

Doddridge County Sheriff
Flood Plain Ordinance Fund

1016
69-217/515

DATE July 2, 2013

PAY TO THE ORDER OF ANTERO RESOURCES

\$ 5,325.36

Five Thousand Three Hundred Twenty-Five Dollars and 36/100 -----

DOLLARS

Security features included. Details on back.



Ralph Sandora
Beth A. Rogers
MCC

MEMO #13-022 Hughes Pad Reimbursement

MP

⑈001016⑈ ⑆051502175⑆ 1196499⑈



ANTERO RESOURCES APPALACHIAN
 1625 17th STREET, SUITE 300
 DENVER, COLORADO 80202

Vendor Name	Vendor No.	Date	Check Number	Check Total
DODDRIDGE COUNTY COMMISSION	43312	Jun-25-2013	32335	\$5,553.01

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
06-AP-11643	HUGHESPAD	06/25/13	5,553.01	0.00	5,553.01
TOTAL INVOICES PAID					5,553.01

By: BH - MEH - AML
 Asst. Chief Tax Deputy

Michael Headley
 Sheriff of Doddridge County

The Person paying Money into the Treasury shall forthwith file one of these Receipts with the County Clerk

Doddridge County, West Virginia

No. 4800

Date: June 27, 2013
 Customer copy

Received: #13-022 Antero \$Resources \$5,553.01

In Payment For: 318 Building Permits (LP)

For: 12-Flood Plain Ordinanc Fund #20 Fund

By: BH - MEH - AML
 Asst. Chief Tax Deputy

Michael Headley
 Sheriff of Doddridge County

DETACH AND RETAIN FOR TAX PURPOSES

Doddridge County Flood Plain Refund Calculator (if not in Flood Plain)**Hughes Pad**

Estimated Construction Costs	\$810,601.89
Amount over \$100,000	\$710,601.89
Drilling Oil and Gas Well Fee	\$1,000.00
Deposit for additional charges	\$1,000.00
\$5 per \$1,000 over \$100,000	\$3,553.01
Amount Due with application	\$5,553.01
95% of Application Fee minus \$1,000 deposit	\$4,325.36
Cost for Permit	\$227.65
Total Refund (Includes 100% of 1,000 deposit)	\$5,325.36

Schedule of Quantities
Well Site: Hughes Drill Pad & Water Storage Pad
Estimate of Project Costs Using Antero's Running Average Figures

CLEARING & GRUBBING, EROSION & SEDIMENT CONTROLS				
	QUANTITY	UNIT		
MOBILIZATION	1	EA		\$ 19,140.00
CONSTRUCTION ENTRANCE	1	EA		\$ 3,172.76
CLEARING & GRUBBING	15.63	AC	\$ 4,513.25	\$ 70,542.10
TREE REMOVAL	13.75	AC	\$ 2,953.00	\$ 40,603.75
8" COMPOST FILTER SOCK	0	LF		\$
12" COMPOST FILTER SOCK	0	LF		\$
18" COMPOST FILTER SOCK	0	LF		\$
24" COMPOST FILTER SOCK	3,129	LF	\$ 9.23	\$ 28,880.67
32" COMPOST FILTER SOCK	0	LF		\$
SUPER SILT FENCE	0	LF		\$
9" STRAW WATTLES	2,517	LF	\$ 3.11	\$ 7,827.87
TOTAL				\$170,167.15
SITE				
	QUANTITY	UNIT		
DRILL PAD EXCAVATION	81,172	CY	\$ 3.75	\$304,395.00
ACCESS ROADS EXCAVATION	3,405	CY	\$ 4.16	\$ 14,164.80
WATER STORAGE PAD EXCAVATION	17,427	CY	\$ 7.00	\$121,989.00
TOPSOIL	6,158	CY	\$ 4.09	\$ 25,186.22
DIVERSION DITCH	1,875	LF	\$ 4.50	\$ 8,437.50
ROAD SIDE DITCH	2,315	LF	\$ 3.99	\$ 9,236.85
TOTAL				\$483,409.37
SUMP(S) PER ANTERO RESOURCES STANDARD DETAIL				
	QUANTITY	UNIT		
INSTALL 102" X 78" X 44" PRECAST SUMP - SEE ANTERO RESOURCES DETAIL	6	EA	\$ 844.22	\$ 5,065.32
VALVE BOX HDPE PIPE (MINIMUM 12" DIAMETER X 48" HIGH)	6	EA	\$ 545.50	\$ 3,273.00
4" PVC CONNECTIVE PIPE (ANTERO SUMP DRAIN DETAIL)	810	LF	\$ 9.42	\$ 7,630.20
TOTAL				\$ 15,968.52
AGGREGATE SURFACING - SPREADING, COMPACTION, and/or INSTALLATION				
	QUANTITY	UNIT		
DRILL PAD AASHTO #1 (8" THICK)	3,640	TON	\$ 2.59	\$ 9,427.60
DRILL PAD 1 1/2" or 3/4" CRUSHER RUN STONE (2" THICK)	1,092	TON	\$ 2.89	\$ 3,155.88
DRILL PAD GEOTEXTILE FABRIC (US 200)	11,335	SY	\$ 1.08	\$ 12,015.10
ACCESS ROADS 6" or 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	2,161	TON	\$ 2.88	\$ 6,223.68
ACCESS ROADS 1 1/2" or 3/4" MINUS CRUSHER RUN AGGREGATE (2" THICK)	540	TON	\$ 2.95	\$ 1,593.00
ACCESS ROADS GEOTEXTILE FABRIC (US 200)	2,382	SY	\$ 1.02	\$ 2,429.64
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	0	SY		\$
WATER STORAGE PAD 6" or 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	2,061	TON	\$ 2.43	\$ 5,008.23
WATER STORAGE PAD 1 1/2" or 3/4" MINUS CRUSHER RUN AGGREGATE (2" THICK)	515	TON	\$ 2.56	\$ 1,318.40
WATER STORAGE PAD GEOTEXTILE FABRIC (US 200)	4,908	SY	\$ 1.18	\$ 5,690.98
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	0	SY		\$
TOTAL				\$ 46,862.49
ROAD CULVERTS				
	QUANTITY	UNIT		
15" HDPE	424	LF	\$ 20.11	\$ 8,526.64
18" HDPE	0	LF		\$
24" HDPE	0	LF		\$
30" HDPE	0	LF		\$
36" HDPE	0	LF		\$
42" HDPE	0	LF		\$
48" HDPE	0	LF		\$
60" HDPE	0	LF		\$
R4 RIP RAP (INLETS/OUTLETS)	23.7	TON	\$ 35.69	\$ 845.85
AASHTO #1 STONE (DITCH CHECKS)	3.0	TON	\$ 61.10	\$ 183.30
DITCH LINING - (ACCESS ROAD) SYNTHETIC MATTING (TRM)	205	SY	\$ 3.45	\$ 707.25
DITCH LINING - (ACCESS ROAD) R4 RIP RAP	845	SY	\$ 26.28	\$ 22,206.60
DITCH LINING - (ACCESS ROAD) JUTE MATTING	524	SY	\$ 3.00	\$ 1,572.00
TOTAL				\$ 34,041.64
FENCING/GATES				
	QUANTITY	UNIT		
8 FT CHAIN LINK FENCE w/MINIMUM 10 FT POST SPACING and BARB WIRE ALONG TOP	544	LF	\$ 16.50	\$ 8,976.00
16 FT DOUBLE GATE	1	EA	\$ 1,200.00	\$ 1,200.00
TOTAL				\$ 10,176.00
SEEDING				
	QUANTITY	UNIT		
SITE SEEDING (LIME, FERTILIZER, SEEDING and HYDRO-MULCH w/TACK (HYC-2 or EQUAL)	10.65	AC	\$ 3,301.25	\$ 35,158.31
TOTAL				\$ 35,158.31
UNFORESEEN SITE CONDITIONS				
	QUANTITY	UNIT		
*ROCK CLAUSE - BLASTING	1.0	CY	\$ 3.27	\$
*ROCK CLAUSE - HOE RAMMING	1.0	CY	\$ 11.35	\$
*FRENCH DRAINS	1.0	FT	\$ 10.93	\$
*PHASE 1 FENCING - STEEL CORRUGATED PANELS w/"T" POST (10 FT CENTERS - WETLAND PROTECTION	1.0	LF	\$ 10.60	\$
*PHASE 2 FENCING - SILT FENCE and/or FILTER SOCK OUTSIDE OF PHASE 3 FENCING - WETLAND PROTECTION	1.0	LF	\$ 6.35	\$
*PHASE 3 FENCING - ORANGE SAFETY FENCE w/"T" POST (10FT CENTERS) - WETLAND PROTECTION	1.0	LF	\$ 4.00	\$
*SILT FENCE	1.0	LF	\$ 2.67	\$
*TEMPORARY SEEDING	1.0	AC	\$ 1,962.50	\$
*CONSTRUCTION STAKEOUT	1.0	HOUR	\$ 105.00	\$
*JUTE MATTING - SLOPE MATTING (TEMPORARY TURF REINFORCEMENT MATTING)	6,957	SY	\$ 2.13	\$ 14,818.41
*GUARD RAIL	1.0	LF	\$	\$
TOTAL				\$
GRAND TOTAL				\$810,601.89



June 25, 2013

Antero Resources
1625 17th Street
Denver, Colorado 80202
Office 303.357.7310
Fax 303.357.7315

Doddridge County Commission
Attn: Dan Wellings, Doddridge County Floodplain Manager
118 East Court Street, Room 102
West Union, WV 26456

Mr. Wellings:

Antero Resources Appalachian Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for our Hughes Drill Pad. Our project is located in Doddridge County, Greenbrier District and per FIRM map #54017C0225C, this location is not within the floodplain.

255

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- FIRM Map
- A detailed set of plans signed by a WV licensed professional engineer
- Site Safety Plan

If you have any questions please feel free to contact me at (303) 357-6820.

Thank you in advance for your consideration.

Sincerely,

Shauna Redican
Permit Representative
Antero Resources Appalachian Corporation

Enclosures

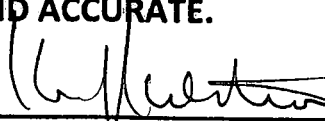
2013 JUN 26 PM 2:22
FIRM
GREENBRIER COUNTY, WV

DODDRIDGE COUNTY FLOODPLAIN DEVELOPMENT PERMIT APPLICATION

SECTION 1: GENERAL PROVISIONS (APPLICANT TO READ AND SIGN)

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. Development shall not be used or occupied until a Certificate of Compliance is issued.
5. The permit will expire if no work is commenced within six months of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
7. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
8. **I, THE APPLICANT CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.**

APPLICANT'S SIGNATURE



DATE June 25, 2013

SECTION 2: PROPOSE DEVELOPMENT (TO BE COMPLETED BY APPLICANT).

IF THE APPLICANT IS NOT A NATURAL PERSON, THE NAME, ADDRESS, AND TELEPHONE NUMBER OF A NATURAL PERSON WHO SHALL BE APPOINTED BY THE APPLICANT TO RECEIVE NOTICE PURSUANT TO ANY PROVISION OF THE CURRENT DODDRIDGE COUNTY FLOODPLAIN ORDINANCE.

Antero Resources Appalachian Corporation - Kevin Kilstrom, Vice
President of Production

APPLICANT'S NAME:

ADDRESS: 1625 17th Street, Denver, CO 80202

TELEPHONE NUMBER: Contact Shauna Redican: 303-357-6820

BUILDER'S NAME: Antero Resources Appalachian Corporation
ADDRESS: 1625 17th Street, Denver, CO 80202
TELEPHONE NUMBER: (303) 357-7310

ENGINEER'S NAME: Allegheny Surveys, Inc. - Thomas D. Corathers
ADDRESS: 172 Thompson Drive, Bridgeport, WV 26330
TELEPHONE NUMBER: 304-848-5035

PROJECT LOCATION:

NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT) Please see attached Exhibit A

ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT) Please see attached Exhibit A

DISTRICT: Greenbrier

DATE/FROM WHOM PROPERTY PURCHASED: N/A

LAND BOOK DESCRIPTION: _____

DEED BOOK REFERENCE: Please see attached Exhibit A

TAX MAP REFERENCE: Please see attached Exhibit A

EXISTING BUILDINGS/USES OF PROPERTY: None

NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY Please see attached Exhibit A

ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY Please see attached Exhibit A

To avoid delay in processing the application, please provide enough information to easily identify the project location.

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

ACTIVITY

STRUCTURAL TYPE

- New Structure
- Addition
- Alteration
- Relocation
- Demolition
- Manufactured/Mobil Home

- Residential (1 – 4 Family)
- Residential (more than 4 Family)
- Non-residential (floodproofing)
- Combined Use (res. & com.)
- Replacement

B. OTHER DEVELOPMENT ACTIVITIES:

- Fill Mining Drilling Pipelining
 - Grading
 - Excavation (except for STRUCTURAL DEVELOPMENT checked above)
 - Watercourse Alteration (including dredging and channel modification)
 - Drainage Improvements (including culvert work) *Replace existing culvert as shown on page 8 of attached design
 - Road, Street, or Bridge Construction *Access Road Construction as shown on page 8 of attached design
 - Subdivision (including new expansion)
 - Individual Water or Sewer System
 - Other (please specify)
-

C. STANDARD SITE PLAN OR SKETCH

1. SUBMIT ALL STANDARD SITE PLANS, IF ANY HAVE BEEN PREPARED.
2. IF STANDARD SITE PLANS HAVE NOT BEEN PREPARED:
SKETCH ON A SEPARATE 8 ½ X 11 INCH SHEET OF PAPER THE SHAPE AND LOCATION OF THE LOT. SHOW THE LOCATION OF THE INTENDED CONSTRUCTION OR LAND USE INDICATING BUILDING SETBACKS, SIZE & HEIGHT. IDENTIFY EXISTING BUILDINGS, STRUCTURES OR LAND USES ON THE PROPERTY.
3. SIGN AND DATE THE SKETCH.

ACTUAL TOTAL CONSTRUCTION COSTS OF THE COMPLETE DEVELOPMENT IRRESPECTIVE OF WHETHER ALL OR ANY PART OF THE SUBJECT PROPOSED CONSTRUCTION PROJECT IS WITHIN THE FLOODPLAIN \$ 810,602.00

*See attached Floodplain Calculation Fee

D. ADJACENT AND/OR AFFECTED LANDOWNER

1. NAME AND ADDRESS OF ALL OWNERS OF SURFACE TRACTS ADJACENT TO THE AREA OF THE SURFACE TRACT (UP & DOWN STREAM) UPON WHICH THE PROPOSED ACTIVITY WILL OCCUR AND ALL OTHER SURFACE OWNERS UP & DOWN STREAM) WHO OWN PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY (IF ONE HAS BEEN COMPLETED).

NAME: Eric Eliezer Nelson
ADDRESS: 2583 Double Camp Road
 Salem, WV 26426

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

1. NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON ANY ADJACENT PROPERTY AT THE TIME THE FLOODPLAIN PERMIT APPLICATION IS FILED AND THE NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN ANY HOME ON ANY PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY.

NAME: N/A
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

E. CONFIRMATION FORM

THE APPLICANT ACKNOWLEDGES, AGREES, AND CONFIRMS THAT HE/IT WILL PAY WITHIN 30 DAYS OF RECEIPT OF INVOICE BY THE COUNTY FOR ALL EXPENSES RELATIVE TO THE PERMIT APPLICATION PROCESS GREATER THAN THE REQUIRED DEPOSIT FOR EXPENSES INCLUDING:

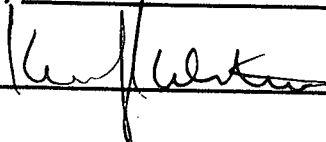
- (A) PERSONAL SERVICE OF PROCESS BY THE DODDRIDGE COUNTY SHERIFF AT THE RATES PERMITTED BY LAW FOR SUCH SERVICE.
- (B) SERVICE BY CERTIFIED MAIL RETURN RECEIPT REQUESTED.
- (C) PUBLICATION.

Hughes Pad Doddridge County Floodplain Permit – Exhibit A

Surface Owner Name	Address	Deed/Page	Tax Map/ Parcel
Eric Eliezer Nelson	1 Corelogic Dr., Westlake, TX 76262	281/361	7/34 and 10/01.3
Eric Eliezer Nelson (2nd Address)	2583 Double Camp Road, Salem, WV 26426	281/361	7/34 and 10/01.3
Jeffrey G. & Darlene Burnside	Rt. 1 Box 386A, Salem, WV 26426	249/575	10, 1 and 1.1
Peter C. McDonald	Rt 1 Box 419, Salem, WV 26426	250/578	7/22

- (D) COURT REPORTING SERVICES AT ANY HEARINGS REQUESTED BY THE APPLICANT.
- (E) CONSULTANTS AND/OR HEARING EXPERTS UTILIZED BY DODDRIDGE COUNTY FLOODPLAIN ADMINISTRATOR/MANAGER OR FLOODPLAIN APPEALS BOARD FOR REVIEW OF MATERIALS AND/OR TESTIMONY REGARDING THE EFFICACY OF GRANTING OR DENYING THE APPLICANT'S FLOODPLAIN PERMIT.

NAME (PRINT): Kevin Kilstrom, Vice President of Production

SIGNATURE:  DATE: 6/25/13

After completing SECTION 2, APPLICANT should submit form to Floodplain Administrator/Manager or his/her representative for review.

SECTION 3: FLOODPLAIN DETERMINATION (to be completed by Floodplain Administrator/Manager or his/her representative)

THE PROPOSED DEVELOPMENT:

THE PROPOSED DEVELOPMENT IS LOCATED ON:

FIRM Panel: 255
 Dated: 10/04/2011

Is **NOT** located in a Specific Flood Hazard Area (Notify applicant that the application review is complete and **NO FLOODPLAIN DEVELOPMENT PERMIT IS REQUIRED**).

Is located in Special Flood Hazard Area.
 FIRM zone designation _____
 100-Year flood elevation is: _____ NGVD (MSL)

Unavailable

The proposed development is located in a floodway.
 BFBM Panel No. _____ Dated _____

See section 4 for additional instructions.

SIGNED Dan Wellings, PS

DATE 08/26/2013

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Floodplain Administrator/Manager or his/her representative)

The applicant must submit the documents checked below before the application can be processed.

- A plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions and proposed development.
- Development plans, drawn to scale, and specifications, including where applicable: details for anchoring structures, storage tanks, proposed elevation of lowest floor, (including basement or crawl space), types of water resistant materials used below the first floor, details of flood proffing of utilities located below the first floor and details of enclosures below the first floor. Also _____

- Subdivision or other development plans (If the subdivision or development exceeds 50 lots or 5 acres, whichever is the lesser, the applicant must provide 100-year flood elevations if they are not otherwise available).
- Plans showing the extent of watercourse relocation and/or landform alterations.
- Top of new fill elevation _____ Ft. NGVD (MSL).
For floodproofing structures applicant must attach certification from registered engineer or architect.
- Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood. A copy of all data and calculations supporting this finding must also be submitted.
- Manufactured homes located in a floodplain area must have a West Virginia Contractor's License and a Manufactured Home Installation License as required by the Federal Emergency Management Agency (FEMA).

Other:

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Administrator/Manager or his/her representative)

I have determined that the proposed activity (type is or is not) in conformance with provisions of the Floodplain Ordinance adopted by the County Commission of Doddridge County on May 21, 2013. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED Dan Wellings, PS DATE 06/26/2013

If the Floodplain Administrator/Manager found that the above was not in conformance with the provisions of the Doddridge County Floodplain Ordinance and/or denied that application, the applicant may complete an appealing process below.

APPEALS: Appealed to the County Commission of Doddridge County? Yes No
Hearing Date: _____
County Commission Decision - Approved Yes No

CONDITIONS: _____

SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Compliance is issued).

The following information must be provided for project structures. This section must be completed by a registered professional engineer or a licensed land surveyor (or attach a certification to this application).

COMPLETE 1 OR 2 BELOW:

- 1 Actual (As-Built) Elevation of the top of the lowest floor (including basement or crawl space is _____ FT. NGVD (MSL)
- 2 Actual (As Built) elevation of floodproofing is _____ FT. NGVD (MSL)

Note: Any work performed prior to submittal of the above information is at risk of the applicant.

SECTION 7: COMPLIANCE ACTION (To be completed by the Floodplain Administrator/Manager or his/her representative).

The Floodplain Administrator/Manager or his/her representative will complete this section as applicable based on inspection of the project to ensure compliance with the Doddridge County Floodplain Ordinance.

INSPECTIONS:

DATE: _____ BY: _____
DEFICIENCIES ? Y/N

COMMENTS _____

SECTION 8: CERTIFICATE OF COMPLIANCE (To be completed by Floodplain Administrator/Manager or his/her representative).

Certificate of Compliance issued: DATE: _____ BY: _____

**CERTIFICATE OF COMPLIANCE
FOR DEVELOPMENT IN SPECIAL FLOOD HAZARD AREA
(OWNER MUST RETAIN)**

PERMIT NUMBER: _____

PERMIT DATE: _____

PURPOSE –

CONSTRUCTION LOCATION: _____

OWNER'S ADDRESS: _____

**THE FOLLOWING MUST BE COMPLETED BY THE FLOODPLAIN
ADMINISTRATOR/MANAGER OR HIS/HER AGENT.**

**COMPLIANCE IS HEREBY CERTIFIED WITH THE REQUIREMENT OF THE
FLOODPLAIN ORDINANCE ADOPTED BY THE COUNTY COMMISSION OF
DODDRIDGE COUNTY ON MAY 21, 2013.**

SIGNED _____ **DATE** _____



Well Site Safety Plan

Antero Resources

Well Name: Carole Unit 1H, Carole Unit 2H, Belton Unit 1H, McClain Unit 1H, Richard Unit 1H, Richard Unit 2H, Earlewine Unit 1H, Earlewine Unit 2H, Hughes Unit 1H, Hughes Unit 2H, Gully Unit 1H and Gully Unit 2H

Pad Location: HUGHES PAD
Doddridge County/ Greenbrier District

GPS Coordinates: Lat 39°13'9.82"/Long 80°37'13.88" (NAD83)

Driving Directions Hughes Pad:

From New Milton:

Head southeast on Co Route 25/Meathouse Fork for 3.5 miles

Turn left onto Snake Run Branch road

After 0.2 miles, make a slight right onto Snake Run

Drive for 1.9 miles, and then continue onto Co Route 46/Standing Stone Rd for 0.5 miles

Turn slight left to stay on Co Route 46/Standing Stone Road, drive for 0.2 miles

Continue onto Co Route 44/Hunters Fork, after ~300 feet, access road will be on the right

Approval Sheet

The West Virginia Department of Environmental Protection Office of Oil and Gas has set forth minimum requirements for a Well Site Safety Plan which shall be submitted with each horizontal well application. A horizontal well shall be any well which meets the definition as provided for in Title 35, Series 8, Section 2.2 of the West Virginia Department of Environmental Protection Office of Oil and Gas.

Approved Safety Plans should be maintained and available at the drilling rig at all times and provided to the local emergency planning committee for the emergency planning district in which the well work will occur or to the county office of emergency services at least seven days before commencement of well work or site preparation work that involves any disturbance of land.

The Safety Plan, once approved, may only be modified upon approval by the West Virginia Department of Environmental Protection Office of Oil and Gas ("Office").

This plan has met the requirements of the West Virginia Department of Environmental Protection Office of Oil and Gas Well Site Safety Plan Standards.

Approved this day _____ of month _____, 20__ by

_____ Date: _____

_____ Date: _____

Site Specific Safety Plan

Antero Resources

1.0 Siting Requirements

1.1. Exhibit 1 provides a plan view map showing the well location, access road, pits, flare lines, dwellings, and noting the north and prevailing wind directions.

1.2. Exhibit 2 also provides an area topographical map showing the well site location

2.0 Site Safety Plan

2.1. Safety Meeting

Safety meetings will be conducted as follows:

- Pre-Drilling,
- Pre-Completion,
- Pre-Workover
- Post Accident/Near Miss, and
- As-Needed.

Safety meetings should be held on-site weekly, at a minimum, prior to the beginning of operations, and:

- Includes personnel employed and involved in the operations, and
- Includes the District Oil and Gas Inspector (or other designated Office of Oil and Gas representative, for the pre-spud meeting only).

Typically, contractor of the operator will conduct these safety meetings with Antero Resources personnel participating as needed. Please list the above personnel as a record of attendance using the form found in Appendix A, or one similar. These records may be maintained separate from this plan.

2.2 Personnel and Visitor Log

This log is intended to provide a current headcount of all persons present at the site at any given time. All personnel and visitors must sign in upon entering the site and sign out upon departure. This log, or one similar, is provided in Appendix B and will be maintained at all times by the Drilling Supervisor or Toolpusher.

2.3 Evacuation Plan

The Drilling Supervisor or Toolpusher will establish a muster point at which all persons on site will assemble for personnel safety and verification of headcount. This point will be located at the entrance to the site.

In the event of an emergency requiring the evacuation of personnel, an audible or visual alarm will be sounded. The Drilling Supervisor and/or the Toolpusher will determine if local residents should be evacuated at this time depending on the outcome of their assessment of the situation.

If local resident evacuation is indicated, the Drilling Supervisor and/or the Toolpusher will be responsible for notifying the local impacted residents, or the local authorities will take this responsibility depending on the urgency, availability and direction of the local authorities. Local authorities have indicated that they will take this responsibility typically and will notify of evacuation mandates via television and radio media announcements in addition to public address units on patrol vehicles. In the event that Antero is directed to take this responsibility, notification will be by dispatching a worker to each affected residence to inform them of evacuation requirements and procedures. See section 8.1 for additional information.

Evacuated local residents may be temporarily housed in local hotels depending on the severity and duration of the emergency. Included in Exhibits 1 & 2 are maps and drawings that may assist in the emergency response and evacuation process.

The Drilling Supervisor and/or the Toolpusher will secure the Personnel and Visitor log before evacuating the site in order to perform a headcount at the muster point.

2.4 Emergency Response Personnel

Requesting public emergency response assistance for this location would be accomplished by the Drilling Supervisor or Toolpusher via telephone to Harrison County Dispatch which can be reached by dialing 911. From there, they will dispatch the appropriate and available emergency response agencies depending on the nature and extent of the emergency.

A list of Emergency Contacts, including Antero's 24 hour emergency contact telephone number, any contractors of the operator, the Department, the local oil and gas inspector, and local emergency response units are found in Appendix C. This list will be posted at the well site.

2.5 Local Schools and Public Facilities

In the event of an emergency requiring the evacuation of schools and public facilities the Drilling Supervisor or Toolpusher will make the required notifications unless the local public emergency responders take on this responsibility. Generally, local emergency responders have stated that they will assume this responsibility. Exhibit 3 lists all schools and public facilities, with their contact information, within a one-mile radius of the horizontal well location.

2.6 Material Safety Data Sheets

The Drilling Supervisor or Contractor of the Operator will maintain Material Data Safety Sheets (MSDS) for all materials and chemicals used on the well site. The MSDS sheets should be located in the Company Representatives Office on-site. Copies of the MSDS sheets may also be obtained from the area Safety Coordinator, the operator contact for maintaining MSDSs, by calling the local Antero Resource Office at 304-622-3842.

3.0 Casing Requirements

3.1 Geologic Prognosis

A list of anticipated freshwater, saltwater, oil and gas, hydrogen sulfide, thief zones, and high pressure and high volume zones, including their expected depth are attached to this plan in Exhibit 4, WW-6B.

3.2 Casing and Cementing Program

Exhibit 4 shows the detailed casing and cementing program, which meets the standards of the American Petroleum Institute (API) and employs a minimum of three strings of casing which are of sufficient weight, quantity and quality for the anticipated conditions to be encountered. This casing and cementing program is designed to maintain well control and integrity. The casing setting depths are sufficient to cover and seal off those zones as identified in Exhibit 4.

4.0 BOP Requirements

4.1 BOP Equipment

The following is a list of all BOP equipment with types, sizes and ratings to be utilized and available during the drilling, completion and work-over of the well.

5M system:

- Annular preventer*
- Pipe ram, blind ram, and, if conditions warrant, as specified by the authorized officer, another pipe ram shall also be required*
- A second pipe ram preventer shall be used with a tapered drill string
- Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter)*
- 3 inch diameter choke line
- 2 choke line valves (3 inch minimum)*
- Kill line (2 inch minimum)
- 2 chokes with 1 remotely controlled from rig floor
- 2 kill line valves and a check valve (2 inch minimum)*
- Upper kelly cock valve with handle available
- When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed)
- Lower kelly cock valve with handle available
- Safety valve(s) and subs to fit all drill string connections in use
- Inside BOP or float sub available
- Pressure gauge on choke manifold
- All BOPE connections subjected to well pressure shall be flanged, welded, or clamped*
- Fill-up line above the uppermost preventer.

If repair or replacement of the BOPE is required after testing, this work shall be performed prior to drilling out the casing shoe.

When the BOPE cannot function to secure the hole, the hole shall be secured using cement, retrievable packer or a bridge plug packer, bridge plug, or other acceptable approved method to assure safe well conditions.

Minimum standards for choke manifold equipment.

- i. All choke lines shall be straight lines unless turns use tee blocks or are targeted with running tees, and shall be anchored to prevent whip and reduce vibration.
- ii. Choke manifold equipment configuration shall be functionally equivalent to the appropriate example diagram shown in Appendix C. The actual configuration of the chokes may vary.

All valves (except chokes) in the kill line choke manifold, and choke line shall be a type that does not restrict the flow (full opening) and that allows a straight through flow).

Pressure gauges in the well control system shall be a type designed for drilling fluid service

5M and higher system accumulator shall have sufficient capacity to open the hydraulically-controlled gate valve (if so equipped) and close all rams plus the annular preventer (for 3 ram systems add a 50 percent safety factor to compensate for any fluid loss in the control system or preventers) and retain a minimum pressure of 200 psi above precharge on the closing manifold without use of the closing unit pumps. The fluid reservoir capacity shall be double the usable fluid volume of the accumulator system capacity and the fluid level of the reservoir shall be maintained at the manufacturer's recommendations. Two independent sources of power shall be available for powering the closing unit pumps. Sufficient nitrogen bottles are suitable as a backup power source only, and shall be recharged when the pressure falls below manufacturer's specifications.

Accumulator Precharge Pressure Test

This test shall be conducted prior to connecting the closing unit to the BOP stack and at least once every 6 months. The accumulator pressure shall be corrected if the measured precharge pressure is found to be above or below the maximum or minimum limit specified below (only nitrogen gas may be used to precharge):

Power Availability

Power for the closing unit pumps shall be available to the unit at all times so that the pumps shall automatically start when the closing valve manifold pressure has decreased to the pre-set level.

Accumulator Pump Capacity

Each BOP closing unit shall be equipped with sufficient number and sizes of pumps so that, with the accumulator system isolated from service, the pumps shall be capable of opening the hydraulically-operated gate valve (if so equipped), plus closing the annular preventer on the smallest size drill pipe to be used within 2 minutes, and obtain a minimum of 200 psi above specified accumulator precharge pressure.

Locking Devices

A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed on all systems of 2M or greater. A valve shall be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve shall be maintained in the open position and shall be closed only when the power source for the accumulator system is inoperative.

Accumulator working pressure rating	Minimum acceptable operating pressure	Desired precharge pressure	Maximum acceptable precharge pressure	Minimum acceptable precharge pressure
1,500 psi	1,500 psi	750 psi	800 psi	700 psi
2,000 psi	2,000 psi	1,000 psi	1,100 psi	900 psi
3,000 psi	3,000 psi	1,000 psi	1,100 psi	900 psi

Remote Controls

Remote controls shall be readily accessible to the driller. Remote controls for all 3M or greater systems shall be capable of closing all preventers. Remote controls for 5M or greater systems shall be capable of both opening and closing all preventers. Master controls shall be at the accumulator and shall be capable of opening and closing all preventers and the choke line valve (if so equipped). No remote control for a 2M system is required.

