west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Monday, July 10, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for LENNY UNIT 2H
47-103-03495-00-00

Slide repair, changed LOD

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926-0450.

James A. Martin
Chief

Operator's Well Number:	LENNY UNIT 2H
Farm Name:	JAMES A SELL
U.S. WELL NUMBER:	47-103-03495-00-00
Horizontal 6A	New Drill
Date Modification Issued:	7/10/2023

07/14/2023

FURBEE WELL PAD & WATER CONTAINMENT PAD

AS-BUILT EROSION & SEDIMENT CONTROL IMPROVEMENT PLANS

GREEN DISTRICT, WETZEL COUNTY, WV
LITTLE MUSRINGUM-MIDDLE ISLAND WATERSHED

APPROVED
WVDEP OOG
Modification
7/10/2023

LOCATION COORDINATES:

ACCESS ROAD "A" ENTRANCE
LATITUDE: 39.554902 LONGITUDE: -80.730989 (NAD 83)
LATITUDE: 39.554822 LONGITUDE: -80.731168 (NAD 27)
N 4378392.15 E 523111.11 (UTM ZONE 17 METERS)

ACCESS ROAD "B" ENTRANCE
LATITUDE: 39.557532 LONGITUDE: -80.734287 (NAD 83)
LATITUDE: 39.557452 LONGITUDE: -80.734465 (NAD 27)
N 4378683.19 E 522826.91 (UTM ZONE 17 METERS)

CENTER OF TANK
LATITUDE: 39.556180 LONGITUDE: -80.730417 (NAD 83)
LATITUDE: 39.556080 LONGITUDE: -80.730596 (NAD 27)
N 4378531.91 E 523159.83 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.556680 LONGITUDE: -80.731075 (NAD 83)
LATITUDE: 39.556780 LONGITUDE: -80.731254 (NAD 27)
N 4378611.65 E 523103.06 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:

THE SLIDE REPAIR IS BEING CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:

ANTERO RESOURCES CORPORATION HAS OBTAINED AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

FLOODPLAIN NOTES:

THE SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #54103C0190C.

GEOTECHNICAL NOTES:

GEOTECHNICAL CONSULTATION WILL TAKE PLACE DURING SLIP REPAIR CONSTRUCTION AS NECESSARY.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN SEPTEMBER, 2019 BY ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE SEPTEMBER 25, 2019 FIGURE 2 MAP WAS PREPARED BY ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC. AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP.

PROJECT CONTACTS:

OPERATOR:
ANTERO RESOURCES CORPORATION
535 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE: (304) 842-4100
FAX: (304) 842-4102

ELI WAGONER - ENVIRONMENTAL ENGINEER & REGULATORY MANAGER
OFFICE: (304) 842-4068 CELL: (304) 476-9770

JON McEVERS - SVP OPERATIONS
OFFICE: (303) 357-8799

AARON KUNZLER - CONSTRUCTION MANAGER
CELL: (304) 842-4191

ROBERT WIRKS - DESIGN MANAGER
OFFICE: (304) 842-4100 CELL: (304) 627-7405

ROBERT EDDY - UTILITY COORDINATOR
CELL: (304) 719-5199

DAVID PATSY - LAND AGENT
CELL: (304) 476-6090

ENGINEER/SURVEYOR:
NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE - PROJECT MANAGER/ENGINEER
OFFICE: (888) 662-4185 CELL: (540) 686-6747

ENVIRONMENTAL:
ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.
VALERIE CLARKSTON - ECOLOGIST
OFFICE: (304) 760-5803 CELL: (513) 382-09257

GEOTECHNICAL:
PENNSYLVANIA SOIL & ROCK, INC.
CHRISTOPHER W. SAMIOS - PROJECT ENGINEER
(412) 372-4000 CELL: (412) 589-0662

NOTES:

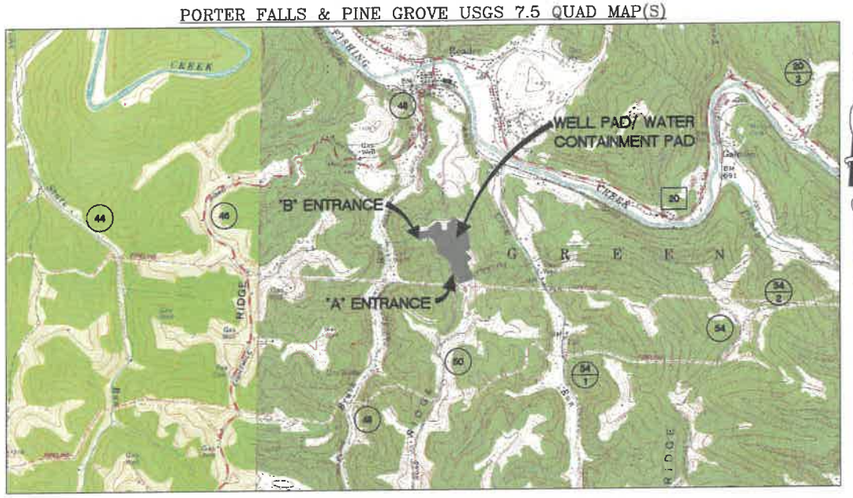
1. ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETE AND PERMANENTLY STABILIZED. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AFTER EACH RUNOFF EVENT IN EXCESS OF 0.5" AND ON A BIWEEKLY BASIS.
2. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS PAVEMENT OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.
3. ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
4. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.
5. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF MAY 24, 2023. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATES.
6. THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
7. THE EXISTING EGRESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.

REPRODUCTION NOTE

THESE PLANS WERE CREATED TO BE PLOTTED ON 22"X34" (ANSI D) PAPER. HALF SCALE DRAWINGS ARE ON 11"X17" (ANSI B) PAPER.

THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

PORTER FALLS & PINE GROVE USGS 7.5 QUAD MAP(S)



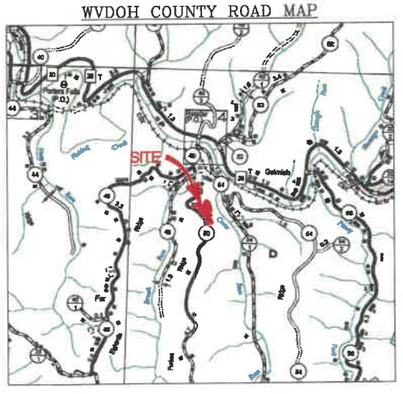
2000 0 2000
SCALE: 1" = 2000'

WEST VIRGINIA STATE PLANE COORDINATE SYSTEM
NORTH ZONE, NAD83
ELEVATION BASED ON NAVD88
ESTABLISHED BY SURVEY GRADE GPS & OPUS POST-PROCESSING

WEST VIRGINIA COUNTY MAP

(NOT TO SCALE)

WVDOH COUNTY ROAD MAP



5000 0 5000
SCALE: 1" = 5000'

MISS Utility of West Virginia
1-800-245-4848
West Virginia State Law
(Section XIV: Chapter 24-C)
Requires that you call two business days before you dig in the state of West Virginia.
IT'S THE LAW!!

AS-BUILT CERTIFICATIONS:

THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 35-8.

SHEET INDEX:

FURBEE LIMITS OF DISTURBANCE AREA (AC)			
Total Site	Permitted	Modification	Total
Access Road "A"	1.79	0.00	1.79
Access Road "B"	3.15	0.00	3.15
Well Pad & Water Containment Pad	13.86	0.00	13.86
Excess/Topsoil Material Stockpiles	11.29	3.10	14.39
Total Affected Area	**30.09**	**3.10**	**33.19**
Total Wooded Acres Disturbed	0.00	2.61	2.61
Impacts to Antero Resources Corp. TM 17-1			
Access Road "A"	1.79	0.00	1.79
Access Road "B"	3.11	0.00	3.11
Well Pad & Water Containment Pad	3.64	0.00	3.64
Excess/Topsoil Material Stockpiles	0.57	0.66	1.23
Total Affected Area	**9.11**	**0.66**	**9.77**
Total Wooded Acres Disturbed	0.00	0.46	0.46
Impacts to Antero Resources Corp. TM 17-12			
Access Road "B"	0.04	0.00	0.04
Well Pad & Water Containment Pad	10.22	0.00	10.22
Excess/Topsoil Material Stockpiles	10.72	2.12	12.84
Total Affected Area	**20.98**	**2.12**	**23.10**
Total Wooded Acres Disturbed	0.00	2.01	2.01
Impacts to Donald L. Mason TM 13-69.1			
Excess/Topsoil Material Stockpiles	0.00	0.32	0.32
Total Affected Area	**0.00**	**0.32**	**0.32**
Total Wooded Acres Disturbed	0.00	0.14	0.14

FURBEE WETLAND IMPACT (SQUARE FEET)			
Wetland and Impact Cause	Fill (SF)	Total Impact (SF)	Total Impact (AC)
Wetland 05 (Slide)	983	983	0.023
Wetland 024 (Slide)	375	375	0.009

FURBEE EPHEMERAL STREAM IMPACT (LINEAR FEET)						
Stream and Impact Cause	Permanent Impacts		Total Permanent Impact (LF)	Temp. Impacts		Total Temp Impact (LF)
	Culvert / Fill (LF)	Inlets/Outlets Structures (LF)		Cofferdam/ E&S Controls (LF)	Distance To L.O.D. (LF)	
Stream 09 (Slide)	0	0	0	0	298	298
Stream 10 (Slide)	0	0	0	0	27	27
Stream 11 (Slide)	0	0	0	0	60	60

FURBEE DITCH IMPACT (LINEAR FEET)						
Stream and Impact Cause	Permanent Impacts		Total Permanent Impact (LF)	Temp. Impacts		Total Temp. Impact (LF)
	Culvert / Fill (LF)	Inlets/Outlets Structures (LF)		Cofferdam/ E&S Controls (LF)	Distance To L.O.D. (LF)	
Ditch 01 (Slide)	0	0	0	0	72	72

Well Name	WV North NAD 27	NAD 27 Lat & Long	UTM (METERS) ZONE 17	NAD 83 Lat & Long
	Permitted Location:			
Eckleberry UNIT 2H	N 387483.73 E 1652791.57	LAT 39-33-26.2103 LONG -80-43-53.2884	N 4378984.95 E 523084.18	LAT 39-33-26.4990 LONG -80-43-52.6555
Eckleberry UNIT 1H	N 387449.25 E 1652795.48	LAT 39-33-26.0677 LONG -80-43-53.2460	N 4378880.56 E 523085.43	LAT 39-33-28.3564 LONG -80-43-52.8031
Reader UNIT 2H	N 387434.77 E 1652799.39	LAT 39-33-25.9251 LONG -80-43-53.1935	N 4378656.17 E 523088.69	LAT 39-33-28.2138 LONG -80-43-52.5508
Reader UNIT 1H	N 387420.28 E 1652803.30	LAT 39-33-25.7825 LONG -80-43-53.1411	N 4378651.78 E 523087.95	LAT 39-33-28.0712 LONG -80-43-52.4982
Lenny UNIT 2H	N 387405.80 E 1652807.20	LAT 39-33-25.6400 LONG -80-43-53.0887	N 4378647.38 E 523089.22	LAT 39-33-25.9286 LONG -80-43-52.4458
Lenny UNIT 1H	N 387391.32 E 1652811.11	LAT 39-33-25.4974 LONG -80-43-53.0363	N 4378642.99 E 523090.48	LAT 39-33-25.7860 LONG -80-43-52.3934
Viewer UNIT 1H	N 387226.65 E 1652894.21	LAT 39-33-23.8812 LONG -80-43-51.9485	N 4378593.25 E 523116.83	LAT 39-33-24.1699 LONG -80-43-51.3037
Viewer UNIT 2H	N 387214.84 E 1652903.46	LAT 39-33-23.7657 LONG -80-43-51.8285	N 4378589.70 E 523119.51	LAT 39-33-24.0544 LONG -80-43-51.1836
Gauss UNIT 1H	N 387203.02 E 1652912.70	LAT 39-33-23.6502 LONG -80-43-51.7084	N 4378586.14 E 523122.39	LAT 39-33-23.9389 LONG -80-43-51.0636
Gauss UNIT 2H	N 387191.21 E 1652921.94	LAT 39-33-23.5347 LONG -80-43-51.5883	N 4378582.59 E 523125.26	LAT 39-33-23.8234 LONG -80-43-50.9435
Makar UNIT 1H	N 387179.39 E 1652931.18	LAT 39-33-23.4191 LONG -80-43-51.4683	N 4378579.04 E 523128.14	LAT 39-33-23.7079 LONG -80-43-50.8235
Makar UNIT 2H	N 387167.58 E 1652940.42	LAT 39-33-23.3036 LONG -80-43-51.3482	N 4378575.49 E 523131.01	LAT 39-33-23.5923 LONG -80-43-50.7034
Furbee UNIT 5H	N 387270.70 E 1652761.06	LAT 39-33-24.2985 LONG -80-43-53.6542	N 4378605.99 E 523075.84	LAT 39-33-24.5871 LONG -80-43-53.0114
Well Pad Elevation	1,212.0			

IMPACTS SHOWN BELOW WERE PERMITTED PREVIOUSLY UNDER THE FURBEE WELL PAD DESIGN

FURBEE WETLAND IMPACT (SQUARE FEET)			
Wetland and Impact Cause	Fill (SF)	Total Impact (SF)	Total Impact (AC)
Wetland 02 (Stockpile "A")	137	137	0.00
Wetland 03 (Well Pad & Water Containment Pad)	1,669	1,669	0.04

FURBEE EPHEMERAL STREAM IMPACT (LINEAR FEET)					
Stream and Impact Cause	Permanent Impacts		Temp. Impacts		Total Impact (LF)
	Culvert / Fill (LF)	Inlets/Outlets Structures (LF)	Cofferdam/ E&S Controls (LF)		
Stream 12 (Well Pad & Water Containment Pad)	33	0	15		48

07/14/2023

NAVITUS
ENERGY ENGINEERING
Telephone: (888) 662-4185 www.NavitusEnrg.com

REVISION	DATE
REVISED PER SLIDE	05-24-2023

Antero Resources

THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

COVER SHEET
FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CYRUS S. KUMP
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: AS SHOWN
SHEET 1 OF 12

CONSTRUCTION AND E&S CONTROL NOTES

CONSTRUCTION NOTES:

1. THE CONTRACTOR IS TO VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION AND WILL NOTIFY NAVITUS ENGINEERING AT (888) 662-4185 IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLAN. ANY WORK PERFORMED BY THE CONTRACTOR AFTER THE FINDING OF SUCH DISCREPANCIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
2. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS HEREIN SHALL CONFORM TO THE CURRENT COUNTY CONSTRUCTION STANDARDS AND SPECIFICATIONS AND/OR CURRENT WV DEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL STANDARDS AND SPECIFICATIONS. SHOULD A CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, AND PLANS OCCUR, THE MOST STRINGENT REQUIREMENT WILL APPLY. THE APPROVAL OF THESE PLANS IN NO WAY RELIEVES THE DEVELOPER OR HIS AGENT OF THE RESPONSIBILITIES CONTAINED IN THE WV DEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.
3. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE. ALSO, A REPRESENTATIVE OF THE DEVELOPER MUST BE AVAILABLE AT ALL TIMES.
4. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING MUD FROM TRUCKS AND/OR OTHER EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS, AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS, ALLAY DUST, AND TO TAKE WHATEVER MEASURES ARE NECESSARY TO INSURE THAT THE STREETS ARE MAINTAINED IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES. CONTRACTOR SHALL ADHERE TO TRAFFIC CONTROL MEASURES AS OUTLINED WITHIN THE APPROVED MM 109 PERMIT.
5. THE LOCATION OF EXISTING UTILITIES SHOWN IN THESE PLANS ARE FROM FIELD LOCATIONS AND/OR GIS DATA. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AS NEEDED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ENGINEER OF ANY CONFLICTS ARISING FROM HIS EXISTING UTILITY VERIFICATION AND THE PROPOSED CONSTRUCTION.
6. THE CONTRACTOR SHALL PROVIDE NOTIFICATION TO THE APPROPRIATE UTILITY COMPANY PRIOR TO CONSTRUCTION OF WATER AND/OR GAS PIPELINES. INFORMATION SHOULD ALSO BE OBTAINED FROM THE APPROPRIATE AUTHORITY CONCERNING PERMITS, CUT SHEETS, AND CONNECTIONS TO EXISTING LINES.
7. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGES TO THE EXISTING STREETS AND UTILITIES WHICH OCCURS AS A RESULT OF HIS CONSTRUCTION PROJECT WITHIN OR CONTIGUOUS WITH THE EXISTING RIGHT-OF-WAY.
8. WHEN GRADING IS PROPOSED WITHIN EASEMENTS OF UTILITIES, LETTERS OF PERMISSION FROM ALL INVOLVED COMPANIES MUST BE OBTAINED PRIOR TO GRADING AND/OR SITE DEVELOPMENT.
9. THE DEVELOPER WILL BE RESPONSIBLE FOR THE RELOCATION OF ANY UTILITIES WHICH IS REQUIRED AS A RESULT OF HIS PROJECT. THE RELOCATION SHOULD BE DONE PRIOR TO CONSTRUCTION.
10. THESE PLANS IDENTIFY THE LOCATION OF ALL KNOWN GRAVESITES. GRAVESITES SHOWN ON THIS PLAN WILL BE PROTECTED IN ACCORDANCE WITH STATE LAW. IN THE EVENT GRAVESITES ARE DISCOVERED DURING CONSTRUCTION, THE OWNER AND ENGINEER MUST BE NOTIFIED IMMEDIATELY.
11. THE CONTRACTOR(S) SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AT LEAST TWO (2) WORKING DAYS, BUT NOT MORE THAN TEN (10) WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.
12. CONTRACTOR TO CONTACT OPERATOR AND ENGINEER IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION.
13. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR 2 DAYS PRIOR TO THE START OF CONSTRUCTION.
14. THE CONTRACTOR IS RESPONSIBLE FOR ALL FILL MATERIAL PLACEMENT REQUIRED DURING THE CONSTRUCTION OF THIS PROJECT. ALL MATERIAL TESTS SHALL BE CONDUCTED BY THE ON-SITE INSPECTOR. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER CERTIFYING THE CONSTRUCTED FACILITY. FAILURE TO CONDUCT THE DENSITY TESTS AND/OR NECESSARY REPAIRS TO DEFICIENT AREAS AS A RESULT OF THE DENSITY TESTING SHALL BE CAUSE FOR NON-ACCEPTANCE OF THE CONSTRUCTED FACILITY.
15. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING THE SITE IN ACCORDANCE WITH THE DESIGN PLANS AND CONSTRUCTION DOCUMENTS AND THE SCOPE OF WORK SHALL CONFORM WITH THE GRADES, BERMS, DEPTHS, DIMENSIONS, ETC. SHOWN HEREON.
16. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS, INCLUDING THE 1970 OSHA ACT. PRECAUTION FOR THE PROTECTION OF PERSONS, INCLUDING EMPLOYEES AND PROPERTY, SHALL ALWAYS BE EXERCISED BY THE CONTRACTOR. INITIATION, MAINTENANCE, AND SUPERVISION OF ALL SAFETY REQUIREMENTS, PRECAUTIONS, AND PROGRAMS IN CONNECTION WITH THE WORK, INCLUDING ALL REQUIREMENTS PER CFR 1910.146, SHALL ALSO BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. CONSTRUCTION ACTIVITIES SHALL BE RESTRICTED TO THE AREAS SHOWN ON THE PLANS WITHIN THE LIMITS OF DISTURBANCE, UNLESS OTHERWISE AUTHORIZED BY ANTERO RESOURCES CORPORATION. MODIFICATION PLAN MUST BE SUBMITTED TO THE WVDEP FOR ANY ACTIVITIES PERFORMED OUTSIDE OF THE LIMITS OF DISTURBANCE.
18. PRESERVATION OF BENCHMARKS, PROPERTY CORNERS, REFERENCE POINTS, STAKES AND OTHER SURVEY REFERENCE MONUMENTS OR MARKERS IS THE RESPONSIBILITY OF THE CONTRACTOR. IN CASES OF WILLFUL OR CARELESS DESTRUCTION THE CONTRACTOR SHALL BE REQUIRED TO REPLACE OR RESTORE SAID MONUMENT OR MARKER. RESETTING OF MARKERS SHALL BE PERFORMED BY A PROFESSIONAL SURVEYOR AS APPROVED BY ANTERO RESOURCES CORPORATION.
19. THE CONTRACTOR SHALL MAINTAIN ADEQUATE CLEARANCE FROM ALL ELECTRIC LINES, IF ANY, IN ACCORDANCE WITH NATIONAL ELECTRICAL SAFETY CODE.
20. THE CONTRACTOR SHALL MINIMIZE ALL CLEARING AND DISTURBANCE TO THE ENVIRONMENT TO THE MAXIMUM EXTENT POSSIBLE. CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE.
21. ANY DIGITAL FILES PROVIDED TO THE CONTRACTOR BY NAVITUS ENGINEERING, INC. ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONSTRUCTION OF THE SITE SHALL MEET ALL DESIGN PARAMETERS OF THE WVDEP APPROVED NAVITUS ENGINEERING, INC. DESIGN PLANS. NAVITUS ENGINEERING, INC. WILL NOT BE HELD LIABLE FOR THE CONTRACTOR USING THE DIGITAL FILES TO WAIVER FROM THE APPROVED DESIGN PLANS.
22. ANY CONSTRUCTION ISSUES OR QUESTIONS SHALL BE BROUGHT TO THE ENGINEER IMMEDIATELY. THE CONSTRUCTION INSPECTOR SHALL BE CONTACTED AND MUST RELAY THESE ISSUES OR QUESTIONS TO THE ENGINEER FOR RESOLUTION. TEMPORARY STABILIZATION SHALL BE APPLIED AS NECESSARY.
23. ALL EXISTING AND DESIGNED CULVERTS AND CULVERT SUMPS SHALL BE CLEANED AND CLEARED OF DEBRIS DURING THE COURSE OF CONSTRUCTION. ANY EXCESS EROSION DUE TO THE PLUGGING OF A CULVERT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

