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west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://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 ECKLEBERRY 1H  
47-103-03492-00-00

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: ECKLEBERRY 1H  
Farm Name: JAMES ALLEN SELL  
U.S. WELL NUMBER: 47-103-03492-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 7/10/2023

07/14/2023

**LOCATION COORDINATES:**

ACCESS ROAD "A" ENTRANCE  
 LATITUDE: 39.554902 LONGITUDE: -80.730989 (NAD 83)  
 LONGITUDE: 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)  
 LONGITUDE: 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)  
 LONGITUDE: 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)  
 LONGITUDE: 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:**

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) 886-8747

OPERATOR:  
 ANTERO RESOURCES CORPORATION  
 535 WHITE OAKS BLVD.  
 BRIDGEPORT, WV 28330  
 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

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:**

- 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.
- 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.
- ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
- ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDDED.
- 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.
- THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
- THE EXISTING EGRESSSES 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.

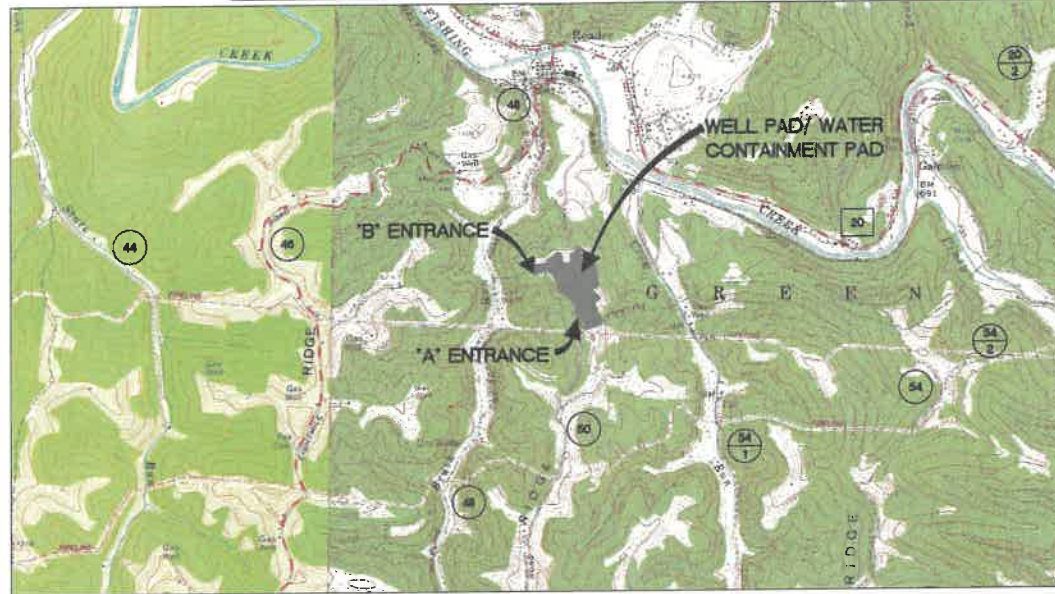
THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

# FURBEE WELL PAD & WATER CONTAINMENT PAD

## AS-BUILT EROSION & SEDIMENT CONTROL IMPROVEMENT PLANS

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

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



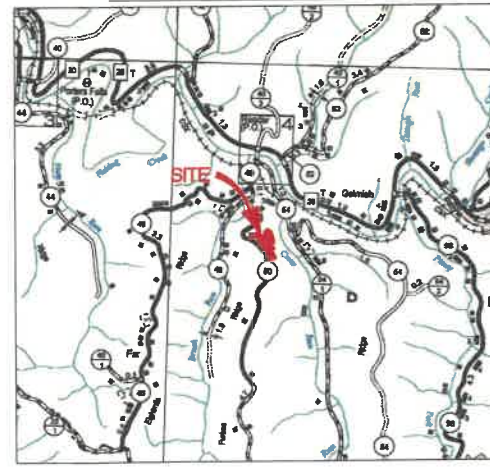
SCALE: 1" = 2000'

WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

WVDOH COUNTY ROAD MAP



SCALE: 1" = 5000'

**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.

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:**

- COVER SHEET
- NOTES
- LEGEND
- OVERALL PLAN SHEET INDEX
- ACCESS ROAD, WELL PAD, & WATER CONTAINMENT PAD AS-BUILT PLAN
- ACCESS ROAD AS-BUILT PROFILES
- WELL PAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT SECTIONS
- STOCKPILE AREA AS-BUILT SECTIONS
- CONSTRUCTION DETAILS

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
<b>Total Affected Area</b>	<b>30.09</b>	<b>3.10</b>	<b>33.19</b>
Total Wooded Acres Disturbed	0.00	2.61	2.61

Impacts to Antero Resources Corp. TM 17-1			
Total Site	Permitted	Modification	Total
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
<b>Total Affected Area</b>	<b>9.11</b>	<b>0.66</b>	<b>9.77</b>
Total Wooded Acres Disturbed	0.00	0.46	0.46

Impacts to Antero Resources Corp. TM 17-12			
Total Site	Permitted	Modification	Total
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
<b>Total Affected Area</b>	<b>20.98</b>	<b>2.12</b>	<b>23.10</b>
Total Wooded Acres Disturbed	0.00	2.01	2.01

Impacts to Donald L. Mason TM 13-69.1			
Total Site	Permitted	Modification	Total
Excess/Topsoil Material Stockpiles	0.00	0.32	0.32
<b>Total Affected Area</b>	<b>0.00</b>	<b>0.32</b>	<b>0.32</b>
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

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

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

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		UTM (METERS) ZONE 17	
	NAD 27 Lat & Long	NAD 27 Lat & Long	NAD 83 Lat & Long	NAD 83 Lat & Long
Eckleberry UNIT 2H	N 387463.73	E 1652791.57	18T UTM 18T UTM	18T UTM 18T UTM
Eckleberry UNIT 1H	N 387448.25	E 1652795.48	18T UTM 18T UTM	18T UTM 18T UTM
Reader UNIT 2H	N 387434.77	E 1652799.39	18T UTM 18T UTM	18T UTM 18T UTM
Reader UNIT 1H	N 387420.28	E 1652803.30	18T UTM 18T UTM	18T UTM 18T UTM
Lenny UNIT 2H	N 387405.80	E 1652807.21	18T UTM 18T UTM	18T UTM 18T UTM
Lenny UNIT 1H	N 387391.32	E 1652811.11	18T UTM 18T UTM	18T UTM 18T UTM
Viewer UNIT 2H	N 387285.55	E 1652804.21	18T UTM 18T UTM	18T UTM 18T UTM
Viewer UNIT 1H	N 387271.06	E 1652808.12	18T UTM 18T UTM	18T UTM 18T UTM
Gauss UNIT 2H	N 387203.02	E 1652912.70	18T UTM 18T UTM	18T UTM 18T UTM
Gauss UNIT 1H	N 387191.21	E 1652916.61	18T UTM 18T UTM	18T UTM 18T UTM
Makar UNIT 2H	N 387179.39	E 1652920.52	18T UTM 18T UTM	18T UTM 18T UTM
Makar UNIT 1H	N 387167.58	E 1652924.43	18T UTM 18T UTM	18T UTM 18T UTM
Furbie UNIT 2H	N 387270.70	E 1652761.06	18T UTM 18T UTM	18T UTM 18T UTM
Furbie UNIT 1H	N 387256.81	E 1652765.97	18T UTM 18T UTM	18T UTM 18T UTM

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

Stream and Impact Cause	Permanent Impacts		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 12 (Well Pad & Water Containment Pad)	33	0	15	48	48

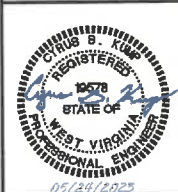
**NAVITUS**  
 ENERGY ENGINEERING

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

DATE	REVISION
05-24-2023 <td>REVISED PER SLIDE</td>	REVISED PER SLIDE

**Antero**  
 THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

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



DATE: 04/18/2022

SCALE: AS SHOWN

SHEET 1 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. TREE LINE	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