4.2 Procedure and Schedule for Testing BOP Equipment

Well Control Equipment Testing

- i. Perform all tests described below using clear water or an air..
- ii. Ram type preventers and associated equipment shall be tested to approved stack working pressure if isolated by test plug or to 80 percent of internal yield pressure of casing if BOP stack is not isolated from casing. Pressure shall be maintained for at least 10 minutes or until requirements of test are met, whichever is longer. If a test plug is utilized, no bleed-off of pressure is acceptable. For a test not utilizing a test plug, if a decline in pressure of more than 10 percent in 30 minutes occurs, the test shall be considered to have failed. Valve on casing head below test plug shall be open during test of BOP stack.
- iii. Annular type preventers shall be tested to 70 percent of rated working pressure. Pressure shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.
- iv. As a minimum, the above test shall be performed:
 - a. when initially installed:
 - b. whenever any seal subject to test pressure is broken:
 - c. following related repairs: and
 - d. 30-day intervals.
- v. Valves shall be tested from working pressure side during BOPE tests with all downstream valves open.
- vi. When testing the kill line valve(s), the check valve shall be held open or the ball removed.
- vii. Annular preventers shall be functionally operated at least weekly.
- viii. Pipe and blind rams shall be activated each trip, however, this function need not be performed more than once a day.
- ix. A BOPE pit level drill shall be conducted weekly for each drilling crew.
- x. Pressure tests shall apply to all related well control equipment.
- xi. All of the above described tests and/or drills shall be recorded in the drilling log.
- xii. For intermediate wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation.
- xiii. For the bottom and horizontal wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation, weekly, and after each bit trip.

4.3 BOP Installation Schedule

The BOP will be installed after running surface casing as well as after running intermediate casing. BOP equipment shall be installed on the innermost string of casing after the surface casing.

4.4 Well Control Training

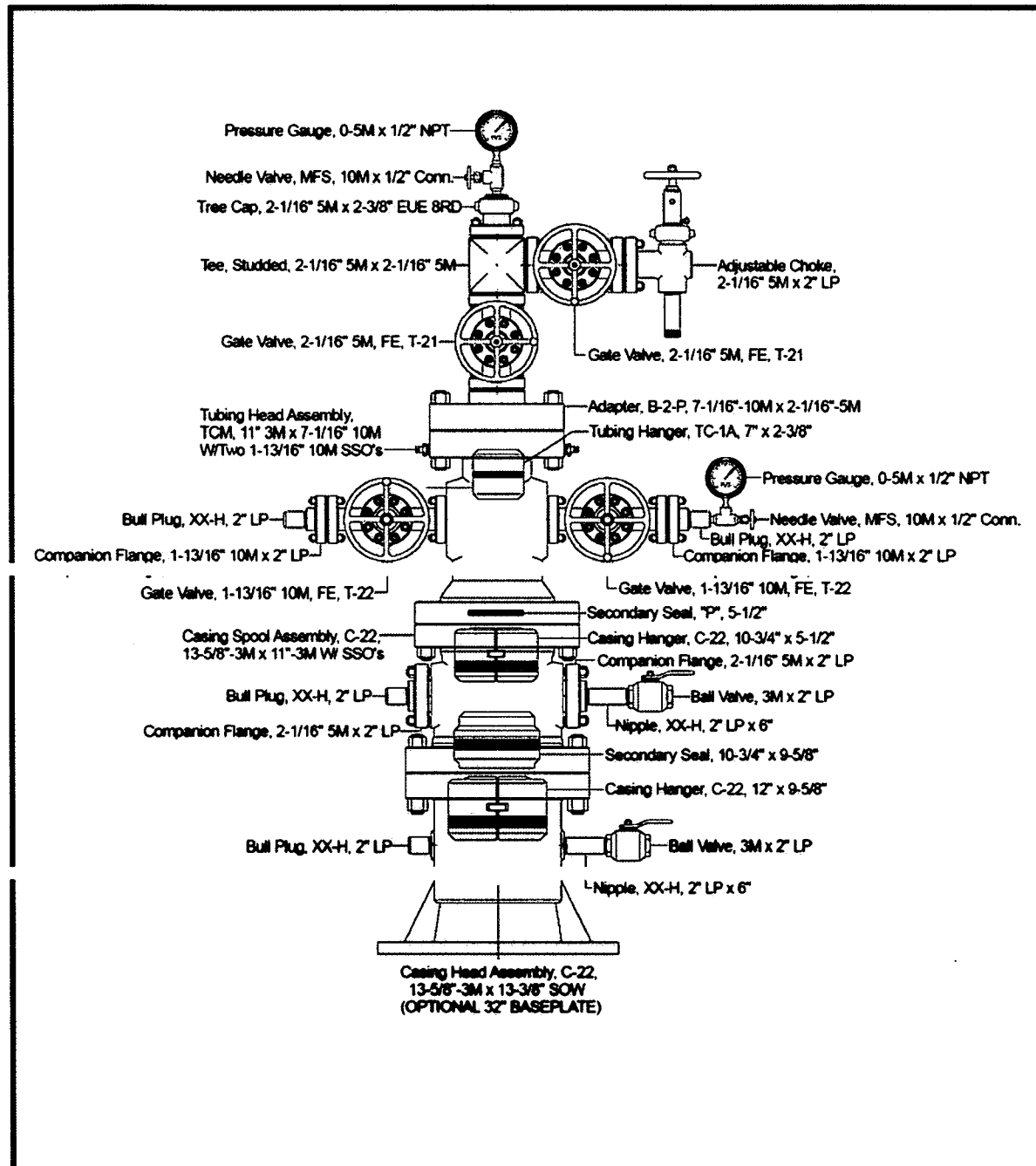
All Drilling Supervisors and Toolpushers used on this well will be IADC trained and certified. A trained person will be present during the drilling operations. Training certificates will be available for review on the location. The list of personnel with said training is provided in Appendix E.

4.5 Drilling Record

The Drilling Supervisor will maintain detailed records of significant drilling events such as lost circulation, hydrogen sulfide gas, fluid entry, kicks and abnormal pressures through the electronic data entry and recording system, Wellview. This system allows the Drilling Supervisor to enter daily reports containing the specified information. The records are then retained electronically at Antero Main Office in Denver, CO.

The Emergency Response Plan for this operating area requires the Drilling Supervisor to notify the district oil and gas inspector or the designated Office of Oil and Gas representative any unusual drilling events such as hydrogen sulfide gas or significant kicks that occur during drilling operations. Any encounter of hydrogen sulfide gas requires immediate notification of the Office of Oil and Gas.

4.6 Schematic and Description of the Wellhead Assembly



5.0 Well Flaring Operations

5.1 Size, Construction and Length of Flare Line

The flare line will be a 4" diameter, steel line that extends 50' from the well. The line will be anchored to the surface of the ground by cross pinning it in place using metal staking at multiple points along the line.

The choke assembly is described in previous section of this document and in drawing "5M Choke Manifold Equipment" BLM drawing Onshore Oil and Gas Order Number 2, Appendix D.

We do not anticipate flaring since we would first attempt to route the flow to the Gas Buster and work the gas kick off from there. Flaring would occur as a last resort or if needed.

5.2 Flare Lighting System

The system for lighting the flare will be an automatic flare igniter using a solar collector panel and battery charger system. A second igniter will be installed as a backup. Should flaring be required or needed.

The Drilling Supervisor will give notification to the local fire department prior to lighting the flare, if practicable, or as soon as possible thereafter.

5.3 Flare Safe Distances

The flare line(s) discharge shall be located not less than 50 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of rig and trailers. The flare system shall have an effective method for ignition. All flammable material beyond the end of the flare line will be cleared to a minimum distance of 50feet.

5.4 Flare Duration

The flare duration should not exceed the maximum time requirements needed to complete the operation.

6.0 Well Killing Operations

6.1 Mud Mixing Inventory

The following shows the inventory of all materials that will be on-site for the mixing of mud:

- 20 sack of Soda Ash
- 480 sacks of KCL
- 200 sacks of Biolose
- 40 sack of Xan-Plex
- 20 buckets of X-Cide 102
- 3 Drums of KD-40
- 5 Buckets of LD-S
- 15 super sack of MIL Bar
- 100 sacks of Soletex
- 40 Sacks of Graphite
- 300 Sack of Salt

Volume of mixed mud = pit volume + equivalent volume in tanks
= 500 bbls + 500 bbls
= 1000 bbls total

Mixed Mud Weight The mixed mud weight will vary depending on the bottom hole pressures and will be calculated and adjusted as we gather more information; we intend to use 12.8 lb – 13.0 lb mud but will adjust the mud weight as information becomes available

Volume of Add'l

Weighting Mat'l Antero will have the necessary materials available to mix up enough mud to weight the mud up 1 lb more than the mud used for drilling; as an estimate, we expect to have 10 pallets of barite on site and 12 pallets of bentonite

Volume Water for Mixing The rig has a 400 bbl rig water tank and the location will have 800 bbls additional in separate tanks.

6.2 Mud Mixing Units

The drilling rig is equipped with 2 mud tanks with agitators and jets such that it can make two pills.

6.3 Kill Procedures

The following paragraph describes the methodology and type of kill procedures that will be used if needed. These procedures are recognized by the IADC.

Once a Kick is detected a prompt shut in of the well is essential. The exact shut in method will be dictated by the operation being performed at the time of the kick, available equipment, plus other extenuating circumstance. The following types of kill operations may be performed to bring the well back under control. The different methods listed below to be used will be determined by the operation being performed at the time of the kick.

Kill Procedures

- 1.) Drillers Method
- 2.) Wait and Weight Method
- 3.) Circulate and Weight Method
- 4.) Concurrent Method
- 5.) Reverse Circulation Method
- 6.) Dynamic Kill Method
- 7.) Bullheading Method
- 8.) Volumetric Method

7.0 Hydrogen Sulfide Operations

7.1 H₂S Monitoring

The equipment and method used for the monitoring, detection and warning of the presence of hydrogen sulfide gas during drilling, completions and work-over operations will be portable electronic gas detection such as BW gas detectors or equivalent. These detectors will be

typically located near the well bore on the drilling rig, outside the data van or on the drillers stand.

7.2 H2S Training

All personnel that will be involved in the drilling operations will be trained in H2S in drilling operations to a minimum of the awareness level. Additional training will be given to the Drilling Supervisors both in H2S and emergency response duties related specifically to air toxins. All of the aforementioned training will be completed prior to spudding the well. These records may be kept separate from this plan.

7.3 Personal Protection Equipment

The following personal protection equipment will be available and in use as needed on location:

- Fire Retardant Clothing (FRC),
- Hardhats,
- safety shoes,
- safety glasses and/or safety goggles/face shields,
- hearing protection earplugs,
- cotton and chemical resistant work gloves, and
- dust mask respirators.

In the event that other hazards are identified or presented during the drilling operation, we will attempt to eliminate the hazard, and if not practical, additional PPE will be provided to mitigate the risk to the worker. In the event that H2S is detected, a hazard assessment will be performed for this exposure along with risk mitigation.

7.4 H2S Notification and Control

The emergency alarm will be audible or visual type which will be detectable by all personnel on location. If dangerous levels of H2S are detected, we will immediately implement our Emergency Response Plan which will provide for site control and evacuation as needed. Generally, the site will be secured such that access is allowed only for trained emergency response personnel. Site security will be accomplished by trained workers stationed at safe points on the perimeter and access road to the site.

If H2S is detected and confirmed, a telephonic notification will be made to the local oil and gas inspector.

8.0 Notification and Protection Zone Standards

8.1 Method of Notification

In an emergency which requires the notification of residents and emergency personnel that may be affected during drilling such as release of H₂S, flaring, etc., the emergency response plan will be immediately implemented. This plan specifies the roles and responsibilities of on-site personnel in case of emergency and addresses emergency notification of potentially affected residents and public emergency response personnel.

In general under the situation presently described, after the activation of the emergency alarm, the on-site personnel will muster for a headcount by the On-Scene Incident Commander which is usually the Drilling Supervisor or Toolpusher. After initial assessment of the situation, the OSIC will notify the public emergency response agency from which direction will be taken. If the agency directs, on-site personnel will notify all local impacted residents of the incident by dispatching a worker by truck to each potentially affected residence. If the public emergency responder does not direct this notification to be made by the operator, then the public response agency will be responsible for this notification. The local emergency responders have, in general, stated that emergency notification of local residents will be accomplished by their means including television and radio announcement as well as public address systems on patrol vehicles. Antero safety coordinators who are located in the field may assist with the notification of local residents.

8.2 Established Protection Zones

Protection zones will be established and maintained based on the nature, extent and severity of the event. These protection zones will be based on those safe distances outlined in the applicable portions of the DOT Emergency Response Guidebook.

Safety Meeting Log

Date: _____ Location(Pad): _____ Well Name: _____

	<u>Name</u>	<u>Organization</u>	<u>Job Title</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____
13.	_____	_____	_____
14.	_____	_____	_____
15.	_____	_____	_____
16.	_____	_____	_____
18.	_____	_____	_____
19.	_____	_____	_____
20.	_____	_____	_____
21.	_____	_____	_____
22.	_____	_____	_____
23.	_____	_____	_____
24.	_____	_____	_____
25.	_____	_____	_____

Appendix C.

EMERGENCY CONTACT LIST AND PHONE NUMBERS

Contact	Phone Number
<p><i>Designated Person and Incident Commander:</i></p> <p>John Kawcak, <i>Operations Manager</i> Tim Culberson, <i>Midstream Construction Manager</i> Terry Wyckoff, <i>Midstream Production Manager</i></p>	<p>817.368.1553 John 918.916.0116 Tim 304.991.0720 Terry</p>
<p><i>Designated Backup Person Incident Commander/Response Coordinator:</i></p> <p>Mike Ward Ricky Jones Norman Wood Stanley Dudley Jeff Partridge Landon West Tim Henrich Mike Alcorn James Harvey Tim Murrell Delf Martinez Ralph Ybarra Virgil Gaither James Neal</p>	<p>580.276.7484 Mike 580.927.6276 Ricky 903.353.4429 Norman 970.618.7602 Stanley 940.577.2288 Jeff 940.389.0602 Landon 720.530.3059 Tim H. 304.627.7070 Mike 918.916.4340 James 903.256.6040 Tim 970.629.0055 Delf 580.927.5606 Ralph 580.504.2366 Virgil 607.644.8701 James</p>
<p>Frontier #3 Frontier #14 Frontier #17 Frontier #8 Frontier #22 Hall Drilling #3</p>	<p>832.487.7965 Rig Sat Phone 713.758.0662 Rig Sat Phone 713.758.0730 Rig Sat Phone 832.531.7014 Rig Sat Phone 713.758.0893 Rig Sat Phone 713.758.0881 Rig Sat Phone</p>
<p>Antero Resources Denver Office 1625 17th Street, Suite 300 Denver, CO 80202</p>	<p>Office: (303) 357-7310 Fax: 303-357-7315</p>
<p>Environmental Manager Jerry Alberts</p>	<p>Direct: (303) 357-7341 Cell: 720-201-0160 24hr</p>

Contact	Phone Number
Safety Manager Rick Blankenship	Direct: (303) 357-7378 Cell: (720) 235-2775 24hr
Vice President Production Kevin Kilstrom	Direct: (303) 357-7335 Cell: (303) 808-0254 24hr
Federal and State Agencies	
National Response Center	(800) 424-8802
West Virginia Office of Water Resources' Emergency Notification Number, Oil Spill Response	1-800-642-3074
West Virginia Office of Oil and Gas Sam Ward, WVDEP Inspector – Harrison County Joe Taylor, WVDEP Inspector – Tyler County David Cowan, WVDEP Inspector – Ritchie County Douglas Newlon, WVDEP Inspector – Doddridge County	(304) 389-7583 cell Sam Ward (304) 380-7469 cell Joe Taylor (304) 389-3509 cell David Cowan (304) 932-8049 cell Douglas Newlon
Environmental Protection Agency (EPA) Region 3	Phone: 215-814-3231 Fax: 215-814-3163
West Virginia Worker's Compensation	1-888-4WVCOMP 1-304-926-3400
West Virginia Fish and Wildlife Service, Field Office, Elkins, WV	Phone: 304-636-6586 Fax: 304-636-7824
US OSHA Charles Green	1-800-321-OSHA (1-800-321-6742) 304.347.5937
Local Agencies and Responders	
Sheriff/Police/Fire Department	911
Harrison County LEPC	304.624.9700 John Keeling
Hospital- United Hospital Center--Clarksburg	304. 624.2121
Harrison County Emergency and Dispatch Business Office	911 304.623.6559

Contact	Phone Number
Doddridge County Emergency	911 304.873.3253
Doddridge County LEPC	304.782.2124 Roland W. Kniceley
WV Highway Patrol	304,782,2124 doddridgeoes@dishmail.net
Public Water Intakes (see App G for add'l points)	to be determined
Waste Removal	
TK Stanley—Waste Removal, Vac Truck	304.622.6677
Stallion	330.760.4248
Waste Management	
Contractors	
Hall Drilling Services MT Hall	304588 3368
TK Stanley	304.622.6677
Cleanup Crews	
Ryan Environmental	304.641.0244
Water Haulers	
TK Stanley	304.476.0396
Hall Drilling	304.483.8125
Frac Tank Suppliers	
TK Stanley—Frac Tank Rental	304.622.6677
Stallion	330.760.4248
Winch Trucks	
TK Stanley	304.476.9588

Contact	Phone Number
Water Moving/Pumping	
TK Stanley	304.476.0396
Pumping Services—Kill Fluids	
Halliburton—Jane Lew	724.743.6601 Central Dispatch
Light Plants	254.434.1469 Hot Lights- Josh
Wolfpack	304-623-1199.
BOPs	
Blue Dot	304.290.7399
Snubbing Services	Basic Energy- 724-825-2548 Bryan Berlison
Cudd Well Control	713.849.2769 Houston
Wild Well Control	281.353.5481
Roustabout Crews	740.473-1305 Hall Drilling Office 304.588.66474 Hall Drilling- Jack 601.410.7440- TK Stanley Office 724.984.7626- TK Stanley- Brett

WV Emergency Reporting

In the event of a hazardous waste or hazardous material release or emergency, please contact:
1-800-642-3074.

Additional Contact Information

1-800-424-8802 National Response Center

1-304-558-5938 DEP Elkview Emergency Response Unit

Email Contacts:

Mike Dorsey Mike.H.Dorsey@wv.gov

Rusty Joins Rusty.T.Joins@wv.gov

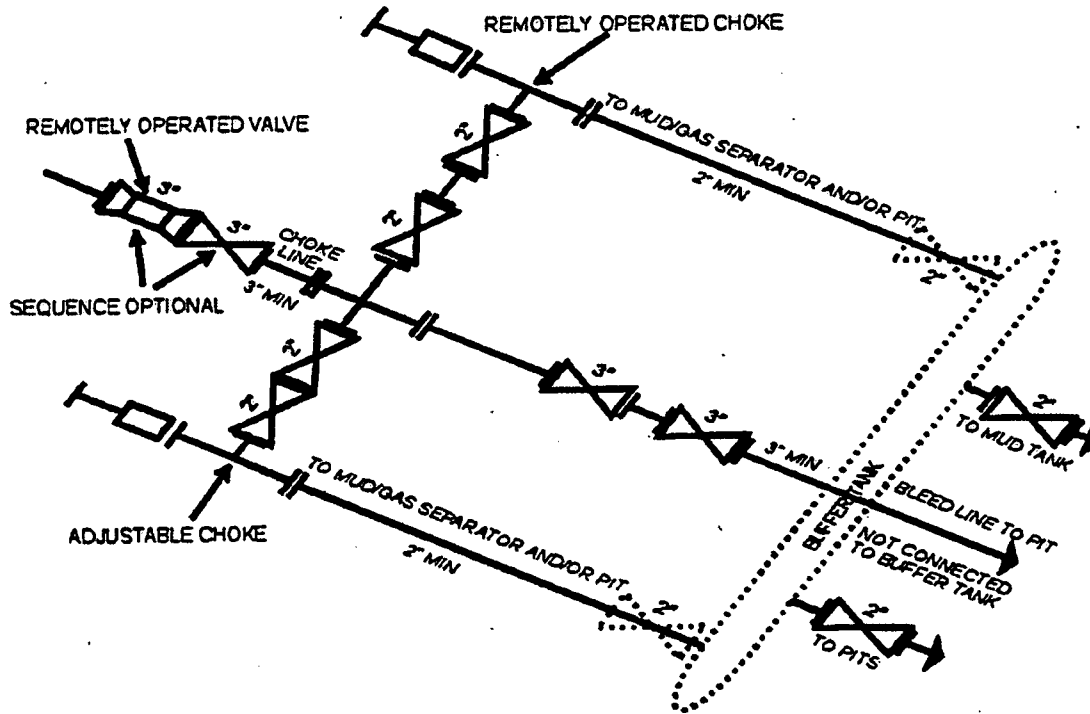
WHERE TO FIND HELP

Doddridge County:

Ambulance, Fire, Law Enforcement Emergencies Call 911
Poison Control Center....1-304-388-4211 or 1-800-222-1222
Emergency Alert System Radio WFBY-FM 106.5

FIRE:	
Doddridge County Ambulance Authority	304-838-5718
Greenwood V.F.D	304-873-3669
McClellan V.F.D	304-782-2774
Smithburg V.F.D	304-873-1493
West Union V.F.D	304-873-1391
B.A.N.C.S V.F.D	304-873-3722
EMS:	
Doddridge County Office of Emergency Service	304-782-2124
Doddridge County EMS	304-873-3330
LAW ENFORCEMENT:	
Doddridge County Sheriff Department	304-873-1000
West Union Police Department	304-873-1107
West Virginia State Police Doddridge County Detachment	304-873-2101
OTHER IMPORTANT NUMBERS:	
W.V. Dept. of Health & Human Resources	304-627-2295
National Response Center (Chemical, Oil Spills & Chemical/Biological Terrorism) (State Emergency Spill Notification)	1-800-424-8802 1-800-642-3074
Allegheny Power	1-800-255-3443
WV State Fire Marshal (Arson Hotline)	304-588-2191 1-800-233-3473
Dominion Hope Gas	1-800-688-4673

Appendix D: Choke Manifold Schematic



5M CHOKE MANIFOLD EQUIPMENT - CONFIGURATION OF CHOKES MAY VARY

Although not required for any of the choke manifold systems, buffer tanks are sometimes installed downstream of the choke assemblies for the purpose of manifolding the bleed lines together. When buffer tanks are employed, valves shall be installed upstream to isolate a failure or malfunction without interrupting flow control. Though not shown on 2M, 3M, 10M, OR 15M drawings, it would also be applicable to those situations.

[54 FR 39528, Sept. 27, 1989]

Appendix E. List of Well Control Trained Personnel

1. John Kawcak- Antero
2. Mike Ward- Drilling Consultant
3. Ricky Jones- Drilling Superintendent
4. Mike Alcorn- Drilling Superintendent
5. Landon West- Completion Consultant
6. Jeff Partridge-Completion Consultant
7. Norman Wood- Drilling Consultant
8. Delf Martinez- Drilling Consultant
9. James Harvey- Drilling Consultant
10. Steve Guffey- Drilling Consultant
11. Tim Murell- Drilling Consultant
12. James Neal-Drilling Consultant
13. Virgil Gaither-Drilling Consultant
14. Ralph Ybarra- Drilling Consultant
15. Bob Belcher- Completion Consultant (Willowbend)
16. Kris Humpert- Completion Consultant (Willowbend)
17. Ronnie Fuller- Completion Consultant (Willowbend)
18. Trevor Lively- Completion Consultant (Willowbend)
19. Trey Armstrong- Completion Consultant (Willowbend)
20. Gary Linn- Completion Consultant (Willowbend)
21. Justin Bowers- Completion Consultant (Willowbend)
22. Michael Petitt- Completion Consultant (Willowbend)
23. Stephen Sanders- Completion Consultant (Willowbend)

SITE PLAN (1)

All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011.



Allegheny Surveys, Inc.
172 Thompson Drive
Bridgeport, WV 26330
(304) 846-5035



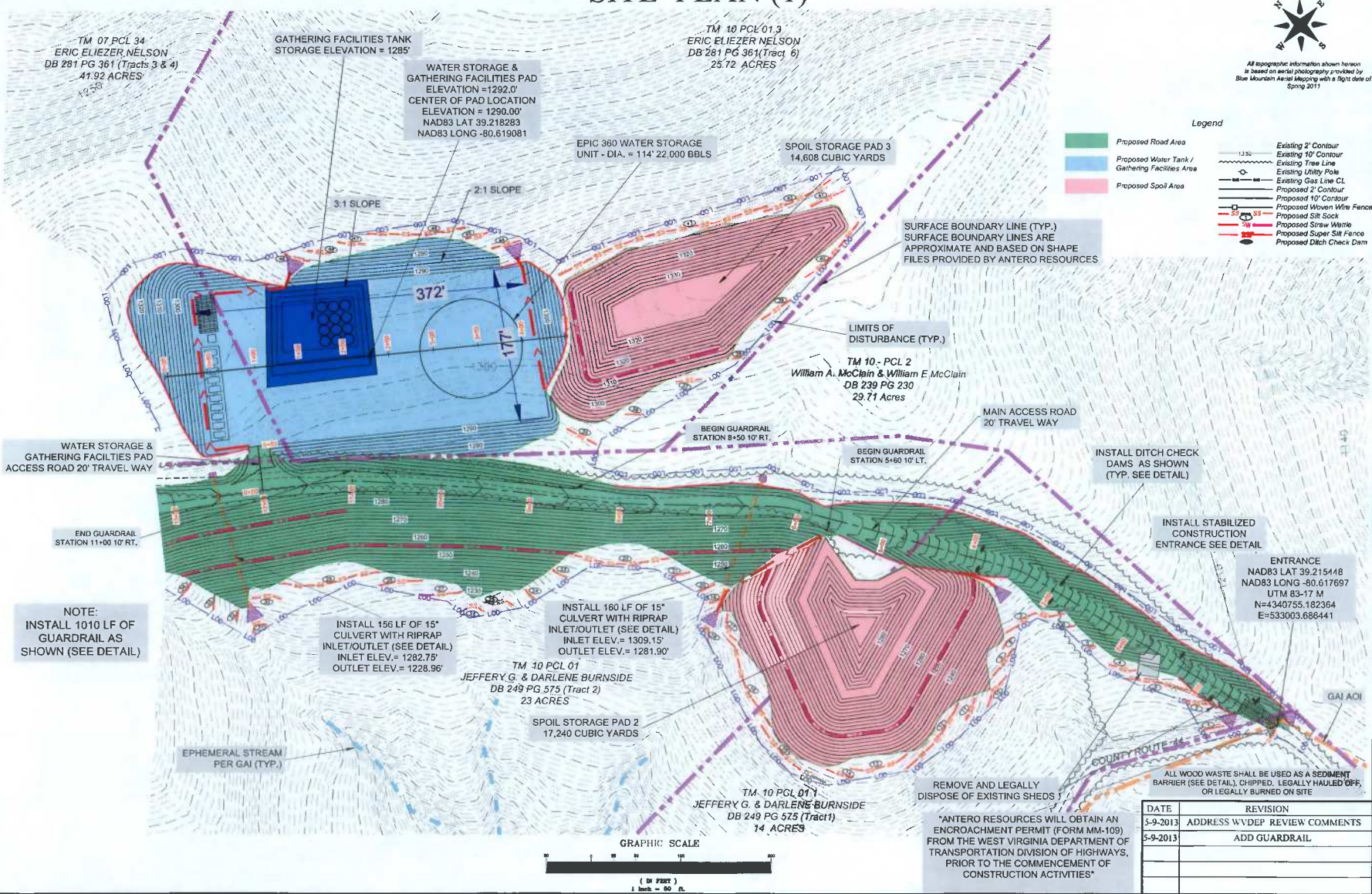
Hornor Shroyer Bros, Engineers
Civil, Mining, Environmental and Consulting Engineering
1000 Mountain View Drive, Suite 200
Martinsburg, WV 26151



THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP.

FINAL SITE DESIGN
HUGHES DRILL PAD SITE ALT-2
GREENBRIER DISTRICT
DODDRIIDGE COUNTY, WV

Date: 3-21-2013
Scale: 1" = 50'
Designed By: TNC & DR



Legend

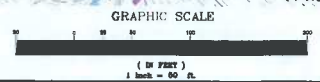
- Proposed Road Area
- Proposed Water Tank / Gathering Facilities Area
- Proposed Spoil Area
- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Pole
- Existing Gas Line CL
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Woven Wire Fence
- Proposed Silt Sock
- Proposed Straw Mattie
- Proposed Super Silt Fence
- Proposed Ditch Check Dam

SURFACE BOUNDARY LINE (TYP.)
SURFACE BOUNDARY LINES ARE APPROXIMATE AND BASED ON SHAPE FILES PROVIDED BY ANTERO RESOURCES

LIMITS OF DISTURBANCE (TYP.)

TM 10 - PCL 2
William A. McClain & William E. McClain
DB 239 PG 230
29.71 Acres

ENTRANCE
NAD83 LAT 39.215448
NAD83 LONG -80.617697
UTM 83-17 M
N=4340755.182364
E=5330003.686441



REMOVE AND LEGALLY DISPOSE OF EXISTING SHEDS 1

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

DATE	REVISION
5-9-2013	ADDRESS WVDEP REVIEW COMMENTS
5-9-2013	ADD GUARDRAIL

TM 07 PCL 34
ERIC ELIEZER NELSON
DB 281 PG 361 (Tracts 3 & 4)
41.92 ACRES

GATHERING FACILITIES TANK
STORAGE ELEVATION = 1285'

WATER STORAGE & GATHERING FACILITIES PAD
ELEVATION = 1292.0'
CENTER OF PAD LOCATION
ELEVATION = 1290.00'
NAD83 LAT 39.218283
NAD83 LONG -80.619081

TM 10 PCL 01.3
ERIC ELIEZER NELSON
DB 281 PG 361 (Tract 6)
25.72 ACRES

EPIC 360 WATER STORAGE
UNIT - DIA. = 114' 22,000 BBLs

SPOIL STORAGE PAD 3
14,608 CUBIC YARDS

3:1 SLOPE

2:1 SLOPE

372'

177'

WATER STORAGE & GATHERING FACILITIES PAD
ACCESS ROAD 20' TRAVEL WAY

END GUARDRAIL
STATION 11+00 10' RT.

NOTE:
INSTALL 1010 LF OF
GUARDRAIL AS
SHOWN (SEE DETAIL)

INSTALL 156 LF OF 15"
CULVERT WITH RIPRAP
INLET/OUTLET (SEE DETAIL)
INLET ELEV. = 1282.75'
OUTLET ELEV. = 1228.96'

TM 10 PCL 01
JEFFERY G. & DARLENE BURNSIDE
DB 249 PG 575 (Tract 2)
23 ACRES

SPOIL STORAGE PAD 2
17,240 CUBIC YARDS

EPHEMERAL STREAM
PER GAI (TYP.)

TM 10 PCL 01.1
JEFFERY G. & DARLENE BURNSIDE
DB 249 PG 575 (Tract 1)
14 ACRES

MAIN ACCESS ROAD
20' TRAVEL WAY

BEGIN GUARDRAIL
STATION 8+50 10' RT.

BEGIN GUARDRAIL
STATION 8+60 10' LT.

