT LEAST 50 FEET FROM WATER'S EDGE AND SHALL BE OF A MINIMUM SIZE NEEDED FOR CONVENIENT PERSPECTIVE.
9. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED DAILY AND REPAIRED IF NECESSARY.
10. ALL CONSTRUCTION FROM THE BANKS OF THE WATERBODIES SHALL BE LIMITED TO THE FOLLOWING:
11. CHEMICALS, FUELS AND LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT SHALL NOT BE REFUELED WITHIN 100 FEET OF THE WATERBODY.
12. INSTALL TRENCH PILES ON BOTH SIDES OF THE WATERBODY TO PREVENT DIVERSION OF WATER INTO UPLAND PORTIONS OF THE PIPELINE TRENCH AND TO KEEP ANY ACCUMULATED TRENCH WATER OUT OF THE WATERBODY.
13. ALL TRENCH PILES SHALL BE INSTALLED AND MAINTAINED IN A WAY MAXIMELY ADJACENT TO WATERBODIES UNTIL STAGING AREA IS PREPARED AND WORK IN THE WATERBODIES IS READY TO COMMENCE.
14. EXCEPT FOR BLASTING AND OTHER ROCK BREAKING MEASURES, COMPLETE IN STREAM CONSTRUCTION ACTIVITIES (INCLUDING TRENCHING, PIPE INSTALLATION AND PILE DRIVING) SHALL BE LIMITED TO A MAXIMUM OF 24 HOURS. STREAM BANKS AND UNCONSOLIDATED STREAM BEDS MAY REQUIRE ADDITIONAL RESTORATION AFTER THIS PERIOD.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
							TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
							(MWC) WET MINOR WATERBODY CROSSING
							

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
SUZANNE MARIE KING
ENGINEER
PE082757

SUZANNE KING REG NO. PE 0827

BL
Companies
ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
LAND SURVEYING

