



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

March 16, 2016

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-8510281, issued to ANTERO RESOURCES 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: KEROGEN UNIT 2H
Farm Name: ZINN, EARNEST E.

API Well Number: 47-8510281

Permit Type: Horizontal 6A Well

Date Issued: 03/16/2016

Promoting a healthy environment.

WW-6B
(04/15)

API NO. 47-085 -
OPERATOR WELL NO. Kerogen Unit 2H
Well Pad Name: Zinn Pad

02/04

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

1) Well Operator: Antero Resources Corpora 494488557 085 - Ritchie Clay Pennsboro 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Kerogen Unit 2H Well Pad Name: Zinn Pad

3) Farm Name/Surface Owner: Earnest E. Zinn, et al Public Road Access: CR 74/9

4) Elevation, current ground: 1135' Elevation, proposed post-construction: 1119'

5) Well Type (a) Gas X Oil Underground Storage

Other

(b) If Gas Shallow X Deep

Horizontal X

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 6700' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6700' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14100' MD

11) Proposed Horizontal Leg Length: 7061'

4708510201

12) Approximate Fresh Water Strata Depths: 107', 431', 497'

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

14) Approximate Saltwater Depths: 1141', 1567'

15) Approximate Coal Seam Depths: 412', 741'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No X

(a) If Yes, provide Mine Info: Name: Depth: Seam: Owner:

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Environmental Protection
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Michael Goff
3/1/2016

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
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#	550' *see #19	550' *see #19	CTS, 764 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2475'	2475'	CTS, 1008 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	14100'	14100'	CTS, 3478 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

4708510281

MAG
3/1/16

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	24"	0.438"	1530	50	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	1000	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12,630	2500	Lead-HPOZ & Tail-H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

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WW-6B
(10/14)

API NO. 47-085 -
OPERATOR WELL NO. Kerogen Unit 2H
Well Pad Name: Zinn Pad

MAG
3/1/2016

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

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 fresh water 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.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

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."

Anticipated Max Pressure - 9300 lbs
Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 27.20 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.27 acres

23) 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. 4708510281

24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake

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

25) 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.

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WW-9
(2/15)

API Number 47 - 085 - _____
Operator's Well No. Kerogen Unit 2H _____

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

470851028

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494488557
Watershed (HUC 10) North Fork Hughes River Quadrangle Pennsboro 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No
Will a pit be used? Yes No

If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled off site.)

Will a synthetic liner be used in the pit? Yes No If so, what ml.? N/A

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 (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
- Other (Explain _____)

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3/1/2016

Will closed loop system be used? If so, describe: Yes

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Sluff Foam, Production - Water Based Mud

-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Stored in tanks, removed offsite and taken to landfill.

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

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 [Signature]

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID-20144028297
MY COMMISSION EXPIRES JULY 21, 2018

Subscribed and sworn before me this 2nd day of February, 20 16

[Signature]
Notary Public

My commission expires July 21, 2018

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Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 27.20 acres Prevegetation pH _____

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

Fertilizer type Hay or straw or Wood Fiber (will be used where needed)

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

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Well Pad (6.27) + Access Road (12.07) + Topsoil Spoil Area 1 (1.11) + Topsoil Spoil Area 2 (1.51) + Topsoil Spoil Area 3 (0.80) + Topsoil Spoil Area 4 (1.17) + Water Containment Pad (2.59) + Staging Area (1.22) = 27.20 Acres

Temporary		Permanent	
Seed Type	lbs/acre	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 (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Michael Doff

Comments: Preseed & mulch any disturbed areas per WV DEP regs. Maintain & upgrade E-n-s as necessary

Title: Oil & Gas Inspector Date: 3/1/2016

Field Reviewed? () Yes () No

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Form WW-9 Additives Attachment

SURFACE INTERVAL

1. Fresh Water
2. Soap –Foamer AC
3. Air

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INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

- 1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
- 2) 1 ppb Conqor 404 (11.76 ppg) / Corrosion Inhibitor
- 3) 4 ppb KLA-Gard (9.17 ppg) / Amine Acid Complex-Shale Stabilizer
- 4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
- 5) 12 ppb KCL / Potassium Chloride-inorganic Salt
- 6) Fresh Water 80 bbls
- 7) Air

