Doddridge County Sheriff
Flood Plain Ordinance Fund

1004
69-217/515

DATE July 2, 2013

PAY TO THE ORDER OF ANTERO RESOURCES $ 3,710.28

Three Thousand Seven Hundred and Ten Dollars and 28/100---------- DOLLARS

Security features included. Details on back.

Ralph Sandora Jr.
Beth A. Rogers

CORNERSTONE BANK
West Union, WV 26456

MEMO #13-009 Revival Pad Reimbursement (Bldg Permit)

⑈001004⑈ ⑆051502175⑆ 11⑈9649⑈9⑈

BLUE TRADITIONAL

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-18-2013	31805	$3,852.93

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
06-AP-8213	REVIVALPAD	06/18/13	3,852.93	0.00	3,852.93
FLOOD PLAIN PERMIT - REVIVAL PAD					
TOTAL INVOICES PAID					3,852.93

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. 4765

Date: June 25, 2013
*****Customer copy*****

Received: #13-009 Antero Resources **$3,852.93**

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)	
Revival Pad	
Estimated Construction Costs	$470,586.00
Amount over $100,000	$370,586.00
Drilling Oil and Gas Well Fee	$1,000.00
Deposit for additional charges	$1,000.00
$5 per $1,000 over $100,000	$1,852.93
Amount Due with application	$3,852.93
95% of Application Fee minus $1,000 deposit	$2,710.28
Cost for Permit	$142.65
Total Refund (Includes 100% of 1,000 deposit)	$3,710.28

ANTERO RESOURCES

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

June 18, 2013

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 Revival Drill Pad. Our project is located in Doddridge County, Grant District and per FIRM map #54017C0130C & 0135C, this location is not within the floodplain.

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
- Copies of other required permits
- 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 24 PM 4:05

REVIVAL PAD

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 Shauna Redican

DATE June 18, 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.

APPLICANT'S NAME: Antero Resources Appalachian Corporation - Shauna Redican, Permit Representative

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. - Charles K. Wilson

ADDRESS: 172 Thompson Drive, Bridgeport, WV 26330

TELEHONE 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: Grant

DATE/FROM WHOM PROPERTY PURCHASED: N/A

LAND BOOK DESCRIPTION:

DEED BOOK REFERENCE: WB 32/354, 188/427 and 206/428

TAX MAP REFERENCE: TM 13, Pcl 10.2 and 19.2, 9.1, 10 and 10.1

EXISTING BUILDINGS/USES OF PROPERTY: None

NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY Larry G. and Joan M. Williams

ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY P.O. Box 231, Munroe Falls, OH 44262

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	[]	Residential (1 – 4 Family)
[]	Addition	[]	Residential (more than 4 Family)
[]	Alteration	[]	Non-residential (floodproofing)
[]	Relocation	[]	Combined Use (res. & com.)
[]	Demolition	[]	Replacement
[]	Manufactured/Mobil Home		

B. OTHER DEVEOPLMENT ACTIVITIES:

X	Fill	[]	Mining	X	Drilling	[]	Pipelining

X Grading

[] Excavation (except for STRUCTURAL DEVELOPMENT checked above)

[] Watercourse Altercation (including dredging and channel modification)

X Drainage Improvements (including culvert work) *Replace existing culvert as shown on page 7 of attached Revival Pad Design

X Road, Street, or Bridge Construction *Access Road Construction as shown on page 7 of attached Revival Pad 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 $ $470, 586.00

*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: N/A
ADDRESS: _____

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.

Doddridge County Floodplain Permit – Exhibit A

Revival Pad Surface Owners:

Owner: Larry G & Jean M Williams
Address: PO Box 231
Munroe Falls, OH 44262

Owner: Mt Salem Revival Grounds Inc.
Address: PO Box 186
West Union, WV 26456

Owner: Randy Taylor Revivals Inc.
c/o Joe M Boyd
Address: PO Box 177
West Union, WV 26456

Owner: Mt Salem Revival Grounds, Inc.
c/o Edith Boyd
Address: PO Box 177
West Union, WV 26456

(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): Anthony Smith

SIGNATURE: _____ **DATE:** 6/24/13

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: 130 & 135

Dated: 10/04/2011

[X] Is **NOT** located in a Specific Flood Hazard Area (Notify applicant that the application review is complete and **NO FLOOPLAIN 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.

FBFM Panel No. _____ Dated _____

[] See section 4 for additional instructions.

SIGNED Dan Wellington DATE 06/24/2013

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 Wetting DATE 06/24/2013

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: 13-009
PERMIT DATE: 6/24/13

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** 06/24/2013

CLEARING & GRUBBING; EROSION & SEDIMENT CONTROLS	Revival Pad			
	QUANTITY	UNIT		
MOBILIZATION	1.0	EA	$24,045.00	$24,045.00
CONSTRUCTION ENTRANCE	1.0	EA	$720.00	$720.00
CLEARING & GRUBBING	15.47	AC	$756.00	$11,695.32
TREE REMOVAL	10.87	AC	$4,756.00	$51,697.72
8" COMPOST FILTER SOCK	1,100	LF	$2.91	$3,201.00
12" COMPOST FILTER SOCK	650	LF	$3.28	$2,132.00
18" COMPOST FILTER SOCK	220	LF	$7.24	$1,592.80
24" COMPOST FILTER SOCK	700	LF	$9.57	$6,699.00
32" COMPOST FILTER SOCK	2,200	LF	$14.00	$30,800.00
SUPER SILT FENCE	100	LF	$8.09	$809.00
9" STRAW WATTLES	3,800	LF	$2.22	$8,436.00
TOTAL				$141,827.84

SITE				
	QUANTITY	UNIT		
DRILL PAD EXCAVATION	27,211	CY	$3.39	$92,245.29
ACCESS ROADS EXCAVATION	20,653	CY	$5.05	$104,297.65
TANK PAD and/or FRAC PIT EXCAVATION	1,635	CY	$4.80	$7,848.00
OFFLOAD PAD	0	CY		$0.00
SPOIL PAD 1	1,831	CY	$2.97	$5,438.07
TOPSOIL	6,000	CY	$4.26	$25,560.00
DIVERSION DITCH	0	LF		$0.00
ROADSIDE DITCH	2,000	LF	$1.72	$3,440.00
TOTAL				$238,829.01

SUMP(S) PER ANTERO RESOURCES STANDARD DETAIL				
	QUANTITY	UNIT		
INSTALL 102" x 78" x 44" PRE CAST SUMP	4	EA	$1,004.00	$4,016.00
VALVE BOX HDPE PIPE (MINIMUM 12" DIAMETER x 48" HEIGHT)	4	EA	$142.00	$568.00
4" PVC CONNECTIVE PIPE (ANTERO SUMP DRAIN DETAIL)	100	LF	$14.82	$1,482.00
TOTAL				$6,066.00

AGGREGATE SURFACING - SPREADING, COMPACTION, and/or INSTALLATION				
	QUANTITY	UNIT		
DRILL PAD AASHTO #1 (8" THICK)	5,750	TON	$1.72	$9,890.00
DRILL PAD 1 1/2" or 3/4" CRUSHER RUN STONE (2" THICK)	1,450	TON	$1.72	$2,494.00
DRILL PAD GEOTEXTILE FABRIC (US 200)	11,500	SY	$1.14	$13,110.00
ACCESS ROADS 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	3,215	TON	$1.72	$5,529.80
ACCESS ROADS 1 1/2" OR 3/4" CRUSHER RUN STONE (2" THICK)	810	TON	$1.72	$1,393.20
ACCESS ROADS GEOTEXTILE FABRIC (US 200)	7,000	SY	$1.14	$7,980.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	7,000	SY	$0.45	$3,150.00
TANK PAD 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	1,850	TON	$1.72	$3,182.00
TANK PAD 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	465	TON	$1.72	$799.80
TANK PAD GEOTEXTILE FABRIC (US 200)	3,858	SY	$1.14	$4,398.12
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	3,858	SY	$0.45	$1,736.10
TOTAL				$53,663.02

ROAD CULVERTS				
	QUANTITY	UNIT		
15" HDPE	280	LF	$35.53	$9,948.40
18" HDPE	0	LF		$0.00
24" HDPE	0	LF		$0.00
30" HDPE	0	LF		$0.00
36" HDPE	0	LF		$0.00
42" HDPE	0	LF		$0.00
48" HDPE	0	LF		$0.00
60" HDPE	0	LF		$0.00
R4 RIP RAP (INLETS/OUTLETS)	42	TON	$4.09	$171.78
AASHTO #1 STONE (DITCH CHECKS)	10	TON	$10.00	$100.00
DITCH LINING - (ACCESS ROAD) JUTE MATTING	0	SY		$0.00
DITCH LINING - (ACCESS ROAD) SYNTHETIC MATTING (TRM)	1,000	SY	$5.28	$5,280.00
TOTAL				$15,500.18

FENCING/GATES				
	QUANTITY	UNIT		
4 FT WOVEN WIRE FARM FENCE w/MINIMUM 10 FT POST SPACING (WOODEN and/or "T" POST)	0.0	LF		$0.00
16 FT DOUBLE GATE	0.0	EA		$0.00
TOTAL				$0.00

SEEDING				
	QUANTITY	UNIT		
SITE SEEDING (LIME, FERTILIZER, SEEDING, AND HYDRO-MULCH w/TACK (HYC-2 OR EQUAL))	7.0	AC	$2,100.00	$14,700.00
TOTAL				$14,700.00

UNFORESEEN SITE CONDITIONS				
	QUANTITY	UNIT		
*ROCK CLAUSE - BLASTING	0.0	CY	$3.40	$0.00
*ROCK CLAUSE - HOE RAMMING	0.0	CY	$10.70	$0.00
*FRENCH DRAINS	0.0	FT	$10.80	$0.00
*PHASE 1 FENCING - STEEL CORRUGATED PANELS w/"T" POST (10 FT CENTERS) - WETLAND PROTECTION	0.0	LF	$10.60	$0.00
*PHASE 2 FENCING - SILT FENCE AND OR FILTER SOCK OUTSIDE OF PHASE 3 FENCING - WETLAND PROTECTION	0.0	LF	$6.35	$0.00
*PHASE 3 FENCING - ORANGE SAFETY FENCE w/"T" POST (10FT CENTERS) - WETLAND PROTECTION	0.0	LF	$5.00	$0.00
*SILT FENCE	0.0	AC	$3.00	$0.00
*TEMPORARY SEEDING	0.0	HOUR	$1,925.00	$0.00
*CONSTRUCTION STAKEOUT	0.0	SY	$125.00	$0.00
* JUTE MATTING - SLOPE MATTING	0.0	SY	$2.00	$0.00
TOTAL				$0.00

GRAND TOTAL	$470,586.05

west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

June 12, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706218, issued to ANTERO RESOURCES APPALACHIAN CORPORATION, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: KOCH UNIT 1H
Farm Name: LARRY WILLIAMS ET AL
API Well Number: 47-1706218
Permit Type: Horizontal 6A Well
Date Issued: 06/12/2013

Promoting a healthy environment.

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

3. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

4. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations,* 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

5. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

west virginia department of environmental protection

WVDEP Office of Oil and Gas
601 57th Street Southeast; Charleston, WV
(304) 926-0450

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
dep.wv.gov

June 12, 2013

Larry G. and Joan M. Williams
P.O. Box 231
Munroe Falls, OH 44262

Re: Permit for Antero: Koch Unit 1H
API number: 17-06218

Mr.and Mrs. Williams:

The Office of Oil and Gas (OOG) has reviewed your comments concerning Antero's permit for the above referenced well. The comment was sent to the operator for their response. The operator has responded and the response is enclosed for your records.

After considering your comments, the applicant's response, and the inspector's findings, the OOG has determined that the permits meet the requirements set forth in Article 6A, Chapter 22 of the West Virginia Code and Legislative Rule Title 35, Series 4 in the statute and legislative rule. Consequently, the OOG is lifting the suspensions today. For your information and convenience, I am including with this letter a copy of the permits as issued.

As you may know, surface owners are entitled to compensation for damages to their property resulting from oil and gas drilling activity. Absent an agreement by the parties, such damage compensation may be addressed pursuant to Article 7, Chapter 22 of the West Virginia Code. Please contact Gene Smith at (304) 926-0499, extension 1652 if you have any questions.

Sincerely,

Laura K. Cooper
WV DEP Office of Oil and Gas
Permitting Section

ANTERO RESOURCES

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

April 29, 2013

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Mr. James Martin
601 57th Street SE
Charleston, WV 25304

RE: **Koch Unit 1H – Surface Owner Comments**
API# 47-017-06218-00
Doddridge County/Grant District, West Virginia

Mr. Martin:

This letter provides Antero Resources Appalachian Corporation (Antero) response to the surface owner comments sent by Larry G. & Joan M. Williams and received by the West Virginia Department of Environmental Protection Office of Oil & Gas on March 19, 2013.

Mr. and Mrs. Williams signed a surface use and compensation agreement with Antero on October 24, 2012. In addition, Antero agrees that Mr. and Mrs. Williams own mineral rights as confirmed by a Title Opinion obtained by Antero on January 16, 2013 and the Oil and Gas Lease signed on October 24, 2012 by and between Mr. & Mrs. Williams and Antero and recorded at Book 280, Page 350 in Doddridge County.

If you have any questions please feel free to contact me at (303) 357-7310.

Best Regards,

Randy Kloberdanz
Director of Regulatory & Environmental Affairs
Antero Resources Appalachian Corporation

TUESDAY 19th, MARCH--2013

17-06218
application rec.
2-28-13

DEPT. OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
CHARLESTON, WV.

DEAR CONCERNED: REA: VOLUNTARY STATEMENT OF NO OBJECTION W/COMMENT:

I WRITE AS one of the land owners in questoon, with my wife (LARRY G. JOAN M. WILLIAMS) that the attached returned form ww-6AW request issued and now returned was of our reply.

WE HAVE NO OBJECTION:

HOWEVER IN THE REQUEST AS WE UNDERSTOOD IT, WERE NO MENTION OF OUR MINERAL RIGHTS WE ARE PAYING TAXES ON, OR AMOUNT TO RECEIVED BY ANTERO WHO WITH THE HORIZONTAL ABILITY WILL BE ABLE TO DRILL UNDER OUR SURFACE LAND, ARE WE TO ASSUME THAT IS OF ANOTHER FORM THIS IS JUST FOR SURFACE WORK ?

WE HAVE MET A FEW TIMES, ADD CORRESPONDED, AND AGREED ON SURFACE AND MINERAL RIGHTS DECISIONS, SIGNED AND AS FAR AS ALL IN THOSE MEETINGS, WE HAVE NO OBJECTIONS. IN FACT WE AS STRANGE AS IT MAY SEEM WANTING OURL LAND BE A WILDLIFE HABITAT AND REFUGE FROM TODAYS ASSULT OF ALL ITS NATIONAAL AND OTHER ABROAD HABITAT, THE WORLD OF POLLCUTION NOW FLOATING FILLING THE SKY SPACE AND FALLING INTOO OUR WATERWAYS, AIR, FOOD SOURCE, SHELTERS, BODY PARTS, SLOWLY KILLING ALL RETURNING OUR EARTH OR EDEN SOME SAY BACK TO NOD, WHY WOULD WE OBJECT FOR WE AS HUMANS ALSO ARE TRAPPED INTO THIS ESTABLISHMENT GOVERNMENT I NOW HAVE LITTLE LOVE FOR (MY OPINION) WORSHIPPING THE MATERIALISTIC GOD BIG MONEY TITHING IT, WE OF COORSE FORCED INTO ITS ARMIES. SO WHY OBJECT WHEN WE ALSO NEED THE BENIFIT, MONEY AND HAVE MEMBERSHIPS IN THE ARMIES. SAYING THAT AS SOME ARMY BEING A LIFE MARINE RESERVIST MOSTLY NOW LEAGUER.

HOWEVER I AM WRITING JUST TO SAY NO OBJECTION EXCEPT, TO LET IT BE KNOWEN WE HAVE ALSO MINERAL RIGHTS UNDER PARTS OF THIS LAND IN SHARES WITH PREVIOUS LAND OWNERS MY FOREPARENTS BOUGHT IT FROM. IT WAS PASSED ON DOWN TO M Y BROTHER HIS WIFE AND MINE.

SO IF THAT IS AGREED UPON OF WHAT WE SIGNED AND ALL OKed BY ANTERO COMPANY DENVER COL MR. Kuhn LAND AGENT GROUPS we met with, Zack Pitzer, Tim Rains, Randall and Steve HARVEY ETC.

WE HAVE NO OBJECTIONS. AT-EASE CARRY-ON. GOD BLESS AND SEMPER-FI.

LARRY G WILLIAMS AND WIFE JOAN M. WILLIAMS. WRITTEN MAILED THIS DAY OF MARCH 19---2013

Larry G. Williams

Joan M. Williams

March 19 - 2013

RECEIVED
Office of Oil & Gas
MAR 21 2013
WV Dept. of Environmental Protection

17-06218

WW - 6B
(1/12)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

17 03 611

1) Well Operator:	Antero Resources Appalachian Corporation	494488557	017- Doddridge	Grant	Smithburg 7.5'
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Koch Unit 1H Well Pad Name: Revival Pad

3 Elevation, current ground: ~1390' Elevation, proposed post-construction: 1378'

4) Well Type: (a) Gas ■ Oil _____
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: 7400' TVD, Anticipated Thickness- 55 Feet, Associated Pressure- 2950#

7) Proposed Total Vertical Depth: 7400' TVD
8) Formation at Total Vertical Depth: Marcellus
9) Proposed Total Measured Depth: 15700' MD
10) Approximate Fresh Water Strata Depths: 292', 374'
11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.
12) Approximate Saltwater Depths: 1079', 1808'
13) Approximate Coal Seam Depths: 328', 883'
14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated
15) Does land contain coal seams tributary or adjacent to, active 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): 15.47 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.22 acres

DC N
4-18-2013

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APR [illegible]

17-06218

WW - 6B
(1/12)

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#	425'	425' *see above	CTS, 590 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2525'	2525'	CTS, 1028 CU. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	15700'	15700'	3899 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			

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Office of Oil & Gas

APR 2 : 2013

DCN
4-19-2013

WW - 6B
(1/12)

17-06218

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.

DCN
4-19-13

Received
Office of Oil & Gas

AP

WW-9
Rev. 1/12

API No. 47 - 017 - 06218
Operator's Well No. Koch Unit 1H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name Antero Resources Appalachian Corporation OP Code 494488557

Watershed Wolfpen Run Quadrangle Smithburg 7.5'

Elevation 1378' County Doddridge District Grant

Description of anticipated Pit Waste: Drilling and Flowback Fluids and Cuttings

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes X No ____

Will a synthetic liner be used in the pit? Yes . If so, what mil.? 60 mil

DCN 4-18-13

Proposed Disposal Method For Treated Pit Wastes:

____ Land Application
____ Underground Injection (UIC Permit Number ____)
■ Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34)
■ Off Site Disposal (Meadowfill Landfill Permit #SWF-1032-98)
____ Other (Explain ____)

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Stiff Foam, Production - Water Based Mud
-If oil based, what type? Synthetic, petroleum, etc. N/A
Additives to be used? Please See Attachment
Will closed loop system be used ? Yes
Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Removed offsite and taken to landfill
-If left in pit and plan to solidify what medium will be used? Cement, lime, N/A
-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98)

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature ____

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental Specialist

Subscribed and sworn before me this 21st day of February, 2013

____ Notary Public

My commission expires 5/18/2015

SHAUNA REDICAN
Notary Public
State of Colorado

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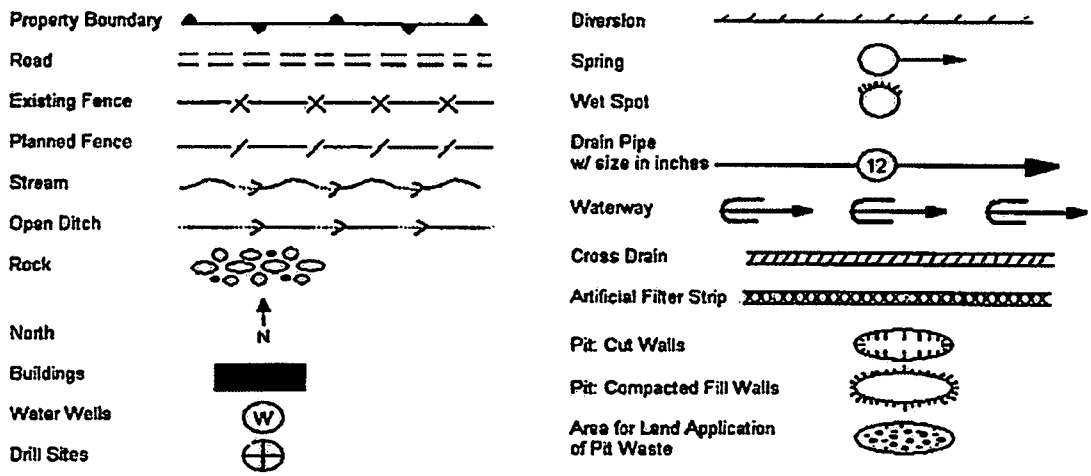
Office of Oil & Gas

WW-9
Rev. 1/12

API No. 47 - 017 - 06218
Operator's Well No. Koch Unit 1H



Road A (5.20) + Road B (0.76) + Drill Pad (5.22) + Frac Pit (2.09) + Connect Road 1 (0.20) Connect Road 2 (0.12) + Spoil Pad (1.88) = 15.47 Acres

Proposed Revegetation Treatment: Acres Disturbed 15.47 Prevegetation pH _____

Lime 2-4 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2-3 Tons/acre Hay or straw or Wood Fiber (will be used where needed)

Seed Mixtures

Area I (Temporary) Seed Type	lbs/acre	Area II (Permanent) Seed Type	lbs/acre
Tall Fescue	45	Tall Fescue	45
Perennial Rye Grass	20	Perennial Rye Grass	20
*or type of grass seed requested by surface owner		*or type of grass seed requested by surface owner	

Attach:
Drawing(s) of road, location,pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Douglas Newlon

Comments: Proceed & Mulch install E+S To Dep regulations

Title: Oil & Gas inspector Date: 4-18-2013

Field Reviewed? (✓) Yes ( ) No

Received
Office of Oil & Gas

Water Management Plan:
Primary Water Sources

WMP-01119 API/ID Number: 047-017-06218 Operator: Antero Resources

Koch Unit 1H

Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for mutiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interepreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.

APPROVED MAY 24 2013

Source Summary

WMP-01119 | API Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Stream/River

o Source **West Fork River @ JCP Withdrawal** Owner: **James & Brenda Raines**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.320913	-80.337572

☑ Regulated Stream? **Stonewall Jackson Dam** Ref. Gauge ID: **3061000** **WEST FORK RIVER AT ENTERPRISE, WV**

Max. Pump rate (gpm): 2,000 **Min. Gauge Reading (cfs): 175.00** **Min. Passby (cfs) 146.25**

DEP Comments:

o Source **West Fork River @ McDonald Withdrawal** Owner: **David Shrieves**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.16761	-80.45069

☑ Regulated Stream? **Stonewall Jackson Dam** Ref. Gauge ID: **3061000** **WEST FORK RIVER AT ENTERPRISE, WV**

Max. Pump rate (gpm): 3,000 **Min. Gauge Reading (cfs): 175.00** **Min. Passby (cfs) 106.30**

DEP Comments:

o Source **West Fork River @ GAL Withdrawal** Owner: **David Shrieves**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.16422	-80.45173

☑ Regulated Stream? **Stonewall Jackson Dam** Ref. Gauge ID: **3061000** **WEST FORK RIVER AT ENTERPRISE, WV**

Max. Pump rate (gpm): 2,000 **Min. Gauge Reading (cfs): 175.00** **Min. Passby (cfs) 106.30**

DEP Comments:

◉ Source **Middle Island Creek @ Dawson Withdrawal** Owner: **Gary D. and Rella A. Dawson**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.379292	-80.867803

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 3,000 **Min. Gauge Reading (cfs): 76.03** **Min. Passby (cfs) 28.83**

DEP Comments:

◉ Source **McElroy Creek @ Forest Withdrawal** Owner: **Forest C. & Brenda L. Moore**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.39675	-80.738197

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 74.77** **Min. Passby (cfs) 13.10**

DEP Comments:

◉ Source **McElroy Creek @ Sweeney Withdrawal** Owner: **Bill Sweeney**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.398123	-80.656808

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 6.66**

DEP Comments:

- Source **Meathouse Fork @ Gagnon Withdrawal** Owner: **George L. Gagnon and Susan C. Gagnon**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.26054	-80.720998

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 71.96** **Min. Passby (cfs) 13.10**

DEP Comments:

- Source **Meathouse Fork @ Whitehair Withdrawal** Owner: **Elton Whitehair**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.211317	-80.679592

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 7.28**

DEP Comments:

- Source **Tom's Fork @ Erwin Withdrawal** Owner: **John F. Erwin and Sandra E. Erwin**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.174306	-80.702992

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 0.59**

DEP Comments:

- Source **Arnold Creek @ Davis Withdrawal** Owner: **Jonathon Davis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.302006	-80.824561

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 3.08**

DEP Comments:

- Source **Buckeye Creek @ Powell Withdrawal** Owner: **Dennis Powell**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.277142	-80.690386

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 4.59**

DEP Comments:

- Source **South Fork of Hughes River @ Knight Withdrawal** Owner: **Tracy C. Knight & Stephanie C. Knight**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.198369	-80.870969

☐ Regulated Stream? Ref. Gauge ID: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Max. Pump rate (gpm): 3,000 **Min. Gauge Reading (cfs): 39.80** **Min. Passby (cfs) 1.95**

DEP Comments:

o Source **North Fork of Hughes River @ Davis Withdrawal** Owner: **Lewis P. Davis and Norma J. Davis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000		39.322363	-80.936771

☐ Regulated Stream? Ref. Gauge ID: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Max. Pump rate (gpm): **1,000** Min. Gauge Reading (cfs): **35.23** Min. Passby (cfs) **2.19**

DEP Comments:

Source Summary

WMP-01119 API Number: 047-017-06218 Operator: Antero Resources

Koch Unit 1H

Purchased Water

o Source **Middle Island Creek @ Solo Construction** Owner: **Solo Construction, LLC**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000	1,000,000	39.399094	-81.185548

☑ Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): Min. Gauge Reading (cfs): **6,468.00** Min. Passby (cfs)

DEP Comments: Elevation analysis indicates that this location has the same elevation as Middle Island Creek's pour point into the Ohio River. As such, it is deemed that water flow at this location is heavily influenced by the Ohio River.

o Source **Sun Valley Public Service District** Owner: **Sun Valley PSD**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/7/2013	11/7/2014	6,610,000	200,000	-	-

☑ Regulated Stream? Stonewall Jackson Dam Ref. Gauge ID: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): Min. Gauge Reading (cfs): **171.48** Min. Passby (cfs)

DEP Comments:

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14397 Source Name: Middle Island Creek @ Solo Construction
Solo Construction, LLC

Source Latitude: 39.399094
Source Longitude: -81.185548

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 County: Pleasants

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm):
Max. Simultaneous Trucks:
Max. Truck pump rate (gpm) 0

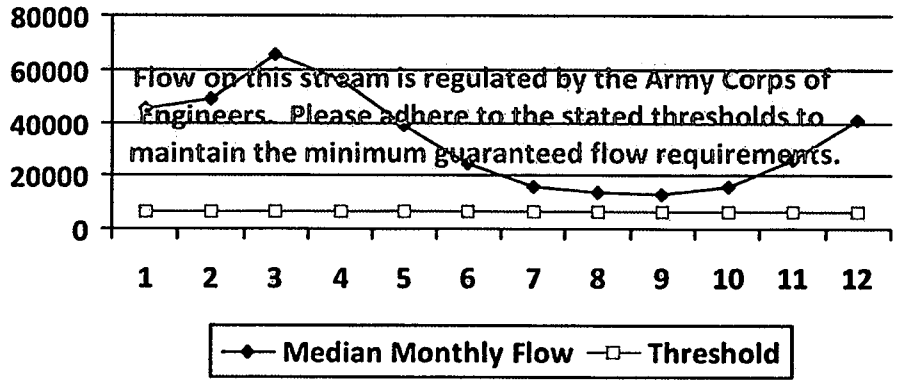
- ☐ Endangered Species?
- ☑ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☑ Regulated Stream? Ohio River Min. Flow
- ☑ Proximate PSD? City of St. Marys
- ☑ Gauged Stream?

