

PENNSYLVANIA PIPELINE PROJECT

CONSTRUCTION SPREAD 3 BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

NOVEMBER 2016

DRAWING INDEX	
SHEET No.	DRAWING TITLE
PCS-0.01	GENERAL NOTES & LEGEND
PCS-0.02	POST CONSTRUCTION STORMWATER MANAGEMENT NOTES
PCS-0.03	SEEDING SPECIFICATIONS
PCS-0.04	POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
PCS-3.01	VALLEY FORGE ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.02	VALLEY FORGE ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.03	CHARGER HIGHWAY CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.04	CHARGER HIGHWAY CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.05	LOCKE MOUNTAIN ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.06	LOCKE MOUNTAIN ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.07	JUNIATA VALLEY ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.08	JUNIATA VALLEY ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.09	HIGH STREET BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.10	HIGH STREET BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.11	RAYSTOWN ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.12	RAYSTOWN ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.13	SEVEN POINTS LOOP BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.14	HAPPY HILLS ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.15	HAPPY HILLS ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.16	HARES VALLEY ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.17	HARES VALLEY ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.18	SHADE VALLEY ROAD BLOCK VALVE PRE CONSTRUCTION STORMWATER MANAGEMENT PLAN
PCS-3.19	SHADE VALLEY ROAD BLOCK VALVE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

PREPARED BY:



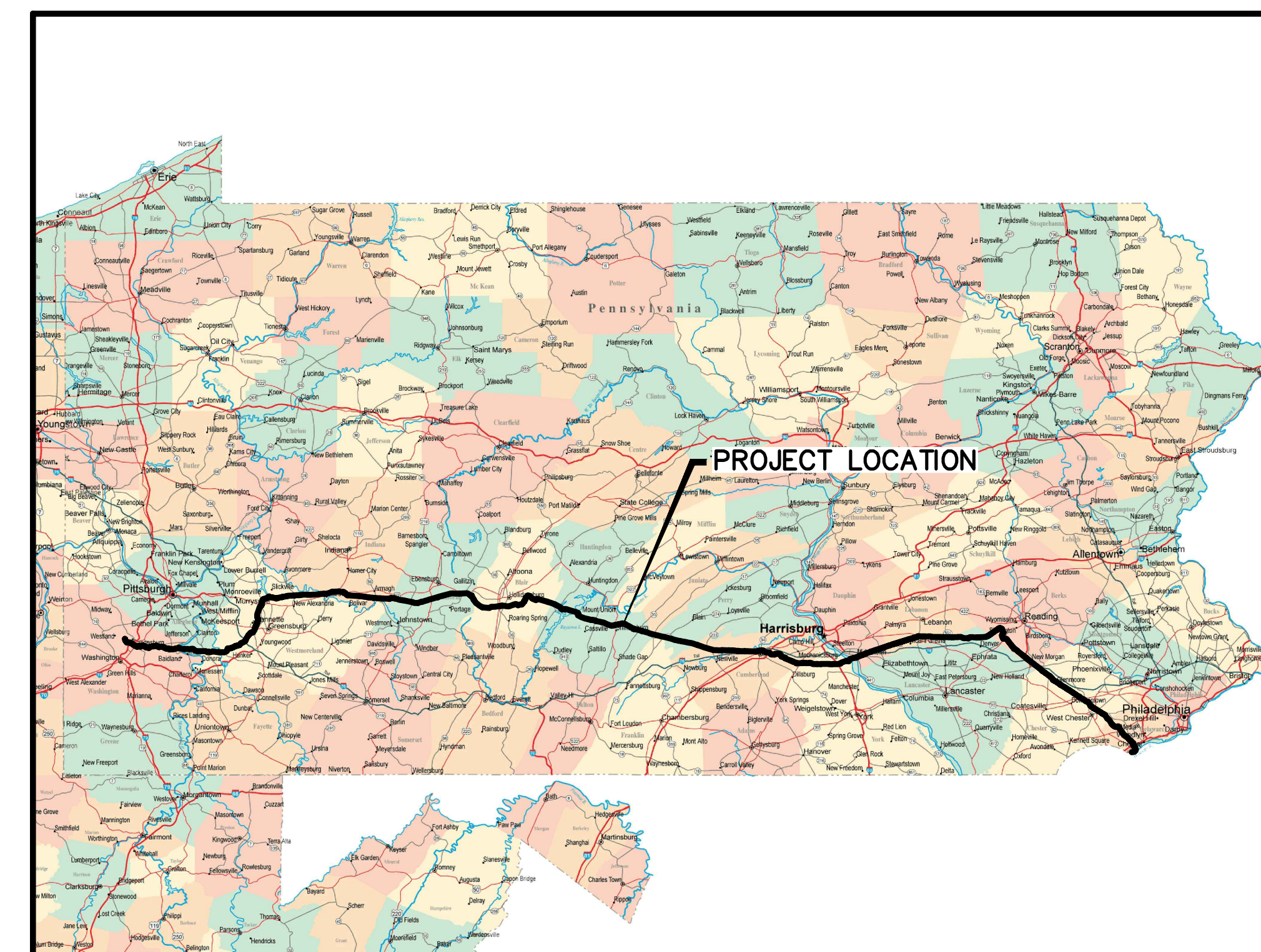
complex world | CLEAR SOLUTIONS™

661 ANDERSEN DRIVE – FOSTER PLAZA 7, PITTSBURGH, PA 15220
TEL: (412) 921-7090 | FAX: (412) 921-4040

PREPARED FOR:



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA



LOCATION MAP
PENNSYLVANIA PIPELINE PROJECT
HOUSTON, PENNSYLVANIA TO MARCUS HOOK, PENNSYLVANIA

NOTES:

1. TOPOGRAPHIC MAPPING AND FEATURES AT BLOCK VALVE SITE WAS TAKEN BY FIELD SURVEY. TOPOGRAPHIC MAPPING AND FEATURES FOR DRAINAGE AREA COMPILED FROM WWW.PASDA.PSU.EDU
2. THE PROJECT TAKES PLACE WITHIN BLAIR COUNTY AND HUNTINGDON COUNTY, PENNSYLVANIA.
3. TOWNSHIP BOUNDARIES TAKEN FROM WWW.PASDA.PSU.EDU.
4. 100-YEAR FEMA FLOODPLAINS FROM WWW.PASDA.PSU.EDU.
5. PIPELINE LOCATION AND RIGHT-OF-WAY FROM SUNOCO PIPELINE L.P.
6. THE RIGHTS-OF-WAYS AND EASEMENTS SHOWN ON THIS PLAN ARE THE RESPONSIBILITY OF SUNOCO PIPELINE L.P. TO SECURE WITH THE INDIVIDUAL PROPERTY OWNER. THE RIGHTS-OF-WAY AND EASEMENTS SHOWN ON THIS PERMIT DRAWING REPRESENT THE BEST AVAILABLE PROPERTY INFORMATION AS PROVIDED TO TETRA TECH, INC. BY SUNOCO PIPELINE L.P. THE RIGHTS-OF-WAY AND EASEMENTS SHALL BE VERIFIED AND LOCATED IN THE FIELD BY SUNOCO PIPELINE L.P.
7. PAST AND PRESENT LAND USE CONSISTS OF AGRICULTURAL, FORESTED AND RESIDENTIAL AREAS. POST CONSTRUCTION LAND USE WILL BE A MAINTAINED, VEGETATED RIGHT-OF-WAY.
8. DRAWINGS REPRESENT THE FINAL PLAN FOR CONSTRUCTION.
9. THE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, INSPECTION REPORTS, AND MONITORING REPORTS MUST BE AVAILABLE FOR REVIEW AND INSPECTION BY THE DEPARTMENT OR CONSERVATION DISTRICT.
10. THE LICENSED PROFESSIONAL OR DESIGNER SHALL BE PRESENT ON SITE FOR THE CONSTRUCTION OF THE INFILTRATION BERMS AND TRENCHES.
11. A RECORDED INSTRUMENT WILL BE RECORDED AT THE RECORDER OF DEEDS TO PROVIDE FOR NECESSARY ACCESS FOR LONG TERM OPERATION AND MAINTENANCE FOR PCSM BMP'S. THE DEED WILL PROVIDE NOTICE THAT THE RESPONSIBILITY FOR THE LONG TERM OPERATION AND MAINTENANCE OF THE PCSM BMP'S IS A COVENANT THAT RUNS WITH THE LAND AND IS BINDING AND ENFORCEABLE BY SUBSEQUENT GRANTEEES.
12. AT BLOCK VALVE SITES, FIELD SURVEYS WERE CONDUCTED TO ACCURATELY REFLECT FIELD CONDITIONS TO FACILITATE THE DESIGN OF THE SITES. THESE SURVEYS WERE CONDUCTED IN THE IMMEDIATE VICINITY OF THE PAD AND ROAD TO BE DESIGNED. DUE TO THE NATURE OF POST CONSTRUCTION STORMWATER DESIGN CRITERIA, SURVEY COULD NOT BE CONDUCTED FOR THE ENTIRE DRAINAGE AREAS AT EACH LOCATION. IN THESE AREAS, LIDAR DATA WAS SUBSTITUTED.

SITE RESTORATION

FOLLOWING COMPLETION OF PIPELINE INSTALLATION AND TRENCH BACKFILLING, THE PIPELINE RIGHT OF WAY, ASSOCIATED WORKSPACES, AND TEMPORARY ACCESS ROADS SHALL BE RETURNED TO THE GENERAL GRADE PRESENT PRIOR TO PIPELINE INSTALLATION IN ORDER TO MAINTAIN PRECONSTRUCTION DRAINAGE PATTERNS. AFTER COMPLETION OF MAJOR CONSTRUCTION WORK, TOPSOIL THAT WAS STOCKPILED DURING CONSTRUCTION WILL BE PLACED ALONG THE ROW. GROUNDS DISTURBED BY ANY OF THE OPERATIONS NECESSARY TO COMPLETE THE WORK FOR THIS PROJECT ARE TO BE PERMANENTLY SEEDED, OR IF SPECIFIED, SODDED, UNLESS OCCUPIED BY STRUCTURES, PAVED OR DESIGNATED AS A PERMANENT ACCESS ROAD. DISTURBED AREAS, WHICH ARE AT FINAL GRADE, SHALL BE SEEDED AND MULCHED ONCE FINAL GRADES ARE ACHIEVED. THE PERMANENT SEED MIXTURE WILL RESTORE DISTURBED AREAS TO A MEADOW IN GOOD CONDITION OR BETTER. IF SEEDING CANNOT BE COMPLETED WITHIN A FOUR (4) DAY PERIOD DUE TO WEATHER CONDITIONS, THE DISTURBED AREA WILL BE MULCHED WITH STRAW AT THE RATE OF THREE (3) TONS PER ACRE. THIS STRAW WILL BE ANCHORED USING A METHOD OUTLINED ON DRAWING PCS-0.03.

SITE RESTORATION CONSTRUCTION SEQUENCE

A GENERALIZED CONSTRUCTION SEQUENCE IS PROVIDED BELOW. THE CONSTRUCTION SEQUENCE IS INTENDED TO PROVIDE A GENERAL COURSE OF ACTION TO CONFORM TO THE APPLICABLE REGULATORY AGENCY REQUIREMENTS FOR SITE RESTORATION AND POST-CONSTRUCTION STORMWATER MANAGEMENT OF THE SITE. NECESSARY STEPS FOR PROPER AND COMPLETE EXECUTION OF WORK PERTAINING TO THIS PLAN, WHETHER SPECIFICALLY MENTIONED OR NOT, ARE TO BE PERFORMED BY THE CONTRACTOR. THE CONTRACTOR WILL COMPLY WITH ALL REQUIREMENTS LISTED IN THIS SECTION. THE CONTRACTOR MAY BE REQUIRED TO ALTER CONTROLS BASED ON THE EFFECTIVENESS OF CONTROLS OR DIFFERING CONDITIONS ENCOUNTERED IN THE FIELD. THE APPROPRIATE COUNTY CONSERVATION DISTRICT AND DEP SHALL BE CONTACTED AND MUST APPROVE ANY DEVIATION TO THE AUTHORIZED PLANS. A PRE-CONSTRUCTION MEETING IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY. THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) OR APPLICABLE COUNTY CONSERVATION DISTRICT, CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, AND THE PLAN PREPARER MUST BE INVITED TO THIS MEETING AT LEAST 7 DAYS IN ADVANCE.

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
2. SURFACE ROUGHENING WILL BE UTILIZED TO ROUGH THE SOIL SURFACE WITH HORIZONTAL DEPRESSIONS FOR THE PURPOSE OF REDUCING RUNOFF VELOCITY, INCREASING INFILTRATION, AIDING THE ESTABLISHMENT OF VEGETATION, AND REDUCING EROSION. SURFACE ROUGHENING SHOULD BE APPLIED TO SLOPES 3H:1V OR STEEPER UNLESS A STABLE ROCK FACE IS PROVIDED OR IT CAN BE SHOWN THAT THERE IS NOT A POTENTIAL FOR SEDIMENT POLLUTION TO SURFACE WATERS. FOR ROUGHENED SURFACES WITHIN 50 FEET OF A SURFACE WATER, AND WHERE BLANKETING OF SEEDED AREAS IS PROPOSED AS THE MEANS TO ACHIEVING PERMANENT STABILIZATION, SPRAY-ON TYPE BLANKETS ARE RECOMMENDED. SURFACE ROUGHENING SHALL BE ACCOMPLISHED USING DOZERS AFFIXED WITH GROUSER TRACKED EQUIPMENT. DOZERS SHALL RUN UP AND DOWN THE SLOPES LEAVING HORIZONTAL GROOVES PERPENDICULAR TO THE SLOPE. DOZER BLADES SHALL BE RAISED AND NOT USED DURING SURFACE ROUGHENING. WHERE COMPACTION DOES OCCUR, CONTRACTOR SHALL SCARIFY THE SOIL OR PROVIDE ADDITIONAL ROUGHENING SUCH AS DEEP RIPPING OR CHISEL RIPPING TO RESTORE THE AREA TO A MINIMAL COMPACTED STATE. IN AREAS OF PROPOSED INFILTRATION, SOILS SHALL BE AMENDED TO 2' BELOW GRADE. SEE SOIL AMENDMENT AND RESTORATION CONSTRUCTION SEQUENCE BELOW.
3. PLACE TOPSOIL FROM TOPSOIL STOCKPILES AS THE UPPER LAYER OF BACKFILL. TOPSOIL SHALL NOT BE PLACED WHEN THE SUBGRADE IS FROZEN OR WHEN IT IS EXCESSIVELY WET OR DRY AND SHALL NOT BE HANDLED WHEN IN A FROZEN OR MUDDY CONDITION.
4. REMOVE GRAVEL AND GEOTEXTILE FROM THE TEMPORARY ACCESS ROADS AND SCARIFY THE SOIL. REFER TO STEP 2 OF THIS SEQUENCE TO ADDRESS COMPACTION AT ACCESS ROADS. AFTER ADDRESSING COMPACTION CONCERNS, PLACE TOPSOIL THAT WAS STRIPPED PRIOR TO INSTALLATION OF THE ACCESS ROADS.
5. IMMEDIATELY SEED AND MULCH DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE ONCE FINAL GRADE IS ESTABLISHED AND TOPSOIL IS PLACED.
6. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70-PERCENT PERENNIAL VEGETATIVE COVER IS ESTABLISHED. REGRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE EROSION AND SEDIMENT CONTROLS.

SOIL AMENDMENT AND RESTORATION CONSTRUCTION SEQUENCE

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
2. IN THE DESIGNATED SOIL AMENDMENT AREA, TILL THE GROUND AND MIX IN THE COMPOST AT A RATIO OF 2:1 (SOIL:COMPOST) TO A DEPTH OF 24 INCHES.
3. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
4. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.

POST CONSTRUCTION STORMWATER MANAGEMENT CONSTRUCTION SEQUENCE

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
 2. INSTALL POST CONSTRUCTION BMP'S AFTER COMPLETION OF PIPELINE CONSTRUCTION:
- INFILTRATION BERM**
1. INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL BMP'S AS PER THE PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL.
 2. INSTALL ORANGE CONSTRUCTION FENCING AROUND THE PONDING AREA OF THE INFILTRATION BERM AS SHOWN ON THE PCSM PLAN DRAWINGS. COMPLETE SITE GRADING AND STABILIZE WITHIN THE LIMIT OF DISTURBANCE EXCEPT WHERE THE INFILTRATION BERM WILL BE CONSTRUCTED AND THE EXTENT OF THE PONDING AREA; MAKE EVERY EFFORT TO MINIMIZE BERM FOOTPRINT AND NECESSARY ZONE OF DISTURBANCE (INCLUDING BOTH REMOVAL OF EXISTING VEGETATION AND DISTURBANCE OF EMPTY SOIL) IN ORDER TO MAXIMIZE INFILTRATION. IF EQUIPMENT MUST TRAVEL THROUGH THE PONDING AREA, TIMBER MATTING SHALL BE PLACED TO MINIMIZE COMPACTION, AND EQUIPMENT TRAFFIC SHALL BE MINIMIZED.
 3. LIGHTLY SCARIFY THE SOIL IN THE AREA OF THE PROPOSED BERM BEFORE DELIVERING SOIL TO SITE.
 4. BRING IN FILL MATERIAL TO MAKE UP THE MAJOR PORTION OF THE BERM. SOIL SHOULD BE ADDED IN 8-INCH LIFTS AND COMPACTED AFTER EACH ADDITION ACCORDING TO DESIGN SPECIFICATIONS. THE SLOPE AND SHAPE OF THE BERM SHOULD BE GRADED OUT AS SOIL IS ADDED.
 5. PROTECT THE SURFACE PONDING AREA AT THE BASE OF THE BERM FROM COMPACTION.
 6. COMPLETE FINAL GRADING OF THE BERM AFTER THE TOP LAYER OF SOIL IS ADDED. TAMP SOIL DOWN LIGHTLY AND SMOOTH SIDES OF THE BERM. THE CREST AND BASE OF THE BERM SHOULD BE AT LEVEL GRADE.
 7. PLANT BERM WITH TURF, MEADOW PLANTS, SHRUBS OR TREES, AS DESIRED.
 8. MULCH PLANTED AND DISTURBED AREAS WITH COMPOST MULCH TO PREVENT EROSION WHILE PLANTS BECOME ESTABLISHED.

INFILTRATION TRENCH

1. INSTALL AND MAINTAIN PROPER EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION.
2. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE.
3. PROTECT INFILTRATION TRENCH AREA FROM COMPACTION PRIOR TO INSTALLATION. INSTALL ORANGE CONSTRUCTION FENCE AROUND THE TRENCH AND, IF APPLICABLE, THE PONDING AREA OF THE DOWNSLOPE BERM.
4. 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. IF IT IS NOT POSSIBLE TO INSTALL THE INFILTRATION TRENCH DURING THE LATER PHASES OF CONSTRUCTION, PLACE COMPOST FILTER SOCK UPSLOPE OF THE TRENCH TO PREVENT SEDIMENT FROM REACHING AND CLOGGING THE TRENCH.
5. EXCAVATE INFILTRATION TRENCH BOTTOM TO A UNIFORM, LEVEL UNCOMPACTED SUBGRADE FREE FROM ROCKS AND DEBRIS. DO NOT COMPACT SUBGRADE. THE CONSTRUCTION EQUIPMENT SHALL REMAIN OUTSIDE OF THE INFILTRATION TRENCH WHILE EXCAVATING IT.
6. 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.
7. INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, ETC.
8. PLACE UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH. CARE SHALL BE TAKEN SO AS NOT TO COMPACT THE SUBGRADE.
9. INSTALL CONTINUOUSLY PERFORATED PIPE AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH. CARE SHALL BE TAKEN SO AS NOT TO COMPACT THE SUBGRADE.
10. FOLD AND SECURE NONWOVEN GEOTEXTILE OVER INFILTRATION TRENCH, WITH MINIMUM OVERLAP OF 16- INCHES.
11. PLACE 6-INCH LIFT OF APPROVED TOPSOIL OVER INFILTRATION TRENCH, AS INDICATED ON PLANS.
12. SEED AND STABILIZE TOPSOIL.
13. ANY SEDIMENT THAT ENTERS INLETS DURING CONSTRUCTION IS TO BE REMOVED WITHIN 24 HOURS.
14. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
15. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.
16. REMOVE EROSION SEDIMENT CONTROL MEASURES UPON ESTABLISHMENT OF A UNIFORM 70% VEGETATIVE COVER OVER THE DISTURBED AREA. RE-GRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE EROSION AND SEDIMENT CONTROLS.

