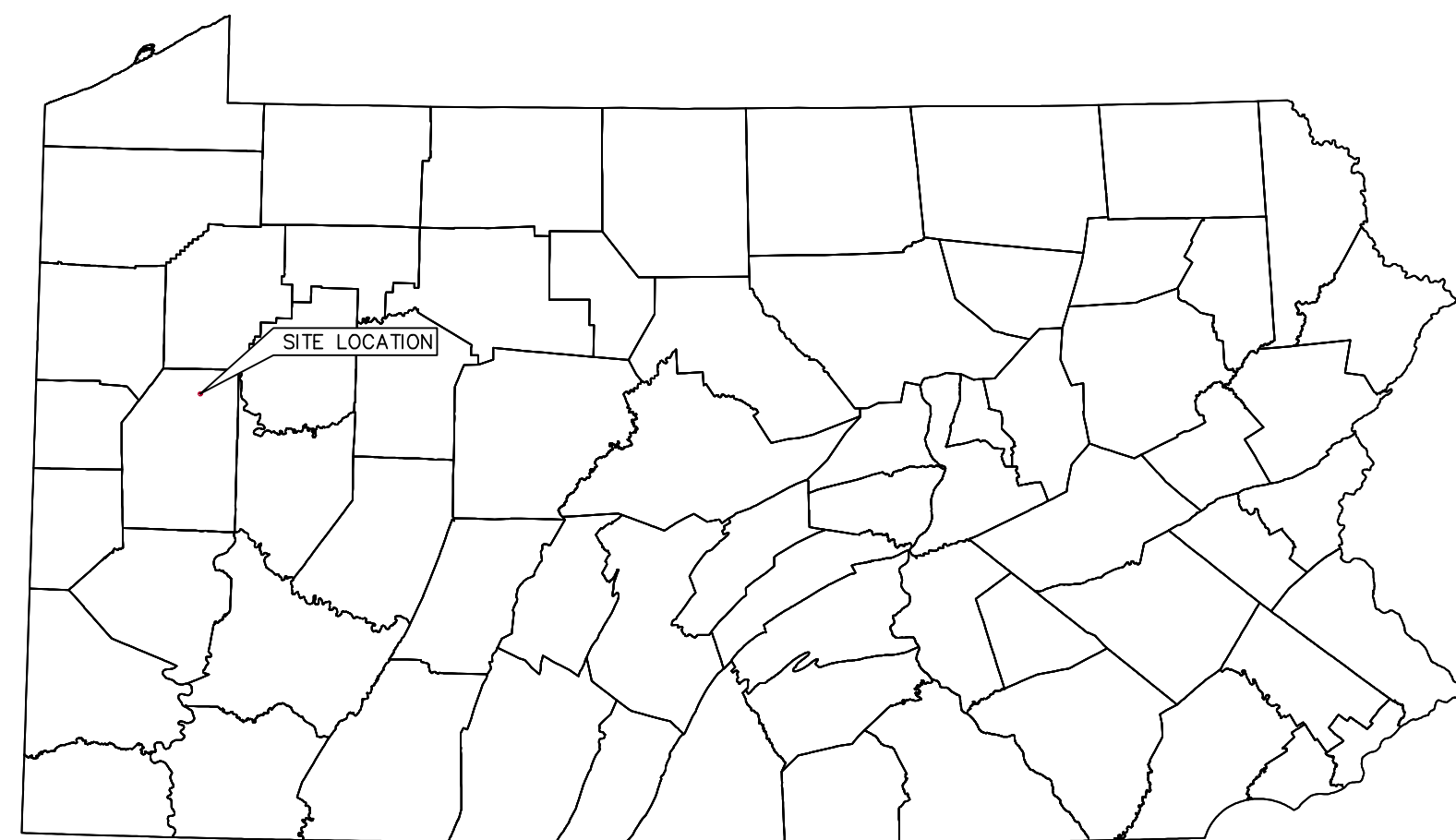


VOGEL LANDFILL, INC. SR89 PROJECT PA STATE GAME LANDS NO. 95

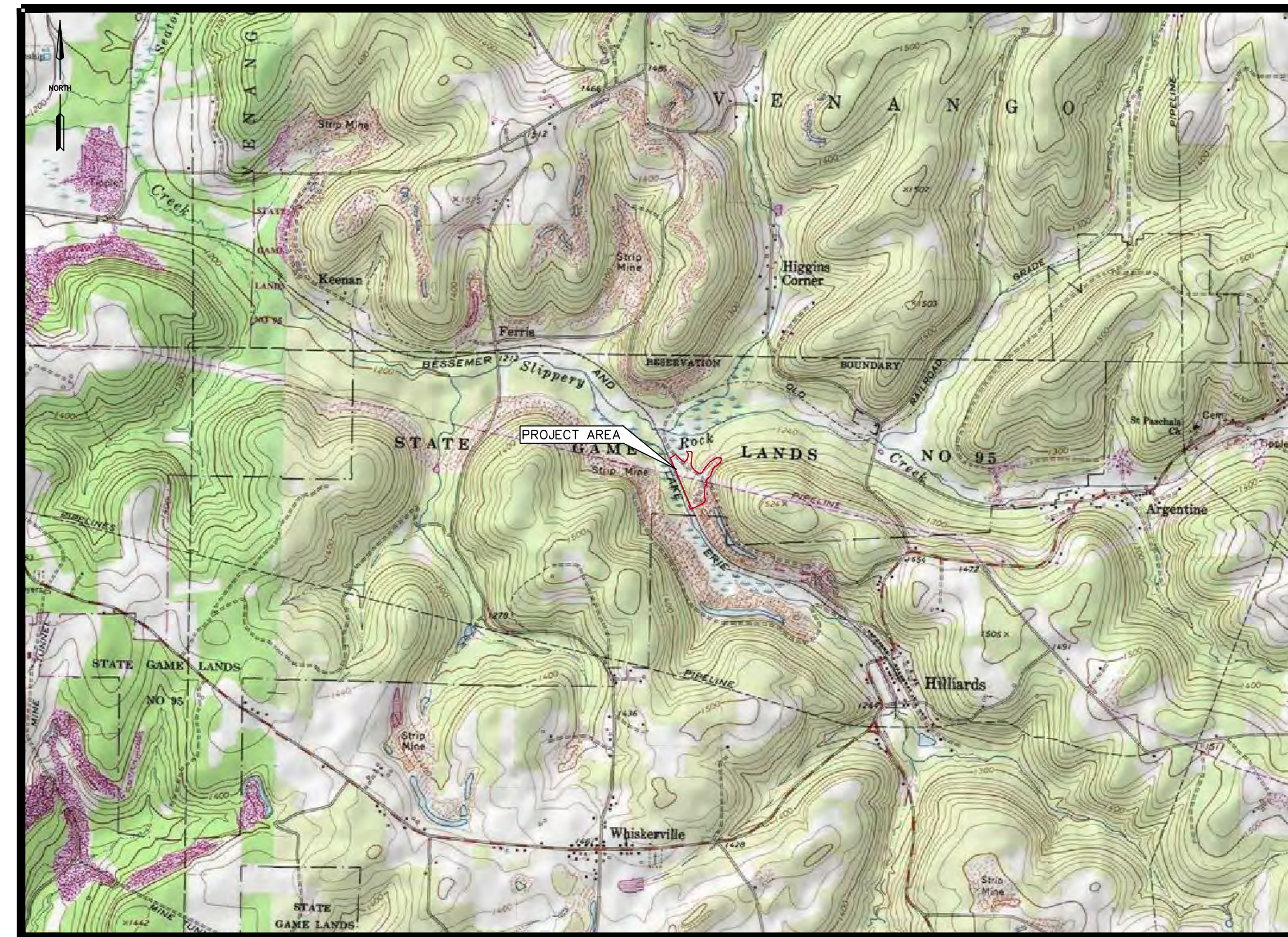
WASHINGTON TOWNSHIP, BUTLER COUNTY, PENNSYLVANIA
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
DECEMBER 2017
REVISED DECEMBER 2018



VICINITY MAP

SITE LOCATION

PA STATE GAME LANDS NO. 95



SITE LOCATION MAP

SCALE 1" = 2000'

DRAWING INDEX		
SHEET NO.	DRAWING TITLE	BAI DRAWING NO.
PCSM-1	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN - COVER SHEET	VOG-108D001H R2
PCSM-2	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN - EXISTING CONDITIONS	VOG-108D001I R1
PCSM-3	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN - PROPOSED CONDITIONS	VOG-108D001J R1
PCSM-4	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN - DETAILS & NOTES	VOG-108D001K R2

PREPARED FOR:
VOGEL DISPOSAL SERVICE, INC.
121 BRICKYARD ROAD
MARS, PA 16046
(724) 625-9000

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES
3 WORKING DAYS NOTICE FOR
CONSTRUCTION PHASE AND 10 WORKING
DAYS IN DESIGN STAGE-STOP CALL
PENNSYLVANIA ONE CALL SYSTEM, INC.