EROSION AND SEDIMENT CONTROL NARRATIVE:

PROJECT DESCRIPTION: THE PURPOSE OF THIS PROJECT IS TO CONSTRUCT A GAS WELL DRILLING PAD AND WATER CONTAINMENT PAD TO AID IN THE DEVELOPMENT OF INDIVIDUAL GAS WELLS. THE ACCESS ROAD ENTRANCE TO THE PROPOSED SITE IS LOCATED ON THE EAST SIDE OF CO. RT. 50, 0.85 MILES SOUTH OF THE INTERSECTION OF CO. RT. 48 & CO. RT. 50 IN GREEN DISTRICT, WETZEL COUNTY, WEST VIRGINIA. THE TOTAL APPROXIMATE LAND DISTURBANCE ASSOCIATED WITH THIS PROJECT IS 33.19 ACRES.

EXISTING SITE CONDITIONS: THE EXISTING SITE IS APPROXIMATELY 11.9% WOODED. THE TOPOGRAPHY RANGES FROM MODERATE TO STEEP TERRAIN (2% TO 70% SLOPES). PRESENT ON SITE ARE ACCESS ROADS, OVERHEAD UTILITIES, EXISTING WATERLINE, EXISTING STRUCTURES, AND STREAMS ARE LOCATED ONSITE. THE SITE IS LOCATED ON A RIDGE AND DRAINS TO LITTLE MUSRINGUM-MIDDLE ISLAND WATERSHED. NO EROSION WAS NOTICED ON SITE.

ADJACENT PROPERTY: THE SITE IS BORDERED BY FORESTED LANDS ON ALL SIDES.

CRITICAL AREAS: THE AREA(S) SHOWN ALONG THE FIELD DELINEATED STREAMS, WETLANDS, AND PONDS, AS SHOWN ON THE PLANS, ARE DESIGNATED AS CRITICAL AREA(S), IF PRESENT. ALL 3:1 SLOPES AND STEEPER, DITCHES, AND OTHER CONTROLS SHALL BE CONSIDERED CRITICAL EROSION AREAS. THESE AREAS SHALL BE MONITORED AND MAINTAINED DAILY DURING CONSTRUCTION AND AFTER EACH RAINFALL OF 0.5 INCHES OR GREATER. COMPOST FILTER SOCKS ARE TO BE USED TO PROTECT THESE FIELD DELINEATED AREA(S) FROM SEDIMENT LEAVING THE SITE. ADDITIONALLY, ORANGE SAFETY FENCE IS RECOMMENDED TO BE INSTALLED ABOVE/AROUND THESE AREA(S), TO SERVE AS A PHYSICAL BARRIER, ENSURING THE AREA(S) ARE NOT DISTURBED. THE LOCAL GOVERNING AUTHORITY WILL HAVE THE AUTHORITY TO RECOMMEND THE PLACEMENT OF ADDITIONAL EROSION CONTROL MEASURES IN THESE AREAS IF IT BECOMES EVIDENT DURING CONSTRUCTION THAT THE ONES IN PLACE ARE NOT FUNCTIONING SUFFICIENTLY.

SOILS: GEOTECHNICAL CONSULTATION WILL TAKE PLACE DURING SLIP REPAIR CONSTRUCTION AS NECESSARY.

OFF SITE AREAS: THERE ARE NO BORROW AREA(S) OR EXPORT STOCKPILE AREA(S) OUTSIDE OF THE PROPOSED LIMITS OF DISTURBANCE FOR THIS PROJECT.

EROSION AND SEDIMENT CONTROL MEASURES: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE CURRENT WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.

STRUCTURAL PRACTICES:

1. INSTALL ORANGE SAFETY FENCE TO ENSURE NO DISTURBANCE TO THE DELINEATED AREA(S).
2. INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
3. INSTALL COMPOST FILTER SOCKS AND/OR SILT FENCE AS SHOWN ON THE PLANS TO REMOVE SEDIMENT FROM RUNOFF. SELECTIVELY REMOVE TREES REQUIRED TO INSTALL COMPOST FILTER SOCK IN WOODED AREAS. CLEARING AND GRUBBING SHALL BE KEPT AT A MINIMUM TO INSTALL E&S CONTROLS.
4. FILL SLOPE SURFACE SHALL BE LEFT IN A ROUGHENED CONDITION TO REDUCE EROSION. CONTRACTOR SHALL REDIRECT RUNOFF AWAY FROM THE FILL SLOPE BY INSTALLING EARTHEN DIVERSION BERMS AND DIVERTING THE RUNOFF TO SEDIMENT TRAPPING DEVICES.
5. INSTALL V-DITCHES, DITCH RELIEF CULVERTS, AND OUTLET PROTECTION (RIP-RAP APRONS) AS SHOWN ON THE PLANS.

DEVICES LISTED ABOVE ARE CONSIDERED MINIMUM EROSION AND SEDIMENT CONTROLS. ADDITIONAL CONTROL MEASURES MAY BE NECESSARY DUE TO CONTRACTOR PHASING OR OTHER UNFORESEEN CONDITIONS. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BMP'S TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION. ALL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE CURRENT WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL. ALL RUNOFF FROM DISTURBED AREAS SHALL PASS THROUGH A SEDIMENT FILTERING DEVICE LOCATED BELOW THE DISTURBED AREA. AT NO TIME WILL UNFILTERED SEDIMENT LADEN RUNOFF BE ALLOWED TO LEAVE THE SITE AND ENTER STATE WATERS.

PERMANENT STABILIZATION: ALL AREAS LEFT UNCOVERED BY EITHER BUILDINGS OR PAVEMENT SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING AND WITHIN SEVEN (7) DAYS. AT NO TIME SHALL LAND LAY DORMANT LONGER THAN TWENTY-ONE (21) DAYS.

MAINTENANCE PROGRAM: ALL BMPS INCLUDING EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED AT A MINIMUM ONCE EVERY SEVEN-CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 INCHES PER 24-HOUR PERIOD, UNTIL THERE IS A UNIFORM, PERENNIAL 70 PERCENT VEGETATIVE COVERAGE ESTABLISHED, UNLESS SUCH INSPECTIONS ARE NOT PRACTICABLE WITHIN 24 HOURS, IN WHICH CASE THAT FACT SHALL BE NOTED IN THE INSPECTION REPORT. ANY REQUIRED REPAIRS OR MAINTENANCE SHALL BE MADE WITHIN 24 HOURS; IF REPAIR IS NOT PRACTICABLE WITHIN 24 HOURS, IT SHALL BE NOTED IN THE INSPECTION REPORT.

TRAPPED SEDIMENT IS TO BE REMOVED AS REQUIRED TO MAINTAIN 50% TRAP AND/OR SOCK EFFICIENCY AND DISPOSED OF AS ENGINEERED FILL ON THE STOCKPILES.

INLETS AND OUTLETS OF DITCH RELIEF CULVERTS SHALL BE CHECKED REGULARLY FOR SEDIMENT BUILD-UP. IF THE INLET AND/OR OUTLET IS CLOGGED BY 50% OR GREATER, IT SHALL BE REMOVED AND CLEANED OR REPLACED IMMEDIATELY.

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

ANY DISTURBED AREAS ALONG THE ACCESS ROAD SHALL BE STABILIZED AS CONSTRUCTION PROCEEDS, PRIOR TO CONTINUING FURTHER ACCESS ROAD CONSTRUCTION, WITH EITHER ROCK STABILIZATION OR SEEDING AND MULCHING METHODS.

SUPER SILT FENCE CAN BE USED IN PLACE OF ANY COMPOST FILTER SOCK.

NOTE: THE WV DEP RETAINS THE RIGHT TO ADD AND/OR MODIFY THESE EROSION AND SEDIMENT CONTROL MEASURES DURING THE CONSTRUCTION PROCESS, WITHIN REASON, TO ENSURE ADEQUATE PROTECTION TO THE PUBLIC AND THE ENVIRONMENT.

SEEDING (SOIL STABILIZATION):

1. CONTRACTOR SHALL APPLY SEED AND STABILIZATION IN ACCORDANCE WITH THE WV DEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE (BMP) MANUAL. BASED UPON SITE SPECIFIC SOIL CHARACTERISTICS.
2. WHEREVER SEEDING IS TO BE APPLIED TO STEEP SLOPES (≥ 3H:1V), SEED MIXTURES SHOULD BE SELECTED THAT ARE APPROPRIATE FOR STEEP SLOPES.

DUST CONTROL:

1. TEMPORARY SEEDING SHALL BE APPLIED TO ALL DISTURBED AREAS SUBJECT TO LITTLE OR NO CONSTRUCTION TRAFFIC.
2. ALL HAUL ROADS AND OTHER HEAVY TRAFFIC ROUTES SHALL BE SPRINKLED WITH WATER UNTIL THE SURFACE IS WET AND REPEATED AS NEEDED TO CONTROL DUST.

CONSTRUCTION SEQUENCE:

THE DEVELOPMENT OF THIS SITE SHALL BE CONSISTENT WITH THE FOLLOWING GENERAL SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL IMPLEMENT, MAINTAIN, AND OPERATE ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES TO EFFECTIVELY MITIGATE THE HAZARD OF ACCELERATED EROSION AND SEDIMENTATION TO ACCEPTABLE LEVELS. MINOR DEVIATIONS FROM THIS SEQUENCE SHALL BE EXECUTED BY THE PROJECT'S SUPERINTENDENT AS NEEDED TO ELIMINATE ANY POTENTIAL EROSIVE CONDITION THAT MAY ARISE FOR THE DURATION OF THE PROJECT. THE WV DEP SHALL BE NOTIFIED OF ANY AND ALL SUCH DEVIATIONS FROM THE APPROVED PLANS.

1. STAKE THE LIMITS OF CONSTRUCTION AND MARK/FLAG ALL IDENTIFIED WETLANDS, STREAMS, UTILITIES, AND OTHER AREAS OF CONCERN FOR CONSTRUCTION ACTIVITIES. INSTALL SIGNS TO DESIGNATE THE AREAS AND ORANGE SAFETY FENCE TO IDENTIFY IMPORTANT PROJECT ATTRIBUTES SUCH AS APPROVED ACCESS ROADS, NO REFUELING ZONES, WETLANDS/STREAM BOUNDS, ETC.
2. A PRE-CONSTRUCTION CONFERENCE WITH THE CONTRACTOR AND THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK TO REVIEW THE CONSTRUCTION DRAWINGS AND PROVIDE ANY REQUESTED GUIDANCE.
3. CONSTRUCT THE ROCK CONSTRUCTION ENTRANCE OR UPGRADE & MAINTAIN EXISTING ROCK CONSTRUCTION ENTRANCE. ALL VEHICLES ENTERING AND EXITING THE SITE SHALL DO SO VIA THE ROCK CONSTRUCTION ENTRANCE.
4. CONSTRUCT ALL BMP'S AS SOON AS CLEARING AND GRUBBING OPERATIONS ALLOW. ONCE INSTALLED, THE AREA ENCOMPASSING THE BMP'S OUTSIDE OF THE GRADING LIMITS SHALL BE SEEDED AND MULCHED IMMEDIATELY.
5. IF APPLICABLE, CONVEY UPSLOPE DRAINAGE AROUND THE SLIDE REPAIR AREA(S) BY CONSTRUCTING ALL DIVERSION BERM(S) AND/OR COMPOST FILTER SOCK DIVERSION(S) AS SHOWN ON THE PLANS.
6. CLEAR AND GRUB THE SITE. ALL WOODY MATERIAL, BRUSH, TREES, STUMPS, LARGE ROOTS, BOULDERS, AND DEBRIS SHALL BE CLEARED FROM THE SITE AREA AND KEPT TO THE MINIMUM NECESSARY FOR PROPER CONSTRUCTION, INCLUDING THE INSTALLATION OF NECESSARY SEDIMENT CONTROLS. TREES, BRUSH, AND STUMPS SHALL BE CUT AND/OR GRUBBED AND BURNED (AS PER WV FOREST FIRE LAWS), REMOVED FROM SITE, OR DISPOSED OF BY OTHER METHODS APPROVED BY WV DEP.
7. IF APPLICABLE, INSTALL ALL WETLAND OR STREAM CROSSINGS AS SHOWN ON THE PLANS.
8. AS NECESSARY, STRIP THE TOPSOIL FROM THE SLIDE REPAIR AREA(S). TOPSOIL STRIPPING SHALL BE KEPT TO A MINIMUM NECESSARY TO CONSTRUCT THE SLIDE REPAIR. PRIOR TO PLACING ANY FILL, THE EXPOSED SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNYIELDING SITE. ALL STRIPPED TOPSOIL SHALL BE STOCKPILED IN AREAS SHOWN IN THE PLANS, OR RE-SPREAD AT AN APPROXIMATE DEPTH OF 2-4 INCHES ON ALL PROPOSED 2:1 OR FLATTER SLOPES, AND IMMEDIATELY STABILIZED. ADDITIONAL BMP MEASURES SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES, IF NECESSARY.
9. CONSTRUCT THE SLIDE REPAIR AREA(S). ALL FILL AREAS, INCLUDING EXCESS MATERIAL STOCKPILES, SHALL BE "KEYED IN" AND COMPACTED IN HORIZONTAL LIFTS WITH A MAXIMUM LOOSE LIFT THICKNESS OF 12" AND MAXIMUM PARTICLE SIZE AS OUTLINED IN THE GEOTECHNICAL REPORT. ALL FILL SHALL BE COMPACTED BY A VIBRATING SHEEPSFOOT ROLLER TO 95% PER THE STANDARD PROCTOR TEST (ASTM-D698). MOISTURE CONTENT WILL BE CONTROLLED IN ACCORDANCE WITH THE STANDARD PROCTOR TEST (ASTM-D698) RESULTS. IT IS ALSO RECOMMENDED THAT EACH LIFT BE PROOF ROLLED WITH A LOADED HAUL TRUCK WHERE APPLICABLE. IF NECESSARY, DITCH RELIEF CULVERTS SHALL BE INSTALLED AT A GRADE OF 1-8% TO MINIMIZE OUTLET VELOCITIES TO THE EXTENT POSSIBLE. INSTALL OUTLET PROTECTION ONCE DITCH RELIEF CULVERTS ARE INSTALLED, AS SHOWN ON PLANS. IMMEDIATELY STABILIZE THE OUTER AREAS AND SIDE SLOPES AS SPECIFIED WITH PERMANENT SEEDING OF THE SLIDE REPAIR AREA(S). EXCESS MATERIAL SHALL BE STOCKPILED (IF NECESSARY) IN AREAS SHOWN IN THE PLANS AND IMMEDIATELY STABILIZED. TOPSOIL SHALL BE STRIPPED FROM ALL STOCKPILE AREAS PRIOR TO CONSTRUCTION OF STOCKPILES. AFTER STOCKPILES ARE CONSTRUCTED, TOPSOIL IS TO BE REAPPLIED AT A DEPTH OF 2"-4". SLOPES SHALL BE TRACKED BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PARALLEL TO THE CONTOUR. ALL DITCH LINES SHALL BE CLEANED PRIOR TO INSTALLATION OF LINED PROTECTION. APPLY SEED AND MULCH TO ALL DISTURBED AREAS. THIS SHALL INCLUDE ALL AREAS THAT WILL NOT BE SUBJECT TO REGULAR TRAFFIC ACTIVITY (TO BE STABILIZED WITH STONE), OR ANY DISTURBED AREA THAT WILL NOT BE RE-DISTURBED BEFORE SITE RECLAMATION BEGINS. IT IS RECOMMENDED THAT THE CONTRACTOR PRIORITIZE COMPLETING ANY IMPROVEMENTS TO THE SITE ENTRANCE AND LEASE ROAD PRIOR TO THE SLIDE REPAIR.
10. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN SEVEN DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS PERMANENTLY CEASED. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES IS PRECLUDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS CONDITIONS ALLOW. WHERE CONSTRUCTION ACTIVITY WILL RESUME ON A PORTION OF THE SITE WITHIN 14 DAYS FROM WHEN ACTIVITIES CEASED, (E.G., THE TOTAL TIME PERIOD THAT CONSTRUCTION ACTIVITY IS TEMPORARILY HALTED IS LESS THAN 14 DAYS) THEN STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THE PORTION OF THE SITE BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED. AREAS WHERE THE SEED HAS FAILED TO GERMINATE ADEQUATELY (UNIFORM PERENNIAL VEGETATION COVER WITH A DENSITY OF 70%) WITHIN 30 DAYS AFTER SEEDING AND MULCHING MUST BE RESEEDED IMMEDIATELY, OR AS SOON AS WEATHER CONDITIONS ALLOW.
11. ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETE AND PERMANENTLY STABILIZED. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AT A MINIMUM ONCE EVERY SEVEN-CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.25 INCHES PER 24-HOUR PERIOD.
12. EROSION AND SEDIMENT CONTROLS CAN BE REMOVED AFTER THERE IS A UNIFORM, PERENNIAL 70 PERCENT VEGETATIVE COVERAGE ESTABLISHED.
13. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.