**APPROVED WVDEP OOG**  
Modification  
7/10/2023

DATE	REVISION
06-24-2023	REVISED PER SLIDE

**Antero**  
resources  
THIS DOCUMENT WAS PREPARED FOR:  
ANTERO RESOURCES CORPORATION

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



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

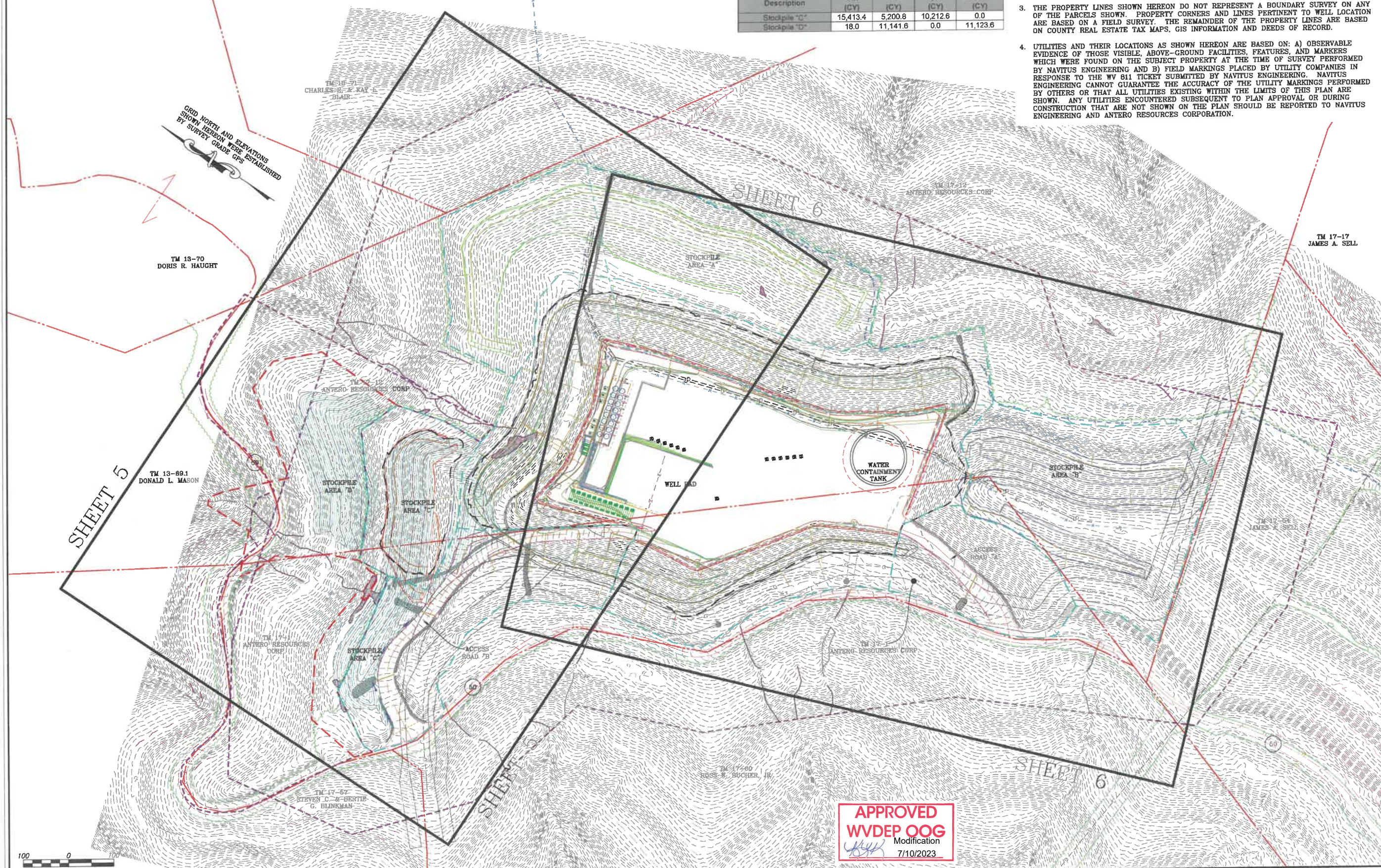
07/14/2023

# 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 TV 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 13-89.1  
DONALD L. MASON

TM 18-71  
CHARLES R. & KAY A. BLAIR

TM 13-15  
ANTERO RESOURCES CORP

TM 17-77  
ANTERO RESOURCES CORP

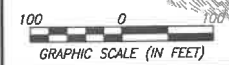
TM 17-67  
STEVEN C. & BERTIE G. BLINKMAN

TM 17-60  
ROSS W. BUCHER, JR.

TM 17-77  
ANTERO RESOURCES CORP

TM 17-17  
JAMES A. SELL

TM 17-68  
JAMES A. SELL



**APPROVED**  
**WV DEP OOG**  
Modification  
7/10/2023

07/14/2023

**NAVITUS**  
ENERGY ENGINEERING  
Telephone: (888) 862-4195 | www.NavitusEng.com

DATE	REVISION
06-24-2023	REVISED PER SLIDE

**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

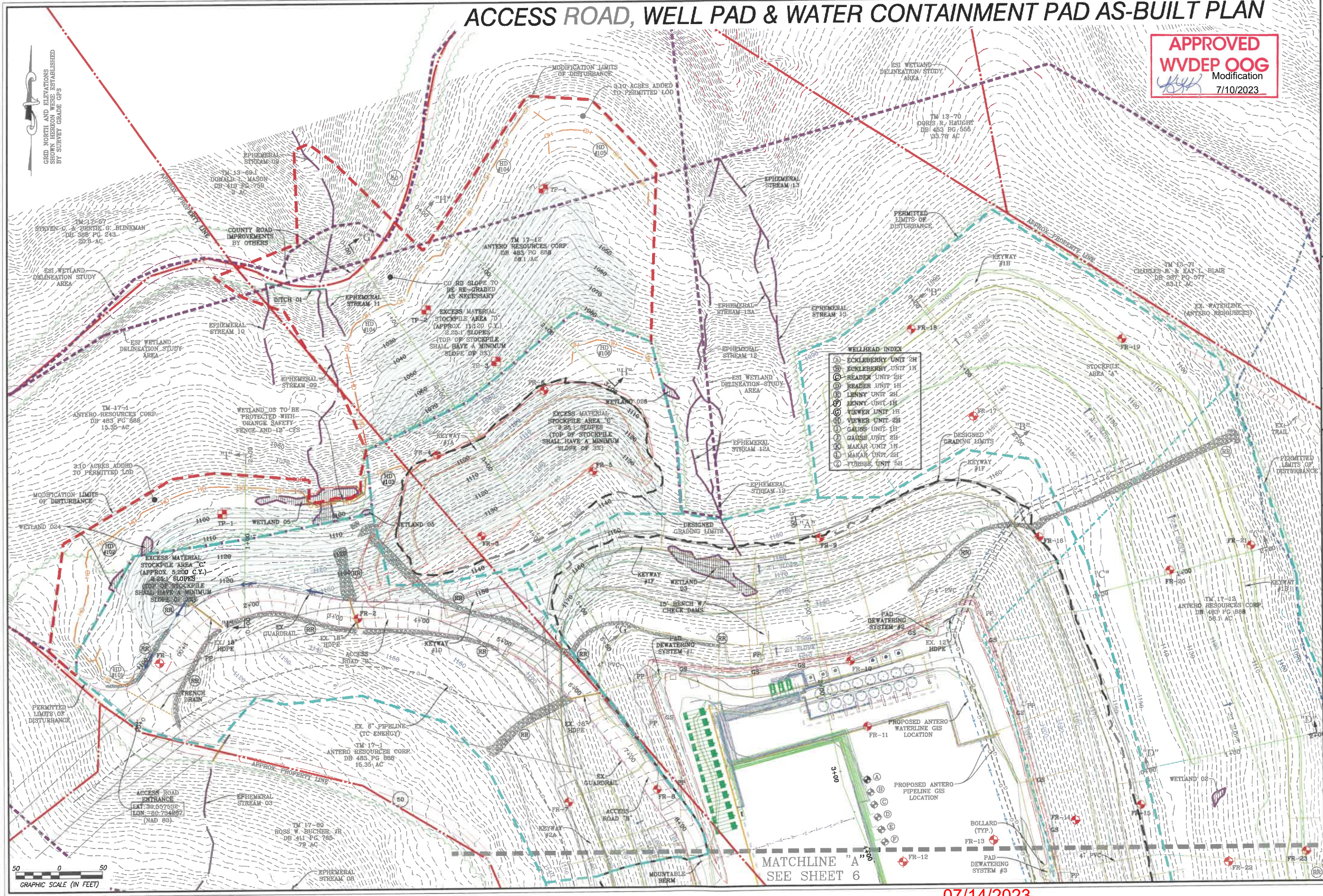


DATE: 04/18/2022  
SCALE: 1" = 100'  
SHEET 4 OF 12

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

**APPROVED**  
**WVDEP OOG**  
 Modification  
 7/10/2023

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



- 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

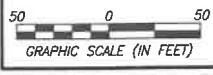
DATE	REVISION
05-24-2023	REVISED PER SLIDE

**Antero**  
 resources  
 THIS DOCUMENT WAS PREPARED FOR:  
 ANTERO RESOURCES CORPORATION

ACCESS ROAD, WELL PAD &  
 WATER CONTAINMENT PAD AS-BUILT PLAN  
**FURBEE**  
 WELL PAD & WATER CONTAINMENT PAD  
 GREEN DISTRICT  
 WETZEL COUNTY, WEST VIRGINIA



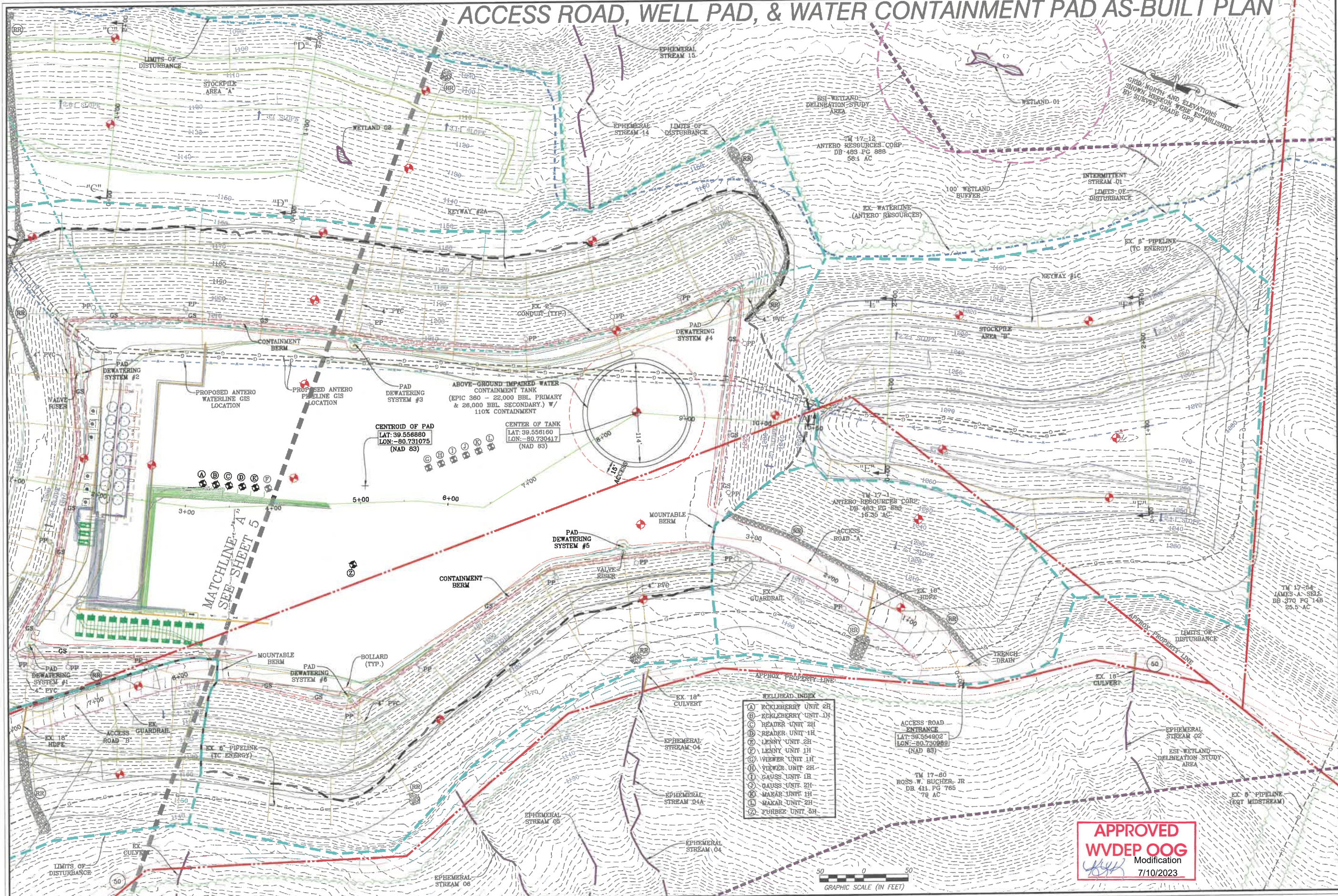
DATE: 04/18/2022  
 SCALE: 1" = 50'  
 SHEET 5 OF 12