SOIL AMENDMENT AND RESTORATION

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
2. IN THE DESIGNATED SOIL AMENDMENT AREA, TILL THE GROUND AND MIX IN THE COMPOST AT A RATIO OF 2:1 (SOIL:COMPOST) TO A DEPTH OF 24 INCHES.
3. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
4. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.

SLOW RELEASE TRENCH

1. INSTALL AND MAINTAIN PROPER EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION.
2. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE.
3. IF POSSIBLE, INSTALL SLOW RELEASE 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. IF IT IS NOT POSSIBLE TO INSTALL THE SLOW RELEASE TRENCH DURING THE LATER PHASES OF CONSTRUCTION, PLACE COMPOST FILTER SOCK UPSLOPE OF THE TRENCH TO PREVENT SEDIMENT FROM REACHING AND CLOGGING THE TRENCH.
4. EXCAVATE SLOW RELEASE TRENCH BOTTOM TO A UNIFORM, LEVEL SUBGRADE FREE FROM ROCKS AND DEBRIS.
5. INSTALL AN IMPERMEABLE LINER WITHIN THE SLOW RELEASE TRENCH. SECURE IMPERMEABLE LINER DURING STONE PLACEMENT WITH AN ANCHOR TRENCH.
6. INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, ETC.
7. PLACE UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH.
8. INSTALL CONTINUOUSLY PERFORATED PIPE AND UNDERDRAIN OUTLET AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH.
9. PLACE 6-INCH LIFT OF APPROVED TOPSOIL OVER SLOW RELEASE TRENCH, AS INDICATED ON PLANS.
10. SEED AND STABILIZE TOPSOIL.
11. ANY SEDIMENT THAT ENTERS INLETS DURING CONSTRUCTION IS TO BE REMOVED WITHIN 24 HOURS.
12. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
13. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.
14. REMOVE EROSION SEDIMENT CONTROL MEASURES UPON ESTABLISHMENT OF A UNIFORM 70% VEGETATIVE COVER OVER THE DISTURBED AREA. RE-GRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE EROSION AND SEDIMENT CONTROLS.

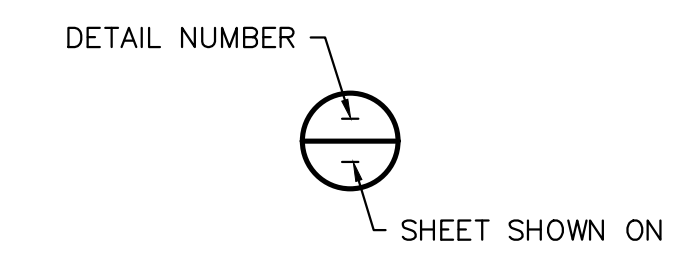
LEVEL SPREADER

1. THE UPHILL DEVELOPMENT SHALL BE STABILIZED BEFORE DIVERTING RUNOFF TO ANY DISPERSING FLOW TECHNIQUES.
2. ALL CONTRIBUTING STORMWATER ELEMENTS (INFILTRATION BERMS, INLETS, OUTLET CONTROL STRUCTURES, PIPES, ETC.) SHALL BE INSTALLED PRIOR TO INSTALLATION OF THE LEVEL SPREADER.
3. HDPE PIPE SHALL BE INSTALLED ALONG A CONTOUR UPHILL OF THE LEVEL SPREADER, WITH CARE TAKEN TO CONSTRUCT A SLIGHTLY SLOPED BOTTOM.
4. IF NECESSARY, INSTALL EROSION CONTROL MATTING ALONG THE LENGTH OF THE LEVEL SPREADER AND TO A DISTANCE DOWNHILL, AS SPECIFIED BY THE MANUFACTURER/SUPPLIER.
5. A BERM SHALL BE INSTALLED ALONG THE OUTLET OF THE HDPE PIPE TO ENSURE STORMWATER RUNOFF IS ROUTED TO THE LEVEL SPREADER.

LEGEND

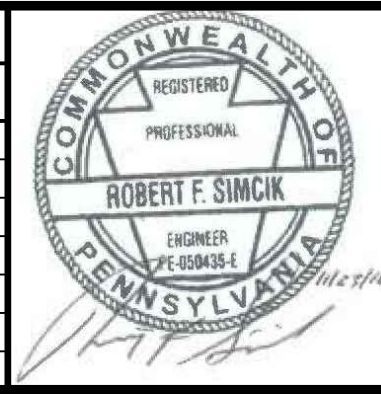
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	EXISTING TREE LINE
	EXISTING FENCELINE
	EXISTING STREAM WITH FLOW DIRECTION
	EXISTING ELECTRIC OVERHEAD
	EXISTING ELECTRIC UNDERGROUND
	EXISTING LIGHT POLE
	EXISTING WATER LINE
	EXISTING GAS LINE
	EXISTING DOMINION GAS LINE
	EXISTING SANITARY SEWER LINE
	EXISTING BUILDING
	PROPERTY LINE
	COUNTY BOUNDARY
	TOWNSHIP BOUNDARY
	100-YEAR FLOODWAY
	100-YEAR FEMA FLOODWAY
	100-YEAR FEMA FLOODPLAIN
	ORANGE CONSTRUCTION FENCE
	EXISTING PEM WETLAND
	EXISTING PFO WETLAND
	EXISTING PSS WETLAND
	PROPOSED PIPE LOCATION
	PROPOSED RIGHT-OF-WAY
	RIPARIAN FOREST BUFFER
	SOIL BOUNDARY
	SOIL TYPE/HYDROLOGY
	SOIL TYPE/HYDROLOGY
	LIMIT OF DISTURBANCE/AREA TO BE RESTORED
	WATER BAR
	TRENCH PLUGS
	CONVENTIONAL BORE
	UNDERDRAIN
	OVERALL DRAINAGE AREA
	POST CONSTRUCTION DETAINED DRAINAGE AREA
	POST CONSTRUCTION DETAINED TIME OF CONCENTRATION
	POST CONSTRUCTION UN-DETAINED TIME OF CONCENTRATION
	PRE CONSTRUCTION TIME OF CONCENTRATION
	PRE CONSTRUCTION IMPERVIOUS AREA
	PRE CONSTRUCTION MEADOW AREA
	PRE CONSTRUCTION FORESTED AREA
	POST CONSTRUCTION GRAVEL AREA
	POST CONSTRUCTION MEADOW AREA
	POST CONSTRUCTION WOODED AREA
	INFILTRATION TEST LOCATION
	PONDING AREA

DETAIL INDICATOR



www.tetrattech.com
661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
GENERAL NOTES & LEGEND**

DATE:	11/23/16
PROJECT NO.:	1121C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-0.01	
SHEET 0.01 OF 23	

LONG TERM INSPECTIONS AND MAINTENANCE FOR SITE RESTORATION AND PCSM CONTROLS:

LONG-TERM MAINTENANCE OF THE PIPELINE ROW WILL INCLUDE PERIODIC VISUAL INSPECTIONS FOR SUFFICIENT VEGETATIVE GROWTH AND COVER. INSUFFICIENT VEGETATIVE COVER IS DEFINED AS ANY AREA NOT ACHIEVING A UNIFORM 70-PERCENT PERENNIAL VEGETATIVE COVER. BARE SPOTS AND AREAS WITH INSUFFICIENT VEGETATIVE COVER WILL BE RESEDED AND MULCHED WITHIN 24 HOURS OF DISCOVERY. THE RIGHT OF WAY WILL BE INSPECTED FOR SIGNS OF EROSION, ESPECIALLY ON STEEP SLOPES. CORRECTIVE MEASURES WILL BE TAKEN, AS NEEDED. IF THERE IS EVIDENCE OF TRENCH SETTLING, THE AREA WILL BE REGRADED TO MAINTAIN PRE-CONSTRUCTION DRAINAGE PATTERNS, MULCHED, AND SEEDED. A WRITTEN REPORT IS REQUIRED FOR EACH INSPECTION AND FOR EACH REPAIR OR MAINTENANCE ACTIVITY, AND THE REPORT SHOULD SPECIFY HOW TO ACCESS THE SITE. SPLP IS RESPONSIBLE FOR MAINTAINING THE ROW UNDER THE PROVISIONS OF THIS PERMIT.

PERMANENT PROPOSED ACCESS ROADS AND VALVE PADS WILL BE CONSTRUCTED AS PART OF THE PROJECT. THESE ACCESS ROADS WILL REMAIN AS A PERMANENT GRAVEL DRIVE AFTER CONSTRUCTION IS COMPLETE. THE ACCESS ROADS WILL BE INSPECTED PERIODICALLY, AND AGGREGATE WILL BE APPLIED TO THE PERMANENT ACCESS ROADS AS NEEDED TO MAINTAIN AN ADEQUATE THICKNESS.

INSPECTION AND MAINTENANCE PROCEDURES FOR PERMANENT POST-CONSTRUCTION STORMWATER MANAGEMENT FACILITIES AND STORMWATER CONVEYANCE BMPs ARE SUMMARIZED BELOW. IF ANY POST-CONSTRUCTION STORMWATER MANAGEMENT FACILITIES ARE CONSTRUCTED PRIOR TO STABILIZATION OF UPSLOPE CONTRIBUTORY DRAINAGE AREAS, INSPECTIONS SHALL OCCUR WEEKLY AND AFTER RUNOFF EVENTS UNTIL THE SURROUNDING AREA ACHIEVES STABILIZATION. SPECIFY WHERE WE HAVE TO DO POST-CONSTRUCTION INFILTRATION TESTING.

INFILTRATION BERM

- THE INFILTRATION BERM SHALL BE INSPECTED AT LEAST 4 TIMES PER YEAR TO ENSURE IT IS INFILTRATING PROPERLY AND NOT CLOGGED WITH SEDIMENT.
- MONITOR DRAWDOWN TIME AFTER THE FIRST MAJOR STORM EVENT. THE BERM SHALL DEWATER WITHIN A MAXIMUM OF 72 HOURS. IF THE BERM IS NOT INFILTRATING WITHIN THE SPECIFIED TIMEFRAME, AMEND THE SOILS WITHIN THE PONDING AREA OF THE BERM (SEE SOIL AMENDMENT DETAIL IN PLANS).
- VEGETATION OVER THE BERM SHALL BE MAINTAINED AS NECESSARY, WHICH MAY REQUIRE ANNUAL MULCHING. ROUTINELY REMOVE ACCUMULATED DEBRIS AND INVASIVE PLANTS AS NEEDED.
- INSPECT FOR SIGNS OF FLOW CHANNELIZATION AND RESTORE LEVEL GRADIENT IMMEDIATELY AFTER ANY DEFICIENCIES ARE OBSERVED.

INFILTRATION TRENCH

- CATCH BASINS AND INLETS FOR THE INFILTRATION TRENCH SHOULD BE INSPECTED AND CLEANED, AS NECESSARY, AT LEAST 4 TIMES PER YEAR.
- THE VEGETATION ALONG THE SURFACE OF THE INFILTRATION TRENCH SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE.
- VEHICLES SHOULD NOT BE PARKED OR DRIVEN ON A VEGETATED INFILTRATION TRENCH, AND CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS.

SOIL AMENDMENT AND RESTORATION

- THE SOIL RESTORATION PROCESS MAY NEED TO BE REPEATED OVER TIME, DUE TO COMPACTION BY USE AND/OR SETTLING.
- SOIL AMENDMENT AREAS SHALL BE INSPECTED AT LEAST 4 TIMES PER YEAR FOR SIGNS OF COMPACTION. TO REMEDY COMPACTION, TILL THE SOIL TO A DEPTH OF 24 INCHES AND MIX IN COMPOST AT A RATIO OF 2:1 (SOIL:COMPOST).

SLOW RELEASE TRENCH

- INLETS AND OUTLETS FOR THE SLOW RELEASE TRENCH SHOULD BE INSPECTED AND CLEANED, AS NECESSARY, AT LEAST 4 TIMES PER YEAR.
- THE VEGETATION ALONG THE SURFACE OF THE SLOW RELEASE TRENCH SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE.
- VEHICLES SHOULD NOT BE PARKED OR DRIVEN ON A SLOW RELEASE TRENCH.

WATER DEFLECTOR

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
- ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WATER DEFLECTOR. THE RUBBER BELT SHALL BE REPLACED WHEN IT IS WORN AND NO LONGER EFFECTIVE.

LEVEL SPREADER

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
- THE RECEIVING LAND SHALL BE IMMEDIATELY RESTORED TO DESIGN CONDITIONS AFTER ANY DISTURBANCE. VEGETATED AREAS SHALL BE SEEDDED AND BLANKETED.
- IT IS CRITICAL THAT EVEN SHEET FLOW CONDITIONS ARE SUSTAINED THROUGHOUT THE LIFE OF THE LEVEL SPREADER, AS THEIR EFFECTIVENESS CAN DETERIORATE DUE TO LACK OF MAINTENANCE, INADEQUATE DESIGN/LOCATION, AND POOR VEGETATION COVER.
 - THE AREA BELOW THE LEVEL SPREADER SHALL BE INSPECTED FOR CLOGGING, DENSITY OF VEGETATION, DAMAGE BY FOOT OR VEHICULAR TRAFFIC, EXCESSIVE ACCUMULATIONS, AND CHANNELIZATION. INSPECTIONS SHALL BE MADE ON A QUARTERLY BASIS FOR THE FIRST TWO YEARS FOLLOWING INSTALLATION, AND THEN ON A SEMIANNUAL BASIS THEREAFTER. INSPECTIONS SHALL ALSO BE MADE AFTER EVERY STORM EVENT GREATER THAN 1-INCH.
 - SEDIMENT AND DEBRIS SHALL BE ROUTINELY REMOVED (BUT NEVER LESS THAN SEMIANNUALLY), OR UPON OBSERVATION, WHEN BUILDUP OCCURS IN THE CLEAN OUTS. REGRAIDING AND RESEEDING MAY BE NECESSARY IN THE AREAS BELOW THE LEVEL SPREADER. REGRAIDING MAY ALSO BE REQUIRED WHEN POOLS OF STANDING WATER ARE OBSERVED ALONG THE SLOPE. (IN NO CASE SHOULD STANDING WATER BE ALLOWED FOR LONGER THAN 72 HOURS).
 - MAINTAINING A VIGOROUS VEGETATIVE COVER ON THE AREAS BELOW THE LEVEL SPREADER IS CRITICAL FOR MAXIMIZING POLLUTANT REMOVAL EFFICIENCY AND EROSION PREVENTION. IF VEGETATIVE COVER IS NOT FULLY ESTABLISHED WITHIN THE DESIGNATED TIME, IT MAY NEED TO BE REPLACED WITH AN ALTERNATIVE SPECIES. (IT IS STANDARD PRACTICE TO CONTRACTUALLY REQUIRE THE CONTRACTOR TO REPLACE DEAD VEGETATION.) UNWANTED OR INVASIVE GROWTH SHALL BE REMOVED ON AN ANNUAL BASIS. BIWEEKLY INSPECTIONS ARE RECOMMENDED FOR AT LEAST THE FIRST GROWING SEASON, OR UNTIL THE VEGETATION IS PERMANENTLY ESTABLISHED. ONCE THE VEGETATION IS ESTABLISHED, INSPECTIONS OF HEALTH, DIVERSITY, AND DENSITY SHALL BE PERFORMED AT LEAST TWICE A YEAR, DURING BOTH THE GROWING AND NON-GROWING SEASON. VEGETATIVE COVER SHALL BE SUSTAINED AT 85% AND REPLACED IF DAMAGE GREATER THAN 50% IS OBSERVED.

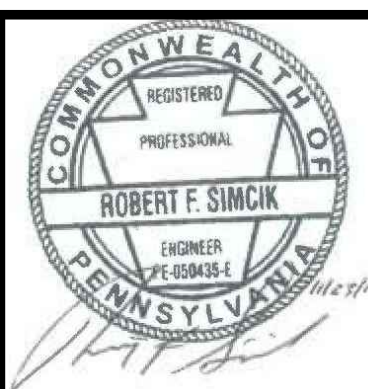
DIVERSION BERM

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
- MAINTAIN TURF GRASS AND OTHER VEGETATION BY MOWING AND RE-MULCHING.
- ROUTINELY REMOVE ACCUMULATED TRASH AND DEBRIS.
- REMOVE INVASIVE PLANTS AS NEEDED.
- INSPECT FOR SIGNS OF FLOW CHANNELIZATION; RESTORE LEVEL GRADIENT IMMEDIATELY AFTER DEFICIENCIES ARE OBSERVED.



www.tetrattech.com
 661 ANDERSEN DRIVE - FOSTER PLAZA 7
 PITTSBURGH, PA 15220
 T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
 SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
 CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
 NOTES**

DATE:	11/23/16
PROJECT NO.:	1121C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-0.02	
SHEET 0.02 OF 23	

TEMPORARY SEEDING

TEMPORARY GRASS COVER SHALL BE ESTABLISHED IN THE FOLLOWING AREAS:

- WHERE SOIL STOCKPILES ARE TO BE EXPOSED FOR A PERIOD GREATER THAN FOUR (4) DAYS, THE STOCKPILE SHALL BE SEEDED.
- WHERE VEGETATIVE FILTERS MUST BE ESTABLISHED BELOW FILTER BAGS, A MINIMUM DISTANCE OF 10 FT SHALL BE SEEDED DOWN SLOPE OF THE TRAP OUTLET.

TEMPORARY COVER

SEED MIXTURE FOR TEMPORARY COVER SHALL CONSIST OF 100% ANNUAL RYEGRASS. SEED SHALL BE APPLIED AT THE RATE OF 40 LB/ACRE OR AS RECOMMENDED BY A LOCAL RECOGNIZED SEED SUPPLIER APPROVED BY THE OWNER'S REPRESENTATIVE. PRIOR TO SEEDING, APPLY 1 TON OF AGRICULTURAL GRADE LIMESTONE PER ACRE PLUS 10-10-10 FERTILIZER AT THE RATE OF 500 LB. PER ACRE AND WORK INTO SOIL.

MULCHING

THE PURPOSE OF MULCH IS TO REDUCE RUNOFF AND EROSION, PREVENT SURFACE COMPACTION OR CRUSTING, CONSERVE MOISTURE, AID IN ESTABLISHING PLANT COVER, AND CONTROL WEEDS. MULCH SHALL BE APPLIED ON ANY AREA SUBJECT TO EROSION, OR WHICH HAS UNFAVORABLE CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH. THE PRACTICE MAY BE USED ALONE OR IN CONJUNCTION WITH OTHER STRUCTURAL AND VEGETATIVE CONSERVATION PRACTICES, SUCH AS WATERWAYS, PONDS, SEDIMENTATION TRAPS OR CRITICAL AREA PLANTING. ON SEDIMENT PRODUCING AREAS WHERE THE PERIOD OF EXPOSURE IS LESS THAN TWO (2) MONTHS, MULCH MATERIALS SHALL BE APPLIED ACCORDING TO THE FOLLOWING GUIDELINES:

- STRAW MULCH SHALL BE APPLIED AT THE RATE OF THREE TONS PER ACRE. CHEMICALLY TREATED OR SALTED STRAW IS NOT ACCEPTABLE AS MULCH.
- STRAW MULCH SHALL BE ANCHORED IMMEDIATELY AFTER APPLICATION BY AT LEAST ONE OF THE FOLLOWING METHODS:
 - "CRIMPED" INTO THE SOIL USING TRACTOR DRAWN EQUIPMENT (STRAIGHT BLADED COULTER OR SIMILAR). THIS METHOD IS LIMITED TO SLOPES NO STEEPER THAN 3:1. MACHINERY SHOULD BE OPERATED ON THE CONTOUR. (CRIMPING OF HAY OR STRAW BY RUNNING IT OVER WITH TRACKED MACHINERY IS NOT RECOMMENDED)
 - ASPHALT, EITHER EMULSIFIED OR CUT-BACK, CONTAINING NO SOLVENTS OR OTHER DILUTING AGENTS TOXIC TO PLANT OR ANIMAL LIFE, UNIFORMLY APPLIED AT THE RATE OF 31 GALLONS PER 1000 FT².
 - SYNTHETIC BINDERS (CHEMICAL BINDERS) MAY BE USED AS RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH PROVIDED SUFFICIENT DOCUMENTATION IS PROVIDED TO SHOW THAT IT IS NON-TOXIC TO NATIVE PLANT AND ANIMAL SPECIES.
 - LIGHTWEIGHT PLASTIC, FIBER, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

MULCHED AREAS SHALL BE CHECKED PERIODICALLY AND AFTER EACH RUNOFF EVENT (E.G. RAIN, SNOWMELT, ETC) FOR DAMAGE UNTIL THE DESIRED PURPOSE OF THE MULCHING IS ACHIEVED. DAMAGED PORTIONS OF THE MULCH OR TIE-DOWN MATERIAL SHALL BE REPAIRED UPON DISCOVERY.