INSTALL DITCH CHECK
DAMS AS SHOWN
(TYP. SEE DETAIL)

INSTALL STABILIZED
CONSTRUCTION
ENTRANCE SEE DETAIL

GAI AOI

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL), CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE

SITE PLAN (2)



All topographic information shown herein is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



Allegheny Surveys, Inc.
172 Thompson Drive
Bridgeport, WV 26330
(304) 848-5035

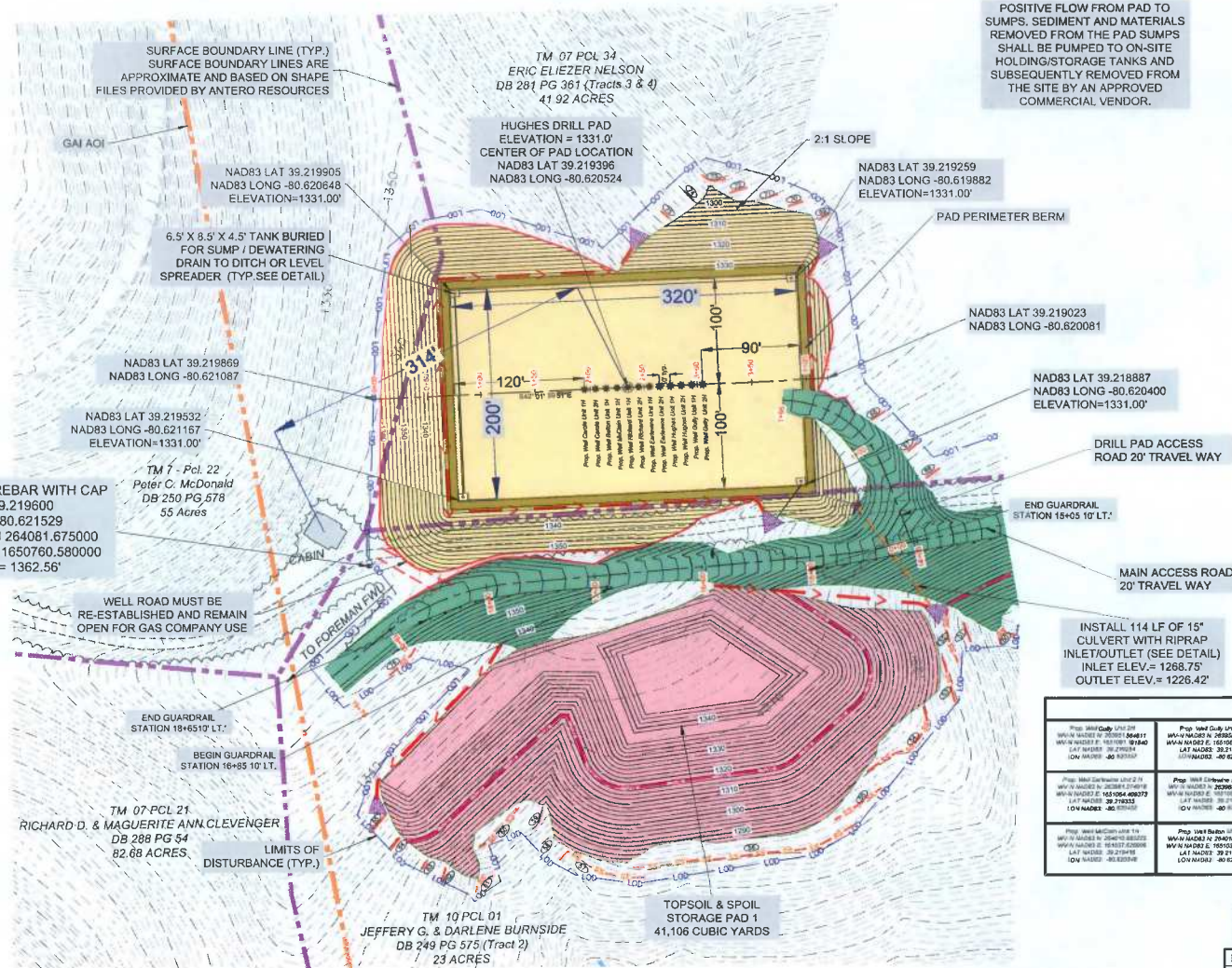


Honor Trace Bros. Engineers
Environmental and Civil Engineering
140 Salem Turn Street, 2nd Floor, Box 306
Charleston, West Virginia, 25301 (304) 281-5440



THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP.

FINAL SITE DESIGN
HUGHES DRILL PAD SITE ALT-2
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV



POSITIVE FLOW FROM PAD TO SUMPS, SEDIMENT AND MATERIALS REMOVED FROM THE PAD SUMPS SHALL BE PUMPED TO ON-SITE HOLDING/STORAGE TANKS AND SUBSEQUENTLY REMOVED FROM THE SITE BY AN APPROVED COMMERCIAL VENDOR.

SITE BENCHMARK = REBAR WITH CAP
NAD83 LAT: 39.219600
NAD83 LONG: -80.621529
NAD83 WV-NORTH N 264081.675000
NAD83 WV-NORTH E 1650760.580000
NAVD88 ELEV = 1362.56'

SURFACE BOUNDARY LINE (TYP.)
SURFACE BOUNDARY LINES ARE APPROXIMATE AND BASED ON SHAPE FILES PROVIDED BY ANTERO RESOURCES

HUGHES DRILL PAD
ELEVATION = 1331.0'
CENTER OF PAD LOCATION
NAD83 LAT 39.219396
NAD83 LONG -80.620524

2:1 SLOPE
PAD PERIMETER BERM
NAD83 LAT 39.219259
NAD83 LONG -80.619882
ELEVATION=1331.00'

6.5' X 8.5' X 4.5' TANK BURIED FOR SUMP / DEWATERING DRAIN TO DITCH OR LEVEL SPREADER (TYP. SEE DETAIL)

NAD83 LAT 39.219869
NAD83 LONG -80.621087

NAD83 LAT 39.219532
NAD83 LONG -80.621167
ELEVATION=1331.00'

TM 7 - Pct. 22
Peter C. McDonald
DB 250 PG 578
55 Acres

NAD83 LAT 39.219023
NAD83 LONG -80.620081

NAD83 LAT 39.218887
NAD83 LONG -80.620400
ELEVATION=1331.00'

DRILL PAD ACCESS ROAD 20' TRAVEL WAY

END GUARDRAIL STATION 15+05.10' LT.

MAIN ACCESS ROAD 20' TRAVEL WAY

INSTALL 114 LF OF 15" CULVERT WITH RIPRAP INLET/OUTLET (SEE DETAIL)
INLET ELEV.= 1268.75'
OUTLET ELEV.= 1226.42'

WELL ROAD MUST BE RE-ESTABLISHED AND REMAIN OPEN FOR GAS COMPANY USE

END GUARDRAIL STATION 18+65.10' LT.

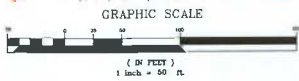
BEGIN GUARDRAIL STATION 16+85.10' LT.

TM 07-PCL 21
RICHARD D. & MAGUERITE ANN CLEVENGER
DB 288 PG 54
82.68 ACRES.

LIMITS OF DISTURBANCE (TYP.)

TM 10 PCL 01
JEFFERY G. & DARLENE BURNSIDE
DB 249 PG 575 (Tract 2)
23 ACRES

TOPSOIL & SPOIL STORAGE PAD 1
41,106 CUBIC YARDS



NOTE:
INSTALL 1,005 LF OF GUARDRAIL AS SHOWN (SEE DETAIL)

Legend

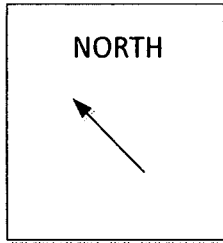
- Proposed Road Area
- Proposed Drill Pad Area
- Proposed Spoil Area
- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Pole
- Existing Gas Line CL
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Silt Sock
- Proposed Straw Wattie
- Proposed Super Silt Fence
- Proposed Ditch Check Dam

Well Table			
Prop. Well Cully Line 211 WVA NAD83 E: 265251.864211 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Cully Line 111 WVA NAD83 E: 265252.864211 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Hughes Line 211 WVA NAD83 E: 265253.864211 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Hughes Line 111 WVA NAD83 E: 265254.864211 LAT NAD83: 39.219140 LOW NAD83: -80.619359
Prop. Well Cully Line 212 WVA NAD83 E: 265252.864212 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Cully Line 112 WVA NAD83 E: 265253.864212 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Hughes Line 212 WVA NAD83 E: 265254.864212 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Hughes Line 112 WVA NAD83 E: 265255.864212 LAT NAD83: 39.219140 LOW NAD83: -80.619359
Prop. Well Cully Line 213 WVA NAD83 E: 265253.864213 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Cully Line 113 WVA NAD83 E: 265254.864213 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Hughes Line 213 WVA NAD83 E: 265255.864213 LAT NAD83: 39.219140 LOW NAD83: -80.619359	Prop. Well Hughes Line 113 WVA NAD83 E: 265256.864213 LAT NAD83: 39.219140 LOW NAD83: -80.619359

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL), CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE

DATE	REVISION
5-9-2013	ADDRESS WVDEP REVIEW COMMENTS
5-9-2013	ADD GUARDRAIL

Date: 3-21-2013
Scale: 1" = 50'
Designed By: TIC & JDR
File No: 10-1240-01-2
Page 9 of 11

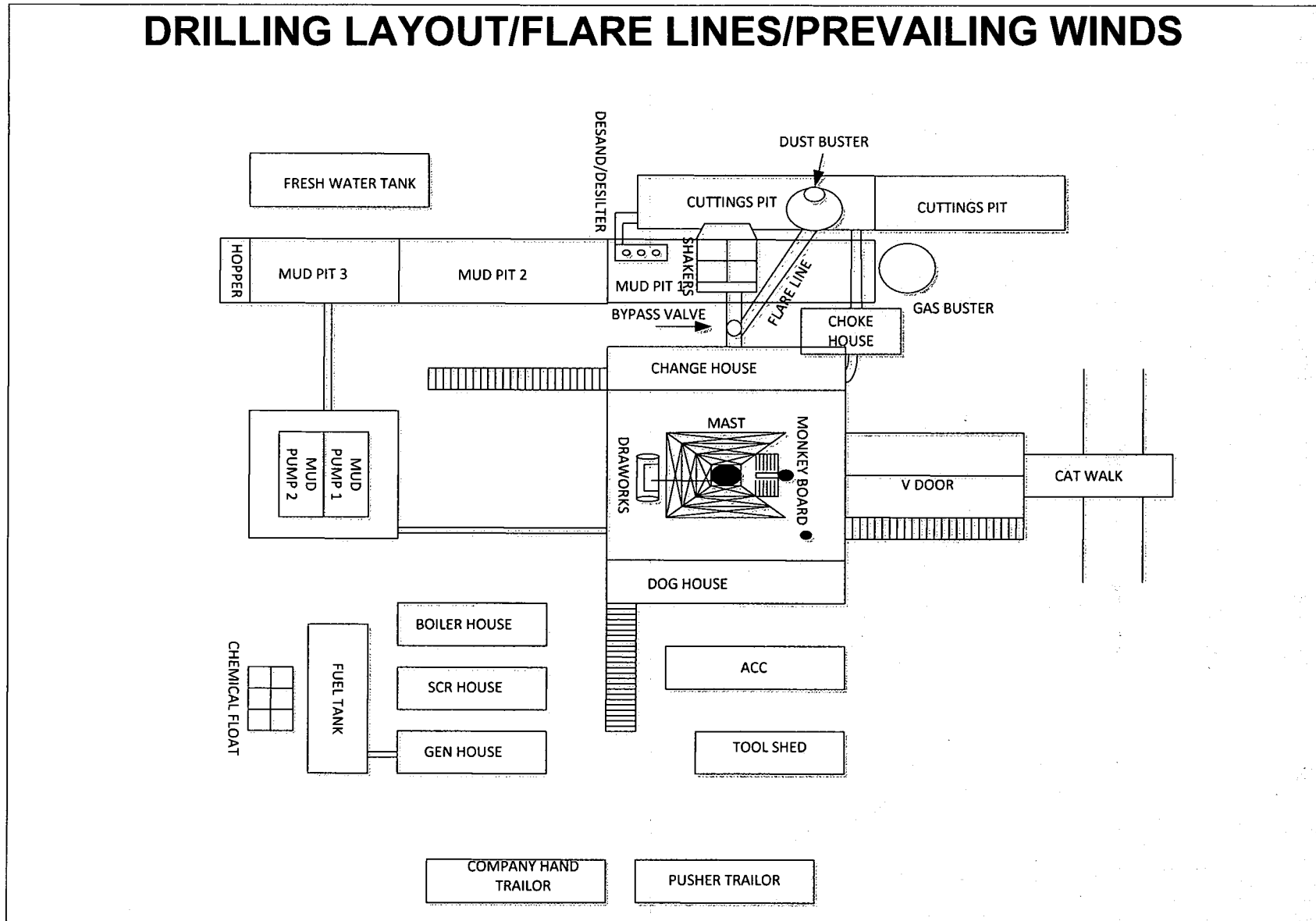


PREVAILING WIND
DIRECTION NNE



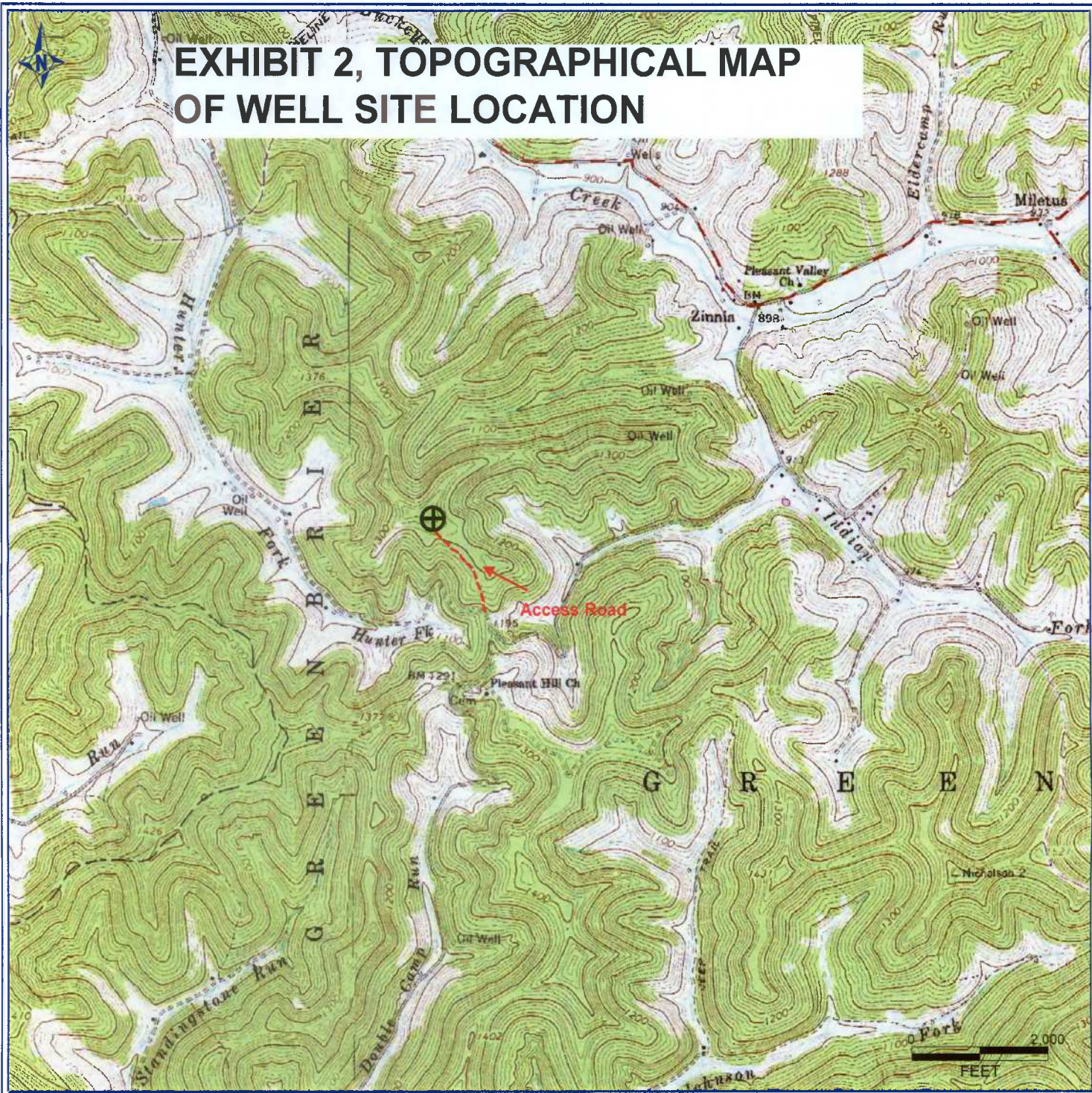
EXHIBIT 1, PAGE 3

DRILLING LAYOUT/FLARE LINES/PREVAILING WINDS



ACCESS ROAD

EXHIBIT 2, TOPOGRAPHICAL MAP OF WELL SITE LOCATION



PETRA 6/26/2012 4:50:27 PM

Antero Resources Corporation

APPALACHIAN BASIN

Hughes Pad
Doddridge County



REMARKS
QUADRANGLE: BIG ISAAC
WATERSHED:
DISTRICT:

**HUGHES PAD - EXHIBIT 3
LIST OF ALL SCHOOLS & PUBLIC FACILITIES WITHIN A
ONE- MILE RADIUS OF PROPOSED WELL SITE**

Facility Name	Telephone Number
None identified within a 1-mile radius	

EXHIBIT 4.a to SSP- WW-6B FORM

WW - 6B
(3/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

- 1) Well Operator: Antero Resources Appalachian Corporation 494488557 017-Doddridge Greenbrier Big Isaac 7.5'
Operator ID County District Quadrangle
- 2) Operator's Well Number: Carole Unit 1H Well Pad Name: Hughes Pad
- 3 Elevation, current ground: -1360' Elevation, proposed post-construction: 1331'
- 4) Well Type: (a) Gas Oil Underground Storage
Other _____
(b) If Gas: Shallow Deep
Horizontal
- 5) Existing Pad? Yes or No: No
- 6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7500' TVD, Anticipated Thickness- 60 Feet, Associated Pressure- 3250#
- 7) Proposed Total Vertical Depth: 7500' TVD
- 8) Formation at Total Vertical Depth: Marcellus
- 9) Proposed Total Measured Depth: 17000' MD
- 10) Approximate Fresh Water Strata Depths: 125', 472'
- 11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.
- 12) Approximate Saltwater Depths: 545', 1952'
- 13) Approximate Coal Seam Depths: 407', 727'
- 14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated
- 15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: No
- 16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale
*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.
- 17) Describe fracturing/stimulating methods in detail:
Antero plans to pump slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."
- 18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 16.51 acres
- 19) Area to be disturbed for well pad only, less access road (acres): 3.04 acres

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	525'	525' *see above	CTS, 729 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2440'	2440'	CTS, 993 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17000'	17000'	4288 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

EXHIBIT 4.b to SSP- WW-6B FORM

WW - 6B
(3/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator:	Antero Resources Appalachian Corporation	494488557	017-Doddridge	Greenbrier	Big Isaac 7.5'
	Operator ID	County	District	Quadrangle	

2) Operator's Well Number: Carole Unit 2H Well Pad Name: Hughes Pad

3 Elevation, current ground: -1360' Elevation, proposed post-construction: 1331'

4) Well Type: (a) Gas Oil Underground Storage
 Other _____
 (b) If Gas: Shallow Deep
 Horizontal

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7500' TVD, Anticipated Thickness- 60 Feet, Associated Pressure- 3250#

7) Proposed Total Vertical Depth: 7500' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 16600' MD

10) Approximate Fresh Water Strata Depths: 125', 472'

11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.

12) Approximate Saltwater Depths: 545', 1952'

13) Approximate Coal Seam Depths: 407', 727'

14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: No

16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale
*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

17) Describe fracturing/stimulating methods in detail:
Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 16.51 acres

19) Area to be disturbed for well pad only, less access road (acres): 3.04 acres

20)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill -up (Cu. Ft.)</u>
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	530'	530' *see above	CTS, 736 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2445'	2445'	CTS, 996 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	16600'	16600'	4288 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

EXHIBIT 4.c to SSP- WW-6B FORM

WW - 6B
(3/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

- 1) Well Operator: Antero Resources Appalachian Corporation 494488557 017-Doddridge Greenbrier Big Isaac 7.5'
Operator ID County District Quadrangle
- 2) Operator's Well Number: Belton Unit 1H Well Pad Name: Hughes Pad
- 3 Elevation, current ground: -1360' Elevation, proposed post-construction: 1331'
- 4) Well Type: (a) Gas Oil Underground Storage
Other _____
(b) If Gas: Shallow Deep
Horizontal
- 5) Existing Pad? Yes or No: No
- 6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7500' TVD, Anticipated Thickness- 60 Feet, Associated Pressure- 3250#
- 7) Proposed Total Vertical Depth: 7500' TVD
- 8) Formation at Total Vertical Depth: Marcellus
- 9) Proposed Total Measured Depth: 16400' MD
- 10) Approximate Fresh Water Strata Depths: 125', 472'
- 11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.
- 12) Approximate Saltwater Depths: 545', 1952'
- 13) Approximate Coal Seam Depths: 407', 727'
- 14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated
- 15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: No
- 16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale
*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.
- 17) Describe fracturing/stimulating methods in detail:
Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 90 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."
- 18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 18.51 acres
- 19) Area to be disturbed for well pad only, less access road (acres): 3.04 acres

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	525'	525' *see above	CTS, 729 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2450'	2450'	CTS, 998 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	16400'	16400'	4120 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

HUGHES PAD ALT-2

FINAL SITE DESIGN, CONSTRUCTION PLAN, & EROSION & SEDIMENT CONTROL PLANS

ANTERO RESOURCES APPALACHIAN CORPORATION

West Virginia Coordinate System of 1983
 State Plane Grid North
 Elevations NAVD88
 Established By Survey Grade GPS

AFFECTED TAX PARCELS: 10/01, 10/01.1, 7/22, 7/34 & 10/01.3
 GREENBRIER DISTRICT, DODDRIDGE COUNTY



Allegheny Surveys, Inc.
 172 Thompson Drive
 Bridgeport, WV 26330
 (304) 848-5035



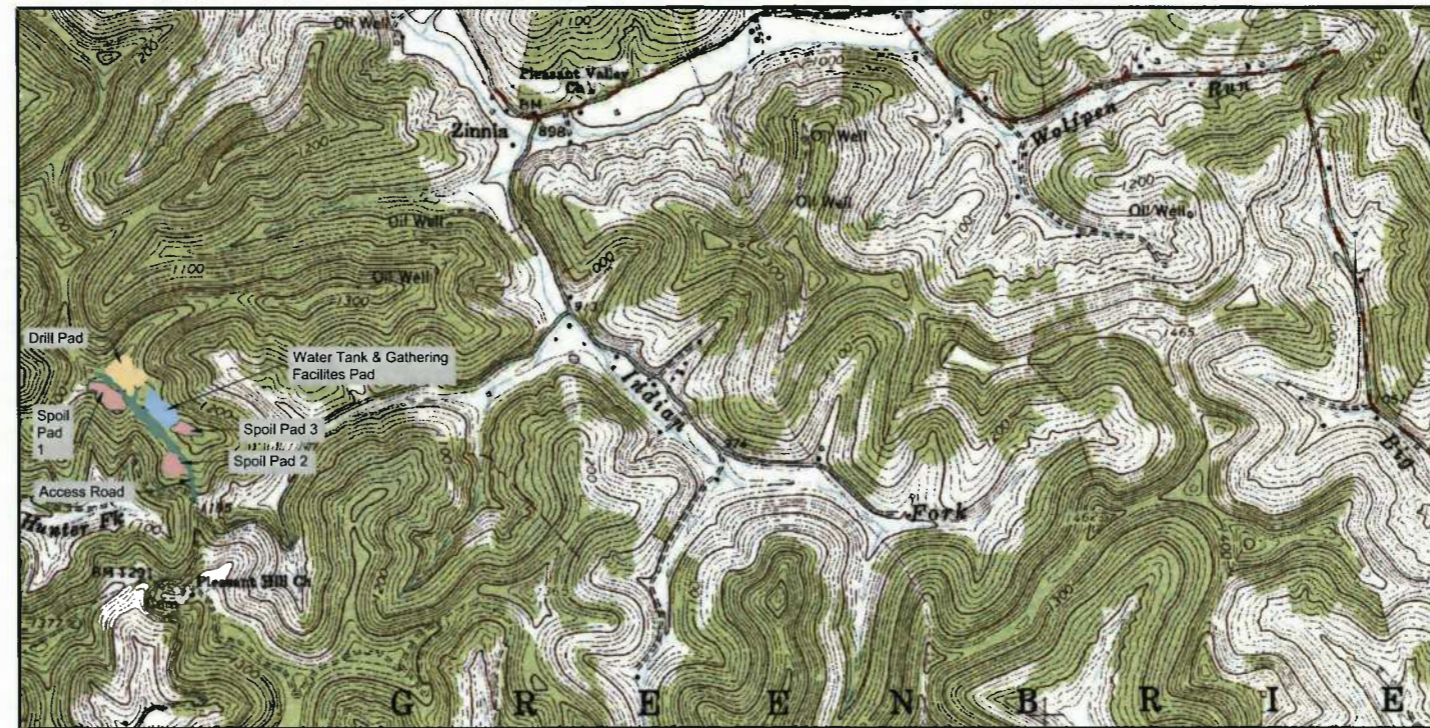
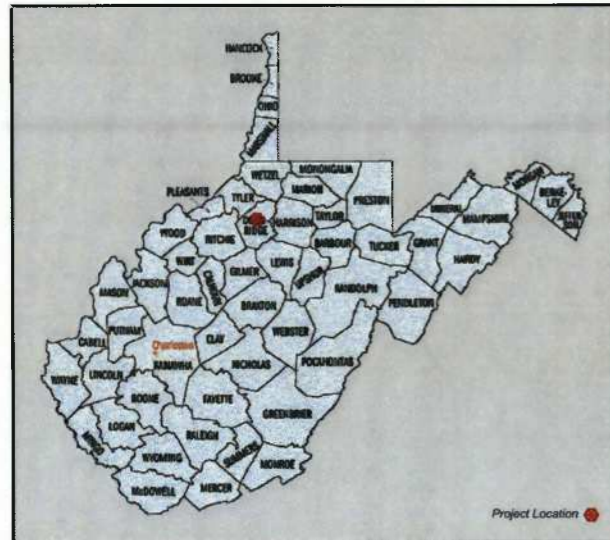
Hornor Bros. Engineers
 Since 1902
 Civil, Mining, Environmental and Consulting Engineering
 140 South Third Street, Post Office Box 306,
 Charleston, West Virginia, 25301 (304) 524-6445



THIS DOCUMENT
 PREPARED FOR
 ANTERO RESOURCES
 APPALACHIAN CORP

COVER SHEET / LOCATION MAP
**HUGHES
 DRILL PAD SITE ALT-2**
 GREENBRIER DISTRICT
 DODDRIDGE COUNTY, WV

DATE: 3-21-2013
 Scale: N/A
 Designed By: TBC & JDR
 File No.: HUGES PROJECTS: 13AH 2013
 13AH 2013-01
 13AH 2013-01-01
 13AH 2013-01-01
 Page 1 of 19



TM 10 - Pct. 01
 Jeffery G. & Darlene Burnside
 DB 249, PG 575 (tract 2)
 23 Acres:
 (Affected area from Proposed Drill Pad = 0.20 Acres)
 (Affected area from Proposed Drill Pad Access Road = 18 feet, 0.10 Acres)
 (Affected area from Proposed Water Storage & Gathering Facilities Pad = 0.04 Acres)
 (Affected area from Proposed Access Road = 1,509 feet, 3.95 Acres)
 (Affected area from Proposed Spoil Pile = 3.09 Acres)

TM 10 - Pct. 01.1
 Jeffery G. & Darlene Burnside
 DB 249, PG 575 (tract 1)
 14 Acres:
 (Affected area from Proposed Access Road = 461 feet, 0.85 Acres)
 (Affected area from Proposed Spoil Pile = 1.11 Acres)

TM 7 - Pct. 22
 Peter C. McDonald
 DB 250, PG 578
 55 Acres:
 (Affected area from Proposed Drill Pad = 0.19 Acres)

TM 7 - Pct. 34
 Eric Eliezer Nelson
 DB 281, PG 361 (tracts 3 & 4)
 41.92 Acres:
 (Affected area from Proposed Drill Pad = 2.65 Acres)
 (Affected area from Proposed Water Storage & Gathering Facilities Pad = 0.62 Acres)
 (Affected area from Proposed Water Storage & Gathering Facilities Pad Access Road = 18 feet, 0.03 Acres)
 (Affected area from Proposed Drill Pad Access Road = 139 feet, 0.26 Acres)

TM 10 - Pct. 01.3
 Eric Eliezer Nelson
 DB 281, PG 361 (tract 6)
 25.72 Acres:
 (Affected area from Proposed Water Storage & Gathering Facilities Pad = 2.07 Acres)
 (Affected area from Proposed Spoil Pile = 1.33 Acres)

Well Location Restrictions:

All Pad limits comply with the following restrictions.

- * 250' from an existing well or developed spring used for human or domestic animals.
- * 625' occupied dwelling or barn greater 2500 SF used for poultry or dairy measured from the center of the pad.
- * 100' from edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
- * 300' from edge of disturbance to naturally reproducing trout streams.
- * 1000' of surface or ground water intake to a public water supply.

Project Contacts

Antero Resources

Anthony Smith - Construction
 304-869-3405 Off. 304-673-6196 Cell

Roger Dunlap - Project Manager
 304-651-5588

Ryan Ward, Environmental Engineer (ALLSTAR)
 866-213-2666, ext 311 Off. 304-692-7477 Cell

John Kawcak, Engineer
 817-368-1553

Dusty Woods
 817-771-1436

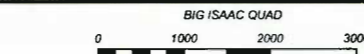
Aaron Kunzler, Construction Manager
 405-227-8344

Surveyor & Engineer

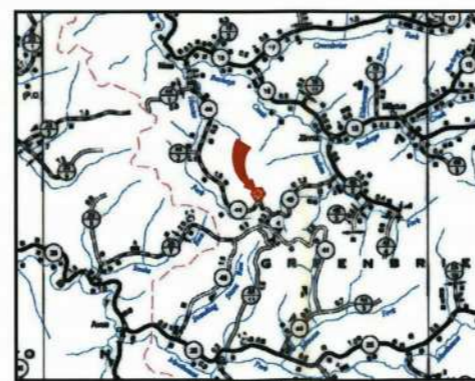
Bill Yetzer, PS, EI - Allegheny Surveys Inc.
 304-848-5035 Off. 304-619-4937 Cell

Tom Corathers, PE, PS - Hornor Brothers Engineers
 304-624-6445 Office

FLOODPLAIN CONDITIONS	
DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:	NO
HEC-RAS STUDY COMPLETED:	N/A
FLOODPLAIN SHOWN ON DRAWINGS:	N/A
FIRM MAP NUMBER(S) FOR SITE:	54017C0255C
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A



SITE LOCATIONS STATE PLANE NAD 83 (WV NORTH ZONE)		
	LATITUDE	LONGITUDE
Begin Access Road	39 21544.8	-80.617897
Center of Pad	39 21939.6	-80.620524
Center of Pad (UTM 83-17 M)	N=4341192.195459	E=532757.99126



Design Certification

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 §35-4-21. The information reflects a Drill Pad and Access Road.

Well Table			
Prop. Well Dolly Unit 2H WV-N NAD83 N: 263951.554611 WV-N NAD83 E: 1651091.191840 LAT NAD83: 39.219254 LON NAD83: -80.620527	Prop. Well Dolly Unit 1H WV-N NAD83 N: 263959.592187 WV-N NAD83 E: 1651084.496223 LAT NAD83: 39.219275 LON NAD83: -80.620380	Prop. Well Hughes Unit 2H WV-N NAD83 N: 263965.419764 WV-N NAD83 E: 1651077.806806 LAT NAD83: 39.219295 LON NAD83: -80.620404	Prop. Well Hughes Unit 1H WV-N NAD83 N: 263973.647341 WV-N NAD83 E: 1651071.104990 LAT NAD83: 39.219315 LON NAD83: -80.620428
Prop. Well Eastmine Unit 2 H WV-N NAD83 N: 263981.274918 WV-N NAD83 E: 1651054.409373 LAT NAD83: 39.219329 LON NAD83: -80.620452	Prop. Well Eastmine Unit 1H WV-N NAD83 N: 263988.702495 WV-N NAD83 E: 1651057.713756 LAT NAD83: 39.219355 LON NAD83: -80.620474	Prop. Well Richard Unit 2H WV-N NAD83 N: 263996.130072 WV-N NAD83 E: 1651051.018139 LAT NAD83: 39.219375 LON NAD83: -80.620500	Prop. Well Richard Unit 1H WV-N NAD83 N: 264003.552648 WV-N NAD83 E: 1651044.322522 LAT NAD83: 39.219396 LON NAD83: -80.620524
Prop. Well McClain Unit 1H WV-N NAD83 N: 264010.985225 WV-N NAD83 E: 1651030.931289 LAT NAD83: 39.219416 LON NAD83: -80.620540	Prop. Well Dalton Unit 1H WV-N NAD83 N: 264016.412802 WV-N NAD83 E: 1651030.931289 LAT NAD83: 39.219436 LON NAD83: -80.620572	Prop. Well Carls Unit 2H WV-N NAD83 N: 264025.840379 WV-N NAD83 E: 1651024.235672 LAT NAD83: 39.219456 LON NAD83: -80.620596	Prop. Well Carls Unit 1H WV-N NAD83 N: 264033.267956 WV-N NAD83 E: 1651017.540655 LAT NAD83: 39.219476 LON NAD83: -80.620620

SHEET INDEX

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DATE	REVISIONS	Date: 3-21-2013
5-8-2013	ADDRESSED WVDEP & ANTERO REVIEW COMMENTS	Scale: N/A
		Designed By: TBC & JDR
		File No.: HUGES PROJECTS: 13AH 2013 13AH 2013-01 13AH 2013-01-01
		Page 1 of 19

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!!



Know what's below.
 Call before you dig.

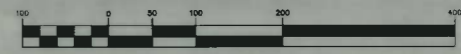
HUGHES DRILL PAD

OVERVIEW PLAN & PLAN SHEET INDEX

ANTERO RESOURCES APPALACHIAN CORPORATION



GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011.