MATCHLINE "A"  
 SEE SHEET 6

07/14/2023

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

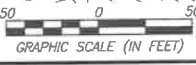


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LON: -80.731075  
(NAD 83)

CENTER OF TANK  
LAT: 39.558160  
LON: -80.730417  
(NAD 83)

- WELLHEAD INDEX**
- (A) ROCKLEBERRY UNIT 2H
  - (B) ROCKLEBERRY 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 2H

**APPROVED WVDEP OOG**  
Modification  
7/10/2023



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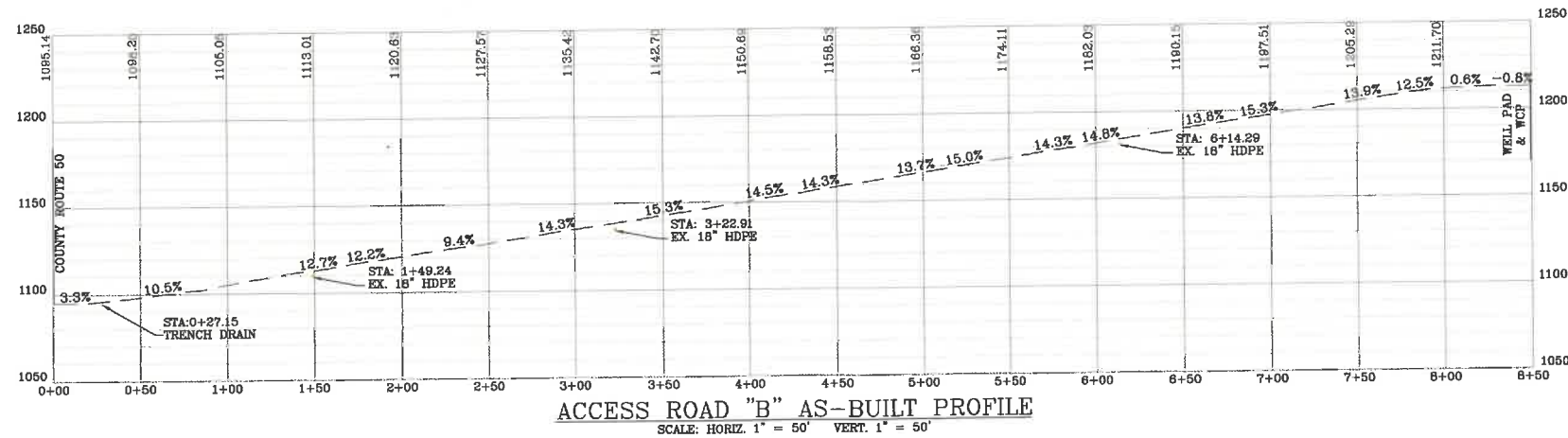
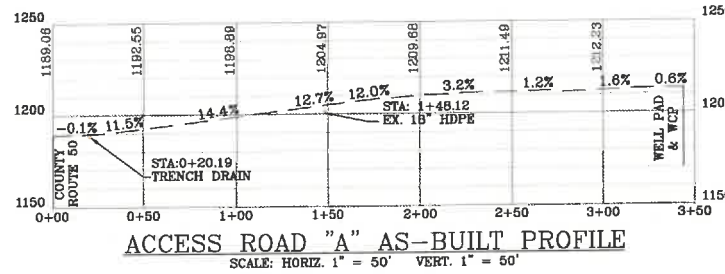
ACCESS ROAD, WELL PAD &  
WATER CONTAINMENT PAD AS-BUILT PLAN  
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WELL PAD & WATER CONTAINMENT PAD  
GREEN DISTRICT  
WETZEL COUNTY, WEST VIRGINIA



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SHEET 6 OF 12

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# ACCESS ROAD AS-BUILT PROFILES



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WELL PAD & WATER CONTAINMENT PAD  
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DATE: 04/18/2022  
SCALE: AS SHOWN  
SHEET 7 OF 12

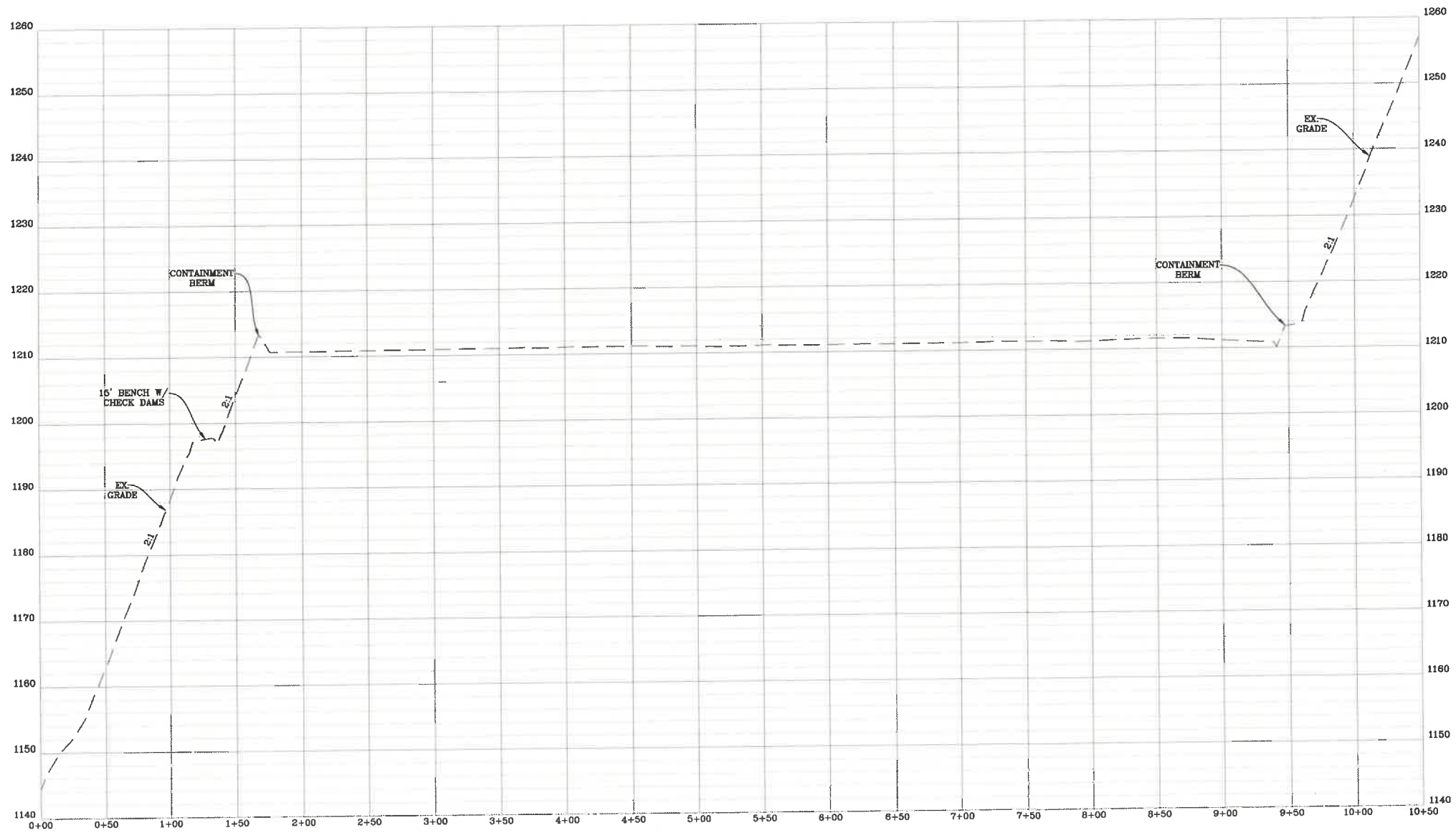
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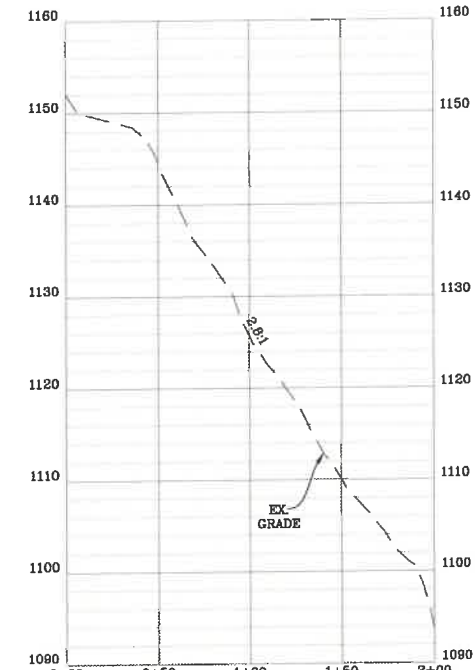