REVEGETATION

LIMING RATES

MINIMUM 6 TONS PER ACRE AT 100% EFFECTIVE NEUTRALIZING VALUE (% ENV), UNLESS THE SOIL TEST DETERMINES THAT A LESSER AMOUNT IS NEEDED. TO DETERMINE THE ACTUAL AMOUNT OF REGULAR LIME TO APPLY, DIVIDE THE AMOUNT CALLED FOR BY THE SOIL TEST BY THE % ENV FOR THE PRODUCT USED. FOR EXAMPLE, IF 6 TONS PER ACRE IS NEEDED AND THE ENV FOR THE LIME USED IS 88%, DIVIDE 6 BY 0.88 RESULTING IN 6.8 TONS NEEDED TO BE APPLIED. FOR DOLOMITIC LIME, WHICH HAS A SIGNIFICANT AMOUNT OF MAGNESIUM IN IT, DIVIDE THE AMOUNT CALLED FOR BY THE SOIL TEST BY THE % CALCIUM CARBONATE EQUIVALENT (% CCE) LISTED FOR THE PRODUCT INSTEAD OF THE % ENV. THE % CCE MAY BE ABOVE 100% WHICH ACCOUNTS FOR THE FACT THAT MAGNESIUM HAS A GREATER EFFECT PER POUND THAN THE CALCIUM IN REGULAR LIME. NOTE: WORK IN LIME AND FERTILIZER TO A DEPTH OF 4 IN. USING SUITABLE EQUIPMENT. WHEN A SOIL TEST REQUIRES MORE THAN 8,000 POUNDS OF LIME PER ACRE, THE LIME MUST BE MIXED INTO THE TOP 6 INCHES OF SOIL.

FERTILIZATION RATES

APPLY 10-20-20 AT 600 POUNDS/ACRE, IF TOP DRESSED OR 1,000 POUNDS/AC, IF INCORPORATED, UNLESS THE SOIL TEST DETERMINES THAT THE RATE CAN BE LESS THAN THESE MINIMUMS.

SOIL AMENDMENT APPLICATION RATE EQUIVALENTS				
SOIL AMENDMENT	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YDS.	NOTES
PERMANENT SEEDING APPLICATION RATE				
AGRICULTURAL LIME	6 TONS	240 LBS.	240 LBS.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS
10-20-20 FERTILIZER	1,000 LBS.	25 LBS.	210 LBS.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS

RECOMMENDED SEED MIXTURES				
MIXTURE NO.	SPECIES	SEEDING RATES - PLS(1)		
		MOST SITES	ADVERSE SITES	
1 (2)	SPRING OATS (SPRING), OR 64 96	64	96	
	ANNUAL RYEGRASS (SPRING OR FALL), OR	10	15	
	WINTER WHEAT (FALL), OR	90	120	
	WINTER RYE (FALL)	56	112	
2 (3)	TALL FESCUE, OR 75	60	75	
	FINE FESCUE, OR 40	35	40	
	KENTUCKY BLUEGRASS, PLUS 25 30	25	30	
	REDTOP(4), OR	3	3	
3	PERENNIAL RYEGRASS	15	20	
	BIRDSFOOT TREFOIL, PLUS 6 10	6	10	
4	TALL FESCUE	30	35	
	BIRDSFOOT TREFOIL, PLUS	6	10	
5 (5)	REED CANARYGRASS	10	15	
	CROWNVEATCH, PLUS	10	15	
6 (5,6)	TALL FESCUE, OR	20	25	
	PERENNIAL RYEGRASS	20	25	
	CROWNVEATCH, PLUS	10	15	
7 (5)	ANNUAL RYEGRASS	20	25	
	BIRDSFOOT TREFOIL, PLUS	20	30	
	CROWNVEATCH, PLUS	20	30	
8	TALL FESCUE	20	25	
	FLATPEA, PLUS	20	30	
	TALL FESCUE, OR	20	30	
9 (7)	PERENNIAL RYEGRASS	20	25	
	SERECIA LESPEDEZA, PLUS	10	20	
	TALL FESCUE, PLUS	20	25	
10	REDTOP(4)	3	3	
	TALL FESCUE, PLUS	40	60	
11	FINE FESCUE	10	15	
	DEERTONGUE, PLUS	15	20	
12(8)	BIRDSFOOT TREFOIL	6	10	
	SWITCHGRASS, OR	15	20	
	BIG BLUESTEM, PLUS	15	20	
13	BIRDSFOOT TREFOIL	6	10	
	ORCHARDGRASS, OR	20	30	
	SMOOTH BROMEGRASS, PLUS	25	35	
	BIRDSFOOT TREFOIL	6	10	

NOTES:

- PURE LIVE SEED (PLS) IS THE PRODUCT OF THE PERCENTAGE OF PURE SEED TIMES PERCENTAGE GERMINATION DIVIDED BY 100. FOR EXAMPLE, TO SECURE THE ACTUAL PLANTING RATE FOR SWITCHGRASS, DIVIDE 12 POUNDS PLS SHOWN ON THE SEED TAG. THUS, IF THE CONTENT OF A GIVEN SEED LOT IS 35 PERCENT, DIVIDE 12 PLS BY 0.35 TO OBTAIN 34.3 POUNDS OF SEED REQUIRED TO PLANT ONE-ACRE. ALL MIXTURES IN THIS TABLE ARE SHOWN IN TERMS OF PLS.
- IF HIGH-QUALITY SEED IS USED, FOR MOST SITES SEED SPRING OATS AT A RATE OF TWO BUSHELS PER ACRE, WINTER WHEAT AT 11.5 BUSHELS PER ACRE, AND WINTER RYE AT ONE BUSHEL PER ACRE. IF GERMINATION IS BELOW 90 PERCENT, INCREASE THESE SUGGESTED SEEDING RATES BY 0.5 BUSHEL PER ACRE.
- THIS MIXTURE IS SUITABLE FOR FREQUENT MOWING. DO NOT CUT SHORTER THAN 4 INCHES.
- KEEP SEEDING RATE TO THAT RECOMMENDED IN TABLE. THESE SPECIES HAVE MANY SEEDS PER POUND AND ARE VERY COMPETITIVE. TO SEED SMALL QUANTITIES OF SMALL SEEDS SUCH AS WEEPING LOVEGRASS AND REDTOP, DILUTE WITH DRY SAWDUST, SAND, RICE HULLS, BUCKWHEAT HULLS, ETC.
- USE FOR HIGHWAY SLOPES AND SIMILAR SITES WHERE THE DESIRED SPECIES AFTER ESTABLISHMENT IS BIG BLUESTEM.
- USE ONLY IN EXTREME SOUTHEASTERN OR EXTREME SOUTHWESTERN PA. SERECIA LESPEDEZA IS NOT WELL ADAPTED TO MOST OF PA.
- DO NOT MOW SHORTER THAN 9 TO 10 INCHES.
- NOTE NOT APPLICABLE BECAUSE CROWNVEATCH IS NOT PROPOSED.
- IF LIMING, FERTILIZATION, AND PREPARATION OF SEEDBED ARE PROPERLY DONE AND IF CARE IS TAKEN TO DRILL AND COVER THE SEED (OR MULCH APPLIED), THE RATE FOR "MOST SITES" SHOULD SUFFICE. HOWEVER, ON ERODED OR COARSE AND POORLY PREPARED SEEDBEDS, PARTICULARLY IF THE SOIL IS VERY ACIDIC OR INFERTILE, THE RATE FOR "ADVERSE SITES" SHOULD BE USED.

PENN DOT FORMULA B				
SEEDING RATE	3 LBS PER 1,000 SQ FT			
SPECIES	% BY WT.	PURITY %	MIN. % GERMINATION	MAX. % WEED SEED
KENTUCKY BLUEGRASS	50	98	80	0.20
PERENNIAL RYE	20	98	90	0.15
RED FESCUE	30	98	85	0.15

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED)		
WELL-DRAINED	1 PLUS	3, 5, 8, OR 12 (1)
VARIABLE DRAINAGE	1 PLUS	3 OR 7
SLOPES AND BANKS (MOWED)		
WELL-DRAINED	1 PLUS	2 OR 10
SLOPES AND BANKS (GRAZED/HAY)		
WELL-DRAINED	1 PLUS	2, 3, OR 13
GULLIES AND ERODED AREAS	1 PLUS	3, 5, 7, OR 12 (1)
EROSION CONTROL FACILITIES (BMPS)		
SOD WATERWAYS, SPILLWAYS, FREQUENT WATER FLOW AREAS	1 PLUS	2, 3, OR 4
DRAINAGE DITCHES		
SHALLOW, LESS THAN THREE FEET DEEP	1 PLUS	2, 3, OR 4
DEEP, NOT MOWED	1 PLUS	5 OR 7
POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS		
MOWED AREAS	1 PLUS	2 OR 3
NON-MOWED AREAS	1 PLUS	5 OR 7
FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS	3 OR 13
HIGHWAYS (2)		
NON-MOWED AREAS	1 PLUS	
WELL-DRAINED	1 PLUS	5, 7, 8, 9, OR 10
VARIABLE DRAINAGE	1 PLUS	3 OR 7
POORLY DRAINAGE	1 PLUS	3 OR 9
AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS	2, 3, OR 10
UTILITY ROW		
WELL-DRAINED	1 PLUS	5, 8, OR 12 (1)
VARIABLE DRAINAGE	1 PLUS	3 OR 7
WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS	2, 3, OR 13
EFFLUENT DISPOSAL AREAS	1 PLUS	3 OR 4
SANITARY LANDFILLS	1 PLUS	3, 5, 7, 11 (1), OR 12 (1)
SURFACE MINES		
SPOILS, MINE WASTES, FLY ASH, SLAG, SETTLING BASIN RESIDUES AND OTHER SEVERELY DISTURBED AREAS (LIME TO SOIL TEST)	1 PLUS	3, 4, 5, 7, 8, 9, 11 (1) OR 12(1)
SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS	3 OR 13

NOTES:

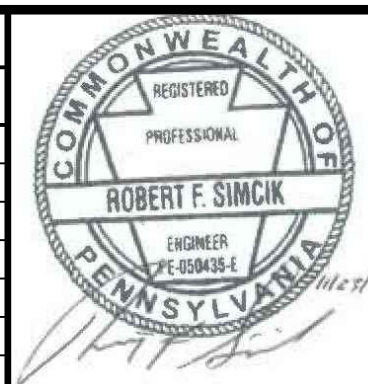
- FOR SEED MIXTURES 11 AND 12, ONLY USE SPRING OATS OR WEEPING LOVEGRASS (INCLUDED IN MIX) AS NURSE CROP.
- CONTACT THE PennDOT DISTRICT ROADSIDE SPECIALIST FOR SPECIFIC SUGGESTIONS ON TREATMENT TECHNIQUES AND MANAGEMENT PRACTICES.

MULCH APPLICATION RATES				
MULCH TABLE	APPLICATION RATE (MINIMUM)			NOTES
	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YDS.	
STRAW	3 TONS	140 LBS.	1,240 LBS.	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	3 TONS	140 LBS.	1,240 LBS.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOODCHIPS	4 TO 6 TONS	185 TO 275 LBS.	1,650 TO 2,500 LBS.	MAY PREVENT GERMINATION OF GRASSES AND LEGUMES
HYDROMULCH	1 TON	47 LBS.	415 LBS.	SEE LIMITATIONS ABOVE



TETRA TECH
www.tetrattech.com
661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

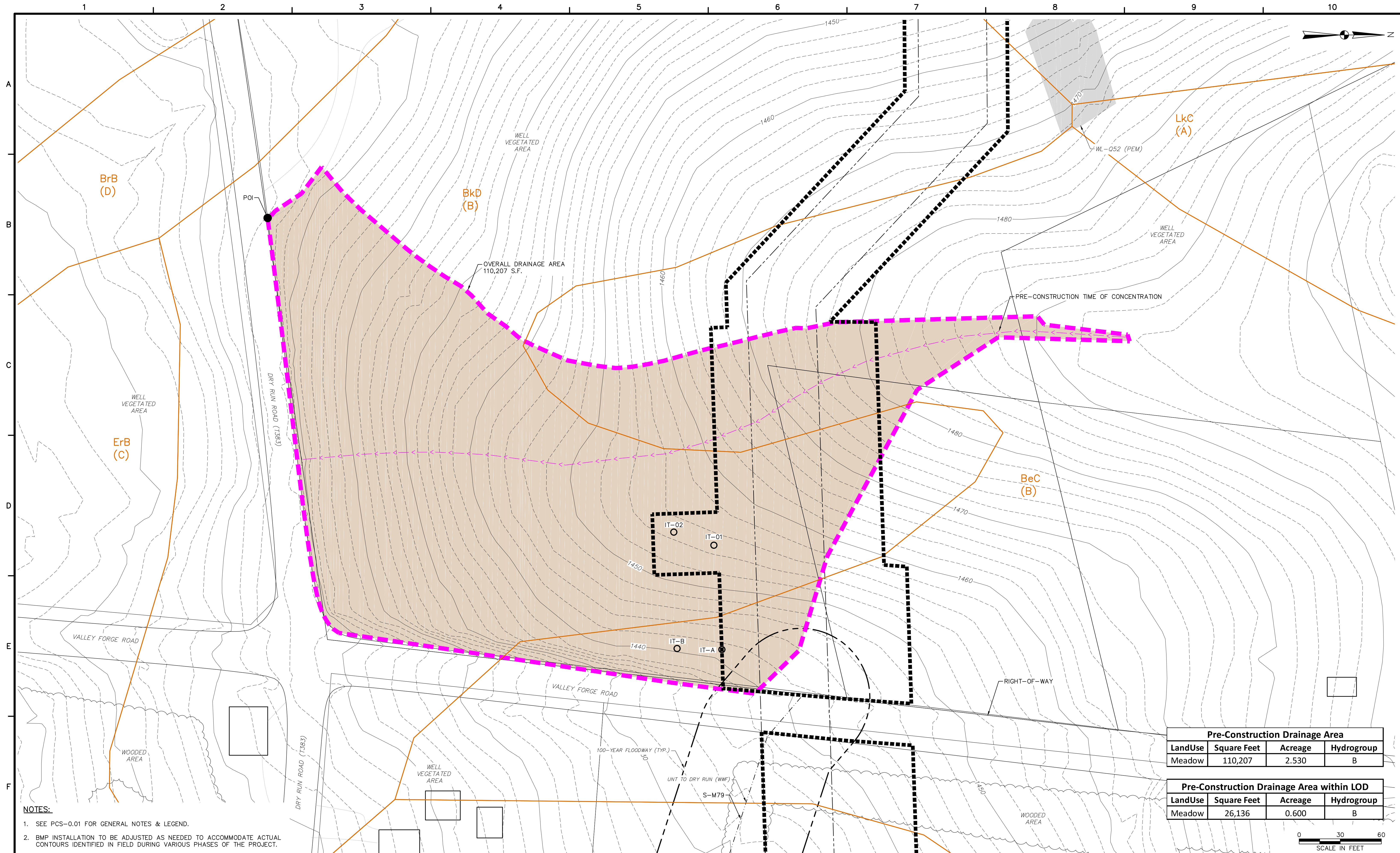
REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
SEEDING SPECIFICATIONS

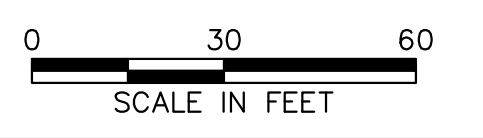
DATE:	11/23/16
PROJECT NO.:	112IC05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT:	TETRA TECH INC.
PCS-0.03	
SHEET 0.03 OF 23	



- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

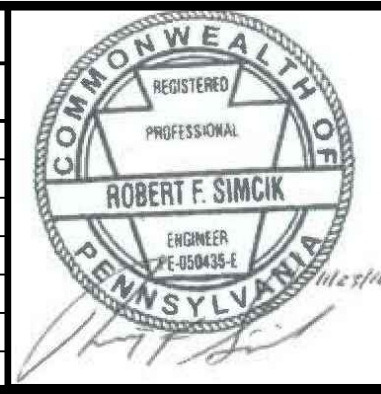
Pre-Construction Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	110,207	2.530	B

Pre-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	26,136	0.600	B



TETRA TECH
www.tetrattech.com
661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS

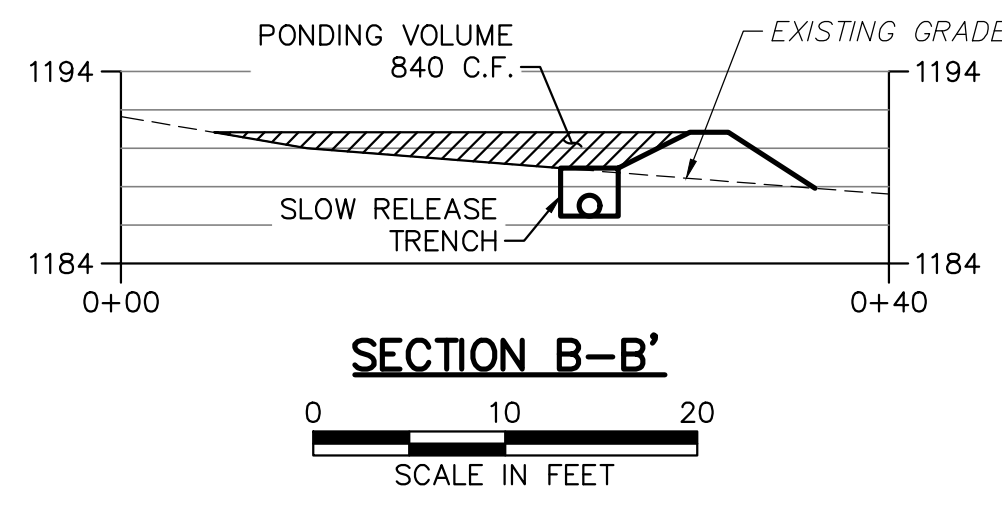


SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

VALLEY FORGE ROAD BLOCK VALVE
PRE-CONSTRUCTION STORMWATER MANAGEMENT PLAN

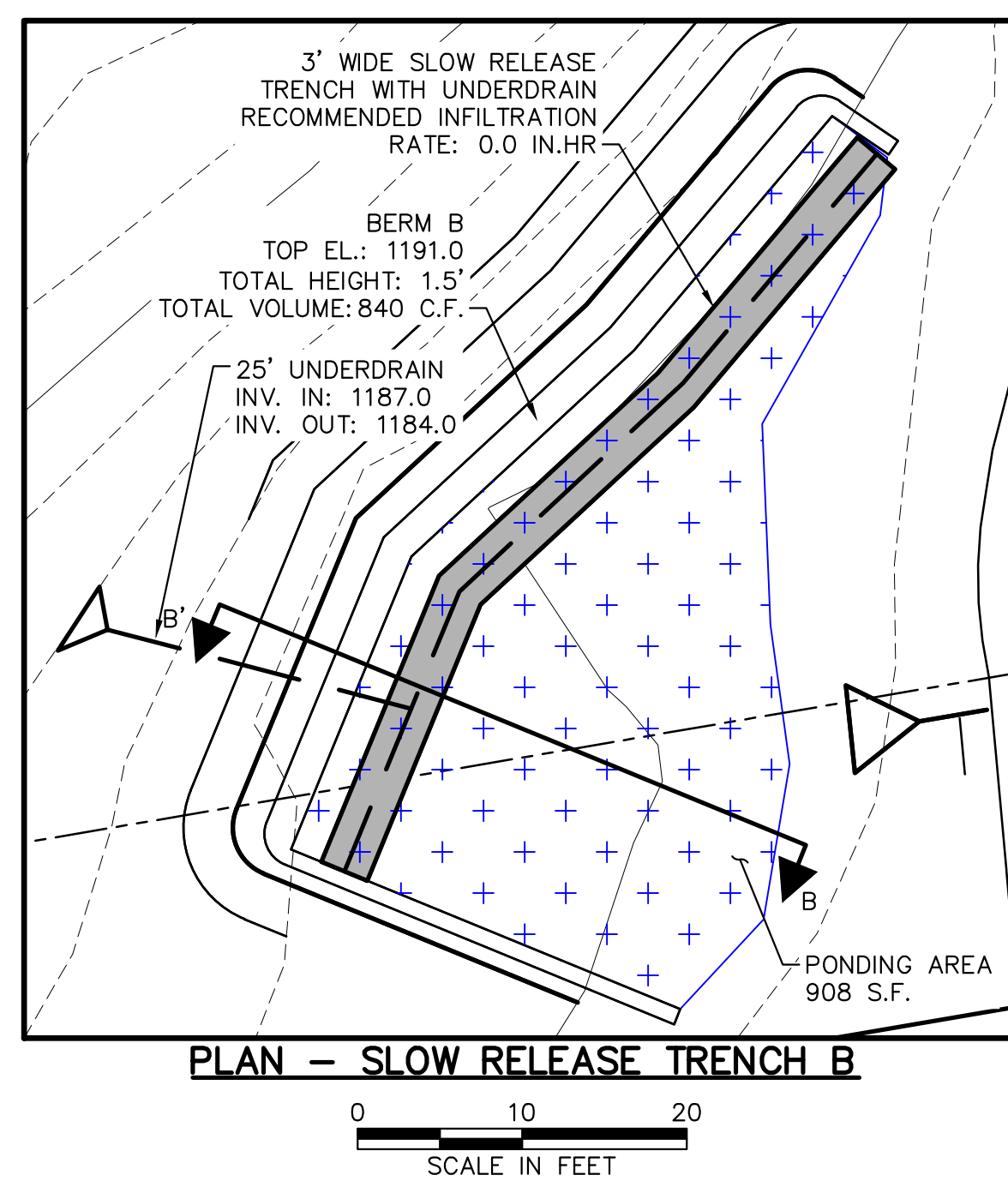
DATE: 11/23/16
PROJECT NO.: 112IC05958
DESIGNED BY: KG
DRAWN BY: BH
CHECKED BY: RS
COPYRIGHT TETRA TECH INC.
PCS-3.01
SHEET 3.01 OF 23