Reference Gaug 9999999 Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.) 25,000.00 Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14398 Source Name: Sun Valley Public Service District
Sun Valley PSD

Source Latitude: -
Source Longitude: -

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 391.85 County: Harrison

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm):
Max. Simultaneous Trucks:
Max. Truck pump rate (gpm)

- ☐ Endangered Species?
- ☑ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☑ Regulated Stream? Stonewall Jackson Dam
- ☐ Proximate PSD?
- ☑ Gauged Stream?

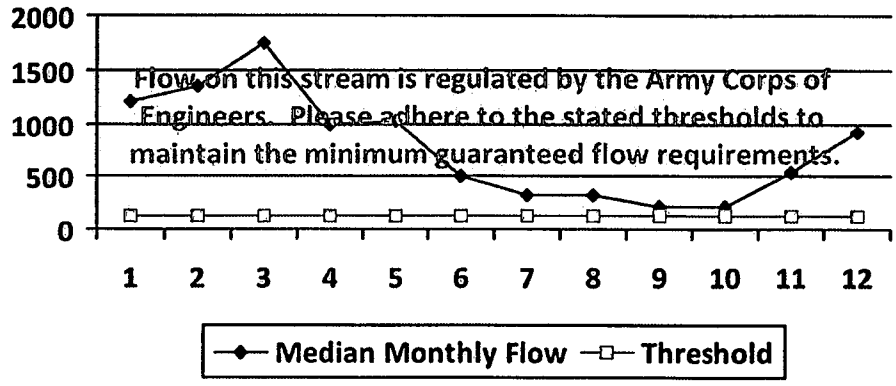
Reference Gaug 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	1,200.75	-	-
2	1,351.92	-	-
3	1,741.33	-	-
4	995.89	-	-
5	1,022.23	-	-
6	512.21	-	-
7	331.86	-	-
8	316.87	-	-
9	220.48	-	-
10	216.17	-	-
11	542.45	-	-
12	926.12	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	
Downstream Demand (cfs):	
Pump rate (cfs):	
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14384 Source Name: West Fork River @ JCP Withdrawal
James & Brenda Raines

Source Latitude: 39.320913
Source Longitude: -80.337572

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 532.2 County: Harrison

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 2,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- ☐ Endangered Species?
- ☑ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☑ Regulated Stream? Stonewall Jackson Dam
- ☐ Proximate PSD?
- ☑ Gauged Stream?

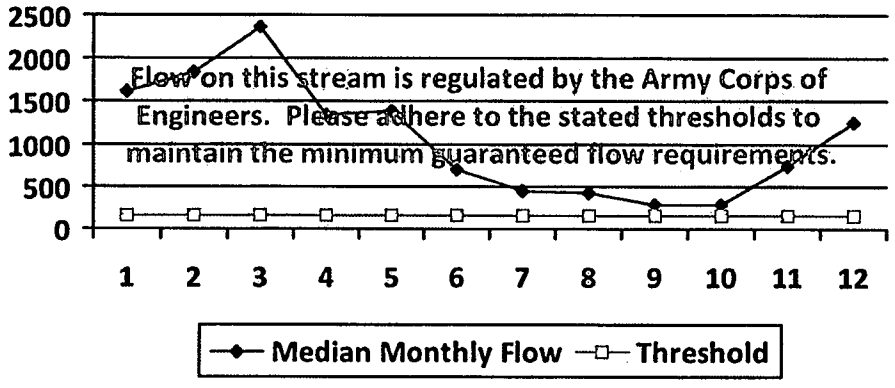
Reference Gaug 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	1,630.82	-	-
2	1,836.14	-	-
3	2,365.03	-	-
4	1,352.59	-	-
5	1,388.37	-	-
6	695.67	-	-
7	450.73	-	-
8	430.37	-	-
9	299.45	-	-
10	293.59	-	-
11	736.74	-	-
12	1,257.84	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	4.46
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14385 Source Name West Fork River @ McDonald Withdrawal
David Shrieves

Source Latitude: 39.16761
Source Longitude: -80.45069

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 314.91 County: Harrison

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

☐ Endangered Species? ☑ Mussel Stream?
☐ Trout Stream? ☐ Tier 3?
☑ Regulated Stream? Stonewall Jackson Dam
☐ Proximate PSD?
☑ Gauged Stream?

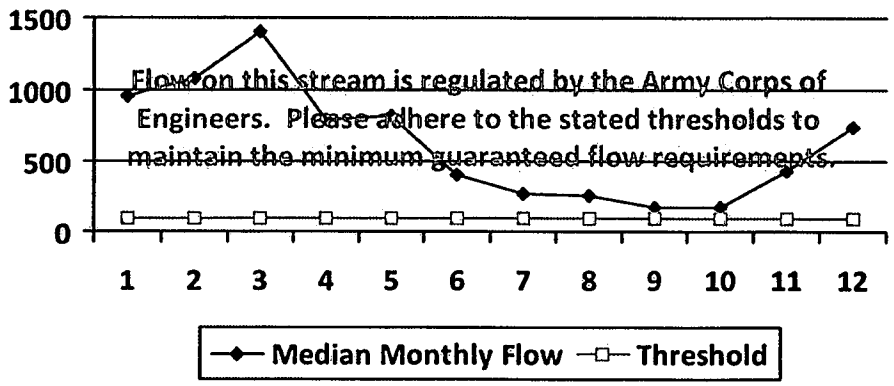
Reference Gaug 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	964.98	-	-
2	1,086.47	-	-
3	1,399.42	-	-
4	800.34	-	-
5	821.52	-	-
6	411.64	-	-
7	266.70	-	-
8	254.66	-	-
9	177.19	-	-
10	173.72	-	-
11	435.94	-	-
12	744.28	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.68
Headwater Safety (cfs):	24.27
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14386 Source Name: West Fork River @ GAL Withdrawal
David Shrieves

Source Latitude: 39.16422
Source Longitude: -80.45173

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 313.67 County: Harrison

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 2,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- ☐ Endangered Species?
- ☑ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☑ Regulated Stream? Stonewall Jackson Dam
- ☐ Proximate PSD?
- ☑ Gauged Stream?

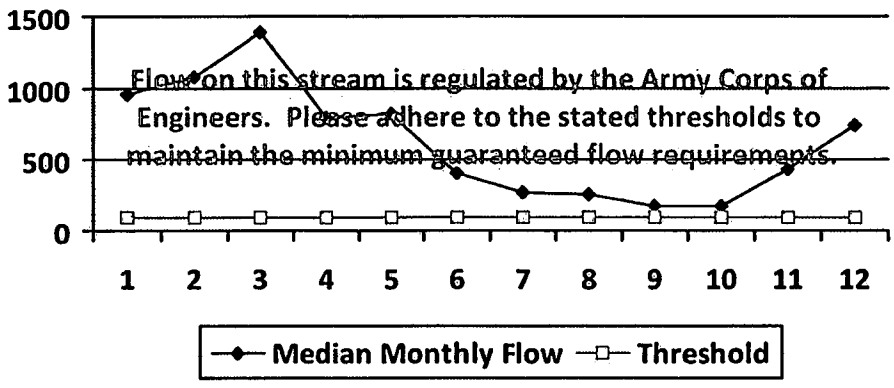
Reference Gaug 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	961.18	-	-
2	1,082.19	-	-
3	1,393.91	-	-
4	797.19	-	-
5	818.28	-	-
6	410.02	-	-
7	265.65	-	-
8	253.65	-	-
9	176.49	-	-
10	173.04	-	-
11	434.22	-	-
12	741.35	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	4.46
Headwater Safety (cfs):	24.18
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14387 Source Name: Middle Island Creek @ Dawson Withdrawal
Gary D. and Rella A. Dawson

Source Latitude: 39.379292
Source Longitude: -80.867803

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 181.34 County: Tyler

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- ☐ Endangered Species?
- ☐ Trout Stream?
- ☐ Regulated Stream?
- ☐ Proximate PSD?
- ☑ Gauged Stream?
- ☑ Mussel Stream?
- ☐ Tier 3?

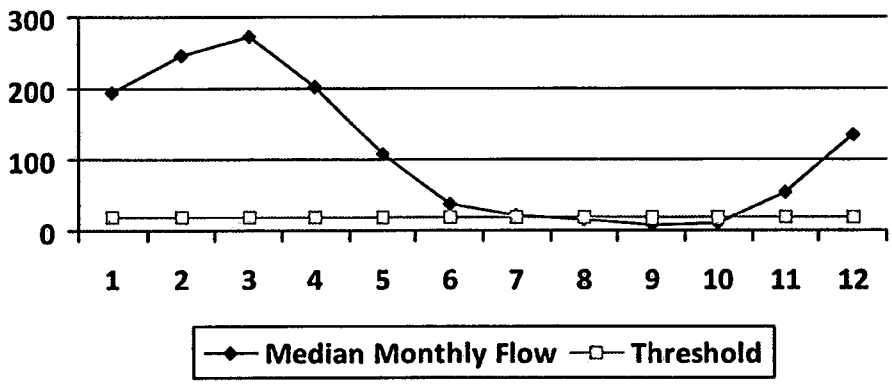
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	194.47	42.06	152.68
2	244.62	42.06	202.83
3	273.72	42.06	231.93
4	203.26	42.06	161.47
5	107.22	42.06	65.43
6	37.44	42.06	-4.35
7	21.19	42.06	-20.60
8	17.45	42.06	-24.34
9	8.94	42.06	-32.85
10	11.23	42.06	-30.56
11	54.82	42.06	13.04
12	133.96	42.06	92.17

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	17.82
Upstream Demand (cfs):	13.10
Downstream Demand (cfs):	6.55
Pump rate (cfs):	6.68
Headwater Safety (cfs):	4.45
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	**76.03**
Passby at Location (cfs):	**28.82**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14388 Source Name McElroy Creek @ Forest Withdrawal
Forest C. & Brenda L. Moore

Source Latitude: 39.39675
Source Longitude: -80.738197

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 88.85 County: Tyler

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

☐ Endangered Species? ☐ Mussel Stream?
☐ Trout Stream? ☐ Tier 3?
☐ Regulated Stream?
☐ Proximate PSD?
☐ Gauged Stream?

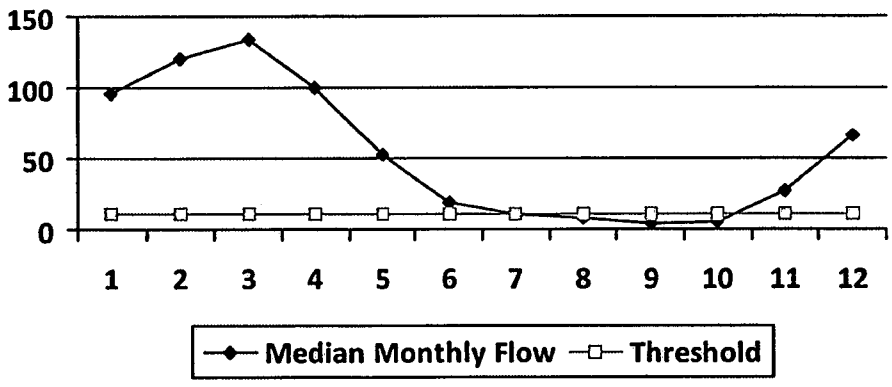
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	95.28	19.78	75.68
2	119.86	19.78	100.25
3	134.11	19.78	114.51
4	99.59	19.78	79.99
5	52.54	19.78	32.93
6	18.35	19.78	-1.26
7	10.38	19.78	-9.22
8	8.55	19.78	-11.05
9	4.38	19.78	-15.23
10	5.50	19.78	-14.10
11	26.86	19.78	7.26
12	65.63	19.78	46.03

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	8.73
Upstream Demand (cfs):	4.46
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	2.18
Ungauged Stream Safety (cfs):	2.18
Min. Gauge Reading (cfs):	**74.19**
Passby at Location (cfs):	**13.09**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14389 Source Name McElroy Creek @ Sweeney Withdrawal
Bill Sweeney

Source Latitude: 39.398123
Source Longitude: -80.656808

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 45.16 County: Doddridge

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

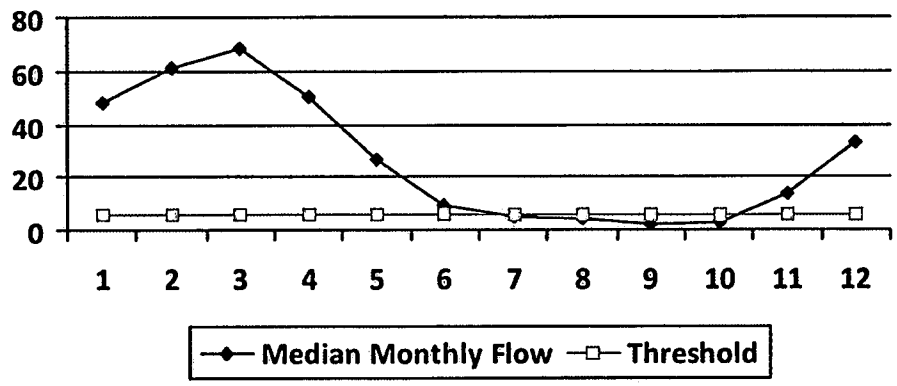
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	48.43	8.88	39.93
2	60.92	8.88	52.42
3	68.17	8.88	59.67
4	50.62	8.88	42.12
5	26.70	8.88	18.21
6	9.32	8.88	0.83
7	5.28	8.88	-3.22
8	4.34	8.88	-4.15
9	2.23	8.88	-6.27
10	2.80	8.88	-5.70
11	13.65	8.88	5.16
12	33.36	8.88	24.86

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	4.44
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	1.11
Ungauged Stream Safety (cfs):	1.11
Min. Gauge Reading (cfs):	**69.73**
Passby at Location (cfs):	**6.66**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14390 Source Name: Meathouse Fork @ Gagnon Withdrawal
George L. Gagnon and Susan C. Gagnon

Source Latitude: 39.26054
Source Longitude: -80.720998

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 60.6 County: Doddridge

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

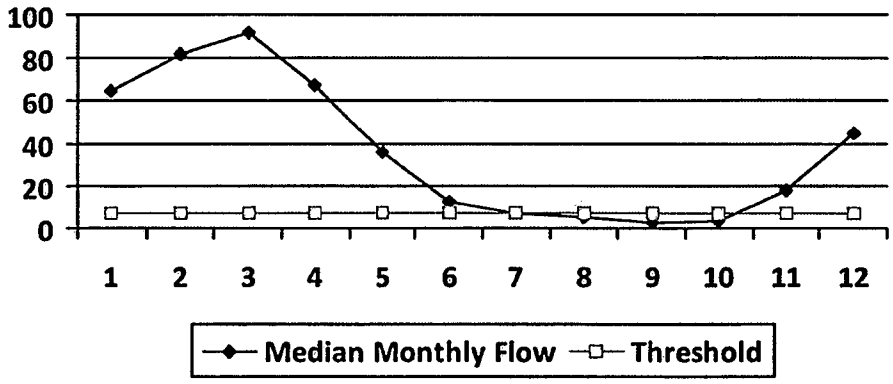
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	64.99	13.39	51.70
2	81.75	13.39	68.46
3	91.47	13.39	78.19
4	67.93	13.39	54.64
5	35.83	13.39	22.55
6	12.51	13.39	-0.77
7	7.08	13.39	-6.20
8	5.83	13.39	-7.45
9	2.99	13.39	-10.30
10	3.75	13.39	-9.53
11	18.32	13.39	5.04
12	44.76	13.39	31.48

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	5.95
Upstream Demand (cfs):	2.23
Downstream Demand (cfs):	2.81
Pump rate (cfs):	2.23
Headwater Safety (cfs):	1.49
Ungauged Stream Safety (cfs):	1.49
Min. Gauge Reading (cfs):	**71.96**
Passby at Location (cfs):	**11.74**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14391 Source Name: Meathouse Fork @ Whitehair Withdrawal
Elton Whitehair

Source Latitude: 39.211317
Source Longitude: -80.679592

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 30.37 County: Doddridge

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

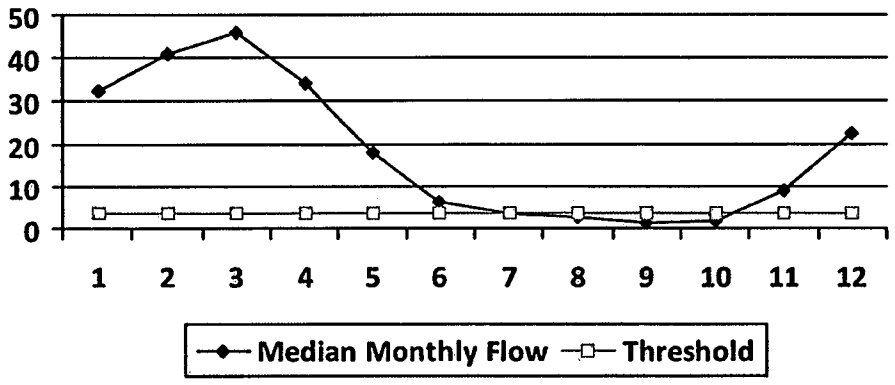
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	32.57	6.70	26.15
2	40.97	6.70	34.55
3	45.84	6.70	39.42
4	34.04	6.70	27.62
5	17.96	6.70	11.54
6	6.27	6.70	-0.15
7	3.55	6.70	-2.87
8	2.92	6.70	-3.50
9	1.50	6.70	-4.92
10	1.88	6.70	-4.54
11	9.18	6.70	2.76
12	22.43	6.70	16.01

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	2.98
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	2.81
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.75
Ungauged Stream Safety (cfs):	0.75
Min. Gauge Reading (cfs):	**69.73**
Passby at Location (cfs):	**7.29**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14392 Source Name: Tom's Fork @ Erwin Withdrawal
John F. Erwin and Sandra E. Erwin

Source Latitude: 39.174306
Source Longitude: -80.702992

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 4.01 County: Doddridge

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

☐ Endangered Species? ☑ Mussel Stream?
☐ Trout Stream? ☐ Tier 3?
☐ Regulated Stream?
☐ Proximate PSD?
☐ Gauged Stream?

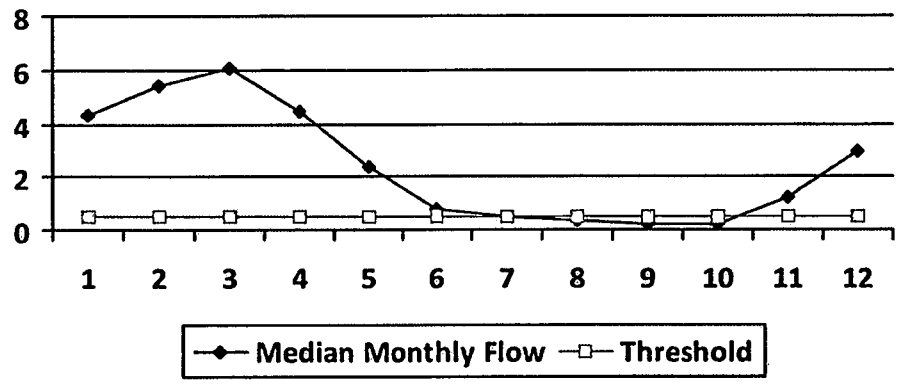
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	4.30	2.82	1.88
2	5.41	2.82	2.98
3	6.05	2.82	3.63
4	4.49	2.82	2.07
5	2.37	2.82	-0.05
6	0.83	2.82	-1.60
7	0.47	2.82	-1.96
8	0.39	2.82	-2.04
9	0.20	2.82	-2.23
10	0.25	2.82	-2.18
11	1.21	2.82	-1.21
12	2.96	2.82	0.54

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	0.39
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.10
Ungauged Stream Safety (cfs):	0.10
Min. Gauge Reading (cfs):	**69.73**
Passby at Location (cfs):	**0.59**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14393 Source Name: Arnold Creek @ Davis Withdrawal
Jonathon Davis

Source Latitude: 39.302006
Source Longitude: -80.824561

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 20.83 County: Doddridge

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- ☐ Endangered Species?
- ☑ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☐ Regulated Stream?
- ☐ Proximate PSD?
- ☐ Gauged Stream?

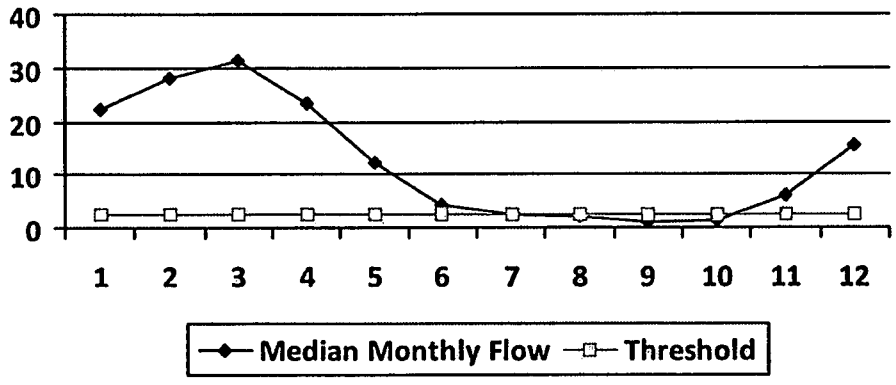
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	22.34	5.30	17.29
2	28.10	5.30	23.05
3	31.44	5.30	26.39
4	23.35	5.30	18.30
5	12.32	5.30	7.26
6	4.30	5.30	-0.75
7	2.43	5.30	-2.62
8	2.00	5.30	-3.05
9	1.03	5.30	-4.03
10	1.29	5.30	-3.76
11	6.30	5.30	1.25
12	15.39	5.30	10.34

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	2.05
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.51
Ungauged Stream Safety (cfs):	0.51
Min. Gauge Reading (cfs):	69.73
Passby at Location (cfs):	3.07

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14394 Source Name: Buckeye Creek @ Powell Withdrawal
Dennis Powell

Source Latitude: 39.277142
Source Longitude: -80.690386

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 31.15 County: Doddridge

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- ☐ Endangered Species?
- ☑ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☐ Regulated Stream?
- ☐ Proximate PSD?
- ☐ Gauged Stream?