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7/10/2023

CONSTRUCTION STANDARDS:

THE DESIGN, CONSTRUCTION, AND REMOVAL OF FILL FOR OIL AND GAS SITES MUST BE ACCOMPLISHED IN SUCH A MANNER AS TO PROTECT THE HEALTH AND SAFETY OF THE PEOPLE, THE NATURAL RESOURCES, AND ENVIRONMENT OF THE STATE. THE SITE SHALL BE DESIGNED, CONSTRUCTED, AND MAINTAINED TO BE STRUCTURALLY SOUND AND REASONABLY PROTECTED FROM UNAUTHORIZED ACTS OF THIRD PARTIES.

1. ALL FILL AREAS SHOULD BE CLEARED OF TREES, STUMPS, AND ANY VEGETATION AND STRIPPED OF TOPSOIL/ORGANIC SOILS PRIOR TO THE START OF FILL PLACEMENT.
2. ANY GROUNDWATER ENCOUNTERED DURING CONSTRUCTION SHALL BE DRAINED TO THE OUTSIDE/DOWNSTREAM TOE OF THE SLOPE. CONSTRUCTED DRAIN SECTION SHALL BE AN EXCAVATED 2' x 2' TRENCH AND BACK FILLED WITH #57 STONE, COMPACTED BY HAND TAMPER. GEOTEXTILE FABRIC SHALL BE USED TO LINE TRENCH.
3. SATISFACTORY MATERIALS FOR USE AS FILL FOR PAD AREAS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2487 AS GW, GP, GM, GC, SW, SP, SM, SC, ML, AND CL GROUPS.
4. GENERALLY, UNSATISFACTORY MATERIALS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2487 AS PT, CH, MH, OL, OH, AND ANY SOIL TOO WET TO FACILITATE COMPACTION. CH AND MH SOILS MAY BE USED SUBJECT TO APPROVAL OF THE ENGINEER.
5. ALL FILL AREAS SHALL BE "KEYED IN" AND COMPACTED IN HORIZONTAL LIFTS WITH A MAXIMUM LOOSE LIFT THICKNESS OF 12" AND MAXIMUM PARTICLE SIZE AS OUTLINED IN THE GEOTECHNICAL REPORT. ALL FILL SHALL BE COMPACTED BY A VIBRATING SHEEPSFOOT ROLLER TO 95% PER THE STANDARD PROCTOR TEST (ASTM-D698). MOISTURE CONTENT WILL BE CONTROLLED IN ACCORDANCE WITH THE STANDARD PROCTOR TEST (ASTM-D698) RESULTS.
6. ROCK LIFTS ARE NOT PROPOSED FOR THE CONSTRUCTION OF THIS SITE. HOWEVER, LARGER ROCK PARTICLES OR BOULDERS THAT ARE ENCOUNTERED DURING CONSTRUCTION NEED TO BE BROKEN DOWN TO A MANAGEABLE SIZE (MAXIMUM 3'x3'x1' THICK) TO BE PLACED AS FILL. DURING PLACEMENT OF FILL CONTAINING LARGE SIZE ROCK PARTICLES, IT IS CRITICAL THAT NO VOID SPACES BE LEFT BETWEEN THE ROCKS. SMALLER ROCK FRAGMENTS AND SOIL MUST BE WORKED INTO ANY OPENINGS BETWEEN THE BOULDERS AFTER THEY ARE PUT IN PLACE. ADDITIONAL GUIDANCE REGARDING ENCOUNTERED ROCK CAN BE FOUND IN THE GEOTECHNICAL REPORT.
7. THE PLACEMENT OF ALL FILL MATERIAL SHALL BE FREE OF WOOD, STUMPS AND ROOTS, LARGE ROCKS AND BOULDERS, AND ANY OTHER NONCOMPACTABLE SOIL MATERIAL. NO FILL SHALL CONTAIN OR BE PLACED ON FROZEN MATERIAL. THE FILL SHALL BE COMPACTED TO A MINIMUM OF VISIBLE NON-MOVEMENT, HOWEVER, THE COMPACTION EFFORT SHALL NOT EXCEED THE OPTIMUM MOISTURE LIMITS.
8. ALL EXPOSED AREAS, NOT COVERED BY COMPACTED GRAVEL OR RIP-RAP SHALL BE LIMED, FERTILIZED, SEEDED AND MULCHED. PERMANENT VEGETATIVE GROUND COVER IN COMPLIANCE WITH THE WV DEP EROSION AND SEDIMENT CONTROL FIELD MANUAL MUST BE ESTABLISHED UPON THE COMPLETION OF CONSTRUCTION. SLOPES SHALL BE MAINTAINED WITH A GRASSY VEGETATIVE COVER AND FREE OF BRUSH AND/OR TREES.
9. IF STANDING WATER IS PRESENT ON SITE, CONTRACTOR TO CORRECT DRAINAGE ISSUE BY DIRECTING WATER TO PROPER E&S CONTROLS OR OUTLET WITH POSITIVE DRAINAGE. IF NECESSARY, CONTACT ENGINEER FOR GUIDANCE IN CORRECTING DRAINAGE ISSUES.
10. ALL DRAINAGE DITCHES, DIVERSIONS, AND CULVERTS SHALL HAVE POSITIVE DRAINAGE AND OUTFALL INTO THE PROPER OUTLET PROTECTION OR LEVEL SPREADING DEVICE. SUPER SILT FENCE, OR APPROVED ALTERNATIVE, SHALL BE INSTALLED WITHIN 5 FEET OF THE OUTLET PROTECTION OR LEVEL SPREADING DEVICE TO PREVENT EROSION DOWNSTREAM. IF EROSION IS PRESENT DOWNSTREAM OF AN EROSION CONTROL DEVICE, CONTRACTOR TO INSTALL ADDITIONAL EROSION CONTROLS AND STABILIZATION TO PREVENT FURTHER EROSION.
11. ALL DRAINAGE DITCHES AND DIVERSIONS THAT ARE ROCK LINED SHALL BE INSTALLED PER THE DETAILS ON THIS PLAN INCLUDING THE NECESSARY INSTALLATION OF ANY GEOTEXTILE FABRIC UNDERNEATH THE ROCK LINING.
12. IF THE EROSION CONTROL DEVICES SHOW EVIDENCE OF BEING INADEQUATE DUE TO CONSTRUCTION MEANS AND METHODS, THE CONTRACTOR IS TO INSTALL ADDITIONAL DRAINAGE DEVICES OR EROSION CONTROLS TO PREVENT FURTHER EROSION FROM OCCURRING.
13. CONTRACTOR IS TO EXTEND ALL KEYWAY AND BONDING BENCH OUTLET DRAINS A MINIMUM OF ONE FOOT PAST THE FINISHED GRADE OF THE SLOPE AND INSTALL THE PROPER OUTLET PROTECTION PER THE DETAIL ON THESE PLANS. ALL OUTLET DRAINS ARE TO BE CLEARLY VISIBLE AND MARKED WITH YELLOW T-POSTS.
14. ALL SLOPES SHALL BE TRACKED IN PER THE DETAILS ON THESE PLANS. CONTRACTOR SHALL REPEAT THIS METHOD ANY TIME AN AREA HAS BEEN DISTURBED PRIOR TO THAT AREA BEING STABILIZED.
15. ALL MAINTENANCE OF EROSION AND SEDIMENT CONTROLS MUST BE PERFORMED IMMEDIATELY ONCE THE CONTRACTOR IS NOTIFIED OF THE DISCREPANCY. CONTRACTOR TO PERFORM MAINTENANCE OR IMMEDIATELY NOTIFY THE SUB-CONTRACTOR PERFORMING THE E&S TASKS. ANY EROSION CONTROL MAINTENANCE THAT IS DEEMED TO BE AN EMERGENCY SHALL BE PERFORMED IMMEDIATELY UPON THE CLIENT, ENGINEER, OR STATE'S REQUEST.
16. ALL LANDOWNER ACCESS ROADS AND EXISTING WELL ROADS THAT ARE BEING MAINTAINED SHALL BE KEPT OPEN DURING THE ENTIRE COURSE OF CONSTRUCTION TO PROVIDE CONTINUOUS ACCESS. IF CLOSURE IS NECESSARY, THE CONTRACTOR SHALL PROVIDE AN EQUIVALENT DETOUR ROUTE TO THE SATISFACTION OF THE LANDOWNER OR WELL OWNER.
17. ANY WATER INFILTRATING AROUND THE WELL PAD DEWATERING SYSTEM SHALL BE CORRECTED IMMEDIATELY TO PREVENT THE FAILURE OF THE SOILS AND DESIGN ASPECTS OF THE DEWATERING SYSTEM. ANY EXCESS EROSION OR SLOPE FAILURES DUE TO THE WATER INFILTRATION IN THE SUMP AREA SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL DITCH RELIEF AND STREAM CROSSING CULVERTS SHALL MEET ALL MANUFACTURER SPECIFICATIONS INCLUDING THE MINIMUM AND MAXIMUM COVER. IF MANUFACTURER SPECIFICATIONS CANNOT BE MET, CONTRACTOR SHALL CONSULT THE ENGINEER OR MANUFACTURER FOR ALTERNATIVES.

SITE CLEANUP & RECYCLE PROGRAM:

1. GARBAGE, FUELS OR ANY SUBSTANCE HARMFUL TO HUMAN, AQUATIC OR FISH LIFE, WILL BE PREVENTED FROM ENTERING SPRINGS, STREAMS, PONDS, LAKES, WETLANDS OR ANY WATER COURSE OR WATER BODY.
2. OILS, FUELS, LUBRICANTS AND COOLANTS WILL BE PLACED IN SUITABLE CONTAINERS AND DISPOSED PROPERLY.
3. ALL TRASH AND GARBAGE WILL BE COLLECTED AND DISPOSED PROPERLY.
4. ALL SEDIMENT REMOVED FROM SEDIMENT CAPTURING DEVICES SHALL BE PLACED ON THE TOPSOIL STOCKPILE, THEN SEEDED AND MULCHED, AS NECESSARY. ALTERNATIVELY, THE REMOVED SEDIMENT CAN BE TRANSPORTED TO A SITE WITH AN APPROVED PERMIT.
5. ALL POLLUTION AND EMERGENCY SPILLS SHALL BE IMMEDIATELY REPORTED TO ANTERO RESOURCES CORPORATION AND THE WVDEP OFFICE OF OIL AND GAS. (EMERGENCY #1-800-642-3074)

NAVITUS
ENERGY ENGINEERING
Telephone: (888) 662-4185 | www.NavitusEng.com

DATE	REVISION
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Antero Resources
THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

LEGEND

FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CYRUS S. KUMP
19578
05/24/2023

DATE: 04/18/2022
SCALE: N/A
SHEET 2 OF 12

07/14/2023

LEGEND

LEGEND

EX. INDEX CONTOUR & CONTOUR LABEL	PR. INDEX CONTOUR (10' INTERVAL) & CONTOUR LABEL
EX. INTERMEDIATE CONTOUR	PR. INTERMEDIATE CONTOUR (2' INTERVAL)
EX. PROPERTY LINE	PR. INTERMEDIATE CONTOUR (1' INTERVAL)
EX. TOP OF BERM	PR. INDEX ROAD CONTOUR (10' INTERVAL) & CONTOUR LABEL
EX. ROAD EDGE OF GRAVEL/DIRT	PR. INTERMEDIATE ROAD CONTOUR (2' INTERVAL)
EX. ROAD EDGE OF PAVEMENT	PR. PADS/STOCKPILE TOPO LIMITS
EX. ROAD CENTERLINE	PERMITTED LIMITS OF DISTURBANCE
EX. GUARDRAIL	MODIFICATION LIMITS OF DISTURBANCE
EX. BRIDGE	PR. ROAD/IMPOUNDMENT EDGE OF GRAVEL
EX. DITCHLINE/DRAINAGE FEATURE	PR. ROAD EDGE OF PAVEMENT
EX. RIP-RAP	PR. ROAD CENTERLINE
EX. CULVERT	PR. GUARDRAIL
EX. TREELINE	PR. ROCK CONSTRUCTION ENTRANCE
EX. BUILDING	PR. AIR BRIDGE
EX. MISCELLANEOUS FEATURE	PR. CULVERT
EX. 100 YR FEMA FLOODPLAIN	PR. DITCH
EX. DELINEATED STREAM	PR. RIP-RAP TRAPEZOIDAL DITCH
EX. DELINEATED WETLAND/POND	PR. OUTLET PROTECTION
100' WETLAND/STREAM BUFFER	PR. ROCK LEVEL SPREADER
STREAM/WETLAND DELINEATION STUDY AREA	PR. COMPOST FILTER SOCK
EX. FENCELINE	PR. SMART FENCE HD
EX. GATE	PR. WELL HEAD
EX. PERIMETER SAFETY FENCE	PR. PAD DEWATERING SYSTEM
EX. ACCESS GATE WITH EMERGENCY LIFELINE	PR. TOP OF PAD CONTAINMENT BERM
EX. WELL HEAD ON DESIGNED PAD	PR. 220' X 320' PAD FOOTPRINT
EX. GAS WELL	PR. SPOT SHOT
EX. PIPELINE	PR. PERIMETER SAFETY FENCE
EX. PIPELINE R/W	PR. ACCESS GATE WITH EMERGENCY LIFELINE
EX. PIPELINE METER	PR. PIPELINE
EX. PIPELINE VALVE	PR. PIPELINE R/W
EX. PIT	PR. OVERHEAD UTILITY
EX. OVERHEAD UTILITY	PR. POWER POLE/GUY WIRE
EX. POWER POLE/GUY WIRE	PR. OVERHEAD UTILITY R/W
EX. UNDERGROUND ELECTRIC	PR. WATERLINE
EX. UNDERGROUND TELEPHONE	BORING LOCATION
EX. UNDERGROUND FIBER OPTIC	X-SECTION/PROFILE GRID INDEX
EX. UTILITY R/W	X-SECTION/PROFILE GRID INTERMEDIATE
EX. WATERLINE	X-SECTION/PROFILE PROPOSED GRADE
EX. WATER WELL/EX. SPRING	X-SECTION/PROFILE EXISTING GRADE
EX. COMPOST SOCK	X-SECTION/PROFILE WATER SURFACE
EX. SMART FENCE HD	X-SECTION/PROFILE CULVERT
EX. SILT FENCE	MATCHLINE
APPROX. LOCATION OF SLIDE AREA	EX. METER
APPROX. LOCATION OF BORROW/ SPOIL AREA	EX. TANK
PR. TOE BENCH	EX. COMBUSTOR
EX. APPROX. SURFACE & SUB-SURFACE ELECTRIC LINE AREA	EX. GPU
EX. APPROX. SURFACE & SUB-SURFACE DUMP LINE AREA	EX. SEPARATOR
EX. APPROX. SURFACE & SUB-SURFACE WELL LINE AREA	EX. VRT
EX. APPROX. SURFACE & SUB-SURFACE SALES LINE AREA	EX. KNOCK-OUT VESSEL

EX. STAIRS/CATWALK	
EX. DEWATERING SYSTEM	
EX. PIG LAUNCHER	
EX. SECONDARY CONTAINMENT	
EX. ABOVE-GND VAPOR LINE	
EX. ESD	EX. MAILBOX
EX. CONTROL PT.	EX. MUSTER AREA

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STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/23/2023

DATE: 04/18/2022
SCALE: N/A
SHEET 3 OF 12

OVERALL PLAN SHEET INDEX

FURBEE WELL PAD & WATER CONTAINMENT PAD				
Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)
Stockpile "C"	15,413.4	5,200.8	10,212.6	0.0
Stockpile "D"	18.0	11,141.6	0.0	11,123.6

GENERAL NOTES:

1. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON APRIL 17, 2019 AERIAL PHOTOGRAPHY COMPILED APRIL 20, 2019 BY THE THRASHER GROUP.
2. AS-BUILT INFORMATION SHOWN HEREON IS BASED ON FIELD SURVEY PERFORMED BY NAVITUS ENGINEERING, INC. ON MAY 24, 2023.
3. THE PROPERTY LINES SHOWN HEREON DO NOT REPRESENT A BOUNDARY SURVEY ON ANY OF THE PARCELS SHOWN. PROPERTY CORNERS AND LINES PERTINENT TO WELL LOCATION ARE BASED ON A FIELD SURVEY. THE REMAINDER OF THE PROPERTY LINES ARE BASED ON COUNTY REAL ESTATE TAX MAPS, GIS INFORMATION AND DEEDS OF RECORD.
4. UTILITIES AND THEIR LOCATIONS AS SHOWN HEREON ARE BASED ON: A) OBSERVABLE EVIDENCE OF THOSE VISIBLE, ABOVE-GROUND FACILITIES, FEATURES, AND MARKERS WHICH WERE FOUND ON THE SUBJECT PROPERTY AT THE TIME OF SURVEY PERFORMED BY NAVITUS ENGINEERING AND B) FIELD MARKINGS PLACED BY UTILITY COMPANIES IN RESPONSE TO THE WV 811 TICKET SUBMITTED BY NAVITUS ENGINEERING. NAVITUS ENGINEERING CANNOT GUARANTEE THE ACCURACY OF THE UTILITY MARKINGS PERFORMED BY OTHERS OR THAT ALL UTILITIES EXISTING WITHIN THE LIMITS OF THIS PLAN ARE SHOWN. ANY UTILITIES ENCOUNTERED SUBSEQUENT TO PLAN APPROVAL OR DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE PLAN SHOULD BE REPORTED TO NAVITUS ENGINEERING AND ANTERO RESOURCES CORPORATION.