Post-Construction Drainage Area 2 within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	3,485	0.080	C
Gravel	871	0.020	C

Post-Construction Undetained Drainage Area 2			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	3,049	0.070	C
Woods	871	0.020	C
Gravel	436	0.010	C

Post-Construction Detained Drainage Area 2			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	1,742	0.040	C
Gravel	436	0.010	C



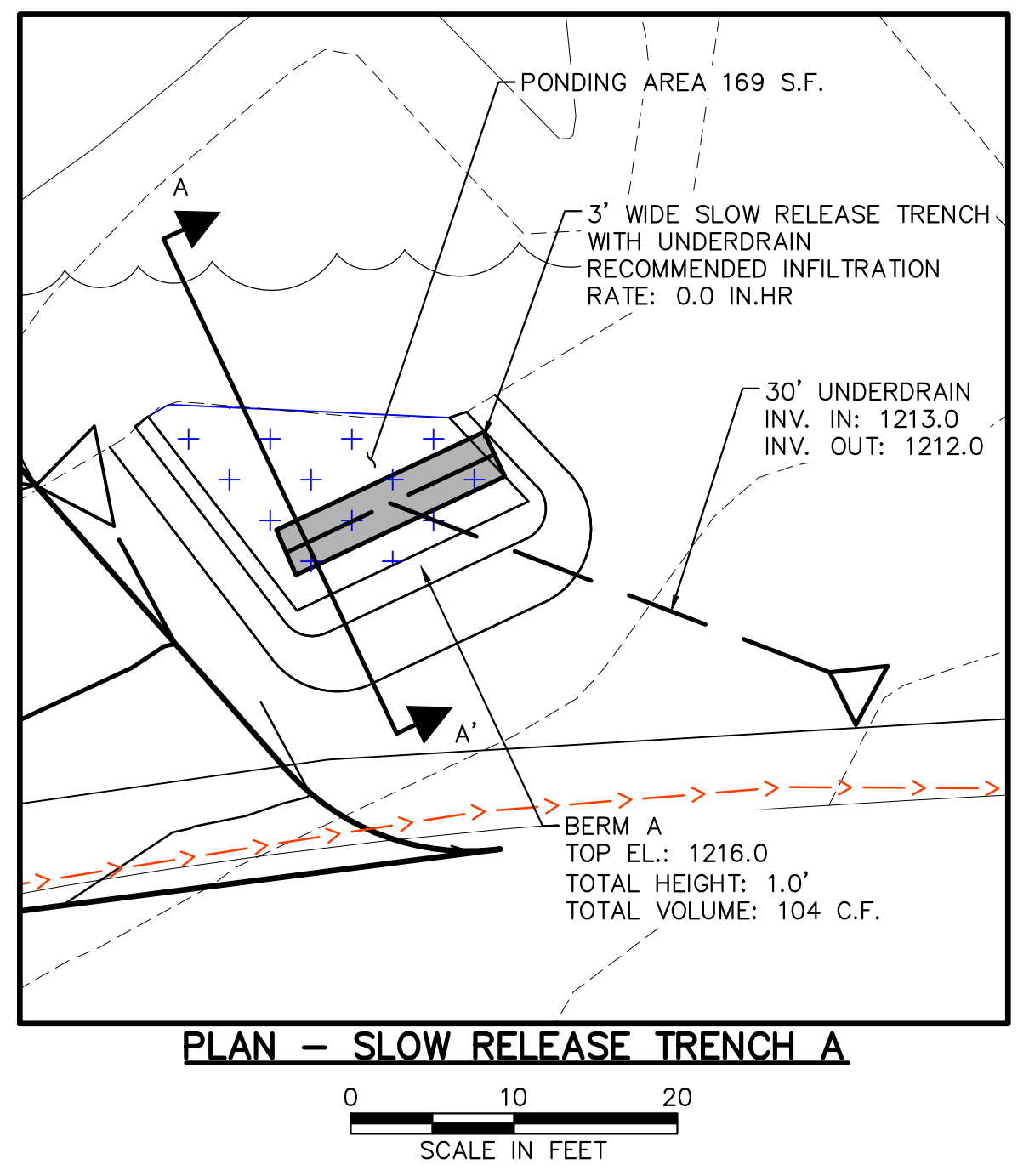
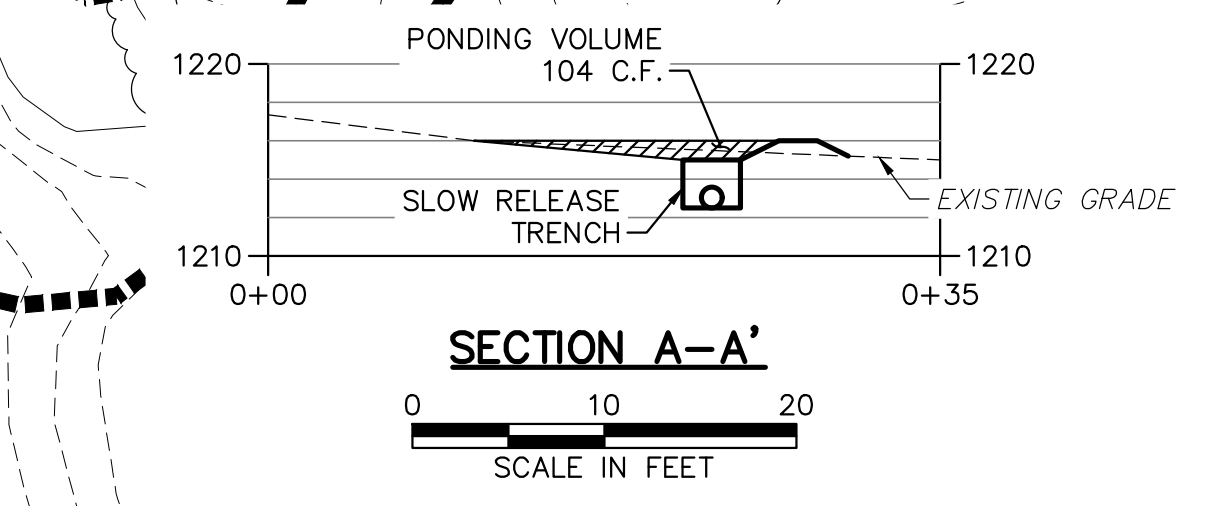
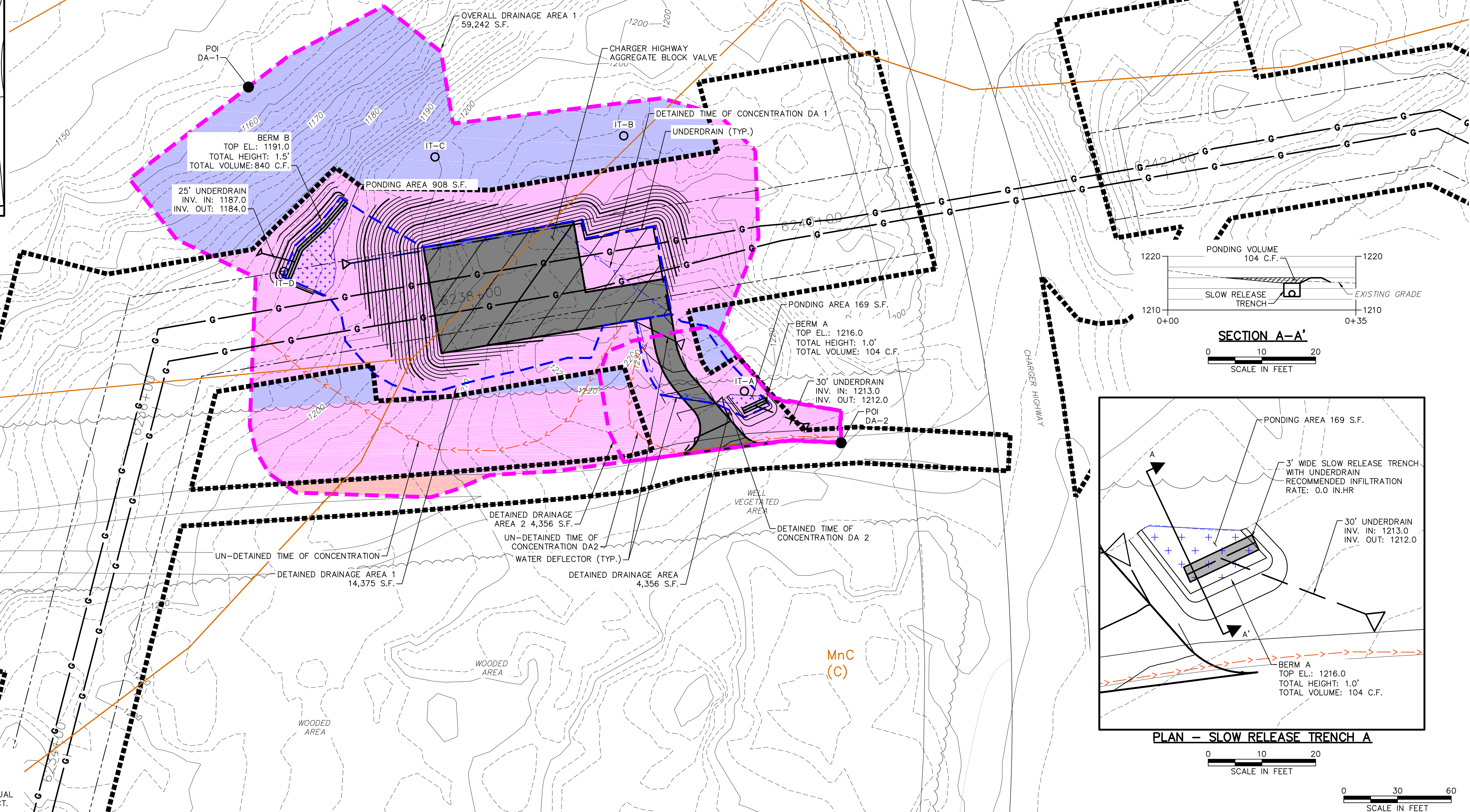
Post-Construction Drainage Area 1 within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	436	0.010	B
Meadow	10,890	0.250	C
Meadow	11,761	0.270	D
Gravel	4,356	0.100	C
Gravel	1,742	0.040	D

Post-Construction Undetained Drainage Area 1			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	4,356	0.100	B
Meadow	13,939	0.320	C
Meadow	6,970	0.160	D
Woods	2,178	0.050	C
Woods	17,424	0.400	D

Post-Construction Detained Drainage Area 1			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	436	0.010	B
Meadow	3,485	0.080	C
Meadow	4,792	0.110	D
Gravel	4,356	0.100	C
Gravel	1,307	0.030	D

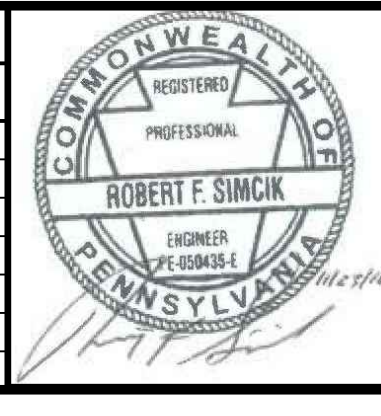
NOTES:

- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
- BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.



TETRA TECH
www.tetrattech.com
661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS

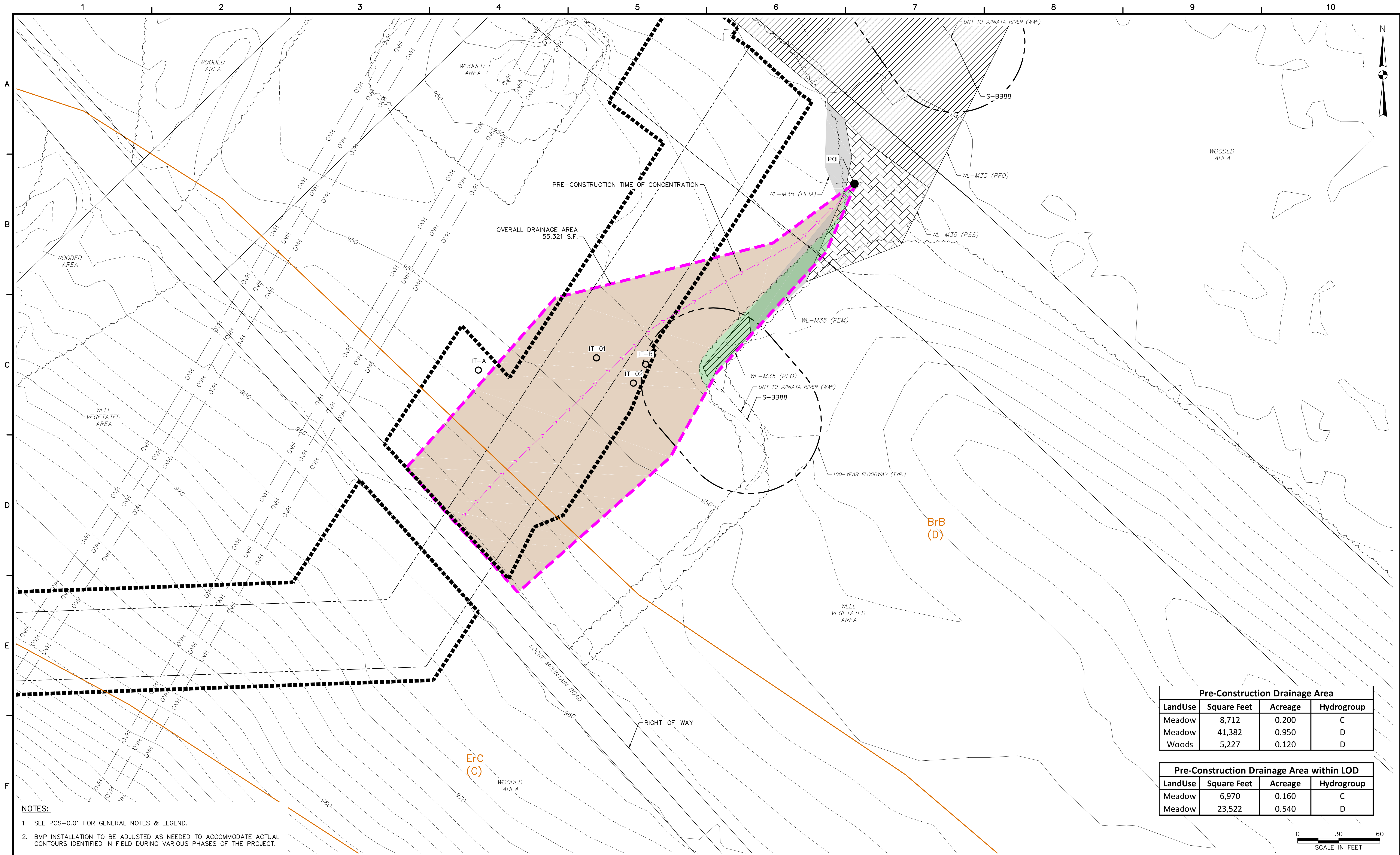


SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

CHARGER HIGHWAY BLOCK VALVE
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN

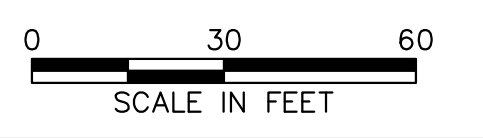
DATE: 11/23/16
PROJECT NO.: 1121C05958
DESIGNED BY: KG
DRAWN BY: BH
CHECKED BY: RS
COPYRIGHT TETRA TECH INC.
PCS-3.04
SHEET 3.04 OF 23



NOTES:
 1. SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 2. BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

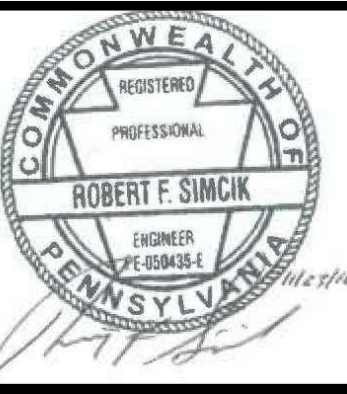
Pre-Construction Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	8,712	0.200	C
Meadow	41,382	0.950	D
Woods	5,227	0.120	D

Pre-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	6,970	0.160	C
Meadow	23,522	0.540	D