# WELL PAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT SECTIONS

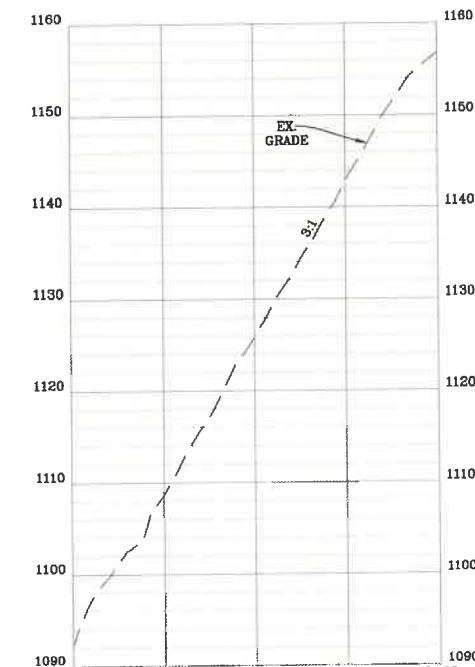
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WELL PAD & WATER CONTAINMENT PAD AS-BUILT CROSS-SECTION "A-A"  
 SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



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'

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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

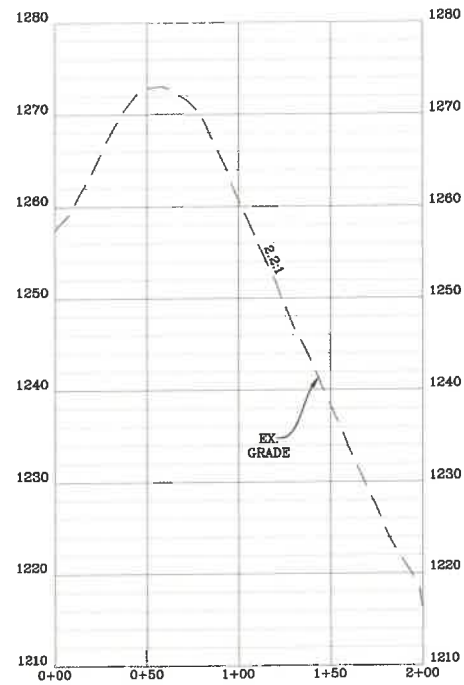


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 SHEET 8 OF 12

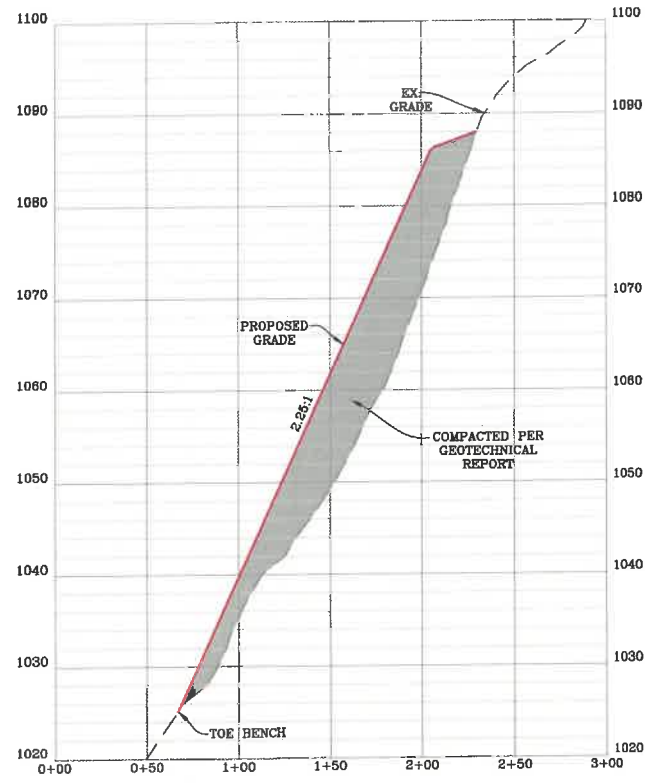
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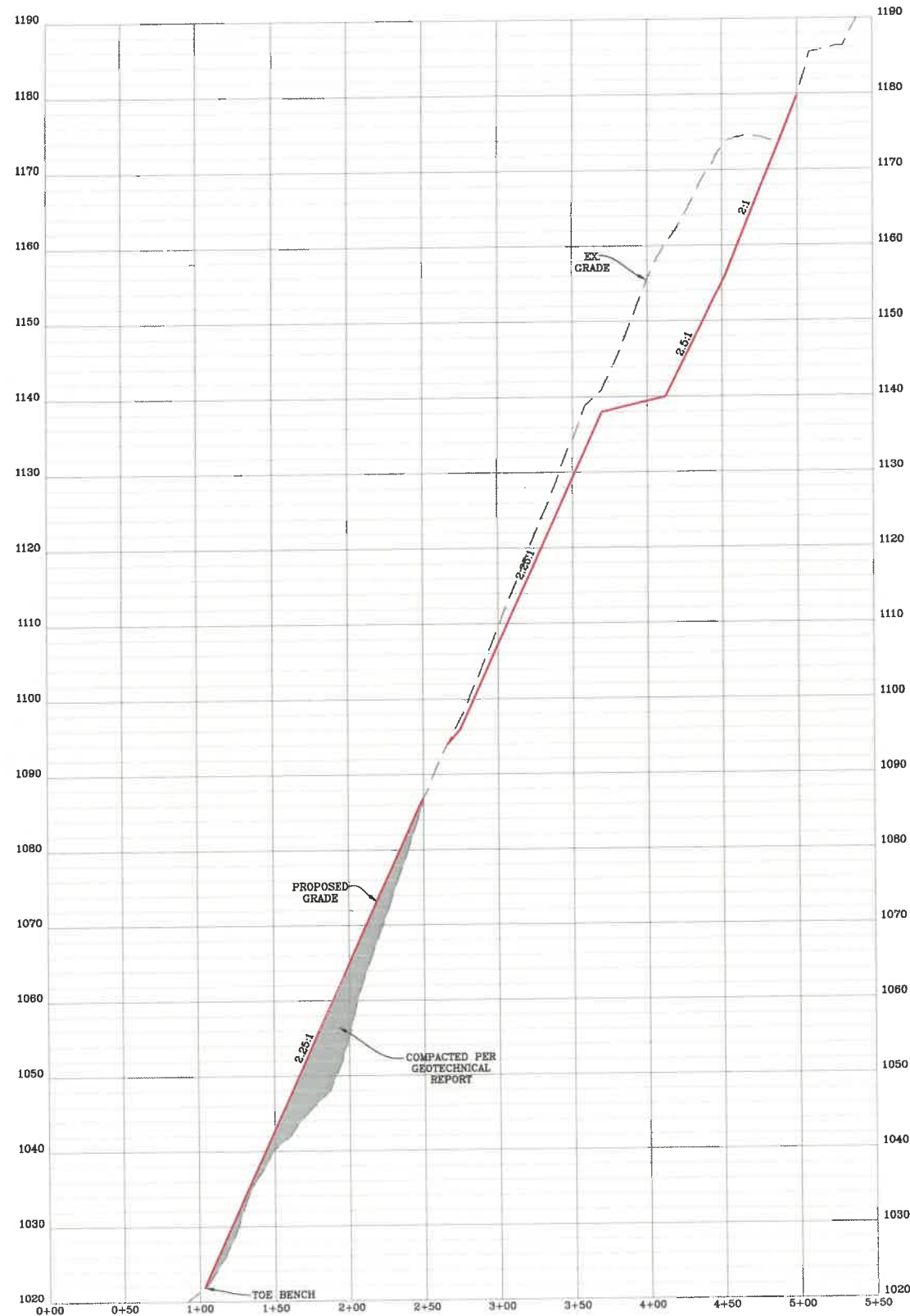
# STOCKPILE AREA AS-BUILT SECTIONS



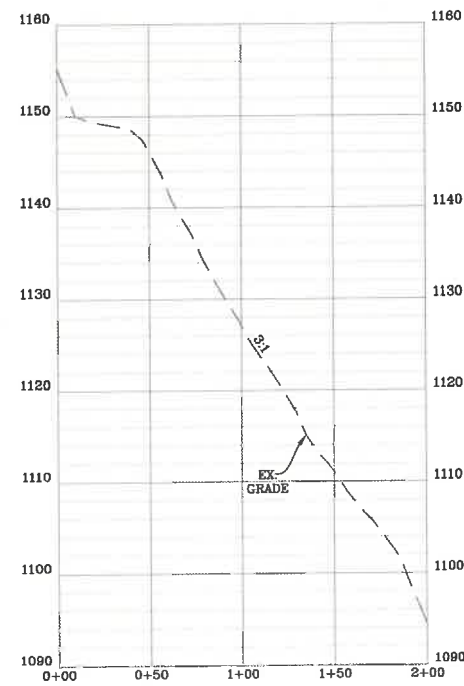
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 CROSS-SECTION "E-E"  
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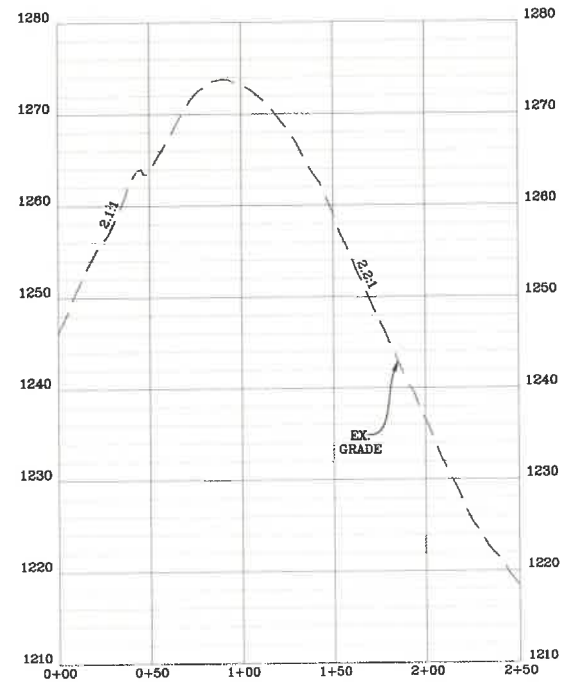
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 CROSS-SECTION "H-H"  
 SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



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'