Allegheny Surveys, Inc.
172 Thompson Drive
Bridgeport, WV 26330
(304) 848-5035



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Bros. Engineers
Civil, Mining, Environmental and
Consulting Engineering
140 South Third Street, First Office Box 306,
Charleston, West Virginia, 25301 (304) 524-6445



THIS DOCUMENT
PREPARED FOR
ANTERO RESOURCES
APPALACHIAN CORP.

OVERVIEW PLAN
**HUGHES
DRILL PAD SITE**
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV



SITE BENCHMARK = REBAR WITH CAP
NAD83 LAT: 39.219600
NAD83 LONG: -80.621529
NAD83 WV-NORTH N 264081.675000
NAD83 WV-NORTH E 1650760.580000
NAVD88 ELEV = 1362.56'

SURFACE BOUNDARY LINE (TYP.)
SURFACE BOUNDARY LINES ARE
APPROXIMATE AND BASED ON
CURRENT DEEDS & SHAPE FILES
PROVIDED BY ANTERO RESOURCES
AND BOUNDARY EVIDENCE COLLECTED
WITH MAPPING GRADE GPS

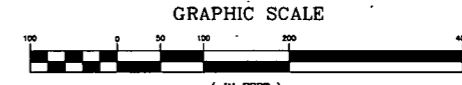
- Legend**
- Proposed Road Area
 - Proposed Drill Pad Area
 - Proposed Water Tank / Gathering Facilities Area
 - Proposed Spoil Area
 - Existing 2' Contour
 - Existing 10' Contour
 - Existing Tree Line
 - Existing Utility Pole
 - Existing Gas Line CL
 - Proposed 2' Contour
 - Proposed 10' Contour

DATE	
	Date: 3-21-2013
	Scale: 1" = 100'
	Designed By: TBC & JDR
	FILE PROJECT: 201303AS101 FILE NO: 130303-002 130303-002-001
	Page 2 of 19

HUGHES DRILL PAD

EXISTING CONDITIONS PLAN

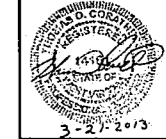
ANTERO RESOURCES APPALACHIAN CORPORATION



All topographic information shown herein is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



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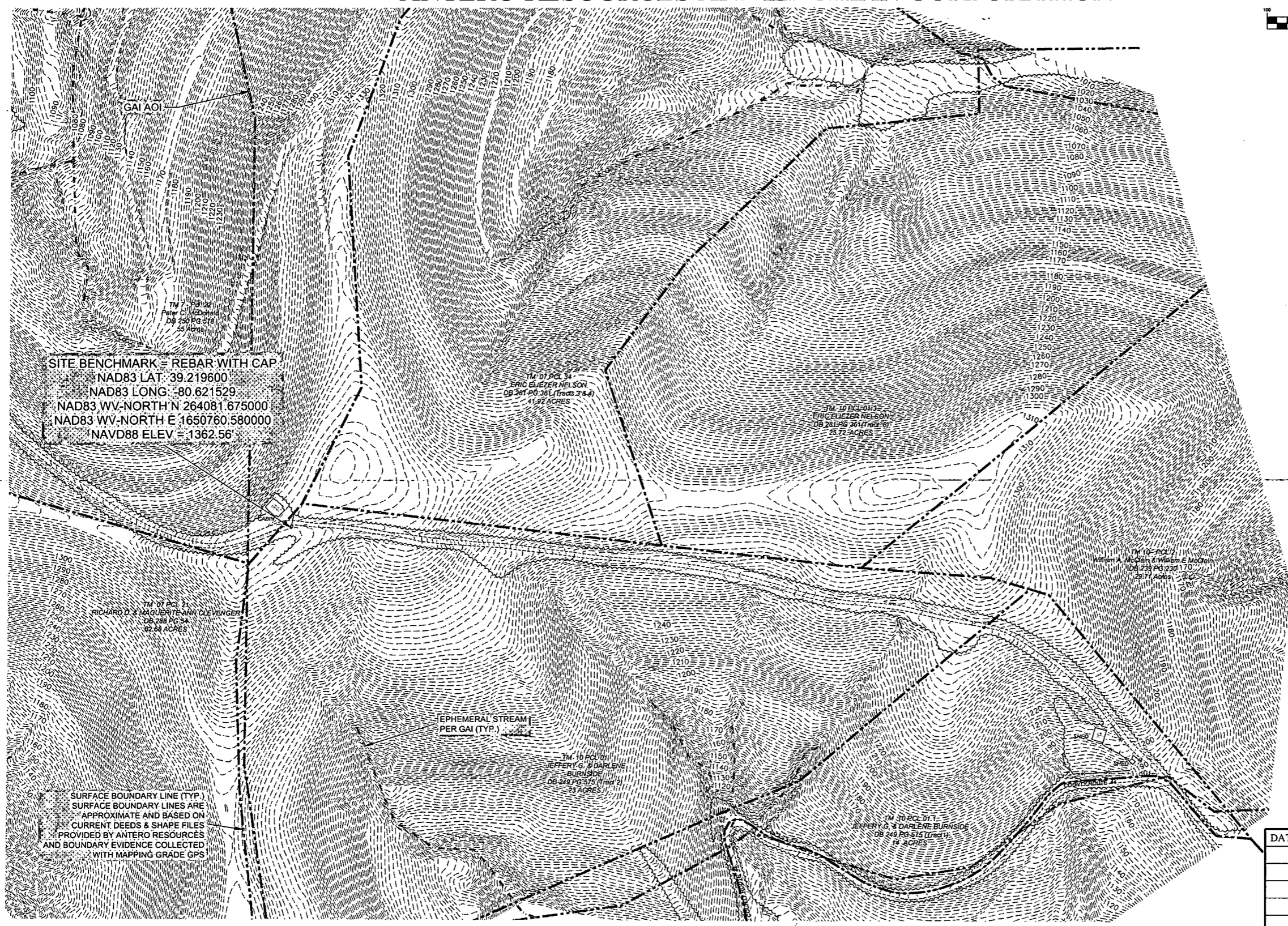


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1902 Mining, Environmental and Civil Consulting Engineering
140 South Third Street, Post Office Box 306, Cambridge, West Virginia 26031 (304) 621-4445



THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

EXISTING CONDITIONS PLAN
HUGHES DRILL PAD SITE
GREENBRIER DISTRICT
DODD BRIDGE COUNTY, WV



SITE BENCHMARK = REBAR WITH CAP
NAD83 LAT: 39.219600
NAD83 LONG: -80.621529
NAD83 WV-NORTH N 264081.675000
NAD83 WV-NORTH E 1650760.580000
NAVD88 ELEV = 1362.56'

TM 07 PCL 34
ERIC ELIEZER NELSON
DB 261 PG 261 (Tracts 3 & 4)
41.82 ACRES

TM 10 PCL 01
ERIC ELIEZER NELSON
DB 261 PG 261 (Tract 5)
23.72 ACRES

TM 12 PCL 11
WILLIAM A. JACKSON ENGINEERS & ARCHITECTS
DB 233 PG 233 170
29.77 ACRES

TM 07 PCL 21
RICHARD D. & MARGUERITE ANN DUEVINGER
DB 288 PG 54
92.84 ACRES

EPHEMERAL STREAM
PER GAI (TYP.)

TM 10 PCL 01
JEFFERY G. & DARLENE BURNSIDE
DB 249 PG 575 (Tract 2)
23 ACRES

TM 30 PCL 01
JEFFERY G. & DARLENE BURNSIDE
DB 249 PG 575 (Tract 1)
14 ACRES

SURFACE BOUNDARY LINE (TYP.)
SURFACE BOUNDARY LINES ARE APPROXIMATE AND BASED ON CURRENT DEEDS & SHAPE FILES PROVIDED BY ANTERO RESOURCES AND BOUNDARY EVIDENCE COLLECTED WITH MAPPING GRADE GPS