661 ANDERSEN DRIVE - FOSTER PLAZA 7
 PITTSBURGH, PA 15220
 T: (412) 921-7090 | F: (412) 921-4040

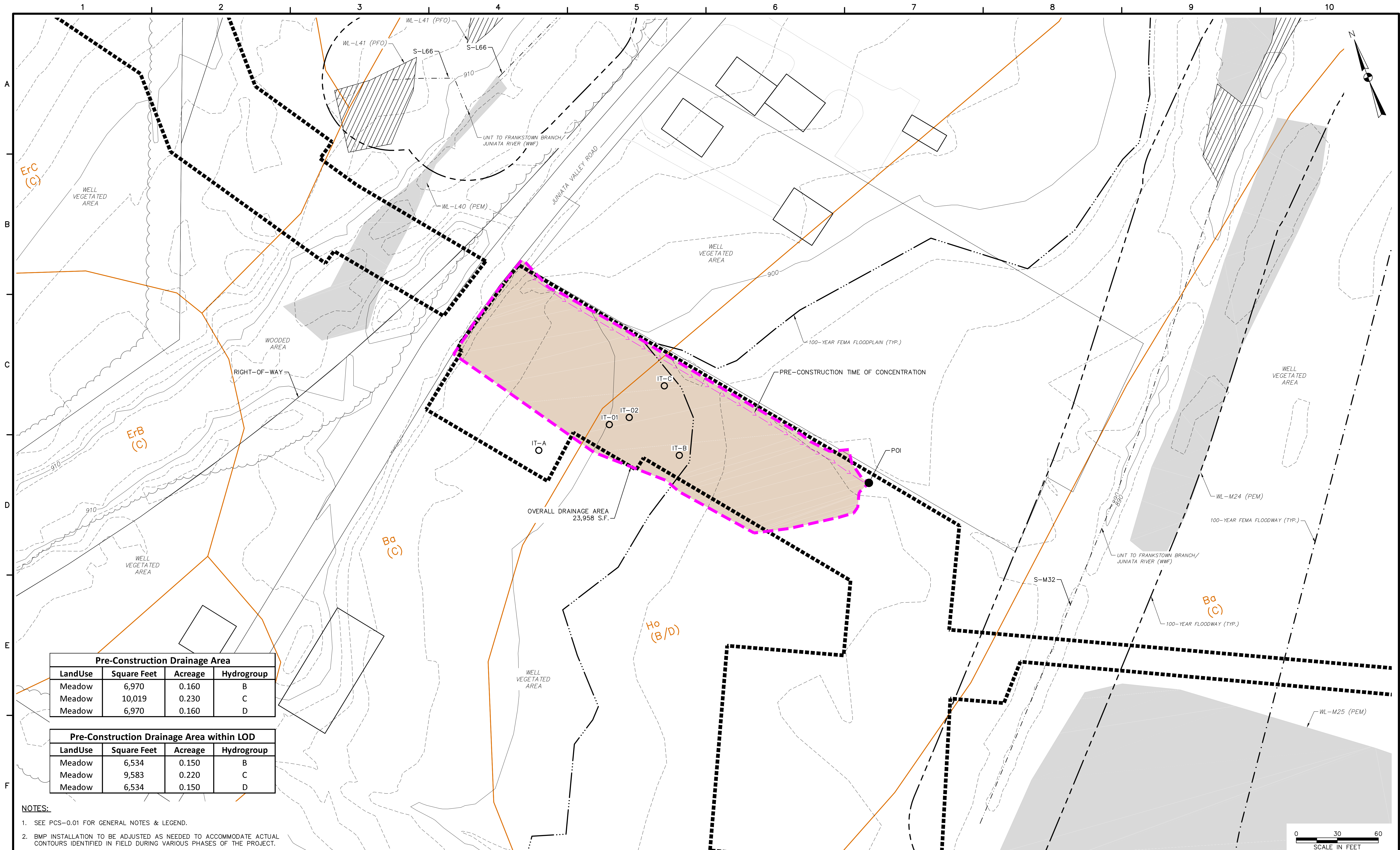
REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
 SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
 CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
 LOCKE MOUNTAIN ROAD BLOCK VALVE
PRE-CONSTRUCTION STORMWATER MANAGEMENT PLAN

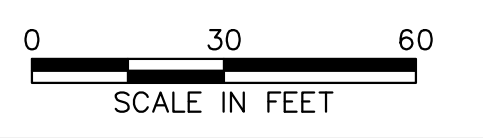
DATE: 11/23/16
 PROJECT NO.: 1121C05958
 DESIGNED BY: KG
 DRAWN BY: BH
 CHECKED BY: RS
 COPYRIGHT TETRA TECH INC.
PCS-3.05
 SHEET 3.05 OF 23



Pre-Construction Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	6,970	0.160	B
Meadow	10,019	0.230	C
Meadow	6,970	0.160	D

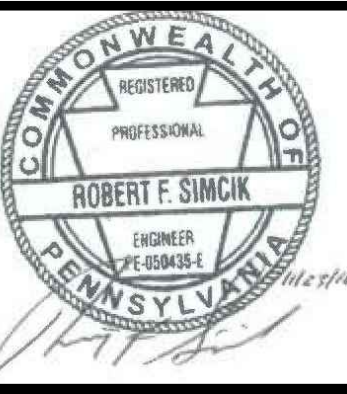
Pre-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	6,534	0.150	B
Meadow	9,583	0.220	C
Meadow	6,534	0.150	D

- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.



661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

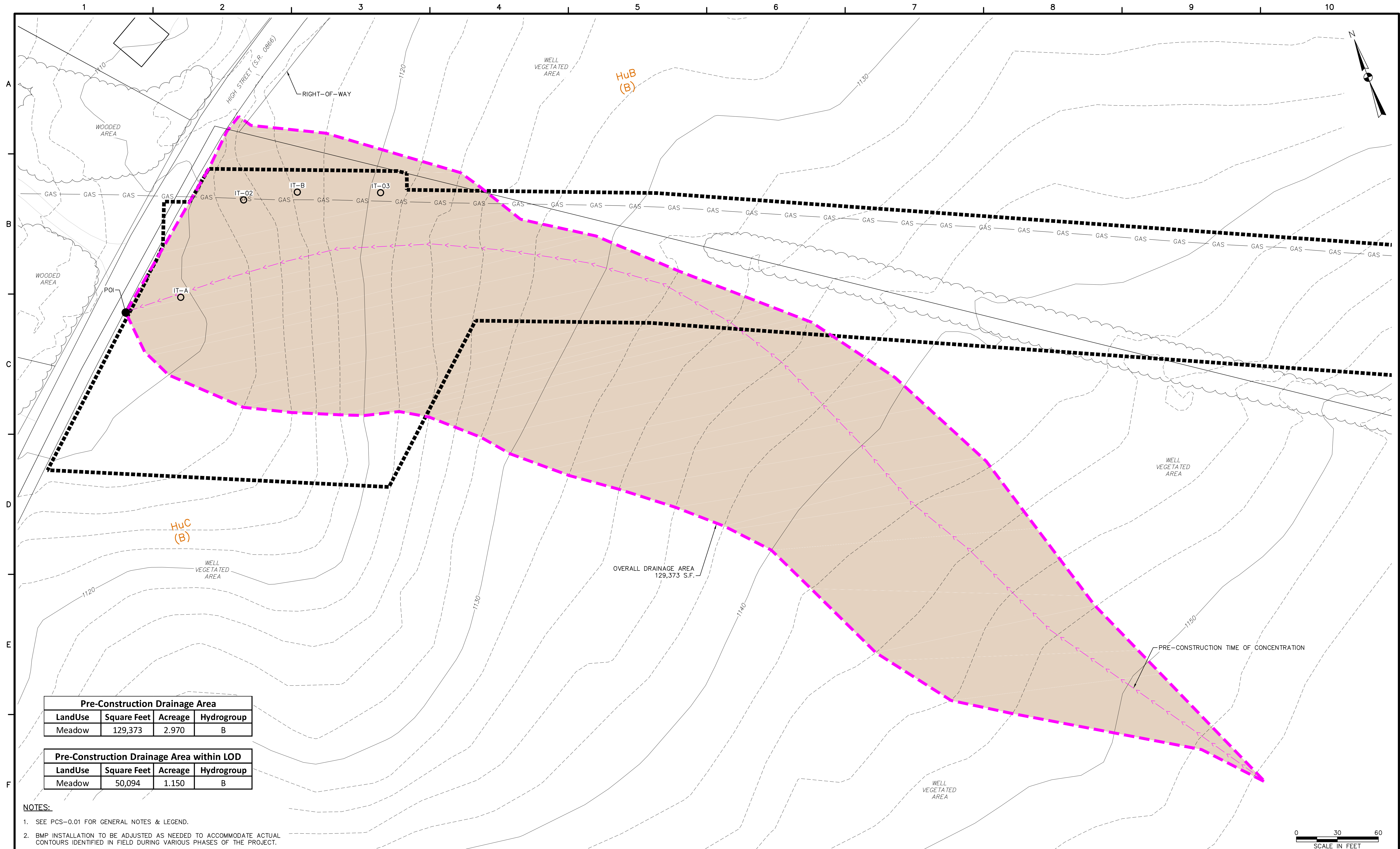
REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**JUNIATA VALLEY ROAD BLOCK VALVE
PRE-CONSTRUCTION STORMWATER MANAGEMENT PLAN**

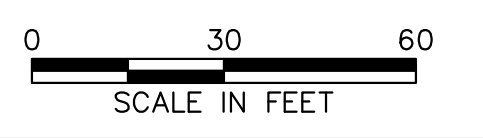
DATE:	11/23/16
PROJECT NO.:	112IC05958
DESIGNED BY:	KG
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-3.07	
SHEET 3.07 OF 23	



Pre-Construction Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	129,373	2.970	B

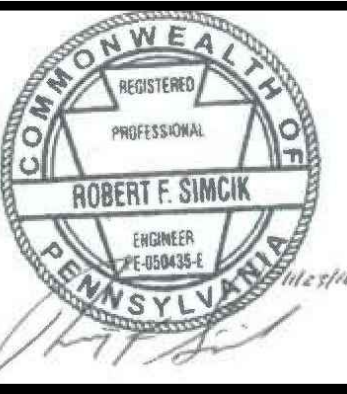
Pre-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	50,094	1.150	B

- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.



661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS

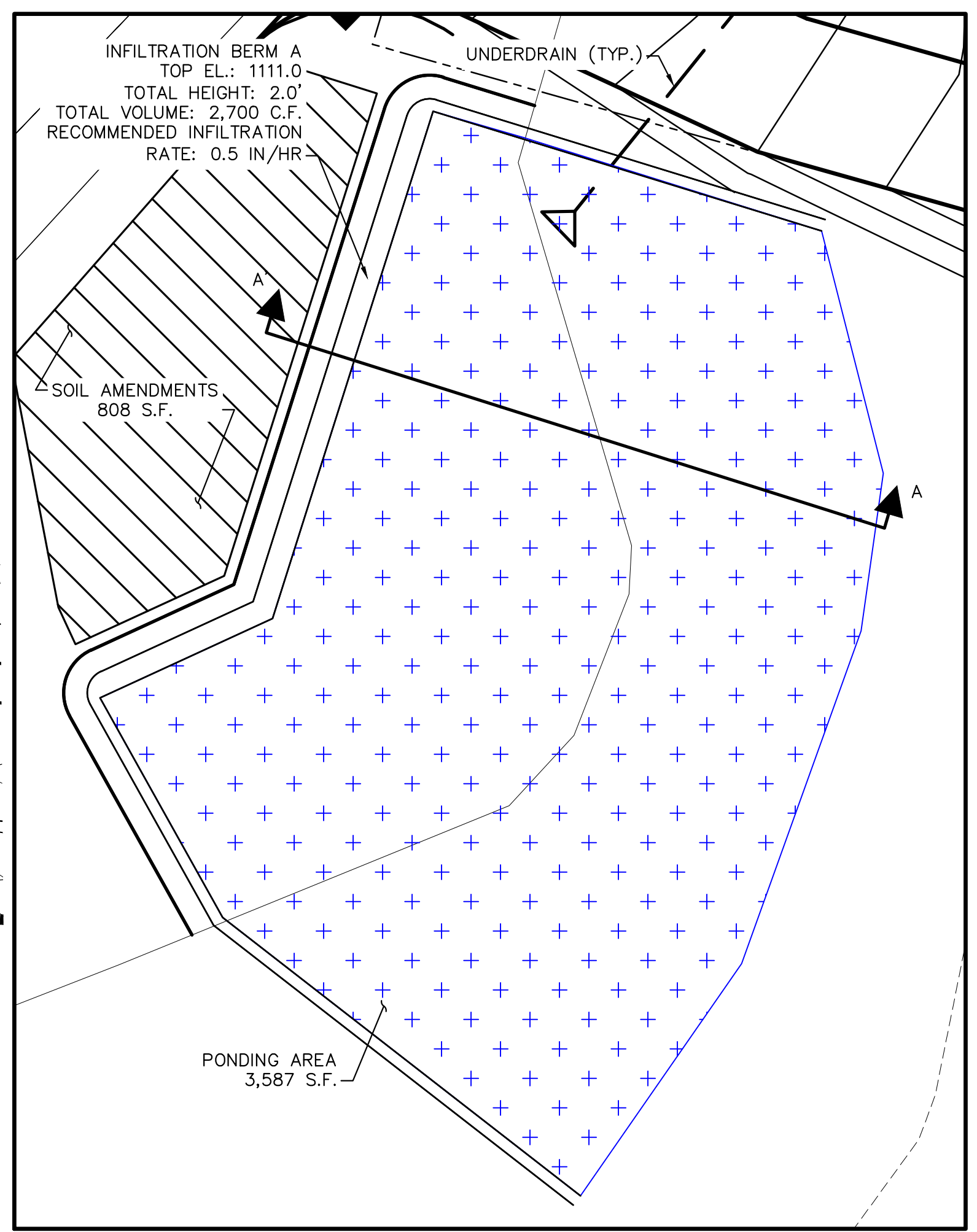
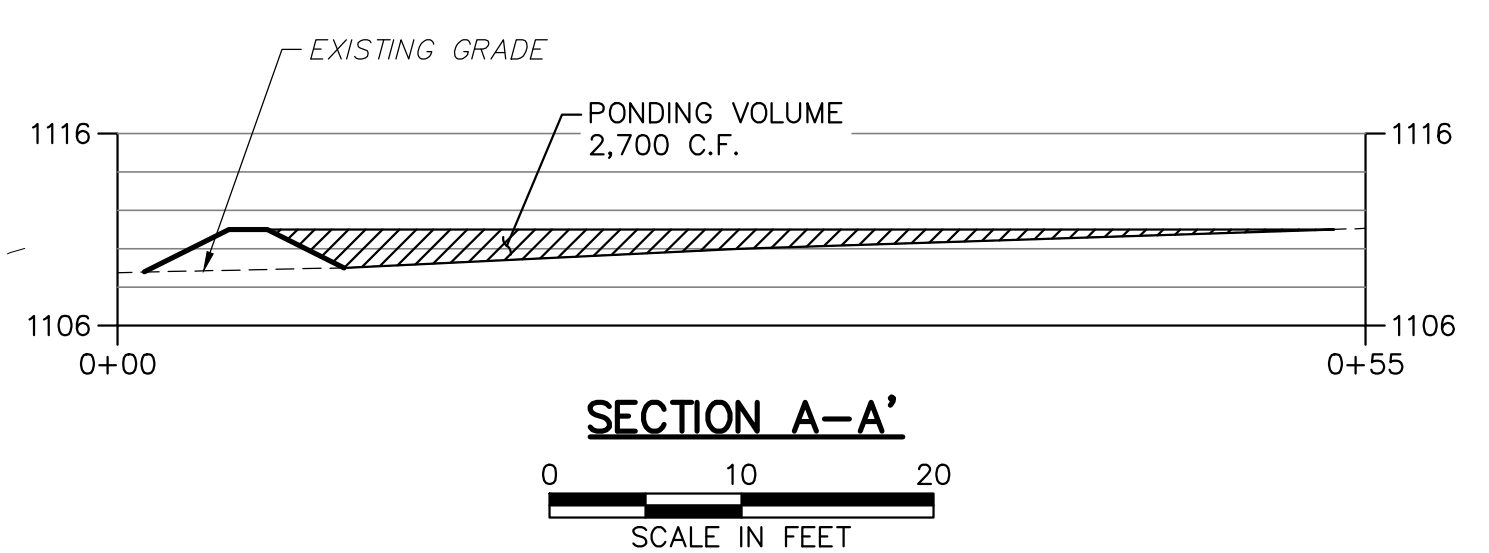
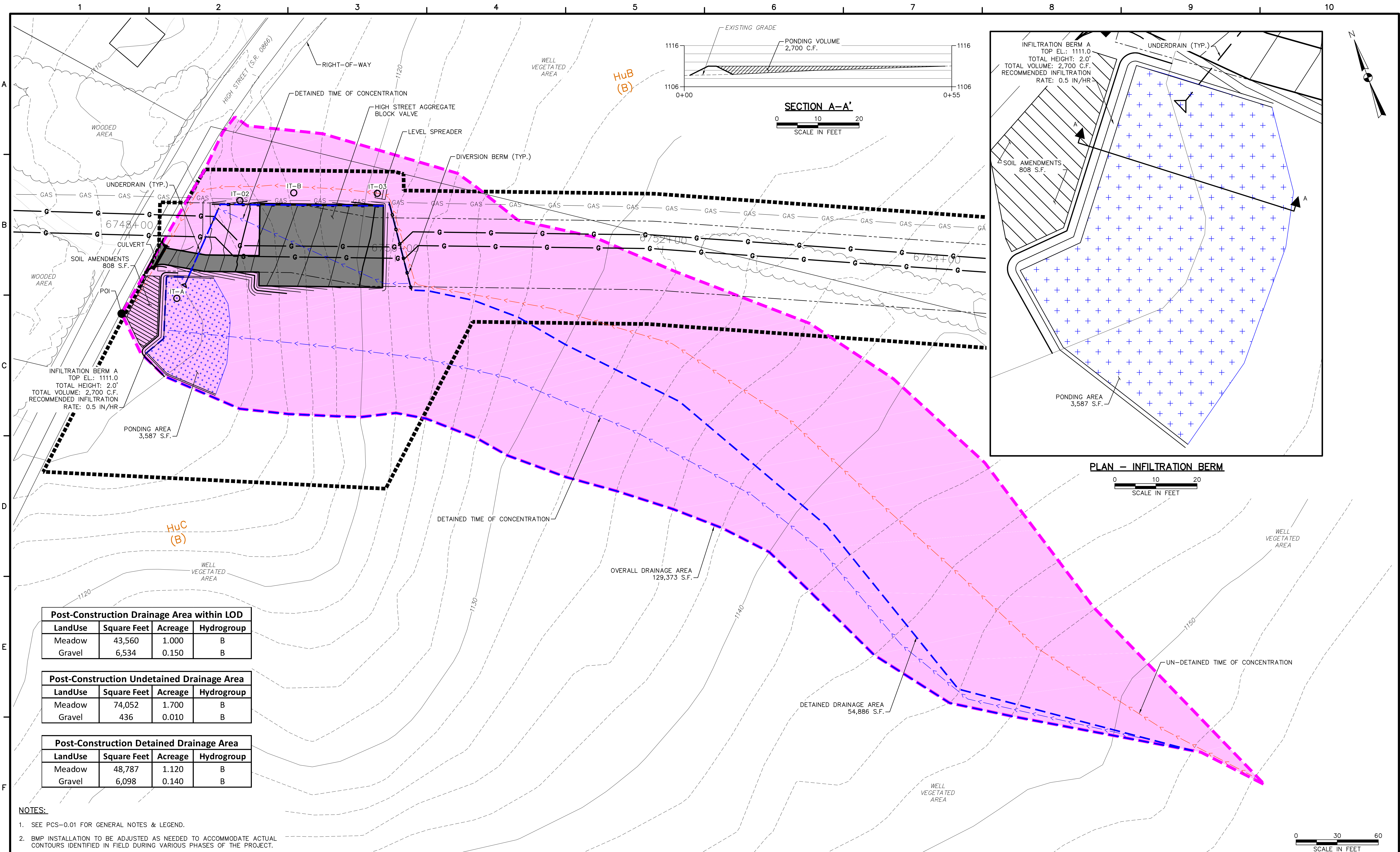


SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

DATE: 11/23/16
PROJECT NO.: 112IC05958
DESIGNED BY: KG
DRAWN BY: BH
CHECKED BY: RS
COPYRIGHT TETRA TECH INC.
PCS-3.09
SHEET 3.09 OF 23

HIGH STREET BLOCK VALVE
PRE-CONSTRUCTION STORMWATER MANAGEMENT PLAN



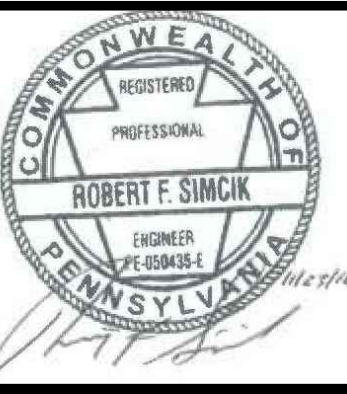
Post-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	43,560	1.000	B
Gravel	6,534	0.150	B

Post-Construction Undetained Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	74,052	1.700	B
Gravel	436	0.010	B

Post-Construction Detained Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	48,787	1.120	B
Gravel	6,098	0.140	B

- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

REVISIONS			
NO.	BY	DATE	REMARKS



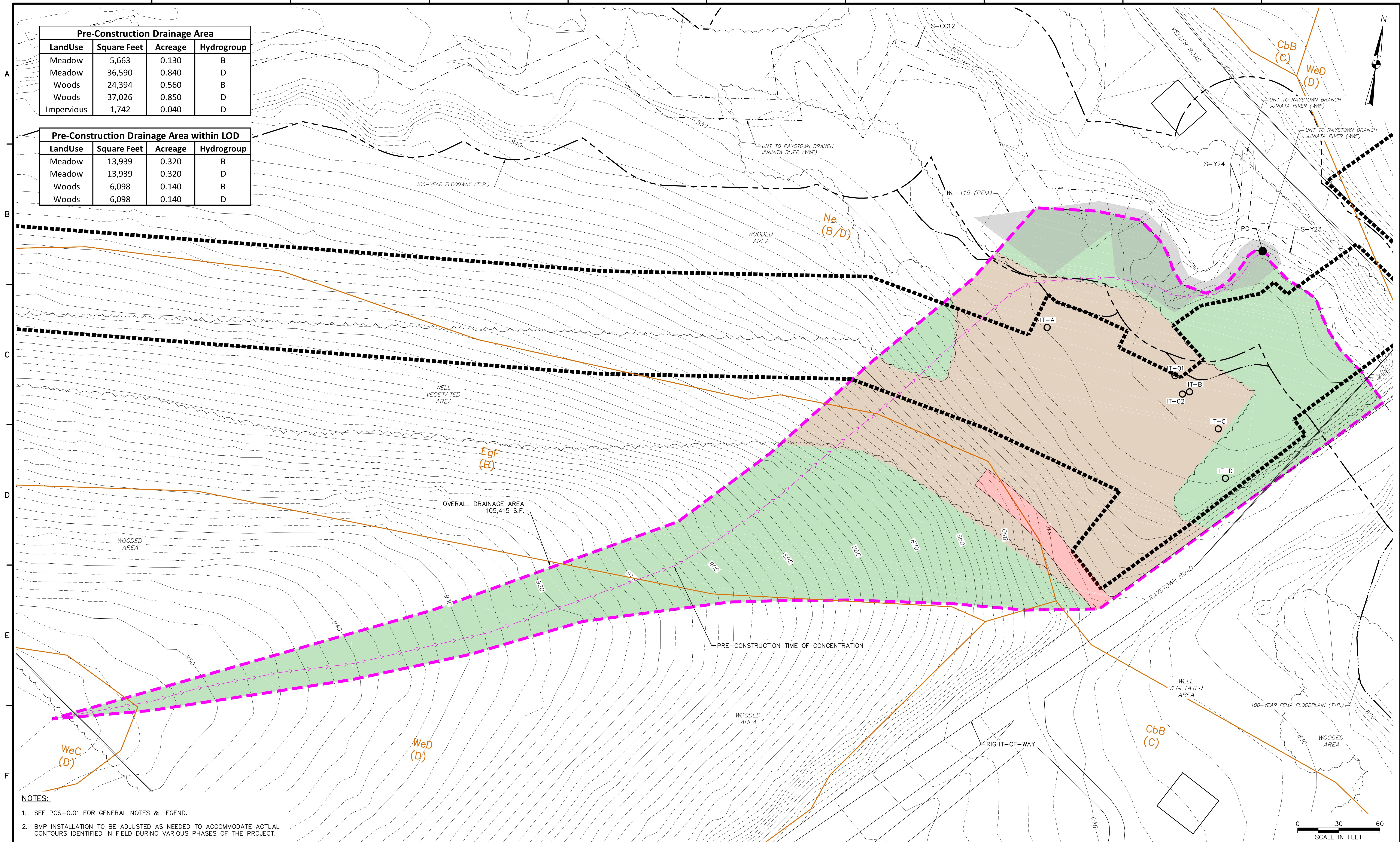
SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**HIGH STREET BLOCK VALVE
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN**

DATE:	11/23/16
PROJECT NO.:	1121C05958
DESIGNED BY:	KG
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-3.10	
SHEET 3.10 OF 23	

Pre-Construction Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	5,663	0.130	B
Meadow	36,590	0.840	D
Woods	24,394	0.560	B
Woods	37,026	0.850	D
Impervious	1,742	0.040	D

Pre-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	13,939	0.320	B
Meadow	13,939	0.320	D
Woods	6,098	0.140	B
Woods	6,098	0.140	D



- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.



www.tetrattech.com
 661 ANDERSEN DRIVE - FOSTER PLAZA 7
 PITTSBURGH, PA 15220
 T: (412) 921-7090 | F: (412) 921-4040

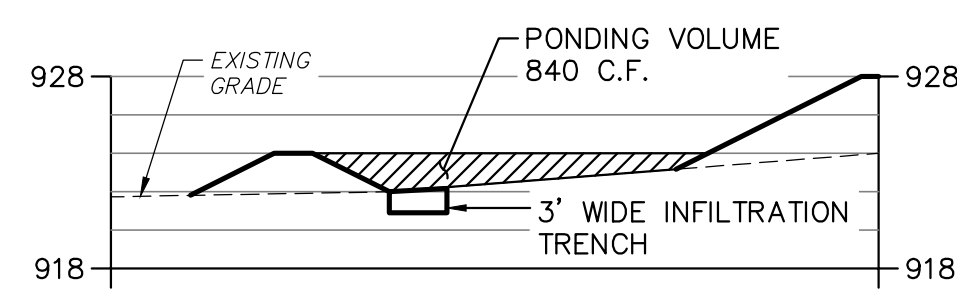
REVISIONS			
NO.	BY	DATE	REMARKS



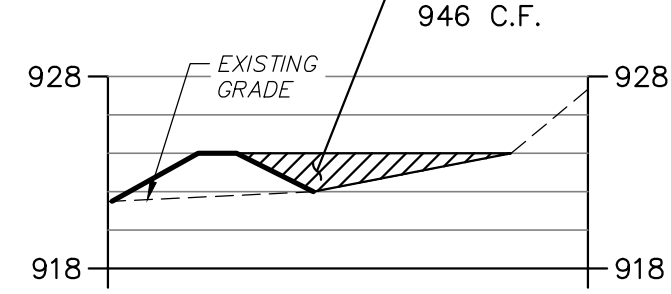
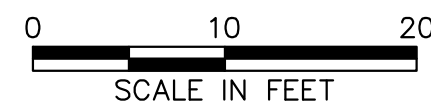
SUNOCO PIPELINE L.P.
 SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
 CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**RAYSTOWN ROAD BLOCK VALVE
 PRE-CONSTRUCTION STORMWATER MANAGEMENT PLAN**

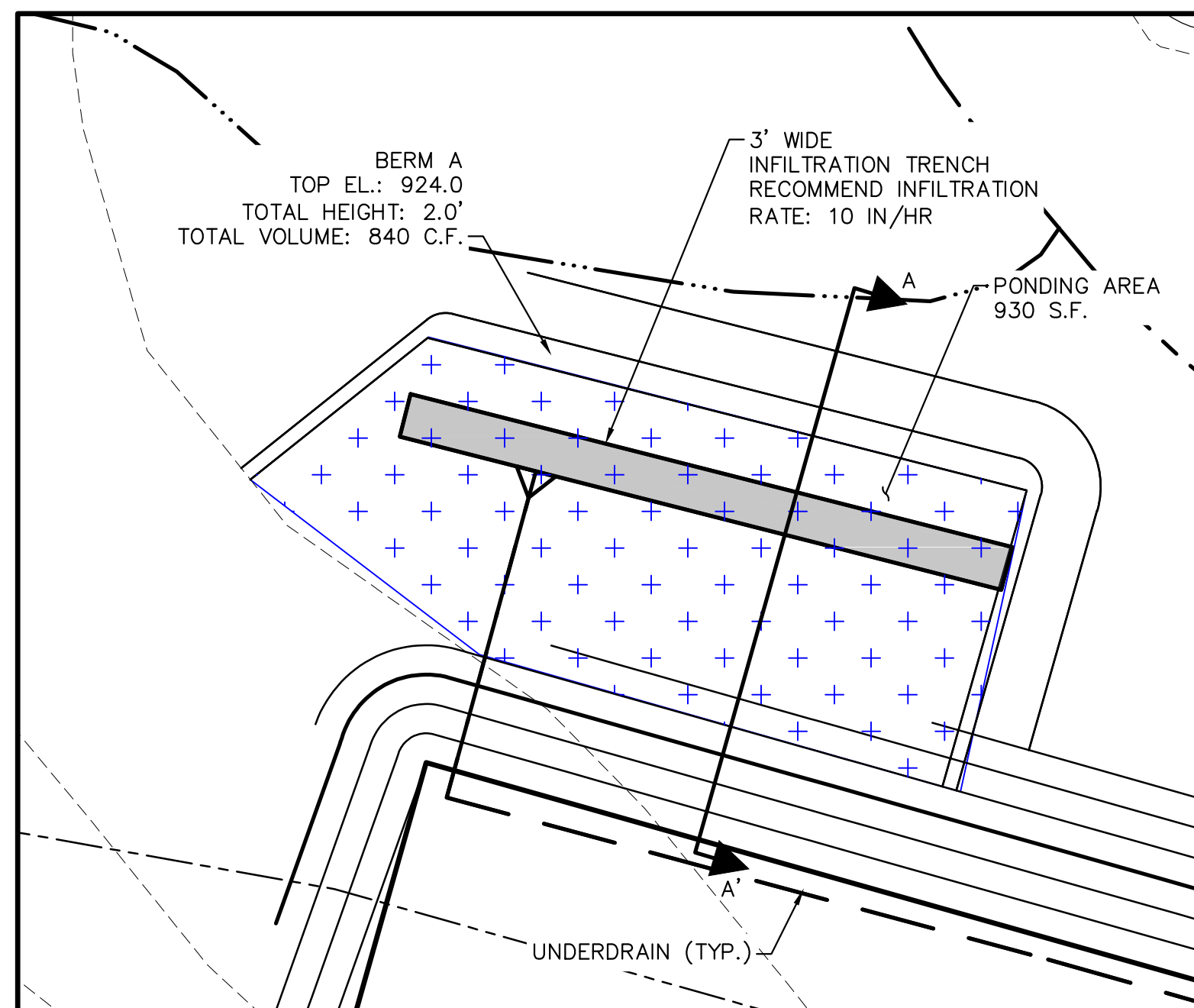
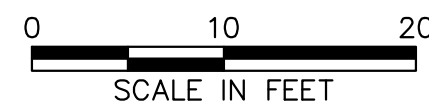
DATE:	11/23/16
PROJECT NO.:	1121C05958
DESIGNED BY:	KG
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-3.11	
SHEET 3.11 OF 23	



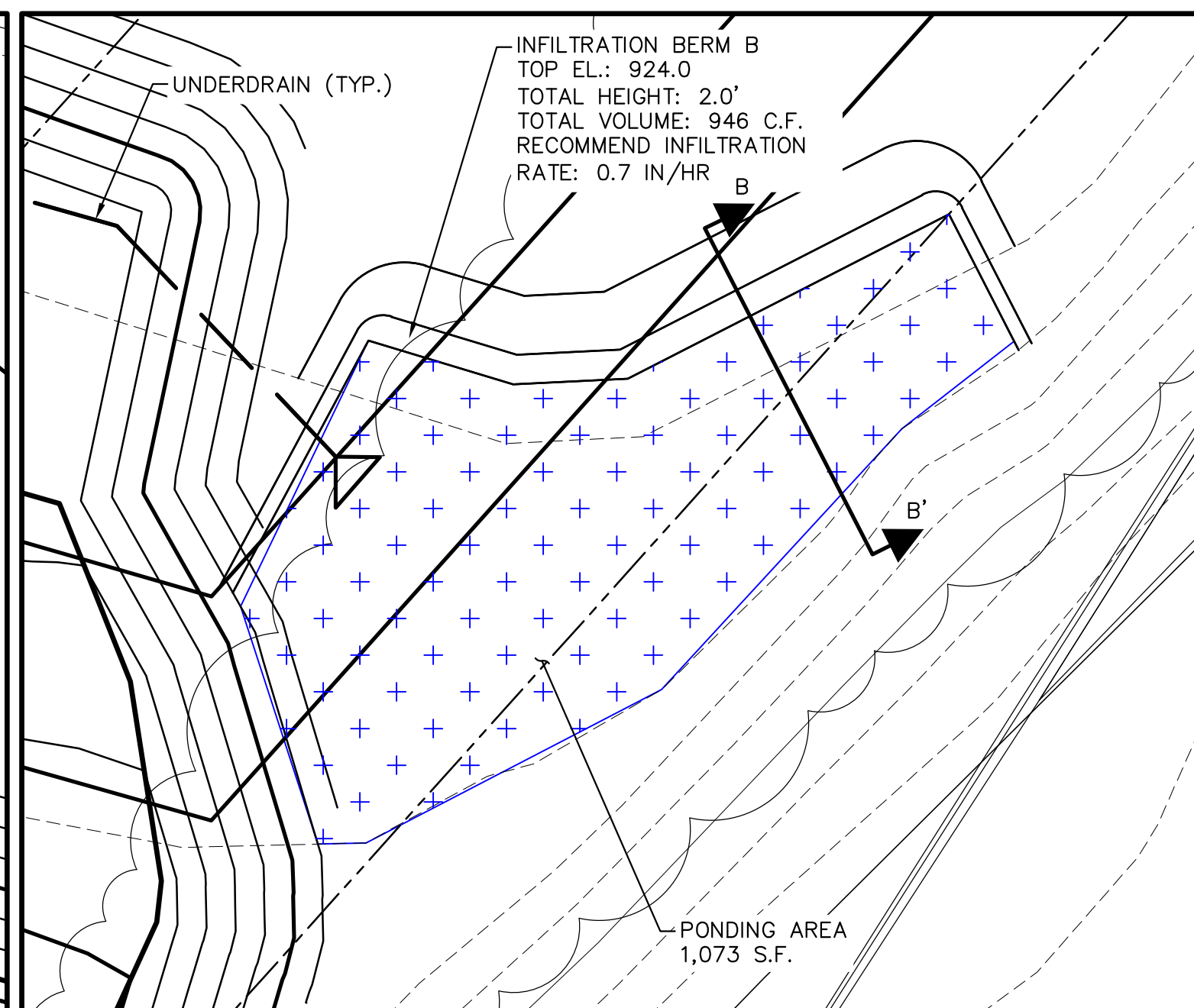
SECTION A-A'



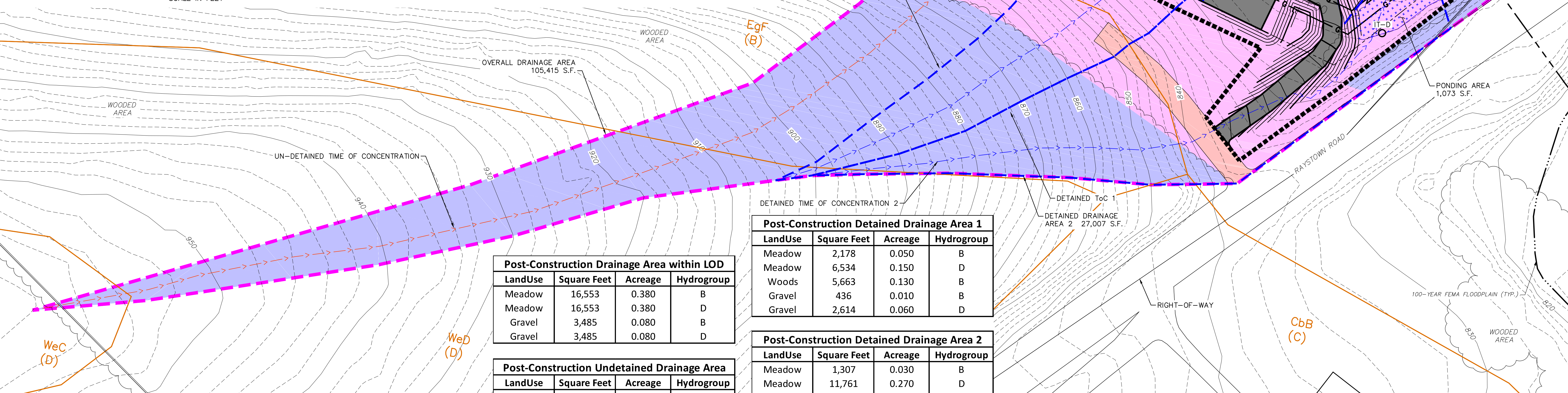
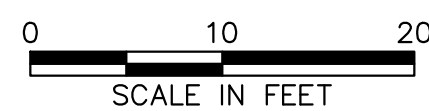
SECTION B-B'



PLAN - INFILTRATION BERM A



PLAN - INFILTRATION BERM B



Post-Construction Detained Drainage Area 1

LandUse	Square Feet	Acreage	Hydrogroup
Meadow	2,178	0.050	B
Meadow	6,534	0.150	D
Woods	5,663	0.130	B
Gravel	436	0.010	B
Gravel	2,614	0.060	D

Post-Construction Drainage Area within LOD

LandUse	Square Feet	Acreage	Hydrogroup
Meadow	16,553	0.380	B
Meadow	16,553	0.380	D
Gravel	3,485	0.080	B
Gravel	3,485	0.080	D

Post-Construction Detained Drainage Area 2

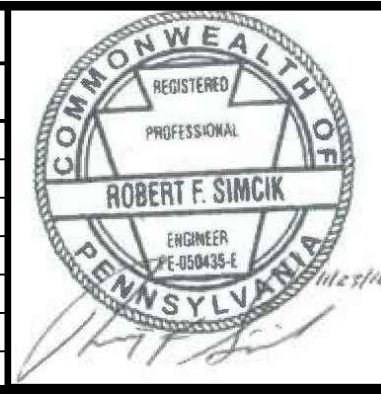
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	1,307	0.030	B
Meadow	11,761	0.270	D
Woods	5,663	0.130	B
Gravel	436	0.010	D
Gravel	7,405	0.170	D

Post-Construction Undetained Drainage Area

LandUse	Square Feet	Acreage	Hydrogroup
Meadow	2,614	0.060	B
Meadow	23,522	0.540	D
Woods	10,890	0.250	B
Woods	23,958	0.550	D

NOTES:
 1. SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 2. BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

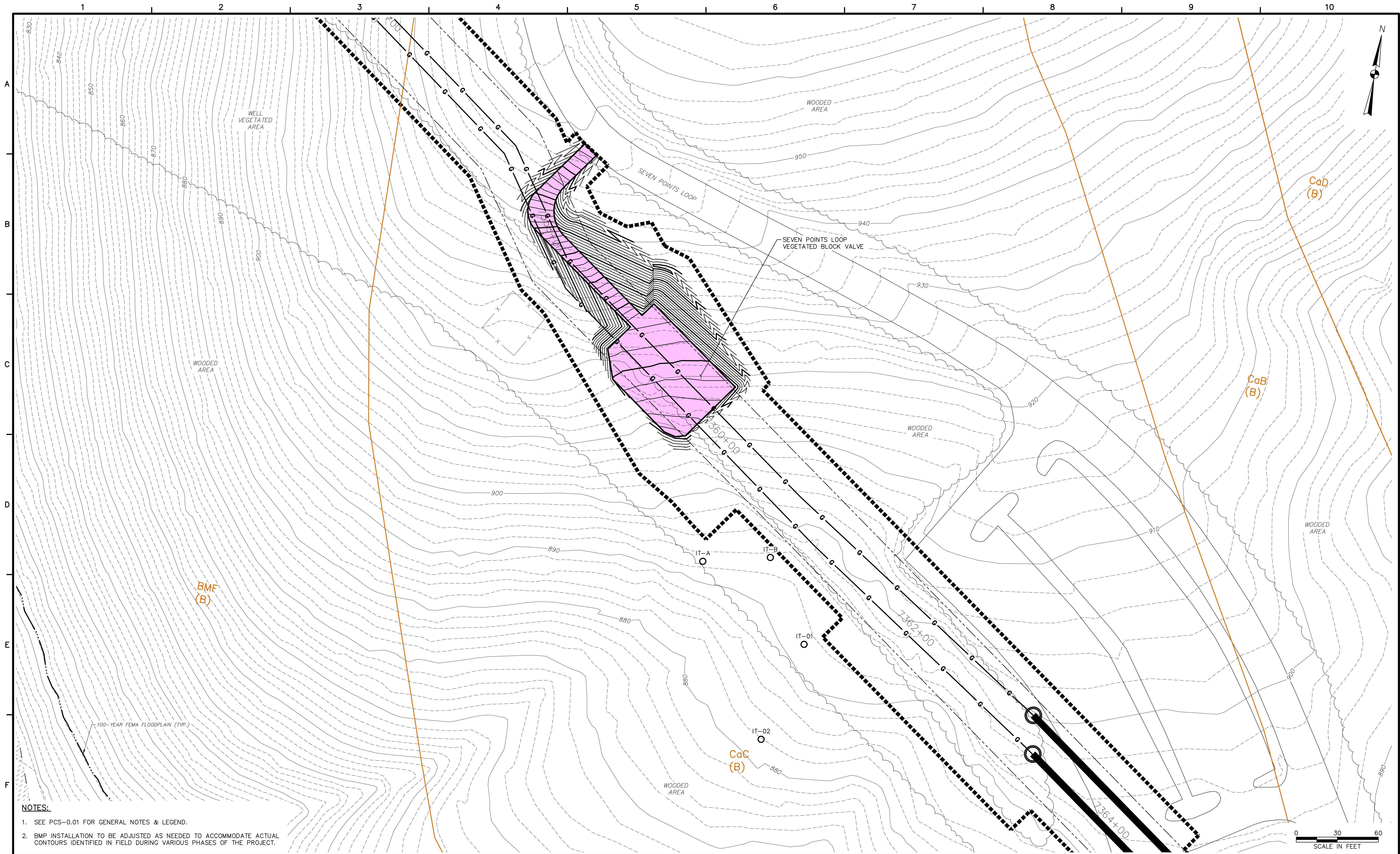
REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
 SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
 CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