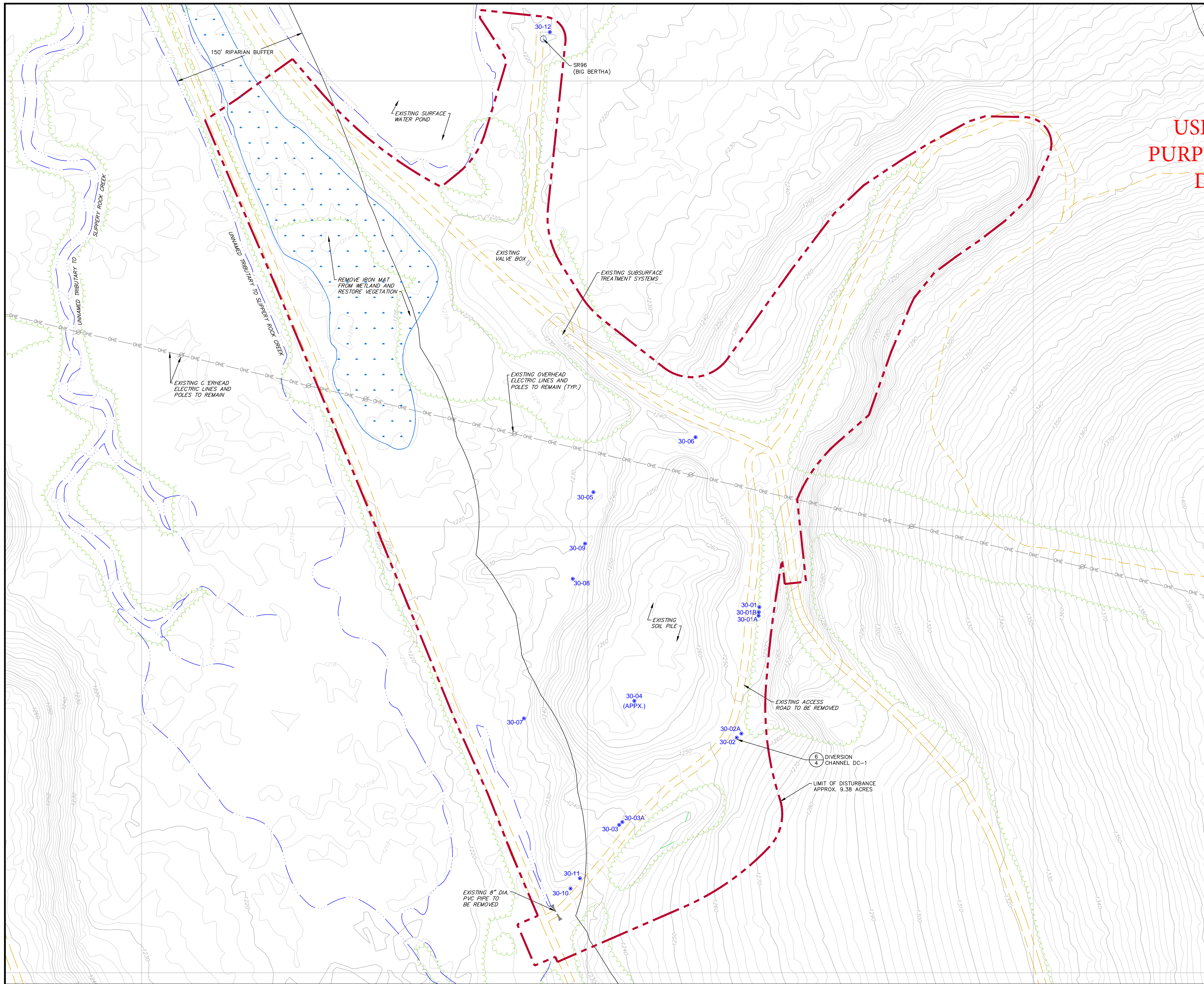
PENNSYLVANIA ONE CALL SYSTEM
PA ACT 172 OF 1986 REQUIRES THREE
WORKING DAYS NOTICE

AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE
ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN
THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL
OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND
THE CHESTER COUNTY CONSERVATION DISTRICT TO AN ON-SITE MEETING.
ALSO, AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE
ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL
NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT
1-800-242-1776 FOR BURIED UTILITY LOCATIONS.

PREPARED BY:
BAI GROUP INC.
Environmental Consultants

STATE COLLEGE OFFICE
2525 GREEN TECH DRIVE, SUITE D
STATE COLLEGE, PA 16803
(814) 238-2060
Environmental Consultants
PROJECT # 17-VOGEL-108

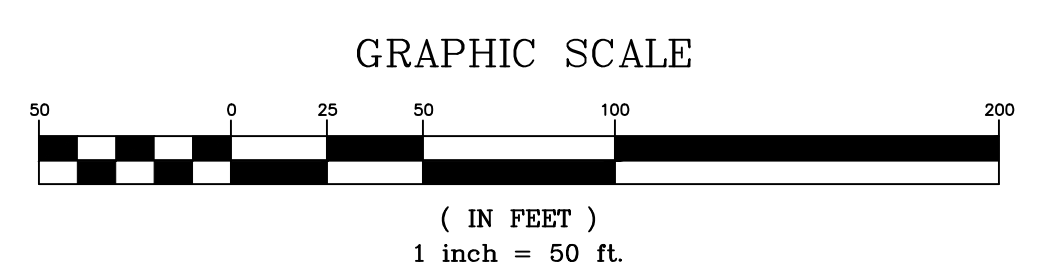
USE FOR INFORMATIONAL
PURPOSES ONLY - SEE AS-BUILT
DRAWINGS FOR FINAL CONDITIONS



USE FOR INFORMATIONAL PURPOSES ONLY - SEE AS-BUILT DRAWINGS FOR FINAL CONDITIONS

- NOTES**
1. BASEMAP TOPOGRAPHY DOWNLOADED FROM PENNSYLVANIA SPATIAL DATA ACCESS WEBSITE. LIDAR TILE NUMBERS 65001380PAS AND 65001390PAS DATED APRIL 2007.
 2. A 150' RIPARIAN BUFFER ZONE IS SHOWN HEREIN. HOWEVER, REVEGETATION OF THESE AREAS AFTER CONSTRUCTION IS NOT NECESSARY AS THIS IS NOT A HQ/EV WATERSHED.

- LEGEND**
- LIMIT OF DISTURBANCE/PERMIT AREA
 - EXISTING GRADE CONTOURS (C.I.=2'/10') (SEE NOTE 1)
 - EXISTING ACCESS ROAD
 - EXISTING TRAIL
 - EXISTING TREE LINE
 - EXISTING WATER SURFACE
 - EXISTING OVERHEAD ELECTRIC LINES
 - EXISTING POWER POLE
 - EXISTING STREAM
 - EXISTING CULVERT PIPE
 - EXISTING WETLAND
 - RIPARIAN BUFFER



REVISIONS		
5/24/2018	150' RIPARIAN BUFFER ADDED, NOTES UPDATED	CMB

BAI GROUP INC. Balanced Environmental Solutions		DATE: 10/27/17 DRAWN BY: RHM CHECKED: PW BAI DRAWING NO: VOGEL-108D0011 R1 SHEET NO: PCSM-2
VOGEL LANDFILL, INC. SR89 PROJECT PA STATE GAME LANDS NO. 95 WASHINGTON TOWNSHIP BUTLER COUNTY PENNSYLVANIA		STATE COLLEGE OFFICE (814) 238-2060 DELAWARE VALLEY OFFICE (610) 495-5585