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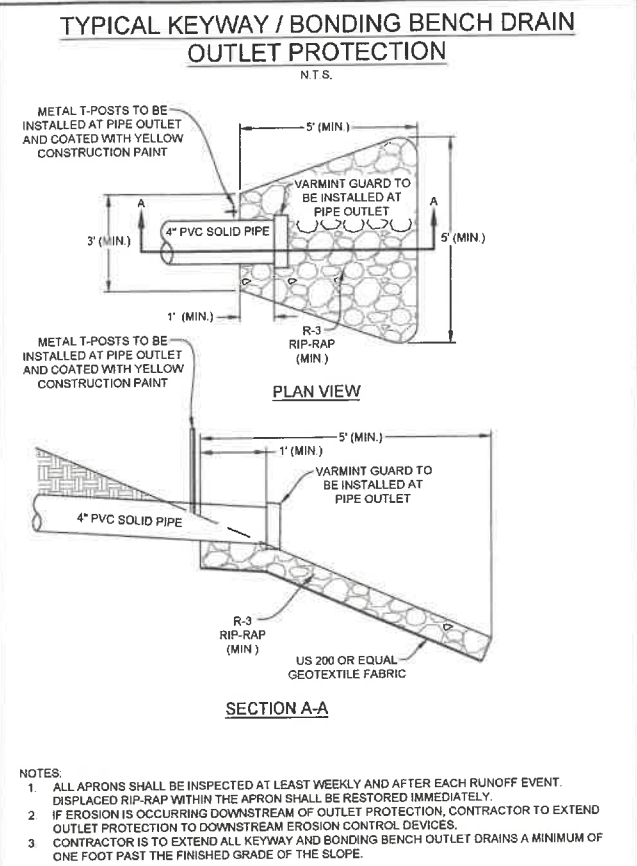
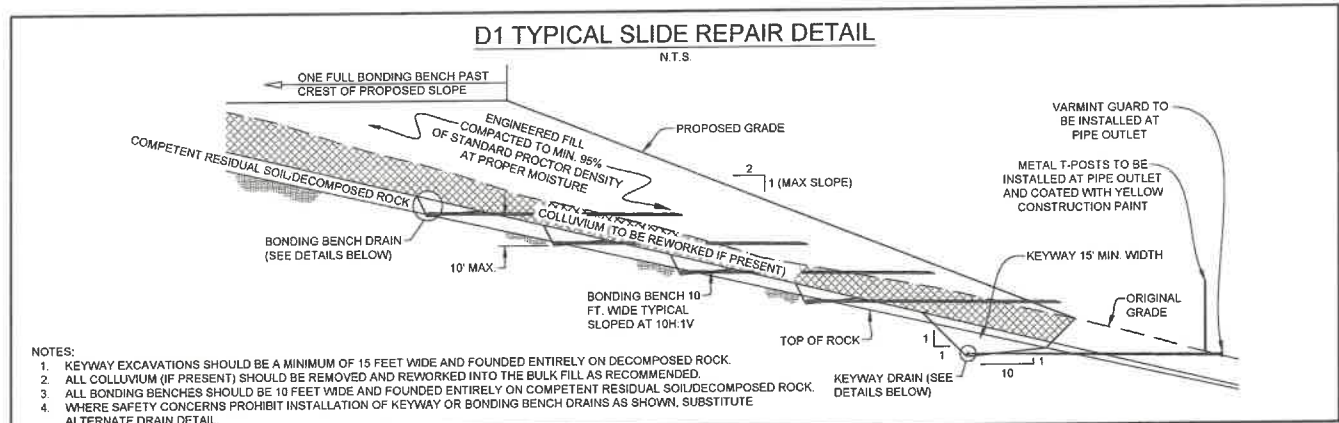
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STOCKPILE AREA AS-BUILT SECTIONS  
**FURBEE**  
 WELL PAD & WATER CONTAINMENT PAD  
 GREEN DISTRICT  
 WETZEL COUNTY, WEST VIRGINIA



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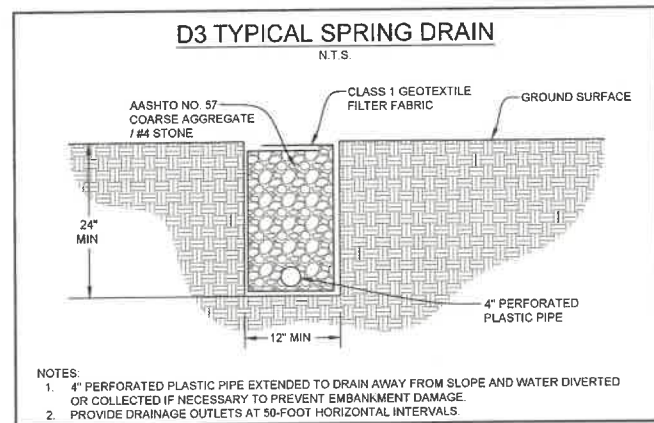
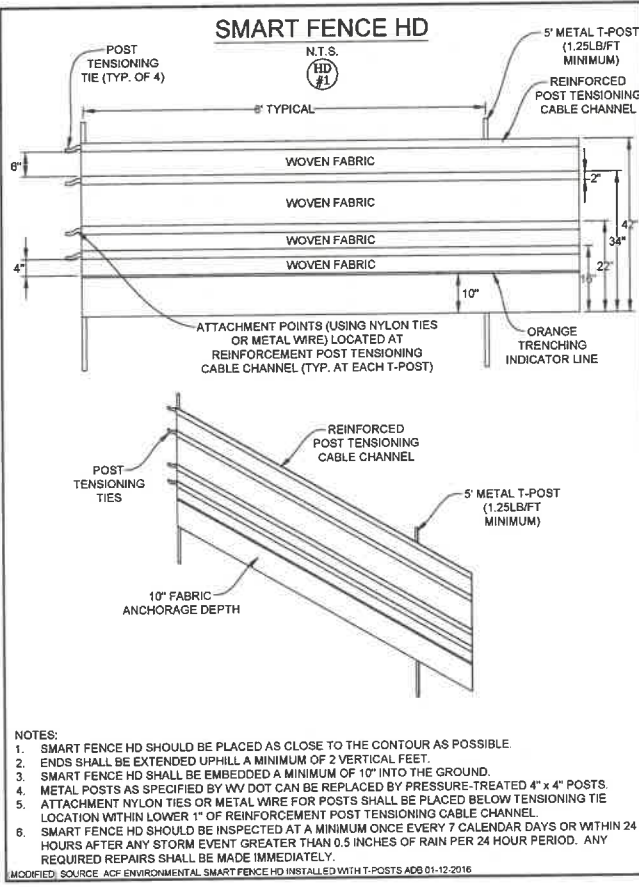
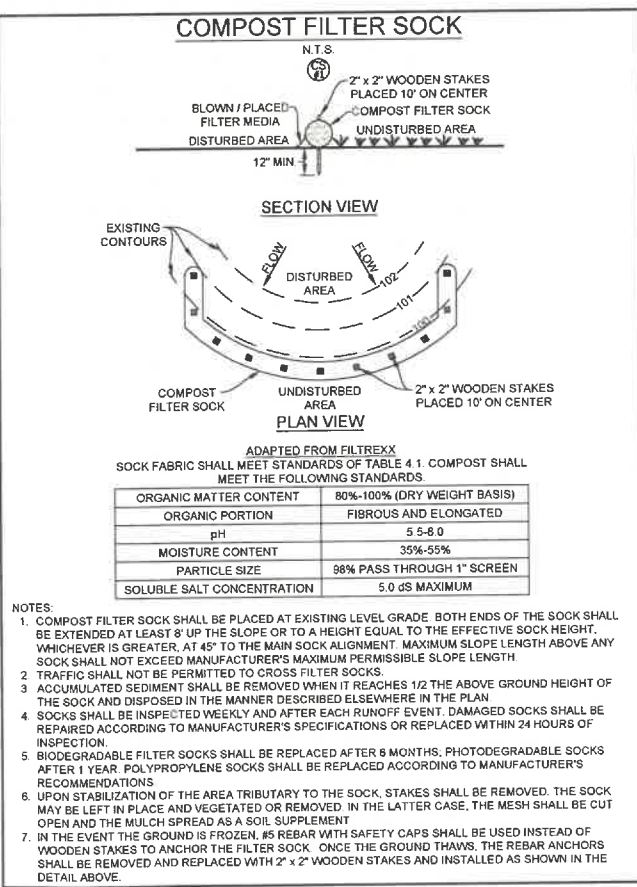
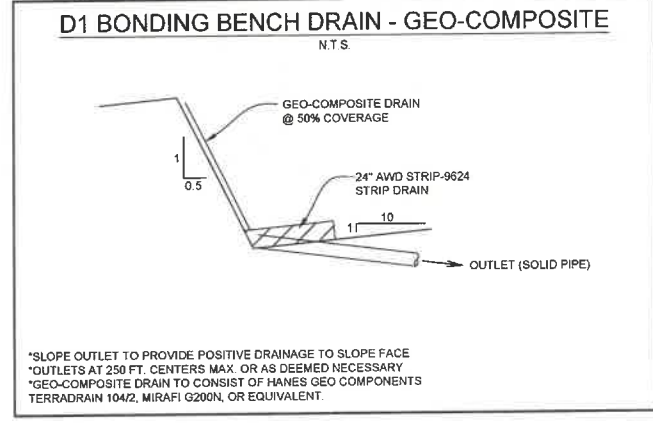
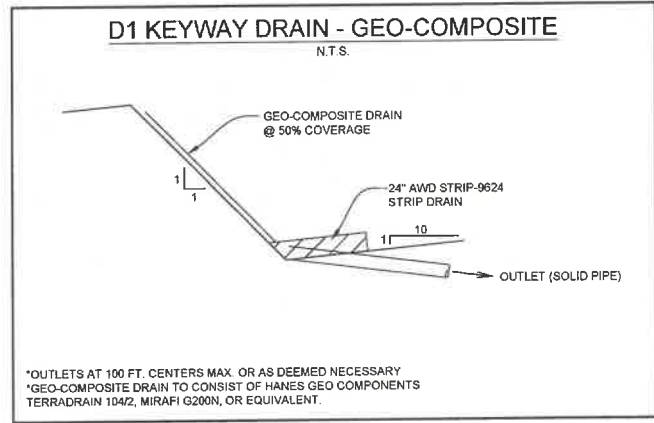
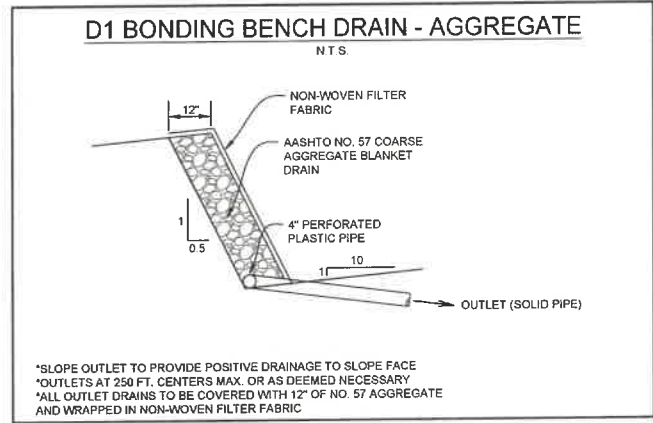
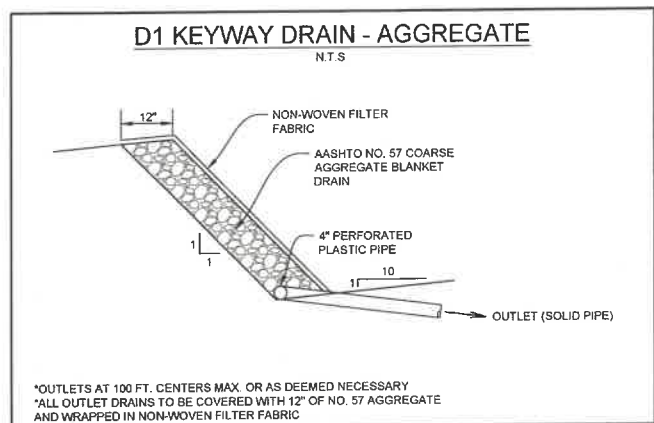