Legend
--- Existing 2' Contour
--- Existing 10' Contour
~~~~~ Existing Tree Line

| DATE | REVISION |
|------|----------|
|      |          |
|      |          |
|      |          |
|      |          |

Date: 3-21-2013  
Scale: 1" = 100'  
Designed By: TBC & JDR  
File No. 174-13-036-2013  
174-13-036-2013.dwg  
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| Schedule of Quantities                              |      |          |            |       |
|-----------------------------------------------------|------|----------|------------|-------|
| Well Site: Hughes Drill Pad & Water Storage Pad     |      |          |            |       |
|                                                     | UNIT | QUANTITY | UNIT PRICE | TOTAL |
| <b>1. Clearing, Grubbing, E&amp;S Controls</b>      |      |          |            |       |
| A. Clearing & Grubbing                              | AC   | 16.51    | \$         |       |
| B. Timber Removal                                   | AC   | 14.62    | \$         |       |
| C. 24" Silt Sock or Silt Fence                      | LF   | 3,161    | \$         |       |
| D. Super Silt Fence                                 | LF   | 0        | \$         |       |
| E. Straw Wattle                                     | LF   | 2,259    | \$         |       |
| <b>2. Excavation (Cut Only)</b>                     |      |          |            |       |
| A. Construction Entrance                            | EA   | 1        | \$         |       |
| B. Drill Pad                                        | CY   | 77,178   | \$         |       |
| C. Water Tank / Gathering Facilities Pad            | CY   | 28,765   | \$         |       |
| D. Access Roads                                     | CY   | 2,946    | \$         |       |
| E. Topsoil                                          | CY   | 5,905    | \$         |       |
| F. Diversion Ditch                                  | LF   | 1,935    | \$         |       |
| G. Roadside Ditch                                   | LF   | 2,217    | \$         |       |
| H. Ditch Lining (Access Road)                       |      |          | \$         |       |
| 1. Rip Rap                                          | SY   | 779      | \$         |       |
| 2. Synthetic Matting (TRM)                          | SY   | 205      | \$         |       |
| 3. Jute Matting                                     | SY   | 524      | \$         |       |
| I. 4" PVC Sump Drain Pipe                           | LF   | 567      | \$         |       |
| J. 6.5'X8.5'X4.5' Sump/Dewatering Tank              | EA   | 4        | \$         |       |
| <b>3. Stone</b>                                     |      |          |            |       |
| A. 6"-8" Rip Rap (Inlets/Outlets)                   | TONS | 23.7     | \$         |       |
| B. #3 Stone (Ditch Checks)                          | TONS | 3.0      | \$         |       |
| <b>4. Aggregate Surfacing</b>                       |      |          |            |       |
| A. Drill Pad 40 Mil. Liner                          | SY   | 7,839    | \$         |       |
| B. Drill Pad 10oz Felt                              | SY   | 7,839    | \$         |       |
| C. Drill Pad 1" Minus Crusher Run Aggregate (2")    | TONS | 747      | \$         |       |
| D. Drill Pad 3" Clean Aggregate (6")                | TONS | 1,867    | \$         |       |
| E. Drill Pad #57 Stone (2")                         | TONS | 684      | \$         |       |
| F. Access Roads 4" Minus Crusher Run Aggregate (8") | TONS | 2,069    | \$         |       |
| G. Access Roads Geotextile Fabric (US 200)          | SY   | 2,382    | \$         |       |
| <b>5. Frac. Water Pit Liner - 60 mil.</b>           |      |          |            |       |
| A. (One) 60 mil Layer                               | SY   | N/A      |            |       |
| B. 10 oz. Felt Under Layment                        | SY   | N/A      | \$         |       |
| <b>6. Road Culverts (3 Total)</b>                   |      |          |            |       |
| A. 15" CMP (3)                                      | LF   | 430      | \$         |       |
| A. 30" CMP (0)                                      | LF   | 0        | \$         |       |
| <b>7. A. Hydro Seeding</b>                          |      |          |            |       |
|                                                     | AC   | 11.29    | \$         |       |
| <b>8. Fence and Gates</b>                           |      |          |            |       |
| A. Woven Wire Fence                                 | LF   | N/A      | \$         |       |
| B. 16' Double Swing Gate                            | EA   | N/A      | \$         |       |
| <b>9. Reclamation</b>                               |      |          |            |       |
| TOTAL                                               | AC   | 5.53     | \$         |       |

**NOTES:**

- TOPSOIL QUANTITY FOR THIS SITE IS ESTIMATED AT A UNIFORM THICKNESS OF 4" OVER THE ENTIRE EXCAVATED AREA. ACTUAL QUANTITY MAY VARY.
- AREAS RECEIVING JUTE MATTING AND SYNTHETIC MATTING (TRM) ARE TO BE SEEDED, LIMED AND FERTILIZED PRIOR TO INSTALLATION OF MATERIALS.

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL SHEET). CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE

| GRADING VOLUMES                                      |          |           |          |
|------------------------------------------------------|----------|-----------|----------|
| DESCRIPTION                                          | CUT (CY) | FILL (CY) | NET (CY) |
| MAIN ACCESS ROAD                                     | 5,506    | 32,516    | -27,010  |
| DRILL PAD ACCESS ROAD                                | 215      | 668       | -453     |
| DRILL PAD                                            | 78,813   | 4,224     | 74,589   |
| WATER STORAGE / GATHERING FACILITIES PAD             | 30,233   | 3,813     | 26,420   |
| WATER STORAGE / GATHERING FACILITIES PAD ACCESS ROAD | 27       | 719       | -692     |
| SPOIL PADS                                           | 0        | 72,954    | -72,954  |
| TOTAL                                                | 114,794  | 114,894   | -100     |

**WATER STORAGE / GATHERING FACILITIES PAD INFORMATION**  
 NAD 83 LAT 39.2184 LONG -80.6191 UTM N=4341069.2078 E=532882.9203 CENTER OF PAD  
 LENGTH 443 Feet WIDTH 210 Feet DEPTH 19 Feet

**ACCESS ROAD BEGINNING 0+00**  
 NAD 83 LAT 39.2154 LONG -80.6177 UTM N=4340755.1824 E=533003.6864

| LOD AREAS (ACRES)                                    |       |
|------------------------------------------------------|-------|
| DESCRIPTION                                          | AREA  |
| MAIN ACCESS ROAD                                     | 4.80  |
| DRILL PAD                                            | 3.04  |
| DRILL PAD ACCESS ROAD                                | 0.36  |
| WATER STORAGE / GATHERING FACILITIES PAD             | 2.73  |
| WATER STORAGE / GATHERING FACILITIES PAD ACCESS ROAD | 0.05  |
| SPOIL PADS                                           | 5.53  |
| TOTAL                                                | 16.51 |
| TOTAL WOODED AREA                                    | 14.62 |

| GRADING                    |         |
|----------------------------|---------|
| CUT SLOPE                  | 2:1     |
| FILL SLOPE                 | 2:1     |
| PAD CONTAINMENT BERM SLOPE | 1.5:1   |
| CUT SWELL FACTOR           | 1.05    |
| FILL SHRINK FACTOR         | 1.00    |
| PAD ELEVATION:             | 1331.0' |

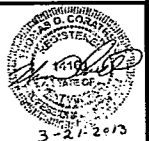
NO AFFECTED STREAMS OR WETLANDS

The earthwork quantities provided are an estimate for consideration. The quantities shown may be greater or less than actually excavated. The engineer is not responsible for variances from the estimated quantities and does not certify to their accuracy.

| DATE | REVISIONS |
|------|-----------|
|      |           |
|      |           |
|      |           |
|      |           |



Allegheny Surveys, Inc.  
 172 Thompson Drive  
 Bridgeport, WV 26330  
 (304) 848-5035



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 140 South Third Street, First Floor Box 306, Charlestown, West Virginia, 25010 (304) 624-6465



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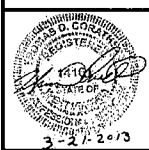
SCHEDULE OF QUANTITIES  
**HUGHES DRILL PAD SITE ALT-2**  
 GREENBRIER DISTRICT  
 DODDRIIDGE COUNTY, WV

Date: 3-21-2013  
 Scale: N/A  
 Designed By: TBC & JDR  
 File No: 175-124-ALT-2.dwg  
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# CONSTRUCTION, GENERAL AND EROSION AND SEDIMENT NOTES



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035



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APPALACHIAN CORP

CONSTRUCTION, GENERAL AND E & S NOTES  
HUGHES  
DRILL PAD SITE ALT-2  
GREENBRIER DISTRICT  
DODDRIDGE COUNTY, WV

Date: 3-21-2013  
Scale: N/A  
Designed by: TBC & JDR  
File No. HES-13-004-010  
Page 5 of 19

## CONSTRUCTION SPECIFICATIONS:

- WATER TANK STORAGE PADS, ROADS AND DRILL PADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND THE SCOPE OF WORK AND SHALL CONFORM GENERALLY WITH THE GRADES, BERMS, DEPTHS AND DIMENSIONS SHOWN.
- THE CONSTRUCTION DOCUMENTS SHOW THE EXISTING AND NEW GRADES AND BERMS, ETC. THAT ALL CUT AND FILL ESTIMATES ARE BASED UPON. THE ENGINEER'S ESTIMATES OF THE QUANTITIES ARE ONLY ESTIMATES AND MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS.
- THE GRADES, BERMS, DEPTHS, AND DIMENSIONS MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS. THE ENGINEER RESERVES THE RIGHT TO CHANGE GRADES, BERMS, DEPTHS AND DIMENSIONS AS NECESSARY TO MEET FIELD CONDITIONS.
- THE CONTRACTOR SHALL PROVIDE THE ENGINEER ALL REASONABLE FACILITIES AND PROVIDE INFORMATION AND SAMPLES AS REQUIRED BY THE ENGINEER FOR PROPER MONITORING AND TESTING OF MATERIAL WORKMANSHIP.
- THE CONTRACTOR SHALL HAVE ON SITE AT ALL TIMES WHEN CONSTRUCTION IS IN PROGRESS A COMPETENT SUPERINTENDENT THOROUGHLY FAMILIAR WITH THE CONSTRUCTION OF EARTH BERMS AND EMBANKMENTS, THE COMPACTION OF SOILS AND PLACEMENTS OF LINERS.
- 24" SILT SOCK OR SUPER SILT FENCE SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH WV DEP BEST MANAGEMENT PRACTICES MANUAL CHAPTER 3. SURFACE WATER SHALL BE DIVERTED AWAY FROM ALL EXCAVATIONS AND THE FACE OF ALL FILLS TO PREVENT FLOODING AND SOFTENING OF THE SUBGRADE OR COMPACTED MATERIALS.
- CLEARING AND GRUBBING SHALL REMOVE ALL BRUSH, TREES, ROOTS, STUMPS, FENCES, SIGNS OR ANY OTHER MATERIAL THAT IS NOT TO BE REUSED FOR THE CONSTRUCTION. SOME STUMPS MAY REMAIN AT THE APPROVAL OF THE ENGINEER. NO CLEARING DEBRIS SHALL BE BURIED ON-SITE WITHOUT THE LANDOWNER'S AND ENGINEER'S WRITTEN PERMISSION. ANY DEBRIS BURIAL SITE SHALL BE SEEDING AND MULCHED.
- TOP SOIL SHALL BE STRIPPED AND STOCKPILED WITH APPROPRIATE STABILIZATION AND SILT FENCE TO PREVENT EROSION. THE TOP SOIL SHALL BE REUSED DURING THE RECLAMATION PROCESS OR ON THE FACE OF THE IMPOUNDMENT PRIOR TO SEEDING.
- TOE CUTS OF 12" MINIMUM WIDE SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR THE IMPOUNDMENT BERM.
- PRIOR TO PLACING ANY FILL, THE EXPOSED SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNYIELDING SITE.
- ALL FILL SHALL BE PLACED IN LOOSE LIFTS OF UP TO 12" AND SHALL BE COMPACTED TO AT LEAST 95% OF THE LABORATORY MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST METHOD (ASTM D 698). THE MOISTURE CONTENT SHALL BE CONTROLLED IN ACCORDANCE WITH THE LIMITS FROM THE STANDARD PROCTOR TEST (ASTM D-698) RESULTS TO FACILITATE COMPACTION. CONTRACTOR IS RESPONSIBLE FOR THE ORIGINAL SOIL TEST AND PROVIDING A COPY OF THE RESULTS WITH MOISTURE-DENSITY CURVE TO THE ENGINEER. THE CONTRACTOR SHALL DO IN-PLACE DENSITY TESTS EVERY THIRD LIFT OF SOIL AND SHALL BE DONE IN TWO RANDOM PLACES ON EACH STRAIGHT SIDE OF THE IMPOUNDMENT BERM. FIELD DENSITY TESTS FOR COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH ASTM D 2922 (NUCLEAR METHOD). RECORDS SHALL BE MAINTAINED OF TEST LOCATION AND RESULTS AND PROVIDED TO THE ENGINEER ON REQUEST. AREAS THAT FAIL FOR COMPACTION SHALL BE REMOVED, RE-COMPACTED AND RETESTED FOR COMPLIANCE. IN LIEU OF STANDARD PROCTOR TESTING, THE CONTRACTOR MAY PROOF-ROLL THE SOIL EVERY 24" OF SOIL LIFT WITH A LOADED 15 TON TANDEM DUMP TRUCK. SOIL THAT DEFLECTS UNDER THE REAR WHEELS GREATER THAN 1/2" SHALL BE REMOVED, RE-COMPACTED AND RETESTED. COMPACTION OF SOIL SHALL BE DONE WITH A 5 TON SMOOTH, SHEEPS FOOT, OR VIBRATORY ROLLER.
- ON-SITE FILL SHALL BE USED TO THE MAXIMUM EXTENT POSSIBLE. ANY IMPORTED FILL SHALL BE CERTIFIED BY THE CONTRACTOR TO BE CLEAR OF ALL HAZARDOUS SUBSTANCES OR MATERIALS. IF MATERIAL IS ENCOUNTERED THAT CANNOT BE RIPPED BY A CAT DO WITH A SINGLE TOOTH RIPPER, THEN THE CONTRACTOR SHALL CONTACT THE ENGINEER WHO WILL VISIT THE SITE AND DETERMINE IF THE MATERIAL MAY BE USED AS IS OR MUST BE REMOVED BY OTHER MEANS. IF UNSUITABLE SOILS IN THE SUBGRADE ARE FOUND THEY SHALL BE REMOVED AND REPLACED WITH APPROPRIATE FILL AT THE CONTRACTOR'S EXPENSE AND THE ENGINEER'S DIRECTION.
- IF SPRINGS OR SEEPS ARE ENCOUNTERED, SUBSURFACE DRAINAGE FEATURES SHALL BE INSTALLED PRIOR TO FILL PLACEMENT. CONTACT ENGINEER FOR EVALUATION AND RECOMMENDATION OF CORRECTIVE MEASURES.
- THE FILL TOE FOR ALL FILL EMBANKMENTS SHALL BE BENCHED OR KEYED INTO THE NATURAL SOIL. ALL FILL TOES SHALL BE SUPPORTED BY COMPETENT BEDROCK OR SOIL MATERIAL.
- FILL PLACED AGAINST EXISTING SLOPES SHALL BE BENCHED INTO THE EXISTING MATERIAL DURING FILL PLACEMENT TO REDUCE THE POTENTIAL FOR DEVELOPMENT OF A SMOOTH INTERFACE BETWEEN THE FILL AND EXISTING SLOPE.
- ANY SOFT AREAS SHALL BE OVER-EXCAVATED TO A FIRM MATERIAL AND BACKFILLED WITH A WELL COMPACTED STRUCTURAL FILL.
- FILL REQUIRED TO OBTAIN DESIGN GRADES SHALL BE PLACED AS CONTROLLED, COMPACTED FILL. THE FILL SHALL BE FREE OF TRASH, WOOD, TOPSOIL, ORGANICS, COAL, COAL MINE REFUSE, FROZEN MATERIAL AND PIECES OF ROCK GREATER THAN 6" IN ANY DIMENSION.
- DURING PLACEMENT OF MATERIAL, MOISTEN OR AERATE EACH LAYER OF FILL, AS NECESSARY, TO OBTAIN THE REQUIRED COMPACTION. FILL SHOULD NOT BE PLACED ON SURFACES THAT ARE MUDDY OR FROZEN, OR HAVE NOT BEEN APPROVED BY PRIOR PROOF-ROLLING. FREE WATER SHALL BE PREVENTED FROM APPEARING ON THE SURFACE DURING OR SUBSEQUENT TO COMPACTION OPERATIONS.
- SOIL MATERIAL WHICH IS REMOVED BECAUSE IT IS TOO WET TO PERMIT PROPER COMPACTION MAY BE SPREAD AND ALLOWED TO DRY. DRYING CAN BE FACILITATED BY DISCING OR HARROWING UNTIL THE MOISTURE CONTENT IS REDUCED TO AN ACCEPTABLE LEVEL. WHEN THE SOIL IS TOO DRY, WATER MAY BE UNIFORMLY APPLIED TO THE LAYER TO BE COMPACTED.
- THE FILL OUTSLOPES SHALL BE OVERBUILT AND TRIMMED BACK TO DESIGN CONFIGURATIONS TO VERIFY PROPER COMPACTION.
- GRANULAR MATERIALS, SUCH AS AASHTO NO. 57 STONE SHALL BE COMPACTED TO 85% OF ITS RELATIVE DENSITY, AS DETERMINED BY ASTM D 4253 AND D 4254 TEST METHODS.
- DRILL PAD SUBGRADE SHOULD BE LINED WITH US 200 GEOTEXTILE FABRIC OR EQUAL, PRIOR TO PLACEMENT OF AGGREGATE.
- PHOTOGRAPHIC DOCUMENTATION SHALL BE TAKEN BY THE CONTRACTOR AND PROVIDED TO THE ENGINEER OF THE FOLLOWING ACTIVITIES: 1. SITE AFTER CLEARING AND GRUBBING; 2. THE SITE AFTER TOPSOIL REMOVAL; 3. TOE KEY AND INSPECTION TRENCH CONSTRUCTION; 4. DAILY PHOTOS OF CUT AND FILL OPERATIONS; 5. PROOF-ROLLING TESTS.
- PRIOR TO AS-BUILT CERTIFICATION, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A COMPLETE BINDER THAT INCLUDES ALL PHOTO DOCUMENTATION, ALL COMPACTION TEST REPORTS, RESULTS AND MAPS, A REPORT OF ALL CUT AND FILL VOLUMES IN CUBIC YARDS, AND A COPY OF THE AS-BUILT CONFIRMATION SURVEY PRIOR TO LINER PLACEMENT.

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL SHEET). CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE.

## GENERAL NOTES

- ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH PROBLEMS. WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
- WORK ON THIS PROJECT SHALL CONFORM TO THE LATEST EDITIONS OF THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE HANDBOOK. IN THE EVENT OF CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT WILL GOVERN.
- EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED DAILY. RELOCATED WHEN NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDING AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
- ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE MEANS OF CLEANING.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PUBLIC OR PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR, AT HIS OR HER EXPENSE, OF ALL EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL CALL MISS UTILITY AT (800) 552-7001.
- INSTALLATION OF CONCRETE, CORRUGATED METAL, OR HDPE STORM PIPE SHALL BE IN CONFORMANCE WITH THESE DRAWINGS.
- ALL MATERIALS USED FOR FILL OR BACK FILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, BOULDERS OR ANY OTHER NON-COMPACTABLE SOIL TYPE MATERIALS. UNSATISFACTORY MATERIALS ALSO INCLUDE MAN MADE FILLS AND REFUSE DEBRIS DERIVED FROM ANY SOURCE.
- MATERIALS USED TO FILL AROUND DRAINAGE STRUCTURES IN UTILITY TRENCHES OR ANY OTHER DEPRESSION REQUIRING FILL OR BACK FILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AS SET FORTH IN ASTM STANDARD D-698. THE CONTRACTOR SHALL, PRIOR TO ANY CONSTRUCTION INVOLVING FILLING OR BACK FILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. THE TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND THE CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THESE TESTS AND THEIR SUBMITTALS.
- FILL SHALL BE PLACED IN LIFTS AT A MAXIMUM UNCOMPACTED DEPTH OF 12-INCHES WITH SOIL FREE FROM AGGREGATES EXCEEDING 6".
- ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER. FAILURE TO CONDUCT DENSITY TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE OF THE FACILITY. TESTS SHALL BE CONDUCTED AT THE SOLE COST OF THE CONTRACTOR OR HIS AGENT.