**USE FOR INFORMATIONAL
PURPOSES ONLY - SEE AS-BUILT
DRAWINGS FOR FINAL
CONDITIONS**

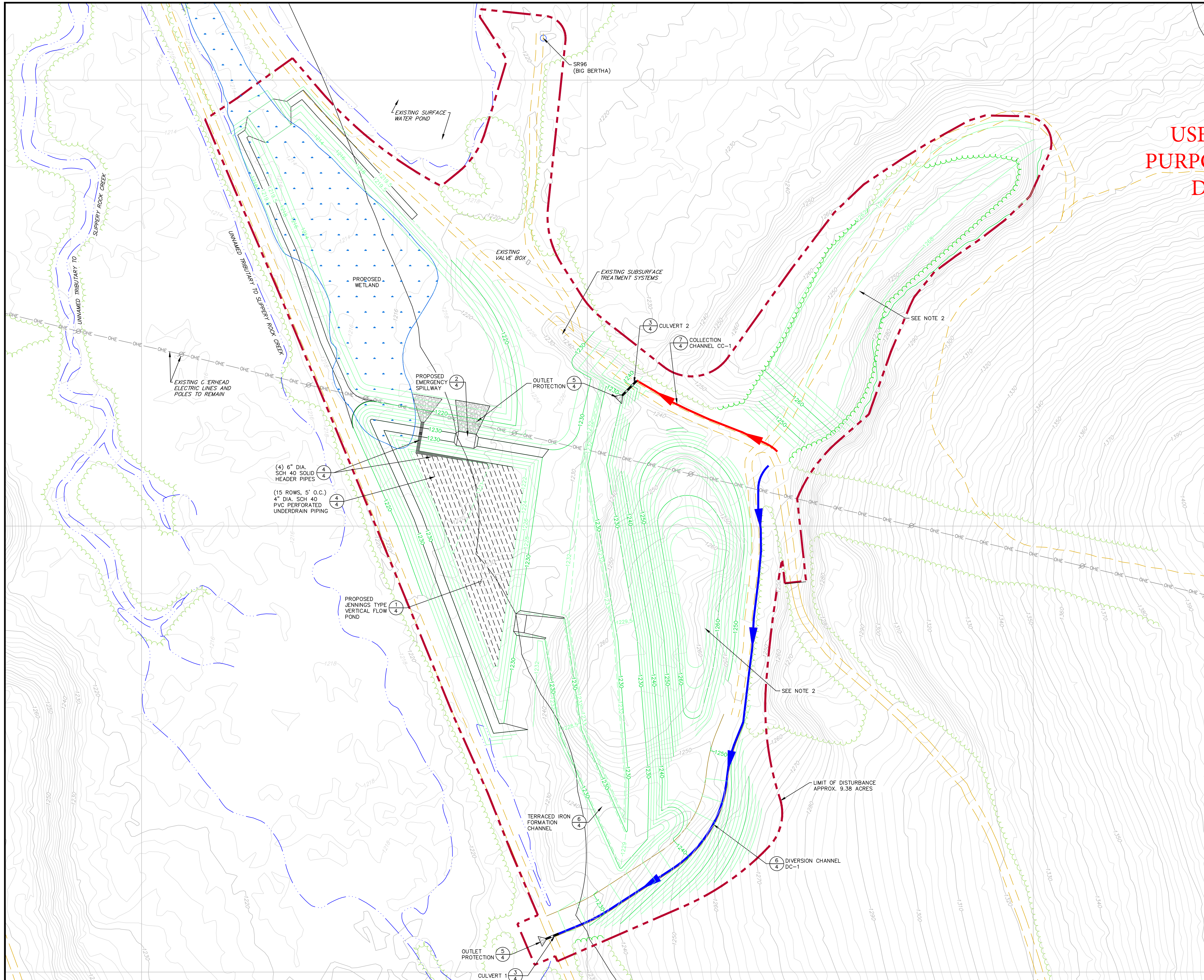
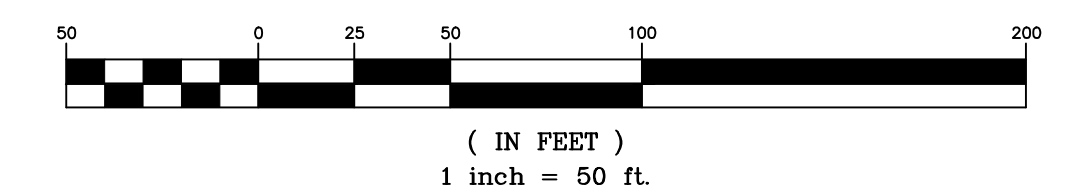
NOTES

1. BASEMAP TOPOGRAPHY DOWNLOADED FROM PENNSYLVANIA SPATIAL DATA ACCESS WEBSITE. LIDAR TILE NUMBERS 65001380PAS AND 65001390PAS DATED APRIL 2007.
2. GRADES DEPICTED ARE APPROXIMATE AND MAY NOT REACH THIS ELEVATION.
3. A 150' RIPARIAN BUFFER ZONE IS SHOWN HEREIN. HOWEVER, REVEGETATION OF THESE AREAS AFTER CONSTRUCTION IS NOT NECESSARY AS THIS IS NOT A HQ/EV WATERSHED.

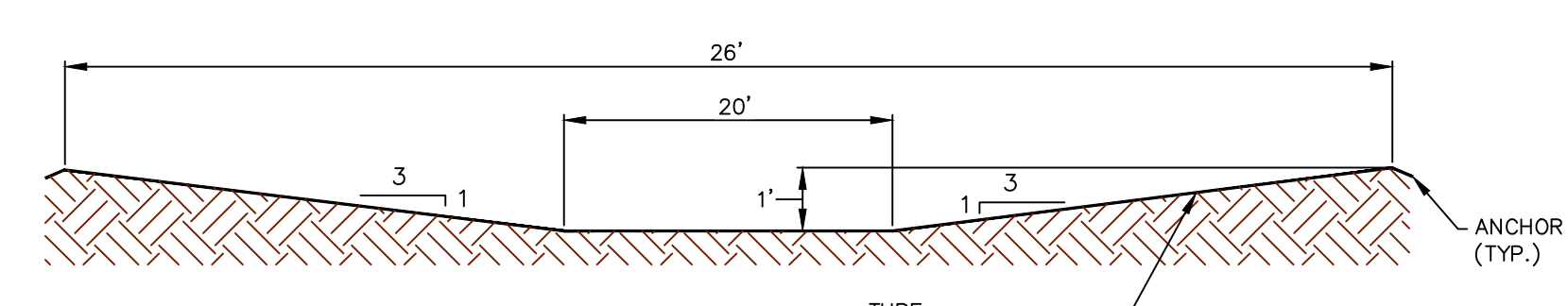
LEGEND

- LIMIT OF DISTURBANCE/PERMIT AREA
- EXISTING GRADE CONTOURS (C.I.=2'/10')
- PROPOSED GRADE CONTOURS (C.I.=2'/10')
- EXISTING ACCESS ROAD
- EXISTING TRAIL
- EXISTING TREE LINE
- PROPOSED TREE LINE
- EXISTING WATER SURFACE
- EXISTING OVERHEAD ELECTRIC LINES
- EXISTING POWER POLE
- EXISTING STREAM
- EXISTING CULVERT PIPE
- EXISTING WETLAND
- RIPARIAN BUFFER
- PROPOSED PERMANENT STORMWATER DIVERSION CHANNEL
- PROPOSED PERMANENT STORMWATER COLLECTION CHANNEL

GRAPHIC SCALE



<p>Balanced Environmental Solutions</p>	<p>REVISIONS</p>	
	<p>5/24/2018</p>	<p>NOTES UPDATED</p>
<p>VOGEL LANDFILL, INC.</p> <p>SR89 PROJECT</p> <p>PA STATE GAME LANDS NO. 95</p> <p>WASHINGTON TOWNSHIP BUTLER COUNTY PENNSYLVANIA</p>		<p>DATE: 10/27/17</p> <p>DRAWN BY: RHM</p> <p>CHECKED: PW</p> <p>BAI DRAWING NO: VOGEL-108D001J R1</p> <p>SHEET NO. PCSM-3</p>
<p>State College Office</p> <p>(814) 238-2060</p>	<p>Delaware Valley Office</p> <p>(610) 495-5585</p>	