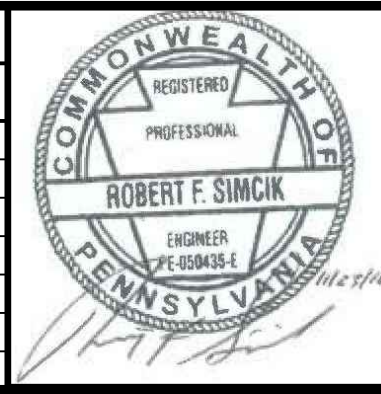
DATE: 11/23/16
 PROJECT NO.: 1121C05958
 DESIGNED BY: KG
 DRAWN BY: BH
 CHECKED BY: RS
 COPYRIGHT TETRA TECH INC.
PCS-3.12
 SHEET 3.12 OF 23



- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

TETRA TECH
www.tetrattech.com
661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

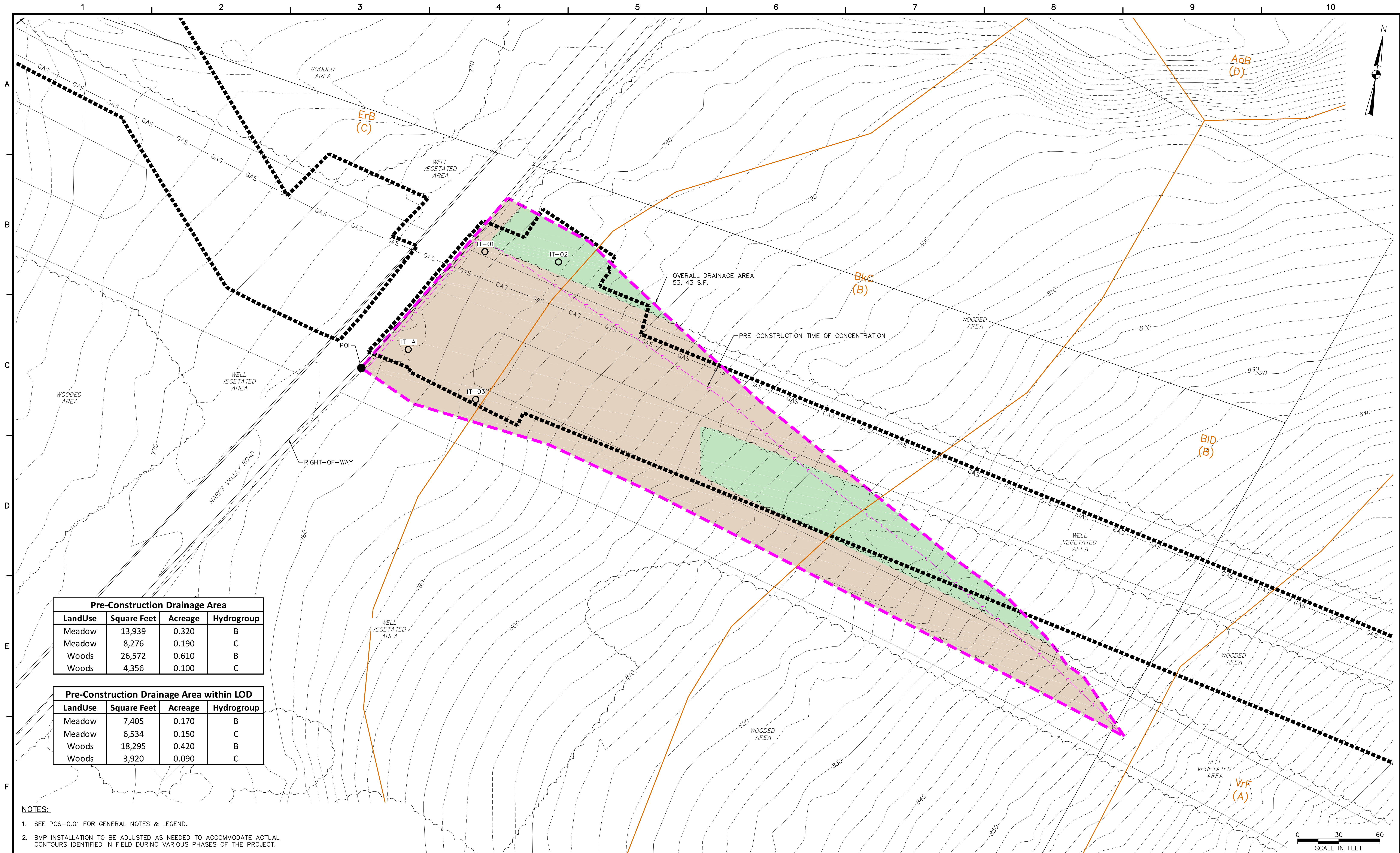
REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**SEVEN POINTS LOOP BLOCK VALVE
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN**

DATE:	11/23/16
PROJECT NO.:	112IC05958
DESIGNED BY:	KG
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-3.13	
SHEET 3.13 OF 23	



Pre-Construction Drainage Area			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	13,939	0.320	B
Meadow	8,276	0.190	C
Woods	26,572	0.610	B
Woods	4,356	0.100	C

Pre-Construction Drainage Area within LOD			
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	7,405	0.170	B
Meadow	6,534	0.150	C
Woods	18,295	0.420	B
Woods	3,920	0.090	C

- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.



661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

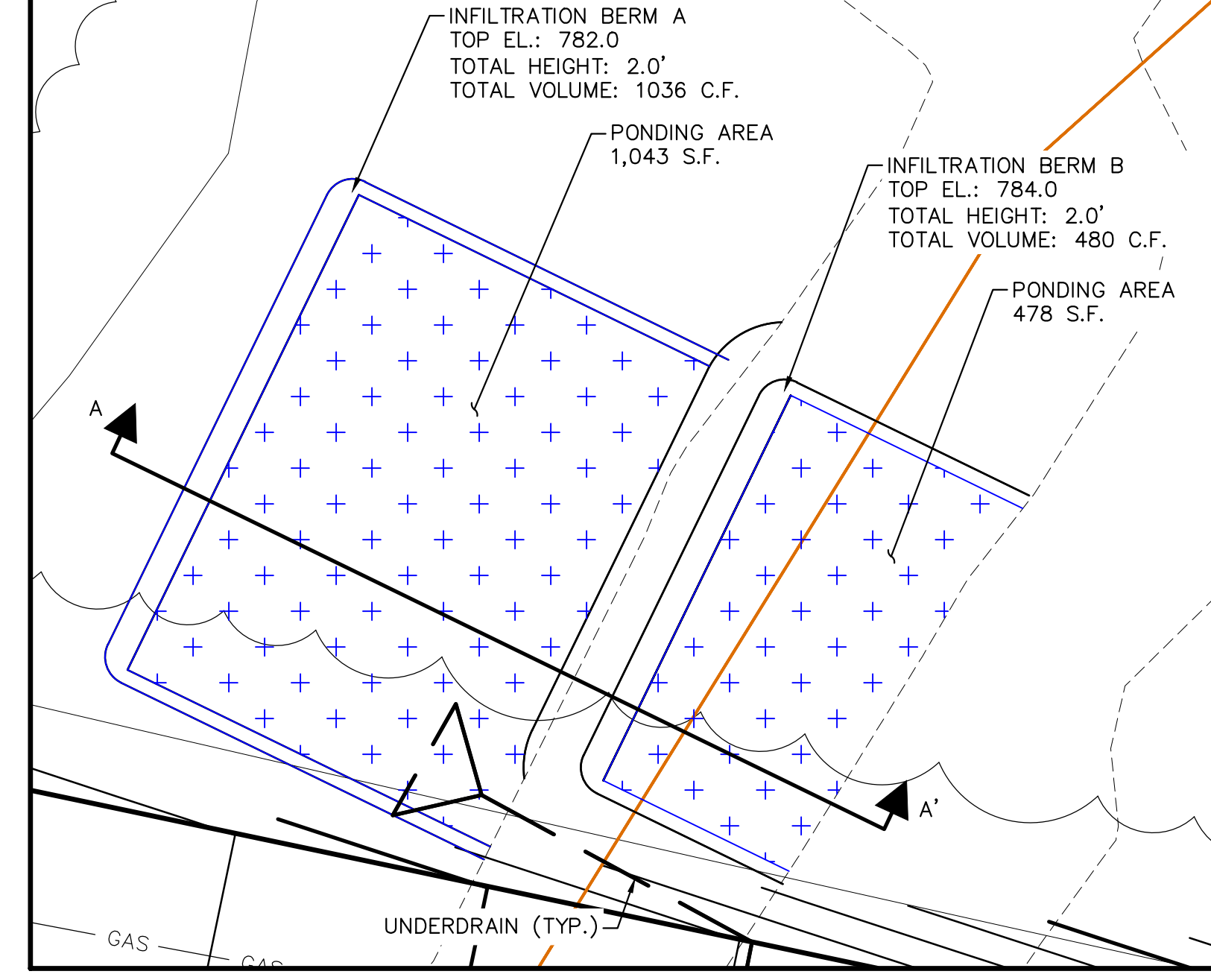
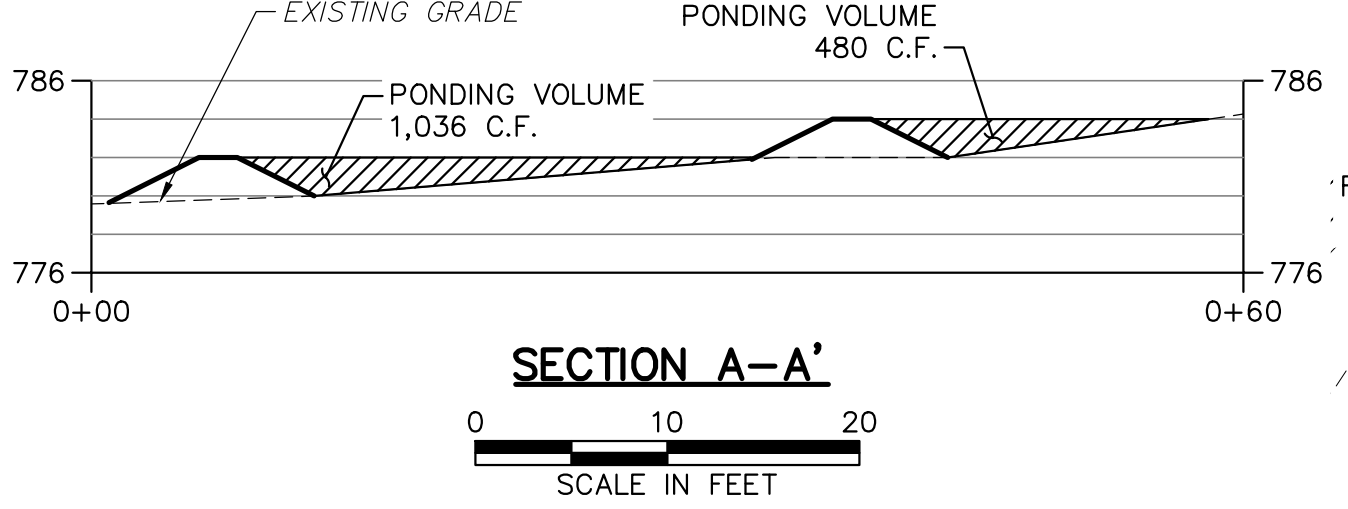
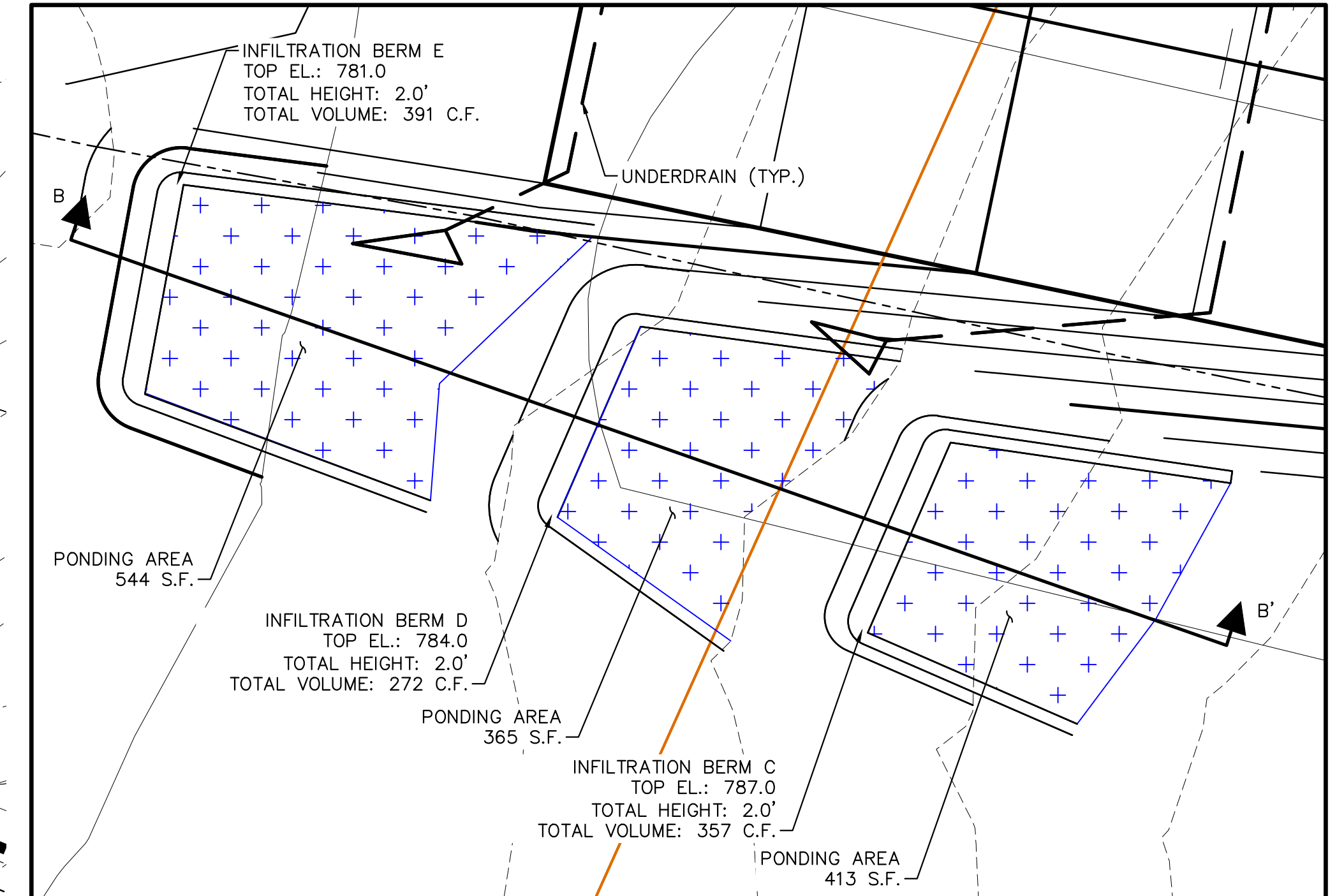
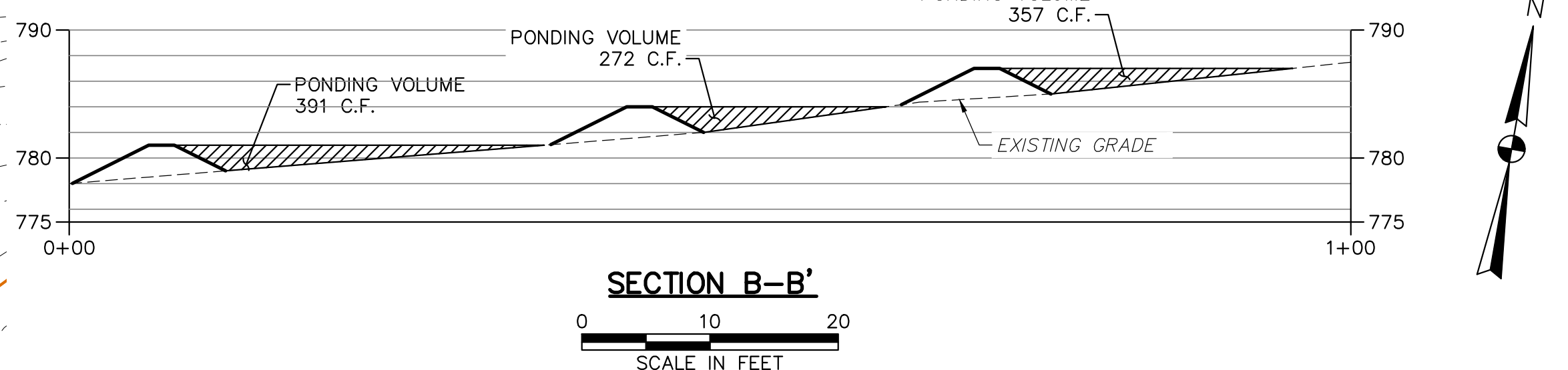
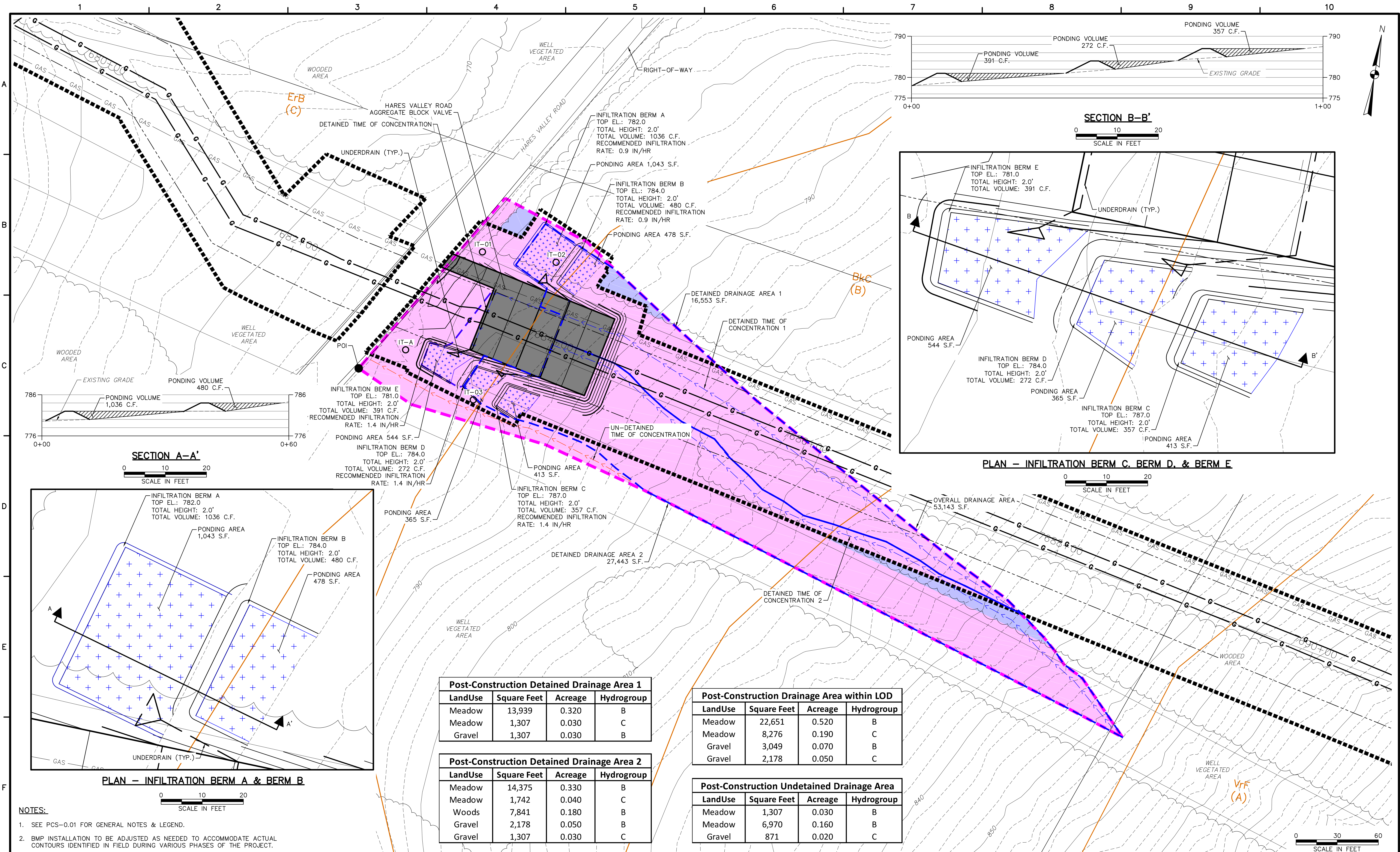
REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
**HARES VALLEY ROAD BLOCK VALVE
PRE-CONSTRUCTION STORMWATER MANAGEMENT PLAN**