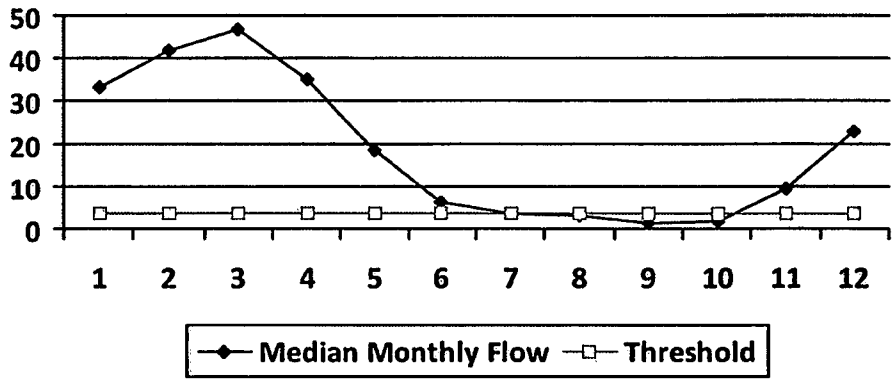
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	33.41	6.82	26.95
2	42.02	6.82	35.56
3	47.02	6.82	40.56
4	34.92	6.82	28.46
5	18.42	6.82	11.96
6	6.43	6.82	-0.03
7	3.64	6.82	-2.82
8	3.00	6.82	-3.46
9	1.53	6.82	-4.92
10	1.93	6.82	-4.53
11	9.42	6.82	2.96
12	23.01	6.82	16.55

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	3.06
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.77
Ungauged Stream Safety (cfs):	0.77
Min. Gauge Reading (cfs):	**69.73**
Passby at Location (cfs):	**4.59**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14395 Source Name South Fork of Hughes River @ Knight Withdrawal
Tracy C. Knight & Stephanie C. Knight

Source Latitude: 39.198369
Source Longitude: -80.870969

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 16.26 County: Ritchie

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

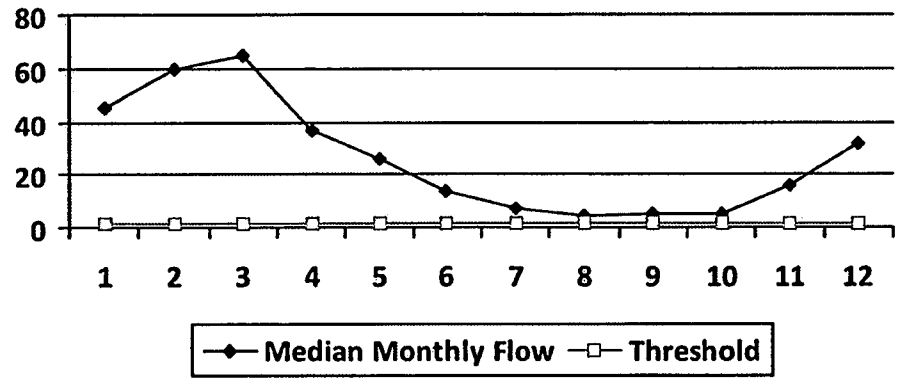
- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.) 229.00 Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	45.67	14.26	31.44
2	59.55	14.26	45.31
3	65.21	14.26	50.97
4	36.87	14.26	22.63
5	25.86	14.26	11.63
6	13.90	14.26	-0.33
7	6.89	14.26	-7.34
8	3.98	14.26	-10.25
9	4.79	14.26	-9.45
10	5.20	14.26	-9.04
11	15.54	14.26	1.30
12	32.06	14.26	17.82

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	1.56
Upstream Demand (cfs):	5.62
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.68
Headwater Safety (cfs):	0.39
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	**39.80**
Passby at Location (cfs):	**1.95**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01119 | API/ID Number: 047-017-06218 | Operator: Antero Resources

Koch Unit 1H

Source ID: 14396 Source Name: North Fork of Hughes River @ Davis Withdrawal
Lewis P. Davis and Norma J. Davis

Source Latitude: 39.322363
Source Longitude: -80.936771

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 15.18 County: Ritchie

Anticipated withdrawal start date: 11/7/2013
Anticipated withdrawal end date: 11/7/2014
Total Volume from Source (gal): 6,610,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

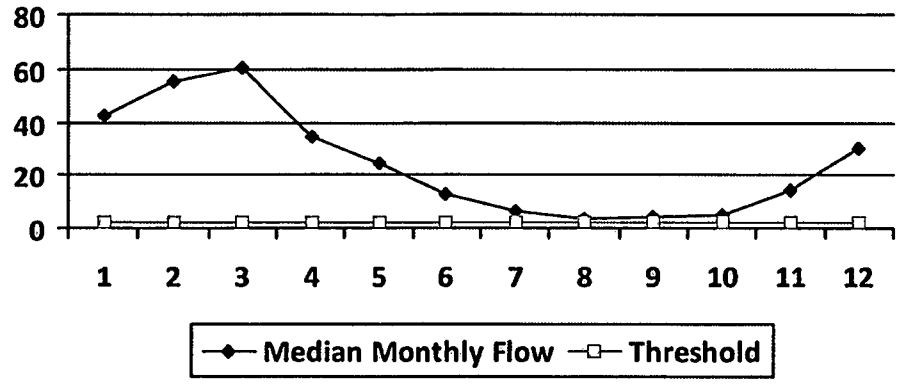
- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

Reference Gaug 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.) 229.00 Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	42.64	4.42	38.36
2	55.59	4.42	51.32
3	60.88	4.42	56.60
4	34.42	4.42	30.14
5	24.15	4.42	19.87
6	12.98	4.42	8.70
7	6.44	4.42	2.16
8	3.72	4.42	-0.56
9	4.47	4.42	0.19
10	4.85	4.42	0.57
11	14.50	4.42	10.23
12	29.93	4.42	25.65

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	1.46
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.36
Ungauged Stream Safety (cfs):	0.36
Min. Gauge Reading (cfs):	**35.23**
Passby at Location (cfs):	**2.19**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

west virginia department of environmental protection

Water Management Plan:
Secondary Water Sources

WMP-01119 API/ID Number 047-017-06218 Operator: Antero Resources

Koch Unit 1H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Lake/Reservior

Source ID: 14399 Source Name City of Salem Reservior (Lower Dog Run)
Public Water Provider

Source start date: 11/7/2013
Source end date: 11/7/2014

Source Lat: 39.28834 Source Long: -80.54966 County Harrison

Max. Daily Purchase (gal) 1,000,000 Total Volume from Source (gal): 6,610,000

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- **For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.**
- **For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.**

Source ID: 14400 Source Name Pennsboro Lake
Source start date: 11/7/2013
Source end date: 11/7/2014

Source Lat: 39.281689 Source Long: -80.925526 County Ritchie

Max. Daily Purchase (gal) Total Volume from Source (gal): 6,610,000

DEP Comments:

Source ID: 14401 Source Name Powers Lake (Wilderness Water Park Dam)
Private Owner
Source start date: 11/7/2013
Source end date: 11/7/2014

Source Lat: 39.255752 Source Long: -80.463262 County Harrison

Max. Daily Purchase (gal) Total Volume from Source (gal): 6,610,000

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 14402 Source Name Powers Lake Two

Source start date: 11/7/2013
Source end date: 11/7/2014

Source Lat: 39.247604 Source Long: -80.466642 County Harrison

Max. Daily Purchase (gal) Total Volume from Source (gal): 6,610,000

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- **For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.**
- **For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.**

Other

Source ID: 14403 Source Name: Poth Lake (Landowner Pond)
Private Owner
Source start date: 11/7/2013
Source end date: 11/7/2014
Source Lat: 39.221306 Source Long: -80.463028 County: Harrison
Max. Daily Purchase (gal): Total Volume from Source (gal): 6,610,000
DEP Comments:

Source ID: 14404 Source Name: Williamson Pond (Landowner Pond)
Source start date: 11/7/2013
Source end date: 11/7/2014
Source Lat: 39.19924 Source Long: -80.886161 County: Ritchie
Max. Daily Purchase (gal): Total Volume from Source (gal): 6,610,000
DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 14405 Source Name Eddy Pond (Landowner Pond) Source start date: 11/7/2013
Source end date: 11/7/2014

Source Lat: 39.19924 Source Long: -80.886161 County Ritchie

Max. Daily Purchase (gal) Total Volume from Source (gal): 6,610,000

DEP Comments:

Source ID: 14406 Source Name Hog Lick Quarry Industrial Facility Source start date: 11/7/2013
Source end date: 11/7/2014

Source Lat: 39.419272 Source Long: -80.217941 County Marion

Max. Daily Purchase (gal) 1,000,000 Total Volume from Source (gal): 6,610,000

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

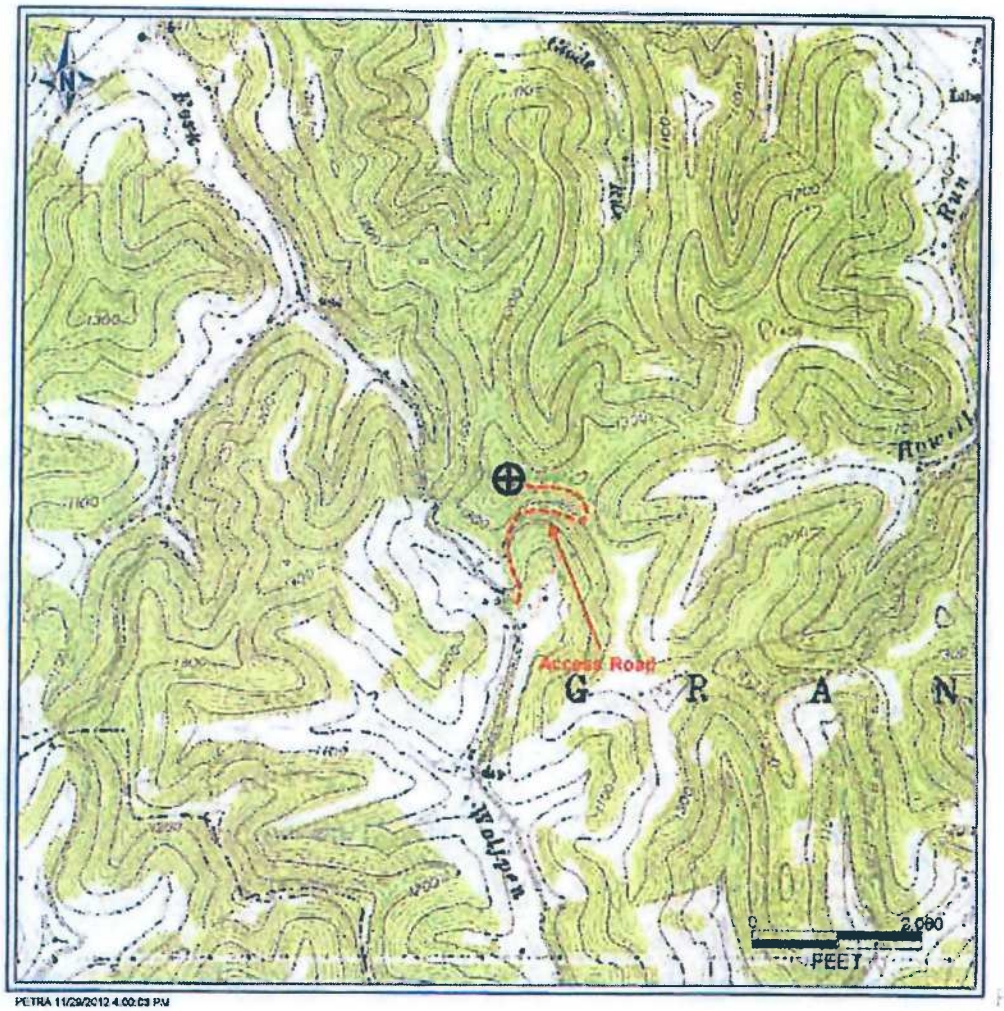
- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 14407 Source Name Glade Fork Mine Industrial Facility
Source start date: 11/7/2013
Source end date: 11/7/2014
Source Lat: 38.965767 Source Long: -80.299313 County Upshur
Max. Daily Purchase (gal) 1,000,000 Total Volume from Source (gal): 6,610,000
DEP Comments:

Recycled Frac Water

Source ID: 14408 Source Name Langfitt Unit 1H
Source start date: 11/7/2013
Source end date: 11/7/2014
Source Lat: Source Long: County
Max. Daily Purchase (gal) Total Volume from Source (gal): 6,610,000
DEP Comments:

17-06218



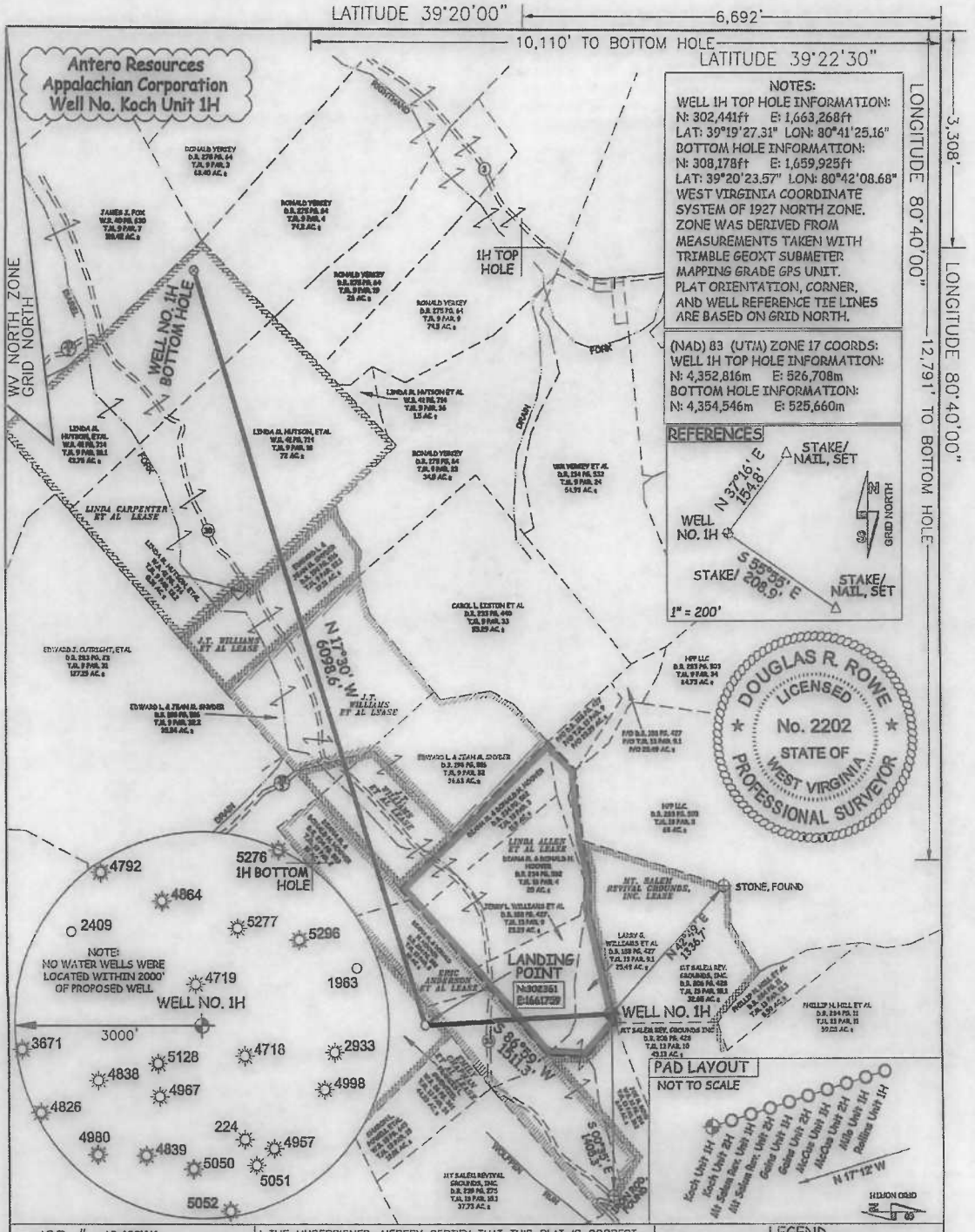
Office of

DCW
4-19-13

Antero Resources Corporation
APPALACHIAN BASIN
Koch Unit 1H Doddridge County
0 2,000 4,000 FEET
REMARKS QUADRANGLE: SMITHBURG WATERSHED: DISTRICT: GRANT
Date: 12/04/12

17-06218 H6A KOCH UNIT 1H
ANTERO RESOURCES

PAD NAME: REVIVAL



JOB # 12-13ZWA
DRAWING # KOCH1H
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PERSCRIBED BY THE DEPTARTMENT OF ENVIRONMENTAL PROTECTION.

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

LEGEND
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted

DRCKR
DOUGLAS R. ROWE P.S. 2202

DATE 02/20/13
OPERATOR'S WELL# KOCH UNIT #1H
API WELL # 47 - 017 6218 H6A
STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,378' WATERSHED WOLFPEN RUN
QUADRANGLE SMITHBURG 7.5' DISTRICT GRANT COUNTY DODDRIDGE
SURFACE OWNER LARRY WILLIAMS ET AL ACREAGE 25.49 ACRES +/-
OIL & GAS ROYALTY OWNER LINDA ALLEN ET AL; ERIC ANDERSON ET AL; EMILY CHAPMAN ET AL; J.T. WILLIAMS ET AL; J.T. WILLIAMS ET AL; J.T. WILLIAMS ET AL; LINDA CARPENTER ET AL LEASE ACREAGE 35.11 ACRES±; 40 ACRES±; 116 ACRES±; 16 ACRES ±; 59 ACRES±; 19.33 ACRES±; 116 ACRES±
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) ___ PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,400' TVD 15,700' MD

WELL OPERATOR ANTERO RESOURCES APPALACHIAN CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1625 17TH STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

FORM WW-6

COUNTY NAME PERMIT

ANTERO
RESOURCES

Well Site Safety Plan
Antero Resources

Well Name: **Koch Unit 1H, Koch Unit 2H, Mt Salem Revival Unit 1H, Mt Salem Revival Unit 2H, Milo Unit 1H**

Pad Location: **REVIVAL PAD**
Doddridge County/ Grant District

GPS Coordinates: Lat 39°19'27.11"/Long 80°41'24.34" (NAD83)

Driving Directions:

From Smithburg, head East on US-50 for ~1.7 miles. Turn left onto Co Route 20 (Morgans Run). After 1.5 miles, road name becomes Co Route 30 (Israels Fork/Wolf Pen), continue for 1.6 more miles. Turn right onto Main Camp Rd (Access Road). Drive for approximately 0.6 miles to top of access road/Pad site.

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: _____

Plan Modification*

Revision No.	Description of Revision	Antero Preparer	Antero Reviewer/Approver	Agency Approval	Date

*The Office of Oil and Gas must approve all changes and modifications to previously approved plans.

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
ii. running tees, and shall be anchored to prevent whip and reduce vibration.
iii. 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

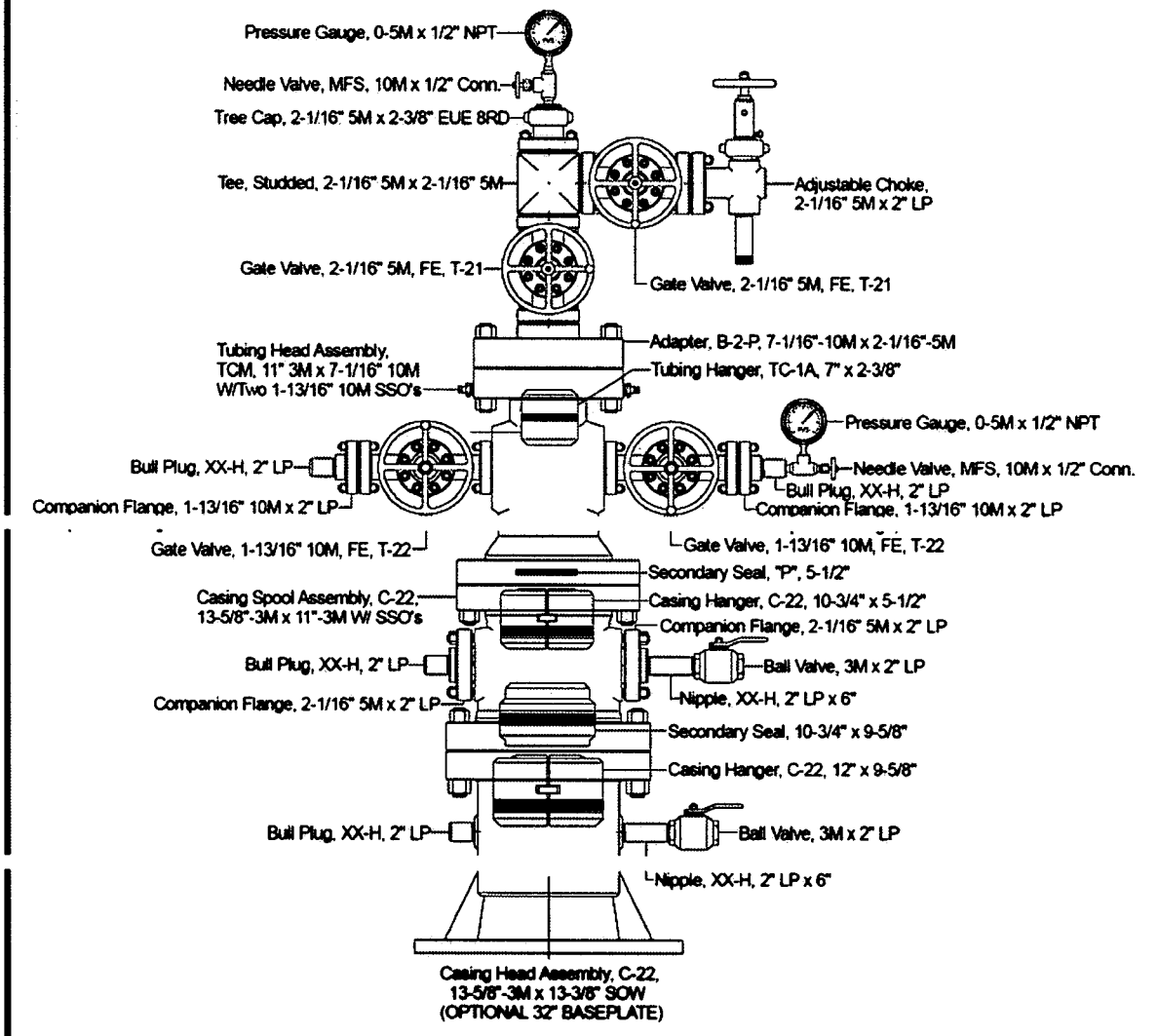
All Drilling Supervisors and Toolpushers used on this well will be IADC trained and certified. A trained person will be present during the drilling operations. Training certificates will be available for review on the location. The list of personnel with said training is provided in Appendix E.

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 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.

Appendix A: Safety Meeting Log, Personnel and Visitor Log & Emergency Contacts

Safety Meeting Log

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

	Name	Organization	Job Title
1.			
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Appendix B.

Daily Personal and Visitor Log

DATE	TIME IN	TIME OUT	NAME	ORGANIZATION

Appendix C.

EMERGENCY CONTACT LIST AND PHONE NUMBERS

Contact	Phone Number
Designated Person and Incident Commander:	
John Kawcak, *Operations Manager*	817.368.1553 John
Tim Culberson, Midstream Construction Manager	918.916.0116 Tim
Terry Wyckoff, Midstream Production Manager	304.991.0720 Terry
Designated Backup Person Incident Commander/Response Coordinator:	
Mike Ward	580.276.7484 Mike
Ricky Jones	580.927.6276 Ricky
Norman Wood	903.353.4429 Norman
Stanley Dudley	970.618.7602 Stanley
Jeff Partridge	940.577.2288 Jeff
Landon West	940.389.0602 Landon
Tim Henrich	720.530.3059 Tim H.
Mike Alcorn	304.627.7070 Mike
James Harvey	918.916.4340 James
Tim Murrell	903.256.6040 Tim
Delf Martinez	970.629.0055 Delf
Ralph Ybarra	580.927.5606 Ralph
Virgil Gaither	580.504.2366 Virgil
James Neal	607.644.8701 James
Frontier #3	832.487.7965 Rig Sat Phone
Frontier #14	713.758.0662 Rig Sat Phone
Frontier #17	713,758.0730 Rig Sat Phone
Frontier #8	832.531.7014 Rig Sat Phone
Frontier #22	713.758.0893 Rig Sat Phone
Hall Drilling #3	713.758.0881 Rig Sat Phone
Antero Resources Denver Office 1625 17th Street, Suite 300 Denver, CO 80202	Office: (303) 357-7310 Fax: 303-357-7315
Environmental Manager Jerry Alberts	Direct: (303) 357-7341 Cell: 720-201-0160 24hr

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 Tristan Jenkins, WVDEP Inspector – Harrison County Joe Taylor, WVDEP Inspector – Tyler County David Cowan, WVDEP Inspector – Ritchie County Sam Ward, WVDEP Inspector – Doddridge County	 (304) 552-3874 cell Tristan Jenkins (304) 380-7469 cell Joe Taylor (304) 389-3509 cell David Cowan (304) 389-7583 cell Sam Ward
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

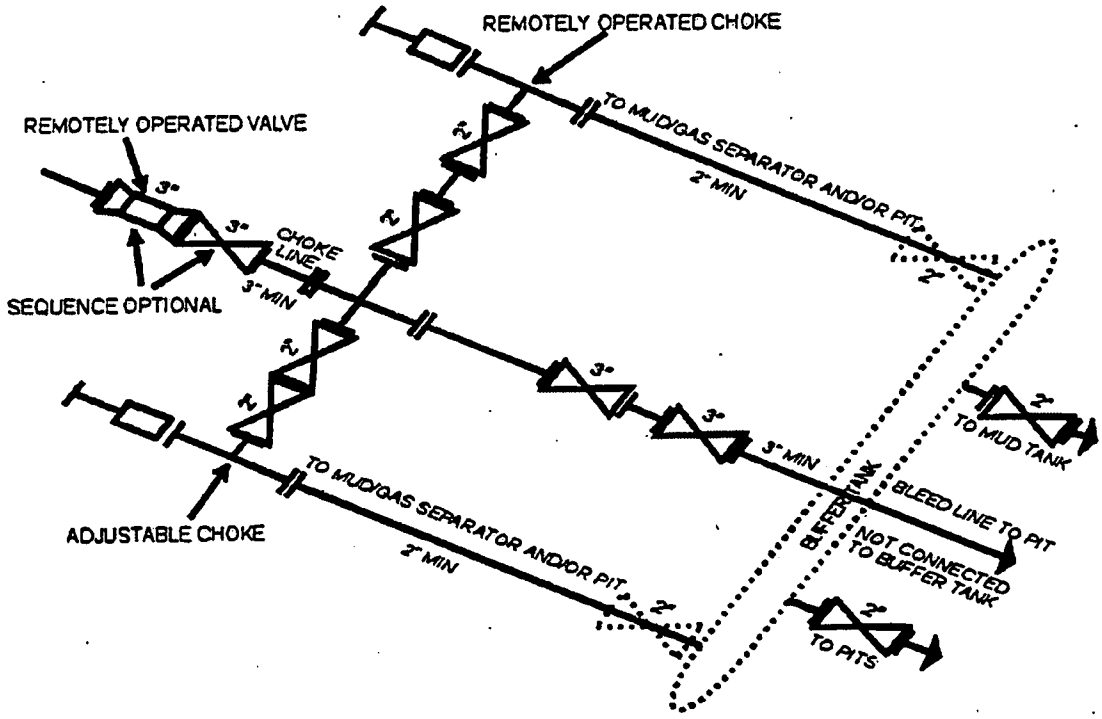
WHERE TO FIND HELP

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 ENFOREMENT:	
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.