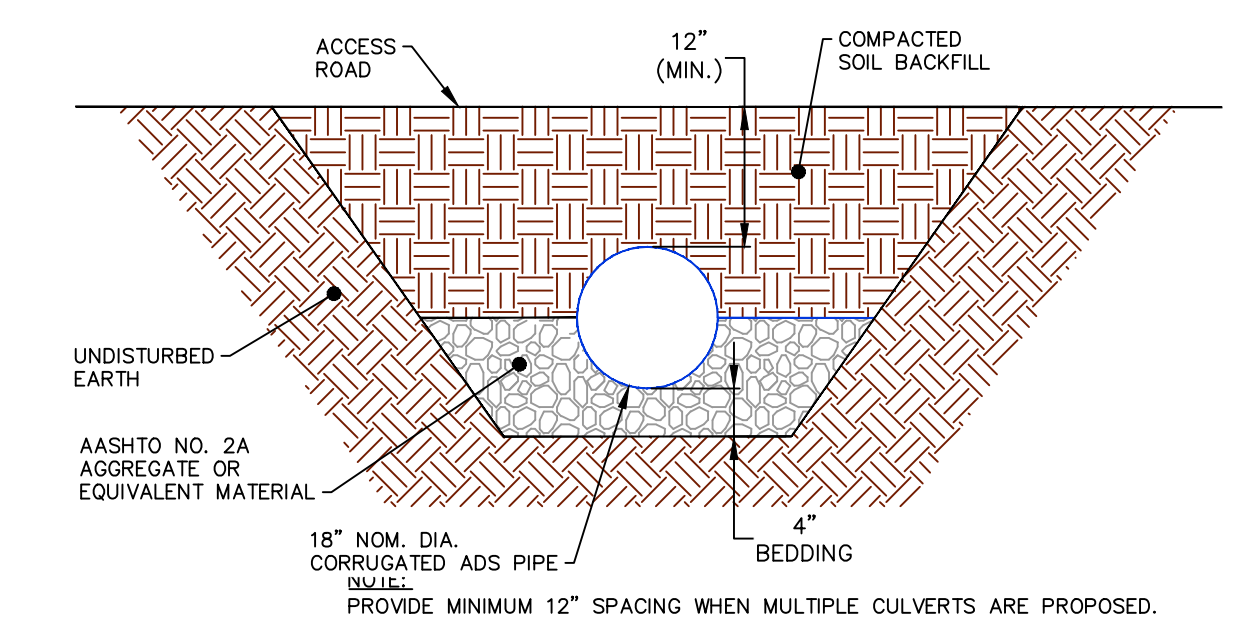


2 VFP EMERGENCY SPILLWAY SECTION
4 NOT TO SCALE

NSCA RIP-RAP GRADATIONS

NSCA NO.	MAX. D ₁₀₀ (in)	AVG. D ₅₀ (in)	MIN. D ₁₀ (in)	PERMISSIBLE VELOCITY (fps)
R-4	12	6	3	9.0

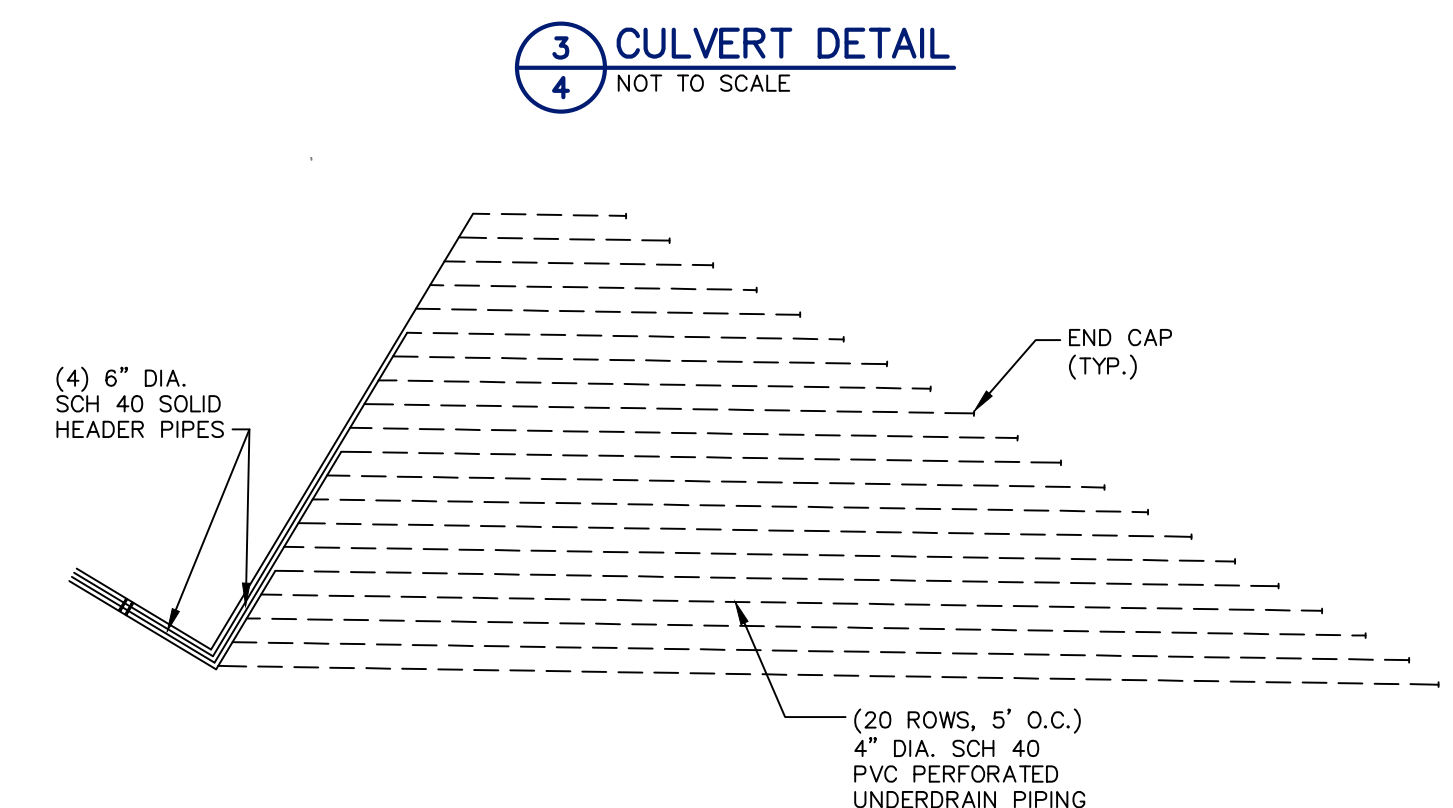
NOTE: UNIT WEIGHT OF ROCK SHALL BE APPROXIMATELY 165 pcf. ROCK RIP-RAP SHALL BE WELL-GRADED CRUSHED STONE COMPLYING WITH PennDOT 408, SECTION 650.



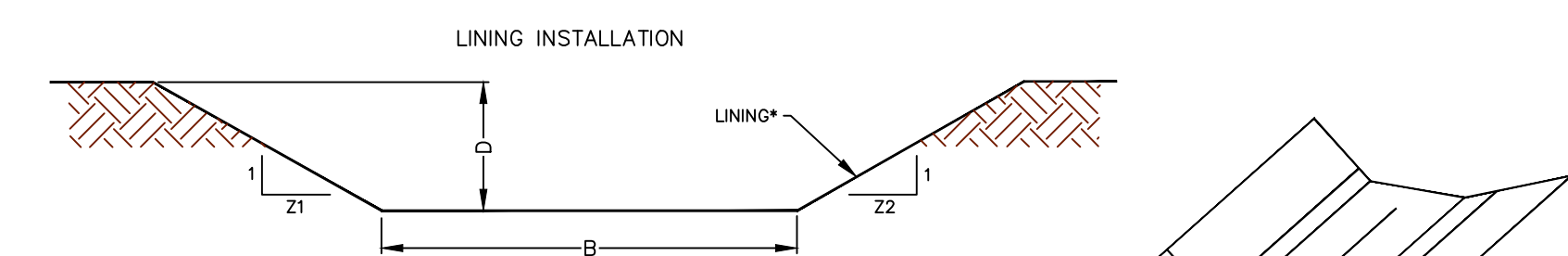
3 CULVERT DETAIL
4 NOT TO SCALE

CULVERT SCHEDULE

CULVERT	ACRES DRAINED (acre)	Q REQ'D (cfs)	Q' AVAIL (cfs)	MIN COVER (in)	MIN SLOPE (%)	LENGTH L (ft)	NO. OF PIPES	CULVERT DIAMETER D (in)	RECEIVING STRUCTURE
TCC-1	0.98	2.06	5.38	12	2	35	2	12	TCC-1
CC-1	11.36	14.09	20.23	12	3	15	2	18	UNIT TO SLIPPERY ROCK CREEK
CULVERT 2	0.73	2.46	4.66	12	3	25	1	12	TIF CHANNEL



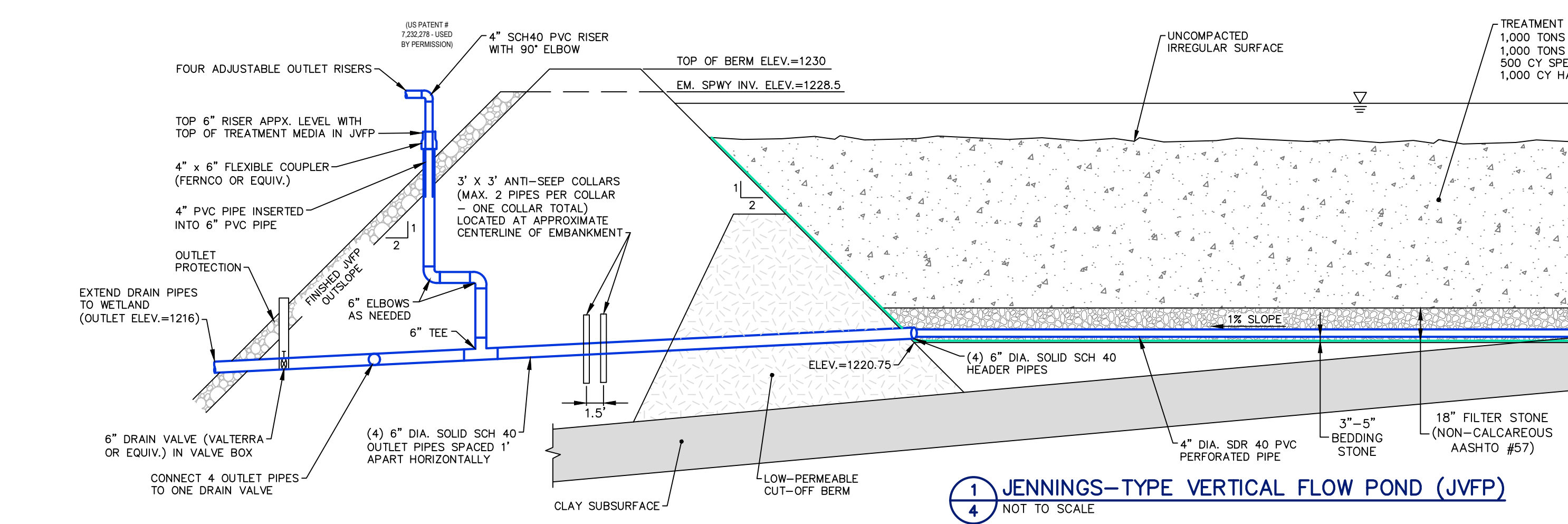
4 JVFP PIPE PLAN
4 NOT TO SCALE



CHANNEL SCHEDULE

CHANNEL I.D.	DEPTH (FT)	BOTTOM WIDTH (FT)	TOP WIDTH (FT)	SIDE SLOPES (Z1/Z2)	FREEBOARD (FT)	LINING
TCC-1	2.0	6.0	1.5	2/2	0.5	TRM/VEG
TCC-2	2.0	6.0	1.0	2/2	0.5	TRM/VEG
CC-1	2.0	6.0	1.0	2/2	0.5	TRM/VEG
DC-1	2.0	6.0	1.5	2/2	0.5	TRM/VEG