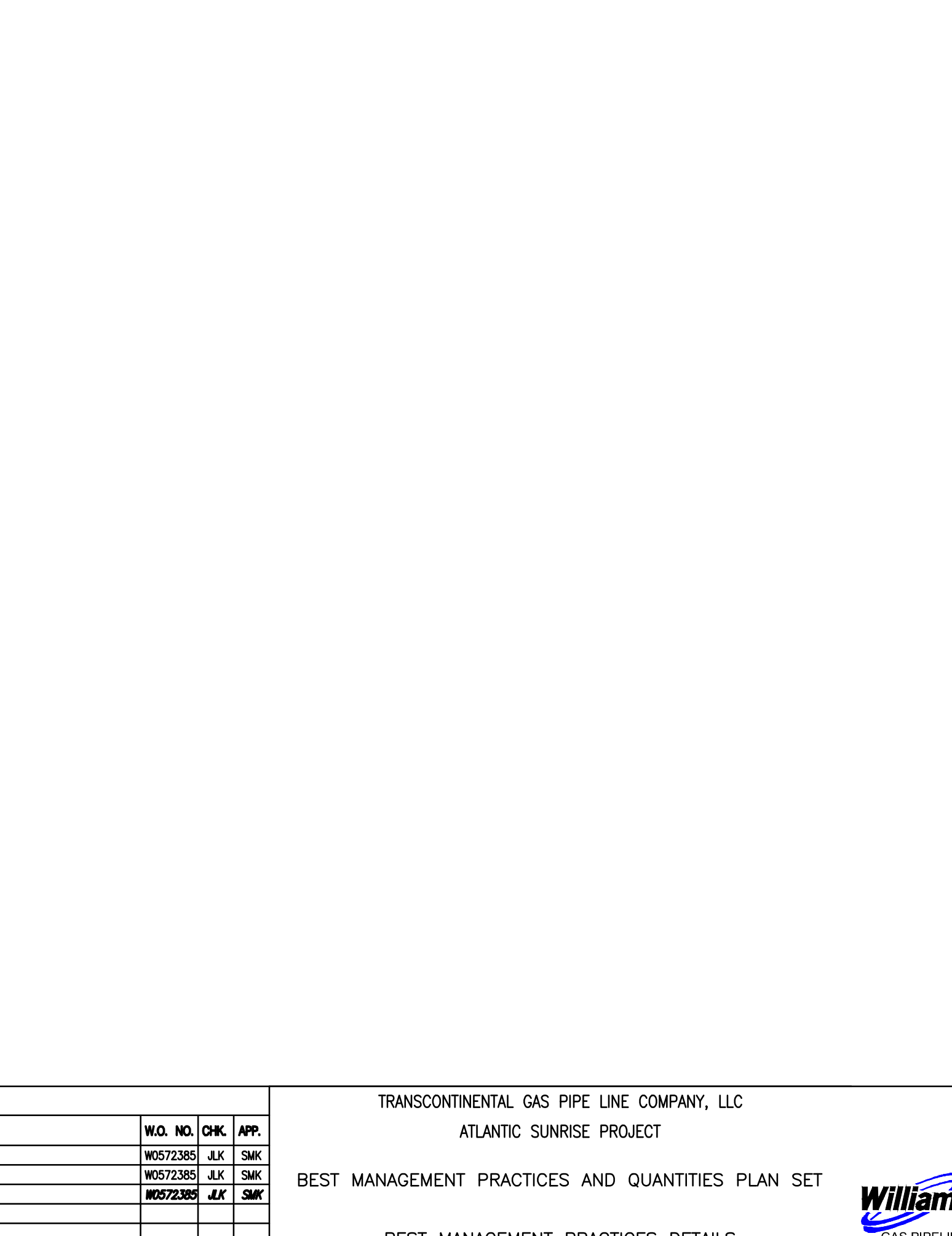
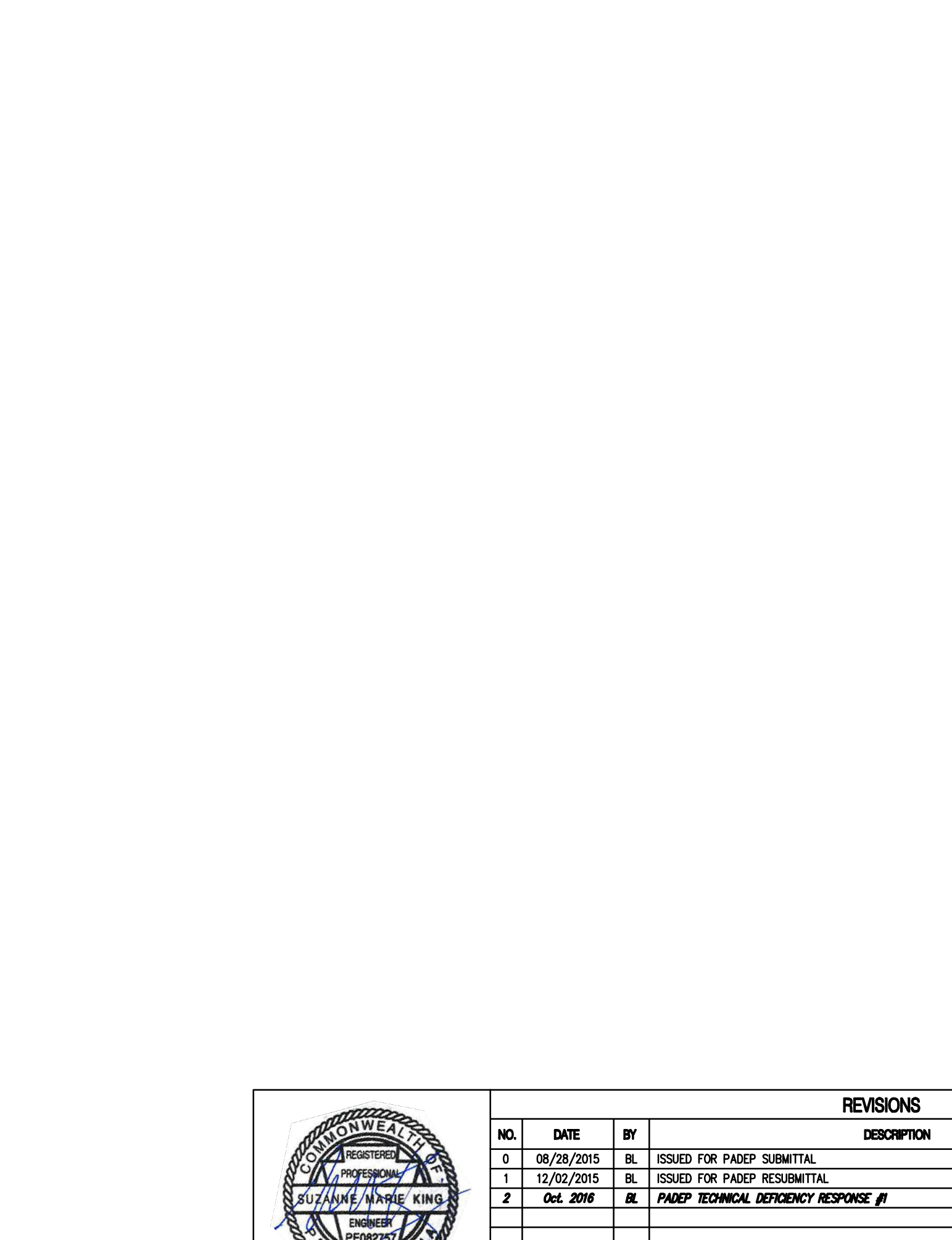
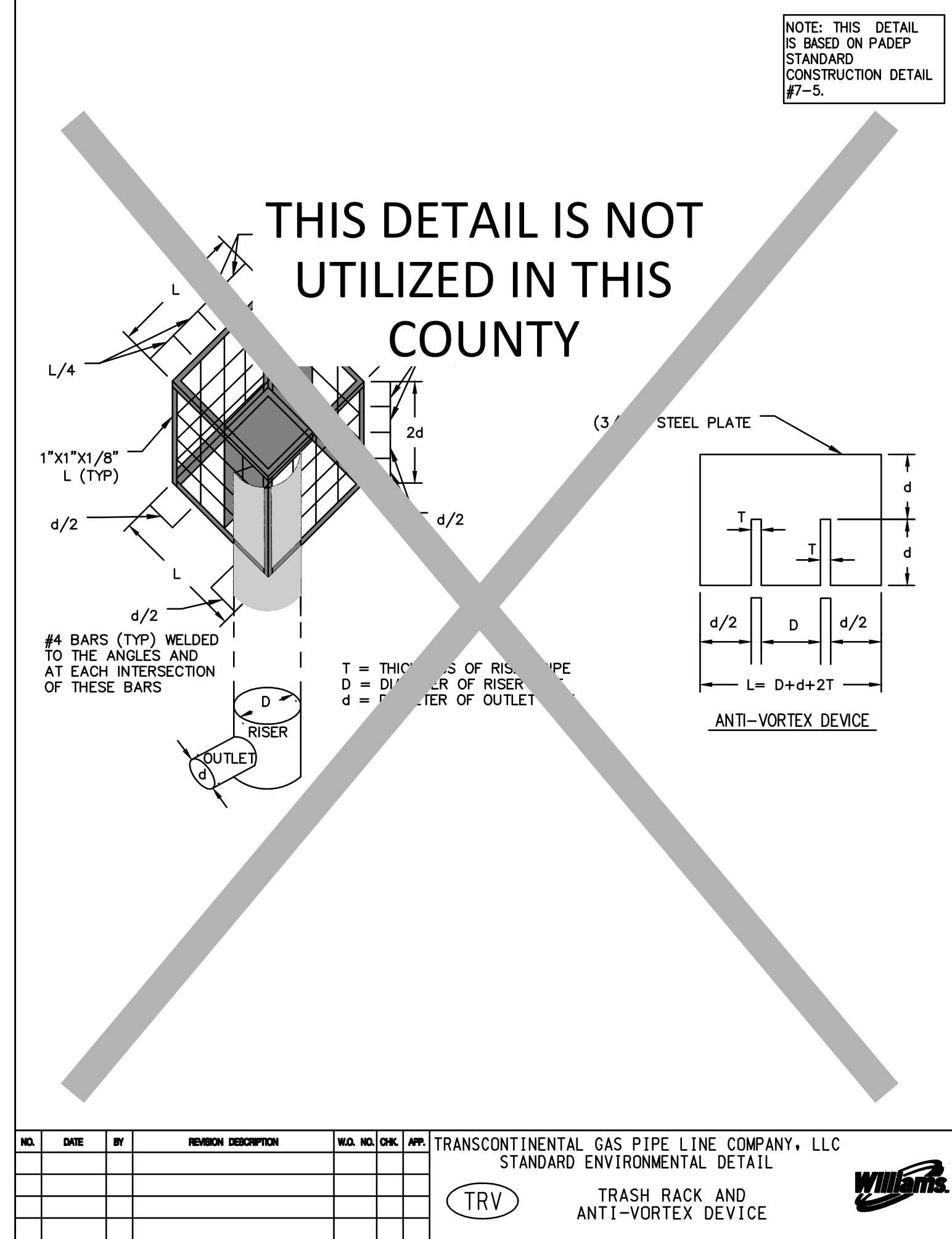
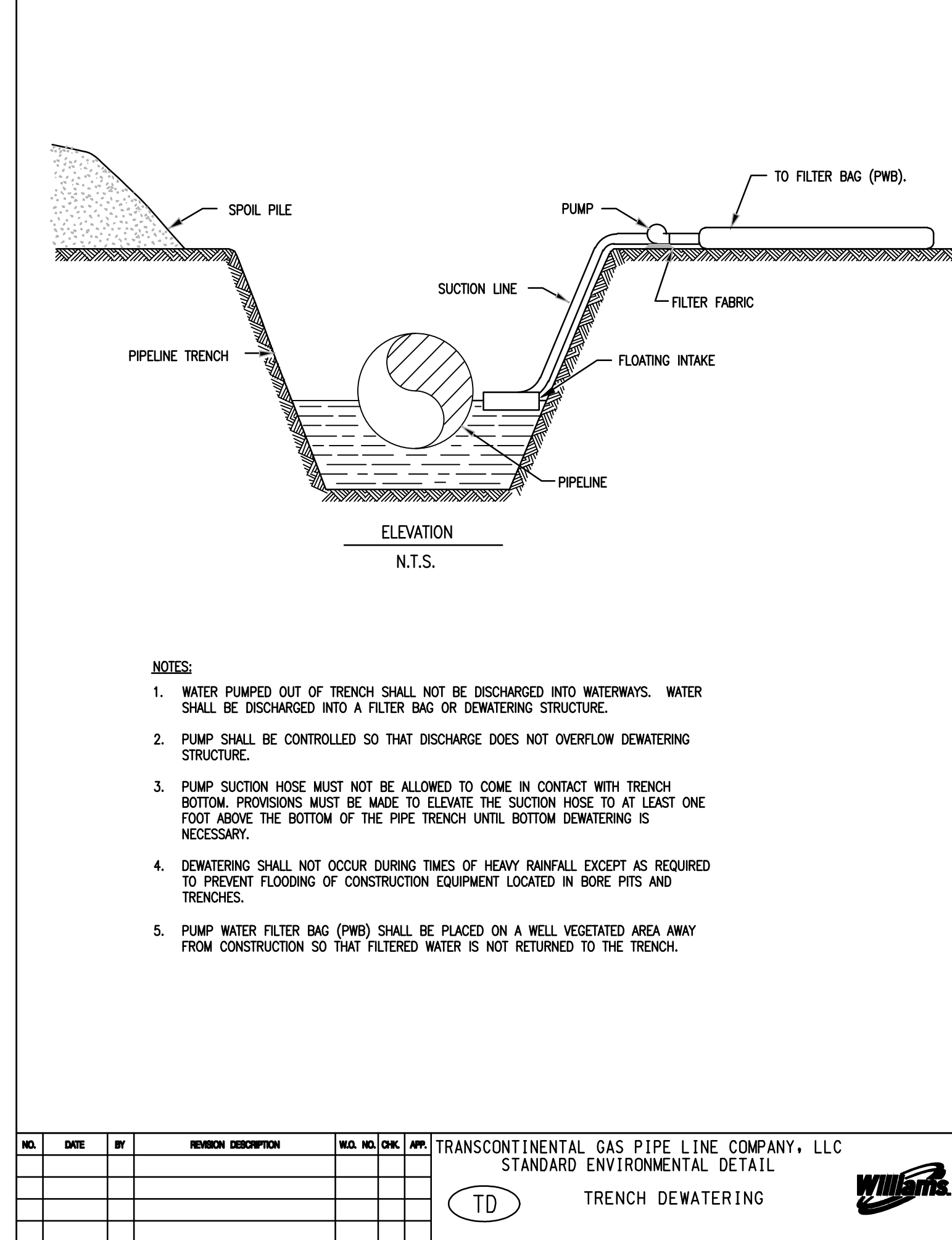
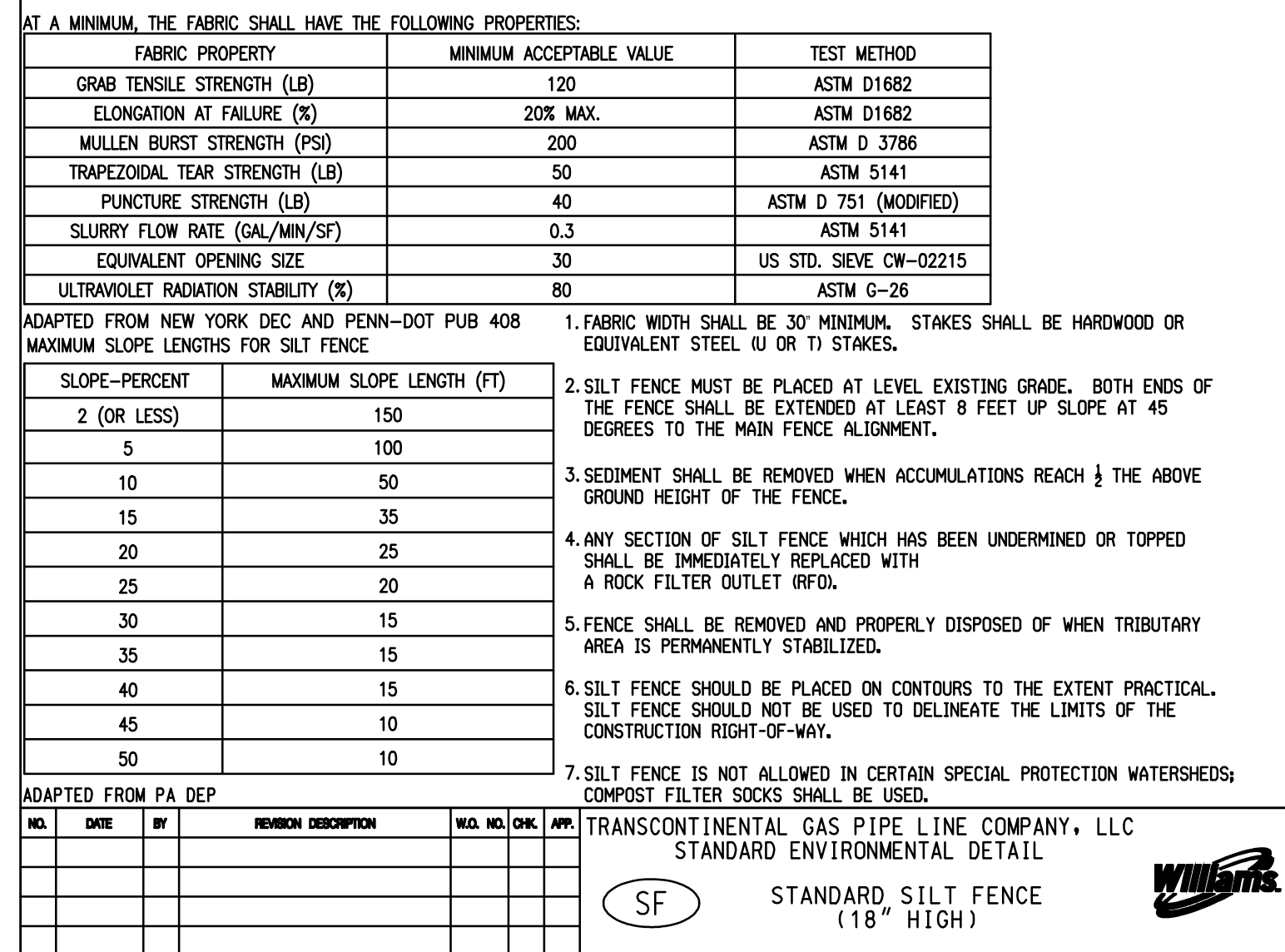
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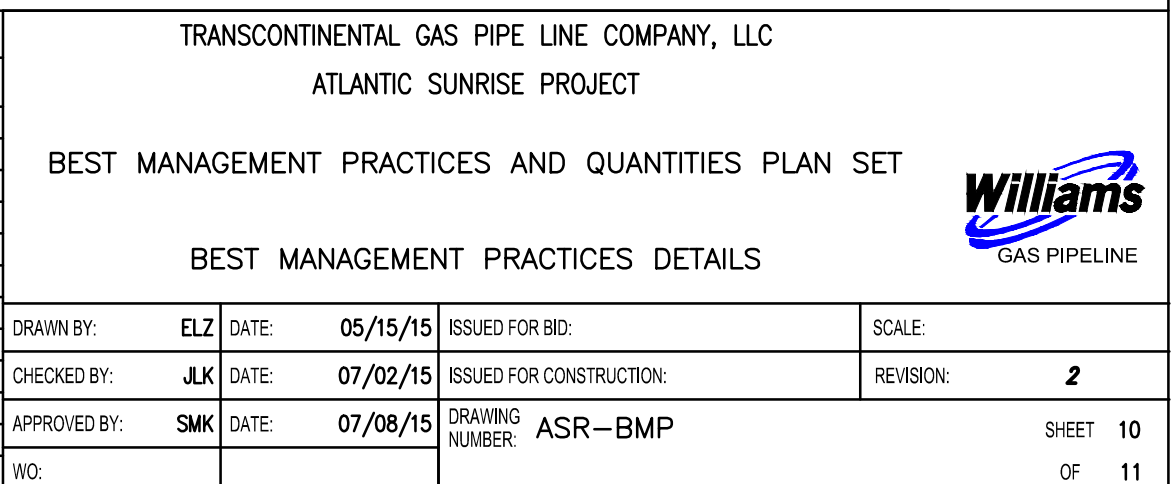