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS

TM 13-70
DORIS R. HAUGHT

TM 18-21
CHARLES E. & KAY L. BLAIR

TM 13-69.1
DONALD L. MASON

TM 17-17
JAMES A. SELL

TM 17-68
JAMES A. SELL

TM 17-67
STEVEN C. & BERTIE G. BLINKMAN

TM 17-60
ROSS E. BUCHER, JR.

TM 12-2
ANTERO RESOURCES CORP

STOCKPILE AREA "A"

STOCKPILE AREA "B"

STOCKPILE AREA "C"

STOCKPILE AREA "D"

WELL PAD

WATER CONTAINMENT TANK

ACCESS ROAD "A"

ACCESS ROAD "B"

SHEET 5

SHEET 6

SHEET 6

100 0 100
GRAPHIC SCALE (IN FEET)

APPROVED
WVDEP OOG
Modification
7/10/2023

07/14/2023

NAVITUS
ENERGY ENGINEERING
Telephone: (888) 662-4185 | www.NavitusEng.com

REVISION	DATE
REVISED PER SLIDE	05-24-2023

Antero Resources

THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

OVERALL PLAN SHEET INDEX

FURBEE

WELL PAD & WATER CONTAINMENT PAD

GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS S. KUHL
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: 1" = 100'
SHEET 4 OF 12

ACCESS ROAD, WELL PAD & WATER CONTAINMENT PAD AS-BUILT PLAN

APPROVED
WVDEP OOG
Modification
7/10/2023

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS

APPROX. PROPERTY LINE

TM 13-69.1
DONALD L. MASON
DB 413 PG 759
3 AC

TM 13-67
STEVEN C. & BERTIE G. BLINKMAN
DB 388 PG 243
20.8 AC

COUNTY ROAD IMPROVEMENTS BY OTHERS

ESI WETLAND DELINEATION STUDY AREA

DITCH 01

EPHEMERAL STREAM 11

EPHEMERAL STREAM 10

ESI WETLAND DELINEATION STUDY AREA

EPHEMERAL STREAM 09

TM 17-1
ANTERO RESOURCES CORP.
DB 483 PG 888
15.35 AC

WETLAND 05 TO BE PROTECTED WITH ORANGE SAFETY FENCE AND 12" CFS

3.10 ACRES ADDED TO PERMITTED LOD

MODIFICATION LIMITS OF DISTURBANCE

WETLAND 024

EXCESS MATERIAL STOCKPILE AREA 'C' (APPROX. 5,200 C.Y.) 4.25:1 SLOPES (TOP OF STOCKPILE SHALL HAVE A MINIMUM SLOPE OF 3%)

PERMITTED LIMITS OF DISTURBANCE

TRENCH DRAIN

ACCESS ROAD ENTRANCE
LAT: 39.557532
LON: -80.734282
(NAD 83)

EPHEMERAL STREAM 03

TM 17-80
ROSS W. BUCHER, JR
DB 411 PG 785
.79 AC

EPHEMERAL STREAM 08

TM 17-1
ANTERO RESOURCES CORP.
DB 483 PG 888
16.35 AC

EX. 8" PIPELINE (TC ENERGY)

APPROX. PROPERTY LINE

TM 17-12
ANTERO RESOURCES CORP
DB 483 PG 888
59.1 AC

CO RD SLOPE TO BE RE-GRADED AS NECESSARY

EXCESS MATERIAL STOCKPILE AREA 'A' (APPROX. 11,120 C.Y.) 2.25:1 SLOPES (TOP OF STOCKPILE SHALL HAVE A MINIMUM SLOPE OF 3%)

EXCESS MATERIAL STOCKPILE AREA 'B' 2.25:1 SLOPES (TOP OF STOCKPILE SHALL HAVE A MINIMUM SLOPE OF 3%)

WETLAND 02B

KEYWAY #1A

KEYWAY #2A

WETLAND 05

WETLAND 03

15' BENCH W/ CHECK DAMS

ACCESS ROAD "B"

ACCESS ROAD "A"

EX. GUARDRAIL

EX. 18" HDPE

EX. 8" HDPE

MOUNTABLE BERM

ESI WETLAND DELINEATION/ STUDY AREA

EPHEMERAL STREAM 13

EPHEMERAL STREAM 13A

EPHEMERAL STREAM 12

EPHEMERAL STREAM 12A

ESI WETLAND DELINEATION STUDY AREA

EPHEMERAL STREAM 19

TM 13-70
DORIS R. HAUGHT
DB 453 PG 556
33.78 AC

PERMITTED LIMITS OF DISTURBANCE

KEYWAY #1B

DESIGNED GRADING LIMITS

KEYWAY #1F

KEYWAY #1E

KEYWAY #1D

KEYWAY #1C

PAD DEWATERING SYSTEM #1

PAD DEWATERING SYSTEM #2

PAD DEWATERING SYSTEM #3

PROPOSED ANTERO WATERLINE GIS LOCATION FR-11

PROPOSED ANTERO PIPELINE GIS LOCATION

BOLLARD (TYP.)

EX. 12" HDPE

4" PVC

6" PVC

TM 13-71
CHARLES R. & KAY I. BLAIR
DB 387 PG 577
63.11 AC

EX. WATERLINE (ANTERO RESOURCES)

STOCKPILE AREA 'A'

EXIT TRAIL

PERMITTED LIMITS OF DISTURBANCE

TM 17-12
ANTERO RESOURCES CORP.
DB 483 PG 888
59.1 AC

WETLAND 02

WELLHEAD INDEX
- (A) ECKLEBERRY UNIT 2H
- (B) ECKLEBERRY UNIT 1H
- (C) READER UNIT 2H
- (D) READER UNIT 1H
- (E) LENNY UNIT 2H
- (F) LENNY UNIT 1H
- (G) VIEWER UNIT 1H
- (H) VIEWER UNIT 2H
- (I) GAUSS UNIT 1H
- (J) GAUSS UNIT 2H
- (K) MAKAR UNIT 1H
- (L) MAKAR UNIT 2H
- (M) FURBEE UNIT 5H

MATCHLINE "A" SEE SHEET 6

50 0 50
GRAPHIC SCALE (IN FEET)

07/14/2023

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ENERGY ENGINEERING
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DATE	REVISION
05-24-2023	REVISED PER SIDE

Antero Resources

THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

ACCESS ROAD, WELL PAD & WATER CONTAINMENT PAD AS-BUILT PLAN

WELL PAD & WATER CONTAINMENT PAD

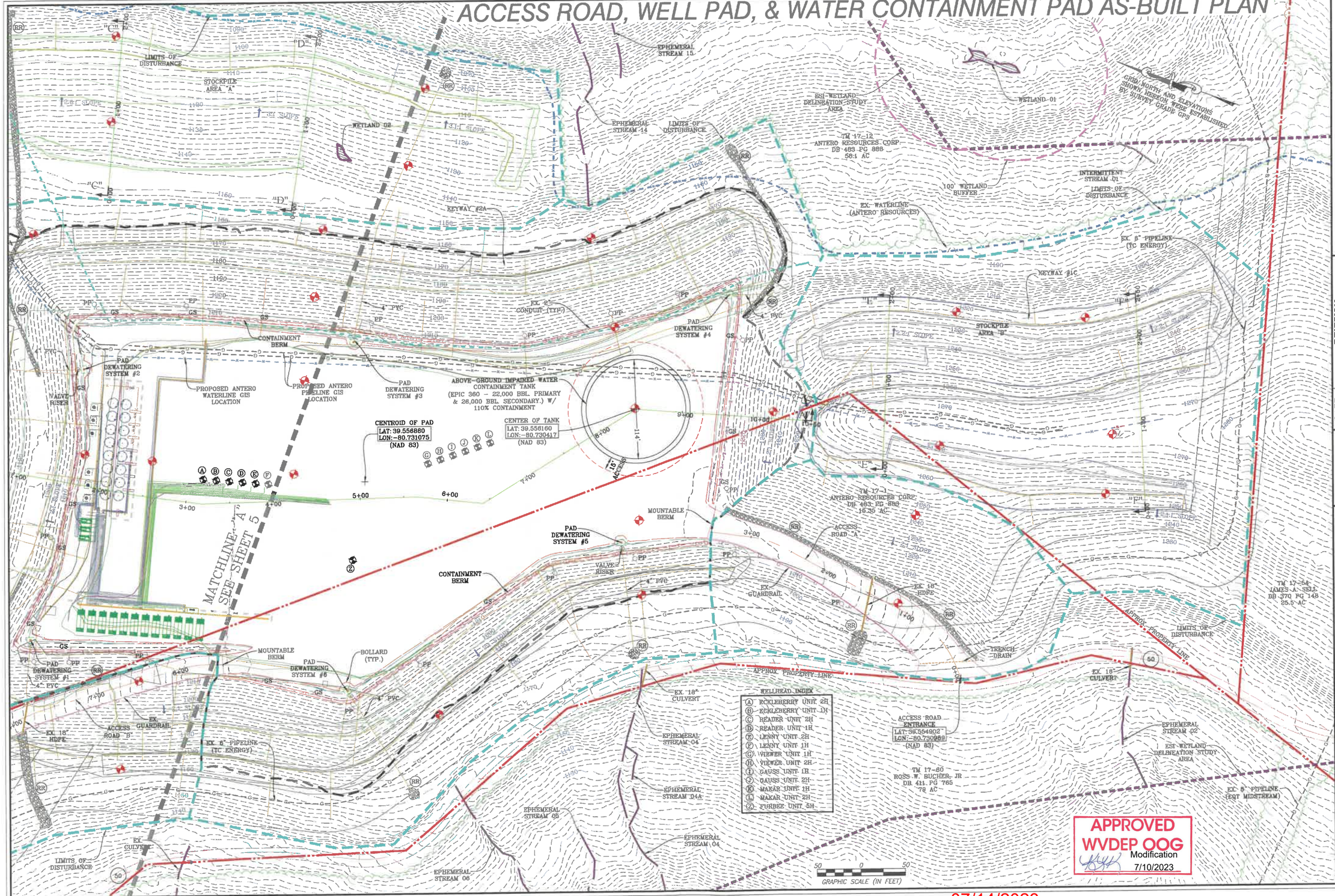
FURBEE

GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CYRUS B. KING
REGISTERED
2578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: 1" = 50'
SHEET 5 OF 12

ACCESS ROAD, WELL PAD, & WATER CONTAINMENT PAD AS-BUILT PLAN



07/14/2023

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DATE	REVISION
05-24-2023	REVISED PER SLIDE

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ACCESS ROAD, WELL PAD & WATER CONTAINMENT PAD AS-BUILT PLAN

WELL PAD & WATER CONTAINMENT PAD

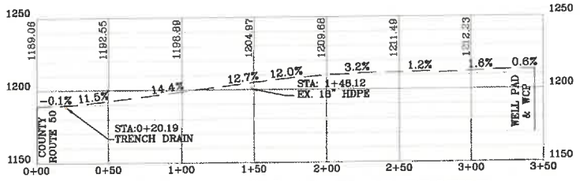
FURBEE

GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS S. KIMES
REGISTERED
19576
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

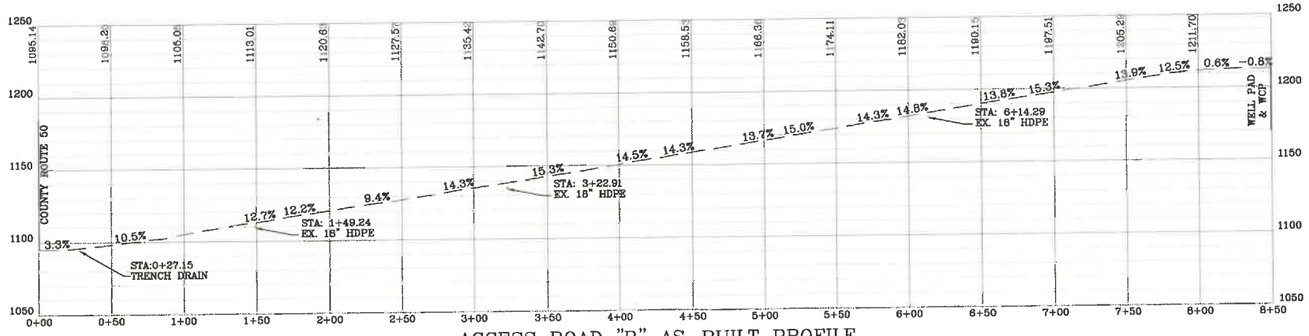
DATE: 04/18/2022
SCALE: 1" = 50'
SHEET 6 OF 12

ACCESS ROAD AS-BUILT PROFILES



ACCESS ROAD "A" AS-BUILT PROFILE

SCALE: HORIZ. 1" = 50' VERT. 1" = 50'



ACCESS ROAD "B" AS-BUILT PROFILE

SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

APPROVED
WVDEP OOG
Modification
7/10/2023

07/14/2023

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ACCESS ROAD AS-BUILT PROFILES

FURBEE

WELL PAD & WATER CONTAINMENT PAD

GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

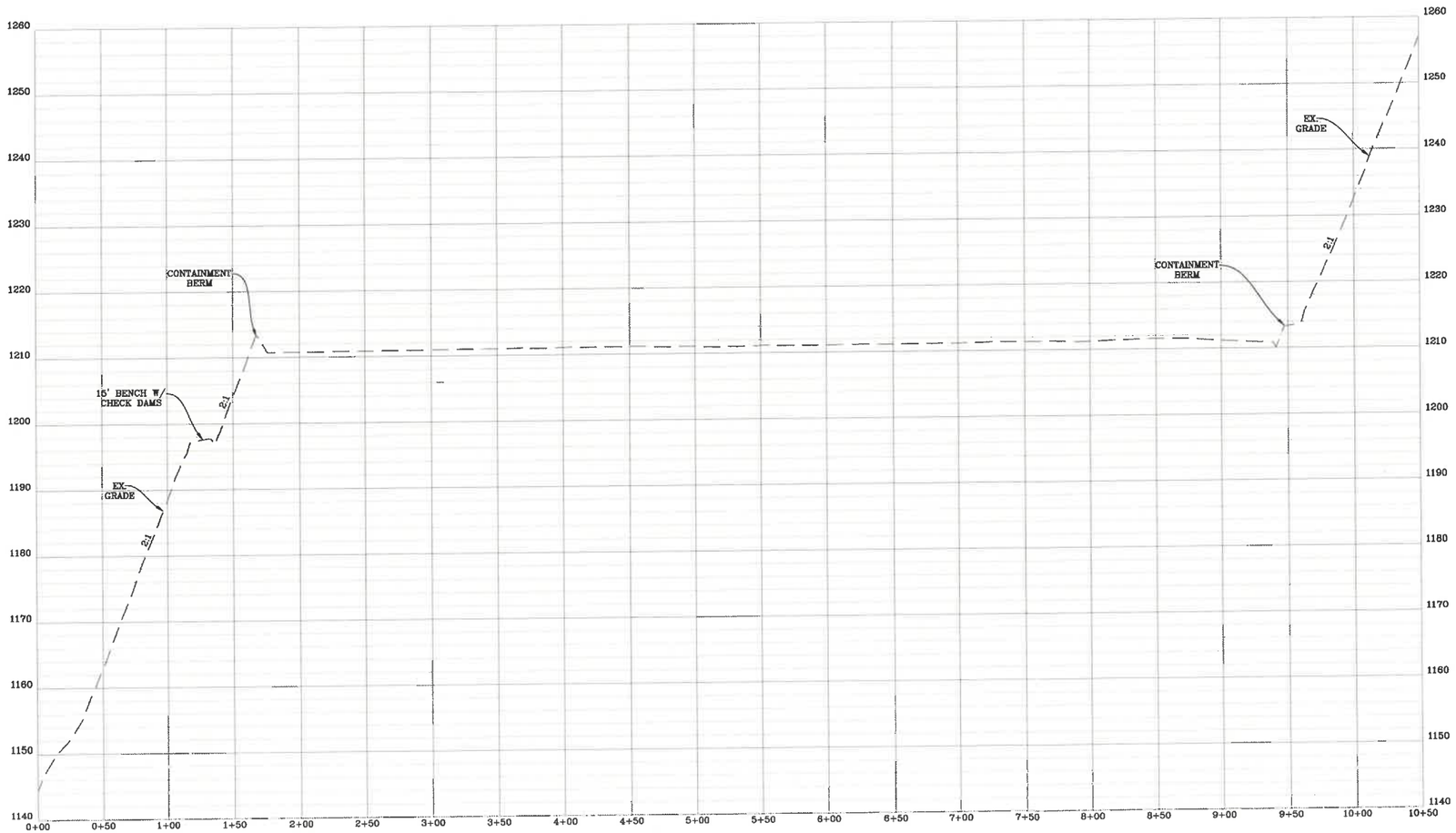
CRUG S. KUHL
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