7 CHANNEL CROSS-SECTION DETAIL
4 NOT TO SCALE



1 JENNINGS-TYPE VERTICAL FLOW POND (JVFP)
4 NOT TO SCALE

USE FOR INFORMATIONAL PURPOSES ONLY - SEE AS-BUILT DRAWINGS FOR FINAL CONDITIONS

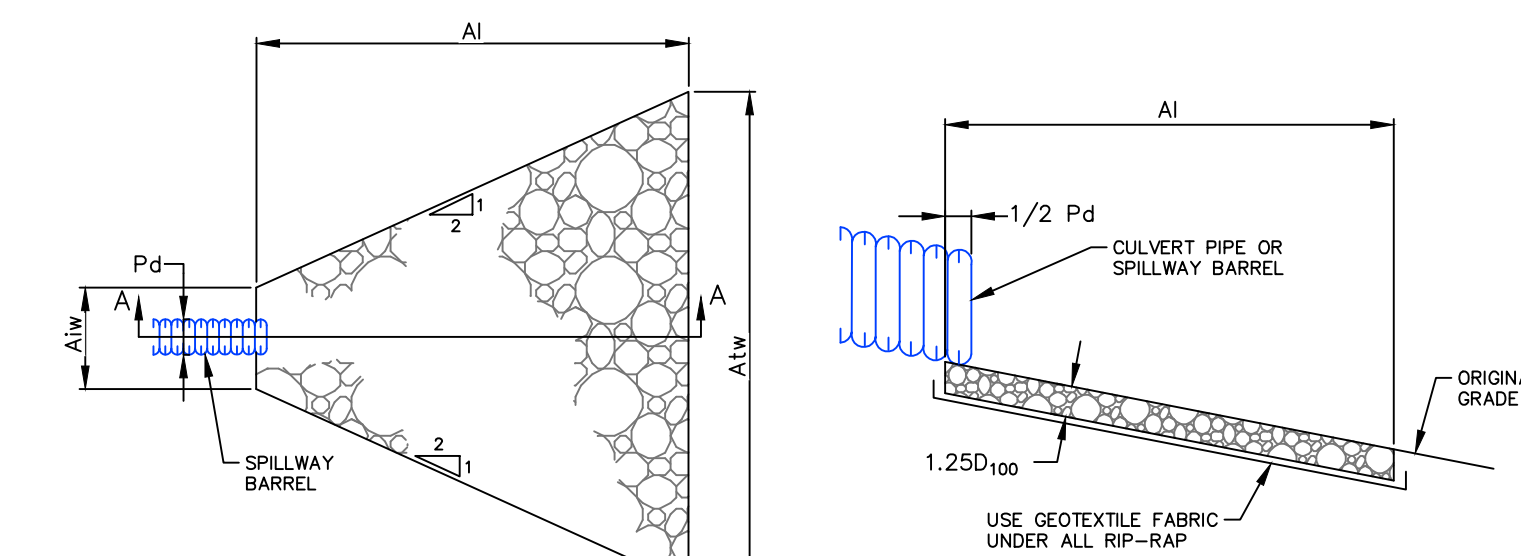
- RESOLUTION TO SOIL LIMITATIONS (SEE TABLE 1 THIS SHEET FOR SOIL LIMITATIONS)**
- CUTBANKS / CAVING: CONDUCT TRENCHING OPERATIONS IN ACCORDANCE WITH OSHA TECHNICAL MANUAL FOR TRENCHING.
 - CORROSION TO CONCRETE / STEEL: PRECAUTIONS SHOULD BE TAKEN TO PROTECT ALL CONCRETE AND STEEL FROM CORROSION BY USING PREVENTATIVE COATINGS.
 - BEDROCK: WHEN BEDROCK IS ENCOUNTERED; IT SHALL BE REMOVED BY MECHANICAL METHODS OR BLASTING. BLASTING SHALL CONFORM WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
 - LOW STRENGTH: TAKE PRECAUTIONS TO PREVENT SLOPE FAILURE BY FLATTENING CUT / FILL SLOPES, NOT OVERLOADING, MAINTAINING LATERAL SUPPORT, AND PREVENTING SATURATION OF SOILS AVOIDING ROCKY CONSTRUCTION.
 - FLOODING/HYDROIC/SLOW PERCOLATION/PONDING/WETNESS/SEASONAL HIGH WATER TABLE: EXCAVATIONS IN SOILS THAT HAVE THESE CHARACTERISTICS WILL LIKELY ENCOUNTER WATER. DEWATER WITH APPROPRIATE MEANS SUCH AS PUMP WATER FILTER BAGS, SEDIMENT TRAPS, ETC.
 - SHRINK / SWELL / FROST ACTION: SOILS THAT HAVE POTENTIAL TO SWELL, SHRINK, OR HEAVE MAY CAUSE DAMAGE TO ROADWAYS OR PADS WHERE FOUNDATIONS ARE CRITICAL. REMOVAL AND REPLACEMENT OF SOILS WITH SUITABLE MATERIAL MAY BE REQUIRED.
 - POOR TOPSOIL / DROUGHTY / WETNESS: SOIL TEST IS ENCOURAGED TO DETERMINE THE APPROPRIATE APPLICATIONS OF SOIL AMENDMENTS TO PROMOTE GROWTH. IDENTIFY SOILS ON-SITE THAT ARE FAIR SOURCES OF TOPSOIL, STRIP AND STOCKPILE FOR USE DURING RESTORATION.
 - EASILY ERODIBLE: PROVIDE PROTECTIVE LINING, SEEDING AND MULCHING. EROSION CONTROL BLANKETS (ROLLS OR HYDRAULICALLY APPLIED), TRACKING SLOPES, UPSTREAM DIVERSIONS, WATERBARS, ETC., TO MINIMIZE EROSION OF THE SOILS.

- CHARACTERISTICS OF EARTH DISTURBANCE ACTIVITY, INCLUDING PAST, PRESENT AND PROPOSED ALTERATIONS TO THE AREA**
- THE PROJECT IS LOCATED ON PENNSYLVANIA GAME LANDS NO. 95. THE LAND IS OPERATED BY THE PENNSYLVANIA GAME COMMISSION FOR WILDLIFE HABITAT AND PUBLIC HUNTING GROUNDS. THE IMMEDIATE PROJECT AREA HAS BEEN AFFECTED BY PAST MINING OPERATIONS THROUGH VARIOUS DISCHARGES OF AMD AND HAS SEVERELY DISTURBED THE DOWNSTREAM NON-FUNCTIONAL WETLAND AREA WHICH WILL BE REMOVED AND REPLACED AS PART OF THIS RESTORATION PROJECT. SURROUNDING AREAS ON THE SITE CONSIST OF WOODED AREAS, ACCESS ROADS, AND SPILL PILES FROM PAST MINING OPERATIONS. REFER TO APPENDIX A FOR THE LOCATION MAP OF THE PROJECT SITE.
- DEVELOPMENT OF THE PROJECT WILL CONSIST OF REMOVAL OF EXISTING TREES AND SOIL PILES WITHIN THE LIMIT OF DISTURBANCE FOR CONSTRUCTION OF A PASSIVE TREATMENT SYSTEM. THE PROJECT AREA AND LIMIT OF DISTURBANCE CONSIST OF APPROXIMATELY 9.38 ACRES. EROSION AND SEDIMENTATION CONTROL STRUCTURES WILL BE CONSTRUCTED FOR THE PROJECT TO ADJUST WATERS DURING CONSTRUCTION OPERATIONS. THE CONSTRUCTED PASSIVE TREATMENT SYSTEM WILL CONSIST OF THE FOLLOWING COMPONENTS: A TERRACED IRON FORMATION CHANNEL, A JENNINGS-TYPE VERTICAL FLOW POND, AND A WETLAND AREA. CONCEPTUAL DESIGN OF THE PASSIVE TREATMENT SYSTEM WAS CONDUCTED BY STREAM RESTORATION, INC.
- PROJECT SITE RUNOFF:**
SURFACE WATER FROM THE PROJECT AREA WILL ACCESS THE COMMONWEALTH SURFACE WATER SYSTEM THROUGH AN UNNAMED TRIBUTARY TO SLIPPERY ROCK CREEK (CWR). THE SURFACE WATER IS CONSIDERED IMPAIRED DUE TO METALS AND SULFATE FROM AID MINE DRAINAGE.
- BMP DESCRIPTION NARRATIVE:**
STORMWATER DURING CONSTRUCTION SHALL BE CONTROLLED BY SEQUENCING THE OPERATIONS AND USING A SELECTION OF BEST MANAGEMENT PRACTICES (BMPs) TO PREVENT EROSION AND OFFSITE SEDIMENTATION. SITE WORK WILL BE CONSTRUCTED IN A SHORT TIMEFRAME AND WILL BE STABILIZED AS WORK PROGRESSES. THE FOLLOWING TEMPORARY BMP'S WILL BE UTILIZED:
- A TEMPORARY SEDIMENTATION BASIN WILL BE CONSTRUCTED TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING CONSTRUCTION. THE BASIN WILL BE CONVERTED TO A WETLAND AFTER THE REST OF THE PASSIVE TREATMENT SYSTEM IS CONSTRUCTED.
 - SITE WILL BE REVEGETATED WITH NATIVE SPECIES.
 - ALL INSTALLED BMP'S WILL BE MONITORED UNTIL FINAL SITE STABILIZATION IS ACHIEVED.
- BMP INSTALLATION SEQUENCE:**
STORMWATER DURING CONSTRUCTION SHALL BE CONTROLLED BY SEQUENCING THE OPERATIONS AND USING A SELECTION OF BEST MANAGEMENT PRACTICES (BMPs) TO PREVENT EROSION AND OFFSITE SEDIMENTATION. SITE WORK WILL BE CONSTRUCTED IN A SHORT TIMEFRAME AND WILL BE STABILIZED AS WORK PROGRESSES. THE FOLLOWING TEMPORARY BMP'S WILL BE UTILIZED:
- A ROCK CONSTRUCTION ENTRANCE WILL BE UTILIZED AT THE ENTRANCE FROM THE ACCESS ROAD. THE ROCK CONSTRUCTION ENTRANCE WILL BE INSTALLED IN ACCORDANCE WITH DETAIL 3 ON SHEETS 5 OF THE DRAWING SET.
 - FABRIC FILTER FENCE OR COMPOST FILTER SOCK WILL BE INSTALLED DOWNGRADIENT OF DISTURBED AREAS NOT OTHERWISE DRAINING TO SEDIMENT BASIN 1, AS SHOWN ON E&S PLAN DRAWINGS. FABRIC FILTER FENCE OR COMPOST FILTER SOCK WILL BE INSTALLED IN ACCORDANCE WITH THE DETAILS ON SHEET 6 OF THE DRAWING SET.
 - SEDIMENTATION BASIN NO. 1 WILL ALSO BE USED TO CONTROL SEDIMENT LEAVING THE SITE. THIS BASIN IS GENERALLY EXISTING, ALTHOUGH SOME IMPROVEMENTS ARE PROPOSED. THE BASIN WILL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS ON SHEET 5 OF THE DRAWING SET.
 - SEDIMENT FILTER BAGS MAY BE USED IF WATER ACCUMULATES WITHIN THE SITE DURING CONSTRUCTION TO FILTER WATER PUMPED FROM DISTURBED AREAS IF THE NEED ARISES. FILTER BAGS WILL BE UTILIZED ON THE DOWNGRADIENT SIDE OF THE EARTHWORK, AS NEEDED. ALTERNATIVELY, WATER MAY BE PUMPED THROUGH THE SEDIMENTATION BASIN 1.
 - CHANNELS AND CULVERTS WILL BE USED TO CONVEY OR DIVERT STORMWATER THROUGHOUT THE SITE. REFER TO THE DETAILS ON SHEET 5 OF THE DRAWING SET. ROCK APRONS WILL BE USED AT PIPE DISCHARGES. SEE DETAIL ON SHEET 5 OF THE DRAWING SET.
 - UPON TEMPORARY CESSATION OF AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OR PHASE OF AN ACTIVITY WHERE A CESSATION OF EARTH DISTURBANCE ACTIVITY WILL EXCEED FOUR DAYS, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED, OR OTHERWISE PROTECTED FROM ACCELERATED E&S PENDING FUTURE EARTH DISTURBANCE ACTIVITIES.
- ALL INSTALLED BMP'S WILL BE MONITORED UNTIL FINAL SITE STABILIZATION IS ACHIEVED.