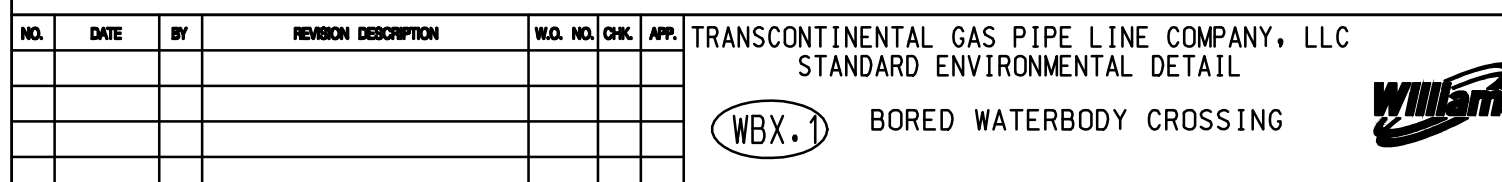
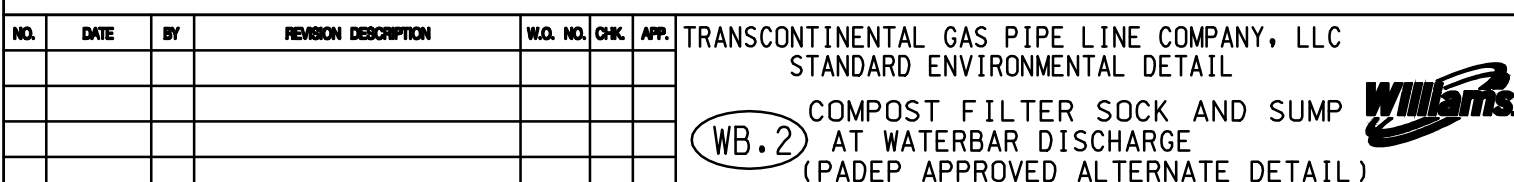
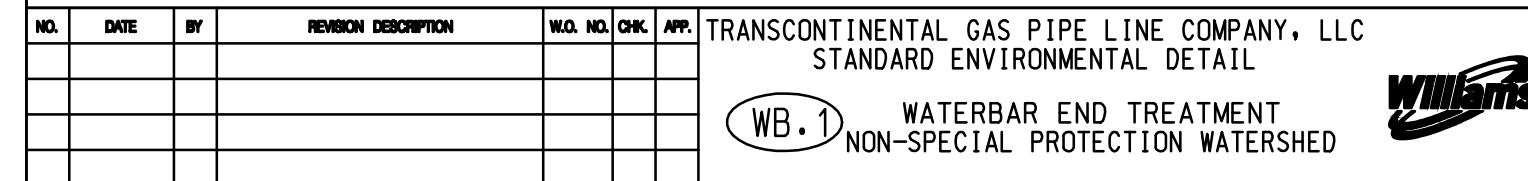
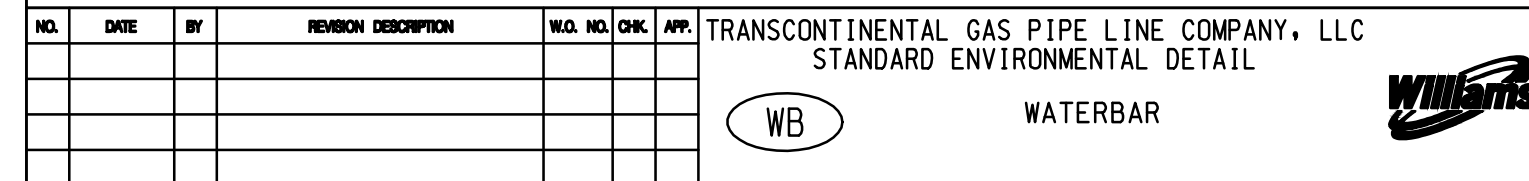
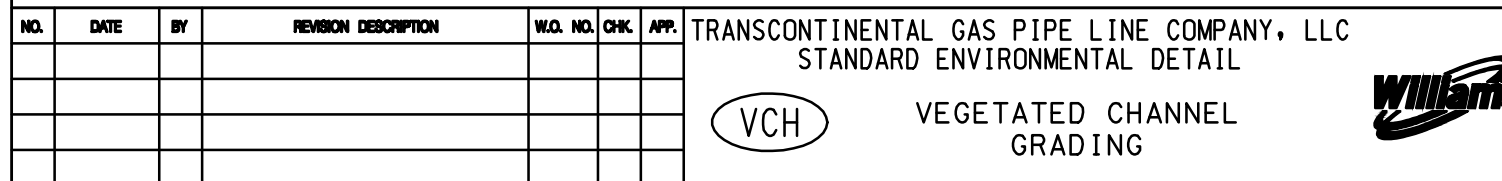
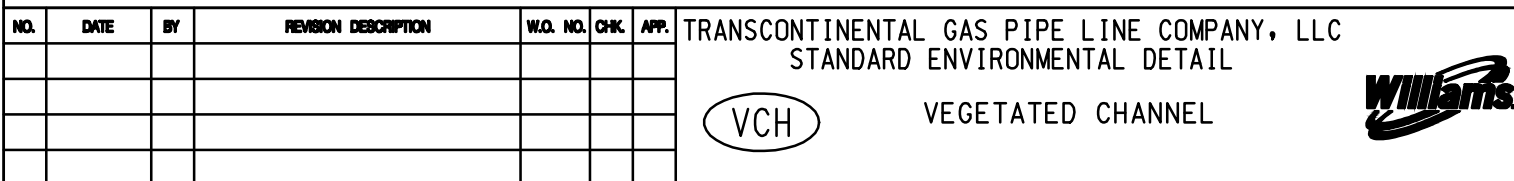
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET

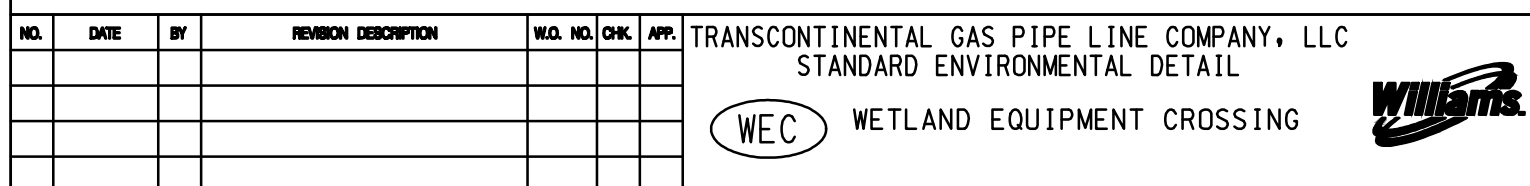
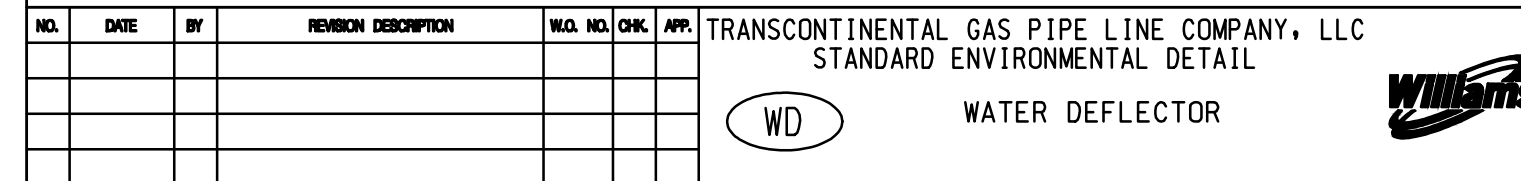
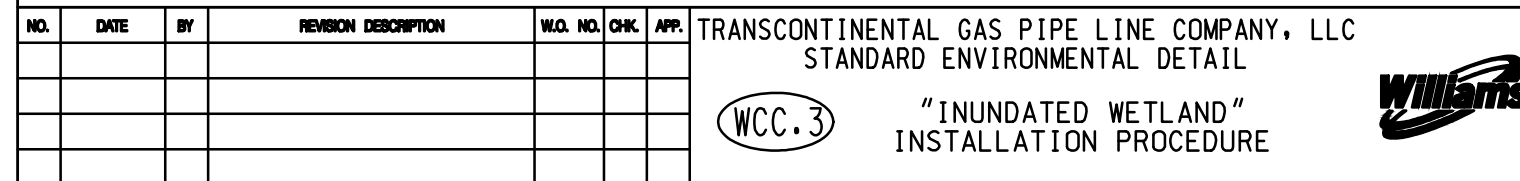
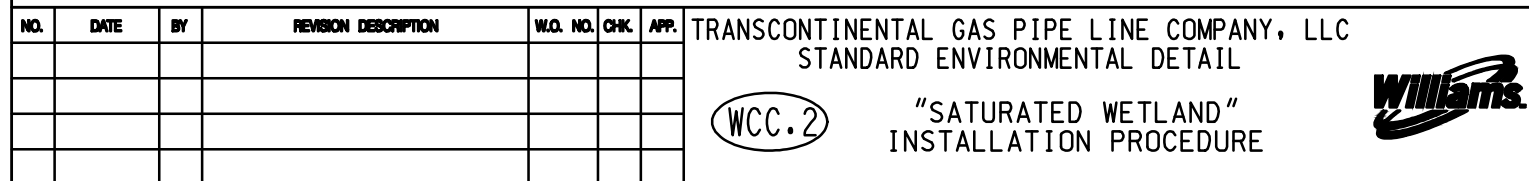
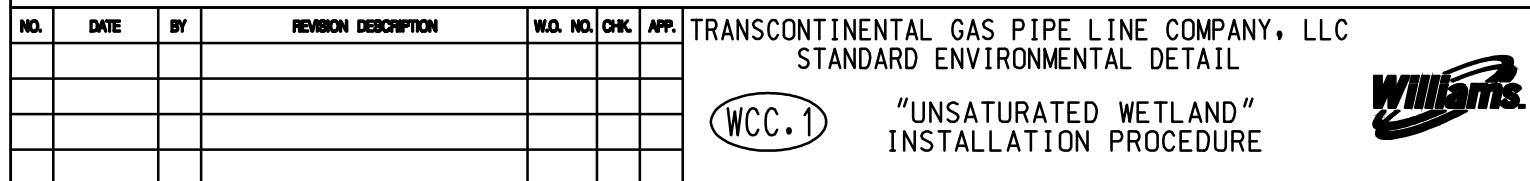
BEST MANAGEMENT PRACTICES DETAILS