05/24/2023

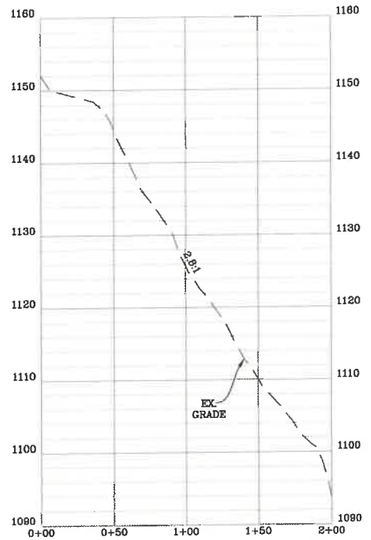
DATE: 04/18/2022
SCALE: AS SHOWN
SHEET 7 OF 12

WELL PAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT SECTIONS

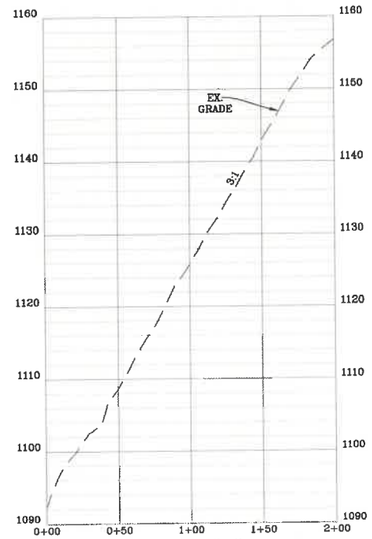
APPROVED
WVDEP OOG
Modification
7/10/2023



WELL PAD & WATER CONTAINMENT PAD AS-BUILT CROSS-SECTION "A-A"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "A" AS-BUILT CROSS-SECTION "C-C"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "A" AS-BUILT CROSS-SECTION "B-B"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

07/14/2023

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WELL PAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT SECTIONS

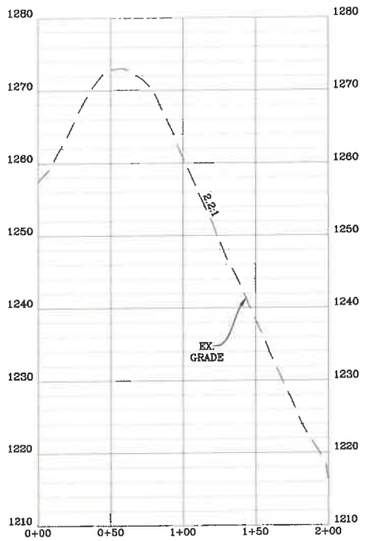
FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS B. KING
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

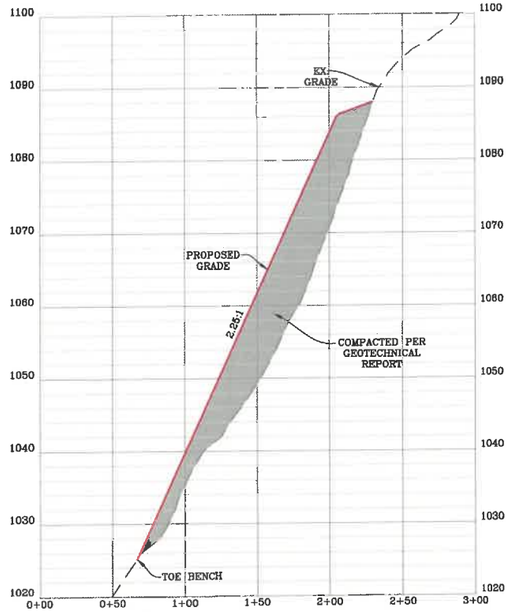
DATE: 04/18/2022
SCALE: AS SHOWN
SHEET 8 OF 12

APPROVED
WVDEP OOG
Modification
7/10/2023

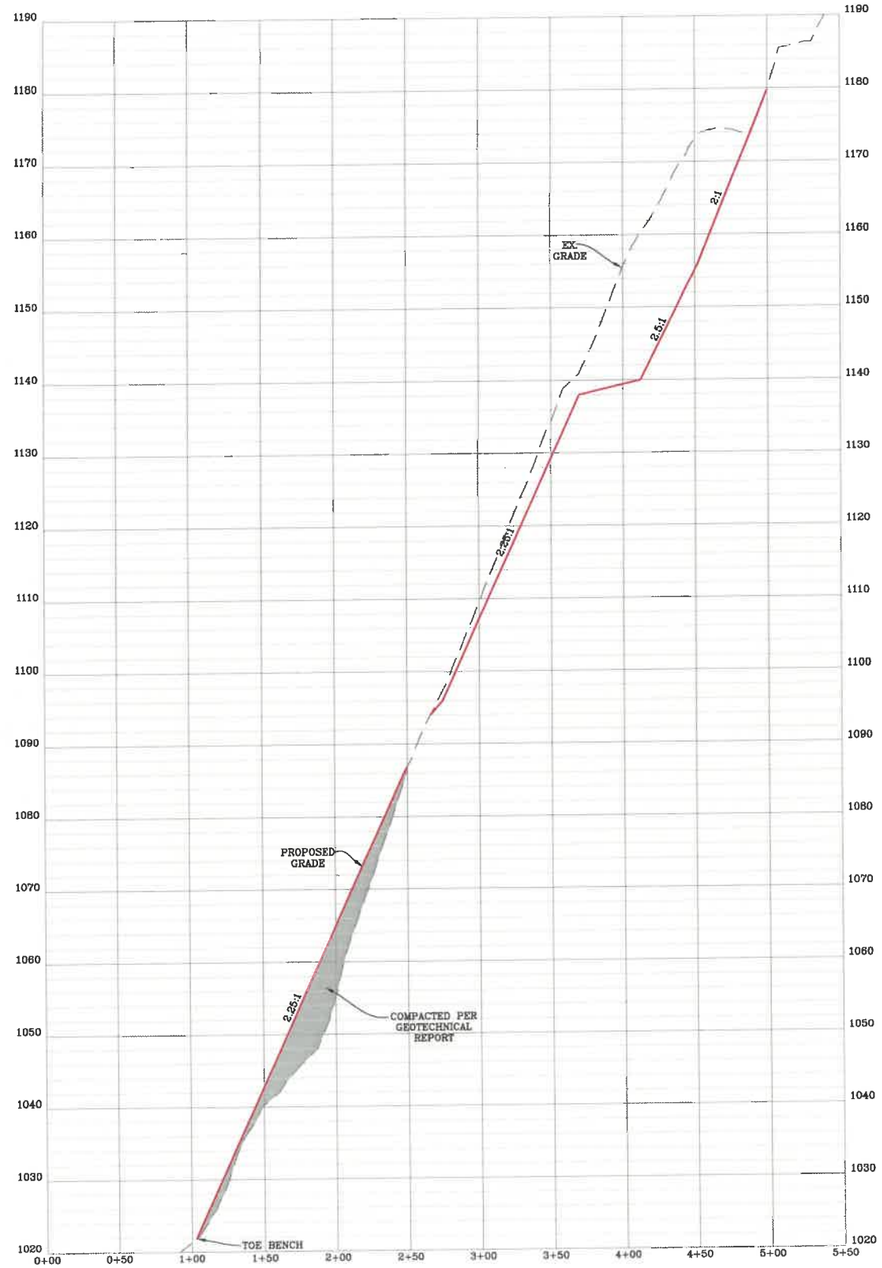
STOCKPILE AREA AS-BUILT SECTIONS



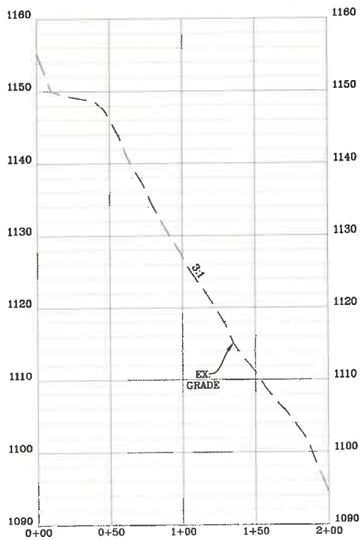
STOCKPILE AREA "B" AS-BUILT
CROSS-SECTION "E-E"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



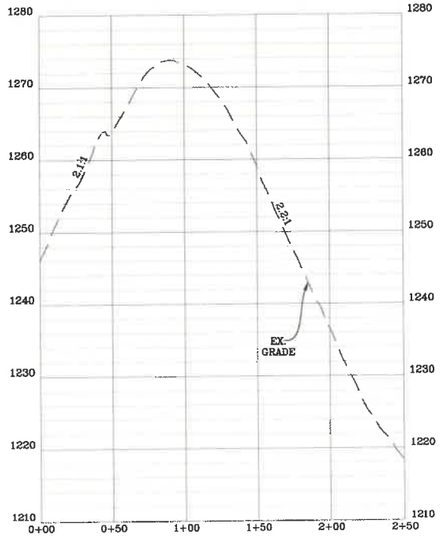
STOCKPILE AREA "C" AS-BUILT
CROSS-SECTION "H-H"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "C" AS-BUILT CROSS-SECTION "G-G"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "A" AS-BUILT
CROSS-SECTION "D-D"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "B" AS-BUILT
CROSS-SECTION "F-F"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

07/14/2023

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STOCKPILE AREA AS-BUILT SECTIONS

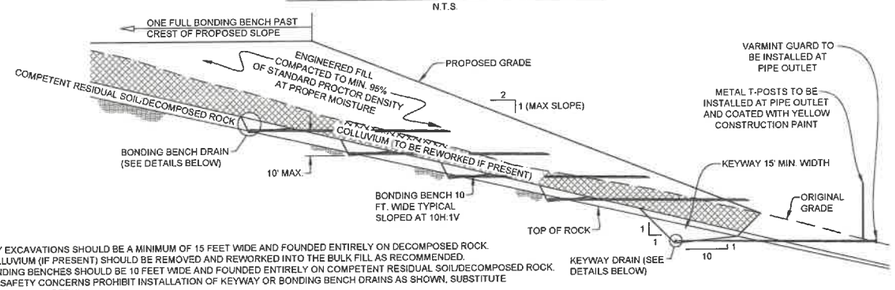
FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS S. KIMP
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: AS SHOWN
SHEET 9 OF 12

D1 TYPICAL SLIDE REPAIR DETAIL

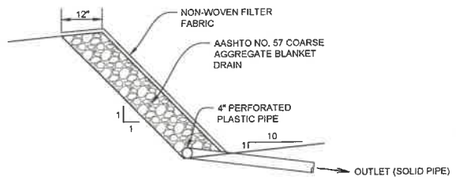
N.T.S.



NOTES:
1. KEYWAY EXCAVATIONS SHOULD BE A MINIMUM OF 15 FEET WIDE AND FOUNDED ENTIRELY ON DECOMPOSED ROCK.
2. ALL COLLUVIUM (IF PRESENT) SHOULD BE REMOVED AND REWORKED INTO THE BULK FILL AS RECOMMENDED.
3. ALL BONDING BENCHES SHOULD BE 10 FEET WIDE AND FOUNDED ENTIRELY ON COMPETENT RESIDUAL SOIL/DECOMPOSED ROCK.
4. WHERE SAFETY CONCERNS PROHIBIT INSTALLATION OF KEYWAY OR BONDING BENCH DRAINS AS SHOWN, SUBSTITUTE ALTERNATE DRAIN DETAIL.

D1 KEYWAY DRAIN - AGGREGATE

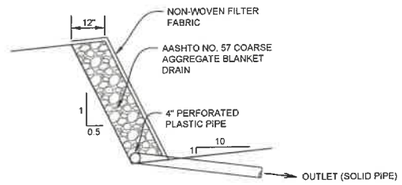
N.T.S



*OUTLETS AT 100 FT. CENTERS MAX. OR AS DEEMED NECESSARY
*ALL OUTLET DRAINS TO BE COVERED WITH 12" OF NO. 57 AGGREGATE AND WRAPPED IN NON-WOVEN FILTER FABRIC

D1 BONDING BENCH DRAIN - AGGREGATE

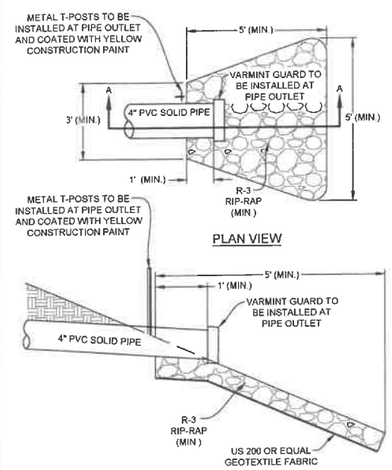
N.T.S.



*SLOPE OUTLET TO PROVIDE POSITIVE DRAINAGE TO SLOPE FACE
*OUTLETS AT 250 FT. CENTERS MAX. OR AS DEEMED NECESSARY
*ALL OUTLET DRAINS TO BE COVERED WITH 12" OF NO. 57 AGGREGATE AND WRAPPED IN NON-WOVEN FILTER FABRIC

TYPICAL KEYWAY / BONDING BENCH DRAIN OUTLET PROTECTION

N.T.S.



NOTES:
1. ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIP-RAP WITHIN THE APRON SHALL BE RESTORED IMMEDIATELY.
2. IF EROSION IS OCCURRING DOWNSTREAM OF OUTLET PROTECTION, CONTRACTOR TO EXTEND OUTLET PROTECTION TO DOWNSTREAM EROSION CONTROL DEVICES.
3. CONTRACTOR IS TO EXTEND ALL KEYWAY AND BONDING BENCH OUTLET DRAINS A MINIMUM OF ONE FOOT PAST THE FINISHED GRADE OF THE SLOPE.

GENERAL SITE EARTHWORK RECOMMENDATIONS

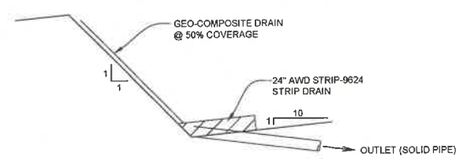
1. ALL FILL AREAS SHOULD BE CLEARED OF TREES, STUMPS, AND VEGETATION AND STRIPPED OF TOPSOIL/ORGANIC SOILS PRIOR TO THE START OF FILL PLACEMENT
2. THE DISTRIBUTION AND GRADATION OF FILL MATERIALS SHALL BE SUCH THAT THE FILL WILL BE FREE OF LENSES, POCKETS, OR LAYERS OF MATERIALS DIFFERING SUBSTANTIALLY IN GRADATION FROM THE SURROUNDING MATERIALS WITHIN THE DESIGNATED FILL AREAS.
3. FILL SHALL BE PLACED AND SPREAD IN SUCCESSIVE AND APPROXIMATE HORIZONTAL LAYERS OF UNIFORM THICKNESS BASED ON THE NOMINAL PARTICLE SIZE OF MATERIAL AND THE SIZE AND TYPE OF THE AVAILABLE COMPACTION EQUIPMENT. IN GENERAL, SOIL SHOULD BE PLACED IN NOMINAL 12 INCH MAXIMUM LOOSE LIFTS. LARGER ROCK INCORPORATED INTO THE FILL SHOULD TYPICAL BE LIMITED TO 12 INCHES THICK X 3 FEET X 3 FEET, WITH ALL VOID SPACE CHOKED WITH SMALLER PARTICLE SIZE MATERIAL.
4. ADEQUATE COMPACTIVE EFFORT IS APPLIED BY UTILIZING THE PROPER COMPACTION EQUIPMENT FOR THE COMPOSITION OF THE FILL MATERIALS BEING PLACED. SEGMENTED, SHEEPSFOOT, AND/OR PADFOOT ROLLERS SHOULD BE USED WHEN PLACING PREDOMINATELY CLAYEY (COHESIVE) FILL MATERIALS. THESE TYPES OF ROLLERS ARE ALSO EFFECTIVE ON CLAYEY SHALES, CLAYSTONE, AND SOFTER SANDSTONE TO BREAK DOWN THE ROCK PARTICLES. SMOOTH DRUM VIBRATORY ROLLERS SHOULD BE UTILIZED ON PREDOMINATELY GRANULAR FILL MATERIALS AND TO SEAL CLAYEY SOILS TO HELP PREVENT SURFACE WATER INFILTRATION AND/OR TO PROMOTE DRAINAGE.
5. ALL FILL MATERIALS SHALL BE COMPACTED BY A SUFFICIENT NUMBER OF COMPLETE TRIPS (I.E. PASSES) OF THE APPROPRIATE COMPACTION EQUIPMENT TO ATTAIN A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM TEST DESIGNATION D698 (STANDARD PROCTOR). MAINTAIN THE MOISTURE CONTENT OF THE FILL MATERIALS AS NECESSARY TO ATTAIN THE DESIRED COMPACTION DENSITY.
6. UNDISTURBED AND/OR FILL MATERIALS PLACED WITHIN THE UPPER 12 INCHES OF FINAL GRADE SHOULD BE COMPACTED TO ATTAIN A MINIMUM OF 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM TEST DESIGNATION D698 (STANDARD PROCTOR) AT AN IN-PLACE MOISTURE WITHIN 3% OF THE MATERIAL'S OPTIMUM MOISTURE CONTENT. THE ENTIRE SUBGRADE SURFACE SHOULD BE THOROUGHLY SEALED USING A VIBRATORY SMOOTH DRUM ROLLER.
7. TO VERIFY THE SPECIFIED DEGREE OF COMPACTION AND TO DETERMINE THE IN-PLACE MOISTURE CONTENT AS STATED ABOVE, IN-PLACE FIELD DENSITY TESTS SHOULD BE PERFORMED IN ACCORDANCE TO THE PROCEDURES OF ASTM D2922 (NUCLEAR DENSOMETER).
8. IN ADDITION TO IN-PLACE FIELD DENSITY TESTING, ACCEPTANCE SHOULD ALSO BE PREDICATED ON A VISUAL PERFORMANCE CRITERIA. OBVIOUS SURFACE RUTTING AND/OR DEFLECTION THAT ARE JUDGED TO BE DETRIMENTAL TO THE OVERALL STABILITY OF THE FILL AREA SHOULD BE REMOVED, MOISTURE CONDITIONED AND RECOMPACTED, OR OTHERWISE ADDRESSED PRIOR TO ACCEPTING THE LIFT.
9. WHERE PREDOMINATELY "ROCKY" FILL MATERIALS ARE PLACED OR WHERE REPRESENTATIVE NUCLEAR DENSOMETER TESTS CANNOT BE OBTAINED, A VISUAL NON-DEFLECTION CRITERIA SHOULD BE DEVELOPED IN CONJUNCTION WITH AN ADEQUATE NUMBER OF ROLLER PASSES FOR ACCEPTANCE.