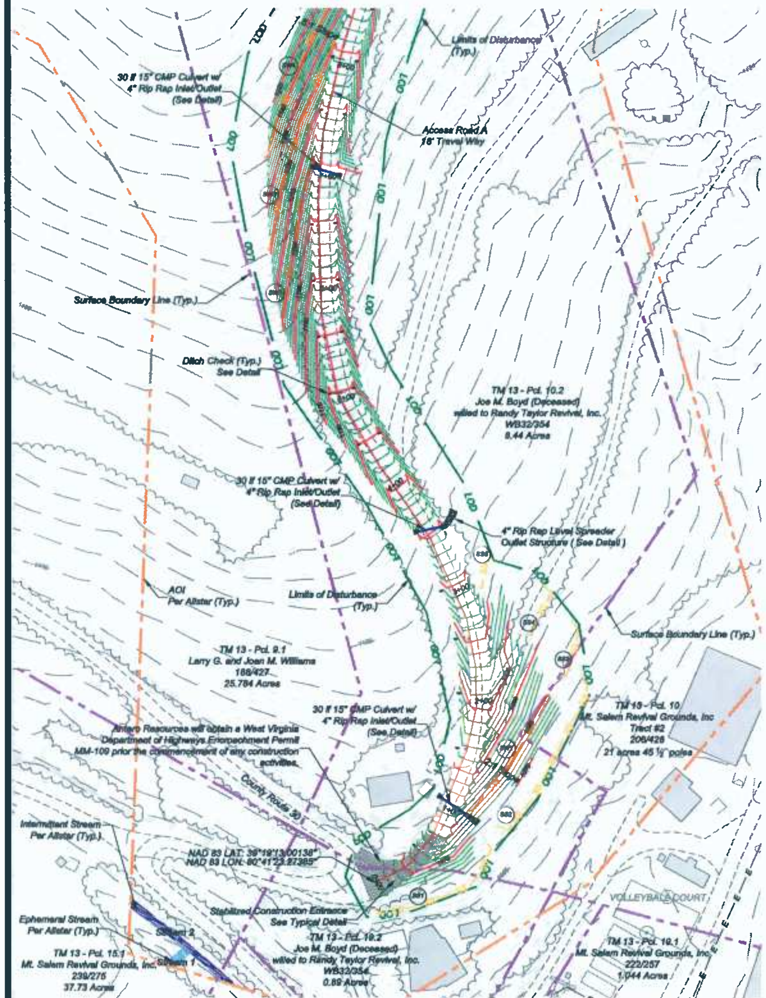
[54 FR 39528, Sept. 27, 1989]

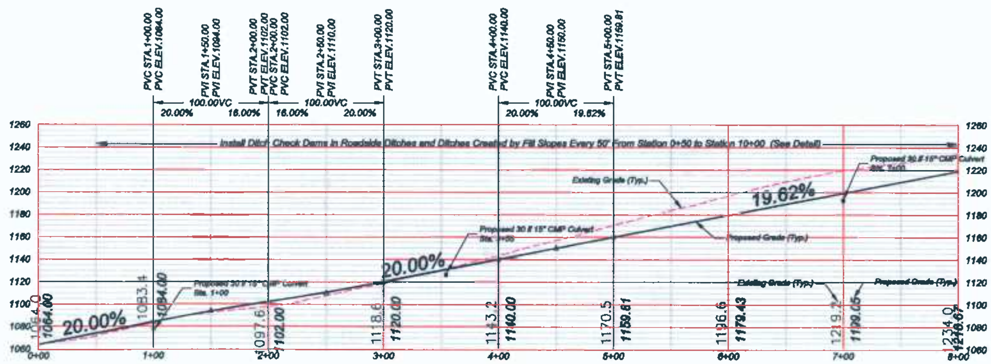
Appendix E. **List of Well Control Trained Personnel**

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) - ACCESS ROAD A STA: 0+00 - 8+00

EXHIBIT 1, PAGE 1





ACCESS ROAD A PROFILE

Horizontal & Vertical Scale: 1" = 50'

0' 50' 100' 150'

LINED DITCH TREATMENT vs SLOPE of DITCH
- Line with Seed & Mulch if slope is less than 3%
- Line with Jute Matting if slope is greater than 3% less than 9%
- Line with turf reinforcement matting (TRM) if slope is greater than 9%
- *Turf reinforcement matting shall be Excelsior Recyclex or Landlok TRM 435 or equal

Legend

- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Line / Pole
- Surface Owner Property Line
- Existing Gas Line CL
- Limits of Disturbance
- Proposed Diversion Ditch
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Super Silt Fence
- Proposed Check Dam
- Proposed Culvert W/ Inlet & Outlet Protection
- Proposed Straw Wattles
- Proposed Silt Sock/Silt Fence
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Rip-Rap

DATE	REVISIONS
11-29-12	Updated Property Owner Information

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

CHARLES K. WILSON REGISTERED NO. 12483 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

L&W ENTERPRISES, INC.
PO BOX 506, 14 SOUTH GROVE ST., PETERSBURG, WV 26847
PH: 304-257-4818 FAX: 304-257-2224 EMAIL: LEWEC@CITLINK.NET

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

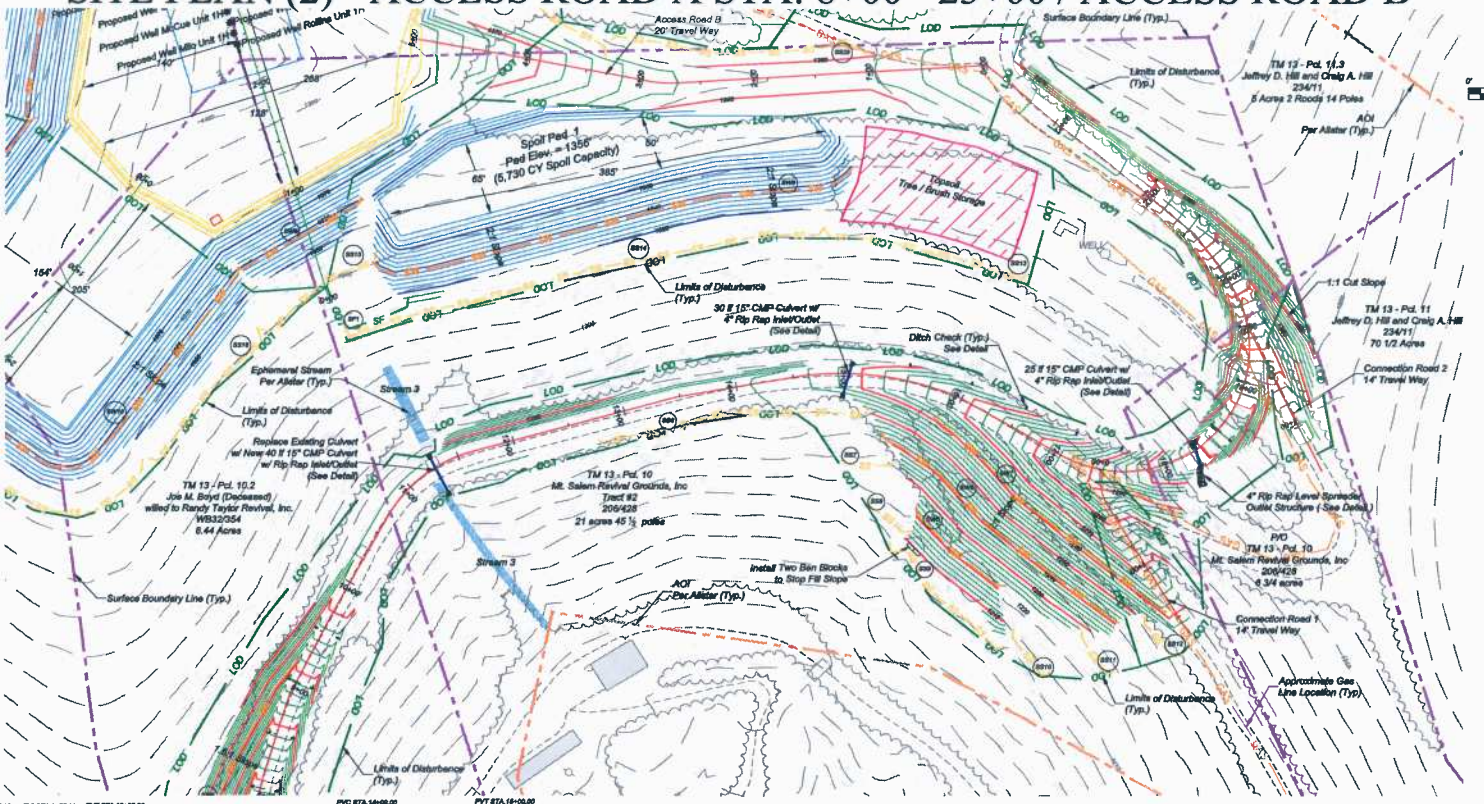
SITE PLAN (1) - ACCESS ROAD A STA: 0+00 - 8+00

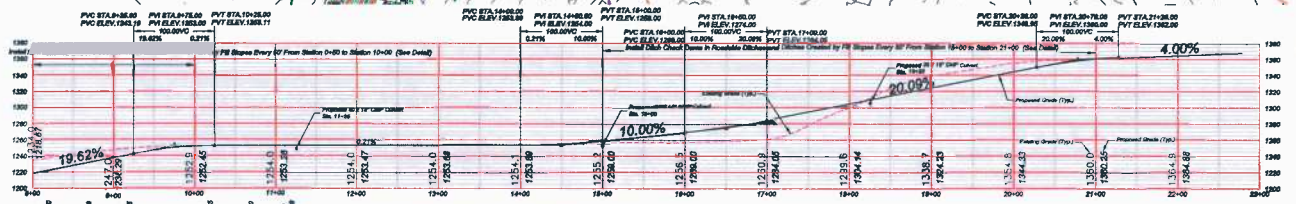
REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 50'
Designed By: CKW/CKM
File No. Antero 216-12
Page 6 of 14

SITE PLAN (2) - ACCESS ROAD A STA: 8+00 - 23+00 / ACCESS ROAD B



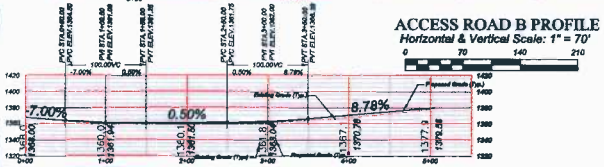


ACCESS ROAD A PROFILE

Horizontal & Vertical Scale: 1" = 70'

0 70 140 210

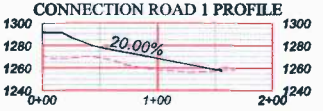
LINED DITCH TREATMENT vs SLOPE of DITCH
Line with Seed & Mulch if slope is less than 3%
Line with Jute Matting if slope is greater than 3% less than 9%
Line with turf reinforcement matting (TRM) if slope is greater than 9%
*Turf reinforcement matting shall be Excelsior Recyclex or
Landlok TRM 450 or equal



ACCESS ROAD B PROFILE

Horizontal & Vertical Scale: 1" = 70'

0 70 140 210



CONNECTION ROAD 1 PROFILE

CONNECTION ROAD 2 PROFILE

Horizontal & Vertical Scale: 1" = 50'

0' 50' 100' 150'

Legend

- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Line / Pole
- Surface Owner Property Line
- Existing Gas Line CL
- Limits of Disturbance
- Proposed Diversion Ditch
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Super Silt Fence
- Proposed Check Dam
- Proposed Culvert W/ Inlet & Outlet Protection
- Proposed Straw Wattles
- Proposed Silt Sock/Silt Fence
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Rip-Rap

DATE	REVISIONS
11-29-12	Updated Property Owner Information
2-25-13	Changed Frac Pit to Tank Pad

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

L&W ENTERPRISES, INC.
PO BOX 69
14 SOUTH GROVE ST.
PH: 304-257-4811
FAX: 304-257-2234
EMAIL: LWENT@STONEWALL.NET
PENNSBORO, WV 26415

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

SITE PLAN (2) - ACCESS ROAD A STA: 8+00 - 23+00 / ACCESS ROAD B

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 50' / 70'
Designed By: CKW/CEM
File No. Antero 216-12
Page 7 of 14

EXHIBIT 1, PAGE 2

NORTH

PREVAILING WIND DIRECTION NNE

ANTERO RESOURCES

EXHIBIT 1
REVIVAL PAD

EXHIBIT 1, PAGE 4

DRILLING LAYOUT/FLARE LINES/PREVAILING WINDS

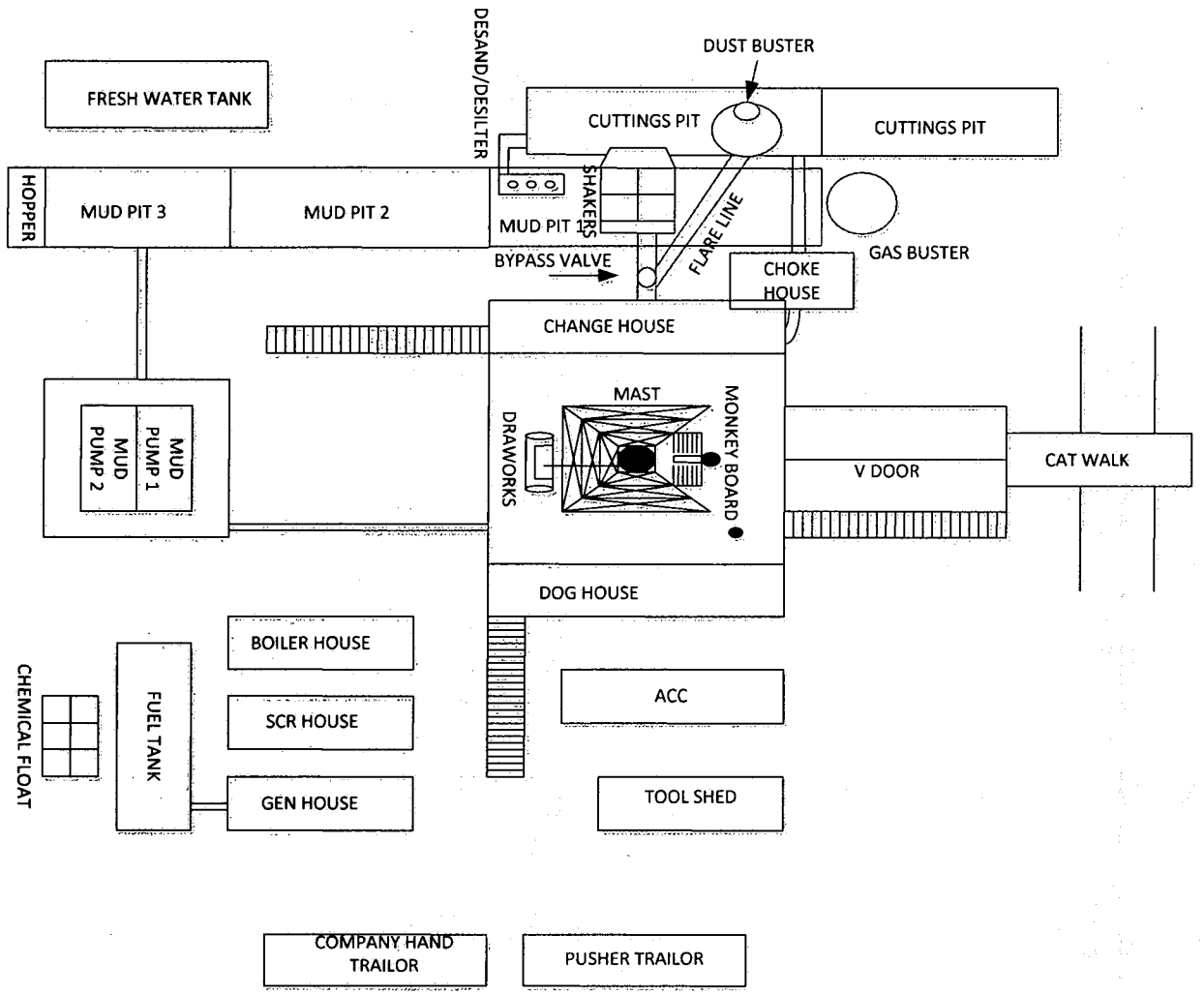
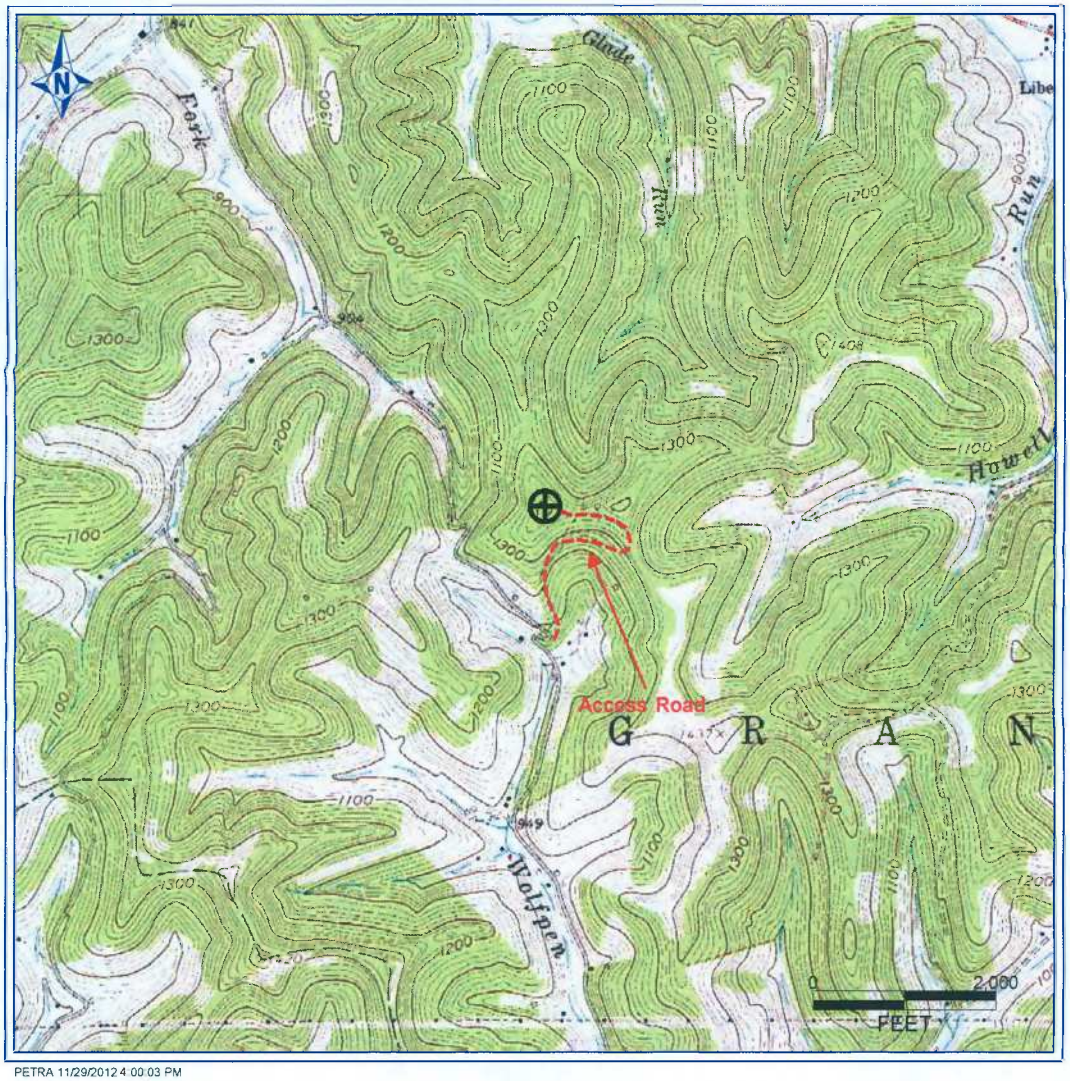


EXHIBIT 2, TOPOGRAPHICAL MAP OF WELL SITE LOCATION (REVIVAL PAD)



PETRA 11/29/2012 4:00:03 PM

Antero Resources Corporation
APPALACHIAN BASIN
REVIVAL PAD Doddridge County
0 2,000 4,000 FEET
REMARKS QUADRANGLE: SMITHBURG WATERSHED: DISTRICT: GRANT
Date: 12/04/12

EXHIBIT 3: LIST OF ALL SCHOOLS & PUBLIC FACILITIES WITHIN A ONE MILE RADIUS OF PROPOSED WELL SITE								
Map	Parcel	Name	Address	City	St	Zip	Phone	Deed Book/Page
13	9.2	WV Dept of Highways	Rt 2	Smithburg	WV	26556	304-627-2412	206/428
13	10,10.1	Mt Salem Revival Grounds	P.O. Box 177	West Union	WV	26456	304-873-2315	206/428
13	19	Mt Salem Revival Grounds	P.O. Box 186	West Union	WV	26456	304-873-2315	239/275
13	15.1	Mt Salem Revival Grounds	P.O. Box 186	West Union	WV	26456	304-873-2315	222/256

WW - 6B
(3/13)

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

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	Grant	Smithburg 7.5'
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Mt Salem Revival Unit 1H Well Pad Name: Revival Pad

3 Elevation, current ground: ~1390' Elevation, proposed post-construction: 1378'

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: 7400' TVD, Anticipated Thickness- 55 Feet, Associated Pressure- 2950#

7) Proposed Total Vertical Depth: 7400' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 14400' MD

10) Approximate Fresh Water Strata Depths: 292', 374'

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

12) Approximate Saltwater Depths: 1079', 1808'

13) Approximate Coal Seam Depths: 328', 863'

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): 15.47 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.22 acres

WW - 6B
(3/13)

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#	435'	435' *see above	CTS, 604 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2540'	2540'	CTS, 1034 CU. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	14400'	14400'	3535 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.

WW - 6B
(3/13)

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

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	Grant	Smithburg 7.5'
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Mt Salem Revival Unit 2H Well Pad Name: Revival Pad

3 Elevation, current ground: ~1390' Elevation, proposed post-construction: 1378'

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: 7400' TVD, Anticipated Thickness- 55 Feet, Associated Pressure- 2950#

7) Proposed Total Vertical Depth: 7400' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 14700' MD

10) Approximate Fresh Water Strata Depths: 292', 374'

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

12) Approximate Saltwater Depths: 1079', 1808'

13) Approximate Coal Seam Depths: 328', 863'

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): 15.47 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.22 acres

WW - 6B
(3/13)

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#	440'	440' *see above	CTS, 611 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2545'	2545'	CTS, 1036 CU. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	14700'	14700'	3616 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			

WW - 6B
(3/13)

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.

WW - 6B
(3/13)

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

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 (Operator ID) | 017- Doddridge (County) | Grant (District) | Smithburg 7.5' (Quadrangle)

2) Operator's Well Number: Milo Unit 1H Well Pad Name: Revival Pad

3 Elevation, current ground: ~1390' Elevation, proposed post-construction: 1378'

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: 7400' TVD, Anticipated Thickness- 55 Feet, Associated Pressure- 2950#

7) Proposed Total Vertical Depth: 7400' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 15800' MD

10) Approximate Fresh Water Strata Depths: 292', 374'

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

12) Approximate Saltwater Depths: 1079', 1808'

13) Approximate Coal Seam Depths: 328', 863'

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): 15.47 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.22 acres

WW - 6B
(3/13)

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#	445'	445' *see above	CTS, 618 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2550'	2550'	CTS, 1038 CU. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	15800'	15800'	3917 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.d 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	Grant	Smithburg 7.5'
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Koch Unit 2H Well Pad Name: Revival Pad

3 Elevation, current ground: ~1390' Elevation, proposed post-construction: 1378'

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: 7400' TVD, Anticipated Thickness- 55 Feet, Associated Pressure- 2950#

7) Proposed Total Vertical Depth: 7400' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 14700' MD

10) Approximate Fresh Water Strata Depths: 292', 374'

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

12) Approximate Saltwater Depths: 1079', 1808'

13) Approximate Coal Seam Depths: 328', 863'

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): 15.47 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.22 acres

WW - 6B
(3/13)

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#	430'	430' *see above	CTS, 597 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2535'	2535'	CTS, 1032 CU. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	14700'	14700'	3622 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.

WW - 6B
(1/12)

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

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Appalachian Corporation | 494488557 (Operator ID) | 017- Doddridge (County) | Grant (District) | Smithburg 7.5' (Quadrangle)

2) Operator's Well Number: Koch Unit 1H Well Pad Name: Revival Pad

3 Elevation, current ground: ~1390' Elevation, proposed post-construction: 1378'

4) Well Type: (a) Gas ■ Oil _____
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: 7400' TVD, Anticipated Thickness- 55 Feet, Associated Pressure- 2950#

7) Proposed Total Vertical Depth: 7400' TVD
8) Formation at Total Vertical Depth: Marcellus
9) Proposed Total Measured Depth: 15700' MD
10) Approximate Fresh Water Strata Depths: 292', 374'
11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.
12) Approximate Saltwater Depths: 1079', 1808'
13) Approximate Coal Seam Depths: 328', 863'
14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated
15) Does land contain coal seams tributary or adjacent to, active 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): 15.47 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.22 acres

WW - 6B
(1/12)

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#	425'	425' *see above	CTS, 590 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2525'	2525'	CTS, 1028 CU. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	15700'	15700'	3899 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.