DATE:	11/23/16
PROJECT NO.:	1121C05958
DESIGNED BY:	KG
DRAWN BY:	BH
CHECKED BY:	RS
COPYRIGHT TETRA TECH INC.	
PCS-3.16	
SHEET 3.16 OF 23	



Post-Construction Detained Drainage Area 1

LandUse	Square Feet	Acreage	Hydrogroup
Meadow	13,939	0.320	B
Meadow	1,307	0.030	C
Gravel	1,307	0.030	B

Post-Construction Drainage Area within LOD

LandUse	Square Feet	Acreage	Hydrogroup
Meadow	22,651	0.520	B
Meadow	8,276	0.190	C
Gravel	3,049	0.070	B
Gravel	2,178	0.050	C

Post-Construction Detained Drainage Area 2

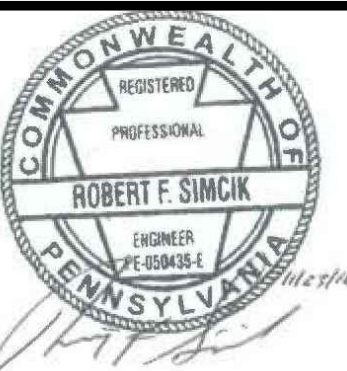
LandUse	Square Feet	Acreage	Hydrogroup
Meadow	14,375	0.330	B
Meadow	1,742	0.040	C
Woods	7,841	0.180	B
Gravel	2,178	0.050	B
Gravel	1,307	0.030	C

Post-Construction Undetained Drainage Area

LandUse	Square Feet	Acreage	Hydrogroup
Meadow	1,307	0.030	B
Meadow	6,970	0.160	B
Gravel	871	0.020	C

NOTES:
 1. SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 2. BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

REVISIONS			
NO.	BY	DATE	REMARKS

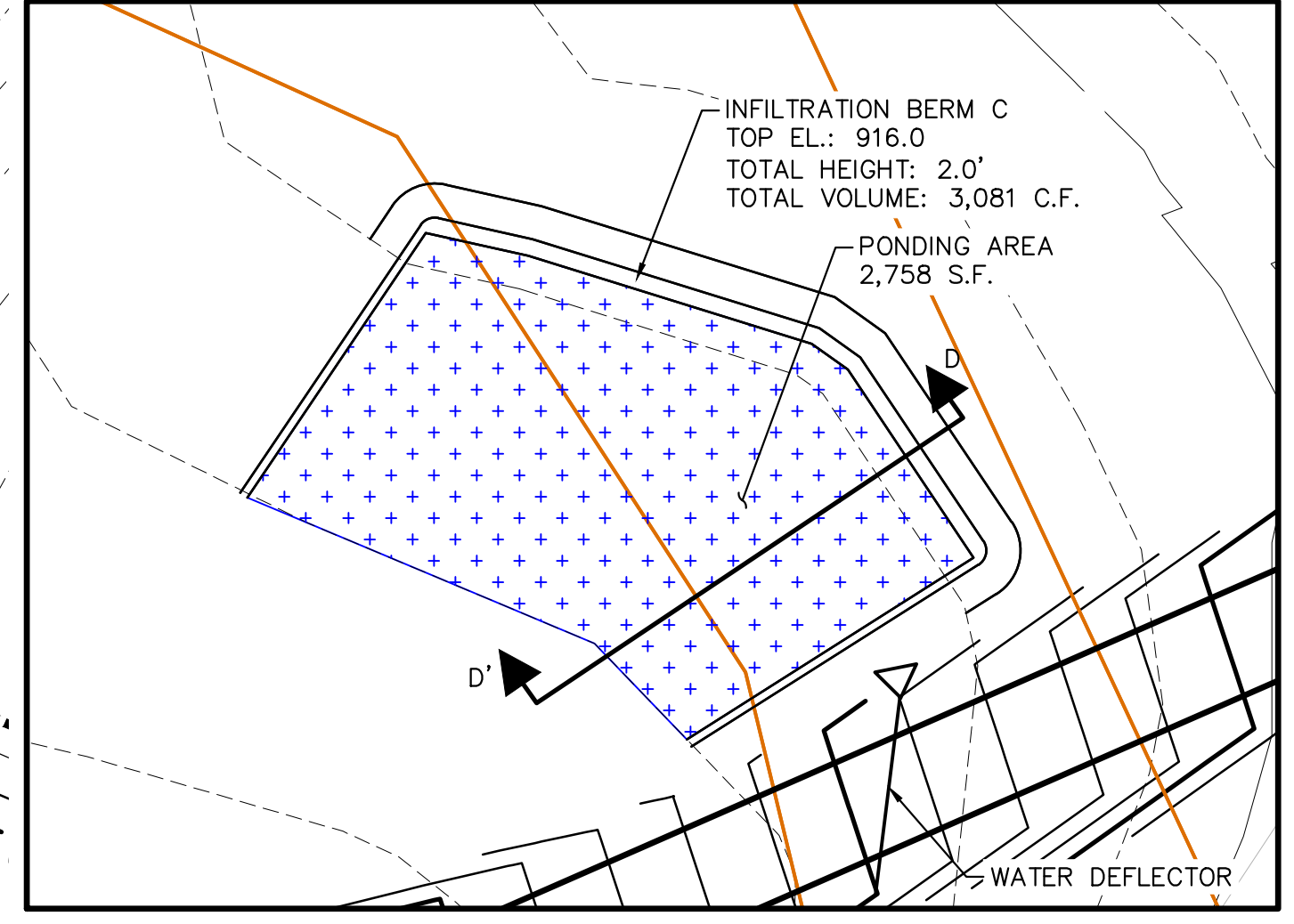
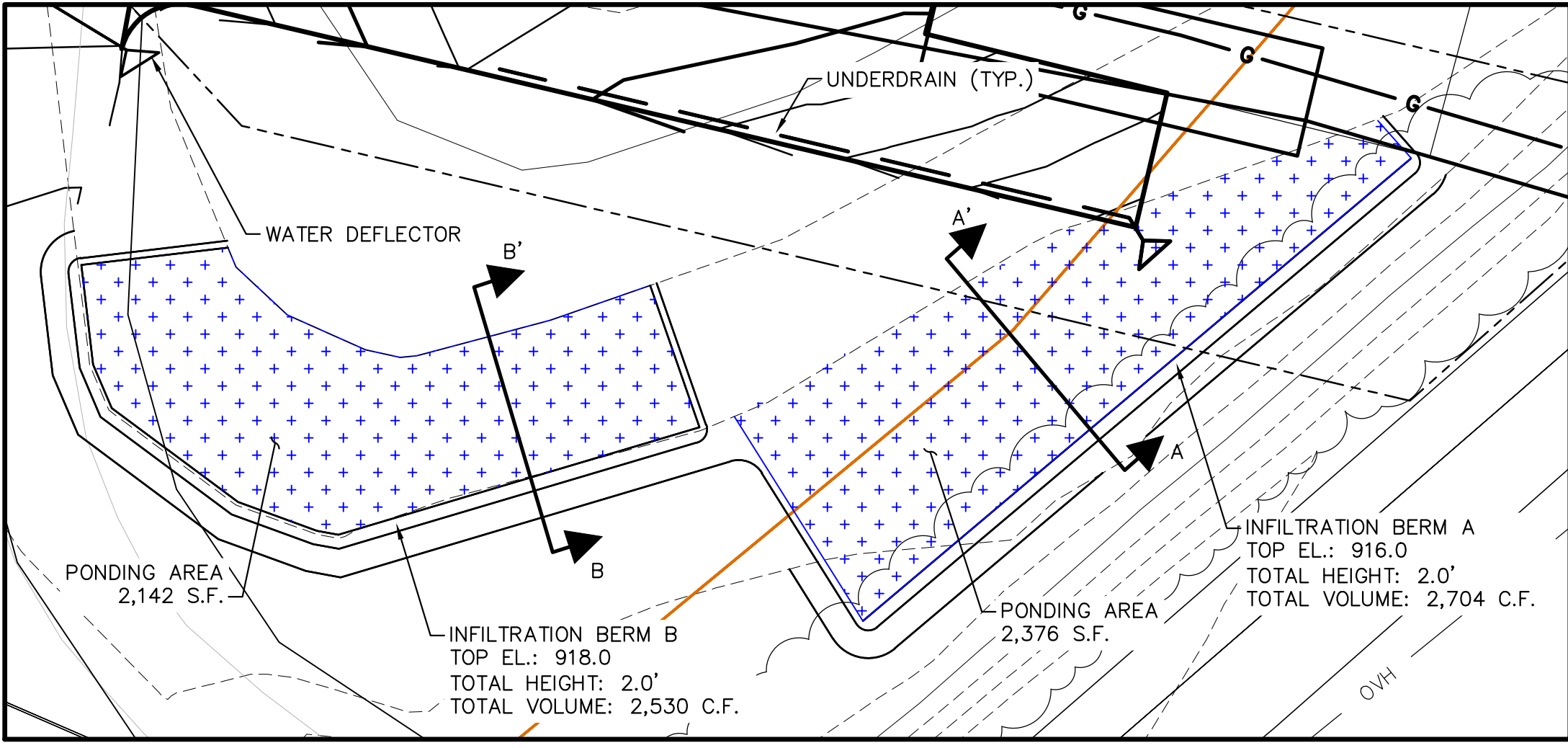
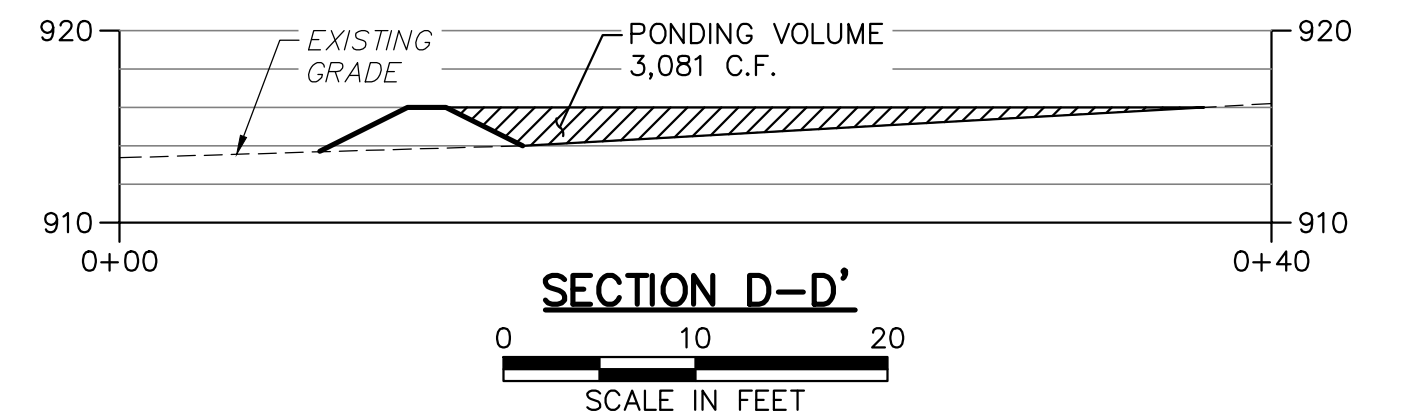
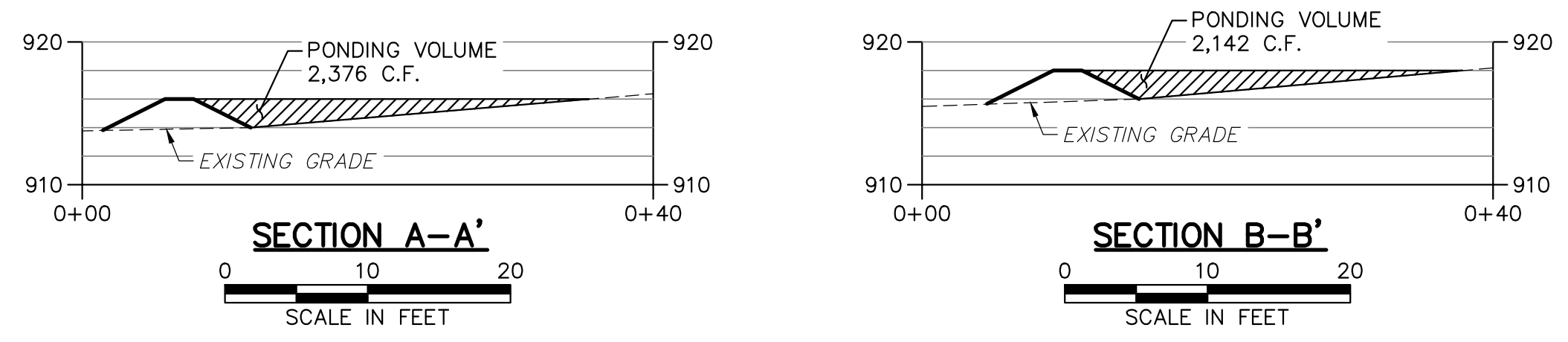
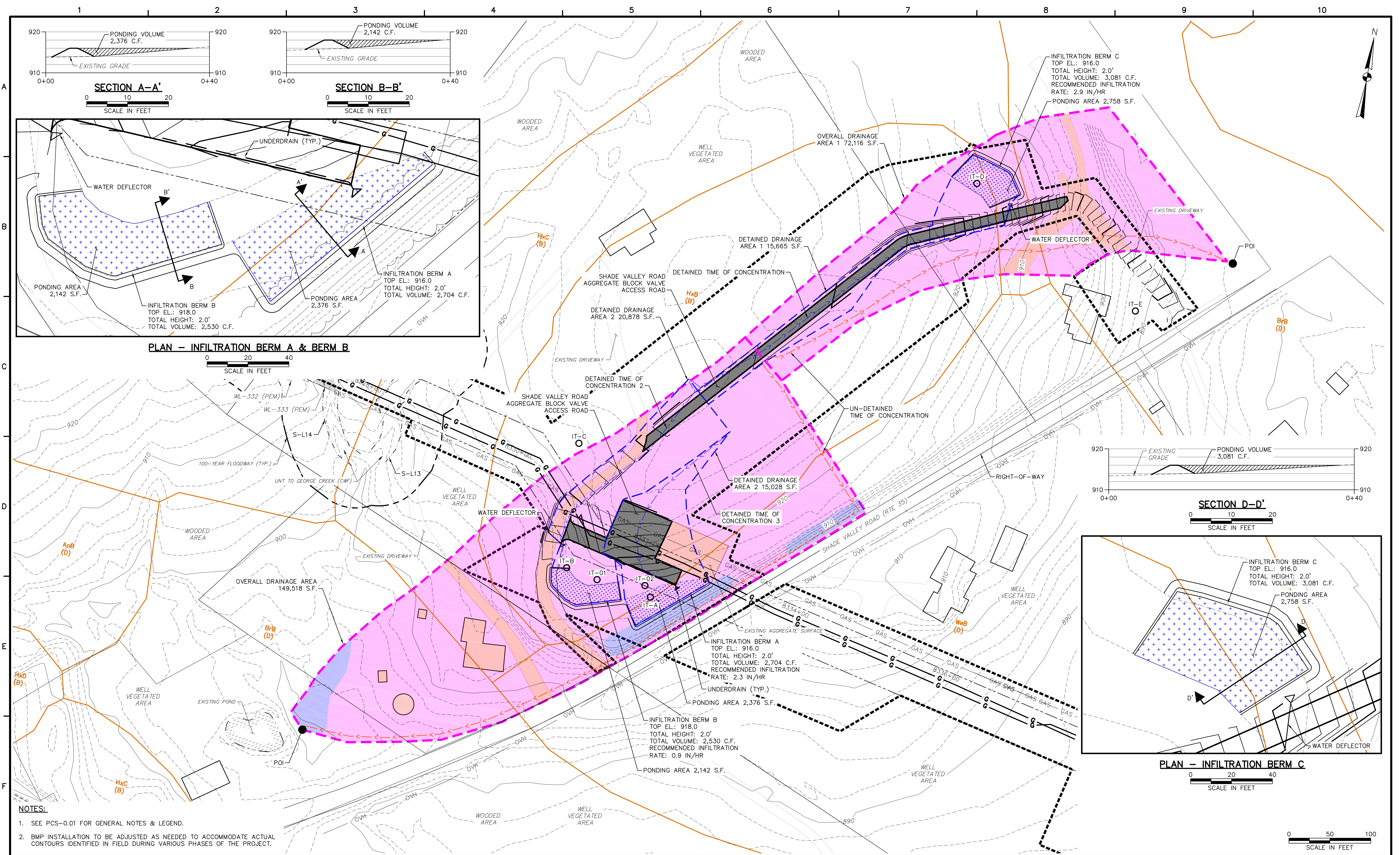


SUNOCO PIPELINE L.P.
 SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
 CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

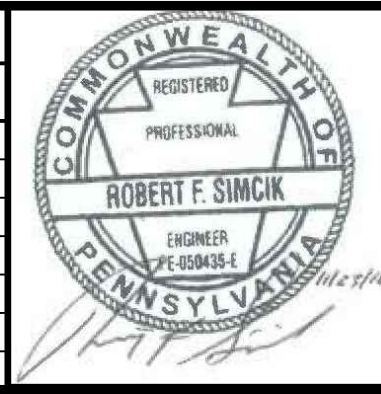
HARES VALLEY ROAD BLOCK VALVE
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN

DATE: 11/23/16
 PROJECT NO.: 1121C05958
 DESIGNED BY: KG
 DRAWN BY: BH
 CHECKED BY: RS
 COPYRIGHT TETRA TECH INC.
PCS-3.17
 SHEET 3.17 OF 23



- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3**

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

DATE: 11/23/16
PROJECT NO.: 112IC05958
DESIGNED BY: KG
DRAWN BY: BH
CHECKED BY: RS
COPYRIGHT TETRA TECH INC.
PCS-3.19
SHEET 3.19 OF 23

TETRA TECH
www.tetrattech.com
661 ANDERSON DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040