- A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION.
- SATISFACTORY MATERIALS FOR USE AS FILL FOR FRESHWATER IMPOUNDMENT EMBANKMENTS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2487AS GM, GC, SM, SC, ML, AND CL GROUPS. A MINIMUM OF THREE SAMPLES MUST BE CLASSIFIED. THE MOISTURE CONTENT SHALL BE CONTROLLED IN ACCORDANCE WITH THE LIMITS FROM THE STANDARD PROCTOR TEST (ASTM D-698) RESULTS TO FACILITATE COMPACTION. 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. SOILS SHALL HAVE A MINIMUM DRY DENSITY OF 82 LB/CF PER ASTM D-698 AND SHALL HAVE A PLASTICITY INDEX LESS THAN 17. SOILS MUST CONTAIN A MINIMUM OF 20% OF PLUS (LARGER THAN) NO. 200 SIEVE AND BE WELL GRADED MATERIAL WITH NO COBBLES OR BOULDER SIZE MATERIAL MIXED WITH THE CLAY.

## EROSION AND SEDIMENT CONTROL NARRATIVE

- THE CONTRACTOR SHALL ARRANGE FOR A PRE-CONSTRUCTION CONFERENCE WITH THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK.
- ALL EROSION CONTROL DEVICES AS SHOWN OR AS REQUIRED, ARE TO BE CONSTRUCTED TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL AND ARE TO BE IN PLACE PRIOR TO ALL CONSTRUCTION.
- EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED CONTINUOUSLY, RELOCATED WHEN AND AS NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDING AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
- ALL DISTURBED AREAS NOT PAVED OR BUILT UPON ARE TO BE FERTILIZED AND HYDRO-SEEDING WITH STRAW AND COTTON PRODUCT WITH TACK AGENTS BY THE CONTRACTOR IN ACCORDANCE WITH THE CURRENT WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.
- ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE IMMEDIATELY REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE METHOD OF CLEANING.
- PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 21 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN SIX MONTHS.
- DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES.
- SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
- STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS IMPOUNDMENTS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
- ALL DISTURBED AREAS NOT PAVED OR BUILT UPON SHALL BE HYDRO-SEEDING AND FERTILIZED, PERFORM PERMANENT TOP SOILING, SEEDING AND FERTILIZING AS SOON AFTER FINISH GRADING AS POSSIBLE. SEEDING SHALL COMPLY WITH THE FOLLOWING:
  - TOPSOIL - 4 INCH MINIMUM FOR PERMANENT TURF
  - FERTILIZER - 500 POUNDS PER ACRES OF 10-20-10 FERTILIZER OR EQUIVALENT POUNDAGE OF DIFFERENT ANALYSIS. WORK INTO SOIL PRIOR TO SEEDING.
  - LIME (PERMANENT SEEDING) - AGRICULTURAL LIME SPREAD AT RATE OF 4 TONS/ACRE. WORK INTO SOIL PRIOR TO SEEDING.
  - MULCH - WOOD FIBER OR CHOPPED STRAW AT RATE OF 2 TONS PER ACRE. HYDRO-MULCH AT RATE OF 30 BALES PER ACRE.
  - SEED - 45 LBS. PER ACRE TALL FESCUE AND 20 LBS. PER ACRE PERENNIAL RYE GRASS. TO BE SEED BY HYDRO-SEEDER.

## EROSION AND SEDIMENT CONTROL NARRATIVE

- PROJECT DESCRIPTION:** THE PURPOSE OF THIS PROJECT IS TO GRADE AND INSTALL EROSION AND SEDIMENT CONTROL MEASURES, IN PREPARATION FOR THE CONSTRUCTION OF A GAS WELL PAD NEAR ZINNIA, WEST VIRGINIA, IN DODDRIDGE COUNTY. THE CONSTRUCTION INCLUDES ACCESS ROADS, WATER STORAGE PAD, DRILL PAD, STORM WATER CONTROLS, AND INCIDENTAL WORK. THE TOTAL APPROXIMATE LAND DISTURBANCE ASSOCIATED WITH THIS PROJECT IS 16.51 ACRES.
- EXISTING SITE CONDITIONS:** THE EXISTING SITE IS UPLAND HARDWOODS WITH GENTLE TO MODERATELY STEEP TOPOGRAPHY WITH 5% TO 20% SLOPES. NO EROSION IS NOTICED ON SITE, OR IN ANY NATURAL DRAINAGE WAYS.
- ADJACENT PROPERTY:** THE SITE IS BORDERED BY UPLAND HARDWOODS.
- SOILS:** NO SOIL STUDIES OR SUBSURFACE INVESTIGATIONS WERE PERFORMED FOR THIS PROJECT.
- OFF SITE AREAS:** THERE SHALL BE NO BORROW AREA OUTSIDE OF THE PROPOSED GRADING AND CONSTRUCTION AREA.
- CRITICAL EROSION AREAS-CONTROL MAINTENANCE:** ALL 3:1 SLOPES AND STEEPER, DITCHES AND OTHER CONTROLS SHALL BE CONSIDERED CRITICAL EROSION AREAS. THESE AREAS SHALL BE MONITORED & MAINTAINED DAILY AND AFTER EACH RAIN FALL OF 0.5 INCHES OR GREATER. 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.
- EROSION AND SEDIMENT CONTROL MEASURES:** UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE CURRENT WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL. THE CONTRACTOR SHALL OBTAIN A COPY OF THIS MANUAL FROM THE WV DEP WEBSITE AND CONSTRUCT ALL DEVICES BASED ON THIS MANUAL OR A HANDBOOK THAT IS COMPARABLE OR EXCEEDS THE SPECIFICATIONS OF THE WEST VIRGINIA MANUAL. THE MINIMUM STANDARDS OF THIS MANUAL SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE. SEE PLANS FOR ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES.
- STRUCTURAL PRACTICES:**
  - DIVERSION DITCHES: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
  - DIVERSION BERMS: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
  - OUTLET PROTECTION: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
  - 24" SILT SOCK/SILT FENCE/SUPER SILT FENCE: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
- VEGETATIVE PRACTICE TOPSOILING:** TOPSOIL WILL BE STRIPPED FROM THE SITE AND STOCKPILED IN AN AREA DETERMINED IN THE FIELD. UPON THE COMPLETION OF THE PROJECT TOPSOIL WILL BE PLACED ON ALL DISTURBED AREAS AT A MINIMUM DEPTH OF 4 INCHES. TEMPORARY SEEDING: ALL DENUDED AREAS LEFT DORMANT FOR MORE THAN 21 DAYS SHALL BE SEEDING WITH A FAST GERMINATING SEED. THE TIME OF YEAR WILL BE THE BASIS FOR THE SEED MIXTURE. PERMANENT SEEDING: ALL SEEDING AREAS WILL BE RESEEDING, MULCHED AND FERTILIZED AS NEEDED TO OBTAIN AN ADEQUATE STAND OF GRASS. PERMANENT SEEDING SHALL BE PLACED WITHIN SEVEN DAYS UPON ACHIEVING FINAL GRADE. WATER, MULCH, AND RESEED AS NECESSARY TO OBTAIN AN ADEQUATE STAND OF VEGETATION, IN THE OPINION OF THE ENGINEER.
- MANAGEMENT STRATEGIES:** CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS WILL BEGIN AND END AS SOON AS POSSIBLE. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES. AFTER ACHIEVING ADEQUATE STABILIZATION OF THE TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED DURING THIS PROCESS SHALL BE STABILIZED.
- SEQUENCE OF EVENTS:**
  - A PRE-CONSTRUCTION CONFERENCE WILL BE HELD ON SITE WITH CONTRACTOR TO REVIEW THE CONSTRUCTION DRAWINGS AND PROVIDE ANY REQUESTED GUIDANCE.
  - CONSTRUCT THE CONSTRUCTION ENTRANCE.
  - CONSTRUCT ALL PROPOSED SEDIMENT CONTROL DEVICES AS SOON AS CLEARING AND GRUBBING OPERATIONS ALLOW. DIVERSIONS AND SEDIMENT BASINS SHALL BE SEEDING AND MULCHED IMMEDIATELY.
  - CLEAR AND GRUB. REMOVE TOPSOIL AND PLACE AT AN AREA DETERMINED IN THE FIELD WHERE EROSION WILL NOT TAKE PLACE. TOPSOIL STOCKPILE TO BE SEEDING AND MULCHED. SILT FENCE SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES.
  - GRADING OPERATIONS AS REQUIRED. CUT SLOPES AND FILL SLOPES SHALL BE TOPSOILED AS NEEDED. DITCH LINES SHALL BE CLEANED. ALL DITCHES WILL HAVE AT LEAST GRASS LINING PROTECTION OR GREATER BASED ON DITCH SLOPE WITH THE FOLLOWING DETERMINATION: 0 TO 4% - ORGANIC JUTE MATTING, 4 TO 10% - SYNTHETIC MATTING (TRM), AND 10% - 20% - RIPRAP.
  - CULVERT INLET AND OUTLET PROTECTION SHALL BE CONSTRUCTED IMMEDIATELY UPON PLACEMENT OF INLETS AND CULVERTS. INSTALLATION OF MATTING AND/OR RIP RAP TO OCCUR ONCE DITCHES ARE CONSTRUCTED.
  - WHEN FINAL GRADE IS ACHIEVED, TOPSOIL TO BE PLACED ON ALL DISTURBED AREAS NOT LINED. HYDRO-SEED ALL DISTURBED AREAS AS REQUIRED. A SOIL SAMPLE SHOULD BE TAKEN AND TESTED TO DETERMINE RECOMMENDED RATES. IF NO SOILS SAMPLE IS TAKEN THE FOLLOWING RATES SHOULD BE APPLIED AS A MINIMUM: LIME AT A RATE OF 4 TONS PER ACRE. FERTILIZER AT A RATE OF 500 LBS. OF 10-20-10 PER ACRE. SEED WITH 45 LBS. PER ACRE OF TALL FESCUE AND 20 LBS. PER ACRE OF PERENNIAL RYE GRASS.
  - LIME, FERTILIZER, AND SEED WILL BE APPLIED BY USING A HYDRO-SEEDER. HYDRO-MULCH PRODUCTS SHALL BE MIXED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
  - FINAL SEEDING MUST OCCUR WITHIN 7 DAYS OF FINAL GRADING.
  - WHEN SITE IS STABILIZED, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPAIR/STABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.
  - MAKE MODIFICATIONS FOR PERMANENT STORM WATER MANAGEMENT.
  - FINAL SITE INSPECTION.
- PERMANENT STABILIZATION:** ALL AREAS LEFT UNCOVERED BY EITHER BUILDINGS OR PAVEMENT SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING AND WITHIN 7 DAYS. AT NO TIME SHALL LAND LAY DORMANT FOR LONGER THAN 21 DAYS. SEE SEQUENCE OF EVENTS FOR RATES.
- MAINTENANCE, AND OTHER CONSIDERATIONS AND GROUND WATER PROTECTION:** ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH RAINFALL OF 0.5 INCH OR MORE. THEY WILL BE INSPECTED FOR UNDERMINING, DETERIORATION, EROSION AND EXCESS DEPOSITED MATERIAL. ALL DEFICIENCIES WILL BE CORRECTED IMMEDIATELY. EXCESS MATERIAL WILL BE SPREAD ON THE SITE IN A MANNER WHERE IT IS NOT LIKELY TO ERODE IN THE FUTURE. CLEANING PROCEDURES WILL BE COMPLETED AT REGULAR INTERVALS AND AT LEAST WHEN SEDIMENT REACHES 33% OF CAPACITY, OR AS SHOWN ON APPLICABLE DETAILS. RECORDS OF CLEANING AND CORRECTIONS WILL BE MAINTAINED BY THE CONTRACTOR. THE "GENERIC GROUNDWATER PROTECTION PLAN FOR CONSTRUCTION SITES" WILL BE USED AND AVAILABLE ON SITE AT ALL TIMES. AN AREA WILL BE PROVIDED FOR VEHICLE AND EQUIPMENT MAINTENANCE. MOBILE FUEL TANKS WITH APPROVED TANKS WILL BE USED ON THIS SITE. PORTABLE SANITARY FACILITIES WILL BE AVAILABLE FOR EMPLOYEES. IF CONCRETE IS USED, EXCESS CONCRETE WILL BE DISPOSED OF PROPERLY AND NOT ALLOWED TO REMAIN ON THIS SITE. MACHINERY WILL NOT BE ALLOWED IN LIVE STREAMS. FLUIDS SUCH AS DIESEL FUEL, GAS, OIL OR ANTIFREEZE WILL BE KEPT IN PROPER CONTAINERS AND ANY SPILLAGE WILL BE CLEANED AND TAKEN OFF SITE TO A PROPER FACILITY. SOLID OR HAZARDOUS WASTES WILL BE DISPOSED IN ACCORDANCE WITH APPROPRIATE STATE AND FEDERAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE CHANGES AND NOTIFY WVDEP OF ANY CHANGES TO GPP. A FINAL INSPECTION WILL BE MADE AT THE CONCLUSION OF THE PROJECT AND ALL CORRECTIONS MADE BEFORE SIGN-OFF OF THE PROJECT SITE.

| DATE | REVISIONS |
|------|-----------|
|      |           |
|      |           |
|      |           |
|      |           |

# E&S CONTROL PLAN (1)



All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035



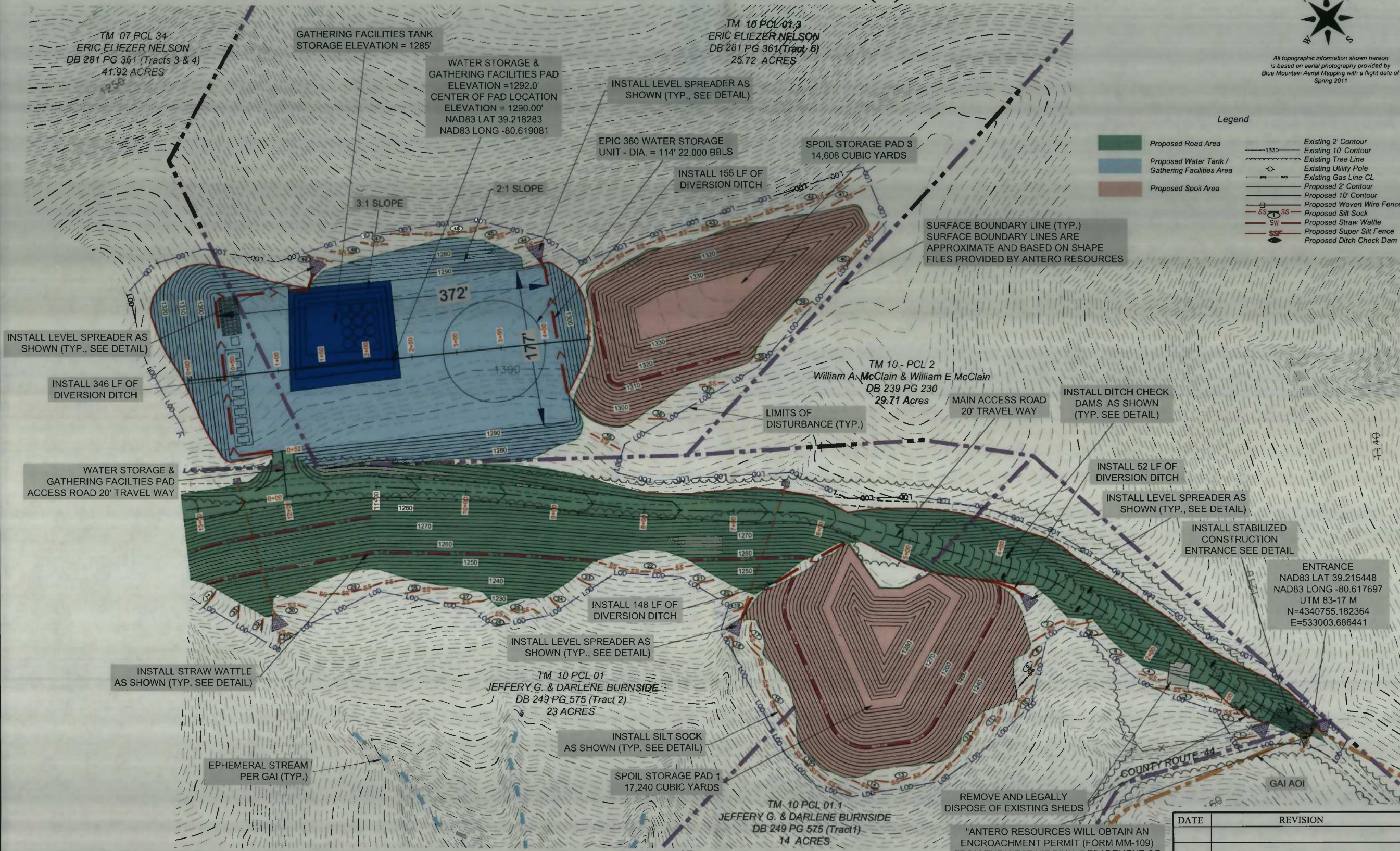
Hornor Bros. Engineers  
1902 Since  
Civil, Mining, Environmental and Consulting Engineering  
140 South Third Street, First Office Box 306,  
Charlottesville, West Virginia, 25301 (504) 634-6440



THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

EROSION AND SEDIMENT CONTROL PLAN  
**HUGHES DRILL PAD SITE ALT-3**  
GREENBRIER DISTRICT  
DODDRIIDGE COUNTY, WV

Date: 3-21-2013  
Scale: 1" = 50'  
Designed By: TBC & IDR  
File No. 13-01-10-002  
Project: HUGHES DRILL PAD SITE ALT-3  
Page 6 of 19



Legend

|             |                                                 |               |                           |
|-------------|-------------------------------------------------|---------------|---------------------------|
| [Green Box] | Proposed Road Area                              | [Dashed Line] | Existing 2' Contour       |
| [Blue Box]  | Proposed Water Tank / Gathering Facilities Area | [Dashed Line] | Existing 10' Contour      |
| [Red Box]   | Proposed Spoil Area                             | [Dashed Line] | Existing Tree Line        |
|             |                                                 | [Dashed Line] | Existing Utility Pole     |
|             |                                                 | [Dashed Line] | Existing Gas Line CL      |
|             |                                                 | [Dashed Line] | Proposed 2' Contour       |
|             |                                                 | [Dashed Line] | Proposed 10' Contour      |
|             |                                                 | [Dashed Line] | Proposed Woven Wire Fence |
|             |                                                 | [Dashed Line] | Proposed Silt Sock        |
|             |                                                 | [Dashed Line] | Proposed Straw Wattle     |
|             |                                                 | [Dashed Line] | Proposed Super Silt Fence |
|             |                                                 | [Dashed Line] | Proposed Ditch Check Dam  |

SURFACE BOUNDARY LINE (TYP.)  
SURFACE BOUNDARY LINES ARE APPROXIMATE AND BASED ON SHAPE FILES PROVIDED BY ANTERO RESOURCES

LIMITS OF DISTURBANCE (TYP.)

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

INSTALL 346 LF OF DIVERSION DITCH

WATER STORAGE & GATHERING FACILITIES PAD ACCESS ROAD 20' TRAVEL WAY

INSTALL STRAW WATTLE AS SHOWN (TYP., SEE DETAIL)

EPHEMERAL STREAM PER GAI (TYP.)

WATER STORAGE & GATHERING FACILITIES PAD ELEVATION = 1292.0'  
CENTER OF PAD LOCATION ELEVATION = 1290.00'  
NAD83 LAT 39.218283  
NAD83 LONG -80.619081

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

EPIC 360 WATER STORAGE UNIT - DIA. = 114' 22,000 BBLs

INSTALL 155 LF OF DIVERSION DITCH

SPOIL STORAGE PAD 3 14,608 CUBIC YARDS

TM 10 - PCL 2  
William A. McClain & William E. McClain  
DB 239 PG 230  
29.71 Acres

MAIN ACCESS ROAD 20' TRAVEL WAY

INSTALL DITCH CHECK DAMS AS SHOWN (TYP., SEE DETAIL)

INSTALL 52 LF OF DIVERSION DITCH

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

INSTALL STABILIZED CONSTRUCTION ENTRANCE SEE DETAIL

ENTRANCE  
NAD83 LAT 39.215448  
NAD83 LONG -80.617697  
UTM 83-17 M  
N=4340755.182364  
E=533003.686441

TM 10 PCL 01  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 2)  
23 ACRES

INSTALL 148 LF OF DIVERSION DITCH

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

INSTALL SILT SOCK AS SHOWN (TYP., SEE DETAIL)

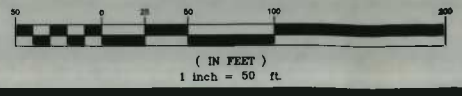
SPOIL STORAGE PAD 1 17,240 CUBIC YARDS

TM 10 PCL 01.1  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 1)  
14 ACRES

REMOVE AND LEGALLY DISPOSE OF EXISTING SHEDS

"ANTERO RESOURCES WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES"

GRAPHIC SCALE



ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL), CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE

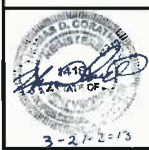
# E&S CONTROL PLAN (2)



All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 648-5035

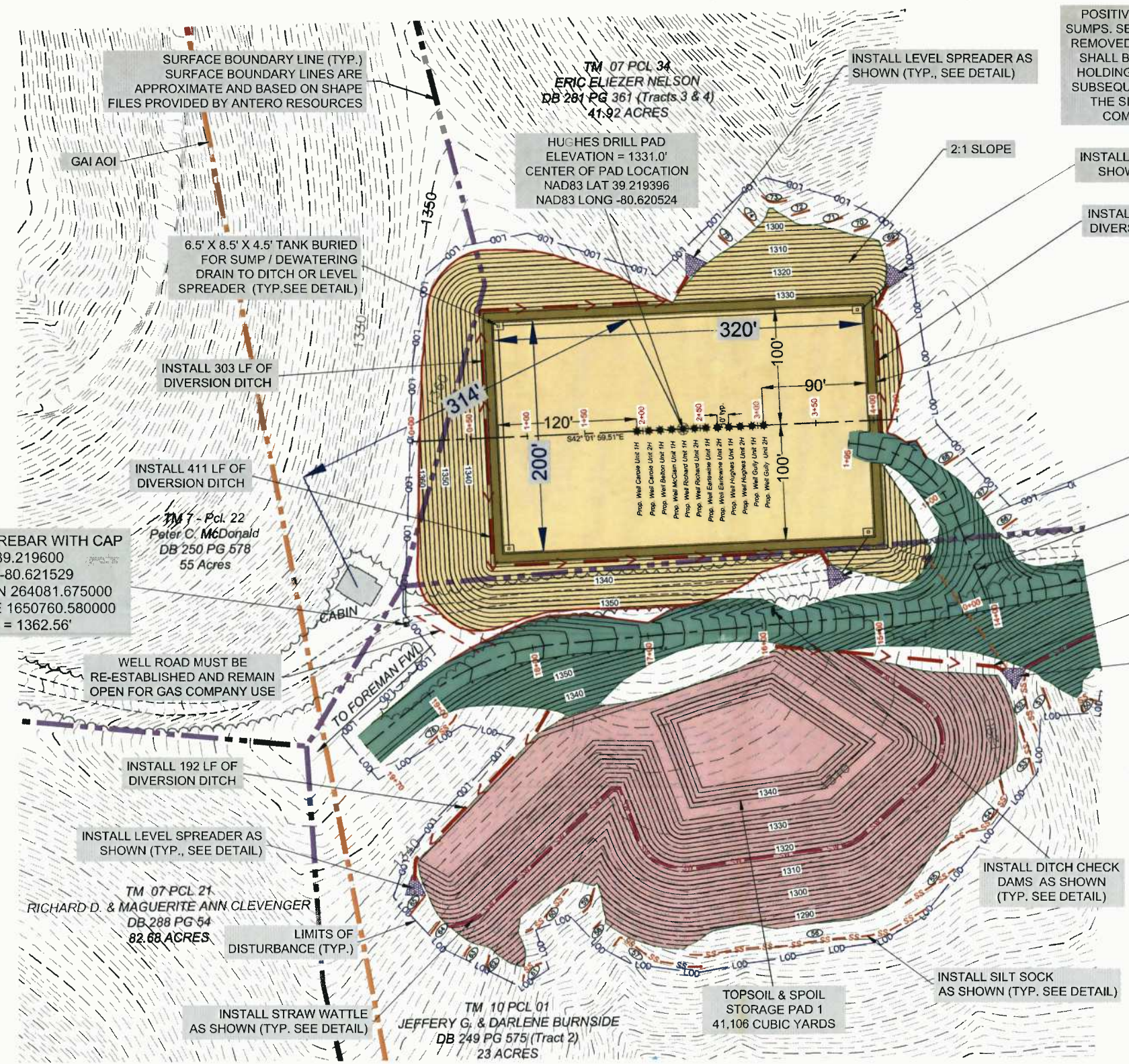


Hornor Bros. Engineers, Inc.  
1902  
Civil, Mining, Environmental and Consulting Engineering  
140 South Third Street, Post Office Box 306,  
Cortlandt, West Virginia, 26031 (504) 824-4445



THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

EROSION AND SEDIMENT CONTROL PLAN  
**HUGHES DRILL PAD SITE ALT-3**  
GREENBRIER DISTRICT  
DODDRIDGE COUNTY, WV



POSITIVE FLOW FROM PAD TO SUMPS. SEDIMENT AND MATERIALS REMOVED FROM THE PAD SUMPS SHALL BE PUMPED TO ON-SITE HOLDING/STORAGE TANKS AND SUBSEQUENTLY REMOVED FROM THE SITE BY AN APPROVED COMMERCIAL VENDOR.

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

INSTALL 130 LF OF DIVERSION DITCH

PAD PERIMETER BERM

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

DRILL PAD ACCESS ROAD 20' TRAVEL WAY

MAIN ACCESS ROAD 20' TRAVEL WAY

INSTALL 198 LF OF DIVERSION DITCH

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

INSTALL DITCH CHECK DAMS AS SHOWN (TYP. SEE DETAIL)

INSTALL SILT SOCK AS SHOWN (TYP. SEE DETAIL)

SURFACE BOUNDARY LINE (TYP.) SURFACE BOUNDARY LINES ARE APPROXIMATE AND BASED ON SHAPE FILES PROVIDED BY ANTERO RESOURCES

6.5' X 8.5' X 4.5' TANK BURIED FOR SUMP / DEWATERING DRAIN TO DITCH OR LEVEL SPREADER (TYP. SEE DETAIL)

INSTALL 303 LF OF DIVERSION DITCH

INSTALL 411 LF OF DIVERSION DITCH

WELL ROAD MUST BE RE-ESTABLISHED AND REMAIN OPEN FOR GAS COMPANY USE

INSTALL 192 LF OF DIVERSION DITCH

INSTALL LEVEL SPREADER AS SHOWN (TYP., SEE DETAIL)

INSTALL STRAW WATTLE AS SHOWN (TYP. SEE DETAIL)

TM 07 PCL 34  
ERIC ELIEZER NELSON  
DB 281 PG 361 (Tracts 3 & 4)  
41.92 ACRES

HUGHES DRILL PAD  
ELEVATION = 1331.0'  
CENTER OF PAD LOCATION  
NAD83 LAT 39.219396  
NAD83 LONG -80.620524

TM 7 - Pcl. 22  
Peter C. McDonald  
DB 250 PG 578  
55 Acres

TM 07 PCL 21  
RICHARD D. & MAGUERITE ANN CLEVENGER  
DB 288 PG 54  
82.68 ACRES

TM 10 PCL 01  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 2)  
23 ACRES

TOPSOIL & SPOIL STORAGE PAD 1  
41,106 CUBIC YARDS

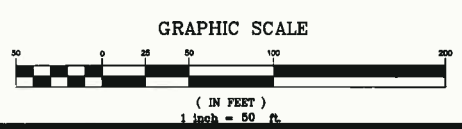
### Legend

- Proposed Road Area
- Proposed Drill Pad Area
- Proposed Spoil Area
- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Pole
- Existing Gas Line CL
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Woven Wire Fence
- Proposed Silt Sock
- Proposed Straw Wattle
- Proposed Super Silt Fence
- Proposed Ditch Check Dam

| Well Table                                                                                                                                 |                                                                                                                                            |                                                                                                                                            |                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Prop. Well Gully Unit 2H<br>WV-N NAD83 N: 263981.564811<br>WV-N NAD83 E: 1651091.191640<br>LAT NAD83: 39.219254<br>LON NAD83: -80.620357   | Prop. Well Gully Unit 1H<br>WV-N NAD83 N: 263988.992187<br>WV-N NAD83 E: 1651084.495223<br>LAT NAD83: 39.219275<br>LON NAD83: -80.620380   | Prop. Well Hughes Unit 2H<br>WV-N NAD83 N: 263986.419764<br>WV-N NAD83 E: 1651077.802656<br>LAT NAD83: 39.219295<br>LON NAD83: -80.620404  | Prop. Well Hughes Unit 1H<br>WV-N NAD83 N: 263973.947941<br>WV-N NAD83 E: 1651071.104690<br>LAT NAD83: 39.219315<br>LON NAD83: -80.620428  |
| Prop. Well Earlema Unit 2H<br>WV-N NAD83 N: 263981.274918<br>WV-N NAD83 E: 1651054.409373<br>LAT NAD83: 39.219335<br>LON NAD83: -80.620452 | Prop. Well Earlema Unit 1H<br>WV-N NAD83 N: 263988.722955<br>WV-N NAD83 E: 1651057.713755<br>LAT NAD83: 39.219355<br>LON NAD83: -80.620475 | Prop. Well Richard Unit 2H<br>WV-N NAD83 N: 263998.120072<br>WV-N NAD83 E: 1651051.018139<br>LAT NAD83: 39.219375<br>LON NAD83: -80.620500 | Prop. Well Richard Unit 1H<br>WV-N NAD83 N: 264003.557648<br>WV-N NAD83 E: 1651044.323522<br>LAT NAD83: 39.219396<br>LON NAD83: -80.620524 |