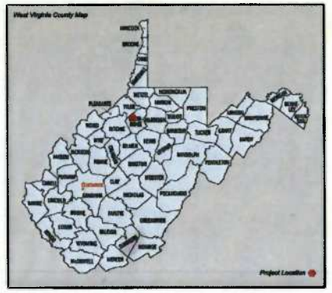
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls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

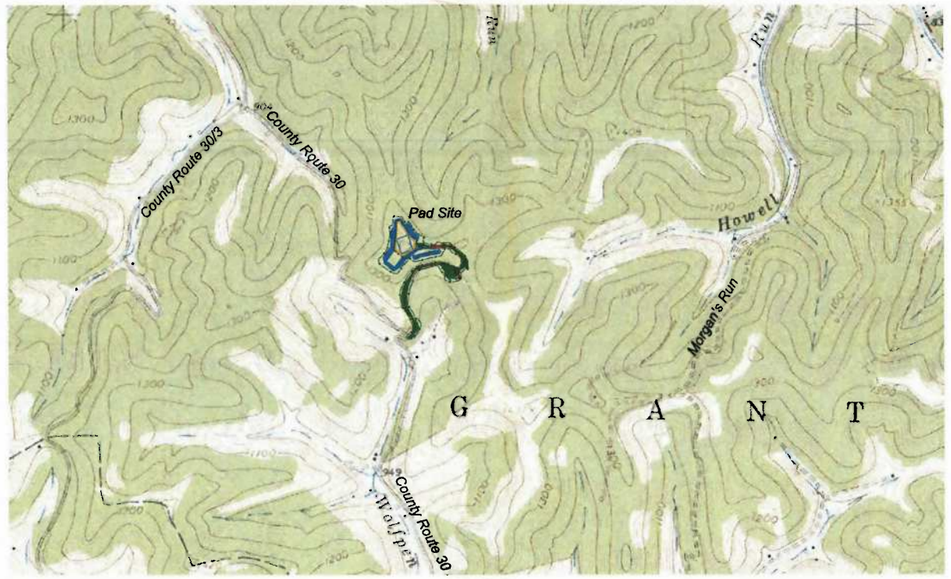
*Note: Attach additional sheets as needed.

REVIVAL PAD

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

ANTERO RESOURCES APPALACHIAN CORPORATION





West Virginia State Plane Coordinate System
North Zone, NAD83
Elevations Based on NAVD88
Established By Survey Grade GPS & OPUS Post-Processing

Well Table				
Prop. Well Koch Unit 1H WV-N NAD83 N: 302476.78 WV-N NAD83 E: 1551827.17 LAT NAD83: 39.3243386 LON NAD83: -80.8601463	Prop. Well Koch Unit 2H WV-N NAD83 N: 302487.21 WV-N NAD83 E: 1551830.14 LAT NAD83: 39.3243124 LON NAD83: -80.8601354	Prop. Well Mt Salem Revival Unit 1H WV-N NAD83 N: 302457.59 WV-N NAD83 E: 1551833.10 LAT NAD83: 39.3242963 LON NAD83: -80.8601245	Prop. Well Mt Salem Revival Unit 2H WV-N NAD83 N: 302448.11 WV-N NAD83 E: 1551836.06 LAT NAD83: 39.3242601 LON NAD83: -80.8601135	Prop. Well Gains Unit 1H WV-N NAD83 N: 302438.59 WV-N NAD83 E: 1551839.03 LAT NAD83: 39.3242340 LON NAD83: -80.8601026
Prop. Well Gains Unit 2H WV-N NAD83 N: 302429.01 WV-N NAD83 E: 1551841.99 LAT NAD83: 39.3242079 LON NAD83: -80.8600917	Prop. Well McCue Unit 1H WV-N NAD83 N: 302418.46 WV-N NAD83 E: 1551844.98 LAT NAD83: 39.3241818 LON NAD83: -80.8600808	Prop. Well McCue Unit 2H WV-N NAD83 N: 302408.90 WV-N NAD83 E: 1551847.92 LAT NAD83: 39.3241557 LON NAD83: -80.8600698	Prop. Well Milo Unit 1H WV-N NAD83 N: 302400.38 WV-N NAD83 E: 1551850.88 LAT NAD83: 39.3241296 LON NAD83: -80.8600589	Prop. Well Rollins Unit 1H WV-N NAD83 N: 302390.80 WV-N NAD83 E: 1551853.85 LAT NAD83: 39.3241035 LON NAD83: -80.8600480

Owner Information					
Affected Tax Parcels in Grant District,Doddridge County					
13/10; 13/10.1; 13/10.2; 13/9.1; 13/19.2					
Owner	TM/Parcel	Deed/Page	Total Acres	Type of Disturbance	Acreage
Joe M. Boyd (Deceased)	13/10.2	WB 32/354	8.44	Road A	2.42
willed to Randy Taylor Revival, Inc.				Water Tank Pad	0.91
				Drill Pad	0.39
				Total	3.72
Joe M. Boyd (Deceased)	13/19.2	WB 32/354	0.69	Road A	0.08
willed to Randy Taylor Revival, Inc.				Total	0.08
Larry G. and Joan M.,	13/9.1	188/427	25.49	Water Tank Pad	1.18
Williams, et ux				Drill Pad	2.32
				Total	3.50
Mt Salem Revival Grounds, Inc.	13/10	206/428	43.13	Road A	2.70
				Road B	0.61
				Connect Road 1	0.20
				Connect Road 2	0.12
				Spoil Pad	1.88
				Drill Pad	0.47
				Total	5.98
Mt Salem Revival Grounds, Inc.	13/10.1	206/428	32.65	Road B	0.15
				Drill Pad	2.04
				Total	2.19
				Grand Total	15.47

LOD Area (ac)	
Road A (2250')	5.20
Road B (505')	0.76
Drill Pad	5.22
Water Tank Pad	2.09
Connect Road 1 (164')	0.20
Connect Road 2 (119')	0.12
Spoil Pad 1	1.88
Total Affected Area	15.47
Total Wooded Acreas Disturbed	10.87
Total Linear Footage of Access Road	3,038

Ephemeral Stream Impact (linear feet)	
Stream 3 (Road A)	40
Total	40

Project Contacts

Antero Resources

Tom Wince - Construction Manager
304-869-3405 Off. 304-483-0933 Cell

Anthony Smith, Field Engineer
304-869-3405 Off. 304-673-6196 Cell

Mike Ash - Survey Coordinator
304-380-6181 Cell

Roger Dunlap - Survey Coordinator
304-651-5588

Eli Wagoner, Environmental Engineer
304-622-3842, ext 311 Off. 304-476-9770 Cell

John Kawcak, Engineer
817-368-1553

Dusty Woods
817-771-1436

Aaron Kunzler, Construction Supervisor
405-227-8344

Surveyor & Engineer

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

Kirk Wilson, PE - L&W Enterprises, Inc
304-257-4818 Off. 304-668-0365 Cell

Well Location Restrictions:

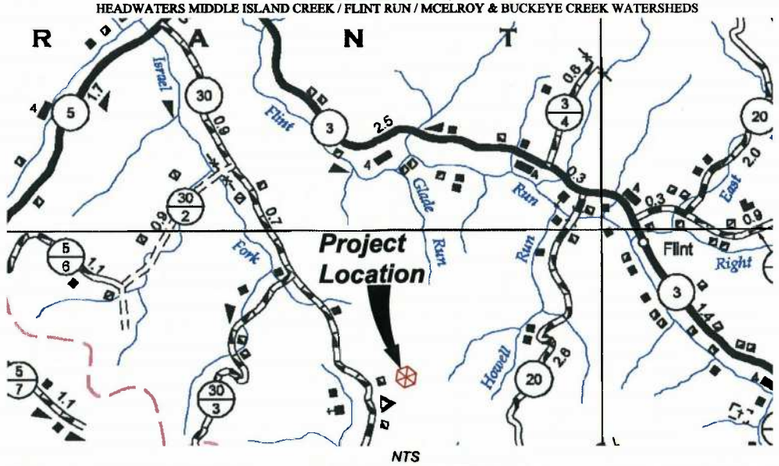
All Pad construction complies with the following restrictions.

* *250' from an existing well or developed spring used for human or domestic animals.*
* *625' from occupied dwelling or barn greater than 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 a naturally reproducing trout stream.*
* *1000' of a surface or ground water intake to a public water supply.*

SMITHBURG
0 1000 2000 3000

SITE LOCATIONS NAD 83		
Begin Acc. Road (UTM Meters)	N=4352365.04 m	E=526739.42 m
Center of Tank Pad (UTM Meters)	N=4352723.75 m	E=526671.47 m
Center of Pad (UTM Meters)	N=4352799.92 m	E=526712.29 m
	LATITUDE	LONGITUDE
Begin Access Road	39.320278	-80.689798
Center of Tank Pad	39.323612	-80.690572
Center of Pad	39.324198	-80.690096

GRANT DISTRICT
DODDRIDGE COUNTY, WV
HEADWATERS MIDDLE ISLAND CREEK / FLINT RUN / MCELROY & BUCKEYE CREEK WATERSHEDS



NTS

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:	54017C0130C
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A

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!!

811 Know what's **below.** **Call** before you dig.

DRAWING INDEX

1 COVER SHEET/LOCATION MAP
2 SCHEDULE OF QUANTITIES
3 CONSTRUCTION, EROSION, & SEDIMENT CONTROL NOTES
4 EXISTING CONDITIONS
5 PLAN SHEET INDEX
6-8 SITE PLANS
9 DRILL PAD BASELINE PROFILE & CROSS SECTIONS
10 WATER TANK PAD BASELINE PROFILE & CROSS SECTIONS
11 ACCESS ROAD A CROSS SECTIONS
12 ACCESS ROAD B, 1, & 2 CROSS SECTIONS
13 DETAILS
14 RECLAMATION PLAN

DATE	REVISIONS
11-29-12	Updated Property Owner Information
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

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

L&W ENTERPRISES, INC.
PO BOX 826
14 SOUTH GROVE ST.
PETERSBURG, WV 26847
PH: 304-257-4818
FAX: 304-257-2224
EMAIL: LEW@FTLL.NET

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

COVER SHEET/LOCATION MAP

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: N/A
Designed By: CKW/CKM
File No. Antero 216-12

REVIVAL PAD

PROJECT LOD OVER FEMA FIRM MAPS 54017C0130C & 0135C

ANTERO RESOURCES APPALACHIAN CORPORATION

SITE LOCATIONS NAD 83		
Begin Acc. Road (UTM Meters)	N=4352365.04 m	E=526739.42 m
Center of Tank Pad (UTM Meters)	N=4352723.75 m	E=526671.47 m
Center of Pad (UTM Meters)	N=4352799.57 m	E=526712.29 m
	LATITUDE	LONGITUDE
Begin Access Road	39.320278	-80.689798
Center of Tank Pad	39.323512	-80.690572
Center of Pad	39.324198	-80.690096

GRANT DISTRICT
DODDRIDGE COUNTY, WV
HEADWATERS MIDDLE ISLAND CREEK / FLINT RUN /
MCELROY & BUCKEYE CREEK WATERSHEDS

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:	54017C0130C & 0135C
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A

N W E S

0 200 400 600

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

L&W ENTERPRISES, INC.
PO BOX 326
14 SOUTH GROVE ST.
PETERSBURG, WV 26847
PH: 304-257-4018
FAX: 304-257-2224
EMAIL: LEVI@FTTLINK.NET

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

PROJECT LOD OVER FEMA FIRM MAPS
54017C0130C & 0135C
REVIVAL PAD
GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 6/14/12
Scale: 1" = 200'
Designed By: CKW/CKM
File No. Antero 216-12
Page 1 of 1

SCHEDULE OF QUANTITIES

CLEARING & GRUBBING, EROSION & SEDIMENT CONTROLS	Revival Pad			
	QUANTITY	UNIT		
MOBILIZATION	1.0	EA		$0.00
CONSTRUCTION ENTRANCE	1.0	EA		$0.00
CLEARING & GRUBBING	15.47	AC		$0.00
TREE REMOVAL	10.87	AC		$0.00
8" COMPOST FILTER SOCK	1,100	LF		$0.00
12" COMPOST FILTER SOCK	650	LF		$0.00
18" COMPOST FILTER SOCK	220	LF		$0.00
24" COMPOST FILTER SOCK	700	LF		$0.00
32" COMPOST FILTER SOCK	2,200	LF		$0.00
SUPER SILT FENCE	100	LF		$0.00
9" STRAW WATTLES	3,800	LF		$0.00
TOTAL				$0.00
SITE	QUANTITY	UNIT		
DRILL PAD EXCAVATION	27,211	CY		$0.00
ACCESS ROADS EXCAVATION	20,653	CY		$0.00
TANK PAD and/or FRAC PIT EXCAVATION	1,635	CY		$0.00
OFFLOAD PAD	0	CY		$0.00
SPOIL PAD 1	1,831	CY		$0.00
TOPSOIL	6,000	CY		$0.00
DIVERSION DITCH	0	LF		$0.00
ROADSIDE DITCH	2,000	LF		$0.00
TOTAL				$0.00
SUMP(S) PER ANTERO RESOURCES STANDARD DETAIL	QUANTITY	UNIT		
INSTALL 302" x 78" x 44" PRE CAST SUMP	4	EA		$0.00
VALVE BOX HDPE PIPE (MINIMUM 12" DIAMETER x 48" HEIGHT)	4	EA		$0.00
4" PVC CONNECTIVE PIPE (ANTERO SUMP DRAIN DETAIL)	100	LF		$0.00
TOTAL				$0.00
AGGREGATE SURFACING - SPREADING, COMPACTION, and/or INSTALLATION	QUANTITY	UNIT		
DRILL PAD AASHTO #1 (6" THICK)	4,300	TON		$0.00
DRILL PAD 1 1/2" or 3/4" CRUSHER RUN STONE (2" THICK)	1,450	TON		$0.00
DRILL PAD GEOTEXTILE FABRIC (US 200)	11,500	SY		$0.00
ACCESS ROADS 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	3,215	TON		$0.00
ACCESS ROADS 1 1/2" OR 3/4" CRUSHER RUN STONE (2" THICK)	810	TON		$0.00
ACCESS ROADS GEOTEXTILE FABRIC (US 200)	7,000	SY		$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	7,000	SY		$0.00
OFFLOAD PAD 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	0	TON		$0.00
OFFLOAD PAD 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	0	TON		$0.00
OFFLOAD PAD GEOTEXTILE FABRIC (US 200)	0	SY		$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	0	SY		$0.00
GATHERING FACILITIES 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	0	TON		$0.00
GATHERING FACILITIES 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	0	TON		$0.00
GATHERING FACILITIES GEOTEXTILE FABRIC (US 200)	0	SY		$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	0	SY		$0.00
TANK PAD 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	1,850	TON		$0.00
TANK PAD 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	465	TON		$0.00
TANK PAD GEOTEXTILE FABRIC (US 200)	3,858	SY		$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	3,858	SY		$0.00
TOTAL				$0.00

ROAD CULVERTS	QUANTITY	UNIT		
15" HDPE	240	LF		$0.00
18" HDPE	0	LF		$0.00
24" HDPE	0	LF		$0.00
30" HDPE	0	LF		$0.00
36" HDPE	0	LF		$0.00
42" HDPE	0	LF		$0.00
48" HDPE	0	LF		$0.00
60" HDPE	0	LF		$0.00
R4 RIP RAP (INLETS/OUTLETS)	40	TON		$0.00
AASHTO #1 STONE (DITCH CHECKS)	10	TON		$0.00
DITCH LINING - (ACCESS ROAD) SEED AND MULCH	0	SY		$0.00
DITCH LINING - (ACCESS ROAD) JUTE MATTING	0	SY		$0.00
DITCH LINING - (ACCESS ROAD) SYNTHETIC MATTING (TRM)	1,000	SY		$0.00
TOTAL				$0.00
FENCING/GATES	QUANTITY	UNIT		
4 FT WOVEN WIRE FARM FENCE w/MINIMUM 10 FT POST SPACING (WOODEN and/or "T" POST)	0.0	LF		$0.00
16 FT DOUBLE GATE	0.0	EA		$0.00
TOTAL				$0.00
SEEDING	QUANTITY	UNIT		
SITE SEEDING (LIME, FERTILIZER, SEEDING, AND HYDRO-MULCH w/TACK (HYC-2 OR EQUAL))	7.0	AC		$0.00
TOTAL				$0.00
UNFORESEEN SITE CONDITIONS	QUANTITY	UNIT		
*ROCK CLAUSE - BLASTING	0.0	CY		$0.00
*ROCK CLAUSE - HOE RAMMING	0.0	CY		$0.00
*FRENCH DRAINS	0.0	FT		$0.00
*ORANGE SAFETY FENCE w/"T" POST (10FT CENTERS) - WETLAND PROTECTION	0.0	LF		$0.00
*STEEL PANELS w/"T" POST (10 FT CENTERS) - WETLAND PROTECTION	0.0	LF		$0.00
*SILT FENCE	0.0	LF		$0.00
*TEMPORARY SEEDING	0.0	AC		$0.00
*CONSTRUCTION STAKEOUT	0.0	HOUR		$0.00
* JUTE MATTING - SLOPE MATTING	0.0	SY		$0.00
TOTAL				$0.00
	GRAND TOTAL			$0.00

The 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.

Revival Quantities						
Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)	Max. Slope	Length Of Slope
Road A	19,440	13,070	6,370	0	20.00%	960'
Road B	30	1,050	0	1,020	8.78%	200'
Drill Pad	27,211	21,800	5,411	0	NA	NA
Water Tank	1,635	8,204	0	6,569	NA	NA
Connect Road 1	633	965	0	332	NA	NA
Connect Road 2	550	30	520	0	NA	NA
Spoil Pad 1	1,831	7,561	0	5,730	NA	NA
Totals	51,330	52,680	12,301	13,651	NA	NA
		Total Spoil (CY) =	-1,350			

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.

EARTHWORK & CAPACITY REPORTS

Access Road A Earthwork Report
Processing 0+00.000 to 22+50.000
Cut Swell Factor: 1.050
Fill Shrink Factor: 1.000
Total Cut : 524894.220 C.F., 19440.527 C.Y.
Total Fill: 352893.336 C.F., 13070.124 C.Y.
Balance Export: 6370.403 C.Y.
Cut to Fill Ratio: 1.49

Access Road B Earthwork Report
Processing 0+00.000 to 5+05.000
Cut Swell Factor: 1.050
Fill Shrink Factor: 1.000
Total Cut : 828.650 C.F., 30.691 C.Y.
Total Fill: 28356.821 C.F., 1050.253 C.Y.
Balance Import: 1019.562 C.Y.
Cut to Fill Ratio: 0.03

Access Road 1 Earthwork Report
Processing 0+11.657 to 1+64.396
Cut Swell Factor: 1.050
Fill Shrink Factor: 1.000
Total Cut : 17106.424 C.F., 633.571 C.Y.
Total Fill: 26079.237 C.F., 965.898 C.Y.
Balance Import: 332.326 C.Y.
Cut to Fill Ratio: 0.66

Access Road 2 Earthwork Report
Processing 0+33.565 to 1+19.618
Cut Swell Factor: 1.050
Fill Shrink Factor: 1.000
Total Cut : 14873.577 C.F., 550.873 C.Y.
Total Fill: 799.005 C.F., 29.593 C.Y.
Balance Export: 521.280 C.Y.
Cut to Fill Ratio: 18.62

Drill Pad Report
Top of pad elevation: 1377.0000
Cut Slope: 66.67% 1.50:1 33.69°
Fill Slope: 50.00% 2.00:1 26.57°

Pad Earthwork Volumes
Total cut : 734,713.7 C.F., 27,211.62 C.Y.
Total fill: 588,620.8 C.F., 21,800.77 C.Y.
Balance Export: 146,092.9 C.F., 5,410.85 C.Y.
Area: 161073.5 Sq.Ft., 3.698 Acres

Water Tank Pad Report
Top of pad elevation: 1377.0000
Cut Slope: 66.67% 1.50:1 33.69°
Fill Slope: 50.00% 2.00:1 26.57°

Total cut : 44,171.3 C.F., 1,635.97 C.Y.
Total fill: 221,529.1 C.F., 8,204.78 C.Y.
Balance Import: 177,357.8 C.F., 6,568.81 C.Y.
Area: 67193.4 Sq.Ft., 1.543 Acres

Spoil Pad 1 Capacity Report
Top of pad elevation: 1356.0000
Cut Slope: 66.67% 1.50:1 33.69°
Fill Slope: 50.00% 2.00:1 26.57°
Cut Swell Factor: 1.05
Fill Shrink Factor: 1.00

Pad Earthwork Volumes
Total cut : 49,445.6 C.F., 1,831.32 C.Y.
Total fill: 204,139.2 C.F., 7,560.71 C.Y.
Balance Import: 154,693.6 C.F., 5,729.39 C.Y.
Area: 40319.7 Sq.Ft., 1.063 Acres

DATE	REVISIONS
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

Allegheny Surveys, Inc.
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(304) 848-5035

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

SCHEDULE OF QUANTITIES
REVIVAL PAD
GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: N/A
Designed By: CKW/CKM
File No. Antero 216-12

CONSTRUCTION, EROSION AND SEDIMENT NOTES

CONSTRUCTION SPECIFICATIONS:

1. THE IMPOUNDMENT 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.
2. THE CONSTRUCTION DOCUMENTS SHOW THE EXISTING AND NEW GRADES AND BERMS, ETC. THAT ALL CUT AND FILL ESTIMATES ARE BASED UPON. THE ENGINEERS ESTIMATES OF THE QUANTITIES ARE ONLY ESTIMATES AND MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS.
3. 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.
4. 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.
5. 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.
6. SILT SOXX / SUPER SILT FENCE SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THE OFFICE OF OIL & GAS, W.VA. EROSION & SEDIMENT CONTROL FIELD MANUAL, MAY 2012. SURFACE WATER SHALL BE DIVERTED AWAY FROM ALL EXCAVATIONS TO PREVENT FLOODING AND SOFTENING OF THE SUBGRADE OR COMPACTED MATERIALS.
7. 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.
8. 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.
9. TOE CUTS OF 10' MINIMUM WIDE SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR THE IMPOUNDMENT BERM. ADDITIONAL TERRACING SHALL BE CONSTRUCTED FOR EACH ADDITIONAL FIFTY (50) VERTICAL FEET OF SLOPE AND SHALL BE A MINIMUM OF TEN (10) FEET WIDE.
10. PRIOR TO PLACING ANY FILL, THE EXPOSED SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNYIELDING SITE.
11. IMPOUNDMENT BERMS SHALL BE UNIFORMLY GRADED SOIL FREE FROM AGGREGATE EXCEEDING 6". THE FILL SHALL BE FREE OF ALL ORGANIC MATERIAL, STUMPS , BRUSH, OR OTHER DELETERIOUS MATTER.
12. ALL FILL SHALL BE PLACED IN LIFTS OF UP TO 12" AND SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY OF THE SOIL PER ASTM D-698. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2% OF THE OPTIMUM 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 LIFT OF SOIL AND SHALL BE DONE IN TWO RANDOM PLACES ON EACH STRAIGHT SIDE OF THE IMPOUNDMENT BERM. 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. THE CONTRACTOR MAY PROOF-ROLL THE SOIL EVERY 12" OF SOIL LIFT WITH A LOADED 15 TON TANDEM DUMP OR LARGER TRUCK. SOIL THAT DEFECTS 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 SHEEPS FOOT, OR VIBRATORY ROLLER DEPENDING ON THE TYPE OF SOIL BEING COMPACTED.
13. 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 D8 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 CONTRACTORS EXPENSE AND THE ENGINEER'S DIRECTION.
14. THE INSIDE OF THE IMPOUNDMENT SHALL BE BOTH SMOOTH DRUM ROLLED AND FREE OF PROTRUDING OR SHARP ROCKS IN ORDER TO RECEIVE THE LINER.
15. PRIOR TO THE LINER INSTALLATION THE CONTRACTOR SHALL CONTACT THE SURVEYOR TO DO AN AS-BUILT SURVEY OF THE IMPOUNDMENT TO ENSURE CONFORMANCE WITH THE ENGINEER'S DRAWINGS. THE SURVEYOR SHALL PROVIDE THE INFORMATION TO THE ENGINEER WHO WILL MAKE DETERMINATIONS ON ANY VARIATION FROM THE DRAWINGS AND DIRECT THE CONTRACTOR TO DO CORRECTIVE WORK.
16. LINER SHALL BE POLYFLEX IMPERVIOUS TEXTURED HDPE GEOMEMBRANE, 60MIL, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. THE TOP OF THE LINER SHALL BE TURNED DOWN INTO A 4' ANCHOR TRENCH AT THE TOP OF THE BERM AND BACKFILLED WITH SELECT FILL AS SHOWN ON THE DRAWINGS OR AS REQUIRED BY THE LINER MANUFACTURER.
17. 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.
18. 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.