DRAWN BY:	ELZ	DATE:	05/15/15	ISSUED FOR BID:		SCALE:	
CHECKED BY:	JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:		REVISION:	2
APPROVED BY:	SMK	DATE:	07/08/15	DRAWING NUMBER:	ASR-BMP	SHEET	5
WO:						OF	11

2 OF 2





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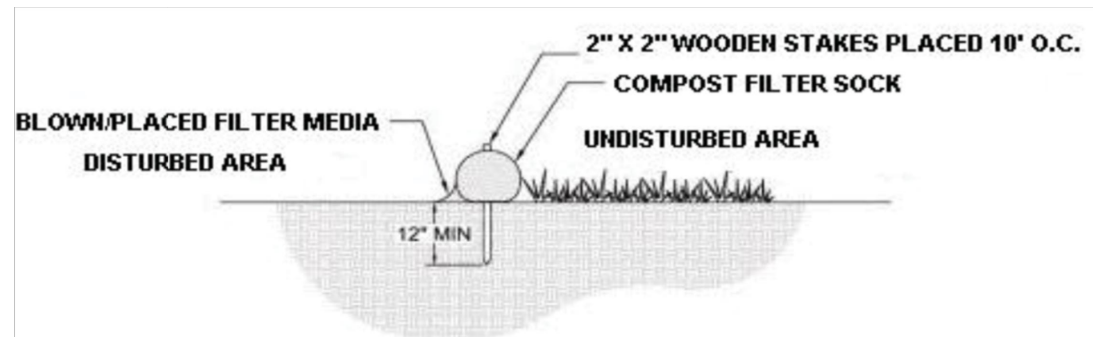
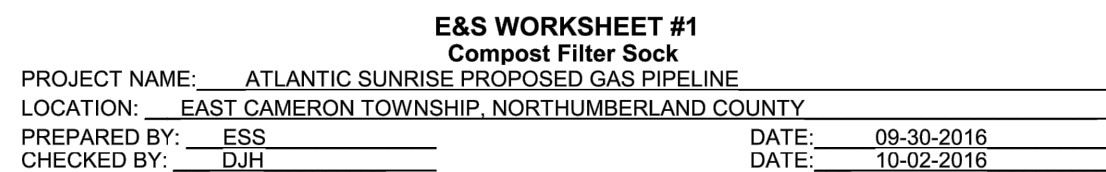
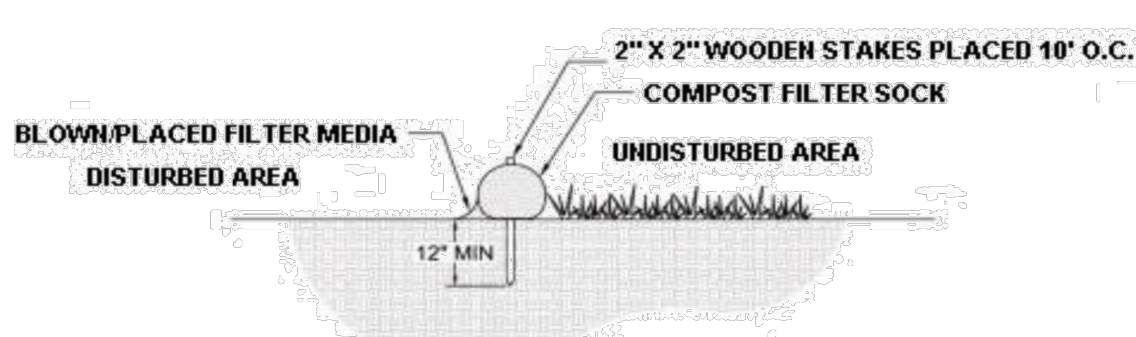
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC			
ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE: 05/15/15	ISSUED FOR BID:
SCALE:			
CHECKED BY:	JLK	DATE: 07/02/15	ISSUED FOR CONSTRUCTION:
REVISION:	2		
APPROVED BY:	SMK	DATE: 07/08/15	DRAWING NUMBER: ASR-BMP
NO:			SHEET 11 OF 11

TABLE 1: SEDIMENT BARRIER SUMMARY



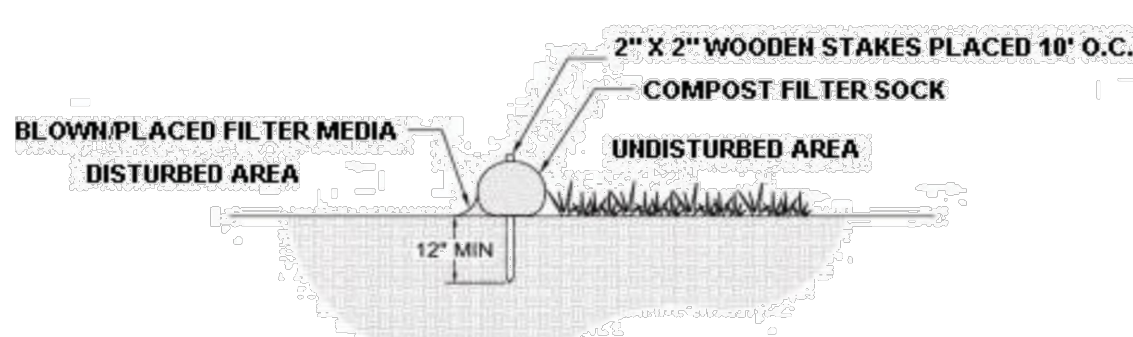
MILEPOST	Dia. In.	LOCATION			SLOPE PERCENT	SLOPE LENGTH ABOVE BARRIER (FT)
		BEGIN STA.	END STA.	TYPE		
M-0247	24	1+99.0	2+10.0		41	64
83	24	4367+50	4393+20		22	60
	24	4393+25	4402+50		12	100
	12	4402+50	4403+50	Stream	10	100
	24	4403+50	4404+75		14	85
	12	4404+75	4405+25	Wetland	2	170
	24	4405+25	4414+00		14	85
84	12	4414+00	4414+00	Road	10	101
	12	4414+00	4419+35		12	115
	18	4419+35	4419+35		32	45
	24	4419+35	4450+30		45	25
	32	4450+30	4453+90		7	420
	12	4453+90	4457+00		11	120
	12	4457+00	4457+00	Road	23	400
	24	4457+00	4470+25		8	85
	M-0252 & M-0323	24	0+00	6+50	20	100
	85	12	4+75	6+25	Road	12
12		4477+75	4480+00		12	100
24		4480+00	4487+00		14	100
12		4487+50	4487+50	Road	8	60
12		4487+50	4493+00		6	120
12		4493+20	4493+20	Road	15	10
12		4494+00	4496+00		6	120
12		4496+00	4496+00	Road	20	20
12		4496+00	4500+75		6	120
12		4501+20	4501+20	Road	20	20
24		4501+25	4504+25		6	120
12		4504+50	4508+00		6	120
12		4508+30	4508+30	Road	2	150
12		4508+50	4510+25		6	120
12		4510+50	4510+50	Road	6	150
M-0240		12	4510+50	4511+50		5
	12	4511+50	4511+50	Stream	5	106
	24	4512+00	4521+50		5	106
	12	4521+50	4521+50	Road	2	320
	12	4521+50	0+75		2	320

SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372



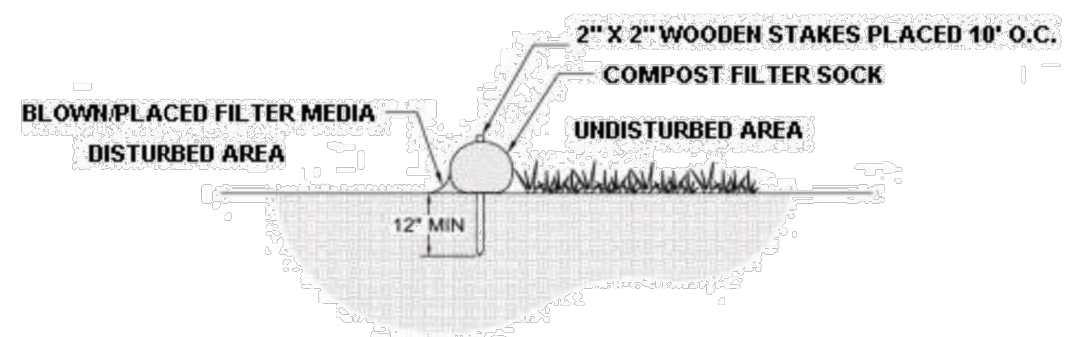
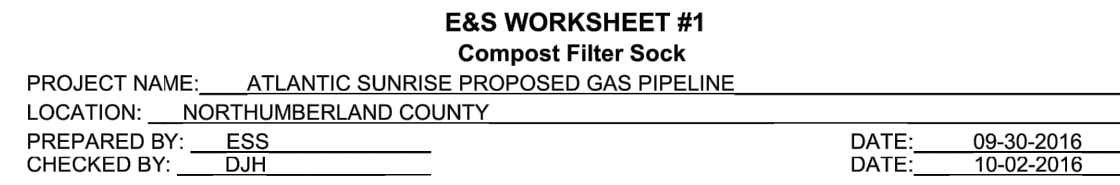
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		BEGIN STA.	END STA.	TYPE			
	12	4525+85	to	3+00	Road	20	
	24	1+00	to	3+00	Road	31	
	24	2+25	to	3+25		37	
	24	3+50	to	3+50	Road	50	
	24	3+50	to	4+50		54	
	32	5+00	to	6+50	Road	50	
	24	5+50	to	6+50		20	
	18	6+50	to	7+25	Road	40	
	18	7+25	to	8+00		7	
	12	8+00	to	8+75	Road	7	
	12	8+75	to	9+75		40	
	12	10+00	to	10+75		18	
24	10+50	to	11+50	Stream	60		
86	12	11+25	to	12+00		10	
	18	12+25	to	16+00		17	
	18	16+00	to	16+50	Road	40	
	24	16+00	to	19+24		17	
	24	4546+50	to	4555+50		85	
	32	4551+50	to	4555+50	Road	40	
	24	4555+75	to	4558+00		17	
	24	4558+00	to	4561+50	Road	40	
	24	4559+50	to	4560+00		17	
	24	4561+50	to	4571+50		17	
	M-0235	12	4571+75	to	4+50	Road/Stream	4
	24	4572+75	to	4+00		70	
M-0372	24	4+50	to	3+50		15	
	12	3+50	to	4+25	Road	9	
	12	4+25	to	6+00		45	
	18	6+00	to	7+25	Stream	15	
	24	7+50	to	10+50		39	
	18	11+00	to	13+00		62	
	24	14+00	to	14+75		32	
	12	15+50	to	20+00		28	

SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372



MILEPOST NO.	Dia. In.	LOCATION				SLOPE PERCENT	SLOPE LENGTH ABOVE BARRIER (FT)	
		BEGIN STA.	to	END STA.	TYPE			
87	18	23+00	to	23+00		14	117	
	12	23+00	to	28+00	Road	10	28	
	12	23+50		28+25	Road	10	108	
	12	24+00	to	29+00	Road	13	118	
	24	27+50	to	34+00		13	100	
	24	34+00		34+00	Road	50	300	
	24	34+00	to	37+25		13	100	
	18	37+00	to	37+25	Road	24	65	
	24	37+25	to	45+00		7	125	
	18	45+00	to	48+25		4	120	
	24	48+25	to	58+75		10	150	
	24	59+00	to	59+00	Road	28	100	
	24	59+25	to	61+00		24	50	
	18	60+50	to	60+50	Stream	20	50	
	18	61+00	to	61+00	Road	30	150	
	24	61+00	to	65+75		10	150	
	24	65+75	to	65+75	Road	30	55	
	88	24	4639+00	to	4646+50		10	150
		24	4647+00	to	4647+50	Road	27	111
		24	4646+50	to	4648+75		27	111
24		4648+75	to	4650+75		6	320	
24		4650+75	to	4753+50		5	175	
18		4653+50	to	4653+50	Road	31	51	
24		4653+50	to	4754+50		5	175	
24		4734+50	to	4763+50		5	175	
18		4661+30	to	4661+30	Road	14	120	
24		4761+25	to	4763+50		5	175	
89	24	4664+75	to	4664+75	Road	26	100	
	24	4765+00	to	4769+00		5	175	
	18	4670+30	to	4670+30	Road	15	100	
	24	4670+25	to	4672+00		20	65	
	24	4672+00	to	4682+00		20	65	
	12	4682+50	to	4682+50	Road	15	100	
	24	4682+50	to	4688+00		20	65	
	12	4689+00	to	4691+50	Wetland	20	65	
	24	4692+50	to	4694+25		20	65	

SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372



MILEPOST NO.	Dia. In.	LOCATION			SLOPE PERCENT	SLOPE LENGTH ABOVE 10% FT.
		BEGIN STA.	END STA.	TYPE		
89	12	4693+25	to 4694+50	Stream	20	65
	24	4694+50	to 4703+25		20	65
	12	4703+50	to 4703+50	Wetland/Road	6	61
	12	4704+75	to 4704+75	Waterbody	6	61
	12	4705+75	to 4705+25	Wetland	6	61
	12	4703+50	to 4706+00		20	65
	24	4706+00	to 4735+75		20	65
	12	4734+75	to 4734+75	Road	20	65
	24	4735+75	to 4739+75		26	112
	24	4739+75	to 4739+75	Road	50	50
	24	4739+75	to 4739+75		45	50
	24	4743+00	to 4743+00	Road	31	60
90	24	4743+00	to 4752+75		30	100
	12	4752+75	to 4752+75	Road	9	126
	24	4752+75	to 4760+50		10	123
	12	4761+00	to 4764+50	Road	2	220
	24	4764+00	to 4767+50		5	238
	12	4768+00	to 4768+00	Road	6	65
M-0167	12	4768+50	to 6+00	Road	7	130
	12	6+00	to 14+50		8	150
	24	14+50	to 14+75	Road	11	241
	12	14+75	to 4790+25		7	493
	12	4790+25	to 4795+00		4	140
	24	4795+00	to 4803+50		3	176
91	12	4803+50	to 4804+50	Stream	5	45
ALIGNMENT EXITS NORTHAMBERLAND COUNTY AND RE-ENTERS AT APPROX. STA 4844+25						
92	12	4844+50	to 4845+50	Stream	5	129
	24	4845+75	to 4857+00		27	100
	24	4857+00	to 4861+50		15	154
M-0271/ M-0437	24	4861+50	to 1+75		35	50
	12	1+50	to 2+75	Stream/Wetland	42	172

SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372

	REVISIONS									TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC			
	NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.	ATLANTIC SUNRISE PROJECT					
	0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK	PROPOSED 42" CENTRAL PENN LINE SOUTH					
	1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK	PENNSYLVANIA BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET					
	2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK	NORTHUMBERLAND COUNTY, PENNSYLVANIA					
								QUANTITY, CROSSING AND ACIDIC SOIL TABLES					
							DRAWN BY:	ELZ	DATE:	05/15/15	ISSUED FOR BID:	SCALE:	
							CHECKED BY:	JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:	REVISION:	2
							APPROVED BY:	SMK	DATE:	07/08/15	DRAWING NUMBER:	SHEET 1 OF 2	
							W.O.:	224-1600-70-28-A/L1113_9-BMP-NO-TB					

TABLE 2: TEMPORARY CLEAN WATER DIVERSION SUMMARY

TEMPORARY DIVERSION SUMMARY - NORTHUMBRLAND COUNTY, PENNSYLVANIA																								
MILE POST	DIVERSION										WATERBODY**				FLUME (CLEAN WATER) CROSSING				LEVEL SPREADER					
	DIVERSION ID	DIVERSION TYPE	BOTTOM WIDTH # (FT)	DEPTH D (FT)	TOP WIDTH W1 (FT)	Z1 (FT)	Z2 (FT)	TEMPORARY LINING	PERMANENT LINING	DISCHARGE TYPE	WIDTH (FT)	LENGTH (FT)	RIP RAP SIZE***	FLUME SLOPE (%)	FLUME CHANNEL WIDTH	FLUME CHANNEL LINING	RIP RAP SIZE***	Q (CFS)	H1	Cu	LENGTH (FT)	DOWNSTREAM COVER	ALLOWABLE VELOCITY (FT/S)	VELOCITY (FT/S)
84	84.01	SWALE	2	2.5	12	2	2	SC150	REINFORCED VEGETATION	FLUME	-	-	-	10	14	P550	R-4	17.28	0.15	3.0	67	FOREST	2	1.99
	84.02	SWALE	2	2.5	12	2	2	SC250	REINFORCED VEGETATION	FLUME	-	-	-	11	12	W3000	R-4	48.48	0.15	3.0	188	FOREST	2	1.99
	84.03	SWALE	2	2	10	2	2	SC250	REINFORCED VEGETATION	FLUME	-	-	-	12	12	W3000	R-4	28.16	0.15	3.0	109	FOREST	2	1.99
	84.04	SWALE	2	2	10	2	2	W3000	REINFORCED VEGETATION	FLUME	-	-	-	12	12	W3000	R-4	37.76	0.15	3.0	146	FOREST	2	1.99
	84.05	FILTER SOCK	0	2	12	0	6	W3000	REINFORCED VEGETATION	FLUME	-	-	-	28	10	W3000	R-5	2.88	0.15	3.0	11	FOREST	2	1.99
85	85.01	SWALE	2	2	10	2	2	SC250	REINFORCED VEGETATION	FLUME	-	-	-	5	14	P550	R-4	23.36	0.15	3.0	90	FOREST	2	1.99
	86.01	SWALE	2	2	10	2	2	SC250	REINFORCED VEGETATION	WATERBODY	2	12	R-4	-	-	-	-	11.36	N/A	N/A	N/A	N/A	N/A	N/A
87	87.01	SWALE	2	2	10	2	2	SC150	REINFORCED VEGETATION	FLUME/OFF-SITE	14	8	R-4	6	14	P550	R-4	4.32	N/A	N/A	N/A	N/A	N/A	N/A
	87.02	SWALE	2	2	10	2	2	CL25	REINFORCED VEGETATION	FLUME/OFF-SITE	14	12	R-4	7	14	P550	R-4	17.28	N/A	N/A	N/A	N/A	N/A	N/A
90	90.01*	SWALE	2	2	10	2	2	SFS	UNREINFORCED VEGETATION	FLUME	-	-	-	7	14	P550	R-4	15.08	0.5	3.0	14	GRASS	4	3.18

*** Sizing was determined using maximum allowable velocity outlined in Table 6.6 of the PA DEP Erosion and Sediment Pollution Control Program Manual, dated March 2012.