### GENERAL SITE EARTHWORK RECOMMENDATIONS

- ALL FILL AREAS SHOULD BE CLEARED OF TREES, STUMPS, AND VEGETATION AND STRIPPED OF TOPSOIL/ORGANIC SOILS PRIOR TO THE START OF FILL PLACEMENT
- 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
- 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 TYPICALLY BE LIMITED TO 12 INCHES THICK X 3 FEET X 3 FEET, WITH ALL VOID SPACE FLOKED WITH SMALLER PARTICLE SIZE MATERIAL.
- ADEQUATE COMPACTION 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.
- ALL FILL MATERIALS SHALL BE COMPACTIONED 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.
- UNDISTURBED AND/OR FILL MATERIALS PLACED WITHIN THE UPPER 12 INCHES OF FINAL GRADE SHOULD BE COMPACTIONED 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.
- 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).
- 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 RECOMPACTIONED, OR OTHERWISE ADDRESSED PRIOR TO ACCEPTING THE LIFT.
- 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:**

- 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 ADDITIONAL GUIDANCE AND RECOMMENDATIONS.



**APPROVED**  
**WVDEP OOG**  
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**FURBEE**  
WELL PAD & WATER CONTAINMENT PAD  
GREEN DISTRICT  
WETZEL COUNTY, WEST VIRGINIA

REGISTERED PROFESSIONAL ENGINEER  
STATE OF WEST VIRGINIA  
1578  
05/24/2023

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



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 CROWNVELCH 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. AN ORGANIC MULCH, STRAW, OR HAY SHOULD BE USED AND THE AREA THEN SEEDS 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	Germs	Origin
Bestfor Intermediate Ryegrass	29.95%	90%	OR
Climate Timothy	24.96%	90%	CAN
Annual Ryegrass *	24.92%	90%	OR
Medium Red Clover *	9.99%	90%	OR
Potomac Orchardgrass	9.46%	90%	OR
Other Crop Seeds:	0.01%		* Variety Not Stated
Inert Matter:	0.69%		
Wired Seeds:	0.02%		AMS: 5143

Table IV-1 Recommended Seeding Dates		
Planting Dates	Recommended Seeding 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 Date	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
Sundgrass	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	Well - Mod. Well	5.0 - 7.5
Crownvetch / Perennial Ryegrass	10 - 15	Well - Mod. Well	5.0 - 7.5
Flatpea or Perennial Pea / Tall Fescue	20	Well - Mod. Well	4.0 - 8.0
Ladino Clover / Serecia Lespedeza / Tall Fescue	30	Well - Mod. Well	4.5 - 7.5
Tall Fescue / Ladino Clover / Redtop	40	Well - Mod. Well	5.0 - 7.5
Crownvetch / Tall Fescue / Redtop	10	Well - Mod. Well	5.0 - 7.5
Tall Fescue / Birdsfoot Trefoil / Redtop	40	Well - Mod. Well	5.0 - 7.5
Serecia Lespedeza / Tall Fescue / Redtop	25	Well - Mod. Well	4.5 - 7.5
Redtop / Tall Fescue / Creeping Red / Tall Fescue	30	Well - Mod. Well	4.5 - 7.5
Perennial Ryegrass / Tall Fescue / Lathco Flatpea *	10	Well - Poorly	5.5 - 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	20	Well - Mod. Well	5.5 - 7.5
Ladino Clover or Birdsfoot Trefoil	2 / 10	Well - Mod. Well	6.5 - 8.0
Timothy / Alfalfa	5	Well - Mod. Well	6.5 - 8.0
Timothy / Birdsfoot Trefoil	5	Well - Mod. Well	6.5 - 8.0
Orchardgrass / Ladino Clover / Redtop	10	Well - Mod. Well	5.5 - 7.5
Orchardgrass / Ladino Clover	2	Well - Mod. Well	5.5 - 7.5
Orchardgrass / Perennial Ryegrass	10	Well - Mod. Well	5.5 - 7.5
Creeping Red Fescue / Perennial Ryegrass	30	Well - Mod. Well	5.5 - 7.5
Orchardgrass or KY Bluegrass	20	Well - Mod. Well	6.0 - 7.5
Birdsfoot Trefoil / Redtop / Orchardgrass	10	Well - Mod. Well	5.5 - 7.5
Lathco Flatpea * / Perennial Ryegrass	30	Well - Mod. Well	5.5 - 7.5
Lathco Flatpea * / Orchardgrass	30	Well - Mod. Well	5.5 - 7.5

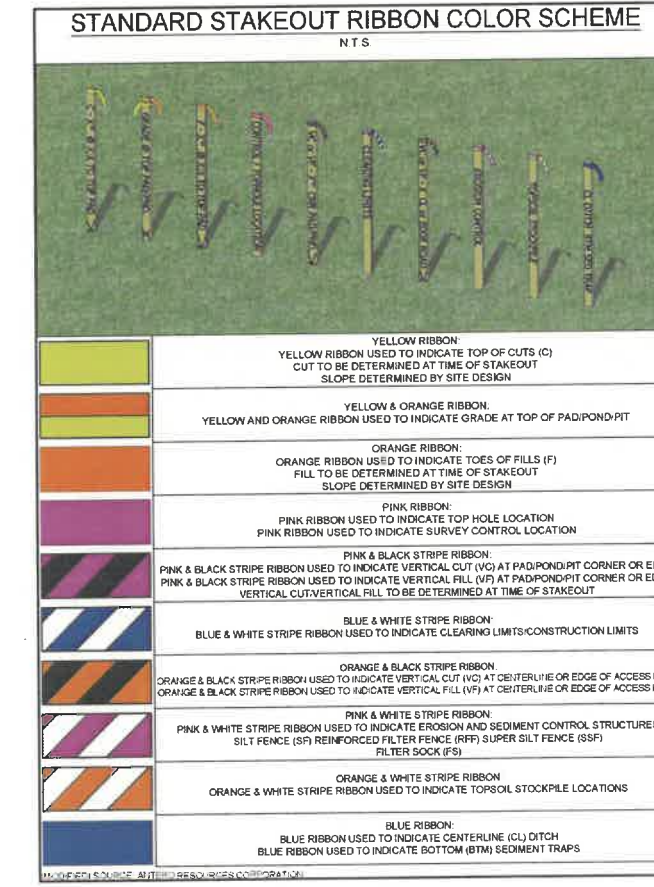
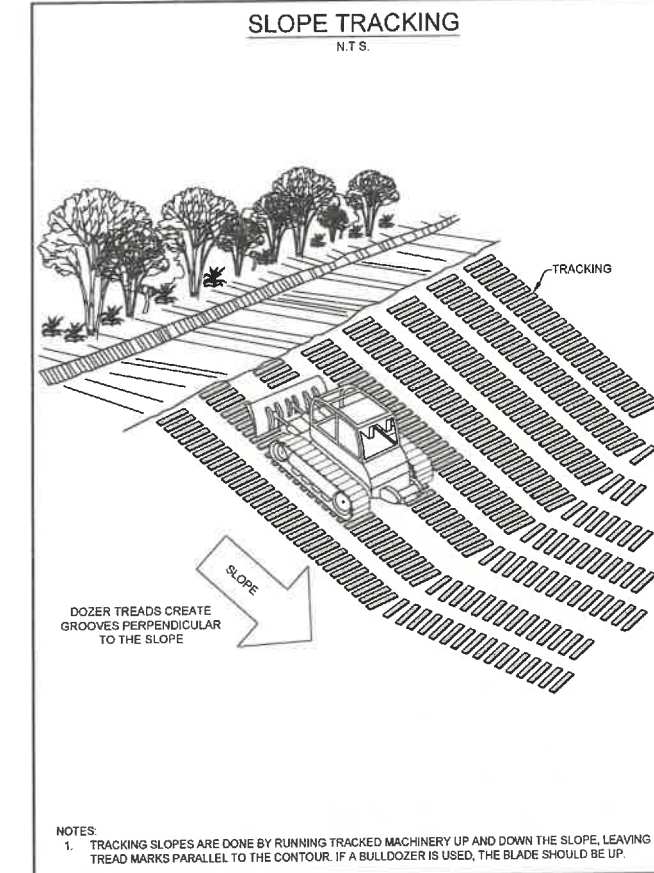
\* Lathco Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.