NOTE:

1. THE GEOTECHNICAL NOTES AND DETAILS SHOWN ON THIS SHEET ARE FOR THE GENERAL EARTHWORK AND SUBSURFACE DRAINAGE ASSOCIATED WITH THE CONSTRUCTION OF THIS SITE. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL INVESTIGATION REPORT FOR ADDITION GUIDANCE AND RECOMMENDATIONS.

D1 KEYWAY DRAIN - GEO-COMPOSITE

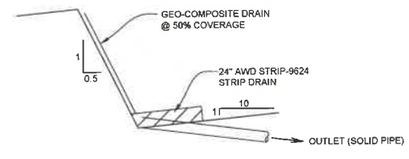
N.T.S.



*OUTLETS AT 100 FT. CENTERS MAX. OR AS DEEMED NECESSARY
*GEO-COMPOSITE DRAIN TO CONSIST OF HANES GEO COMPONENTS TERRADRAIN 104/2, MIRAFI G200N, OR EQUIVALENT.

D1 BONDING BENCH DRAIN - GEO-COMPOSITE

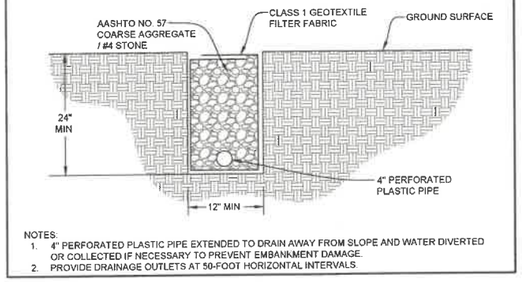
N.T.S.



*SLOPE OUTLET TO PROVIDE POSITIVE DRAINAGE TO SLOPE FACE
*OUTLETS AT 250 FT. CENTERS MAX. OR AS DEEMED NECESSARY
*GEO-COMPOSITE DRAIN TO CONSIST OF HANES GEO COMPONENTS TERRADRAIN 104/2, MIRAFI G200N, OR EQUIVALENT.

D3 TYPICAL SPRING DRAIN

N.T.S.



NOTES:
1. 4" PERFORATED PLASTIC PIPE EXTENDED TO DRAIN AWAY FROM SLOPE AND WATER DIVERTED OR COLLECTED IF NECESSARY TO PREVENT EMBANKMENT DAMAGE.
2. PROVIDE DRAINAGE OUTLETS AT 50-FOOT HORIZONTAL INTERVALS.

APPROVED
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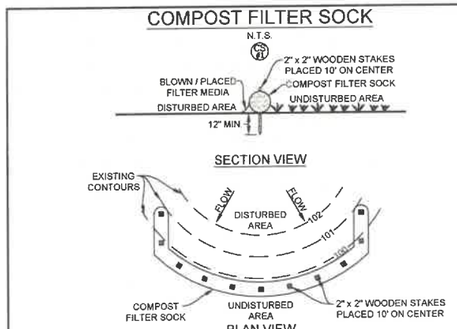
7/10/2023

COMPOST FILTER SOCK

N.T.S.



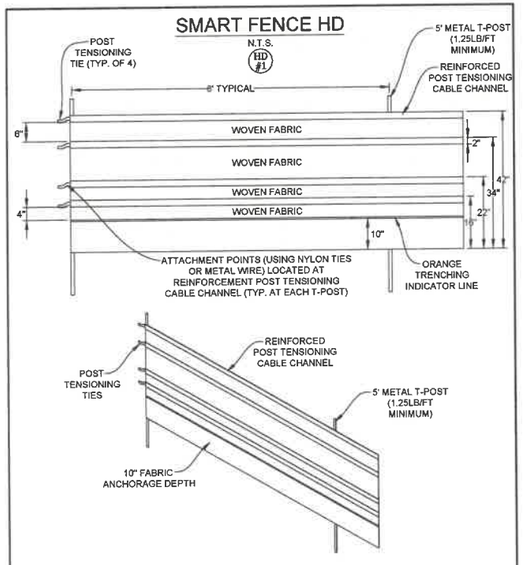
ADAPTED FROM FILTREXX
SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1. COMPOST SHALL MEET THE FOLLOWING STANDARDS:

ORGANIC MATTER CONTENT	80%-100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5-8.0
MOISTURE CONTENT	35%-55%
PARTICLE SIZE	98% PASS THROUGH 1" SCREEN
SOLUBLE SALT CONCENTRATION	5.0 dS MAXIMUM

NOTES:
1. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8' UP THE SLOPE OR TO A HEIGHT EQUAL TO THE EFFECTIVE SOCK HEIGHT, WHICHEVER IS GREATER, AT 45° TO THE MAIN SOCK ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED MANUFACTURER'S MAXIMUM PERMISSIBLE SLOPE LENGTH.
2. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
4. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
5. BIODEGRADABLE FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
7. IN THE EVENT THE GROUND IS FROZEN, #5 REBAR WITH SAFETY CAPS SHALL BE USED INSTEAD OF WOODEN STAKES TO ANCHOR THE FILTER SOCK. ONCE THE GROUND THAWS, THE REBAR ANCHORS SHALL BE REMOVED AND REPLACED WITH 2" x 2" WOODEN STAKES AND INSTALLED AS SHOWN IN THE DETAIL ABOVE.

SMART FENCE HD

N.T.S.



NOTES:
1. SMART FENCE HD SHOULD BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE.
2. ENDS SHALL BE EXTENDED UPHILL A MINIMUM OF 2 VERTICAL FEET.
3. SMART FENCE HD SHALL BE EMBEDDED A MINIMUM OF 10" INTO THE GROUND.
4. METAL POSTS AS SPECIFIED BY WV DOT CAN BE REPLACED BY PRESSURE-TREATED 4" x 4" POSTS.
5. ATTACHMENT NYLON TIES OR METAL WIRE FOR POSTS SHALL BE PLACED BELOW TENSIONING TIE LOCATION WITHIN LOWER 1" OF REINFORCEMENT POST TENSIONING CABLE CHANNEL.
6. SMART FENCE HD SHOULD BE INSPECTED AT A MINIMUM ONCE EVERY 7 CALENDAR DAYS OR WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

MODIFIED, SOURCE: ACF ENVIRONMENTAL SMART FENCE HD INSTALLED WITH T-POSTS ADD 01-12-2016

07/14/2023

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Antero Resources

THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

LEGEND

FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS S. KIMP
REGISTERED
19578
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: N/A
SHEET 10 OF 12

REVEGETATION

TAKEN FROM THE
WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL
WEST VIRGINIA DIVISION OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS
CHARLESTON, W.VA.
SECTION IV

APPROVED
WVDEP OOG
Modification
7/10/2023

TEMPORARY SEEDING:

a. GENERAL CONDITIONS WHERE PRACTICE APPLIES
WHERE EXPOSED SOIL SURFACES ARE NOT TO BE FINE-GRADED OR WORKED FOR PERIODS LONGER THAN 21 DAYS. TEMPORARY VEGETATIVE COVER WITH SEDIMENT CONTROLS MUST BE ESTABLISHED WHERE RUNOFF WILL GO DIRECTLY INTO A STREAM. IMMEDIATELY UPON CONSTRUCTION OF THE SITE (SITE INCLUDES ROAD AND LOCATION), VEGETATION MUST BE ESTABLISHED ON ROAD BANK AND LOCATION SLOPES. A PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO AREAS THAT WILL BE LEFT UN-WORKED FOR A PERIOD OF MORE THAN SIX MONTHS

b. SEED MIXTURES AND PLANTING DATES
REFER TO TABLES IV-2 THROUGH IV-4 FOR RECOMMENDED DATES TO ESTABLISH VEGETATIVE COVER AND THE APPROVED LISTS OF TEMPORARY AND PERMANENT PLANT SPECIES AND PLANTING RATES. TABLE IV-3 GIVES RECOMMENDED TYPES OF TEMPORARY VEGETATION, RATES OF APPLICATION, AND OPTIMUM SEEDING DATES. IN SITUATIONS WHERE ANOTHER COVER IS DESIRED, CONTACT THE LOCAL SOIL CONSERVATION DISTRICT FOR SEEDING RECOMMENDATIONS.

c. SEED APPLICATION
APPLY SEED BY BROADCASTING, DRILLING, OR BY HYDROSEED ACCORDING TO THE RATES INDICATED IN TABLE IV-3. PERFORM ALL PLANTING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. NECESSARY SITE PREPARATION AND ROUGHENING OF THE SOIL SURFACE SHOULD BE DONE JUST PRIOR TO SEEDING. SEEDBED PREPARATION MAY NOT BE REQUIRED ON NEWLY DISTURBED AREAS.

PERMANENT SEEDING:

a. GENERAL
PERMANENT VEGETATIVE COVER WILL BE ESTABLISHED WHERE NO FURTHER SOIL DISTURBANCE IS ANTICIPATED OR NEEDED. SOIL FERTILITY AND PH LEVEL SHOULD BE TESTED AND ADJUSTED ACCORDING TO SEED SPECIES PLANTED. PLANTING OF PERMANENT VEGETATIVE COVERS MUST BE PERFORMED ON ALL DISTURBED AREAS AFTER COMPLETION OF THE DRILLING PROCESS. ANY SITE THAT CONTAINS SIGNIFICANT AMOUNTS OF TOPSOIL SHALL HAVE THE TOPSOIL REMOVED AND STOCKPILED WHEN FEASIBLE. TOPSOIL SHOULD NOT BE ADDED TO SLOPES STEEPER THAN 2:1 UNLESS A GOOD BONDING TO THE SUB-LAYER CAN BE ACHIEVED. AFTER PROPER GRADING AND SEEDBED PREPARATION, THE VEGETATION WILL REESTABLISH GROUND COVER FOR THE CONTROL OF SURFACE WATER RUNOFF EROSION.
ALL REQUIRED SEEDBED PREPARATION AND LOOSENING OF SOIL BY DISKING OR DOZER TRACKING SHOULD BE PERFORMED JUST PRIOR TO SEEDING. IF SEEDBED PREPARATION IS NOT FEASIBLE, 50% MORE SEED SHALL BE ADDED TO THE RECOMMENDED RATES SHOWN IN TABLES IV-3 AND IV-4.
WHEN HYDROSEEDING, SEEDBED PREPARATION MAY NOT BE NECESSARY IF ADEQUATE SITE PREPARATION WAS PERFORMED. INCORPORATE THE APPROPRIATE AMOUNT OF LIME AND/OR FERTILIZER IN THE SLURRY MIX WHEN HYDROSEEDING.
WHEN HYDROSEEDING, FIRST MIX THE LIME, FERTILIZER, AND HYDRO-MULCH IN THE RECOMMENDED AMOUNT OF WATER. MIX THE SEED AND INOCULANTS TOGETHER WITHIN ONE HOUR PRIOR TO PLANTING, AND ADD TO THE SLURRY JUST BEFORE SEEDING. APPLY THE SLURRY UNIFORMLY OVER THE PREPARED SITE. ASSURE THAT AGITATION IS CONTINUOUS THROUGHOUT THE SEEDING OPERATION AND THE MIX IS APPLIED WITHIN ONE HOUR OF INITIAL MIXING.

b. LIME AND FERTILIZER
1. LIME SHALL BE APPLIED TO ALL PERMANENT SEEDINGS. THE PH OF THE SOIL IS TO BE DETERMINED AND LIME APPLIED ACCORDINGLY. ONCE THE PH IS KNOWN, SELECT THE AMOUNT OF LIME TO BE APPLIED FROM TABLE IV-5.
2. FERTILIZER SHALL BE APPLIED IN ALL PERMANENT SEEDINGS. APPLY THE EQUIVALENT FOR 500 LBS. MINIMUM 10-20-20 FERTILIZER PER ACRE OR USE THE AMOUNT OF FERTILIZER AND LIME RECOMMENDED BY A CERTIFIED SOIL TEST.
3. APPLICATION: FOR BEST RESULTS AND MAXIMUM BENEFITS, THE LIME AND FERTILIZER ARE TO BE APPLIED AT THE TIME OF SEEDBED PREPARATION.

c. PERMANENT SEED MIXTURES
PLANNERS SHOULD TAKE INTO CONSIDERATION THE SPECIES MAKEUP OF THE EXISTING PASTURE AND THE LANDOWNER'S FUTURE PASTURE MANAGEMENT PLANS WHEN RECOMMENDING SEED MIXTURES. SELECTION: FROM TABLES IV-4A AND IV-4B, PERMANENT SEEDING MIXTURES SUITABLE FOR ESTABLISHMENT IN WEST VIRGINIA.
NOTES:
1. ALL LEGUMES MUST BE PLANTED WITH THE PROPER INOCULANTS PRIOR TO SEEDING
2. 'LATHCO' FLATPEA IS POTENTIALLY POISONOUS TO SOME LIVESTOCK.
3. ONLY ENDOPHYTE FREE VARIETIES OF TALL FESCUE SHOULD BE USED. TALL FESCUE AND CROWNVETCH ARE ALSO VERY INVASIVE SPECIES, NON-NATIVE TO WV.
4. FOR UNPREPARED SEEDBEDS OR SEEDING OUTSIDE THE OPTIMUM TIMEFRAMES, ADD 50% MORE SEED TO THE SPECIFIED RATE. MIXTURES IN TABLE IV-4B ARE MORE WILDLIFE AND FARM FRIENDLY; THOSE LISTED IN BOLD ARE SUITABLE FOR USE IN SHADED WOODLAND SETTINGS. MIXTURES IN ITALIC ARE SUITABLE FOR USE IN FILTER STRIPS.

d. SEEDING FOR WILDLIFE HABITAT
CONSIDER THE USE OF THE NATIVE PLANTS OR LOCALLY ADAPTED PLANTS WHEN SELECTING COVER TYPES AND SPECIES FOR WILDLIFE HABITAT. WILDLIFE FRIENDLY SPECIES OR MIXES THAT HAVE MULTIPLE VALUES SHOULD BE CONSIDERED. SEE WILDLIFE FRIENDLY SPECIES/MIXTURES IN TABLE IV-4B. CONSIDER SELECTING NO OR LOW MAINTENANCE LONG-LIVED PLANTS ADAPTABLE TO SITES WHICH MAY BE DIFFICULT TO MAINTAIN WITH EQUIPMENT.

MULCHING

a. GENERAL ORGANIC MULCHES
THE APPLICATION OF STRAW, HAY, OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE TO PREVENT EROSION. STRAW MADE FROM WHEAT OR OATS IS THE PREFERRED MULCH. THE USE OF HAY IS PERMISSIBLE, BUT NOT ENCOURAGED DUE TO THE RISK OF SPREADING INVASIVE SPECIES. MULCH MUST BE APPLIED TO ALL TEMPORARY AND PERMANENT SEEDING ON ALL DISTURBED AREAS. DEPENDING ON SITE CONDITIONS, IN CRITICAL AREAS SUCH AS WATERWAYS OR STEEP SLOPES, ADDITIONAL OR SUBSTITUTE SOIL PROTECTIVE MEASURES MAY BE USED IF DEEMED NECESSARY. EXAMPLES INCLUDE JUTE MESH AND SOIL STABILIZATION BLANKETS OR EROSION CONTROL MATTING.
AREAS THAT HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING. MULCHES CONSERVE DESIRABLE SOIL PROPERTIES, REDUCE SOIL MOISTURE LOSS, PREVENT CRUSTING AND SEALING OF THE SOIL SURFACE, AND PROVIDE A SUITABLE MICROCLIMATE FOR SEED GERMINATION.
AREAS THAT CANNOT BE SEEDED BECAUSE OF THE SEASON SHOULD BE MULCHED TO PROVIDE SOME PROTECTION TO THE SOIL SURFACE. AN ORGANIC MULCH, STRAW, OR HAY SHOULD BE USED AND THE AREA THEN SEEDED AS SOON AS WEATHER OR SEASONAL CONDITIONS PERMIT. DO NOT USE FIBER MULCH (CELLULOSE-HYDROSEED) ALONE FOR THIS PRACTICE; AT NORMAL APPLICATION RATES IT WILL NOT GIVE THE SOIL PROTECTION OF OTHER TYPES OF MULCH.
WOOD CELLULOSE FIBER MULCH IS USED IN HYDROSEEDING OPERATIONS AND APPLIED AS PART OF THE SLURRY. IT CREATES THE BEST SEED-SOIL CONTACT WHEN APPLIED OVER THE TOP OF (AS A SEPARATE OPERATION) NEWLY SEEDED AREAS. FIBER MULCH DOES NOT ALONE PROVIDE SUFFICIENT PROTECTION ON HIGHLY ERODIBLE SOILS, OR DURING LESS THAN FAVORABLE GROWING CONDITIONS. FIBER MULCH SHOULD NOT BE USED ALONE DURING THE DRY SUMMER MONTHS OR WHEN USED FOR LATE FALL MULCH COVER. USE STRAW MULCH DURING THESE PERIODS AND FIBER MULCH MAY BE USED TO TACK (ANCHOR) THE STRAW MULCH. FIBER MULCH IS WELL SUITED FOR STEEP SLOPES, CRITICAL AREAS, AND AREAS SUSCEPTIBLE TO WIND.

b. CHEMICAL MULCHES, SOIL BINDERS, AND TACKIFIERS
A WIDE RANGE OF SYNTHETIC SPRAY ON MATERIALS ARE MARKETED TO STABILIZE AND PROTECT THE SOIL SURFACE. THESE ARE MIXED WITH WATER AND SPRAYED OVER THE MULCH AND TO THE SOIL. THEY MAY BE USED ALONE IN SOME CASES AS TEMPORARY STABILIZERS, OR IN CONJUNCTION WITH FIBER MULCH, STRAW, OR HAY.
WHEN USED ALONE, MOST CHEMICAL MULCHES DO NOT HAVE THE CAPABILITY TO INSULATE THE SOIL OR RETAIN SOIL MOISTURE THAT ORGANIC MULCHES HAVE.

c. SPECIFICATIONS
FROM TABLE IV-6 SELECT THE TYPE OF MULCH AND RATE OF APPLICATION THAT WILL BEST SUIT THE CONDITIONS AT THE SITE.

d. ANCHORING
DEPENDING ON THE FIELD SITUATION, MULCH MAY NOT STAY IN PLACE BECAUSE OF WIND ACTION OR RAPID WATER RUNOFF. IN SUCH CASES, MULCH IS TO BE ANCHORED MECHANICALLY OR WITH MULCH NETTING.
1. MECHANICAL ANCHORING
APPLY MULCH AND PULL MULCH ANCHORING TOOL OVER THE MULCH. WHEN A DISK IS USED, SET THE DISK STRAIGHT AND PULL ACROSS SLOPE. MULCH MATERIAL SHOULD BE TUCKED INTO THE SOIL ABOUT 3".
2. MULCH NETTING
FOLLOW MANUFACTURER'S RECOMMENDATION WHEN POSITIONING AND STAPLING THE MULCH NETTING IN THE SOIL.