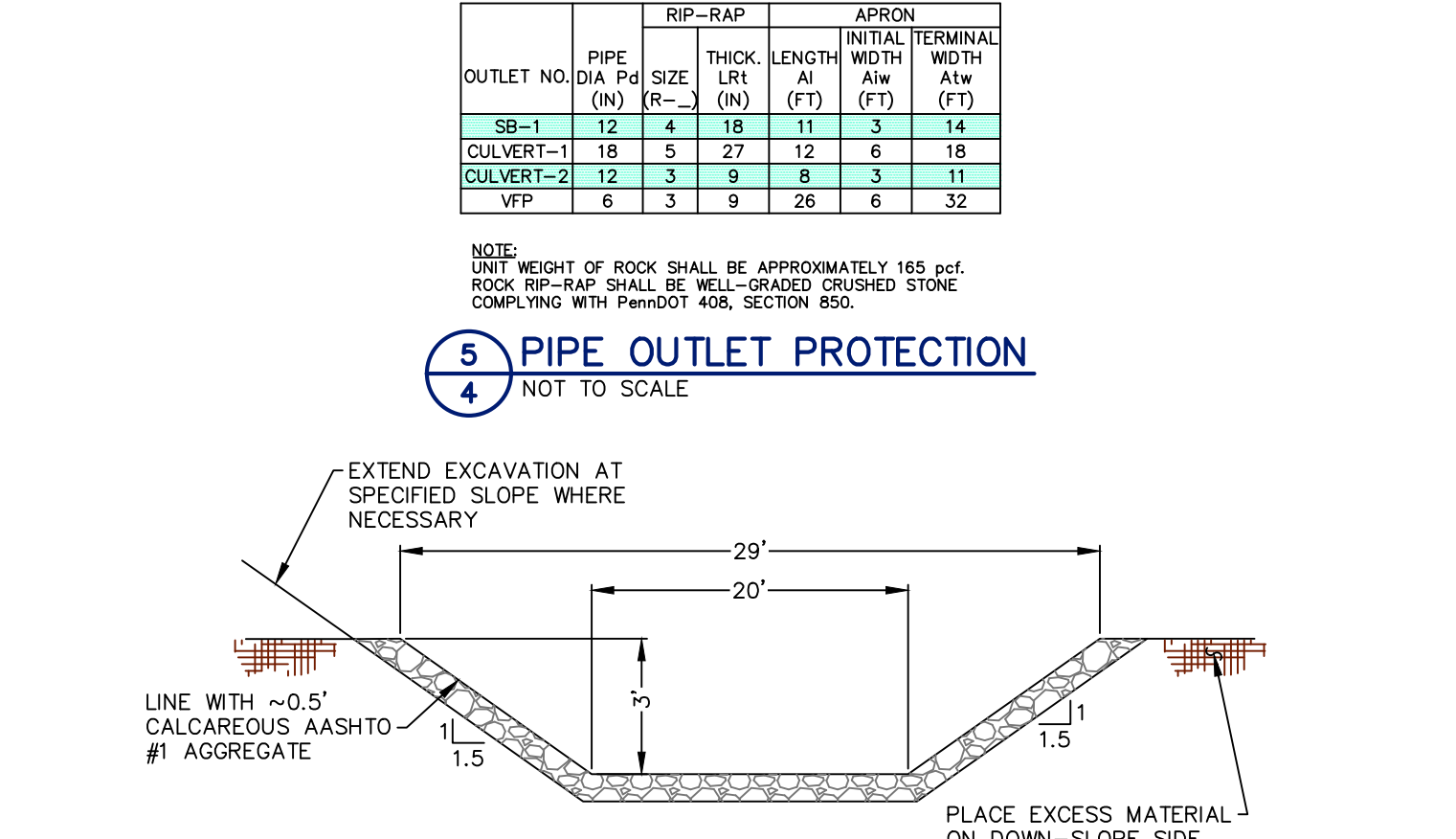
- PERMANENT BMP'S WILL CONSIST OF:**
- DISTURBED AREAS NOT UTILIZED FOR THE PASSIVE TREATMENT SYSTEM WILL RECEIVE TOPSOIL (IF NEEDED) AND SOIL AMENDMENTS, PERMANENT SEEDING, AND MULCH AS SPECIFIED IN THE PLAN AND DURING OPERATIONS.
 - A WETLAND WILL BE CONSTRUCTED ON THE NORTHERN PORTION OF THE PROJECT AREA. THE WETLAND WILL BE CONSTRUCTED IN ACCORDANCE WITH THE PLAN DRAWINGS.
- STAGING OF EARTHWORK ACTIVITIES:**
AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THESE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT 811 TO LOCATE BURIED UTILITIES.
- THE INTENT OF THE PLAN IS TO PREVENT SEDIMENT FROM LEAVING THE LIMIT OF DISTURBANCE BY LIMITING THE WORK AREA ALLOWED AND BY STABILIZING THE WORK AREA AS THE CONSTRUCTION PROGRESSES. THIS PLAN ALSO SEEKS TO MINIMIZE THE EXTENT AND DURATION OF EARTH DISTURBANCE AS WELL AS KEEP COMPACTION OF SOILS TO A MINIMUM. GIVEN THE NATURE OF THE PROJECT, A REDUCTION IN STORMWATER RUNOFF IS ANTICIPATED DUE TO PROMOTION OF VEGETATION AND RESTORATION OF WETLANDS CURRENTLY DESIGNATED AS NON-FUNCTIONAL.
- CARE SHOULD BE TAKEN TO PLACE THE EXCAVATED MATERIAL AWAY FROM STREAM BANKS, DRAINAGE CHANNELS AND VEHICULAR TRAVEL WAYS AS APPLICABLE. PROJECT EXISTING DRAINAGE FEATURES AND VEGETATION NOT PROPOSED TO BE DISTURBED. STOCKPILES THAT ARE GOING TO REMAIN FOR LONGER THAN FOUR DAYS SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING AND MULCH FOR STABILIZATION. RESTORATION WORK SHOULD BE DONE AS THE PROJECT PROGRESSES, AND NOT BE LEFT UNTIL THE END OF THE JOB. AT A MINIMUM, NO RUNOFF SHALL BE LEFT EXPOSED WITHOUT SOME FORM OF STABILIZATION, UNLESS SHOWN OTHERWISE TO CONSTRUCTION TRAFFIC. THE PROJECT WILL NOT GENERATE ANY WASTE. IF UNKNOWN WASTES ARE ENCOUNTERED DURING THE PROJECT, THEY WILL BE DISPOSED OF BY DEP REGULATIONS AS NOTED.
- A SEQUENCE OF OPERATIONS TO ACHIEVE THE ABOVE IS AS FOLLOWS:
- CONSTRUCTION SEQUENCE:**
- AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES (INCLUDING CLEARING AND GRUBBING), THE OWNER AND/OR OPERATOR SHALL WRITE ALL CONTRACTORS THE PLAN PREPARED BY THE LAND MANAGEMENT GROUP SUPERVISOR FOR THE POC AND A REPRESENTATIVE FROM BUTLER COUNTY CONSERVATION DISTRICT FOR A PRECONSTRUCTION MEETING.
 - MOBILIZE CONSTRUCTION EQUIPMENT AND MATERIALS TO THE PROJECT SITE.
 - THE LIMIT OF DISTURBANCE WILL BE DELINEATED FOR POC REGIONAL FORESTRY STAFF TO COMPLETE A TIMBER VALUATION PRIOR TO CONDUCTING ANY SURFACE ACTIVITIES.
 - CONSTRUCT AND INSTALL ROCK CONSTRUCTION ENTRANCE AS INDICATED ON THE PLANS. MAINTAIN CONSTRUCTION ENTRANCE APPROPRIATELY THROUGHOUT CONSTRUCTION. REMOVE AND STABILIZE TEMPORARY CONTROL MEASURES UPON ESTABLISHMENT OF PERMANENT VEGETATION.
 - INSTALL PROTECTIVE BARRIER AROUND AREAS TO BE PROTECTED, SUCH AS WETLANDS AND STREAMS. PROTECTIVE BARRIERS MAY BE EARTHEN BERM, ORANGE SAFETY FENCE, JERSEY BARRIERS, OR SIMILAR.
 - INSTALL EROSION AND SEDIMENT CONTROL BMP'S AS DIRECTED ON THE PLANS AND AS NECESSARY DURING CONSTRUCTION. EARTH DISTURBANCE CANNOT OCCUR UNTIL E&S BMP'S HAVE BEEN INSTALLED TO TREAT THE WATERSHED AREA IN WHICH DISTURBANCE WILL OCCUR.
 - INSTALL COMPOST FILTER SOCK AS SHOWN ON THE PLANS (CLEARING AND GRUBBING SHOULD BE LIMITED TO WHAT IS NECESSARY FOR INSTALLATION). ALL INSTALLED BMP'S SHALL BE INSPECTED WEEKLY AND AFTER RUNOFF EVENTS. UPON INSPECTION, NECESSARY REPAIRS SHALL BE PERFORMED BY THE CONTRACTOR. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF CONTROLS.
 - CONSTRUCT SEDIMENT BASIN 1 BY CONSTRUCTING A SOIL BERM AT THE NORTH END OF THE PROJECT AREA. REMOVE IRON MAT PRIOR TO CONSTRUCTION OF BERM. INSTALL THE PIPE BARREL AND RISER FOR THE PRINCIPAL SPILLWAY IN ACCORDANCE WITH THE DESIGN REQUIREMENTS. INSTALL RIPRAP APRON AT OUTLET OF BARREL PIPE. INSTALL BARRIERS ON PRINCIPAL SPILLWAY RISER PIPE. GRADE EMERGENCY SPILLWAY CHANNEL OVER THE SOIL BERM. STABILIZE THE BERM AND EMERGENCY SPILLWAY AND INSTALL TURF REINFORCEMENT MAT IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS AND DESIGN REQUIREMENTS.
 - REMOVE THE EXISTING 8-INCH DIAMETER PVC PIPE CULVERT. REMOVE OR PILE THE EXISTING 12-INCH DIAMETER CONCRETE PIPE CULVERT WHICH CROSSES THE LOWER ACCESS ROAD.
 - CONSTRUCT TEMPORARY COLLECTION CHANNEL TCC-1, TEMPORARY COLLECTION CHANNEL TCC-2, TEMPORARY CULVERT 1, AND PROPOSED ACCESS ROAD IN ACCORDANCE WITH THE DESIGN REQUIREMENTS. STABILIZE ALL AREAS WHICH ACHIEVE FINAL GRADE ELEVATION INCLUDING DISTURBED AREA LOCATED UPSLOPE OF THE PROPOSED ACCESS ROAD.