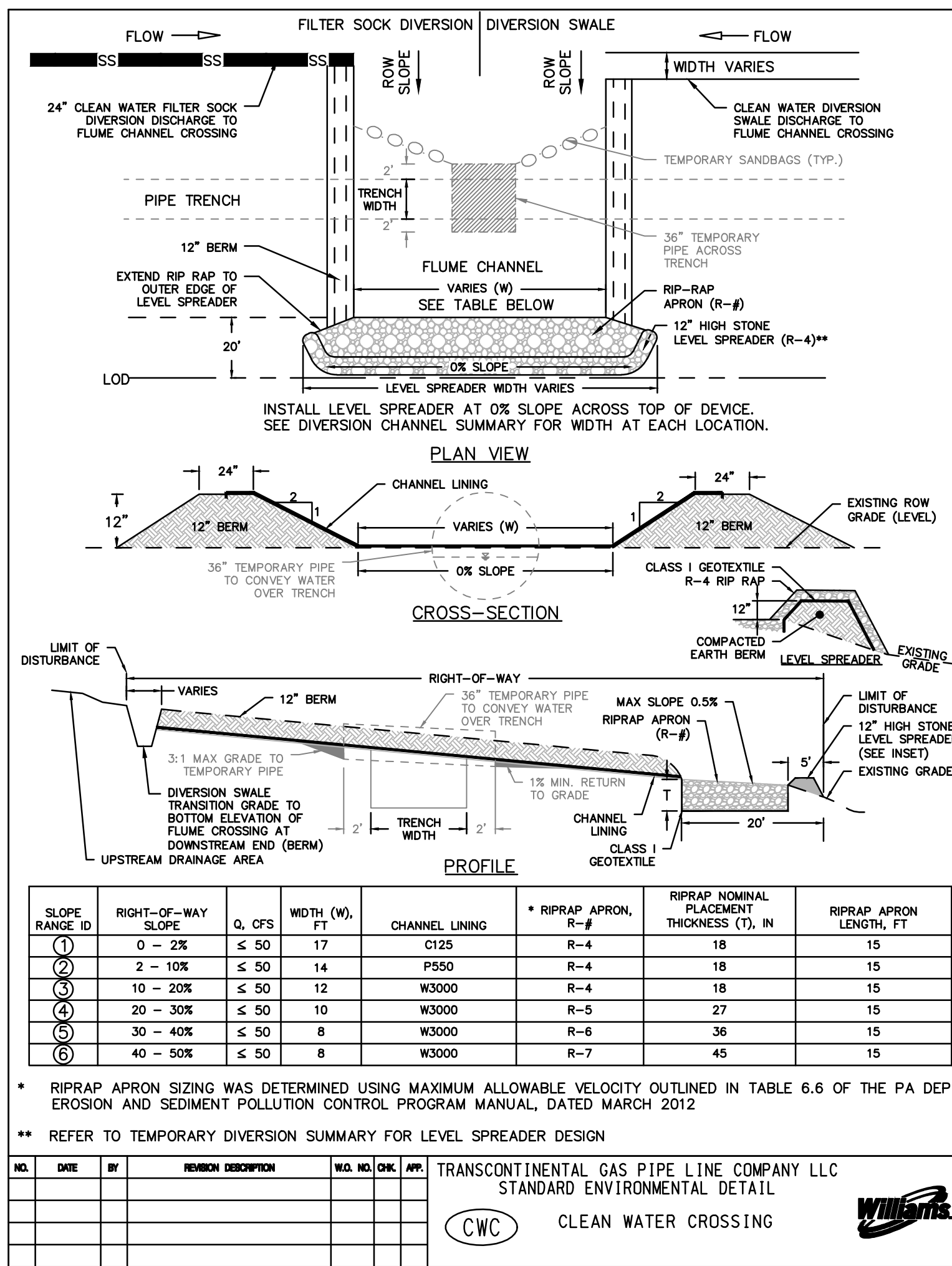


TABLE 3: WATERBODIES CROSSED BY CPLS PIPELINE AND ACCESS ROADS IN NORTHUMBERLAND COUNTY

Waterbody ID	Waterbody Name	Milepost	County	Township	Stream Type	State Water Quality Use Classification - Designated Use	State Fishery Classification	Crossing Method	Crossing Window
WW-T44-10002C	UNT to Mahanoy Creek(WW-T44-10002C)	83.38	Northumberland	East Cameron	Perennial	WWF, MF	None	Flume	None
WW-T01-10001	Mahanoy Creek(WW-T01-10001)	83.39	Northumberland	East Cameron	Perennial	WWF, MF	None	Flume	None
WW-T04-10002	UNT to Shamokin Creek(WW-T04-10002)	85.45	Northumberland	Coal	Intermittent	WWF, MF	None	Dam-and-Pump	None
WW-T04-10001	Shamokin Creek(WW-T04-10001)	MOC-0240 0.20	Northumberland	Coal	Perennial	WWF, MF	None	Dam-and-Pump	None
WW-T18-10002	Quaker Run(WW-T18-10002)	86.60	Northumberland	Coal	Perennial	CWF, MF	None	Flume	None
WW-T68-11001B	UNT to Quaker Run(WW-T68-11001B)	M-03720.11	Northumberland	Coal	Ephemeral	CWF, MF	None	Flume	None
WW-T68-11001	UNT to Quaker Run(WW-T68-11001)	M-03720.13	Northumberland	Coal	Intermittent	CWF, MF	None	Dam-and-Pump	None
WW-T58-11001	Coal Run(WW-T58-11001)	MOC-0235 1.15	Northumberland	Coal	Perennial	CWF, MF	None	Dam-and-Pump	None
WW-T44-11002	UNT to South Branch Roaring Creek(WW-T44-11002)	88.89	Northumberland	Coal	Intermittent	HQ-CWF, MF	Approved Trout Waters, Wild Trout Waters	Dam-and-Pump	January 1 through September 30
WW-T47-11002	South Branch Roaring Creek(WW-T47-11002)	91.76	Northumberland	Ralpho	Perennial	HQ-CWF, MF	Class A Wild Trout Waters	Dam-and-Pump	April 2 through September 30
WW-T44-11001A	UNT to South Branch Roaring Creek(WW-T44-11001A)	M-04370.03	Northumberland	Ralpho	Intermittent	HQ-CWF, MF	Class A Wild Trout Waters	Dam-and-Pump	April 2 through September 30
Access Roads									
WW-T44-10002	UNT to Mahanoy Creek	AR-NO-075	Northumberland	East Cameron	Perennial	WWF, MF	None	N/A	None
WW-T68-10001	UNT to Shamokin Creek	AR-NO-079.1	Northumberland	Coal	Ephemeral	WWF, MF	None	N/A	None
WW-T58-11001A	Coal Run	AR-NO-082	Northumberland	Coal	Ephemeral	CWF, MF	None	N/A	None
Waterbody IDs with "RS" designations are in non-surveyed area and are based on remote sensing Key:									
CWF = Coldwater Fishes		HQ=High Quality		WWF=Warm Water Fishes					
MF = Migratory Fishes		TSF=Trout Stocked Fishes							
UNT = Unnamed Tributary		EV=Exceptional Value							