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



DATE	REVISION
05-24-2023	REVISED PER SLIDE



LEGEND

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



07/14/2023

REVISION	REVISED PER
DATE	05-24-2023

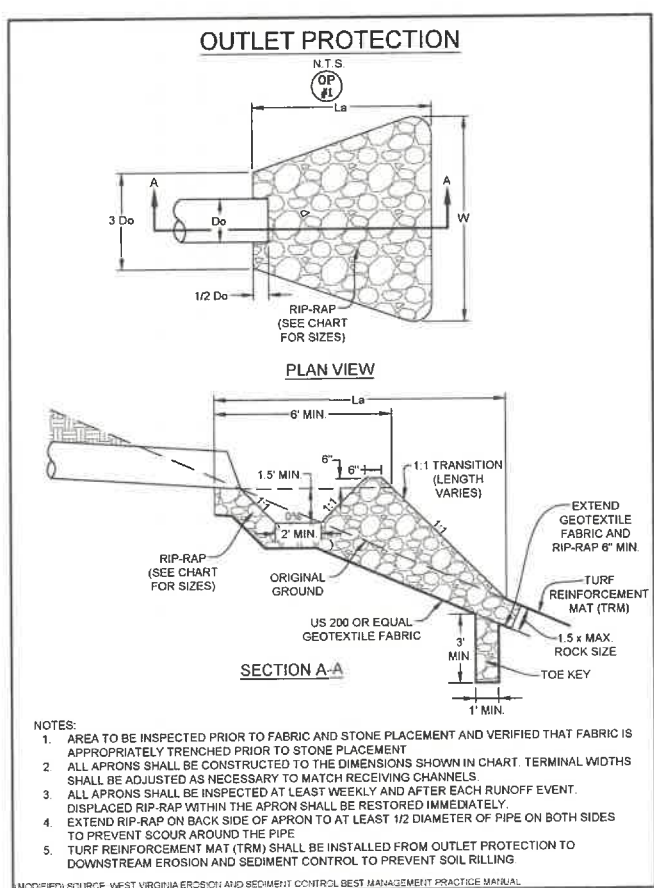
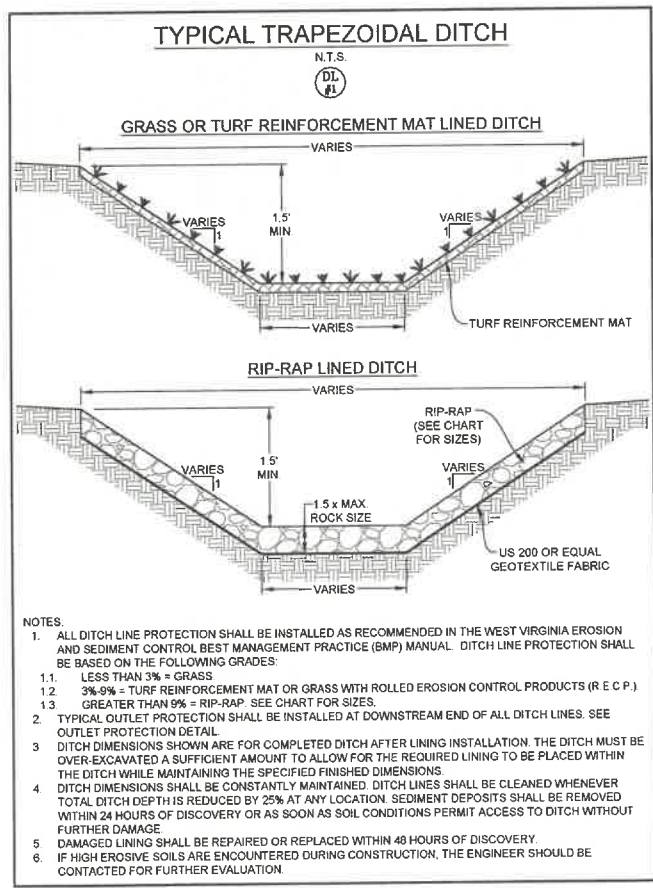
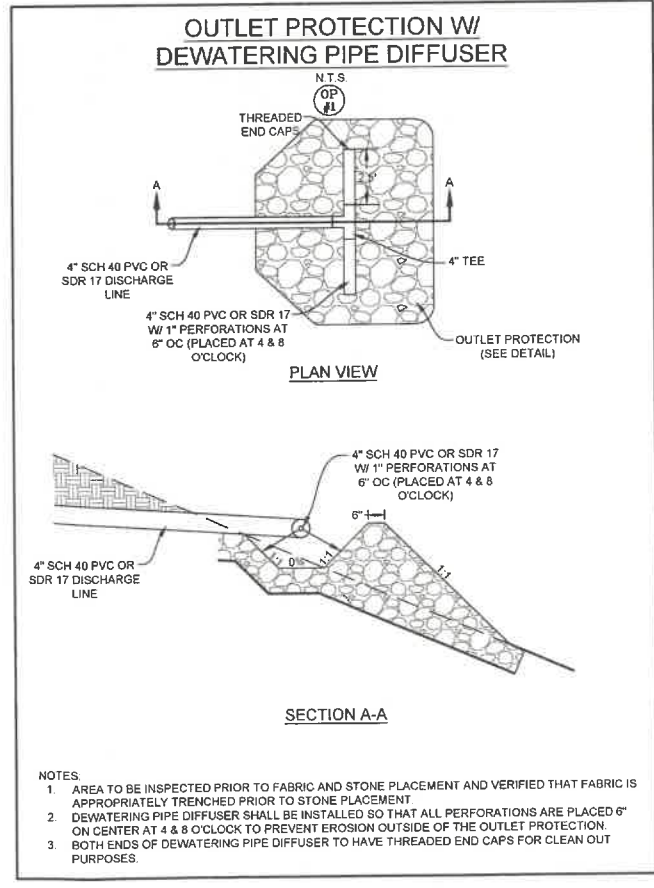
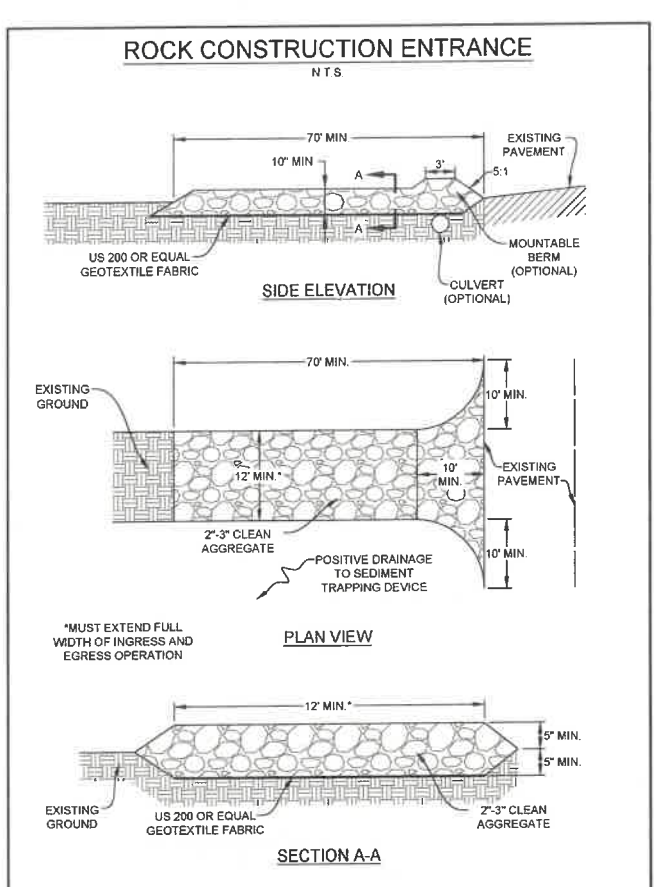
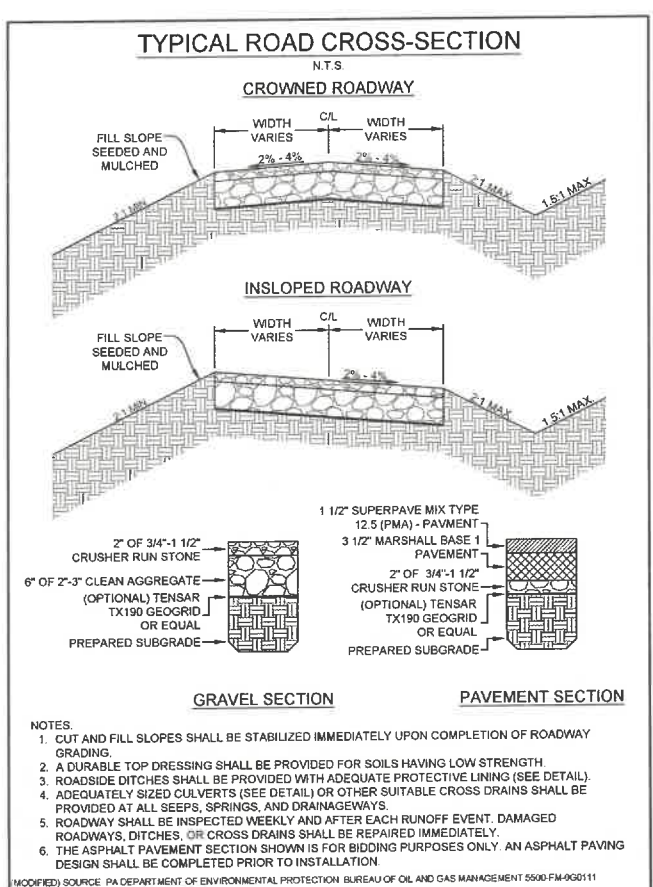
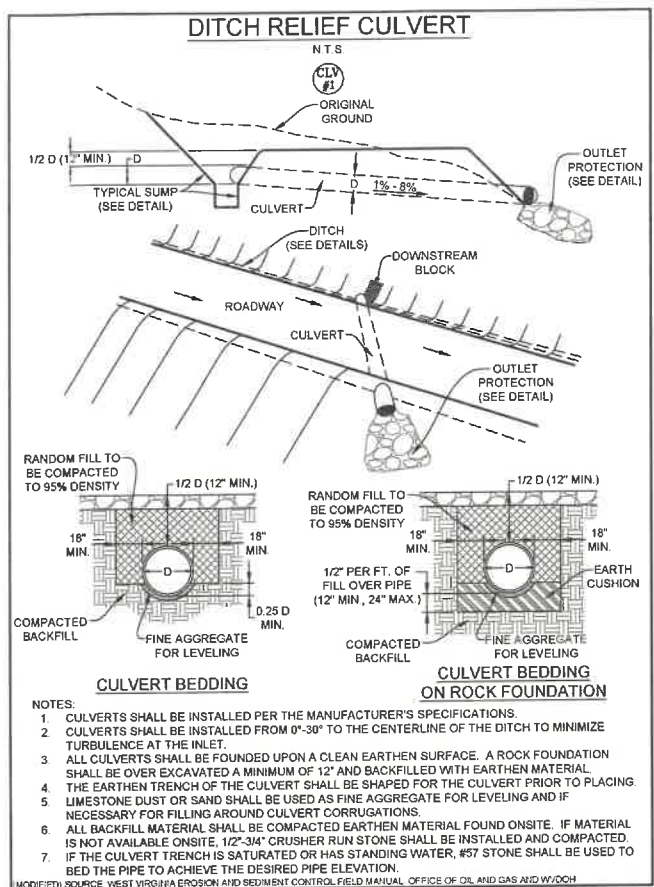
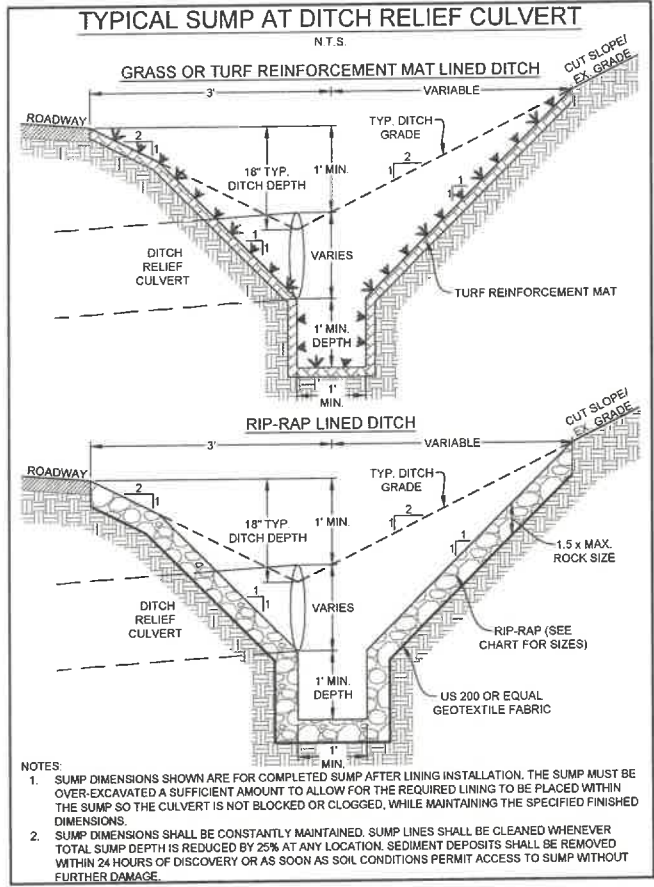
THIS DOCUMENT WAS PREPARED FOR:  
**ANTERO RESOURCES CORPORATION**