GENERAL NOTES

1. 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.
2. WORK ON THIS PROJECT SHALL CONFORM TO THE OFFICE OF OIL & GAS, W.VA. EROSION & SEDIMENT CONTROL FIELD MANUAL, MAY, 2012. IN THE EVENT OF CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT WILL GOVERN.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED DAILY, RELOCATED WHEN NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
4. 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.
5. 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.
6. INSTALLATION OF CONCRETE, CORRUGATED METAL, OR HDPL STORM PIPE SHALL BE IN CONFORMANCE WITH THESE DRAWINGS.
7. 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.
8. 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 OPERATIONS 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.
9. FILL SHALL BE PLACED IN LIFTS AT A MAXIMUM UNCOMPACTED DEPTH OF 12-INCHES WITH SOIL FREE FROM AGGREGATES EXCEEDING 6".
10. 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.
11. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION.
12. SATISFACTORY MATERIALS FOR USE AS FILL FOR PAD AREAS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2487AS GW, GP, GM, GC, SW, SP, SM, SC, ML, AND CL GROUPS. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2% OF THE OPTIMUM 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 92LB/CF PER ASTM D-698 AND SHALL HAVE A PLASTICITY INDEX LESS THAT 17.
13. CONTRACTOR SHALL SUBMIT AND ADHERE TO A GENERAL GROUNDWATER PROTECTION PLAN.

EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL ARRANGE FOR A PRE-CONSTRUCTION CONFERENCE WITH THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK.
2. 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.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED CONTINUOUSLY, RELOCATED WHEN AND AS NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
4. ALL DISTURBED AREAS NOT PAVED OR BUILT UPON ARE TO BE FERTILIZED, SEEDED, HYDRO-SEEDED (WITH STRAW AND COTTEN PRODUCT WITH TACK AGENT) OR MULCHED BY THE CONTRACTOR IN ACCORDANCE WITH THE OFFICE OF OIL & GAS, W.VA. EROSION & SEDIMENT CONTROL FIELD MANUAL, MAY 2012.
5. 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.
6. 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.
7. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES.
8. 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.
9. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS IMPOUNDMENTS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
10. 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.
11. ALL DISTURBED AREAS NOT PAVED OR BUILT UPON SHALL BE SEEDED, SLOPE MATTED AND FERTILIZED. PERFORM PERMANENT TOP SOILING, SEEDING, FERTILIZING, AND MATTING AS SOON AFTER FINISH GRADING AS POSSIBLE. SEEDING SHALL COMPLY WITH THE FOLLOWING:
    - A. TOPSOIL - 4 INCH MINIMUM FOR PERMANENT TURF
    - B. FERTILIZER - 500 POUNDS PER ACRES OF 10-20-10 FERTILIZER OR EQUIVALENT POUNDAGE OF DIFFERENT ANALYSIS. WORK INTO SOIL PRIOR TO SEEDING.
    - C. LIME (PERMANENT SEEDING) - AGRICULTURAL LIME SPREAD AT RATE OF 4 TONS/ACRE. WORK INTO SOIL PRIOR TO SEEDING.
    - D. MULCH - WOOD FIBER OR CHOPPED STRAW AT RATE OF 2 TONS PER ACRE. HYDRO-MULCH (EAST COAST EROSION CONTROL HY-C2 OR EQUAL) AT MANUFACTURER'S RECOMMEND RATE OR 2500 LB/AC WHICHEVER IS GREATER.
    - E. SEED - 45 LBS. PER ACRE TALL FESCUE AND 20 LBS. PER ACRE PERENNIAL RYE GRASS. TO BE SEEDED BY HAND OR HYDRO-SEEDER.

EROSION AND SEDIMENT CONTROL NARRATIVE

1. 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 HARLIN, WEST VIRGINIA, IN DODDRIDGE COUNTY. THE CONSTRUCTION INCLUDES FOUR ACCESS ROADS, DRILL PAD, ONE SPOIL PADS, ONE WATER TANK PAD, STORM WATER CONTROLS, AND INCIDENTAL WORK. THE TOTAL APPROXIMATE LAND DISTURBANCE ASSOCIATED WITH THIS PROJECT IS 18.47 ACRES.
2. EXISTING SITE CONDITIONS: THE EXISTING SITE IS UPLAND HARDWOODS WITH MODERATE TO STEEP TOPOGRAPHY WITH 5% TO 50% SLOPES. NO EROSION IS NOTICED ON SITE, ON ADJOINING PROPERTIES OR IN ANY NATURAL DRAINAGE WAYS. THE SITE IS ON ONE DRAINAGE AREA.
3. ADJACENT PROPERTY: THE SITE IS BORDERED ON ALL SIDES BY UPLAND HARDWOODS.
4. SOILS: NO SOIL STUDIES OR INVESTIGATIONS WERE DONE FOR THIS PROJECT.
5. OFF SITE AREAS: THERE SHALL BE NO BORROW AREA OUTSIDE OF THE PROPOSED GRADING AND CONSTRUCTION AREA.
6. 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.
7. EROSION AND SEDIMENT CONTROL MEASURES: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE OFFICE OF OIL & GAS, W.VA. EROSION AND SEDIMENT CONTROL FIELD MANUAL, MAY 2012. THE CONTRACTOR SHALL OBTAIN A COPY OF THIS MANUAL FROM THE WVDEP 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.
8. 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.
    - -SILT SOXX/STRAW WATTLES/SUPER SILT FENCE: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
9. VEGETATIVE PRACTICE TOPSOILING: TOPSOIL WILL BE STRIPPED FROM THE SITE AND STOCKPILED IN AN AREA AS SHOWN ON THESE PLANS. 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 SEEDED WITH A FAST GERMINATING SEED. THE TIME OF YEAR WILL BE THE BASIS FOR THE SEED MIXTURE. PERMANENT SEEDING: ALL SEEDED AREAS WILL BE RESEEDED, 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.
10. 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 THE TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED DURING THIS PROCESS SHALL BE STABILIZED.
11. SEQUENCE OF EVENTS:
    - A. 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 SOON AS CLEARING AND GRUBBING OPERATIONS ALLOW. DIVERSIONS AND SEDIMENT BASINS SHALL BE SEEDED AND MULCHED IMMEDIATELY.
    - D. CLEAR AND GRUB, REMOVE TOPSOIL AND PLACE AT AN AREA DETERMINED IN THE FIELD WHERE EROSION WILL NOT TAKE PLACE. TOPSOIL STOCKPILE TO BE SEEDED AND MULCHED. SILT FENCE SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES.
    - E. GRADING OPERATIONS AS REQUIRED. CUT SLOPES AND FILL SLOPES SHALL BE TOPSOILED IF 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 3% - GRASS LINED, 3 TO 9% - JUTE MATTING, AND 9% OR GREATER -TRM.
    - F. 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.
    - G. WHEN FINAL GRADE IS ACHIEVED, TOPSOIL 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 SOILS SAMPLE IS TAKEN THE FOLLOWING RATES SHOULD BE APPLIED AS A MINIMUM: LIME AT A RATE OF 4 TONS PER ACRE. FERTILIZE AT A RATE OF 600 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.
    - H. LIME, FERTILIZER, AND SEED WILL BE APPLIED BY HAND OR USING A HYDRO-SEEDER. HYDRO-MULCH PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
    - I. FINAL SEEDING MUST OCCUR WITHIN 7 DAYS OF FINAL GRADING.
    - J. WHEN SITE IS STABILIZED WITH ESTABLISHED TURF GREATER THAN 70%, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPAIR/STABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.
    - K. MAKE MODIFICATIONS FOR PERMANENT STORM WATER MANAGEMENT.
    - L. FINAL SITE INSPECTION.
12. 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.
13. 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 ON THE SITE IN A MANNER WHERE IT IS NOT LIKELY TO ERODE IN THIS FUTURE. CLEANING PROCEDURES WILL BE COMPLETED AT REGULAR INTERVALS AND AT LEAST WHEN SEDIMENT REACHES CLEAN OUT LEVELS SHOWN. RECORDS OF CLEANING AND CORRECTIONS WILL BE MAINTAINED BY THE CONTRACTOR. THE "DEMERIC 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 CONTRACTORS 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
2-20-13	Updated Construction Notes per WVDEP Comments
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

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EMAIL: EMAG@INTLINK.NET

L&W Enterprises Incorporated

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

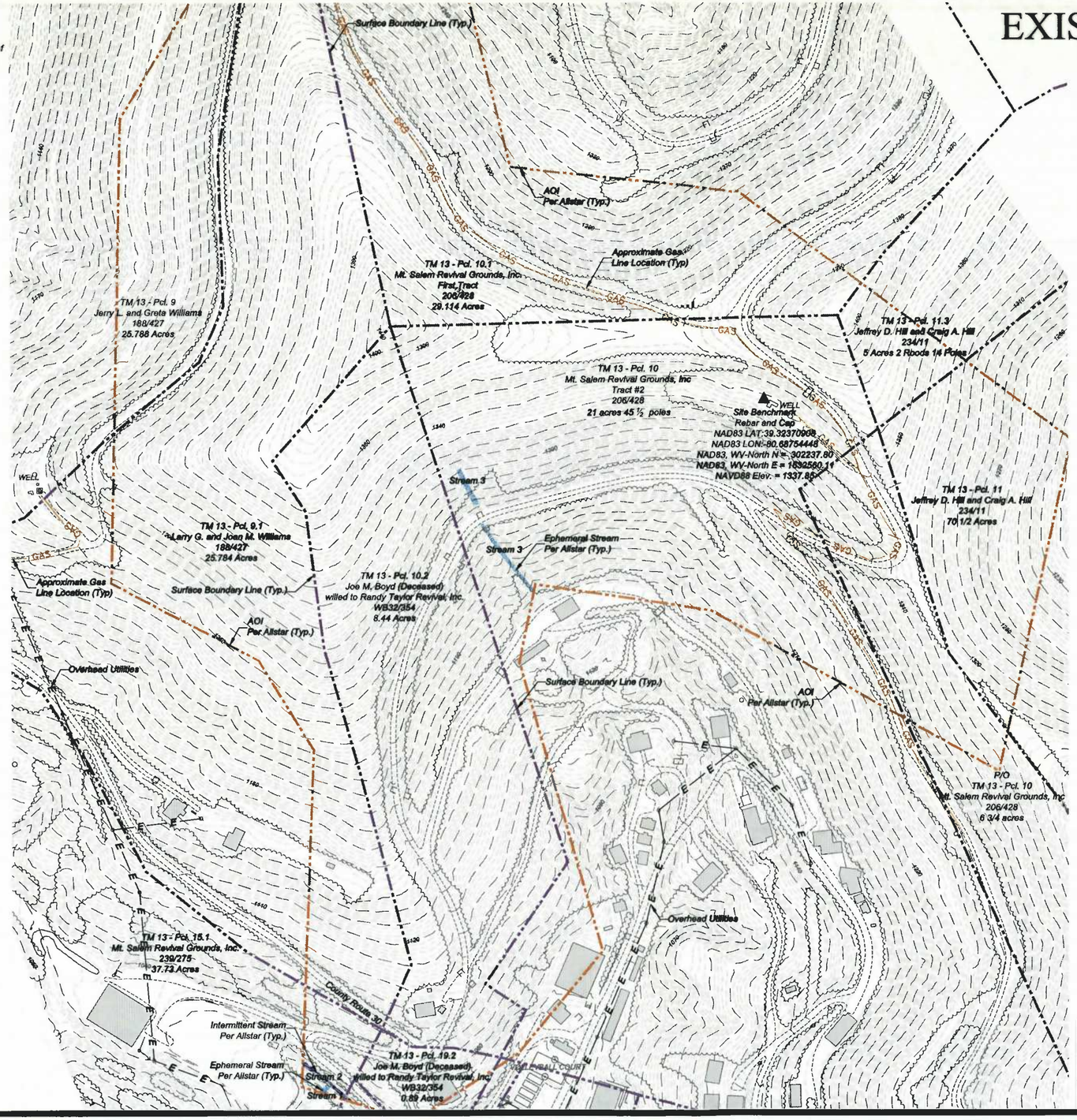
CONSTRUCTION, EROSION AND SEDIMENT NOTES

REVIVAL PAD
GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: N/A
Designed By: CKW/CKM
File No. Antero 216-12

EXISTING CONDITIONS

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



0 100 200 300

Legend

- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Pole / Line
- Existing Gas Line CL

NOTE: All surface boundary line shown hereon are based on current Deeds and boundary evidence collected with mapping grade GPS receivers.

DATE	REVISIONS
11-29-12	Updated Property Owner Information

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

EXISTING CONDITIONS

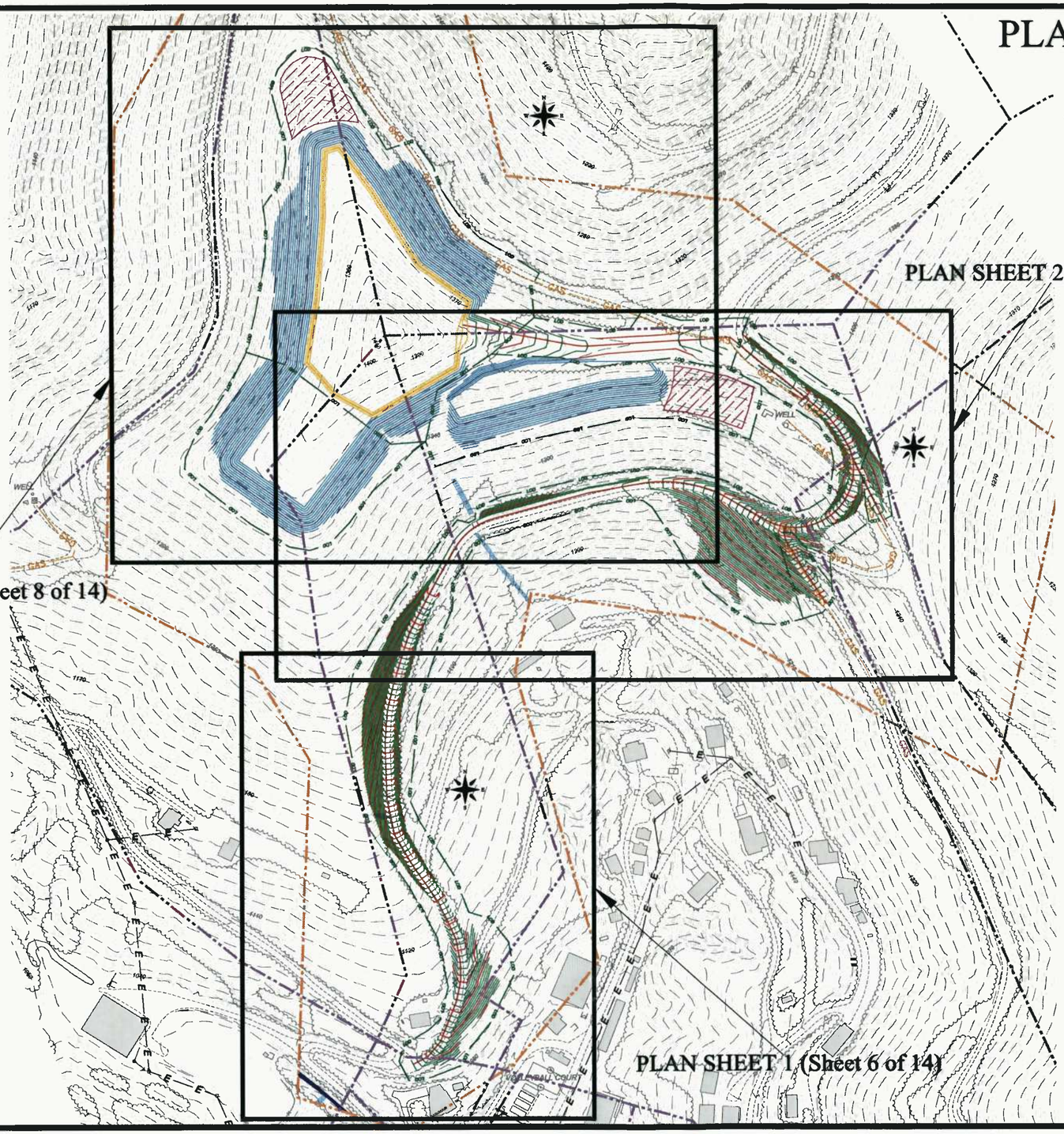
REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 100'
Designed By: CKW/CKM
File No. Antero 216-12
Page 4 of 14

PLAN SHEET INDEX

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



N W E S

0 100 200 300

Legend

- *Existing 2' Contour*
- *Existing 10' Contour*
- *Existing Tree Line*
- *Existing Utility Pole / Line*
- GAS *Existing Gas Line CL*

NOTE: All surface boundary line shown hereon are based on current Deeds and boundary evidence collected with mapping grade GPS receivers.

DATE	REVISIONS
2-25-13	Changed Frac Pit to Tank Pad

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

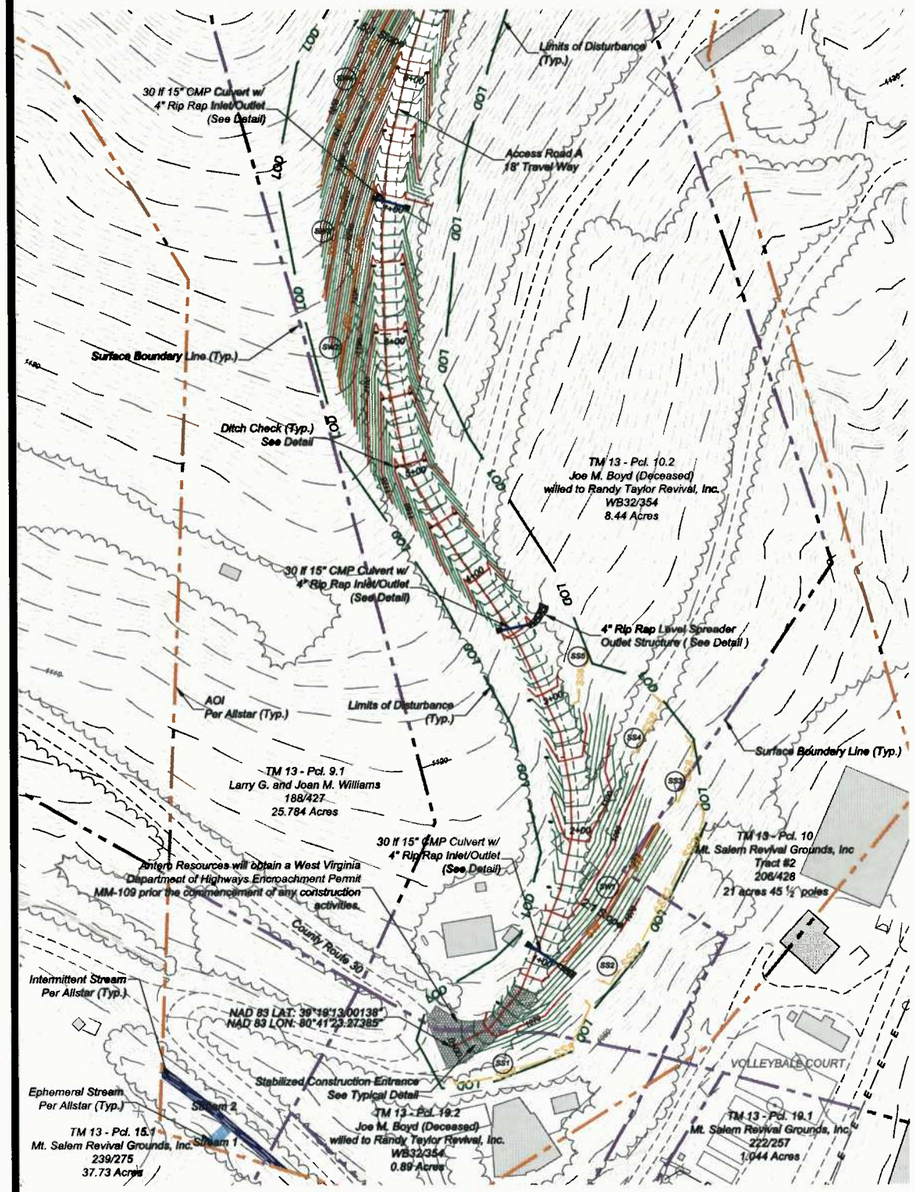
PLAN SHEET INDEX

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

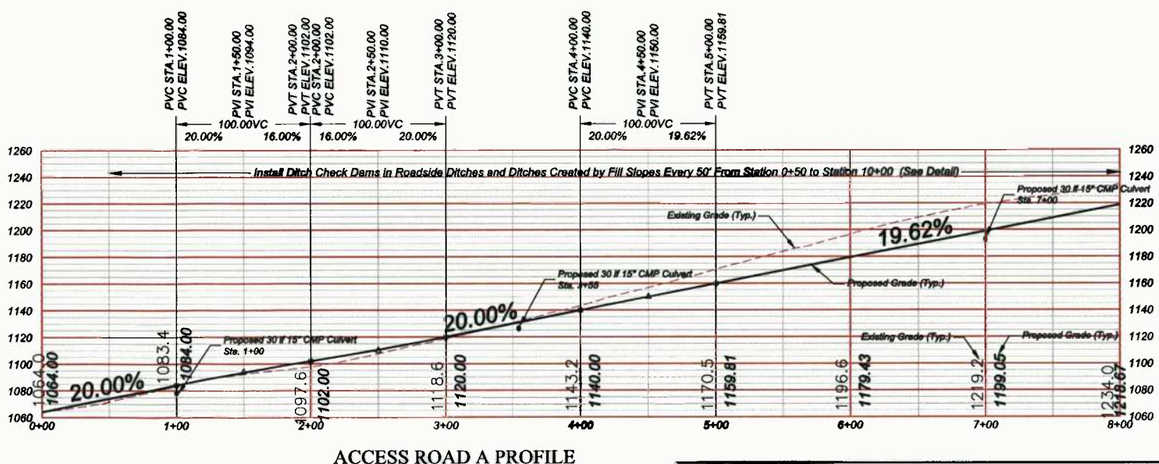
Date: 10/8/12
Scale: 1" = 100'
Designed By: CKW/CKM
File No. Antero 216-12
Page 5 of 14

SITE PLAN (1) - ACCESS ROAD A STA: 0+00 - 8+00



N W E S

0' 50' 100' 150'



ACCESS ROAD A PROFILE

Horizontal & Vertical Scale: 1" = 50'

0' 50' 100' 150'

LINED DITCH TREATMENT vs SLOPE of DITCH
Line with Seed & Mulch if slope is less than 3%
Line with Jute Matting if slope is greater than 3% less than 9%
Line with turf reinforcment matting (TRM) if slope is greater than 9%
*Turf reinforcment matting shall be Excelisor Recyclex or Landlok TRM 435 or equal

Legend

- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- E — E — Existing Utility Line / Pole
- Surface Owner Property Line
- GAS — Existing Gas Line CL
- LOD — Limits of Disturbance
- Proposed Diversion Ditch
- Proposed 2' Contour
- Proposed 10' Contour
- SF — Proposed Super Silt Fence
- Proposed Check Dam
- Proposed Culvert W/ Inlet & Outlet Protection
- SW — Proposed Straw Wattles
- SSXX — Proposed Silt Soxx w/ Diameter
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Rip-Rap

* Silt Soxx Diameter in Inches
* Super Silt Fence Can be Substituted for Silt Soxx of any Size

DATE	REVISIONS
11-29-12	Updated Property Owner Information
4-9-13	Updated Per New Antero Standards

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

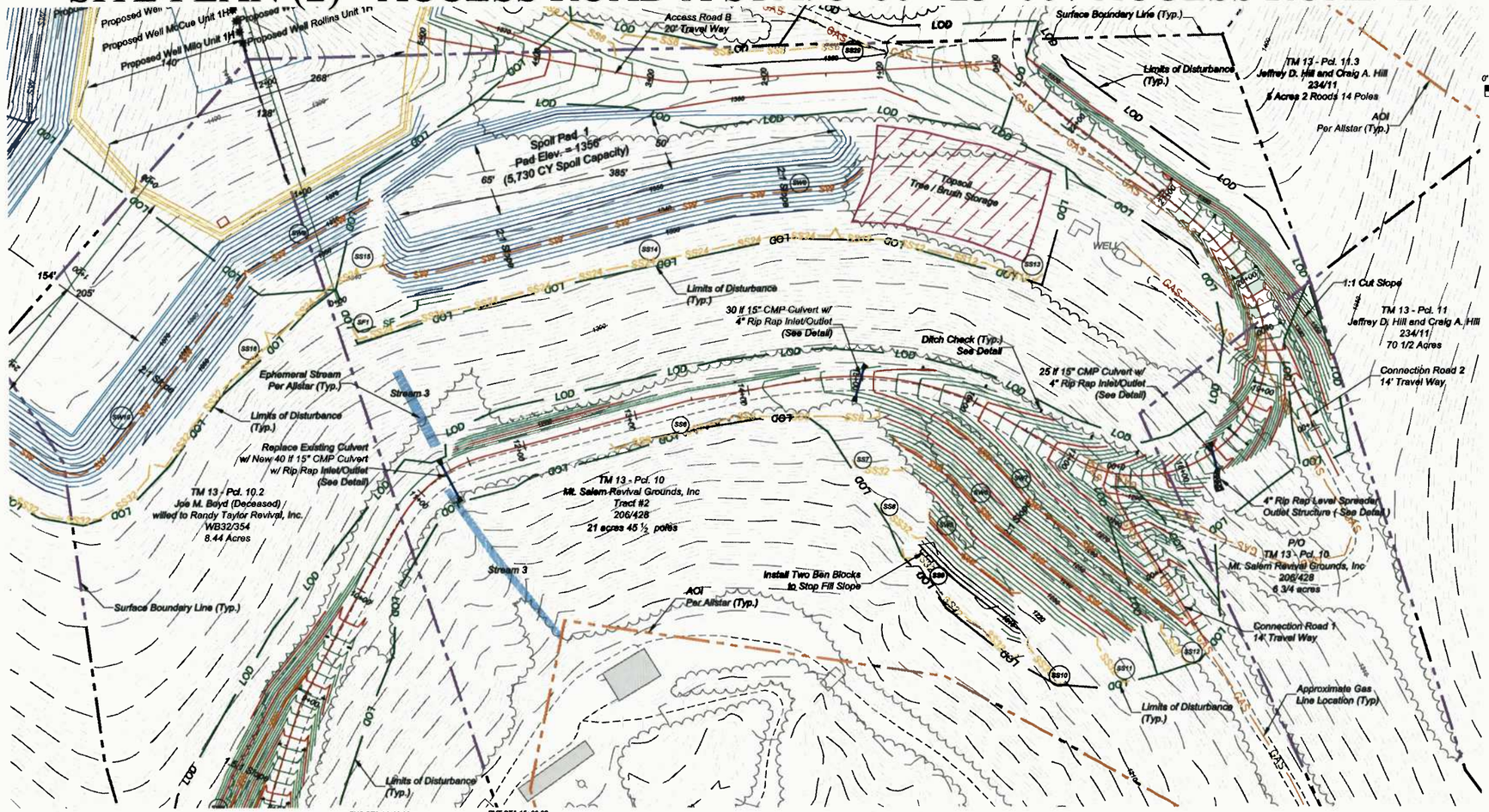
SITE PLAN (1) - ACCESS ROAD A STA: 0+00 - 8+00