| Prop. Well McClain Unit 1H<br>WV-N NAD83 N: 264010.865225<br>WV-N NAD83 E: 1651037.629608<br>LAT NAD83: 39.219416<br>LON NAD83: -80.620548 | Prop. Well Belton Unit 1H<br>WV-N NAD83 N: 264018.412802<br>WV-N NAD83 E: 1651020.821295<br>LAT NAD83: 39.219435<br>LON NAD83: -80.620572  | Prop. Well Carole Unit 2H<br>WV-N NAD83 N: 264025.840379<br>WV-N NAD83 E: 1651024.236872<br>LAT NAD83: 39.219455<br>LON NAD83: -80.620595  | Prop. Well Carole Unit 1H<br>WV-N NAD83 N: 264033.267858<br>WV-N NAD83 E: 1651017.540055<br>LAT NAD83: 39.219476<br>LON NAD83: -80.620620  |

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL), CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE

| DATE | REVISION |
|------|----------|
|      |          |
|      |          |
|      |          |
|      |          |



Date: 3-21-2013  
Scale: 1" = 50'  
Designed By: TBC & JDR  
File No: 174-13-000000  
THESE PROJECTS ARE THE PROPERTY OF ANTERO RESOURCES APPALACHIAN CORP.  
Page 7 of 19

# SITE PLAN (1)



All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035



Hornor Bros. Engineers  
1902 Since  
Civil, Mining, Environmental and Consulting Engineering  
140 South Third Street, First Floor Box 306,  
Conaury, West Virginia, 26030 (304) 534-6445

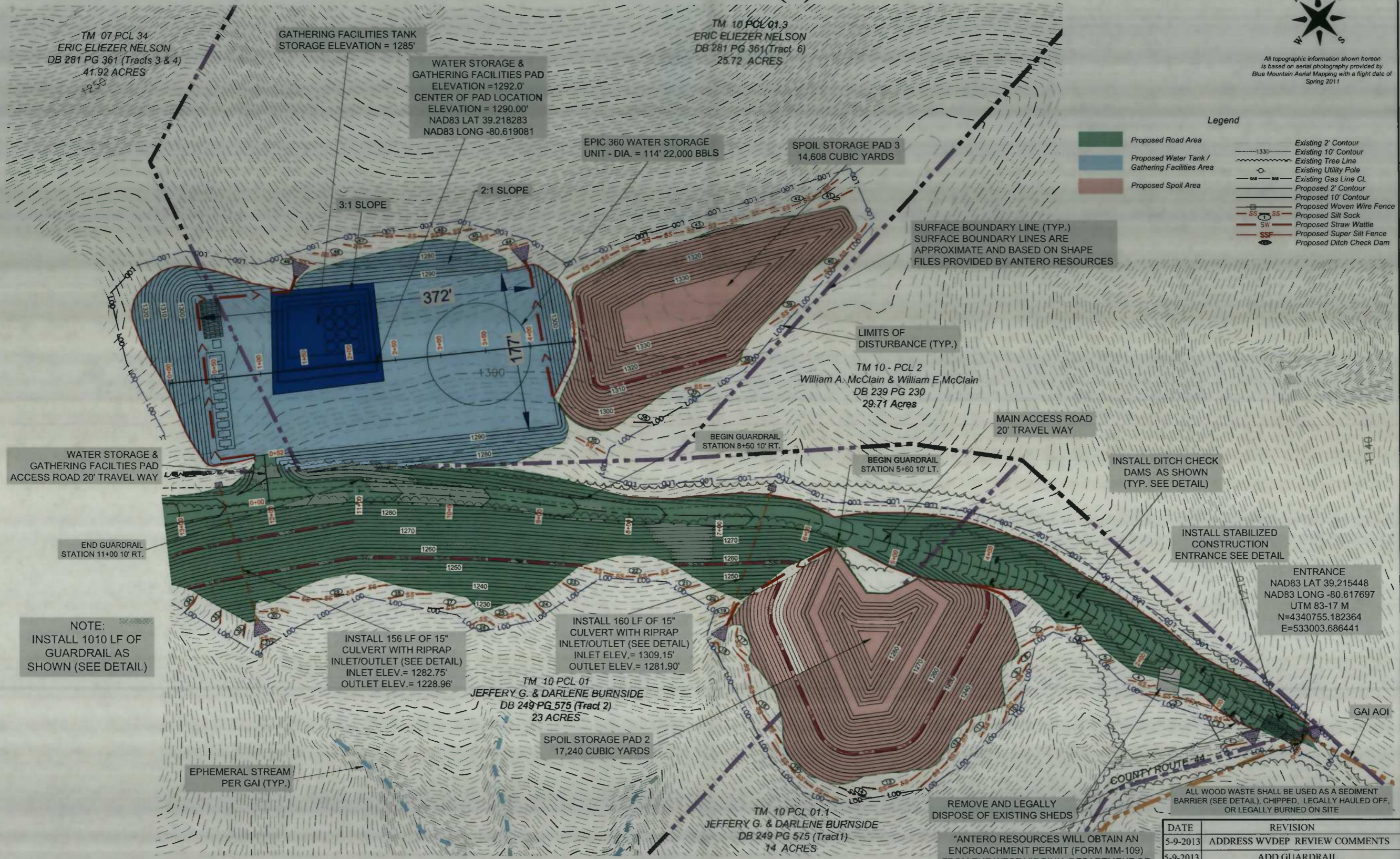


THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

FINAL SITE DESIGN  
**HUGHES DRILL PAD SITE ALT-2**  
GREENBRIER DISTRICT  
DODDRIIDGE COUNTY, WV

Date: 3-21-2013  
Scale: 1" = 50'  
Designed By: TBC & JDR  
Page 8 of 19

- Legend**
- Proposed Road Area
  - Proposed Water Tank / Gathering Facilities Area
  - Proposed Spoil Area
  - Existing 2' Contour
  - Existing 10' Contour
  - Existing Tree Line
  - Existing Utility Pole
  - Existing Gas Line CL
  - Proposed 2' Contour
  - Proposed 10' Contour
  - Proposed Woven Wire Fence
  - Proposed Silt Sock
  - Proposed Straw Wattle
  - Proposed Super Silt Fence
  - Proposed Ditch Check Dam



WATER STORAGE & GATHERING FACILITIES PAD  
ACCESS ROAD 20' TRAVEL WAY

END GUARDRAIL  
STATION 11+00 10' RT.

NOTE:  
INSTALL 1010 LF OF  
GUARDRAIL AS  
SHOWN (SEE DETAIL)

INSTALL 156 LF OF 15"  
CULVERT WITH RIPRAP  
INLET/OUTLET (SEE DETAIL)  
INLET ELEV. = 1282.75'  
OUTLET ELEV. = 1228.96'

INSTALL 160 LF OF 15"  
CULVERT WITH RIPRAP  
INLET/OUTLET (SEE DETAIL)  
INLET ELEV. = 1309.15'  
OUTLET ELEV. = 1281.90'

TM 10 PCL 01  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 2)  
23 ACRES

SPOIL STORAGE PAD 2  
17,240 CUBIC YARDS

TM 10 PCL 01.1  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 1)  
14 ACRES

REMOVE AND LEGALLY  
DISPOSE OF EXISTING SHEDS

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT  
BARRIER (SEE DETAIL), CHIPPED, LEGALLY HAULED OFF,  
OR LEGALLY BURNED ON SITE



SURFACE BOUNDARY LINE (TYP.)  
SURFACE BOUNDARY LINES ARE  
APPROXIMATE AND BASED ON SHAPE  
FILES PROVIDED BY ANTERO RESOURCES

LIMITS OF  
DISTURBANCE (TYP.)  
TM 10 - PCL 2  
William A. McClain & William E. McClain  
DB 239 PG 230  
29.71 Acres

SPOIL STORAGE PAD 3  
14,608 CUBIC YARDS

EPIC 360 WATER STORAGE  
UNIT - DIA. = 114' 22,000 BBLs

WATER STORAGE &  
GATHERING FACILITIES PAD  
ELEVATION = 1292.0'  
CENTER OF PAD LOCATION  
ELEVATION = 1290.00'  
NAD83 LAT 39.218283  
NAD83 LONG -80.619081

TM 07 PCL 34  
ERIC ELIEZER NELSON  
DB 281 PG 361 (Tracts 3 & 4)  
41.92 ACRES

GATHERING FACILITIES TANK  
STORAGE ELEVATION = 1285'

TM 10 PCL 01.3  
ERIC ELIEZER NELSON  
DB 281 PG 361 (Tract 6)  
25.72 ACRES

"ANTERO RESOURCES WILL OBTAIN AN  
ENCROACHMENT PERMIT (FORM MM-109)  
FROM THE WEST VIRGINIA DEPARTMENT OF  
TRANSPORTATION DIVISION OF HIGHWAYS,  
PRIOR TO THE COMMENCEMENT OF  
CONSTRUCTION ACTIVITIES"

| DATE     | REVISION                      |
|----------|-------------------------------|
| 5-9-2013 | ADDRESS WYDEP REVIEW COMMENTS |
| 5-9-2013 | ADD GUARDRAIL                 |
|          |                               |
|          |                               |



# SITE PLAN (2)



All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035

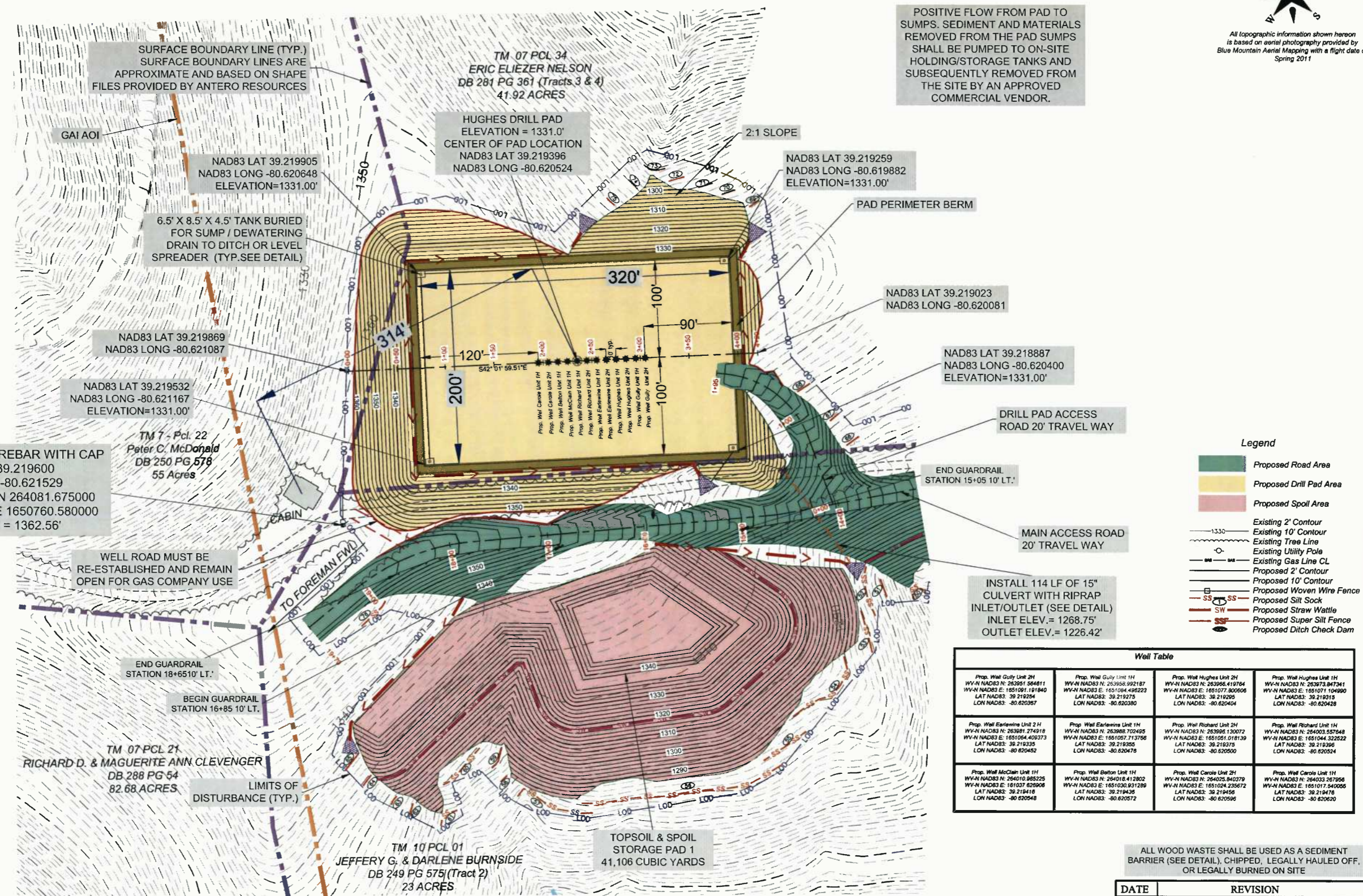


Horner Bros. Engineers  
Since 1902  
1902 Mining, Environmental and  
Civil, Consulting Engineering  
140 South Third Street, Post Office Box 306,  
Charleston, West Virginia, 25301 (304) 524-4445



THIS DOCUMENT  
PREPARED FOR  
ANTERO RESOURCES  
APPALACHIAN CORP

FINAL SITE DESIGN  
**HUGHES**  
DRILL PAD SITE ALT-2  
GREENBRIER DISTRICT  
DODDRIIDGE COUNTY, WV



POSITIVE FLOW FROM PAD TO SUMPS. SEDIMENT AND MATERIALS REMOVED FROM THE PAD SUMPS SHALL BE PUMPED TO ON-SITE HOLDING/STORAGE TANKS AND SUBSEQUENTLY REMOVED FROM THE SITE BY AN APPROVED COMMERCIAL VENDOR.

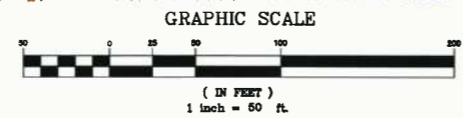
INSTALL 114 LF OF 15" CULVERT WITH RIPRAP INLET/OUTLET (SEE DETAIL)  
INLET ELEV.= 1268.75'  
OUTLET ELEV.= 1226.42'

| Well Table                                                                                                                                  |                                                                                                                                             |                                                                                                                                           |                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Prop. Well Gully Unit 2H<br>WV-N NAD83 N: 26391.564611<br>WV-N NAD83 E: 1651091.191840<br>LAT NAD83: 39.219254<br>LON NAD83: -80.620387     | Prop. Well Gully Unit 1H<br>WV-N NAD83 N: 26396.992187<br>WV-N NAD83 E: 1651084.498220<br>LAT NAD83: 39.219275<br>LON NAD83: -80.620380     | Prop. Well Hughes Unit 2H<br>WV-N NAD83 N: 26396.419764<br>WV-N NAD83 E: 1651077.800606<br>LAT NAD83: 39.219205<br>LON NAD83: -80.620404  | Prop. Well Hughes Unit 1H<br>WV-N NAD83 N: 26395.847241<br>WV-N NAD83 E: 1651071.104990<br>LAT NAD83: 39.219315<br>LON NAD83: -80.620428  |
| Prop. Well Earlewine Unit 2H<br>WV-N NAD83 N: 26398.274919<br>WV-N NAD83 E: 1651064.409273<br>LAT NAD83: 39.219335<br>LON NAD83: -80.620452 | Prop. Well Earlewine Unit 1H<br>WV-N NAD83 N: 26398.702495<br>WV-N NAD83 E: 1651057.713766<br>LAT NAD83: 39.219355<br>LON NAD83: -80.620476 | Prop. Well Richard Unit 2H<br>WV-N NAD83 N: 26396.130072<br>WV-N NAD83 E: 1651051.018139<br>LAT NAD83: 39.219375<br>LON NAD83: -80.620500 | Prop. Well Richard Unit 1H<br>WV-N NAD83 N: 26403.557648<br>WV-N NAD83 E: 1651044.322522<br>LAT NAD83: 39.219396<br>LON NAD83: -80.620524 |
| Prop. Well McClain Unit 1H<br>WV-N NAD83 N: 26403.885225<br>WV-N NAD83 E: 1651037.629068<br>LAT NAD83: 39.219416<br>LON NAD83: -80.620548   | Prop. Well Belton Unit 1H<br>WV-N NAD83 N: 26401.612802<br>WV-N NAD83 E: 1651030.931290<br>LAT NAD83: 39.219435<br>LON NAD83: -80.620572    | Prop. Well Carol Unit 2H<br>WV-N NAD83 N: 26402.840379<br>WV-N NAD83 E: 1651024.236672<br>LAT NAD83: 39.219456<br>LON NAD83: -80.620596   | Prop. Well Carol Unit 1H<br>WV-N NAD83 N: 26403.267956<br>WV-N NAD83 E: 1651017.540566<br>LAT NAD83: 39.219476<br>LON NAD83: -80.620620   |

ALL WOOD WASTE SHALL BE USED AS A SEDIMENT BARRIER (SEE DETAIL), CHIPPED, LEGALLY HAULED OFF, OR LEGALLY BURNED ON SITE

| DATE     | REVISION                      |
|----------|-------------------------------|
| 5-9-2013 | ADDRESS WVDEP REVIEW COMMENTS |
| 5-9-2013 | ADD GUARDRAIL                 |

NOTE:  
INSTALL 1,005 LF OF GUARDRAIL AS SHOWN (SEE DETAIL)



SITE BENCHMARK = REBAR WITH CAP  
NAD83 LAT: 39.219600  
NAD83 LONG: -80.621529  
NAD83 WV-NORTH N 264081.675000  
NAD83 WV-NORTH E 1650760.580000  
NAVD88 ELEV = 1362.56'

SURFACE BOUNDARY LINE (TYP.)  
SURFACE BOUNDARY LINES ARE APPROXIMATE AND BASED ON SHAPE FILES PROVIDED BY ANTERO RESOURCES

NAD83 LAT 39.219905  
NAD83 LONG -80.620648  
ELEVATION=1331.00'

6.5' X 8.5' X 4.5' TANK BURIED FOR SUMP / DEWATERING DRAIN TO DITCH OR LEVEL SPREADER (TYP. SEE DETAIL)

NAD83 LAT 39.219869  
NAD83 LONG -80.621087

NAD83 LAT 39.219532  
NAD83 LONG -80.621167  
ELEVATION=1331.00'

TM 7 - Pcl. 22  
Peter C. McDonald  
DB 250 PG 578  
55 ACRES

WELL ROAD MUST BE RE-ESTABLISHED AND REMAIN OPEN FOR GAS COMPANY USE

END GUARDRAIL STATION 18+6510' LT.

BEGIN GUARDRAIL STATION 16+85 10' LT.

TM 07-PCL 21  
RICHARD D. & MAGUERITE ANN CLEVINGER  
DB 288 PG 54  
82.68 ACRES

LIMITS OF DISTURBANCE (TYP.)

TM 07 PCL 34  
ERIC ELIEZER NELSON  
DB 281 PG 361 (Tracts 3 & 4)  
41.92 ACRES

HUGHES DRILL PAD  
ELEVATION = 1331.0'  
CENTER OF PAD LOCATION  
NAD83 LAT 39.219396  
NAD83 LONG -80.620524

2:1 SLOPE

NAD83 LAT 39.219259  
NAD83 LONG -80.619882  
ELEVATION=1331.00'

PAD PERIMETER BERM

NAD83 LAT 39.219023  
NAD83 LONG -80.620081

NAD83 LAT 39.218887  
NAD83 LONG -80.620400  
ELEVATION=1331.00'

DRILL PAD ACCESS ROAD 20' TRAVEL WAY

END GUARDRAIL STATION 15+05 10' LT.

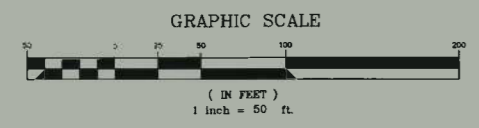
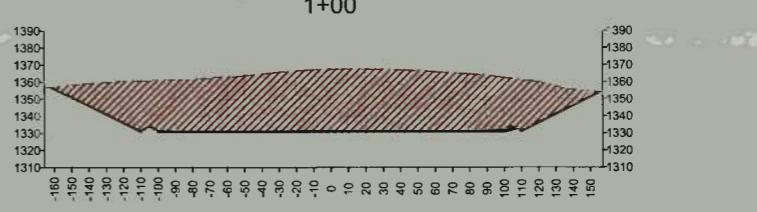
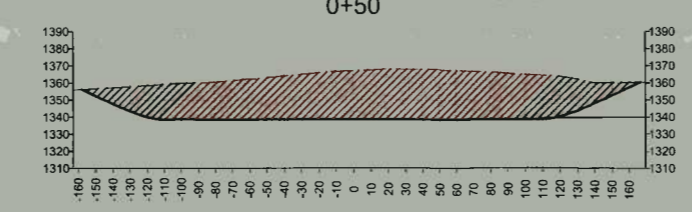
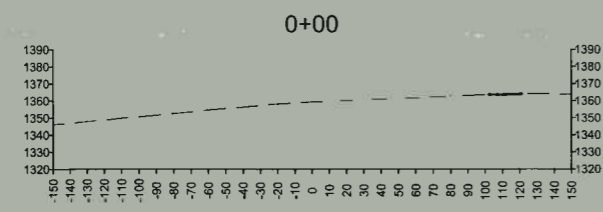
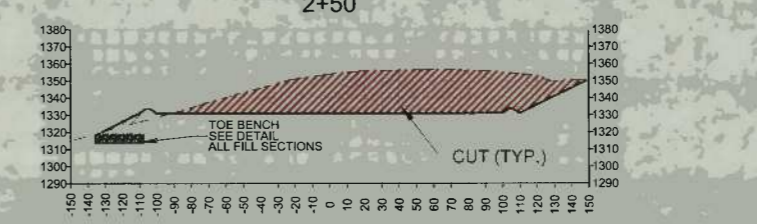
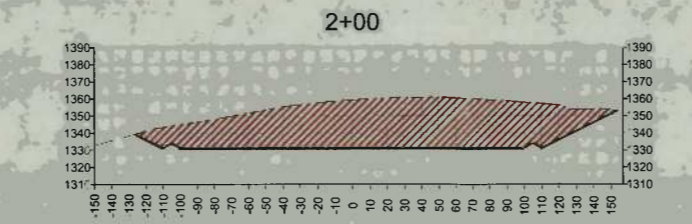
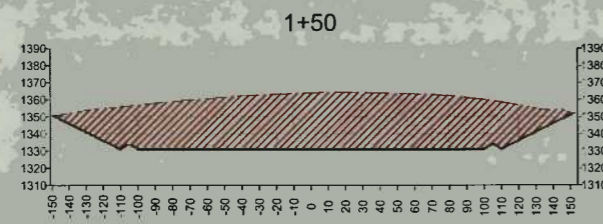
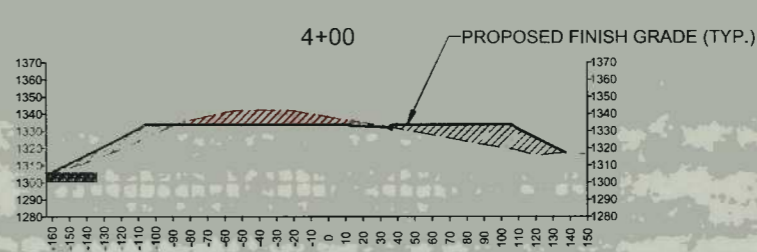
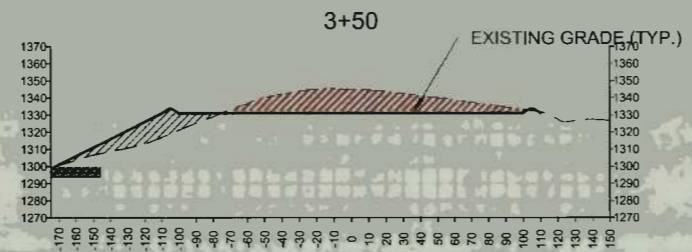
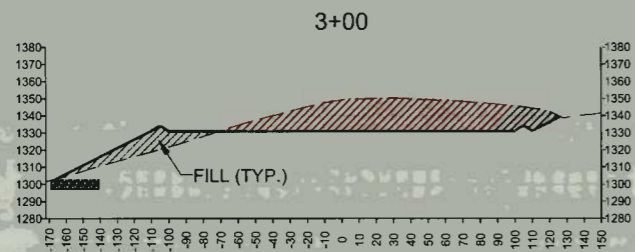
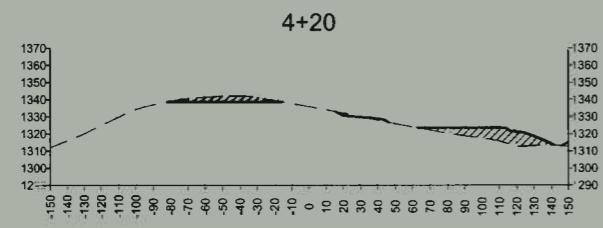
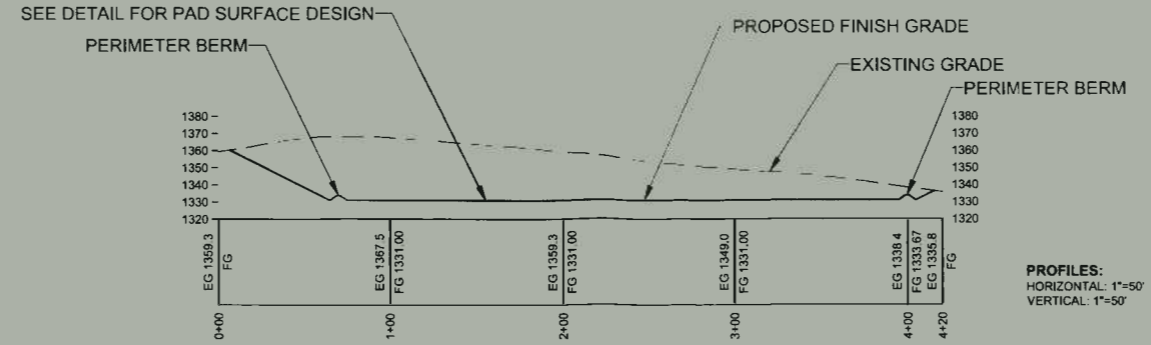
MAIN ACCESS ROAD 20' TRAVEL WAY

TOPSOIL & SPOIL STORAGE PAD 1  
41,106 CUBIC YARDS

TM 10 PCL 01  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 2)  
23 ACRES

Date: 3-21-2013  
Scale: 1" = 50'  
Designed By: TBC & JDR  
File No. 17423702-002  
PROJECT: HUGHES DRILL PAD SITE ALT-2  
Page 9 of 19

# DRILL PAD PROFILE & CROSS SECTIONS 0+00 - 4+20

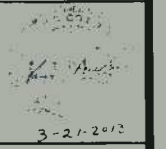


SECTIONS:  
HORIZONTAL: 1"=50'  
VERTICAL: 1"=50'

| DATE     | REVISIONS         | DATE                                         |
|----------|-------------------|----------------------------------------------|
| 5-8-2013 | ADDED TOE BENCHES | 3-21-2013                                    |
|          |                   | Scale: 1" = 50'                              |
|          |                   | Designed By: JDR                             |
|          |                   | File No. 13-03-0012-10-11-11-11-SECTIONS-ALT |
|          |                   | Page 10 of 19                                |



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035



Hornor Since 1902 Bros. Engineers  
1902 Bros. Engineers  
Civil, Mining, Environmental and  
Consulting Engineering  
140 South Third Street, Post Office Box 308,  
Cranberry, West Virginia, 26031 (304) 624-6645

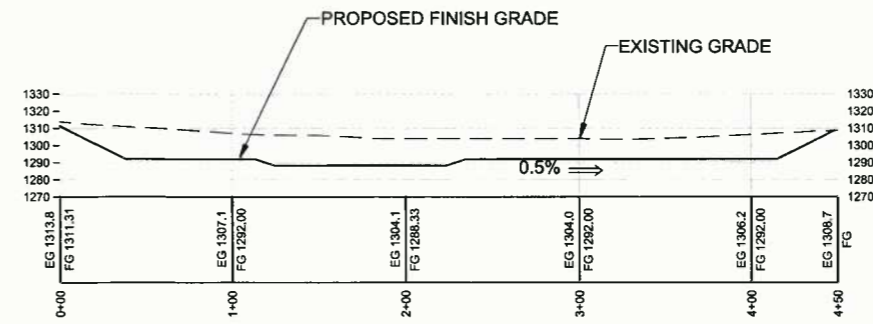


THIS DOCUMENT  
PREPARED FOR  
ANTERO RESOURCES  
APPALACHIAN CORP.

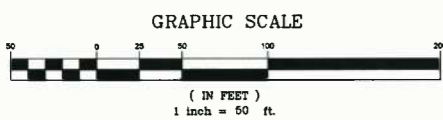
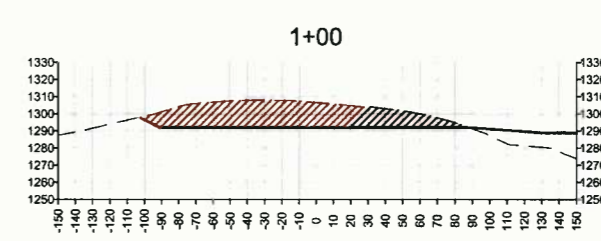
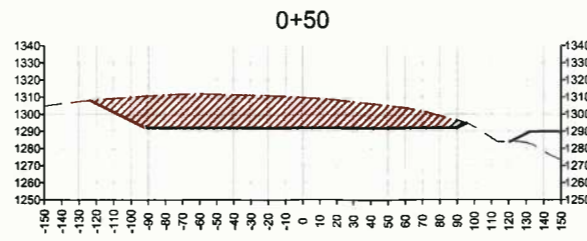
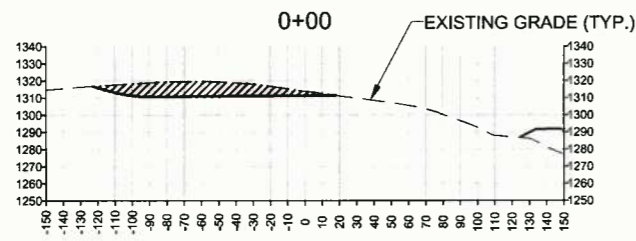
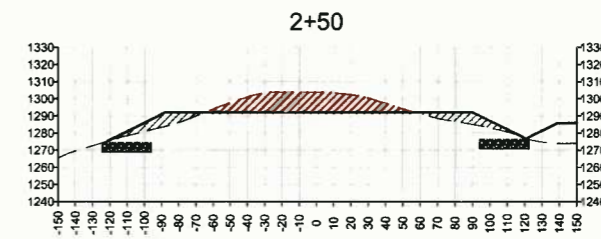
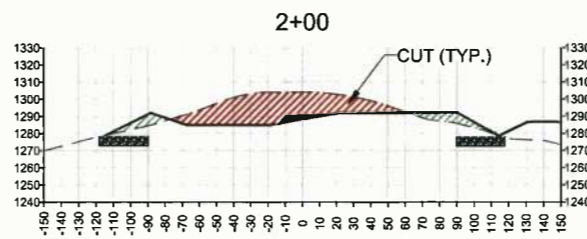
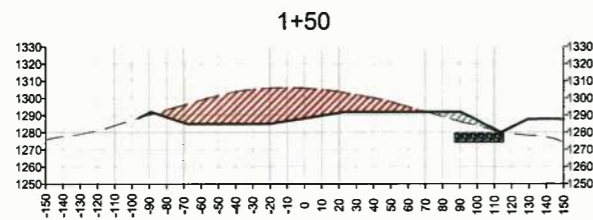
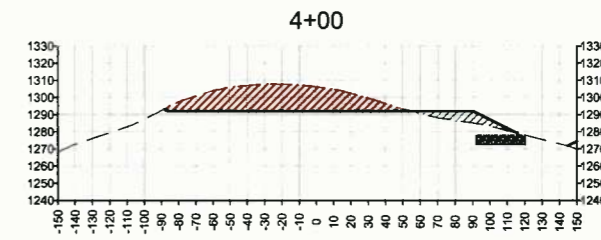
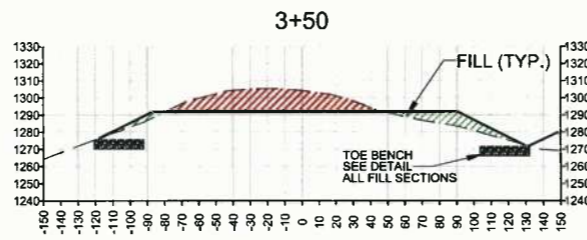
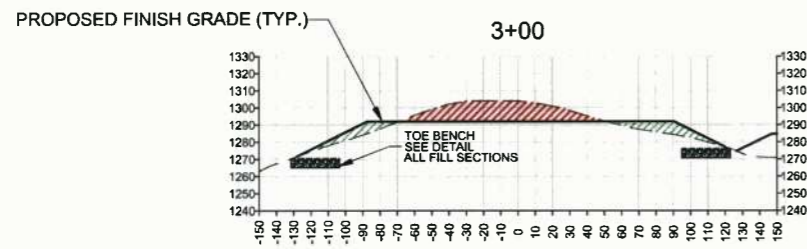
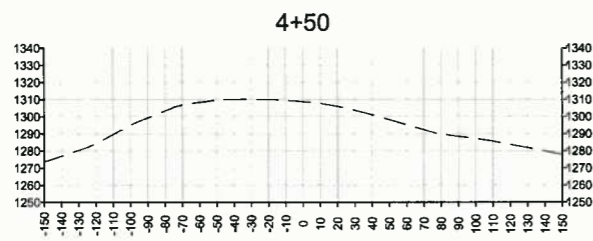
DRILL PAD PROFILE & CROSS SECTIONS  
HUGHES  
DRILL PAD SITE  
GREENBRIER DISTRICT  
DODDRIIDGE COUNTY, WV

Date: 3-21-2013

# WATER TANK PAD/GATHERING FACILITIES PAD PROFILE & CROSS SECTIONS 0+00 - 4+50



PROFILES:  
HORIZONTAL: 1"=50'  
VERTICAL: 1"=50'



SECTIONS:  
HORIZONTAL: 1"=50'  
VERTICAL: 1"=50'

| DATE     | REVISIONS         | Scale: 1" = 50'                              |
|----------|-------------------|----------------------------------------------|
| 5-8-2013 | ADDED TOE BENCHES | Designed By: JDR                             |
|          |                   | FILE NO. 13-0000017-01<br>FINAL SECTIONS.dwg |
|          |                   | Page 11 of 19                                |



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Consulting Engineering  
140 South Third Street, Post Office Box 306,  
Carmarthen, West Virginia, 26031 (304) 824-6445



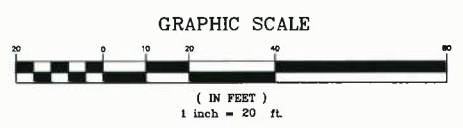
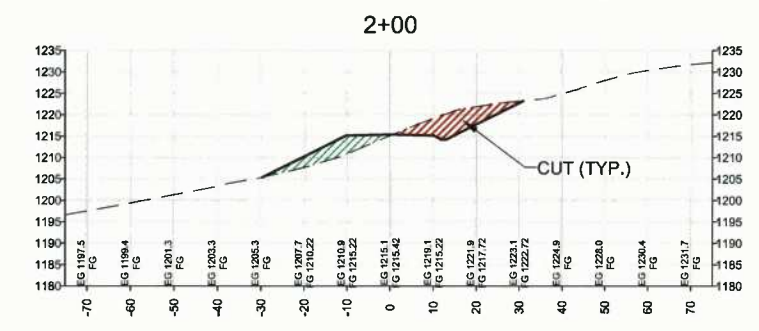
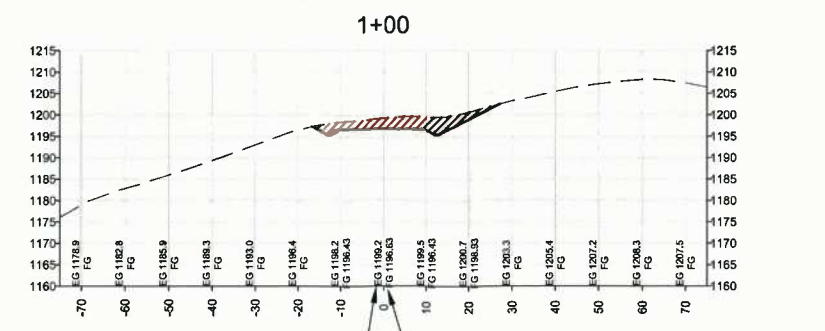
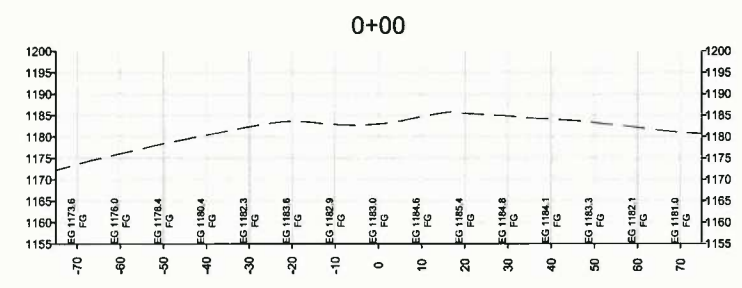
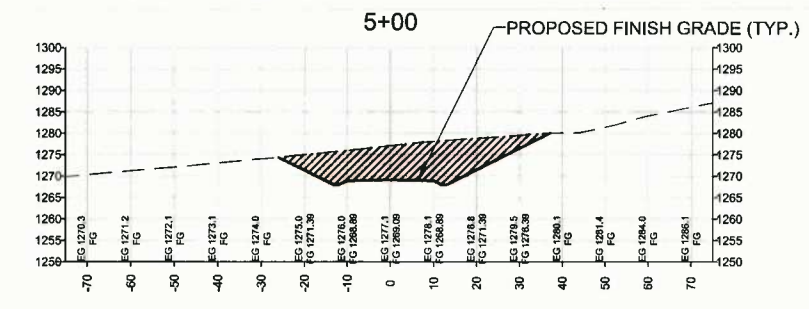
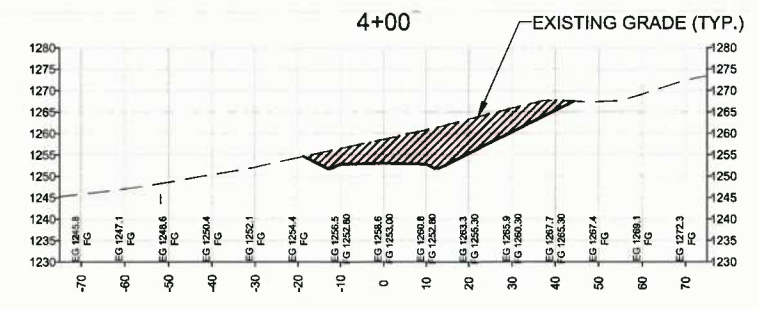
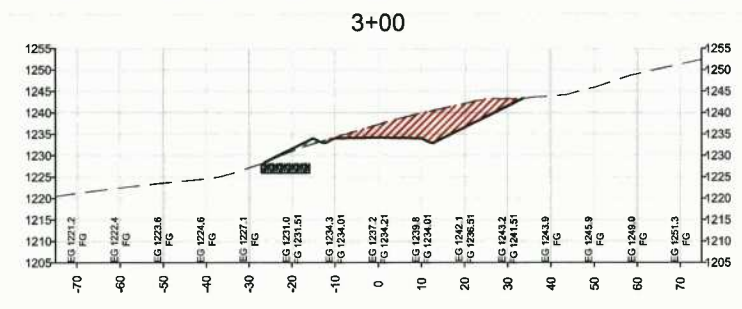
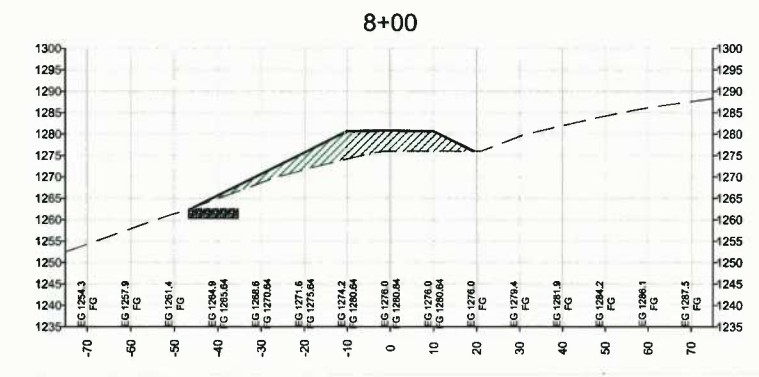
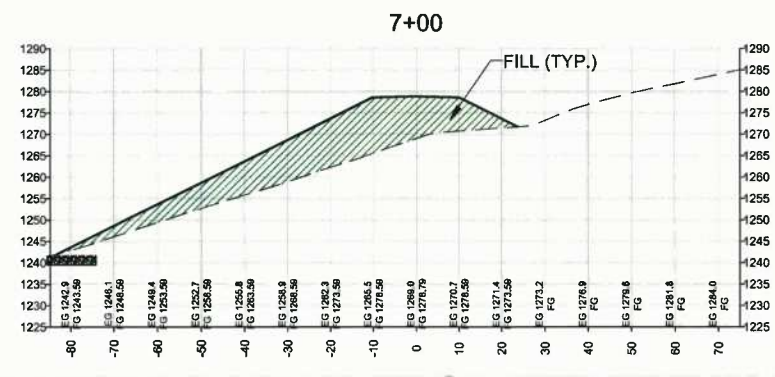
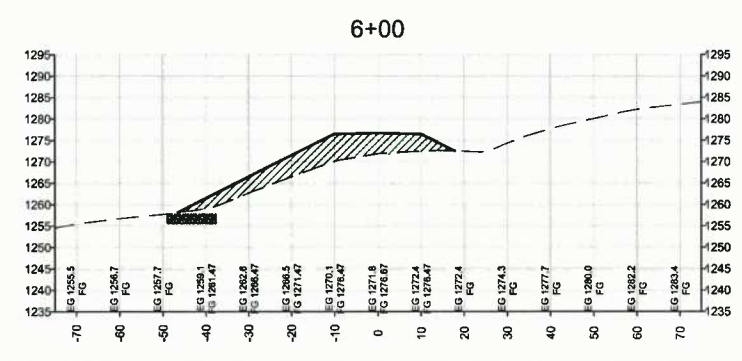
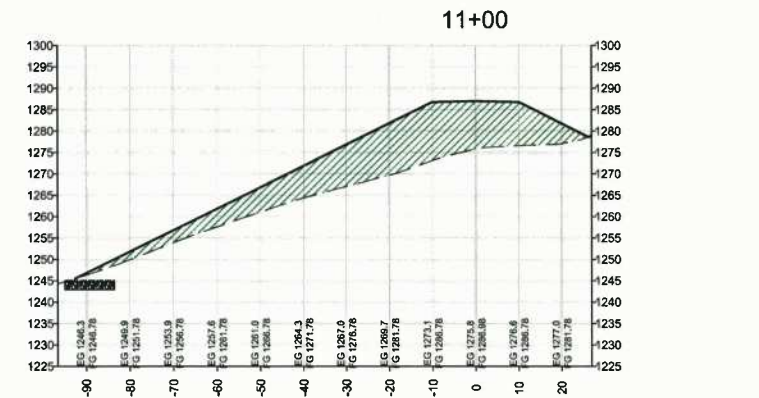
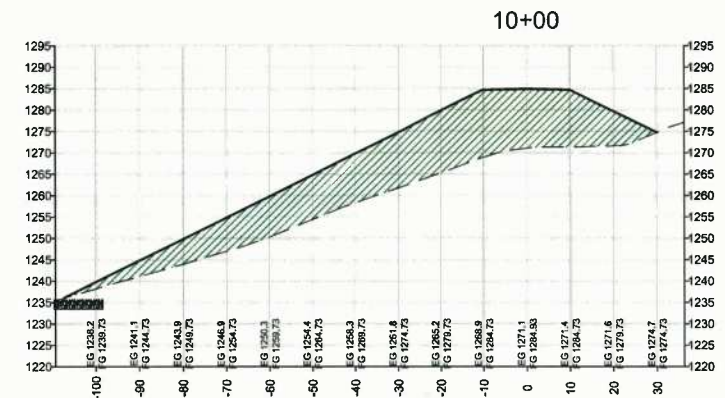
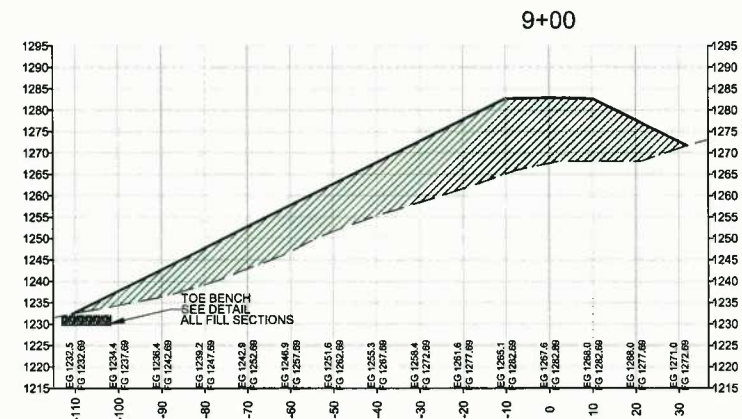
THIS DOCUMENT  
PREPARED FOR  
ANTERO RESOURCES  
APPALACHIAN CORP

WATER TANK PAD/GATHERING FACILITIES PAD  
PROFILE & CROSS SECTIONS  
HUGHES  
DRILL PAD SITE  
GREENER DISTRICT  
DODDRIDGE COUNTY, WV

Date: 3-21-2013



# MAIN ACCESS ROAD CROSS SECTIONS 0+00 - 11+00



SECTIONS:  
HORIZONTAL: 1"=20'  
VERTICAL: 1"=20'

| DATE     | REVISIONS         |
|----------|-------------------|
| 5-8-2013 | ADDED TOE BENCHES |

Date: 3-21-2013  
Scale: 1" = 20'  
Designed By: JDR  
File No: 13-20-0001-17-1  
Page 13 of 19

ACCESS ROADS CROSS SECTIONS  
**HUGHES**  
DRILL PAD SITE  
GREENBRIER DISTRICT  
DODDRIEGE COUNTY, WV

THIS DOCUMENT  
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APPALACHIAN CORP

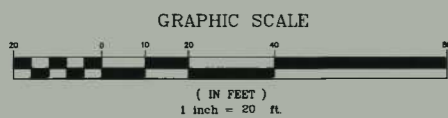
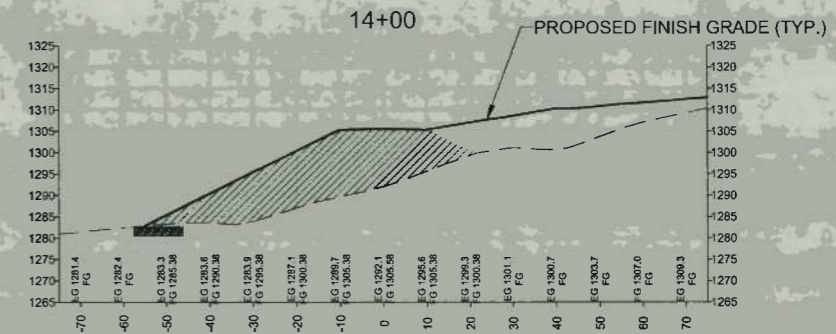
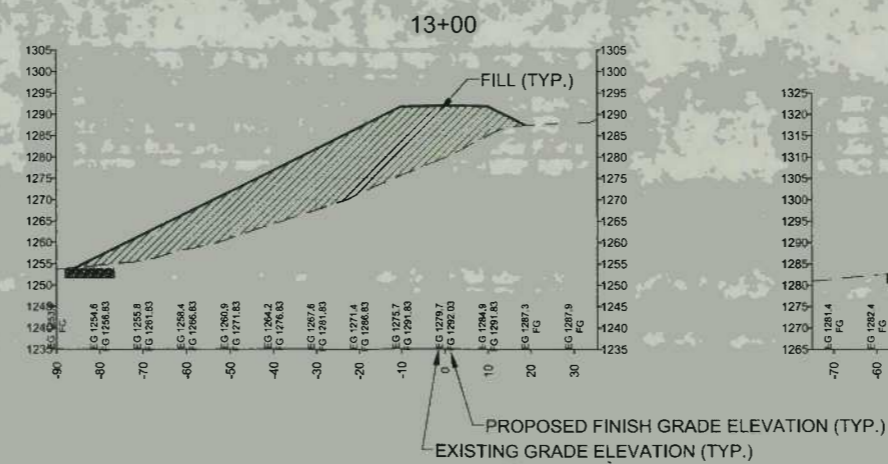
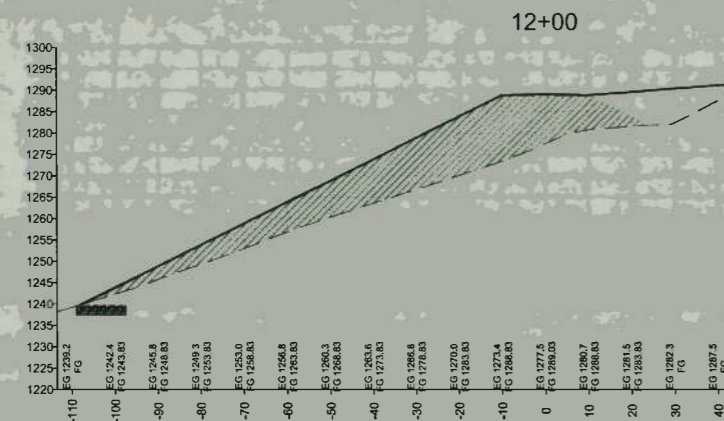
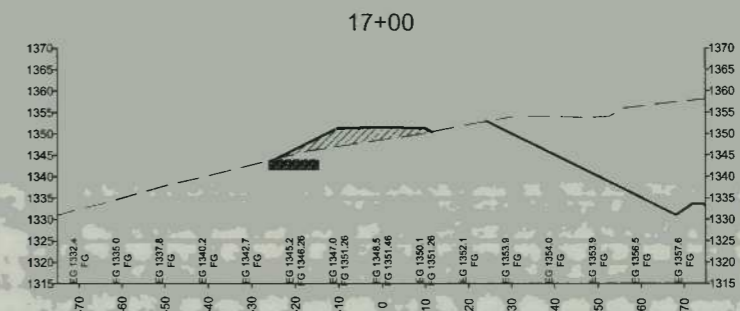
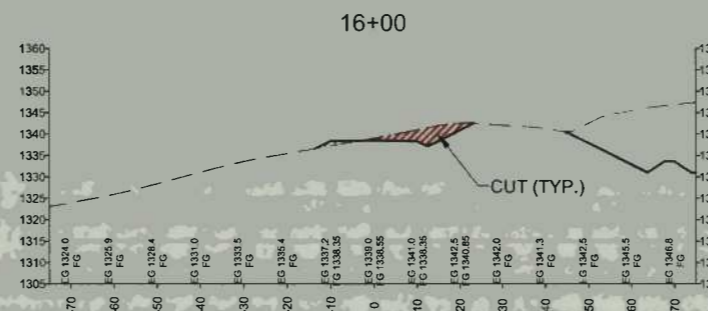
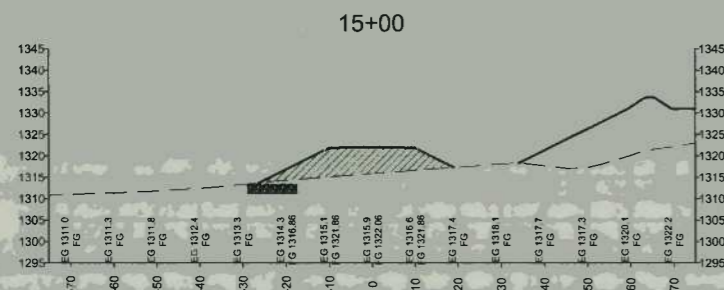
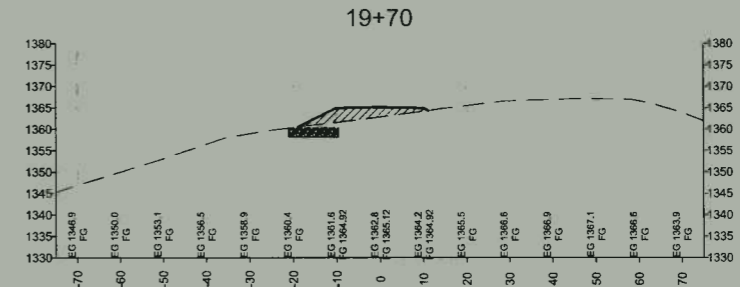
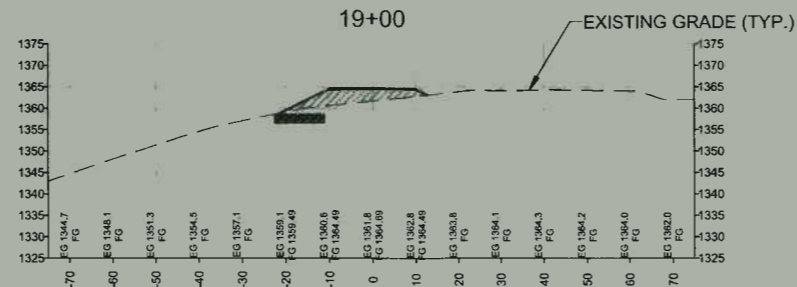
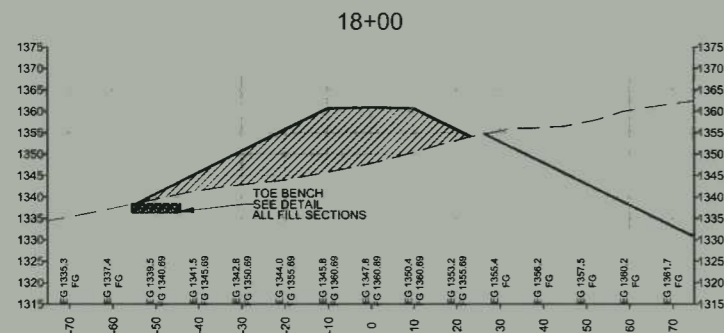


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172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035

# MAIN ACCESS ROAD CROSS SECTIONS 12+00 - 19+70



SECTIONS:  
HORIZONTAL: 1"=20'  
VERTICAL: 1"=20'

| DATE     | REVISIONS         |
|----------|-------------------|
| 5-8-2013 | ADDED TOE BENCHES |



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ACCESS ROADS CROSS SECTIONS  
**HUGHES  
DRILL PAD SITE**  
GREENBRIER DISTRICT  
DODDRIIDGE COUNTY, WV

Date: 3-21-2013

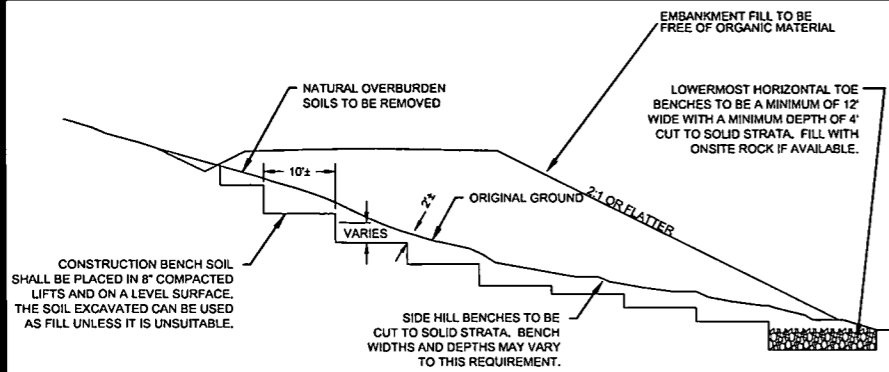
Scale: 1" = 20'

Designed By: JDR

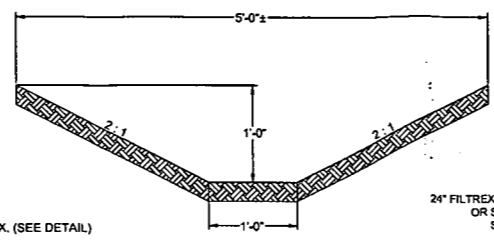
FILE NO. 1304-130-2013-04-01  
FINAL SECTIONS 14.17.dwg

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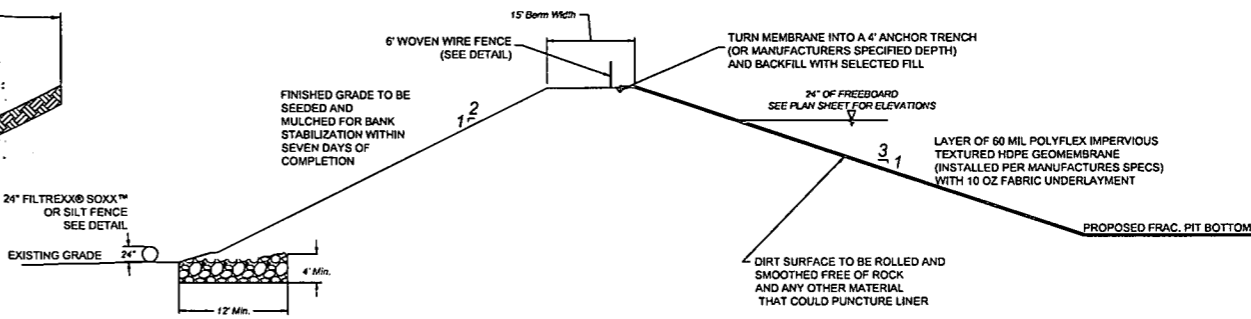




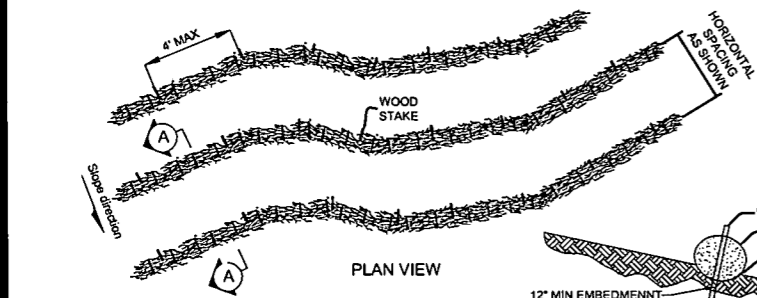
EMBANKMENT FILL BENCH DETAIL (TYP.)  
N.T.S.



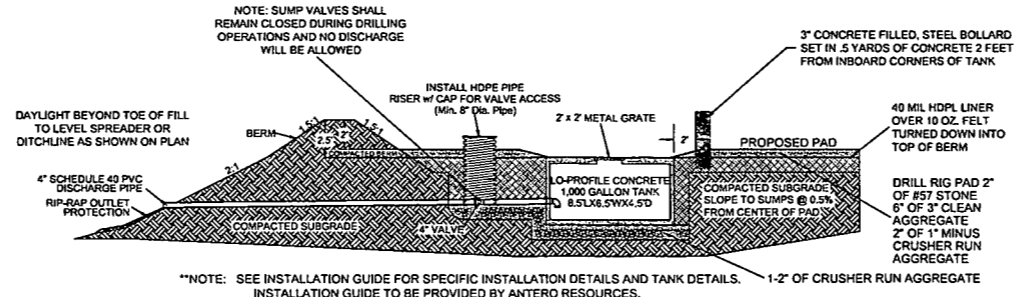
TYPICAL ROAD DITCH DETAIL  
N.T.S.



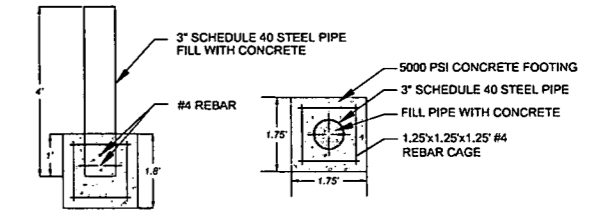
TYPICAL FRAC. PIT EMBANKMENT DETAIL  
N.T.S.



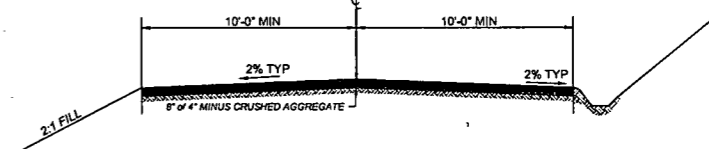
STRAW WATTLE DETAIL  
N.T.S.



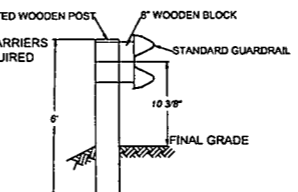
PAD DIVERSION BERM & SUMP/DEWATERING DETAIL  
N.T.S.



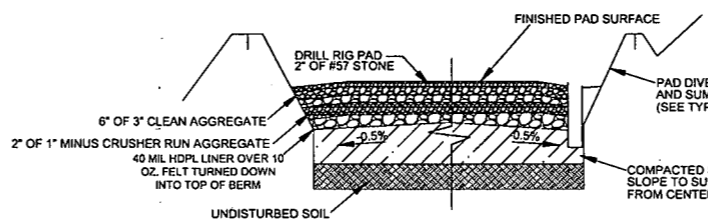
TYPICAL BOLLARD DETAIL  
N.T.S.



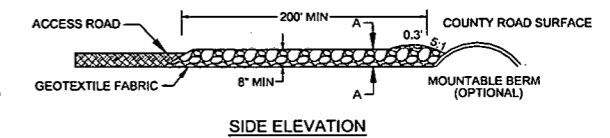
TYPICAL ROAD CROSS SECTION DETAIL  
N.T.S.



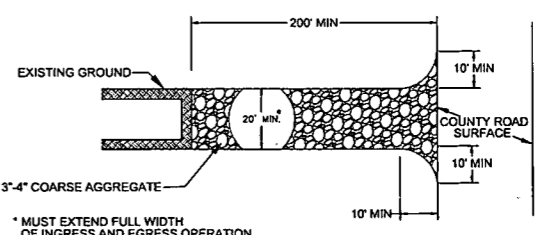
GUARDRAIL DETAIL  
N.T.S.



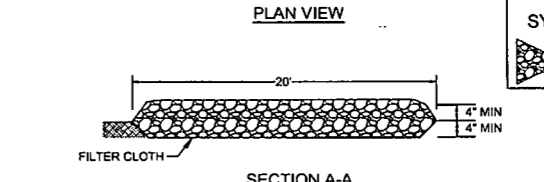
TYPICAL PAD CROSS-SECTION DETAIL  
N.T.S.



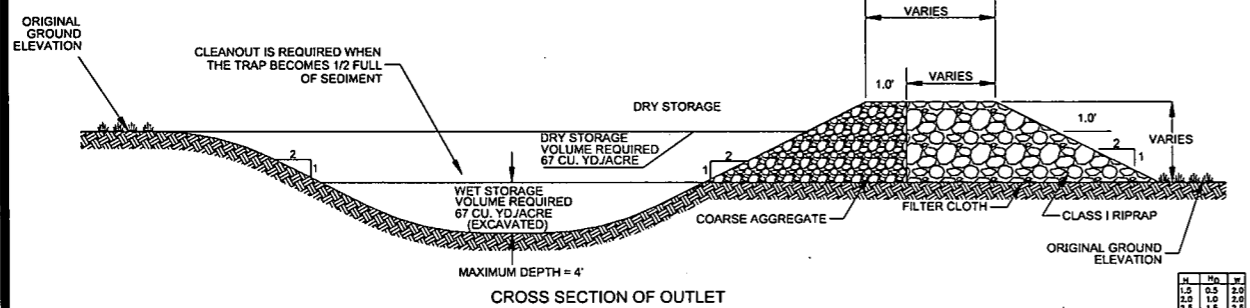
SIDE ELEVATION



PLAN VIEW



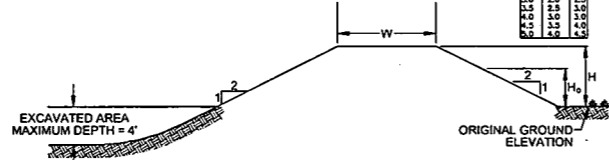
STONE CONSTRUCTION ENTRANCE DETAIL  
N.T.S.



CROSS SECTION OF OUTLET

TEMPORARY SEDIMENT TRAP NOTES:

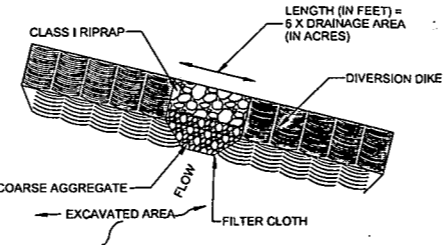
1. THE DETAIL SHOWN IS A GENERAL SCHEMATIC. THE CONTRACTOR SHALL DESIGN AND SIZE EACH TRAP ACCORDING TO HIS GRADING PLAN.
2. SEDIMENT TRAPS SHALL BE USED IN AREAS WHERE THE TOTAL CONTRIBUTING DRAINAGE AREA IS LESS THAN 5 ACRES.
3. FILL MATERIAL FOR ANY SEDIMENT TRAP EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION, ORGANIC MATERIAL, LARGE STONES, AND OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHOULD BE COMPACTED IN 6\"/>
- 4. ANY SEDIMENT TRAP EARTH EMBANKMENT SHALL BE SEEDED WITH TEMPORARY VEGETATION IMMEDIATELY AFTER INSTALLATION.
- 5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
- 6. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE UPSLOPE DRAINAGE AREA HAS BEEN STABILIZED.
- 7. ALL CUT AND FILL SLOPES FORMING THE SEDIMENT TRAP SHALL BE 2:1 OR FLATTER.
- 8. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 OF THE VOLUME. SEDIMENT REMOVED FROM THE TRAP SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE AND CAUSE SEDIMENTATION PROBLEMS.
- 9. THE STRUCTURE SHOULD BE CHECKED REGULARLY TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT.
- 10. A RIPRAP SPILLWAY CHANNEL MAY BE NECESSARY IF A CONCENTRATED OUTLET FLOW IS ANTICIPATED.
- 11. FILTER STONE SHALL BE REGULARLY CHECKED TO ENSURE THAT FILTRATION PERFORMANCE IS MAINTAINED. STONE CHOKED WITH SEDIMENT SHALL BE REMOVED AND CLEANED OR REPLACED.



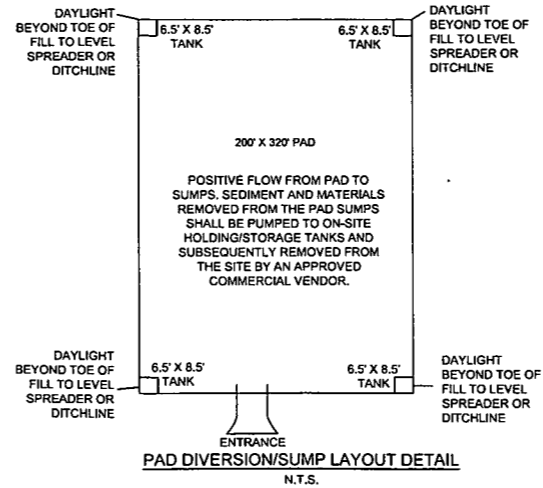
TEMPORARY SEDIMENT TRAP DETAIL  
N.T.S.

MINIMUM TOP WIDTH (W) REQUIRED FOR SEDIMENT TRAP EMBANKMENTS ACCORDING TO HEIGHT OF EMBANKMENT (FEET)

| H   | W   | H   | W   |
|-----|-----|-----|-----|
| 1.5 | 0.5 | 2.0 | 1.0 |
| 2.0 | 1.0 | 2.5 | 1.5 |
| 2.5 | 1.5 | 3.0 | 2.0 |
| 3.0 | 2.0 | 3.5 | 2.5 |
| 3.5 | 2.5 | 4.0 | 3.0 |
| 4.0 | 3.0 | 4.5 | 3.5 |
| 4.5 | 3.5 | 5.0 | 4.0 |
| 5.0 | 4.0 | 5.5 | 4.5 |



OUTLET (PERSPECTIVE VIEW)

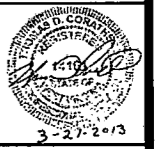


PAD DIVERSION/SUMP LAYOUT DETAIL  
N.T.S.

| DATE     | REVISIONS                                | Date: 3-21-2013           |
|----------|------------------------------------------|---------------------------|
| 5-8-2013 | ADDRESSED WVDEP & ANTERO REVIEW COMMENTS | Scale: N/A                |