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



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

**APPROVED**  
**WVDEP OOG**  
Modification  
*[Signature]*  
7/10/2023



07/14/2023

on McEvers 6/6/23

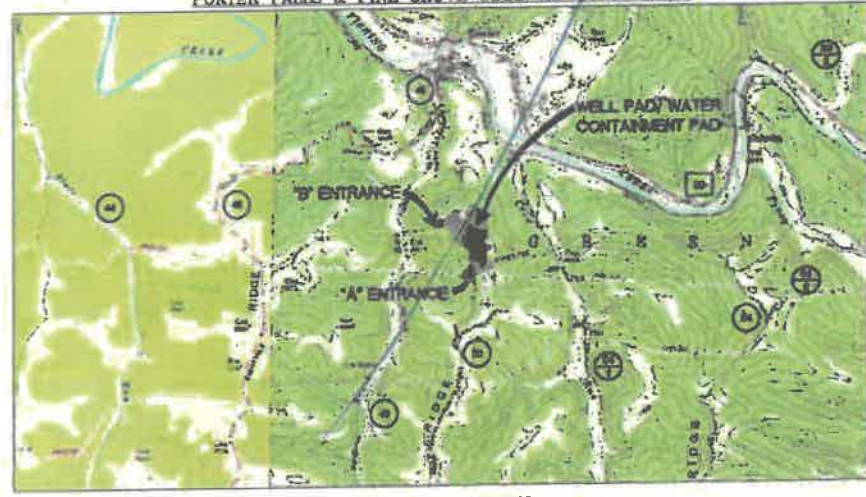
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**ACCESS ROAD "A" ENTRANCE**  
 LATITUDE: 38.564902 LONGITUDE: -80.730969 (NAD 83)  
 LONGITUDE: 38.554622 LONGITUDE: -80.731168 (NAD 83)  
 N 4378992.15 E 523111.11 (UTM ZONE 17 METERS)  
**ACCESS ROAD "B" ENTRANCE**  
 LATITUDE: 38.575732 LONGITUDE: -80.734287 (NAD 83)  
 LONGITUDE: 38.567453 LONGITUDE: -80.734485 (NAD 83)  
 N 4378993.19 E 522268.01 (UTM ZONE 17 METERS)  
**CENTER OF TANK**  
 LATITUDE: 38.566180 LONGITUDE: -80.730417 (NAD 83)  
 LONGITUDE: 38.566090 LONGITUDE: -80.730596 (NAD 83)  
 N 4378631.91 E 523169.83 (UTM ZONE 17 METERS)  
**CENTROID OF PAD**  
 LATITUDE: 38.566280 LONGITUDE: -80.731075 (NAD 83)  
 LONGITUDE: 38.566780 LONGITUDE: -80.731254 (NAD 83)  
 N 4378611.63 E 523103.06 (UTM ZONE 17 METERS)

# FURBEE WELL PAD & WATER CONTAINMENT PAD

## AS-BUILT EROSION & SEDIMENT CONTROL IMPROVEMENT PLANS

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

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



WEST VIRGINIA STATE PLANE COORDINATE SYSTEM  
 ELEVATION BASED ON NAVD83  
 ESTABLISHED BY SURVEY GRADE CP&G & OF&S  
 POST-PROCESSING

**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-108) 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 #54108C0100C.

**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 JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE SEPTEMBER 20, 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) 642-4100  
 FAX: (304) 642-4198

**ELI WAGNER - ENVIRONMENTAL ENGINEER & REGULATORY MANAGER**  
 OFFICE: (304) 642-4086 CELL: (304) 476-8770

**JOH McEVERS - SVT OPERATIONS**  
 OFFICE: (304) 357-8769

**AARON KUNZLER - CONSTRUCTION MANAGER**  
 CELL: (304) 642-4191

**ROBERT WELLS - DESIGN MANAGER**  
 OFFICE: (304) 642-4100 CELL: (304) 627-7405

**ROBERT EDDY - UTILITY COORDINATOR**  
 CELL: (304) 718-5190

**DAVID PATSY - LAND AGENT**  
 CELL: (304) 476-8080

**ENGINEER/SURVEYOR:**  
 NAVITUS ENGINEERING, INC.  
 CYRUS S. KUMP, PE - PROJECT MANAGER/ENGINEER  
 OFFICE: (606) 682-4185 CELL: (640) 686-6747

**ENVIRONMENTAL:**  
 ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.  
 VALERIE CLARKSTON - ECOLOGIST  
 OFFICE: (304) 790-5803 CELL: (518) 362-09267 (412) 372-4000 CELL: (412) 569-0662

**GEOTECHNICAL:**  
 PENNSYLVANIA SOIL & ROCK, INC.  
 CHRISTOPHER W. SANDS - PROJECT ENGINEER  
 (412) 372-4000 CELL: (412) 569-0662



**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 38-8.

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!!

**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 SCALES OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

**SHEET INDEX:**

- COVER SHEET
- NOTES
- LEGEND
- OVERALL PLAN SHEET INDEX
- ACCESS ROAD, WELL PAD, & WATER CONTAINMENT PAD AS-BUILT PLAN
- ACCESS ROAD AS-BUILT PROFILES
- WELL PAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT SECTIONS
- STOCKPILE AREA AS-BUILT SECTIONS
- CONSTRUCTION DETAILS

**FURBEE WETLAND IMPACT (SQUARE FEET)**

Wetland and Impact Cause	FW (SF)	Total Impact (SF)	Total Impact (AC)
Wetland 02 (Shrub/A*)	855	855	0.023
Wetland 03 (Sedge)	275	275	0.009

**FURBEE PERMANENT STREAM IMPACT (LINEAR FEET)**

Stream and Impact Cause	Permanently Impacted		Temp. Impacts		Total Temp. Impact (L.F.)
	Culvert / FW (L.F.)	Inlets/Outlets Structures (L.F.)	Cofferdam/SES Controls (L.F.)	Distance To L.O.D. (L.F.)	
Stream 09 (Sedge)	0	0	0	208	208
Stream 10 (Sedge)	0	0	0	27	27
Stream 11 (Sedge)	0	0	0	60	60
Club 01 (Sedge)	0	0	0	72	72

**FURBEE PERMANENT STREAM IMPACT (SQUARE FEET)**

Stream and Impact Cause	Culvert / FW (L.F.)	Inlets/Outlets Structures (L.F.)	Total Permanent Impact (L.F.)	Cofferdam/SES Controls (L.F.)	Distance To L.O.D. (L.F.)	Total Temp. Impact (L.F.)
Club 01 (Sedge)	0	0	0	0	72	72

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

**FURBEE WETLAND IMPACT (SQUARE FEET)**

Wetland and Impact Cause	FW (SF)	Total Impact (SF)	Total Impact (AC)
Wetland 02 (Shrub/A*)	137	137	0.00
Wetland 03 (Well Pad & Water Containment Pad)	1,889	1,889	0.04

**NAVITUS ENERGY ENGINEERING**  
 Telephone: (800) 682-4185 www.NavitusEng.com

REVISION PER SLIDE

DATE: 04/18/2022

COVER SHEET

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

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

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

Stephen Mccoy Digitally signed by Stephen Mccoy Date: 2023.05.11 11:25:11 -0400