- PERFORM CLEARING OF EXISTING TREES, STUMPS, AND BRUSH LOCATED WITHIN THE LIMIT OF DISTURBANCE. TREES, STUMPS, AND BRUSH REMOVED FOR THE PROJECT WILL BE PLACED IN PILES ON THE PROPERTY IN AREAS AS APPROVED BY POC OFFICIALS.
 - CONSTRUCT VERTICAL FLOW POND IN ACCORDANCE WITH DESIGN PLANS. STABILIZE ALL AREAS WHICH ACHIEVE FINAL GRADE ELEVATION.
 - PERFORM EXCAVATION OF CONSTRUCTION AREA MINE SPILL PILE. EXCAVATED SPILL MATERIALS WILL BE STOCKPILED IN THE EXISTING STRIP CUT FROM PREVIOUS MINING OPERATIONS. EXCESS SOIL MATERIAL WILL REMAIN AS PERMANENT FILL IN THE AREA. FILL AREAS WHICH ACHIEVE GRADE ELEVATION SHALL BE STABILIZED IMMEDIATELY.
 - CONSTRUCT TERRACED IRON FORMATION CHANNEL IN ACCORDANCE WITH DESIGN PLANS. STABILIZE ALL AREAS WHICH ACHIEVE FINAL GRADE ELEVATION.
 - PERFORM FINAL GRADING OF PROJECT AREA AND PERMANENTLY STABILIZE ALL DISTURBED AREAS.
 - UPON STABILIZATION OF UPGRADEMENT AREA, CONVERT TCC-2 INTO DIVERSION CHANNEL, DC-1 AND CONSTRUCT THE REMAINDER OF DC-1. STABILIZE THE ENTIRE CHANNEL AREA, SLOPES, AND OUTLET ACCORDING TO DESIGN REQUIREMENTS.
 - INSTALL CULVERT 1 FOR CROSSING UNDER THE EXISTING LOWER ACCESS ROAD FOR DISCHARGE OF DC-1. STABILIZE THE DISTURBED AREAS ACHIEVE FINAL GRADE ELEVATION.
 - UPON STABILIZATION OF UPGRADEMENT AREAS, REMOVE TEMPORARY CHANNEL TCC-1 AND TEMPORARY CULVERT 1. STABILIZE ALL AREAS WHICH ACHIEVE FINAL GRADE ELEVATION.
 - CONVERT SEDIMENT BASIN 1 TO THE WETLAND IN ACCORDANCE WITH DESIGN PLANS. STABILIZE ALL AREAS WHICH ACHIEVE FINAL GRADE ELEVATION.
 - IF WATER ACCUMULATES WITHIN THE SITE DURING CONSTRUCTION, EXCESS WATER WILL BE PUMPED OFFSITE. PUMPED WATER FILTER BAGS WILL BE USED TO FILTER WATER PUMPED FROM DISTURBED AREAS IF THE NEED ARISES. FILTER BAGS WILL BE UTILIZED ON THE DOWNGRADIENT SIDE OF THE EARTHWORK, AS NEEDED. ALTERNATIVELY, WATER MAY BE PUMPED THROUGH THE SEDIMENTATION BASIN 1.
 - BAGS SHOULD BE LOCATED IN WELL VEGETATED (GRASSY) AREAS AND DISCHARGE INTO STABLE EROSION RESISTANT AREAS. FILTER BAGS WILL BE REMOVED WHEN THEY BECOME 1/2 FULL. THE USE OF FILTER BAGS WILL CONTINUE UNTIL THE CONSTRUCTION AREA HAS BEEN STABILIZED AND SUCCESSFULLY REVEGETATED.
 - REMOVE ANY DEBRIS AND ENSURE ADEQUATE FLOW IN PERMANENT STORMWATER DIVERSION STRUCTURES. REPAIR PERMANENT E&S CONTROL STRUCTURES AS NECESSARY. REMOVE THE TEMPORARY E&S CONTROL MEASURES ONCE VEGETATION HAS BECOME ESTABLISHED (>70% COVER).
 - DEMOLITION OF EQUIPMENT AND MATERIALS FROM THE SITE.
- DEVIATION FROM THE SCHEDULE OF CONSTRUCTION ACTIVITIES MAY BE NECESSARY BASED ON SPECIFIC SITE CONDITIONS AND OCCURRENCES AT THE TIME OF CONSTRUCTION. CONSTRUCTION OPERATIONS MAY BE CONDUCTED AT THE SITE AT ANY TIME NECESSARY TO COMPLETE THE PROJECT IN A TIMELY MANNER.
- CONSTRUCTED WETLAND:**
THE DESIGN OF THE PROPOSED WETLAND CREATION AREA CONSISTS OF RESTORING THE FUNCTIONS OF THE EXISTING WETLAND ECOSYSTEM IMPAIRED BY AMD DRAINAGE. THE SITE WILL BE DESIGNED TO MIMIC THAT OF THE ORIGINAL WETLAND WHILE CREATING HABITAT FOR A WIDE ARRAY OF WILDLIFE.
- HYDROLOGIC DESIGN:**
THE HYDROLOGY THAT WILL DRIVE THE NEWLY CREATED WETLANDS WILL BE FROM A NATURALLY OCCURRING / SEASONAL FLUCTUATING HIGH-WATER TABLE AND SURFACE WATER INFILTS FROM THE AMD TREATMENT SYSTEM.
- GRADING DESIGN:**
THE OVERALL GRADING DESIGN WITHIN WETLAND CREATION AREAS WILL INCLUDE STRIPPING THE EXISTING IRON MAT RESULTING FROM THE AMD DRAINAGE. A 6 - 12" LAYER OF TOPSOIL, / BEST AVAILABLE MATERIAL WILL BE ADDED TO THE APPROPRIATE ORIGINAL GRADE. TOPSOIL AND OR COMPOST MAY NEED TO BE PROVIDED AND/OR AMENDED INTO THE UPPER 12" OF STRIPPED MATERIAL TO BE PLACED AS FINAL GRADE.
- VEGETATIVE DESIGN:**
UPON FINAL GRADING OF THE SITE WILL RESULT IN MICROTOPOGRAPHIC CHANGES IN ELEVATIONS WHICH WILL RESULT IN SEVERAL HYDROLOGIC REGIMES WITHIN THE WETLAND CREATION AREA. VEGETATIVE DESIGN OF AN SITE OUTLINES A SPECIFIC HERBACEOUS SEED MIX THAT WAS SELECTED FOR THE SITE. THE SITE WILL BE SEEDED IMMEDIATELY FOLLOWING FINAL GRADING OPERATIONS.
- THE ENTIRE WETLAND CREATION AREA WILL BE SEEDED WITH THE MIXTURE SPECIFIED IN THE SEEDING AND MULCHING SECTION ROW. STRAW MULCH WILL BE APPLIED AT A RATE OF 3 TONS PER ACRE TO THE NEWLY SEEDED AREAS TO PROTECT AGAINST EROSION DURING SEED GERMINATION.
- MAINTENANCE PLAN:**
THE GOAL OF THE PROPOSED WETLAND IS FOR THE SITE TO BE SELF-SUSTAINING POST-CONSTRUCTION WITH LITTLE TO NO MAINTENANCE BEYOND THE FIVE-YEAR MONITORING PERIOD. MAINTENANCE WILL BE THE RESPONSIBILITY OF STREAM RESTORATION, INC. THE SITE SHALL BE INSPECTED AT LEAST TWICE A YEAR FOR THE FIRST TWO YEARS AND NO LESS THAN ONCE PER YEAR DURING THE FOLLOWING THREE YEARS, OR AS DIRECTED BY REGULATORY AGENCIES. MAINTENANCE ACTIVITIES MAY INCLUDE TREATMENT OF INVASIVE SPECIES AND OTHER APPROPRIATE MEASURES TO ENSURE THE PERFORMANCE STANDARDS ARE BEING MET.