|          |                                          | Designed By: TBC & JDR    |
|          |                                          | File No. 17-13-CV-ALT-2-2 |
|          |                                          | Page 16 of 19             |



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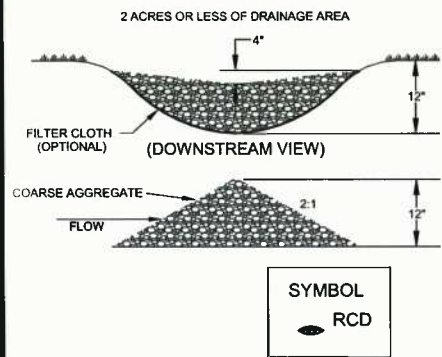
Hornor Bros. Engineers  
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Consulting Engineering  
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Camden, West Virginia, 26031 (304) 824-6443



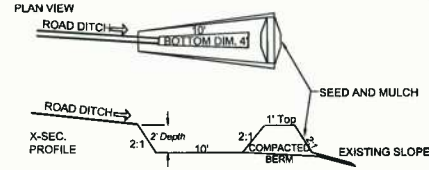
THIS DOCUMENT  
PREPARED FOR  
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APPALACHIAN CORP.

CONSTRUCTION DETAILS  
**HUGHES**  
**DRILL PAD SITE ALT-2**  
GREENBRIER DISTRICT  
DODDRIIDGE COUNTY, WV



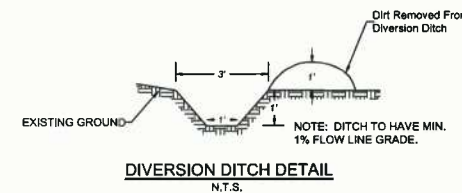


DITCH CHECK DAM DETAIL/  
SPACING AS INDICATED ON PROFILES  
N.T.S.

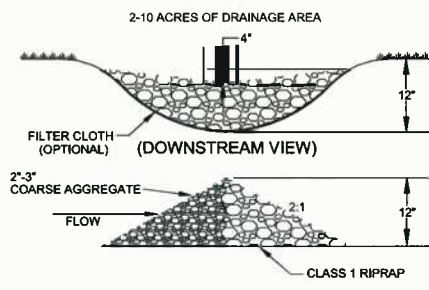


LEVEL SPREADER DETAIL  
N.T.S.

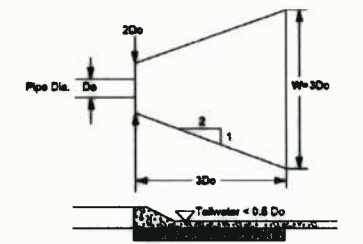
NOTE: TO BE PLACED AT THE ENDS OF DITCHES CALLING FOR LEVEL SPREADERS  
LEVEL SPREADERS WILL BE CUT INTO THE CONTOUR OF THE EXISTING SLOPE.



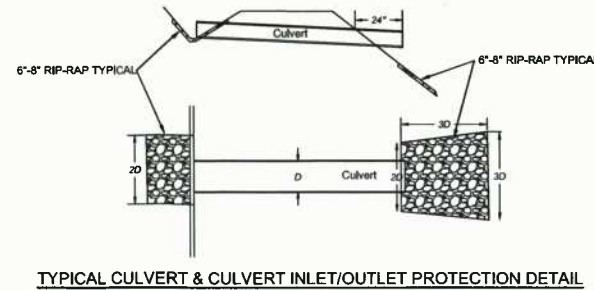
DIVERSION DITCH DETAIL  
N.T.S.



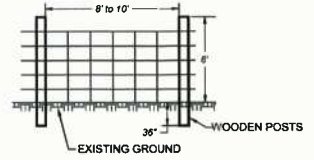
DITCH CHECK DAM DETAIL/  
SPACING AS INDICATED ON PROFILES  
N.T.S.



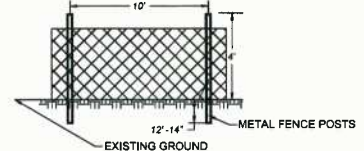
RIP RAP APRON OUTLET PROTECTION  
MINIMUM TAILWATER CONDITION  
N.T.S.



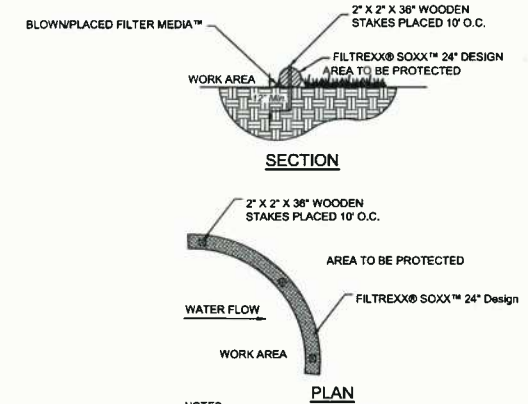
TYPICAL CULVERT & CULVERT INLET/OUTLET PROTECTION DETAIL  
N.T.S.



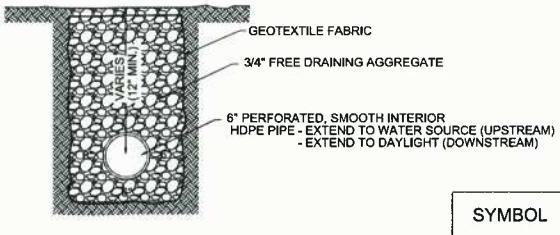
TYPICAL WOVEN WIRE FENCE DETAIL  
N.T.S.



TYPICAL CONSTRUCTION FENCE DETAIL  
N.T.S.



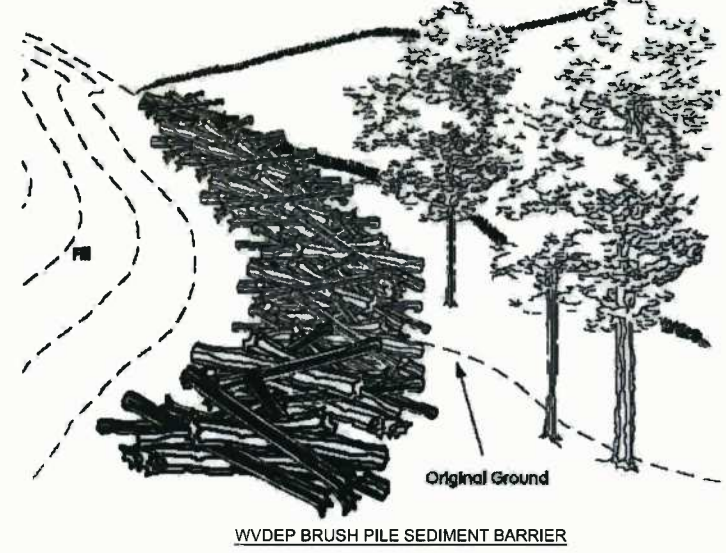
FILTREXX "SOXX" 24" FILTER SOCK DETAIL  
N.T.S.



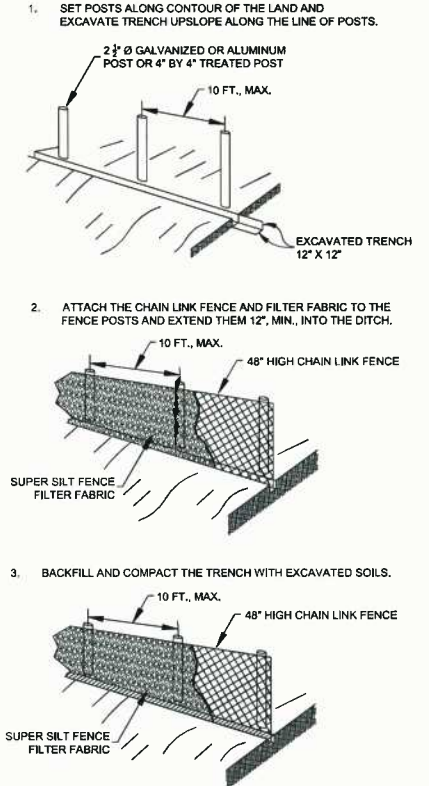
SEEP/SPRING DRAIN DETAIL  
N.T.S.

|  |                                                                                                                                                                                                                                                                                                            |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Yellow Ribbon:</b><br>Yellow Ribbon used to indicate Top of Cut (TC)<br>Cut to be determined at time of subsoil<br>Slope determined by site design                                                                                                                                                      |
|  | <b>Yellow &amp; Orange Ribbon:</b><br>Yellow and Orange Ribbon used to indicate Grade at Top of Pad/Pond/PS                                                                                                                                                                                                |
|  | <b>Orange Ribbon:</b><br>Orange Ribbon used to indicate toes of Fills (F)<br>Fill to be determined at time of subsoil<br>Slope determined by site design                                                                                                                                                   |
|  | <b>Pink Ribbon:</b><br>Pink Ribbon used to indicate Top Hole Location<br>Pink Ribbon used to indicate Survey Control Location                                                                                                                                                                              |
|  | <b>Pink &amp; Black Stripes Ribbon:</b><br>Pink & Black Stripes Ribbon used to indicate Vertical Cut (VC) at Pad/Pond/PS corner or edge<br>Pink & Black Stripes Ribbon used to indicate Vertical Fill (VF) at Pad/Pond/PS corner or edge<br>Vertical Cut/Vertical Fill to be determined at time of subsoil |
|  | <b>Blue &amp; White Stripes Ribbon:</b><br>Blue & White Stripes Ribbon used to indicate clearing limits/construction limits                                                                                                                                                                                |
|  | <b>Orange &amp; Black Stripes Ribbon:</b><br>Orange & Black Stripes Ribbon used to indicate Vertical Cut (VC) at Cornerline or edge of access road<br>Orange & Black Stripes Ribbon used to indicate Vertical Fill (VF) at cornerline or edge of access road                                               |
|  | <b>Pink &amp; White Stripes Ribbon:</b><br>Pink & White Stripes Ribbon used to indicate Slope Erosion and Sediment Control Structures<br>Silt Fence (SF) Retarded Silt Fence (RSF) Super Silt Fence (SSF)<br>Filter Sock (FS)                                                                              |
|  | <b>Orange &amp; White Stripes Ribbon:</b><br>Orange & White Stripes Ribbon used to indicate Spill Stockpile Locations                                                                                                                                                                                      |
|  | <b>Blue Ribbon:</b><br>Blue Ribbon used to indicate Bottom (B) of<br>Blue Ribbon used to indicate Bottom (B) of<br>Blue Ribbon used to indicate Bottom (B) of                                                                                                                                              |

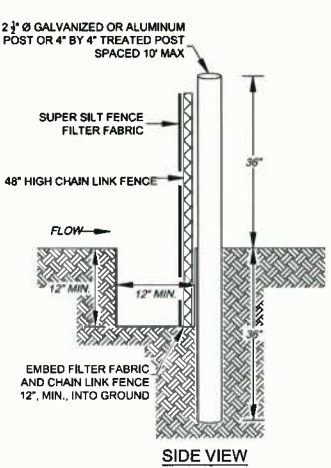
ANTERO RESOURCES STANDARD RIBBON COLOR SCHEME



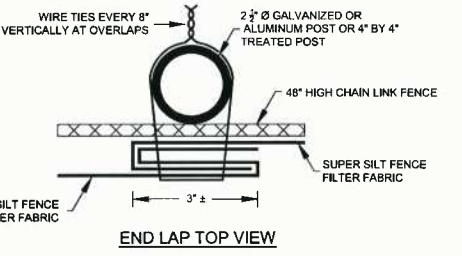
WVDEP BRUSH PILE SEDIMENT BARRIER



SUPER SILT FENCE DETAIL  
N.T.S.

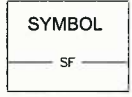


SIDE VIEW



END LAP TOP VIEW

- SUPER SILT FENCE NOTES:**
- CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 608 OF THE WYDCH SPECIFICATIONS. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE POSTS WITH WIRE TIES OR STAPLES.
  - POSTS NEED NOT BE SET IN CONCRETE.
  - THE FILTER FABRIC SHALL BE FASTENED TO THE CHAIN LINK FENCE WITH TIES EVERY 24" AT THE TOP AND MID SECTION.
  - FABRIC AND FENCE SHALL BE EMBEDDED 12", MINIMUM, INTO THE GROUND.
  - A 6" MINIMUM OVERLAP SHALL BE PROVIDED WHERE TWO SECTIONS OF FABRIC ADJOIN. THE OVERLAPPED FABRIC SHALL BE FOLDED TOGETHER AND ATTACHED TO THE CHAIN LINK FENCE.
  - 4" BY 4" PRESSURE TREATED POSTS MAY BE SUBSTITUTED FOR METAL FENCE POSTS WITH THE APPROVAL OF THE ENGINEER.
  - THE LENGTH OF SLOPE ABOVE THE FENCE SHALL NOT EXCEED 400 FEET IN STEEP TERRAIN. IN FLATTER AREAS THE LENGTH CAN BE EXTENDED WITH THE APPROVAL OF THE ENGINEER.



SYMBOL  
SF

| DATE | REVISIONS |
|------|-----------|
|      |           |
|      |           |
|      |           |
|      |           |

Date: 3-21-2013  
Scale: N/A  
Designed By: TBC & JDR  
File No. 17-03-07-0002  
17-03-07-0002-01.dwg  
Page 17 of 19



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035



Hornor Bros. Engineers  
Since 1902  
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Consulting Engineering  
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ANTERO RESOURCES  
THIS DOCUMENT  
PREPARED FOR  
ANTERO RESOURCES  
APPALACHIAN CORP

CONSTRUCTION DETAILS  
**HUGHES**  
DRILL PAD SITE ALT-2  
GREENBRIER DISTRICT  
DODDRIDGE COUNTY, WV

# RECLAMATION PLAN (1)



All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



Allegheny Surveys, Inc.  
172 Thompson Drive  
Bridgeport, WV 26330  
(304) 848-5035



Hornor Bros. Engineers  
1902 Since  
Civil, Mining, Environmental and Consulting Engineering  
140 South Third Street, First Floor Box 306,  
Conaught, West Virginia, 26020 (304) 624-6445



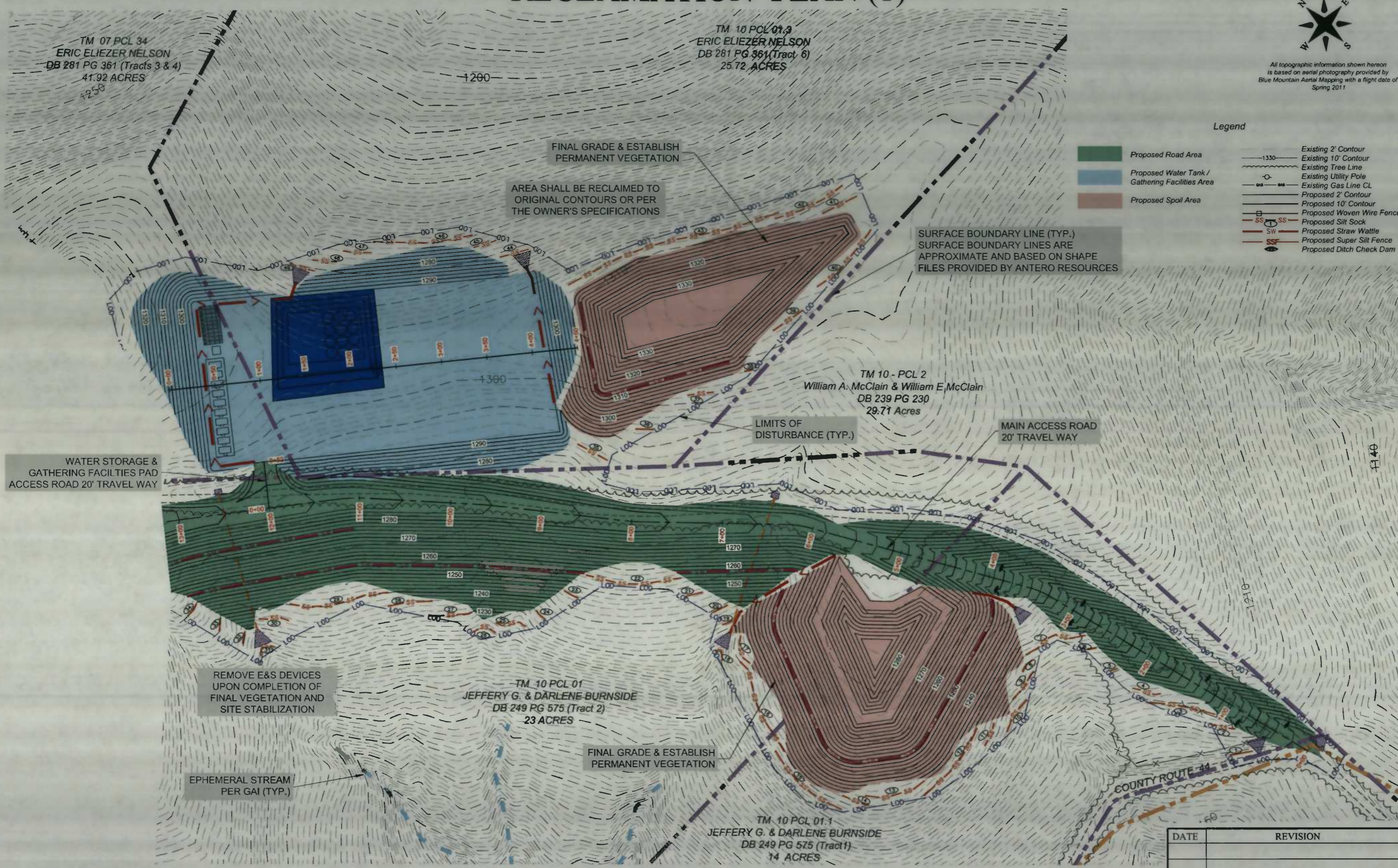
THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

RECLAMATION PLAN  
**HUGHES DRILL PAD SITE ALT-2**  
GREENBRIER DISTRICT  
DODDRIDGE COUNTY, WV

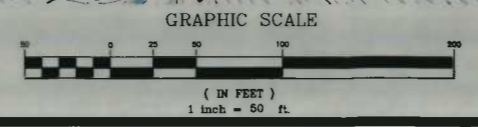
Date: 3-21-2013  
Scale: 1" = 50'  
Designed By: TBC & IDR  
File No. PROJECTS/2013/AS/101  
P/101-DRILL-ALT-2-01  
Page 18 of 19

### Legend

- Proposed Road Area
- Proposed Water Tank / Gathering Facilities Area
- Proposed Spoil Area
- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Pole
- Existing Gas Line CL
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Woven Wire Fence
- Proposed Silt Sock
- Proposed Straw Wattle
- Proposed Super Silt Fence
- Proposed Ditch Check Dam



NOTE:  
SEE RECLAMATION NOTES  
ON SHEET 19 OF 19



| DATE | REVISION |
|------|----------|
|      |          |
|      |          |
|      |          |
|      |          |

# RECLAMATION PLAN (2)



All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011



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Bridgeport, WV 26330  
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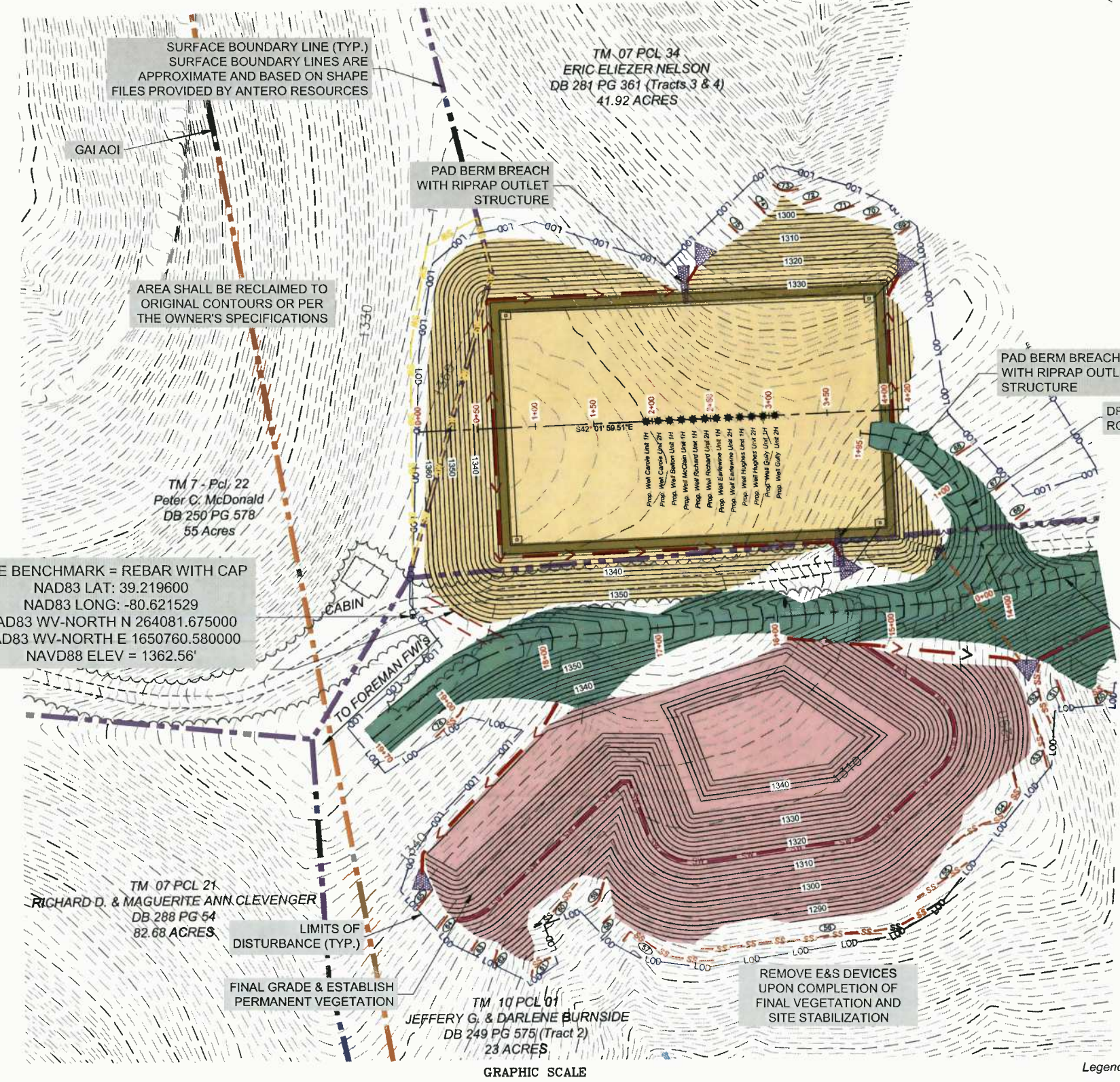
Hornor Bros. Engineers  
1902 C. G. ...  
Civil, Mining, Environmental and  
Consulting Engineering  
140 South Third Street, Post Office Box 306,  
Crandall, West Virginia, 26031 (304) 424-0440



THIS DOCUMENT  
PREPARED FOR  
ANTERO RESOURCES  
APPALACHIAN CORP

RECLAMATION PLAN  
HUGHES  
DRILL PAD SITE ALT-2  
GREENBRIER DISTRICT  
DODDRIEGE COUNTY, WV

Date: 3-21-2013  
Scale: 1" = 50'  
Designed By: JDR  
Page 19 of 19



### POST CONSTRUCTION DRILLING/FRACTURING REQUIREMENTS:

1. EROSION AND SEDIMENT CONTROLS SHALL BE REPAIRED/RE-ESTABLISHED IN AREAS WHERE AT LEAST 70% TURF HAS NOT BEEN ATTAINED OR EROSION HAS OCCURRED SINCE INITIAL CONSTRUCTION. REPAIRS TO CRITICAL EROSION AREAS (REGRAIDDING, SEEDING AND MULCH AND/OR SLOPE MATTING) SHALL BE COMPLETED BEFORE DRILLING/FRACTURING OPERATIONS COMMENCE. WV OOC BMP SHALL BE USED FOR EROSION AND SEDIMENT CONTROLS.
2. MAINTENANCE AND OTHER CONSIDERATIONS AND GROUND WATER PROTECTION: ALL EROSION AND SEDIMENT CONTROL AND DRILL PAD CONTAINMENT MEASURES WILL BE CHECKED DAILY AND AFTER EACH RAINFALL OF 0.5 INCHES OR MORE. THEY WILL BE INSPECTED FOR UNDERMINING, DETERIORATION, FROSION AND FLYS/DPOSITED MATERIAL. ALL DEFICIENCIES WILL BE CORRECTED IMMEDIATELY. EXCESS MATERIAL WILL BE SPREAD ON THE SITE SO THAT IT DOES NOT ERODE IN THE FUTURE. CLEANING PROCEDURES WILL BE COMPLETED AT REGULAR INTERVALS AND AT LEAST WHEN SEDIMENT REACHED CLEAN OUT LEVELS SHOWN. RECORDS OF CLEANING AND CORRECTIONS WILL BE MAINTAINED BY THE CONTRACTOR. THE "GENERIC GROUNDWATER PROTECTION PLAN FOR CONSTRUCTION SITES" WILL BE USED AND AVAILABLE ON-SITE AT ALL TIMES. AN AREA WILL BE PROVIDED FOR VEHICLE AND EQUIPMENT MAINTENANCE. MOBILE FUEL TRUCKS WITH APPROVED TANKS WILL BE USED ON THIS SITE. PORTABLE SANITARY FACILITIES WILL BE AVAILABLE FOR EMPLOYEES. IF CONCRETE IS USED, EXCESS CONCRETE WILL BE DISPOSED OF PROPERLY AND NOT ALLOWED TO REMAIN ON THIS SITE. MACHINERY WILL NOT BE ALLOWED IN LIVE STREAMS. FLUIDS SUCH AS DIESEL FUEL, GAS, OIL OR ANTIFREEZE WILL BE KEPT IN PROPER CONTAINERS AND ANY SPILLAGE WILL BE CLEANED AND TAKEN OFF-SITE TO A PROPER FACILITY. SOLID OR HAZARDOUS WASTES WILL BE DISPOSED IN ACCORDANCE WITH APPROPRIATE STATE AND FEDERAL REGULATIONS.

### RECLAMATION CONSTRUCTION SPECIFICATIONS:

1. THE IMPOUNDMENT SHALL BE RECLAIMED TO LANDOWNER'S SPECIFICATIONS OR AS NEAR TO ORIGINAL PRE-DISTURBED GRADES AS POSSIBLE. THE LINER SHALL BE REMOVED AND DISPOSED APPROPRIATELY OR RECYCLED.
2. EROSION AND SEDIMENT CONTROLS SHALL BE REPAIRED/RE-ESTABLISHED PRIOR TO RECLAMATION WORK COMMENCEMENT.
3. THE CONTRACTOR SHALL HAVE ON-SITE AT ALL TIMES WHEN CONSTRUCTION IS IN PROGRESS A COMPETENT SUPERINTENDENT THOROUGHLY FAMILIAR WITH THE CONSTRUCTION OF EARTH BERMS AND EMBANKMENTS, THE COMPACTION OF SOILS, AND THE PLACEMENT OF LINERS.
4. SURFACE WATER SHALL BE DIVERTED AWAY FROM ALL EXCAVATIONS TO PREVENT FLOODING AND SOFTENING OF THE SUB-GRADE OR COMPACTED MATERIALS.
5. TOPSOIL SHALL BE STRIPPED AND STOCKPILED WITH APPROPRIATE STABILIZATION AND SILT FENCE TO PREVENT EROSION. THE TOPSOIL SHALL BE REUSED DURING THE RECLAMATION PROCESS OR PLACED ON THE FACE OF EMBANKMENTS PRIOR TO SEEDING.
6. THE CUT KEYWAYS OF 12" MINIMUM WIDTH SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR ANY CONSTRUCTED EMBANKMENT FILL SLOPE. SIDE HILL BENCHES ARE TO BE CUT TO SOLID STRATA AS THE EMBANKMENT FILL PROGRESSES UPWARD (SEE CONSTRUCTION DETAIL). ADDITIONAL TERRACING SHALL BE CONSTRUCTED FOR EACH ADDITIONAL FIFTY (50) VERTICAL FEET OF SLOPE AND SHALL BE A MINIMUM OF TEN (10) FEET WIDE.
7. PRIOR TO PLACING ANY FILL, THE EXPOSED SUB-GRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNYIELDING SITE.
8. ALL FILL SHALL BE PLACED IN LIFTS OF UP TO 12" IN DEPTH AND SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY OF THE SOIL PER ASTM D-99. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 4% OF THE OPTIMUM TO FACILITATE COMPACTION. THE CONTRACTOR SHALL PERFORM FOUR (4) RANDOM IN-PLACE DENSITY TESTS ON EVERY LIFT OF COMPACTED SOIL. RECORDS SHALL BE MAINTAINED OF TEST LOCATIONS AND RESULTS AND PROVIDED TO THE WELL SITE DEVELOPER ON REQUEST. AREAS THAT FAIL FOR COMPACTION SHALL BE REMOVED, RE-COMPACTED AND RETESTED FOR COMPLIANCE. IN LIEU OF IN-PLACE DENSITY TESTING, THE CONTRACTOR MAY PROOF-ROLL EACH 12" SOIL LIFT WITH A LOADED 11 TON TANDEM DUMP TRUCK. SOIL THAT DEFLECTS UNDER THE REAR WHEELS GREATER THAN 4" SHALL BE REMOVED, RE-COMPACTED AND RETESTED. COMPACTION OF SOIL SHALL BE ACCOMPLISHED WITH A 3 TON SHEEP'S FOOT, OR VIBRATORY ROLLER.

9. MAINTENANCE AND OTHER CONSIDERATIONS AND GROUND WATER PROTECTION: ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH RAINFALL OF 0.5 INCHES OR MORE. THEY WILL BE INSPECTED FOR UNDERMINING, DETERIORATION, EROSION AND EXCESS DEPOSITED MATERIAL. ALL DEFICIENCIES WILL BE CORRECTED IMMEDIATELY. EXCESS MATERIAL WILL BE SPREAD AND STABILIZED ON THE SITE SO THAT IT DOES NOT ERODE IN THE FUTURE. CLEANING PROCEDURES WILL BE COMPLETED AT REGULAR INTERVALS AND AT LEAST WHEN SEDIMENT REACHED CLEAN OUT LEVELS SHOWN. RECORDS OF CLEANING AND CORRECTIONS WILL BE MAINTAINED BY THE CONTRACTOR. THE "GENERIC GROUNDWATER PROTECTION PLAN FOR CONSTRUCTION SITES" WILL BE USED AND AVAILABLE ON-SITE AT ALL TIMES. AN AREA WILL BE PROVIDED FOR VEHICLE AND EQUIPMENT MAINTENANCE. MOBILE FUEL TRUCKS WITH APPROVED TANKS WILL BE USED ON THIS SITE. PORTABLE SANITARY FACILITIES WILL BE AVAILABLE FOR EMPLOYEES. IF CONCRETE IS USED, EXCESS CONCRETE WILL BE DISPOSED OF PROPERLY AND NOT ALLOWED TO REMAIN ON THIS SITE. MACHINERY WILL NOT BE ALLOWED IN LIVE STREAMS. FLUIDS SUCH AS DIESEL FUEL, GAS, OIL OR ANTIFREEZE WILL BE KEPT IN PROPER CONTAINERS AND ANY SPILLAGE WILL BE CLEANED AND TAKEN OFF-SITE TO A PROPER FACILITY. SOLID OR HAZARDOUS WASTES WILL BE DISPOSED IN ACCORDANCE WITH APPROPRIATE STATE AND FEDERAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE CHANGES AND NOTIFY WRITER OF ANY CHANGES TO O.P.P. A FINAL INSPECTION WILL BE MADE AT THE CONCLUSION OF THE PROJECT AND ALL CORRECTIONS MADE BEFORE SIGN-OFF OF THE PROJECT SITE.

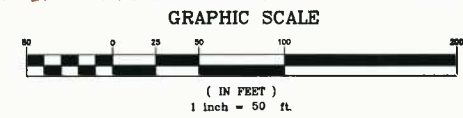
### SEQUENCE OF EVENTS:

- A. PRE-CONSTRUCTION CONFERENCE WILL BE HELD ON-SITE WITH CONTRACTOR TO REVIEW THE CONSTRUCTION DRAWINGS AND PROVIDE ANY REQUESTED GUIDANCE.
- B. CONSTRUCT THE CONSTRUCTION ENTRANCE.
- C. CONSTRUCT ALL PROPOSED SEDIMENT CONTROL DEVICES AS SHOWN.
- D. REMOVE TOPSOIL AND PLACE AT AN AREA DETERMINED IN THE FIELD WHERE EROSION WILL NOT TAKE PLACE. SILT FENCE SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES.
- E. GRADING OPERATIONS AS REQUIRED. FILL SLOPES SHALL BE TOPSOILED.
- F. WHEN FINAL GRADE IS ACHIEVED, TOPSOIL IS TO BE PLACED ON ALL DISTURBED AREAS NOT LINED. SEED ALL DISTURBED AREAS AS REQUIRED. A SOIL SAMPLE SHOULD BE TAKEN AND TESTED TO DETERMINE RECOMMENDED RATES. IF NO SOIL SAMPLE IS TAKEN THE FOLLOWING RATES SHOULD BE APPLIED AS A MINIMUM: LIME AT A RATE OF 4 TONS PER ACRE, FERTILIZER AT A RATE OF 500 LBS OF 10-20-10 PER ACRE, SEED WITH 45 LBS. PER ACRE OF TALL FESCUE AND 20 LBS. PER ACRE OF PERENNIAL RYE GRASS.
- G. LIME, FERTILIZER, AND SEED WILL BE APPLIED BY HAND OR USING A HYDRO-SEEDER. HYDRO-MULCH PRODUCTS SHALL BE MIXED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
- H. FINAL SEEDING MUST OCCUR WITHIN SEVEN (7) DAYS OF FINAL GRADING.
- I. WHEN SITE IS STABILIZED, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPAIRS/STABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.
- J. MAKE MODIFICATIONS FOR PERMANENT STORMWATER MANAGEMENT.
- K. FINAL SITE INSPECTION.
- L. PERMANENT STABILIZATION: ALL AREAS LEFT UNCOVERED BY EITHER BUILDINGS OR PAYMENT SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISHED GRADING AND WITHIN SEVEN (7) DAYS. AT NO TIME SHALL LAND LAY DORMANT FOR LONGER THAN TWENTY-ONE (21) DAYS.

### Legend

- 1330 — Existing 2' Contour
- 1300 — Existing 10' Contour
- Existing Tree Line
- Existing Utility Pole
- Existing Gas Line CL
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Woven Wire Fence
- Proposed Silt Sock
- Proposed Straw Wattle
- Proposed Super Silt Fence
- Proposed Ditch Check Dam

- Proposed Road Area
- Proposed Drill Pad Area
- Proposed Spoil Area



SITE BENCHMARK = REBAR WITH CAP  
NAD83 LAT: 39.219600  
NAD83 LONG: -80.621529  
NAD83 WV-NORTH N 264081.675000  
NAD83 WV-NORTH E 1650760.580000  
NAVD88 ELEV = 1362.56'

SURFACE BOUNDARY LINE (TYP.)  
SURFACE BOUNDARY LINES ARE  
APPROXIMATE AND BASED ON SHAPE  
FILES PROVIDED BY ANTERO RESOURCES

AREA SHALL BE RECLAIMED TO  
ORIGINAL CONTOURS OR PER  
THE OWNER'S SPECIFICATIONS

PAD BERM BREACH  
WITH RIPRAP OUTLET  
STRUCTURE

PAD BERM BREACH  
WITH RIPRAP OUTLET  
STRUCTURE

DRILL PAD ACCESS  
ROAD 20' TRAVEL WAY

MAIN ACCESS ROAD  
20' TRAVEL WAY

REMOVE E&S DEVICES  
UPON COMPLETION OF  
FINAL VEGETATION AND  
SITE STABILIZATION

LIMITS OF  
DISTURBANCE (TYP.)  
FINAL GRADE & ESTABLISH  
PERMANENT VEGETATION

TM 7 - Pcl. 22  
Peter C. McDonald  
DB 250 PG 578  
55 Acres

TM 07 PCL 34  
ERIC ELIEZER NELSON  
DB 281 PG 361 (Tracts 3 & 4)  
41.92 ACRES

TM 07 PCL 21  
RICHARD D. & MAGUERITE ANN CLEVENGER  
DB 288 PG 54  
82.68 ACRES

TM 10 PCL 01  
JEFFERY G. & DARLENE BURNSIDE  
DB 249 PG 575 (Tract 2)  
23 ACRES