ANTERO'S PREFERRED SEED MIXTURE

HALL'S #1 PASTURE MIXTURE

Species/Contains	Pure Seed	Germ	Origin
Bestfor Intermediate Ryegras	29.95%	90%	OR
Climax Timothy	24.96%	90%	CAN
Annual Ryegrass *	24.92%	90%	OR
Medium Red Clover *	8.99%	90%	OR
Potomac Orchardgrass	9.46%	90%	OR
Other Crop Seeds:	0.01%		* Variety Not Stated
Inert Matter:	0.69%		AMS: 5143
Weed Seeds:	0.02%		

Table IV-1
Recommended Seeding Dates

Planting Dates	Suitability
March 1 - April 15 and August 1 - October 1	Best Seeding Periods
April 15 - August 1	HIGH RISK - moisture stress likely
October 1 - December 1	HIGH RISK - freeze damage to young seedlings
December 1 - March 1	Good seeding period. Dormant seeding

Table IV-2
Acceptable Fertilization Recommendation

Species	N (lbs/ac)	P2O5 (lbs/ac)	Example Rec. (per acre)
Cool Season Grass	40	80	400 lbs. 10-20-20
CS Grass & Legume	30	60	300 lbs. 10-20-20
Temporary Cover	40	40	200 lbs. 19-19-19

Table IV-3
Temporary Cover

Species	Seeding Rate (lbs/acre)	Optimum Seeding Dates	Drainage	pH Range
Annual Ryegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Poorly	5.5 - 7.5
Field Bromegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Mod. Well	6.0 - 7.0
Spring Oats	96	3/1 - 6/15	Well - Poorly	5.5 - 7.0
Sundangrass	40	5/15 - 8/15	Well - Poorly	5.5 - 7.5
Winter Rye	168	8/15 - 10/15	Well - Poorly	5.5 - 7.5
Winter Wheat	180	8/15 - 11/15	Well - Mod. Well	5.5 - 7.0
Japanese Millet	30	6/15 - 8/15	Well	4.5 - 7.0
Redtop	5	3/1 - 6/15	Well	4.0 - 7.5
Annual Ryegrass	26	3/1 - 6/15	Well - Poorly	5.5 - 7.5
Spring Oats	64	3/1 - 6/15	Well - Poorly	5.5 - 7.5

NOTE: *These rates should be increased by 50% if planted April 15 - August 1 and October 1 - March 1.*

Table IV-4A
Permanent Seeding Mixture

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage preference	pH Range
Crownvetch / Tall Fescue	10 - 15 / 30	Well - Mod. Well	5.0 - 7.5
Crownvetch / Perennial Ryegrass	10 - 15 / 20	Well - Mod Well	5.0 - 7.5
Flatpea or Perennial Pea / Tall Fescue	**20 / 15**	**Well - Mod. Well**	**4.0 - 8.0**
Ladino Clover / Serecia Lespedeza / Tall Fescue	30 / 25 / 2	Well - Mod. Well	4.5 - 7.5
Tall Fescue / Ladino Clover / Redtop	*40 / 3 / 3*	*Well - Mod. Well*	*5.0 - 7.5*
Crownvetch / Tall Fescue / Redtop	10 / 20 / 3	Well - Mod. Well	5.0 - 7.5
Tall Fescue / Birdsfoot Trefoil / Redtop	40 / 10 / 3	Well - Mod. Well	5.0 - 7.5
Serecia Lespedeza / Tall Fescue / Redtop	25 / 30 / 3	Well - Mod. Well	4.5 - 7.5
Redtop / Tall Fescue / Creeping Red	30 / 3 / 50	Well - Mod. Well	5.0 - 7.5
Tall Fescue	*50*	*Well - Poorly*	*4.5 - 7.5*
Perennial Ryegrass / Tall Fescue / Lathco Flatpea *	**10 / 15 / 20**	**Well - Poorly**	**5.8 - 8.0**

** 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.*
Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

Table IV-4B
Wildlife and Farm Friendly Seed Mixtures

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage preference	pH Range
KY Bluegrass / Redtop / Ladino Clover or Birdsfoot Trefoil	20 / 3 / 2 / 10	Well - Mod. Well	5.5 - 7.5
Timothy / Alfalfa	5 / 12	Well - Mod. Well	6.5 - 8.0
Timothy / Birdsfoot Trefoil	5 / 8	Well - Poorly	5.5 - 7.5
Orchardgrass / Ladino Clover / Redtop	*10 / 2 / 3*	*Well - Mod. Well*	*5.5 - 7.5*
Orchardgrass / Ladino Clover	*10 / 2*	*Well - Mod. Well*	*5.5 - 7.5*
Orchardgrass / Perennial Ryegrass	*20 / 10*	*Well - Mod. Well*	*5.5 - 7.5*
Creeping Red Fescue / Perennial Ryegrass	**30 / 10**	*Well - Mod. Well*	**5.5 - 7.5**
Orchardgrass or KY Bluegrass	20	Well - Mod. Well	6.0 - 7.5
Birdsfoot Trefoil / Redtop / Orchardgrass	10 / 5 / 20	Well - Mod. Well	5.5 - 7.5
Lathco Flatpea */ Perennial Ryegrass	**30 / 20**	**Well - Mod. Well**	**5.5 - 7.5**
Lathco Flatpea */ Orchardgrass	30 / 20	Well - Mod. Well	5.5 - 7.5

** 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.*
Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

Table IV-5
Lime and Fertilizer Application Table

pH of Soil	Lime in Tons per Acre	Fertilizer, Lbs. per Acre (10-20-20 or Equivalent)
Above 6.0	2	500
5.0 to 6.0	3	500
Below 5.0	4	500

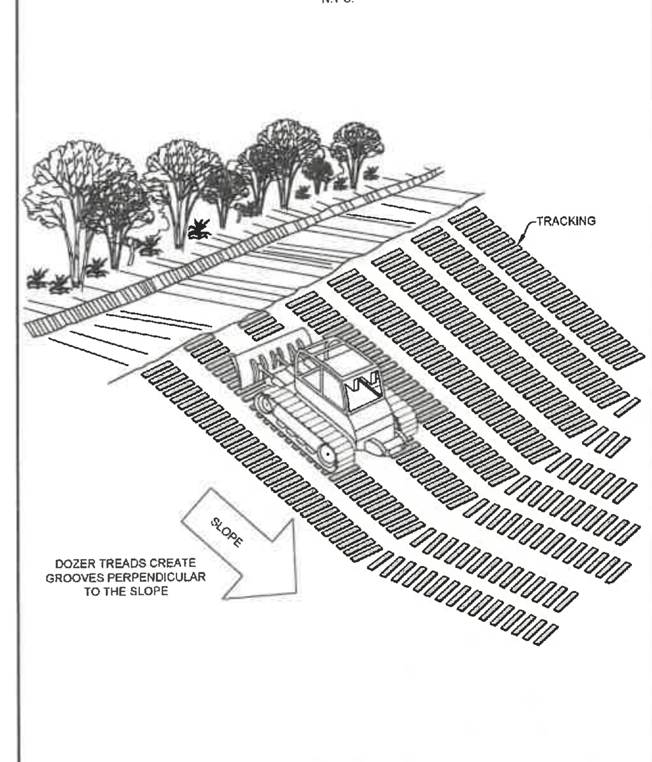
The pH can be determined with a portable pH testing kit or by sending the soil samples to a soil testing laboratory. When 4 tons of lime per acre are applied it must be incorporated into the soil by disking, backblading or tracking up and down the slope.

Table IV-6
Mulch Materials Rates and Uses

Material	Minimum Rates per acre	Coverage	Remarks
Hay or Straw	2 to 3 Tons 100 to 150 bales	Cover 75% to 90% of Surface	Subject to wind blowing or washing unless tied down
Wood Fiber Pulp Fiber Wood - Cellulose Recirculated Paper	1000 to 1500 lbs	Cover all Disturbed Areas	For hydroseeding

SLOPE TRACKING

N.T.S.



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

STANDARD STAKEOUT RIBBON COLOR SCHEME

N.T.S.

Ribbon	Description
Yellow	YELLOW RIBBON: YELLOW RIBBON USED TO INDICATE TOP OF CUTS (C) CUT TO BE DETERMINED AT TIME OF STAKEOUT SLOPE DETERMINED BY SITE DESIGN
Yellow & orange	YELLOW & ORANGE RIBBON: YELLOW AND ORANGE RIBBON USED TO INDICATE GRADE AT TOP OF PAD/POND/PIT
Orange	ORANGE RIBBON: ORANGE RIBBON USED TO INDICATE TOES OF FILLS (F) FILL TO BE DETERMINED AT TIME OF STAKEOUT SLOPE DETERMINED BY SITE DESIGN
Pink	PINK RIBBON: PINK RIBBON USED TO INDICATE TOP HOLE LOCATION PINK RIBBON USED TO INDICATE SURVEY CONTROL LOCATION
Pink & black stripe	PINK & BLACK STRIPE RIBBON: PINK & BLACK STRIPE RIBBON USED TO INDICATE VERTICAL CUT (VC) AT PAD/POND/PIT CORNER OR EDGE PINK & BLACK STRIPE RIBBON USED TO INDICATE VERTICAL FILL (VF) AT PAD/POND/PIT CORNER OR EDGE VERTICAL CUT/VERTICAL FILL TO BE DETERMINED AT TIME OF STAKEOUT
Blue & white stripe	BLUE & WHITE STRIPE RIBBON: BLUE & WHITE STRIPE RIBBON USED TO INDICATE CLEARING LIMITS/CONSTRUCTION LIMITS
Orange & black stripe	ORANGE & BLACK STRIPE RIBBON: ORANGE & BLACK STRIPE RIBBON USED TO INDICATE VERTICAL CUT (VC) AT CENTERLINE OR EDGE OF ACCESS ROAD ORANGE & BLACK STRIPE RIBBON USED TO INDICATE VERTICAL FILL (VF) AT CENTERLINE OR EDGE OF ACCESS ROAD
Pink & white stripe	PINK & WHITE STRIPE RIBBON: PINK & WHITE STRIPE RIBBON USED TO INDICATE EROSION AND SEDIMENT CONTROL STRUCTURES SILT FENCE (SF) REINFORCED FILTER FENCE (RFF) SUPER SILT FENCE (SSF) FILTER SOCK (FS)
Orange & white stripe	ORANGE & WHITE STRIPE RIBBON ORANGE & WHITE STRIPE RIBBON USED TO INDICATE TOPSOIL STOCKPILE LOCATIONS
Blue	BLUE RIBBON: BLUE RIBBON USED TO INDICATE CENTERLINE (CL) DITCH BLUE RIBBON USED TO INDICATE BOTTOM (BTM) SEDIMENT TRAPS

MODIFIED SOURCE: ANTERO RESOURCES CORPORATION

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REVISION	DATE
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Antero Resources

THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

LEGEND
FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

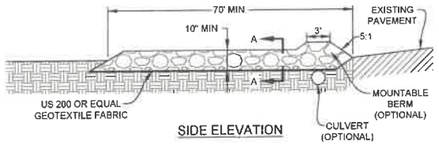
REGISTERED 19578 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: N/A
SHEET 11 OF 12

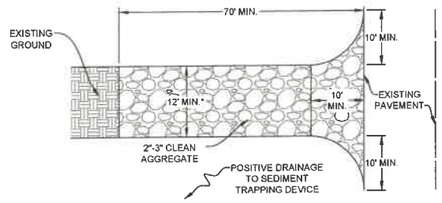
07/14/2023

ROCK CONSTRUCTION ENTRANCE

N.T.S.

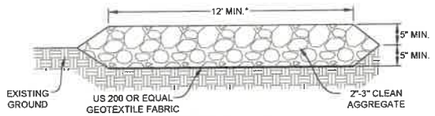


SIDE ELEVATION



*MUST EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION

PLAN VIEW



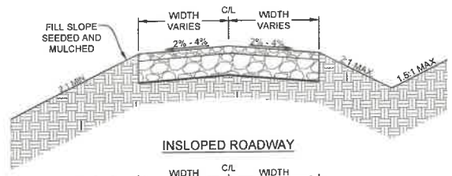
SECTION A-A

MODIFIED) SOURCE: ADAPTED FROM THE 1983 MARYLAND STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL AND VA. DSWC

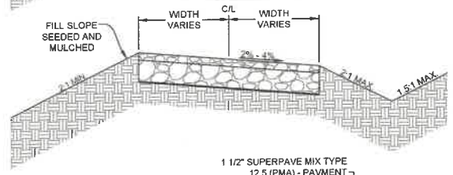
TYPICAL ROAD CROSS-SECTION

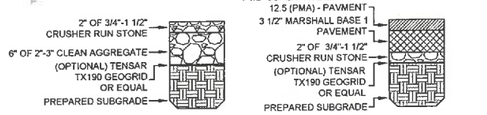
N.T.S.

CROWNED ROADWAY



INSLOPED ROADWAY





GRAVEL SECTION PAVEMENT SECTION

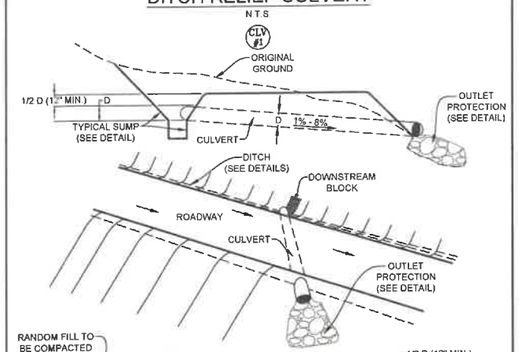
NOTES:
1. CUT AND FILL SLOPES SHALL BE STABILIZED IMMEDIATELY UPON COMPLETION OF ROADWAY GRADING.
2. A DURABLE TOP DRESSING SHALL BE PROVIDED FOR SOILS HAVING LOW STRENGTH.
3. ROADSIDE DITCHES SHALL BE PROVIDED WITH ADEQUATE PROTECTIVE LINING (SEE DETAIL).
4. ADEQUATELY SIZED CULVERTS (SEE DETAIL) OR OTHER SUITABLE CROSS DRAINS SHALL BE PROVIDED AT ALL SEEPS, SPRINGS, AND DRAINAGEWAYS.
5. ROADWAY SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED ROADWAYS, DITCHES, OR CROSS DRAINS SHALL BE REPAIRED IMMEDIATELY.
6. THE ASPHALT PAVEMENT SECTION SHOWN IS FOR BIDDING PURPOSES ONLY. AN ASPHALT PAVING DESIGN SHALL BE COMPLETED PRIOR TO INSTALLATION.

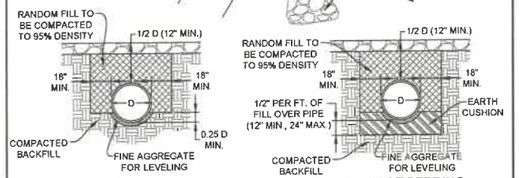
MODIFIED) SOURCE: PA DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF OIL AND GAS MANAGEMENT 5500-FM-0G0111 APPENDIX A, BMP CONSTRUCTION DETAILS

DITCH RELIEF CULVERT

N.T.S.

CLV #1





CULVERT BEDDING

CULVERT BEDDING ON ROCK FOUNDATION

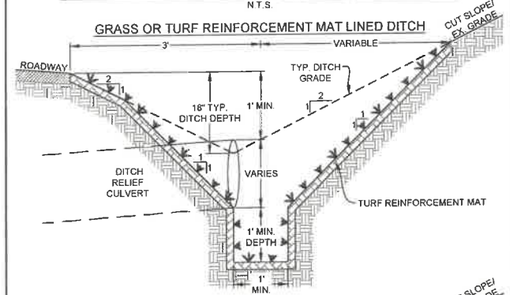
NOTES:
1. CULVERTS SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS.
2. CULVERTS SHALL BE INSTALLED FROM 0°-30° TO THE CENTERLINE OF THE DITCH TO MINIMIZE TURBULENCE AT THE INLET.
3. ALL CULVERTS SHALL BE FOUNDED UPON A CLEAN EARTHEN SURFACE. A ROCK FOUNDATION SHALL BE OVER EXCAVATED A MINIMUM OF 12" AND BACKFILLED WITH EARTHEN MATERIAL.
4. THE EARTHEN TRENCH OF THE CULVERT SHALL BE SHAPED FOR THE CULVERT PRIOR TO PLACING.
5. LIMESTONE DUST OR SAND SHALL BE USED AS FINE AGGREGATE FOR LEVELING AND IF NECESSARY FOR FILLING AROUND CULVERT CORRUGATIONS.
6. ALL BACKFILL MATERIAL SHALL BE COMPACTED EARTHEN MATERIAL FOUND ONSITE. IF MATERIAL IS NOT AVAILABLE ONSITE, 1/2"-3/4" CRUSHER RUN STONE SHALL BE INSTALLED AND COMPACTED.
7. IF THE CULVERT TRENCH IS SATURATED OR HAS STANDING WATER, #57 STONE SHALL BE USED TO BED THE PIPE TO ACHIEVE THE DESIRED PIPE ELEVATION.

MODIFIED) SOURCE: WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL, OFFICE OF OIL AND GAS AND WVDOH

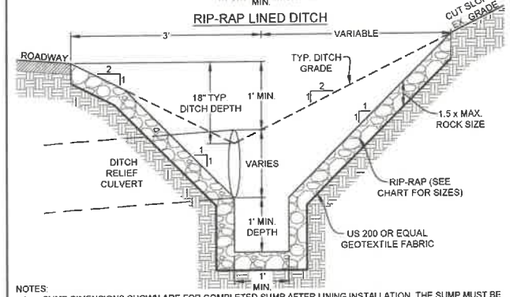
TYPICAL SUMP AT DITCH RELIEF CULVERT

N.T.S.