- SEEDING AND MULCHING:**
UPON FINAL COMPLETION OF AN EARTH DISTURBANCE ACTIVITY, THE SITE SHALL IMMEDIATELY HAVE TOPSOIL RESTORED, SEEDED AND MULCHED. TEMPORARY EROSION AND SEDIMENTATION CONTROL BMP'S CAN BE REMOVED WHEN THE SITE MEETS FINAL STABILIZATION. FINAL STABILIZATION MEANS THAT ALL SOLID-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT AN ACCEPTABLE BMP WHICH PERMANENTLY MINIMIZES ACCELERATED EROSION AND SEDIMENTATION HAS BEEN INSTALLED. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.
- TOPSOIL WILL BE REPLACED PRIOR TO STABILIZATION. DISTURBED AREAS SHALL BE SEEDED WITH ONE OF THE CORRESPONDING MIXTURES FROM THE LIST BELOW. THE POC WILL BE CONSULTED PRIOR TO VEGETATION. DEPENDING ON WHAT THE FINAL GRADE AROUND THE TREATMENT SYSTEM LOOKS LIKE, THE POC MAY CHOOSE OTHER MIXES FOR LOWER MAINTENANCE. THE SEED MIX (ENHANCED PASSIVE AID MINE OBL. WETLAND MIX OR SIMILAR) WILL BE USED TO VEGETATE THE WETLAND. APPLY LIME AND FERTILIZER IN ACCORDANCE WITH SOIL TEST RECOMMENDATIONS. IF SOIL TEST RESULTS ARE UNAVAILABLE, APPLY AGRICULTURAL GRADE LIME AT A RATE OF 6 TONS PER ACRE AND APPLY 10-20-20 FERTILIZER AT A RATE OF 1000 LBS/ACRE. STRAW MULCH SHALL BE APPLIED AT A RATE OF AT LEAST 3 TONS PER ACRE.
- PREFERRED SEED MIX:**
ALL STEEP SLOPES, PIPELINES, & DURING OPERATIONS
2 LBS/ACRE - LITTLE BLUESTEM
10 LBS/ACRE - CANADA WILDRYE
10 LBS/ACRE - TIMOTHY
3 LBS/ACRE - ALSKE CLOVER
3 LBS/ACRE - LADINO CLOVER
1 BUSH/ACRE - ANNUAL CEREAL GRAIN (OATS IN SPRING, WINTER GRAIN RYE IN FALL)
APPLY STRAW (NOT HAY) TO PROVIDE COMPLETE COVERAGE OF SOIL
- PROPOSED WETLAND AREA - PASSIVE AID MINE OBL. WETLAND MIX**
22.0% CAREX VULPINODIA, PA ECTOTYPE (FOX SEDGE)
20.0% CAREX LYRATA, PA ECTOTYPE (SHALLOW SEDGE)
20.0% ELYMUS RIPARIUS, PA ECTOTYPE (RIVERBANK WILDRYE)
6.0% CAREX SPRIEGLI, PA ECTOTYPE (FRINGED (WOODING) SEDGE)
6.0% SORBUS ATROBACCATA, PA ECTOTYPE (GREEN BULBUSH)
6.0% SPARGANIUM EURYCARPUM, PA ECTOTYPE (GIANT BUR REED)
6.0% SORBUS EXPANSUS, PA ECTOTYPE (WOOD BULBUSH)
4.0% JUNCO EFFUSUS (SOFT TUSH)
3.0% SORBUS CYPRIANUS, PA ECTOTYPE (WOOLOGRASS)
APPLY STRAW (NOT HAY) TO PROVIDE COMPLETE COVERAGE OF SOIL
- ALTERNATE SEED MIXES:**
ORIGINALLY FORESTED - LESS STEEP AREAS & DURING ALL FINAL RESTORATION
5 LBS/ACRE - TIMOTHY
5 LBS/ACRE - BROODFOOT TREFOIL
1 LB/ACRE - CANADA WILDRYE
1 LB/ACRE - INDIANGRASS
2 LBS/ACRE - LITTLE BLUESTEM
1 LB/ACRE - SIDE-OATS GRAMA
1 LB/ACRE - SMTGRASS
1/4 LB/ACRE - LANCE-LEAFED COREOPSIS
1/4 LB/ACRE - MAHONNIA SUNFLOWER
1 BUSH/ACRE - ANNUAL CEREAL GRAIN (OATS IN SPRING, GRAIN RYE OR WHEAT IN FALL)
APPLY STRAW (NOT HAY) TO PROVIDE COMPLETE COVERAGE OF SOIL
- ORIGINALLY AGRICULTURAL/STRIP MINE/OLD FIELD - LESS STEEP AREAS & DURING ALL FINAL RESTORATION**
2 LBS/ACRE - TIMOTHY
5 LBS/ACRE - CANADA WILDRYE
5 LBS/ACRE - LITTLE BLUESTEM
5 LBS/ACRE - SIDE-OATS GRAMA
5 LBS/ACRE - BROODFOOT TREFOIL
1/4 LB/ACRE - LANCE-LEAFED COREOPSIS
1/4 BUSH/ACRE - ANNUAL CEREAL GRAIN (GRAIN RYE IN FALL, OATS IN SPRING)
- E&S MAINTENANCE PROGRAM:**
THE CONTRACTOR SHALL ASSESS THE WORKING CONDITION OF THE E&S CONTROLS AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED STRUCTURES, BLOCKED STRUCTURES, OR OTHER PROBLEMS IDENTIFIED DURING THE INSPECTIONS SHALL BE REPAIRED PROMPTLY.
- ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. AT THE END OF EACH DAY, SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE.
- RESPONSIBILITY FOR MAINTAINING PERMANENT DRAINAGE CONTROL FACILITIES UPON COMPLETION OF CONSTRUCTION SHALL BE ASSUMED BY THE DEVELOPER.



5 PIPE OUTLET PROTECTION
4 NOT TO SCALE



6 TERRACED IRON FORMATION (TIF)
4 NOT TO SCALE

BAI GROUP INC.
Balanced Environmental Solutions

REVISIONS

DATE	DESCRIPTION	BY
5/24/2018	TERRACED IRON FORMATION DETAIL ADDED. PCSM NOTES UPDATED	CMB
12/08/2018	PCSM NOTES UPDATED	CJE

VOGEL LANDFILL, INC.
SR89 PROJECT
PA STATE GAME LANDS NO. 95
WASHINGTON TOWNSHIP BUTLER COUNTY PENNSYLVANIA

DATE: 10/27/17
DRAWN BY: RHM
CHECKED BY: PW
BAI DRAWING NO: VOGEL-082D001K R2
SHEET NO.: PCSM-4

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