TABLE 6: LOCATIONS OF ACIDIC BEDROCK ALONG CPLS PIPELINE IN NORTHUMBERLAND COUNTY

Pipeline Facility/ County	Mile Post		Linear Distance	Bedrock Formation	Acid Potential	Karst	Rock Type	Rippability	MoC Number MP to MP	Formation	Rock Type
	From	To									
Northumberland	82.6	83.1	0.5	Catskill (Duncannon member) / Specht Kopf / Pocono	Typically Non-acid sulfide bearing.		Sandstone, siltstone, and mudstone	Difficult	M-0194 0.9 to 1.13	tskill Duncannon & S K	same
Northumberland	83.0	83.5	0.5	Mauch Chunk	Typically Non-acid sulfide bearing.		Shale, sandstone, and siltstone	Moderately easy to moderately difficult			
Northumberland	83.8	84.6	0.8	Pottsville Group	Typically anthracite coal-bearing.		Sandstone, siltstone, shale & conglomerate	Difficult			
Northumberland	84.8	85.0	0.2	Mauch Chunk	Typically Non-acid sulfide bearing.		Shale, sandstone, and siltstone	Moderately easy to moderately difficult			
Northumberland	86.2	86.4	0.2	Llewellyn	Typically anthracite coal-bearing.		Sandstone, siltstone, & conglomerate	Difficult			
Northumberland	88.9	89.2	0.3	Mauch Chunk	Typically Non-acid sulfide bearing.		Shale, sandstone, and siltstone	Moderately easy to moderately difficult			
Northumberland	89.4	89.7	0.3	Pocono	Typically Non-acid sulfide bearing.		Sandstone, siltstone, conglomerate	Difficult			
Northumberland	89.9	90.2	0.3	Catskill (Buddys Run member)	Typically Non-acid sulfide bearing.		Shale, siltstone, and sandstone	Moderately difficult, easy in shale	M-0167 0.0 to 0.34 M-0197 0.0 to 0.4 M-0174 0.0 to 0.3	Catskill Buddys Run Catskill Irsh Valley Catskill Buddys Run	same sandstone, siltstone same
Columbia	100.2	100.7	0.5								

TABLE 5: LOCATIONS OF ACID SOILS ALONG
CPLS PIPELINE IN NORTHUMBERLAND COUNTY

MP Begin	MP End	County	Map Unit Symbol	pH
M-0194 0.89	M-0194 1.04	Northumberland	Def	5.1
M-0194 1.07	M-0194 1.18	Northumberland	Def	5.1
82.59	82.67	Northumberland	Def	5.1
82.78	83.14	Northumberland	HuF	4.6
83.14	83.33	Northumberland	LiD	4.6
83.33	83.41	Northumberland	AB6	5.6
83.41	83.43	Northumberland	W	Water
83.43	83.46	Northumberland	Uf	6.2
83.46	83.52	Northumberland	LoF	4.6
83.52	83.77	Northumberland	McC	4.6
83.77	84.11	Northumberland	WkE	5.3
84.11	84.33	Northumberland	HuD	4.6
84.33	84.60	Northumberland	HuB	4.6
84.60	84.71	Northumberland	HuD	4.6
84.71	84.73	Northumberland	Uh	Udortients
84.73	84.92	Northumberland	HuD	4.6
84.92	84.98	Northumberland	Uh	Udortients
84.98	85.09	Northumberland	HuD	4.6
85.09	85.13	Northumberland	HuF	4.6
85.13	85.28	Northumberland	Uh	Udortients
85.28	85.38	Northumberland	BxD	4.6
85.38	85.43	Northumberland	BxB	4.6
85.43	85.49	Northumberland	Snb	4.6
85.49	85.55	Northumberland	HuD	4.6
85.55	85.62	Northumberland	HuB	4.6
85.62	85.81	Northumberland	BxB	4.6
85.81	85.87	Northumberland	HuF	4.6
85.87	85.98	Northumberland	Uf	6.2
85.98	86.02	Northumberland	Du	Dumps, mine
86.02	86.08	Northumberland	Uh	Udortients
86.08	86.15	Northumberland	HuF	4.6
86.15	86.32	Northumberland	HuD	4.6
86.32	86.38	Northumberland	HuF	4.6
86.38	86.41	Northumberland	Uh	Udortients
86.41	86.50	Northumberland	HuF	4.6
86.50	87.03	Northumberland	Uh	Udortients
87.03	87.20	Northumberland	HuD	4.6
87.20	87.32	Northumberland	Uh	Udortients
87.32	87.43	Northumberland	HuD	4.6
87.43	87.54	Northumberland	HuB	4.6
87.54	87.68	Northumberland	HuD	4.6
87.68	87.75	Northumberland	HuF	4.6
87.75	88.13	Northumberland	Uh	Udortients
88.13	88.17	Northumberland	HuD	4.6
88.17	88.23	Northumberland	Uh	Udortients
88.23	88.32	Northumberland	HuF	4.6
88.32	88.47	Northumberland	HuF	4.6
88.47	88.53	Northumberland	HuD	4.6
88.53	88.62	Northumberland	Def	5.1
88.62	88.97	Northumberland	LiD	4.6
88.97	89.10	Northumberland	BxD	4.6
89.10	89.13	Northumberland	Snb	4.6
89.13	89.17	Northumberland	BxB	4.6
89.17	89.25	Northumberland	BxD	4.6
89.25	89.48	Northumberland	LiD	4.6
89.48	89.86	Northumberland	Def	5.1
89.86	90.16	Northumberland	LiD	4.6
90.16	90.37	Northumberland	Mb6	4.6
90.37	90.39	Northumberland	CaB	5.3
M-0167 0.00	M-0167 0.17	Northumberland	CaB	5.3
M-0167 0.17	M-0167 0.34	Northumberland	CaC	5.3
90.73	90.75	Northumberland	CaC	5.3
90.71	90.82	Northumberland	CaB	5.3
90.82	90.89	Northumberland	CaC	5.3
90.89	90.92	Northumberland	CaD	5.3
90.92	90.93	Northumberland	WkE	5.3
90.93	90.94	Northumberland	Ug	6.2
90.94	90.97	Northumberland	WkE	5.3
90.97	90.98	Northumberland	Ug	6.2
91.74	91.76	Northumberland	Hv	6.5
91.76	91.82	Northumberland	WkE	5.3
91.82	91.96	Northumberland	WkD	5
91.96	92.02	Northumberland	WkC	5
92.02	92.06	Northumberland	WkD	5
92.06	92.22	Northumberland	WkE	5.3
92.22	92.29	Northumberland	Ln6	5.9

NOTE: SEE THE SUPPORTING PIPELINE AND ACCESS ROAD EROSION AND SEDIMENT CONTROL NARRATIVES FOR DEFINITIONS AND DESCRIPTIONS OF THE MAP UNIT SYMBOL ABBREVIATIONS.



TABLE 4: WETLANDS CROSSED BY CPLS PIPELINE
AND ACCESS ROADS IN NORTHUMBERLAND COUNTY

Wetland ID	Milepost	County	Township	Wetland Classes Impacted
W-T44-11001C	88.83	Northumberland	Coal	PFO
W-T44-11001A /W-T44-11001A-2	89.08	Northumberland	Coal	PEM
W-T18-10001	83.43	Northumberland	East Cameron	PEM
W-T49-11001	91.77	Northumberland	Ralpho	PEM
W-T49-11003	M-04370.05	Northumberland	Ralpho	PEM
Access Roads				
W-T68-10001	AR-NO-079.1	Northumberland	Coal	PEM

Wetland IDs with "RS" designations are in non-surveyed area and are based on remote sensing Key:

PEM = Palustrine Emergent
PFO = Palustrine Forested
PSS = Palustrine Scrub-Shrub

Wetland IDs with "RS" designations are in non-surveyed area and are based on remote sensing
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 <p>SUZANNE KING REG. NO. PE 082757</p> <p>BMP Companies</p> <p>ARCHITECTURE ENGINEERING ENVIRONMENTAL AND SCIENTIFIC</p>	REVISIONS							TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT				
	NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.	PROPOSED 42" CENTRAL PENN LINE SOUTH PENNSYLVANIA BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET NORTHUMBERLAND COUNTY, PENNSYLVANIA QUANTITY, CROSSING AND ACIDIC SOIL TABLES				
	0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK					
	1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK					
	2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK					
<p>SUZANNE KING REG. NO. PE 082757</p> <p>BMP Companies</p> <p>ARCHITECTURE ENGINEERING ENVIRONMENTAL AND SCIENTIFIC</p>							<p>DRAWN BY: ELZ DATE: 05/15/15 ISSUED FOR BID: SCALE: </p> <p>CHECKED BY: JLK DATE: 07/02/15 ISSUED FOR CONSTRUCTION: REVISION: 2</p> <p>APPROVED BY: SMK DATE: 07/08/15 DRAWING NUMBER: SHEET 2</p> <p>WO: 224-1600-70-28-A/LL113.9-BMP-NO-TB OF 2</p>					