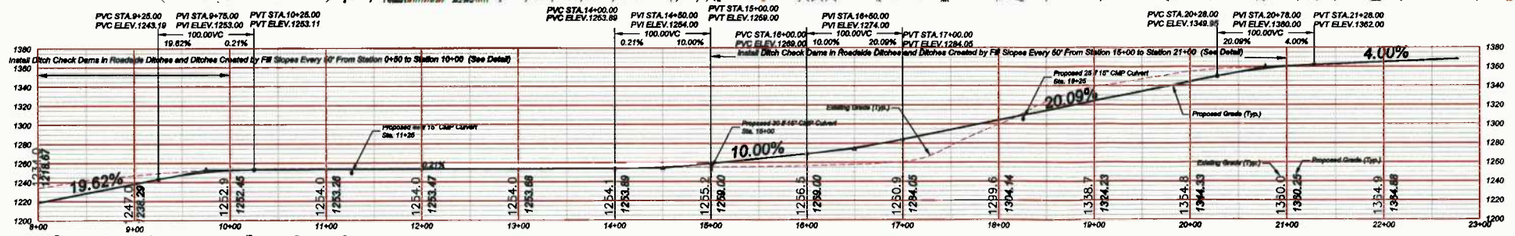
REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 50'
Designed By: CKW/CKM
File No. Antero 216-12
Page 6 of 14

SITE PLAN (2) - ACCESS ROAD A STA: 8+00 - 23+00 / ACCESS ROAD B



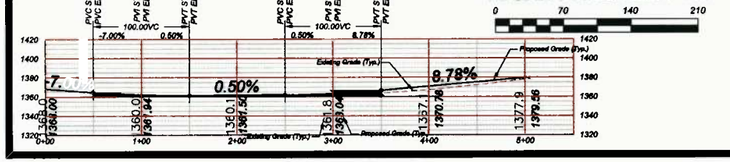


ACCESS ROAD A PROFILE

Horizontal & Vertical Scale: 1" = 70'

0 70 140 210

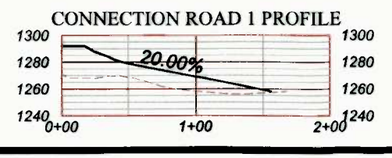
LINED DITCH TREATMENT vs SLOPE of DITCH
Line with Seed & Mulch if slope is less than 3%
Line with Jute Matting if slope is greater than 3% less than 9%
Line with turf reinforcment matting (TRM) if slope is greater than 9%
**Turf reinforcment matting shall be Excelsior Recyclex or Landlok TRM 435 or equal*



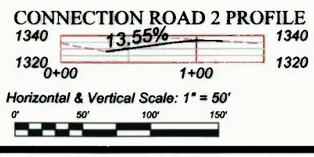
ACCESS ROAD B PROFILE

Horizontal & Vertical Scale: 1" = 70'

0 70 140 210



CONNECTION ROAD 1 PROFILE



CONNECTION ROAD 2 PROFILE

Horizontal & Vertical Scale: 1" = 50'

0' 50' 100' 150'

Legend

- Existing 2' Contour
- Existing 10' Contour
- Existing Tree Line
- Existing Utility Line / Pole
- Surface Owner Property Line
- Existing Gas Line CL
- Limits of Disturbance
- Proposed Diversion Ditch
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Super Silt Fence
- Proposed Check Dam
- Proposed Culvert W/ Inlet & Outlet Protection
- Proposed Straw Wattles
- Proposed Silt Soxx w/ Diameter
- Proposed 2' Contour
- Proposed 10' Contour
- Proposed Rip-Rap

* Silt Soxx Diameter in Inches
* Super Silt Fence Can be Substituted for Silt Soxx of any Size

DATE	REVISIONS
11-29-12	Updated Property Owner Information
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

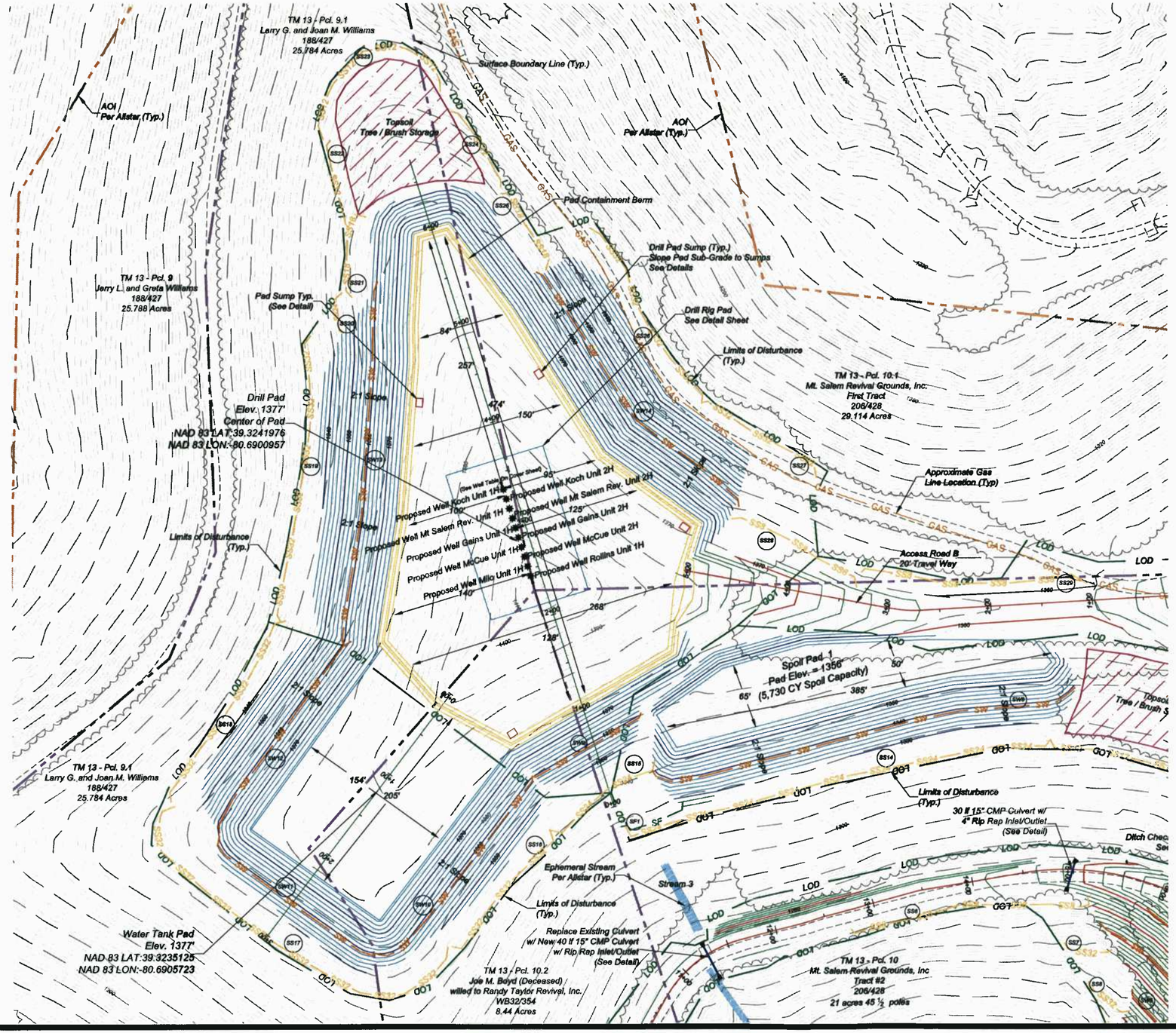
SITE PLAN (2) - ACCESS ROAD A STA: 8+00 - 23+00 / ACCESS ROAD B

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 50' / 70'
Designed By: CKW/CKM
File No. Antero 216-12
Page 7 of 14

SITE PLAN (3)



Legend

Existing 2' Contour	Proposed Check Dam
Existing 10' Contour	Proposed Culvert W/ Inlet & Outlet Protection
Existing Tree Line	Proposed Straw Wattles
Existing Utility Line / Pole	Proposed Silt Soxx w/ Diameter
Surface Owner Property Line	Proposed 2' Contour
Existing Gas Line CL	Proposed 10' Contour
Limits of Disturbance	Proposed Rip-Rap
Proposed Diversion Ditch	* Silt Soxx Diameter in Inches
Proposed 2' Contour	* Super Silt Fence Can be Substituted for Silt Soxx of any Size
Proposed 10' Contour	
Proposed Super Silt Fence	

DATE	REVISIONS
11-29-12	Updated Property Owner Information
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

SITE PLAN (3)

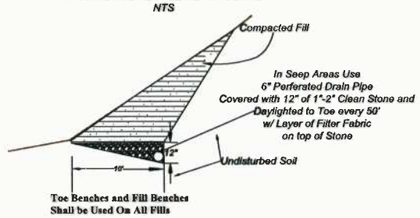
REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

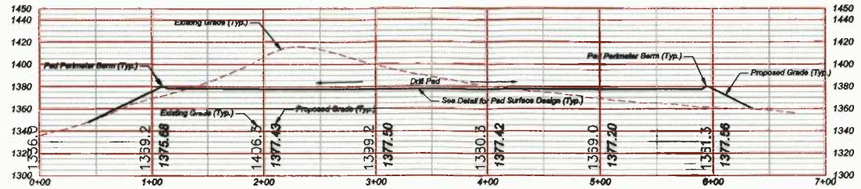
Date: 10/8/12
Scale: 1" = 50'
Designed By: CKW/CKM
File No. Antero 216-12
Page 8 of 14

DRILL PAD BASELINE
PROFILE AND CROSS SECTIONS

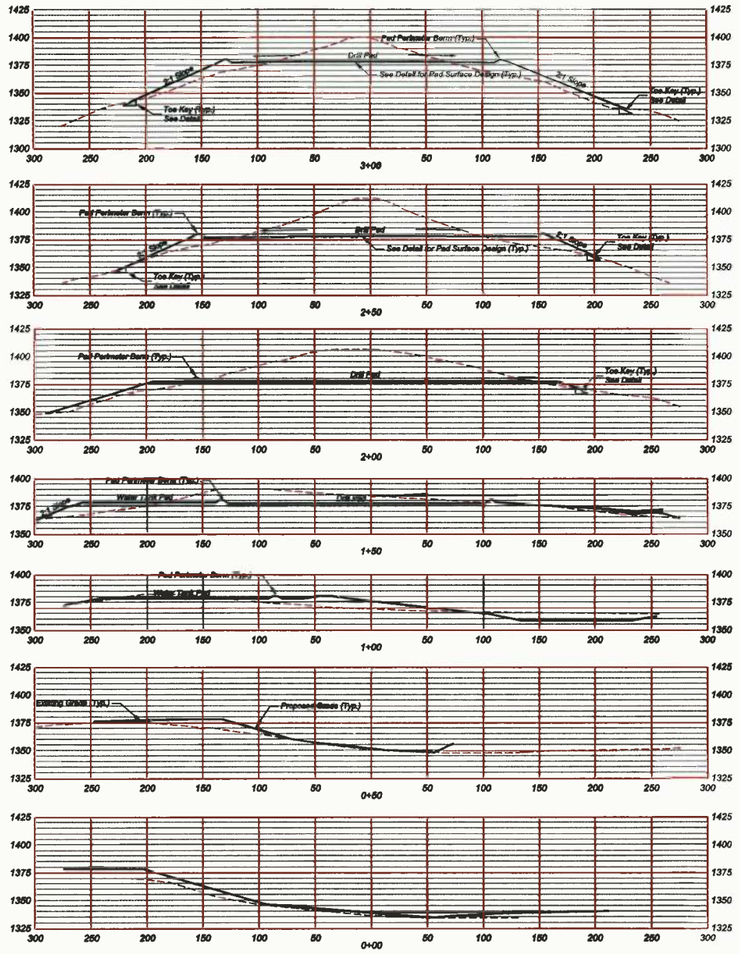
TYPICAL TOE KEY/FILL BENCH DETAIL
NTS

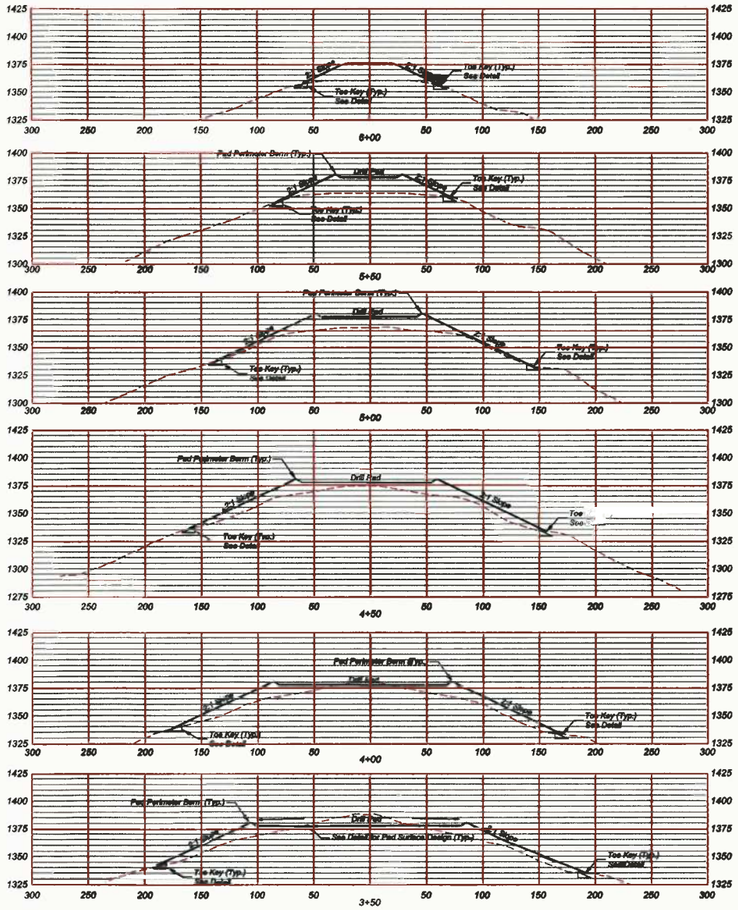


Toe Benches and Fill Benches Shall be Used On All Fills



PROFILE





CROSS SECTIONS

Horizontal & Vertical Scale: 1" = 60'

0 60 120 180

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

DRILL PAD BASELINE
PROFILE AND CROSS SECTIONS

REVIVAL PAD

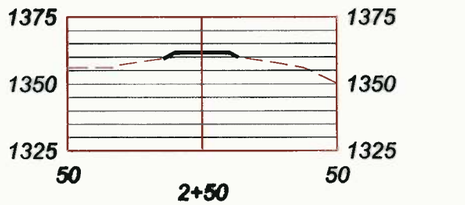
GRANT DISTRICT
DODDRIDGE COUNTY, WV

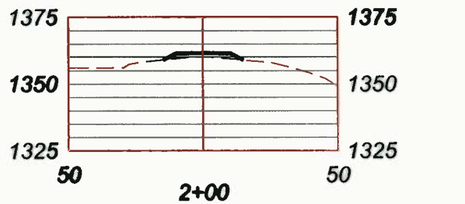
DATE	REVISIONS
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

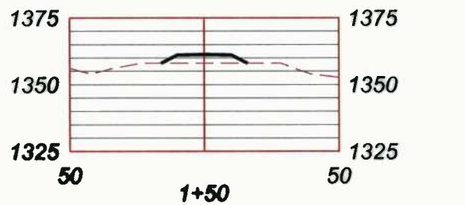
Date: 10/8/12
Scale: 1" = 60'
Designed By: CKW/CKM
File No. Antero 216-12

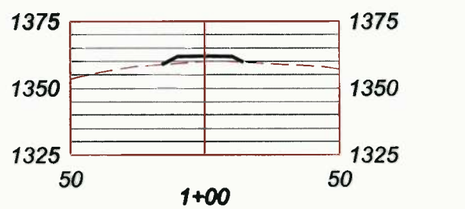
ACCESS ROAD B, 1, & 2 CROSS SECTIONS

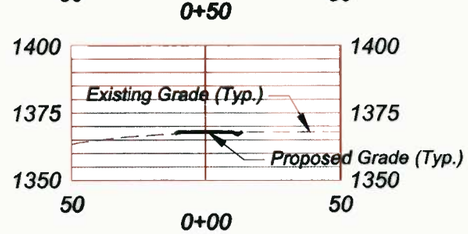
ACCESS ROAD B

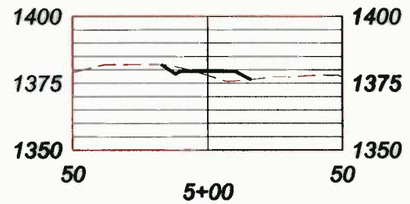


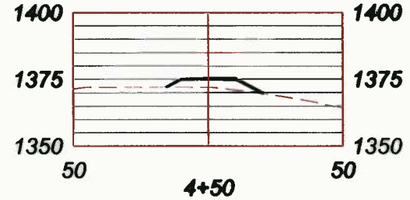


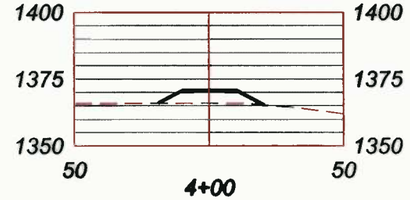


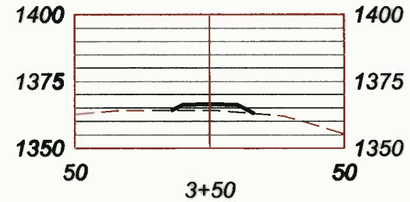




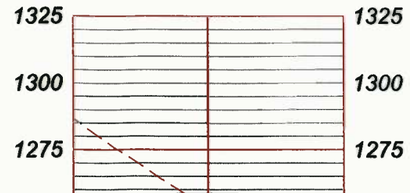


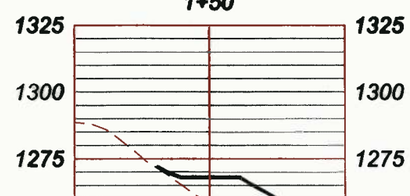


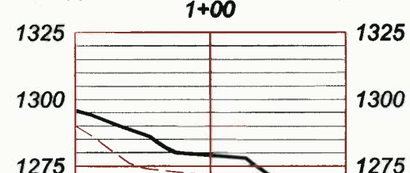


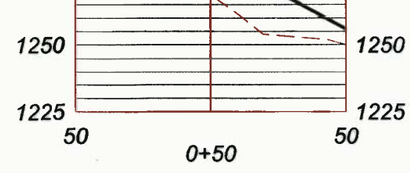


ACCESS ROAD 1









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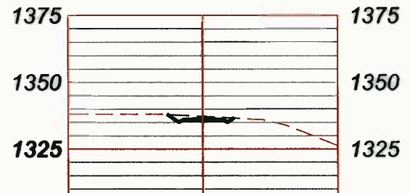
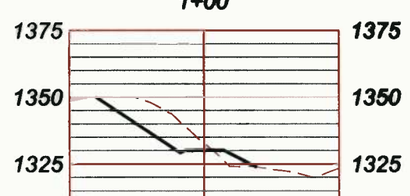
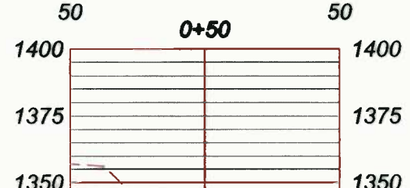
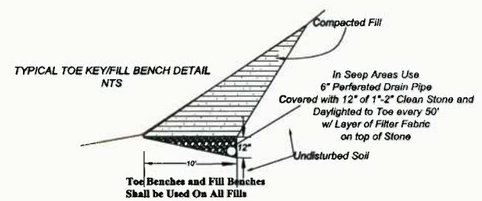








CROSS SECTIONS

Horizontal & Vertical Scale: 1" = 25'

0 25 50 75

DATE	REVISIONS
4-9-13	Updated Per New Antero Standards

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

L&W ENTERPRISES, INC.
PO BOX 326
14 SOUTH GROVE ST.
PETERSBURG, WV 26847
PH: 304-257-4818
FAX: 304-257-2234
EMAIL: LWE@FLTLINK.NET

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

ACCESS ROAD B, 1, & 2 CROSS SECTIONS

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12

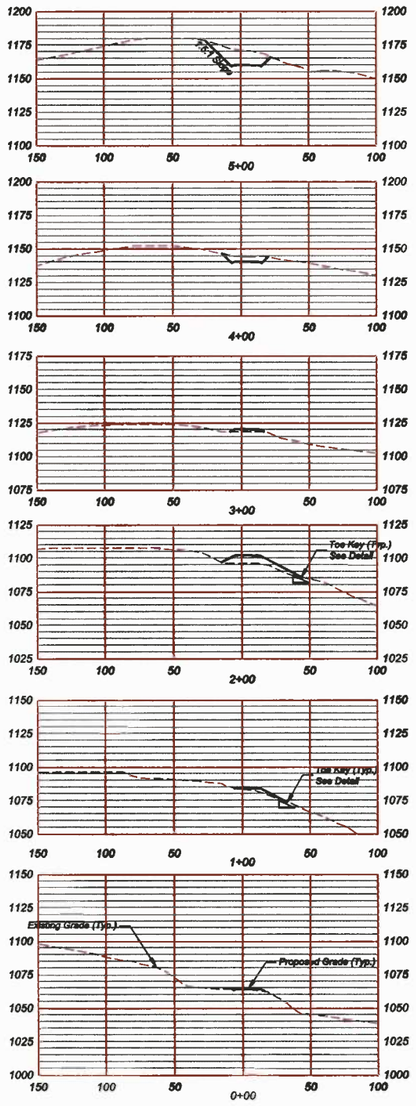
Scale: 1" = 25'

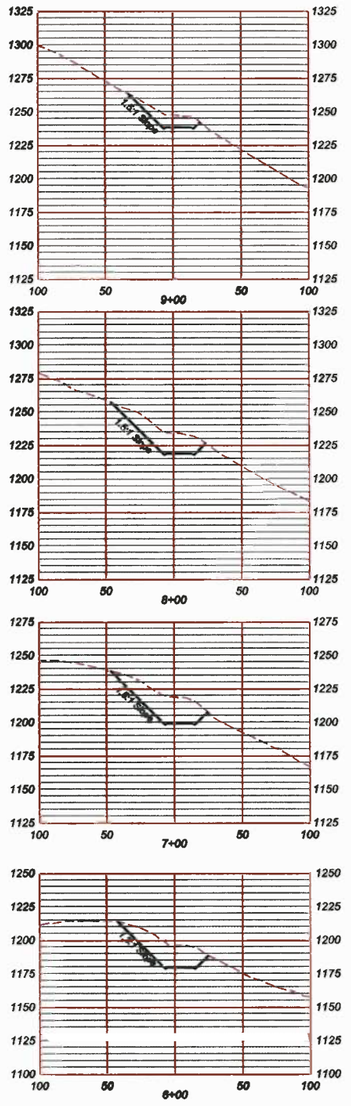
Designed By: CKW/CKM

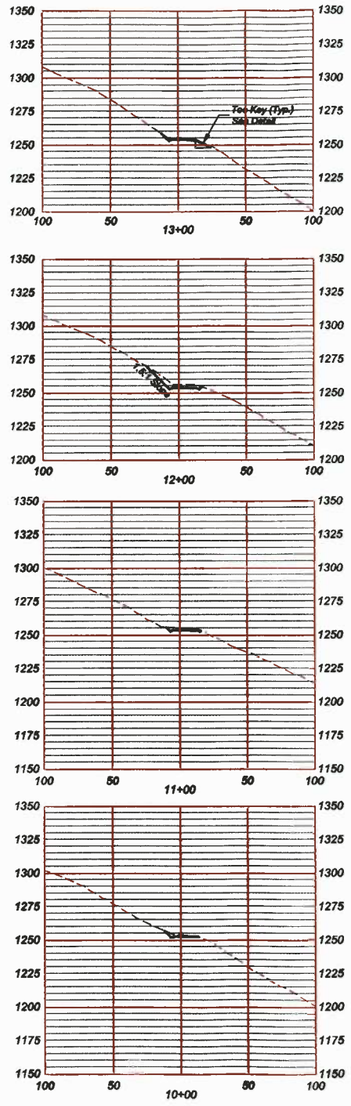
File No. Antero 216-12

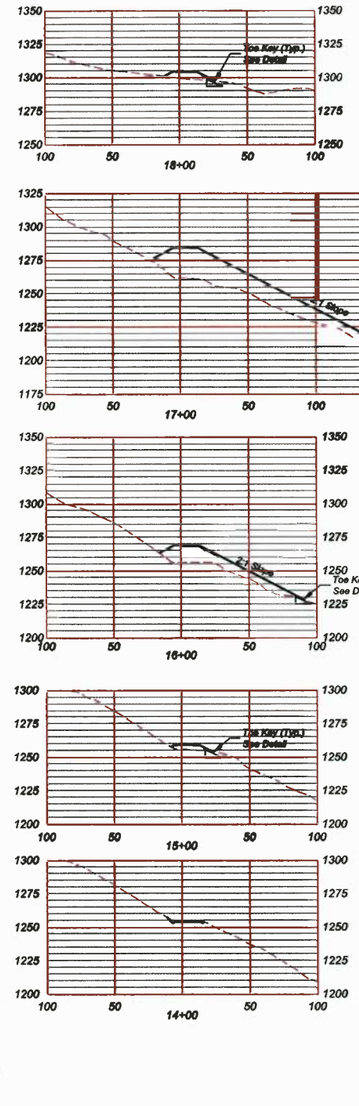
Page 12 of 14

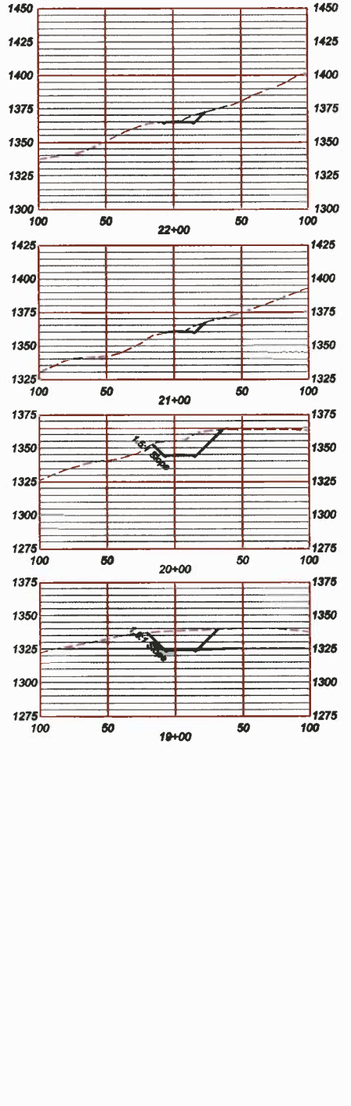
ACCESS ROAD A CROSS SECTIONS

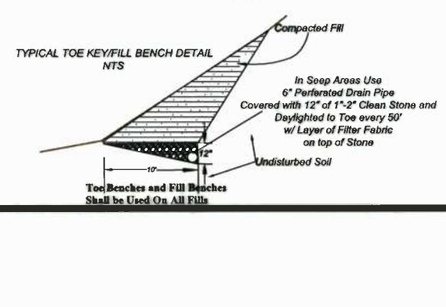












CROSS SECTIONS

Horizontal & Vertical Scale: 1" = 50'