GRASS OR TURF REINFORCEMENT MAT LINED DITCH



RIP-RAP LINED DITCH

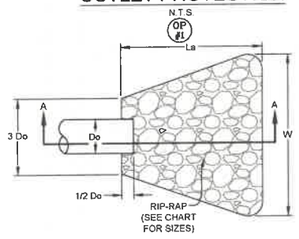


NOTES:
1. SUMP DIMENSIONS SHOWN ARE FOR COMPLETED SUMP AFTER LINING INSTALLATION. THE SUMP MUST BE OVER-EXCAVATED A SUFFICIENT AMOUNT TO ALLOW FOR THE REQUIRED LINING TO BE PLACED WITHIN THE SUMP SO THE CULVERT IS NOT BLOCKED OR CLOGGED, WHILE MAINTAINING THE SPECIFIED FINISHED DIMENSIONS.
2. SUMP DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. SUMP LINES SHALL BE CLEANED WHENEVER TOTAL SUMP DEPTH IS REDUCED BY 25% AT ANY LOCATION. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO SUMP WITHOUT FURTHER DAMAGE.

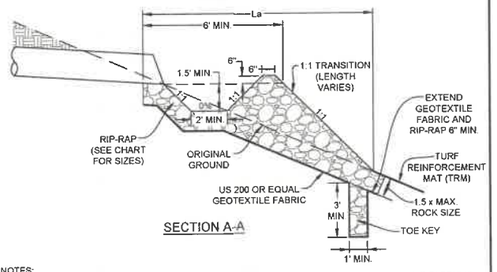
OUTLET PROTECTION

N.T.S.

OP #1



PLAN VIEW



SECTION A-A

NOTES:
1. AREA TO BE INSPECTED PRIOR TO FABRIC AND STONE PLACEMENT AND VERIFIED THAT FABRIC IS APPROPRIATELY TRENCHED PRIOR TO STONE PLACEMENT.
2. ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN IN CHART. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.
3. ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIP-RAP WITHIN THE APRON SHALL BE RESTORED IMMEDIATELY.
4. EXTEND RIP-RAP ON BACK SIDE OF APRON TO AT LEAST 1/2 DIAMETER OF PIPE ON BOTH SIDES TO PREVENT SCOUR AROUND THE PIPE.
5. TURF REINFORCEMENT MAT (TRM) SHALL BE INSTALLED FROM OUTLET PROTECTION TO DOWNSTREAM EROSION AND SEDIMENT CONTROL TO PREVENT SOIL RILLING.

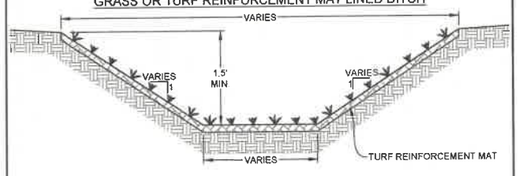
MODIFIED) SOURCE: WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL

TYPICAL TRAPEZOIDAL DITCH

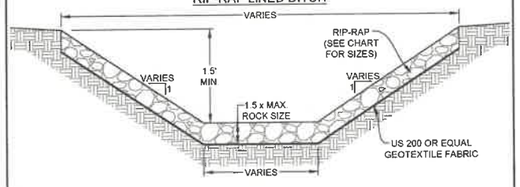
N.T.S.

DL #1

GRASS OR TURF REINFORCEMENT MAT LINED DITCH



RIP-RAP LINED DITCH

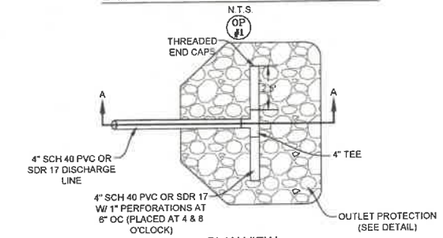


NOTES:
1. ALL DITCH LINE PROTECTION SHALL BE INSTALLED AS RECOMMENDED IN THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE (BMP) MANUAL. DITCH LINE PROTECTION SHALL BE BASED ON THE FOLLOWING GRADES:
   1.1. LESS THAN 3% = GRASS
   1.2. 3%-9% = TURF REINFORCEMENT MAT OR GRASS WITH ROLLED EROSION CONTROL PRODUCTS (R E C P.)
   1.3. GREATER THAN 9% = RIP-RAP. SEE CHART FOR SIZES.
2. TYPICAL OUTLET PROTECTION SHALL BE INSTALLED AT DOWNSTREAM END OF ALL DITCH LINES. SEE OUTLET PROTECTION DETAIL.
3. DITCH DIMENSIONS SHOWN ARE FOR COMPLETED DITCH AFTER LINING INSTALLATION. THE DITCH MUST BE OVER-EXCAVATED A SUFFICIENT AMOUNT TO ALLOW FOR THE REQUIRED LINING TO BE PLACED WITHIN THE DITCH WHILE MAINTAINING THE SPECIFIED FINISHED DIMENSIONS.
4. DITCH DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. DITCH LINES SHALL BE CLEANED WHENEVER TOTAL DITCH DEPTH IS REDUCED BY 25% AT ANY LOCATION. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO DITCH WITHOUT FURTHER DAMAGE.
5. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.
6. IF HIGH EROSIVE SOILS ARE ENCOUNTERED DURING CONSTRUCTION, THE ENGINEER SHOULD BE CONTACTED FOR FURTHER EVALUATION.

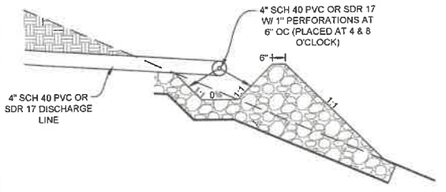
OUTLET PROTECTION W/ DEWATERING PIPE DIFFUSER

N.T.S.

OP #1



PLAN VIEW



SECTION A-A

NOTES:
1. AREA TO BE INSPECTED PRIOR TO FABRIC AND STONE PLACEMENT AND VERIFIED THAT FABRIC IS APPROPRIATELY TRENCHED PRIOR TO STONE PLACEMENT.
2. DEWATERING PIPE DIFFUSER SHALL BE INSTALLED SO THAT ALL PERFORATIONS ARE PLACED 6" ON CENTER AT 4 & 8 O'CLOCK TO PREVENT EROSION OUTSIDE OF THE OUTLET PROTECTION.
3. BOTH ENDS OF DEWATERING PIPE DIFFUSER TO HAVE THREADED END CAPS FOR CLEAN OUT PURPOSES.

APPROVED
WVDEP OOG
Modification
7/10/2023

07/14/2023

NAVITUS ENERGY ENGINEERING
Telephone: (888) 662-4185 | www.NavitusEnrg.com

REVISION	DATE
REVISED PER SLIDE	05-24-2023

Antero Resources

THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

LEGEND

FURBEE

WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

CHRIS S. KING REGISTERED 19578 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
05/24/2023

DATE: 04/18/2022
SCALE: N/A
SHEET 12 OF 12

Jon McEvers 6/6/23

FURBEE WELL PAD & WATER CONTAINMENT PAD

AS-BUILT EROSION & SEDIMENT CONTROL IMPROVEMENT PLANS

GREEN DISTRICT, WETZEL COUNTY, WV
LITTLE MUSRINGUM-MIDDLE ISLAND WATERSHED

LOCATION COORDINATES:

ACCESS ROAD "A" ENTRANCE
LATITUDE: 39.554902 LONGITUDE: -80.730989 (NAD 83)
LATITUDE: 39.554822 LONGITUDE: -80.731168 (NAD 27)
N 4378392.15 E 523111.11 (UTM ZONE 17 METERS)

ACCESS ROAD "B" ENTRANCE
LATITUDE: 39.557532 LONGITUDE: -80.734287 (NAD 83)
LATITUDE: 39.557453 LONGITUDE: -80.734465 (NAD 27)
N 4378683.19 E 522828.91 (UTM ZONE 17 METERS)

CENTER OF TANK
LATITUDE: 39.556160 LONGITUDE: -80.730417 (NAD 83)
LATITUDE: 39.556080 LONGITUDE: -80.730596 (NAD 27)
N 4378531.91 E 523159.83 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.556580 LONGITUDE: -80.731075 (NAD 83)
LATITUDE: 39.556780 LONGITUDE: -80.731254 (NAD 27)
N 4378611.65 E 523103.06 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:

THE SLIDE REPAIR IS BEING CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:

ANTERO RESOURCES CORPORATION HAS OBTAINED AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

FLOODPLAIN NOTES:

THE SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #54103C0190C.

GEOTECHNICAL NOTES:

GEOTECHNICAL CONSULTATION WILL TAKE PLACE DURING SLIP REPAIR CONSTRUCTION AS NECESSARY.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN SEPTEMBER, 2019 BY ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE SEPTEMBER 25, 2019 FIGURE 2 MAP WAS PREPARED BY ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC. AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP.

PROJECT CONTACTS:

OPERATOR:
ANTERO RESOURCES CORPORATION
535 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE: (304) 842-4100
FAX: (304) 842-4102

ELI WAGONER – ENVIRONMENTAL ENGINEER & REGULATORY MANAGER
OFFICE: (304) 842-4068 CELL: (304) 476-9770

JON McEVERS – SVP OPERATIONS
OFFICE: (303) 357-6799

AARON KUNZLER – CONSTRUCTION MANAGER
CELL: (304) 842-4191

ROBERT WIRKS – DESIGN MANAGER
OFFICE: (304) 842-4100 CELL: (304) 627-7405

ROBERT KODY – UTILITY COORDINATOR
CELL: (304) 719-5199

DAVID PATSY – LAND AGENT
CELL: (304) 476-6090

ENGINEER/SURVEYOR:
NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE – PROJECT MANAGER/ENGINEER
OFFICE: (888) 662-4185 CELL: (540) 686-6747

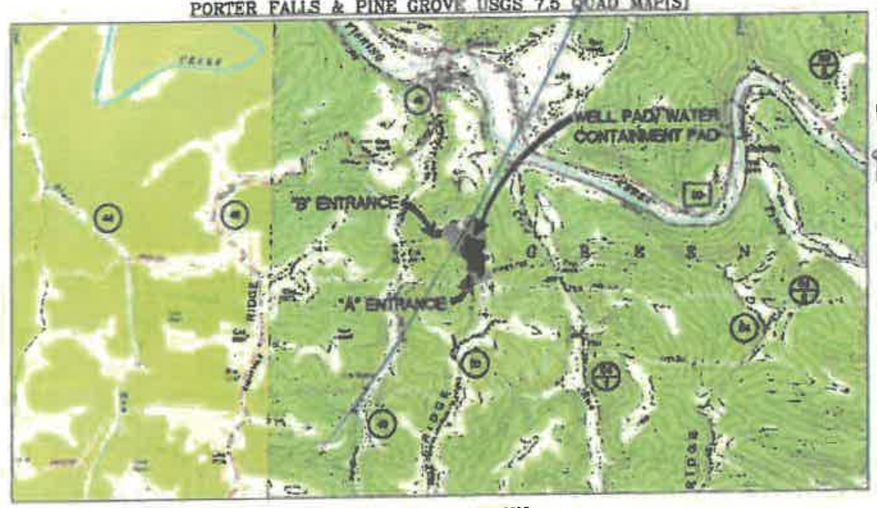
ENVIRONMENTAL:
ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.
VALERIE CLARKSTON – ECOLOGIST
OFFICE: (304) 760-5803 CELL: (513) 382-09257

GEOTECHNICAL:
PENNSYLVANIA SOIL & ROCK, INC.
CHRISTOPHER W. SAMIOS – PROJECT ENGINEER
(412) 372-4000 CELL: (412) 589-0662

NOTES:

1. ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETE AND PERMANENTLY STABILIZED. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AFTER EACH RUNOFF EVENT IN EXCESS OF 0.5" AND ON A BIWEEKLY BASIS.
2. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS PAVEMENT OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.
3. ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
4. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.
5. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF MAY 24, 2023. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATES.
6. THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
7. THE EXISTING EGRESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.

PORTER FALLS & PINE GROVE USGS 7.5 QUAD MAP(S)

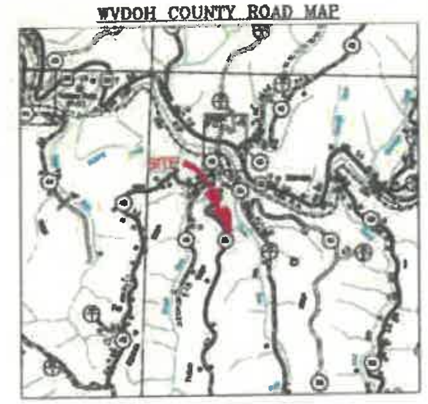


WEST VIRGINIA STATE PLANE COORDINATE SYSTEM NORTH ZONE, NAD83 ELEVATION BASED ON NAVD88 ESTABLISHED BY SURVEY GRADE GPS & OPUS POST-PROCESSING

WEST VIRGINIA COUNTY MAP

(NOT TO SCALE)

WVDOH COUNTY ROAD MAP



AS-BUILT CERTIFICATIONS:

THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CSR 35-8.

MISS Utility of West Virginia
1-800-245-4848
West Virginia State Law
(Section XIV: Chapter 24-C)
Requires that you call two business days before you dig in the state of West Virginia.
IT'S THE LAW!!

SHEET INDEX:

FURBEE LIMITS OF DISTURBANCE AREA (AC)			
Total Site	Permitted	Modification	Total
Access Road "A"	1.79	0.00	1.79
Access Road "B"	3.15	0.00	3.15
Well Pad & Water Containment Pad	13.86	0.00	13.86
Excess/Topsoil Material Stockpiles	11.29	3.10	14.39
Total Affected Area	30.09	3.10	33.19
Total Wooded Acres Disturbed	0.00	2.61	2.61
Impacts to Antero Resources Corp. TM 17-1			
Access Road "A"	1.79	0.00	1.79
Access Road "B"	3.11	0.00	3.11
Well Pad & Water Containment Pad	3.64	0.00	3.64
Excess/Topsoil Material Stockpiles	0.57	0.66	1.23
Total Affected Area	9.11	0.66	9.77
Total Wooded Acres Disturbed	0.00	0.46	0.46
Impacts to Antero Resources Corp. TM 17-43			
Access Road "B"	0.04	0.00	0.04
Well Pad & Water Containment Pad	10.22	0.00	10.22
Excess/Topsoil Material Stockpiles	10.72	2.12	12.84
Total Affected Area	20.98	2.12	23.10
Total Wooded Acres Disturbed	0.00	2.01	2.01
Impacts to Donald L. Mason TM 13-69.1			
Excess/Topsoil Material Stockpiles	0.00	0.32	0.32
Total Affected Area	0.00	0.32	0.32
Total Wooded Acres Disturbed	0.00	0.14	0.14

FURBEE WETLAND IMPACT (SQUARE FEET)			
Wetland and Impact Cause	Fill (SF)	Total Impact (SF)	Total Impact (AC)
Wetland 05 (Slide)	883	883	0.023
Wetland 024 (Slide)	375	375	0.009

FURBEE EPHEMERAL STREAM IMPACT (LINEAR FEET)						
Stream and Impact Cause	Permanent Impacts: Culvert / Fill (LF)	Permanent Impacts: Inlets/Outlets Structures (LF)	Total Permanent Impact (LF)	Temp. Impacts: Cofferdam/ E&S Controls (LF)	Temp. Impacts: Distance To L.O.D. (LF)	Total Temp. Impact (LF)
Stream 09 (Slide)	0	0	0	0	295	295
Stream 10 (Slide)	0	0	0	0	27	27
Stream 11 (Slide)	0	0	0	0	60	60

FURBEE DITCH IMPACT (LINEAR FEET)						
Stream and Impact Cause	Permanent Impacts: Culvert / Fill (LF)	Permanent Impacts: Inlets/Outlets Structures (LF)	Total Permanent Impact (LF)	Temp. Impacts: Cofferdam/ E&S Controls (LF)	Temp. Impacts: Distance To L.O.D. (LF)	Total Temp. Impact (LF)
Ditch 01 (Slide)	0	0	0	0	72	72

Well Name	WV North NAD 27	NAD 27 Lat & Long	UTM (NAD 83) Zone 17	NAD 83 Lat & Long
	Permitted Location			
[illegible] UNIT 2H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 1H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 2H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 1H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 2H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 1H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 1H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 2H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 1H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 2H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 1H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
[illegible] UNIT 2H	N [illegible] E [illegible]	LAT 39-33-[illegible] LONG -80-43-[illegible]	N [illegible] E [illegible]	LAT [illegible] LONG [illegible]
Furbee UNIT 5H	N 357270.70 E [illegible]	LAT 39-33-[illegible] LONG -80-43-53.0642	N [illegible] E 523075.84	LAT 39-33-24.3571 LONG -80-43-53.0114
Well Pad Elevation		[illegible]		

IMPACTS SHOWN BELOW WERE PERMITTED PREVIOUSLY UNDER THE FURBEE WELL PAD DESIGN

FURBEE WETLAND IMPACT (SQUARE FEET)			
Wetland and Impact Cause	Fill (SF)	Total Impact (SF)	Total Impact (AC)
Wetland 02 (Stockpile "A")	137	137	0.00
Wetland 03 (Well Pad & Water Containment Pad)	1,669	1,669	0.04

FURBEE EPHEMERAL STREAM IMPACT (LINEAR FEET)				
Stream and Impact Cause	Permanent Impacts: Culvert / Fill (LF)	Permanent Impacts: Inlets/Outlets Structures (LF)	Temp. Impacts: Cofferdam/ E&S Controls (LF)	Total Impact (LF)
Stream 12 (Well Pad & Water Containment Pad)	33	0	15	48

NAVITUS ENERGY ENGINEERING
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DATE	REVISION
05-24-2023	REVISED PER SLIDE

Antero
THIS DOCUMENT WAS PREPARED FOR: ANTERO RESOURCES CORPORATION

COVER SHEET
FURBEE
WELL PAD & WATER CONTAINMENT PAD
GREEN DISTRICT
WETZEL COUNTY, WEST VIRGINIA

05/24/2023

DATE: 04/18/2022
SCALE: AS SHOWN
SHEET 1 OF 12

Stephen Mccoy Digitally signed by Stephen Mccoy Date: 2023.05.26 11:06:51 -04'00'

RECEIVED
Office of Oil and Gas
JUN 13 2023
WV Department of Environmental Protection

07/14/2023