0' 50' 100' 150'

DATE	REVISIONS
4-9-13	Updated Per New Antero Standards

Allegheny Surveys, Inc.
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NO. 12483
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PROFESSIONAL ENGINEER

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

ACCESS ROAD A CROSS SECTIONS

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

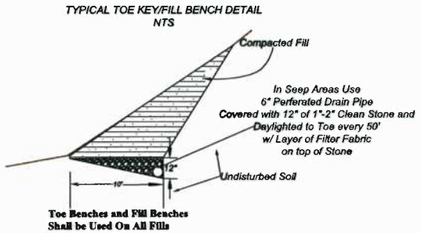
Date: 10/8/12

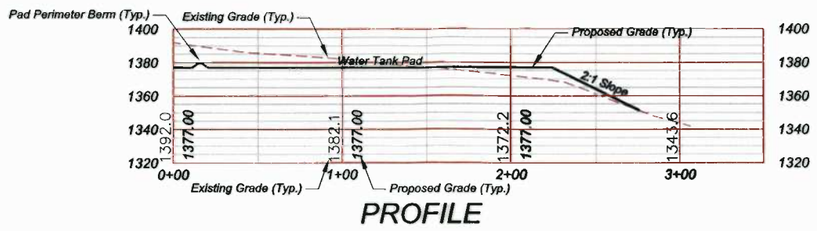
Scale: 1" = 50'

Designed By: CKW/CKM

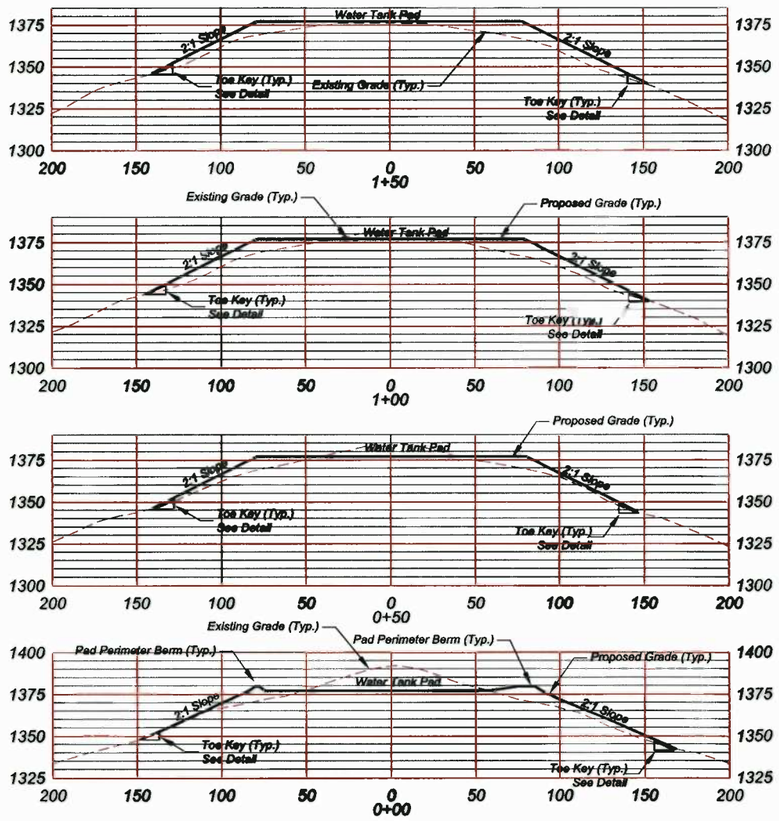
File No. Antero 216-12

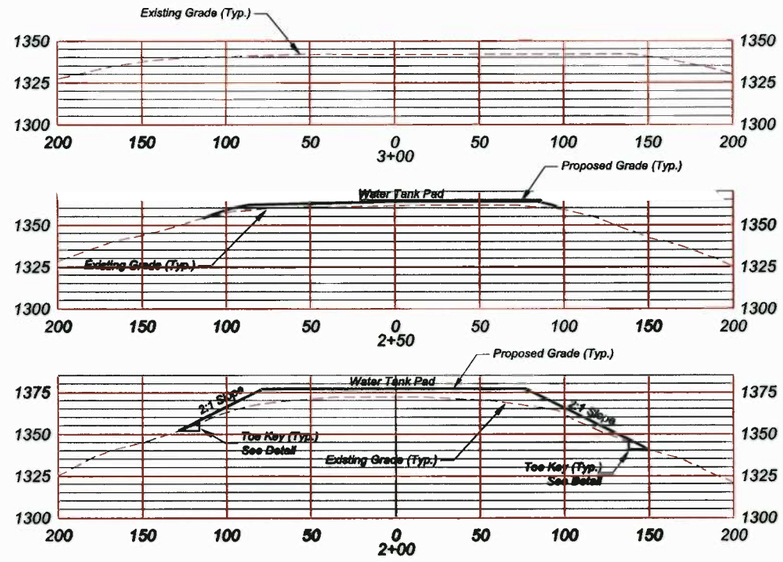
WATER TANK PAD BASELINE
PROFILE AND CROSS SECTIONS





PROFILE





CROSS SECTIONS

Horizontal & Vertical Scale: 1" = 40'

0 40 80 120

DATE	REVISIONS
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

Allegheny Surveys, Inc.
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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

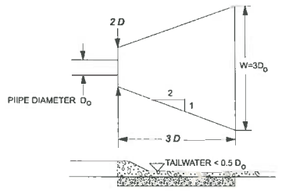
WATER TANK PAD BASELINE PROFILE AND CROSS SECTIONS

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 40'
Designed By: CKW/CKM
File No. Antero 216-12

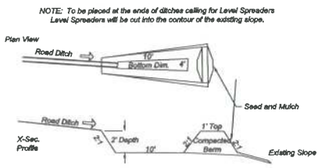
DETAILS



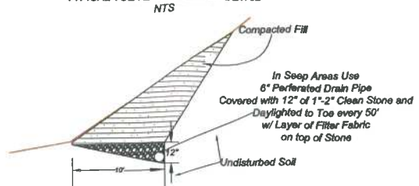
RIP RAP ARPRON OUTLET PROTECTION MINIMUM TAILWATER CONDITION

LEVEL SPREADER DETAIL
NTS

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.

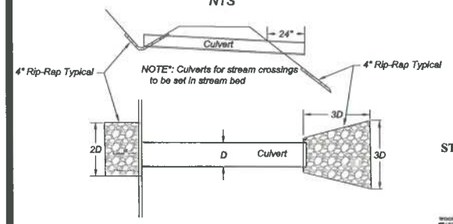


TYPICAL TOE KEY/FILL BENCH DETAIL
NTS

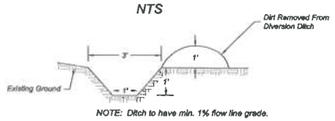


Toe Benches and Fill Benches Shall be Used On All Fills

TYPICAL CULVERT & CULVERT INLET AND OUTLET PROTECTION DETAIL
NTS

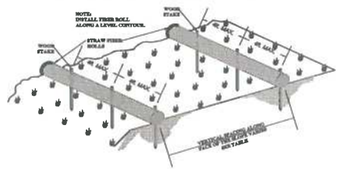


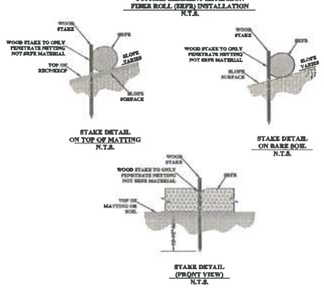
DIVERSION DITCH DETAIL
NTS

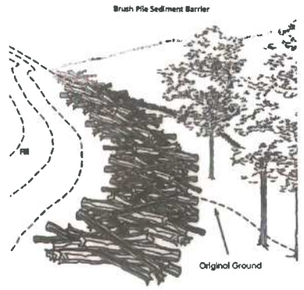


NOTE: Ditch to have min. 1% flow line grade.

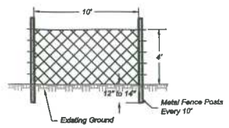
STRAW WATTLE SEDIMENT RETENSION FIBER ROLL (SRFR) INSTALLATION



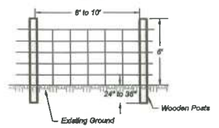




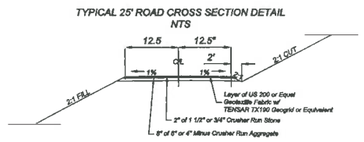
TYPICAL CONSTRUCTION FENCE DETAIL
NTS



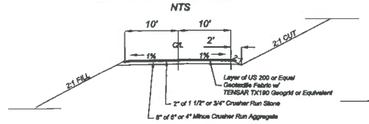
TYPICAL WOVEN WIRE FENCE DETAIL
NTS



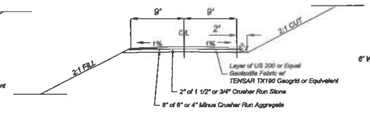
TYPICAL 25' ROAD CROSS SECTION DETAIL
NTS



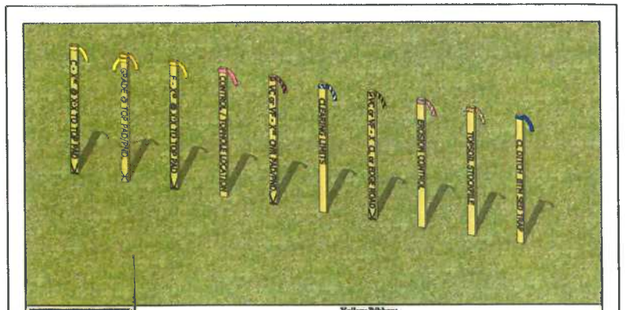
TYPICAL 20' ROAD CROSS SECTION DETAIL
NTS



TYPICAL 18' ROAD CROSS SECTION DETAIL
NTS

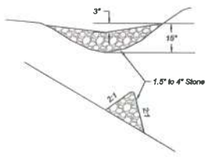


ANTERO RESOURCES
STANDARD RIBBON
COLOR SCHEME

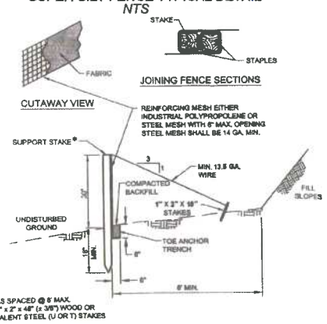


	Yellow Ribbon: Yellow Ribbon used to indicate top of Cuts (C) Cut to be determined at time of stakeout Slope determined by site design
	Yellow & Orange Ribbon: Yellow and Orange Ribbon used to indicate Grade at Top of Pad/Pond/Pit
	Orange Ribbon: Orange Ribbon used to indicate toes of Fills (F) Fill to be determined at time of stakeout Slope determined by site design
	Pink Ribbon: Pink Ribbon used to indicate Top Hole Location Pink Ribbon used to indicate Survey Control Location
	Pink & Black Stripe Ribbon: Pink & Black Stripe Ribbon used to indicate Vertical Cut (VC) at Pad/Pond/Pit corner or edge Pink & Black Stripe Ribbon used to indicate Vertical Fill (VF) at Pad/Pond/Pit corner or edge Vertical Cut/Vertical Fill to be determined at time of stakeout
	Blue & White Stripe Ribbon: Blue & White Stripe Ribbon used to indicate clearing limits/construction limits
	Orange & Black Stripe Ribbon: Orange & Black Stripe Ribbon used to indicate Vertical Cut (VC) at Centerline or edge of access road Orange & Black Stripe Ribbon used to indicate Vertical Fill (VF) at centerline or edge of access road
	Pink & White Stripe Ribbon: Pink & White Stripe Ribbon used to indicate Erosion and Sediment Control Structures Silt Fence (SF) Reinforced Filter Fence (RFF) Super Silt Fence (SSF) Filter Sock (FS)
	Orange & White Stripe Ribbon: Orange & White Stripe Ribbon used to indicate Topsoil Stockpile Locations
	Blue Ribbon: Blue Ribbon used to indicate Centerline (℄) Ditch Blue Ribbon used to indicate Bottom (BTM) Sediment Traps

DITCH CHECK DAM DETAIL
SPACING AS INDICATED ON PROFILES
NTS

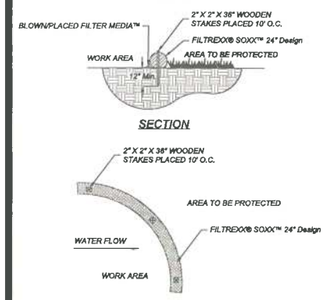


SUPER SILT FENCE TYPICAL DETAIL
NTS



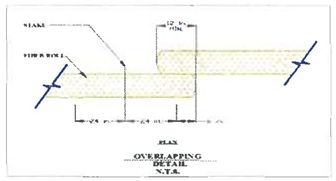
* STAKES SPACED @ 6' MAX. USE 2" x 2" x 48" (4 3/8") WOOD OR EQUIVALENT STEEL (U OR T) STAKES

FILTREXX "SOXX" 24" FILTER SOCK DETAIL
NTS

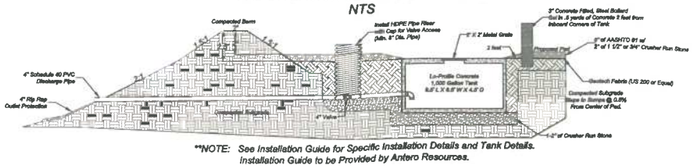


NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTER MEDIA™ FILL TO MEET APPLICATION REQUIREMENTS.

SILT SOXX STAKE OUT

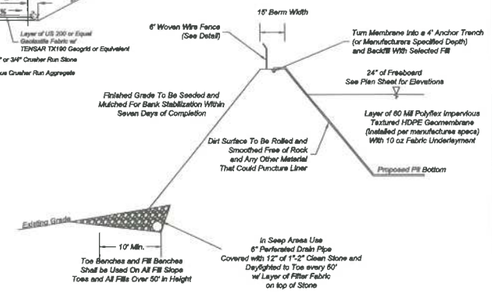


PAD DIVERSION BERM & SUMP DETAIL
NTS

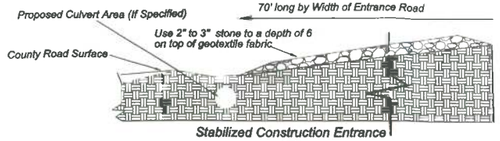


**NOTE: See Installation Guide for Specific Installation Details and Tank Details. Installation Guide to be Provided by Antero Resources.

TYPICAL EMBANKMENT DETAIL

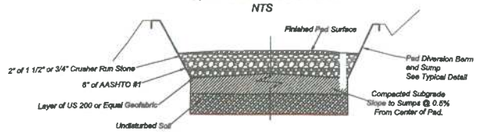


Proposed Culvert Area (If Specified)
70' long by Width of Entrance Road
Use 2" to 3" stone to a depth of 6 on top of geotextile fabric
County Road Surface



Stabilized Construction Entrance
NTS

Typical Pad Cross-Section
NTS



DATE	REVISIONS
2-20-13	Updated Sump Detail
4-9-13	Updated Per New Antero Standards

Date: 10/8/12
Scale: N/A
Designed By: CKW/CKM
File No. Antero 216-12
Page 13 of 14

Allegheny Surveys, Inc.
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ANTERO RESOURCES

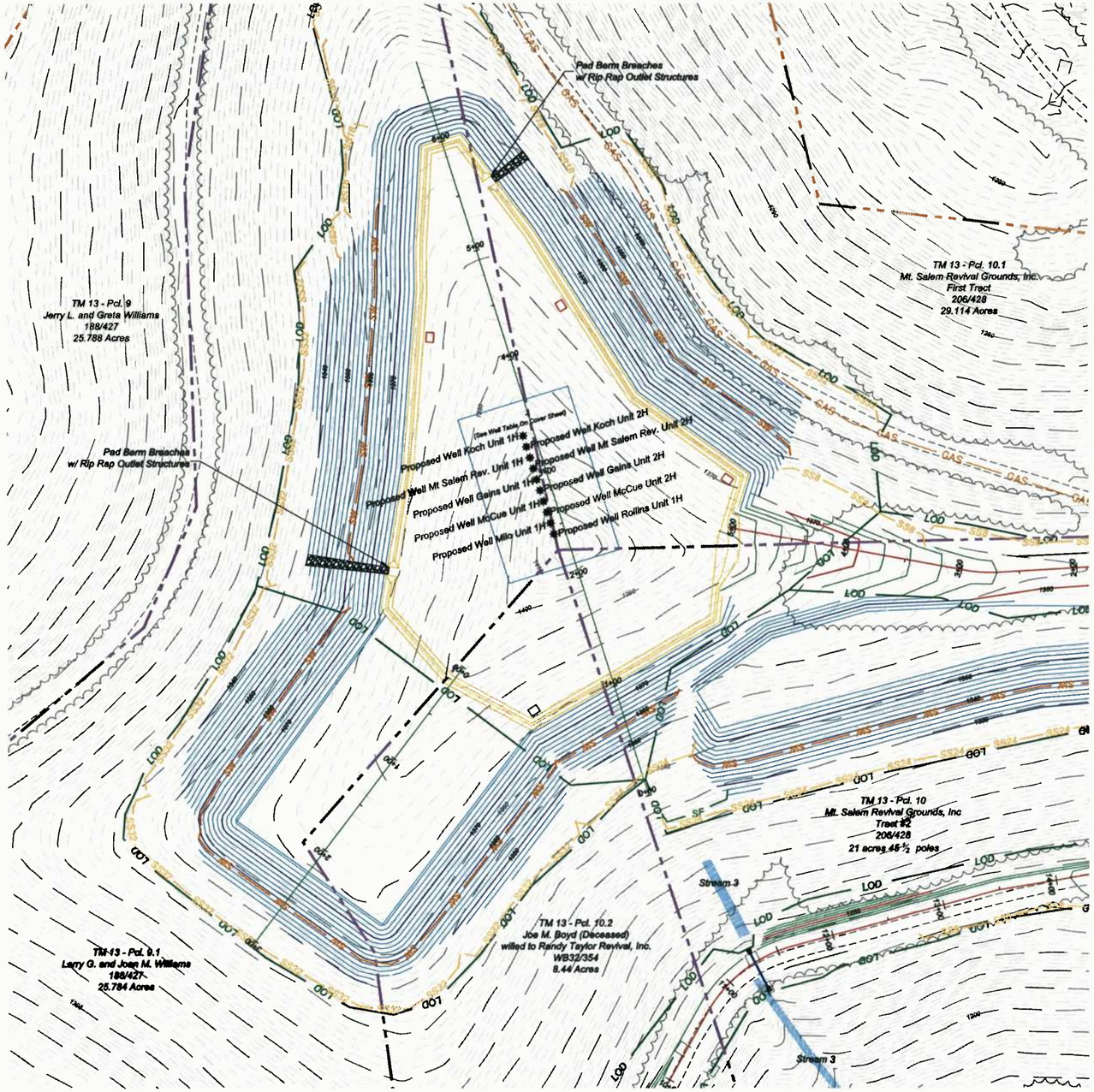
THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

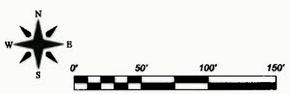
DETAILS

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

RECLAMATION PLAN





RECLAIMATION CONSTRUCTION SPECIFICATIONS:

1. THE IMPOUNDMENT SHALL BE RECLAIMED TO LANDOWNERS 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 PLACEMENTS 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. 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.
6. TOE CUTS OF 10' MINIMUM WIDE SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR THE IMPOUNDMENT BERM. 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 18" AND SHALL BE COMPACTED TO 90% OF THE STANDARD PROCTOR DENSITY OF THE SOIL PER ASTM D-698. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2% OF THE OPTIMUM TO FACILITATE COMPACTION. THE CONTRACTOR SHALL DO IN-PLACE DENSITY TESTS EVERY LIFT OF SOIL AND SHALL BE DONE IN TWO RANDOM PLACES ON EACH STRAIGHT SIDE OF THE IMPOUNDMENT BERM. 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 MODIFIED PROCTOR TESTING, THE CONTRACTOR MAY PROOF-ROLL THE SOIL EVERY 12" OF SOIL LIFT WITH A LOADED 15 TON TANDEM DUMP TRUCK. SOIL THAT DEFECTS 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 SHEEPS FOOT, OR VIBRATORY ROLLER.
9. TOP SOIL SHALL BE PLACED ON THE FINAL SURFACE AND TRACKED IN WITH DOZERS ONLY AND FERTILIZED, LIMED, SEEDED AND MULCHED AT RATES ESTABLISHED ON SHEET 3 OF THESE PLANS. THE SITE SHALL BE MAINTAINED AND MANAGED TO ESTABLISH A UNIFORM TURF UNTIL 70% OF THE AREA IS ESTABLISHED. AFTER FINAL INSPECTION, ALL E&S CONTROLS SHALL BE REMOVED AND ANY DISTURBED AREAS RESEEDED AND MULCHED.
10. 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 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 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 CONTRACTORS 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.
11. SEQUENCE OF EVENTS:
    - A. 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.
    - G. WHEN FINAL GRADE IS ACHIEVED, TOPSOIL 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 SOILS SAMPLE IS TAKEN THE FOLLOWING RATES SHOULD BE APPLIED AS A MINIMUM: LIME AT A RATE OF 4 TONS PER ACRE. FERTILIZE AT A RATE OF 500 LBS. OF 10-20-10 PER ACRE. SEED WITH 46 LBS. PER ACRE OF TALL FESCUE AND 20 LBS. PER ACRE OF PERENNIAL RYE GRASS.
    - H. LIME, FERTILIZER, AND SEED WILL BE APPLIED BY HAND OR USING A HYDRO-SEEDER. HYDRO-MULCH PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
    - I. FINAL SEEDING MUST OCCUR WITHIN 7 DAYS OF FINAL GRADING.
    - J. WHEN SITE IS STABILIZED, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPAIR/STABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.
    - K. MAKE MODIFICATIONS FOR PERMANENT STORM WATER MANAGEMENT.
    - L. FINAL SITE INSPECTION.
12. 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.

*NOTE: No additional site grading is required for site reclamation

*NOTE: An additional 20 tons of 4" Rip Rap is required for pad outlet structures.

Legend

Existing 2' Contour	Proposed Check Dam
1330 Existing 10' Contour	Proposed Culvert W/ Inlet & Outlet Protection
Existing Tree Line	SW Proposed Straw Wattles
E E Existing Utility Line / Pole	SSXX Proposed Silt Soxx w/ Diameter
Surface Owner Property Line	Proposed 2' Contour
GAS Existing Gas Line CL	1330 Proposed 10' Contour
LOD Limits of Disturbance	Proposed Rip-Rap
Proposed Diversion Ditch	* Silt Soxx Diameter in Inches
Proposed 2' Contour	* Super Silt Fence Can be Substituted for Silt Soxx of any Size
1330 Proposed 10' Contour	
SF Proposed Super Silt Fence	

DATE	REVISIONS
11-29-12	Updated Property Owner Information
2-20-13	Reclamation Note Addition per WVDEP Comments
2-25-13	Changed Frac Pit to Tank Pad
4-9-13	Updated Per New Antero Standards

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ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

RECLAMATION PLAN

REVIVAL PAD

GRANT DISTRICT
DODDRIDGE COUNTY, WV

Date: 10/8/12
Scale: 1" = 50'
Designed By: CKW/CKM
File No. Antero 216-12
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