PRODUCTION INTERVAL

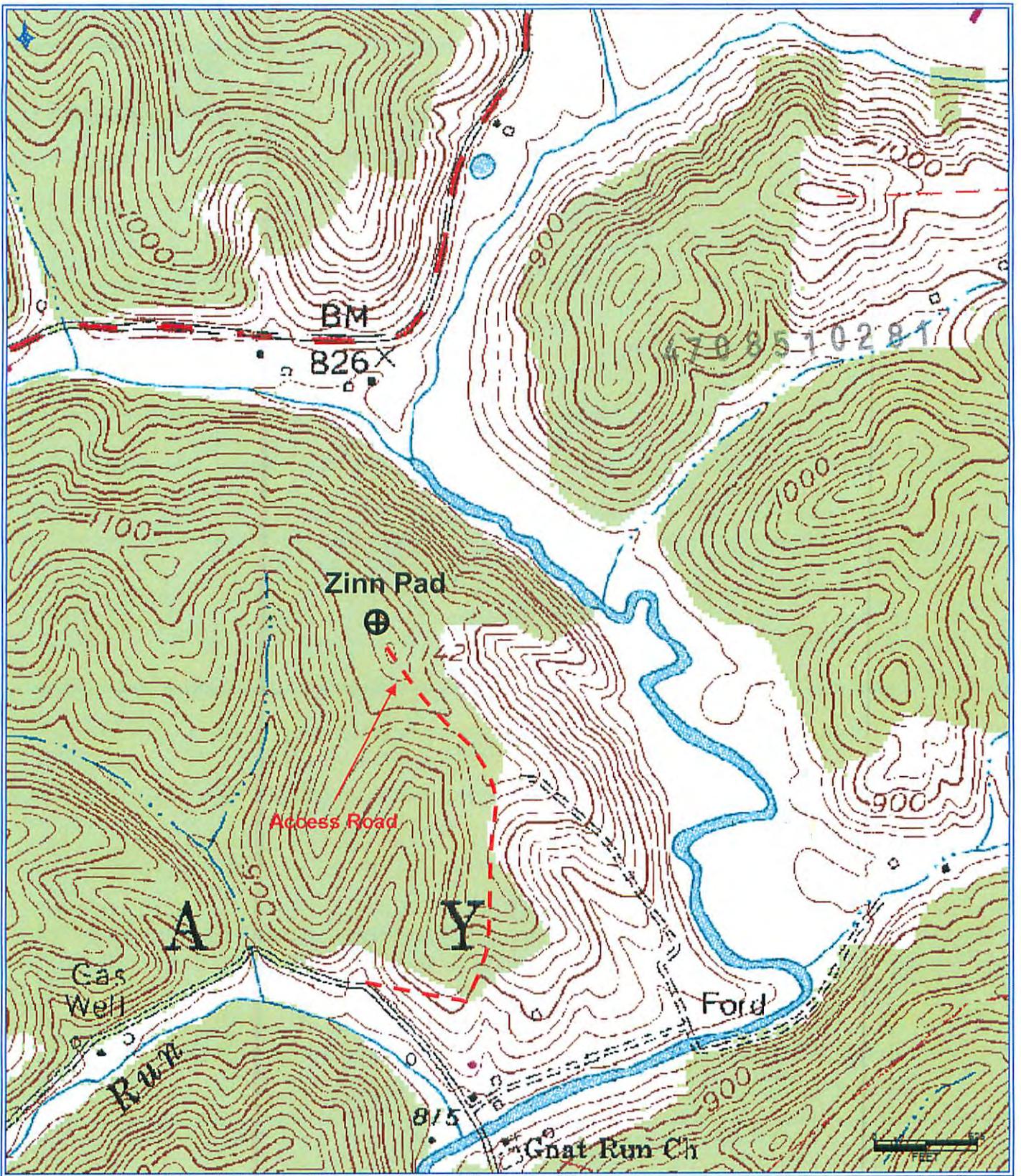
1. Alpha 1655
Salt Inhibitor
2. Mil-Carb
Calcium Carbonate
3. Cottonseed Hulls
Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal
Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol
Amine Acid Complex – Shale Stabilizer
6. Xan-Plex
Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)
Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill
Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda
Sodium Hydroxide – Alkalinity Control
10. Mil-Lime
Calcium Hydroxide – Lime
11. LD-9
Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica
Hydro-Biotite Mica – LCM

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13. Escaid 110
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligco
Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep
Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous
Inorganic Salt
18. D-D
Drilling Detergent – Surfactant
19. Terra-Rate
Organic Surfactant Blend
20. W.O. Defoam
Alcohol-Based Defoamer
21. Perma-Lose HT
Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D
Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells
Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite
Natural Graphite – LCM
25. Mil Bar
Barite – Weighting Agent
26. X-Cide 102
Biocide
27. Soda Ash
Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol
Amine Acid complex – Shale Stabilizer
29. Sulfatrol
Sulfonated Asphalt – Shale Control Additive
30. Xanvis
Viscosifier For Water-Based Muds
31. Milstarch
Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube
Drilling Fluid Lubricant

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Antero Resources Corporation
 Appalachian Basin
 Kerogen Unit 2H
 Ritchie County
 Quadrangle: Pennsboro
 Watershed: South Fork Hughes River
 District: Clay
 Date: 8-27-14

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911 Address
1957 Gnats Run Road
Pennsboro, WV 26415

Well Site Safety Plan

Antero Resources

Well Name: Piedmont Unit 1H (API# 47-085-10171),
Piedmont Unit 2H, Norma Unit 1H (API# 47-085-
10169), Norma Unit 2H (API# 47-085-10170),
Kerogen Unit 1H, Kerogen Unit 2H, Earnest Unit
1H, Earnest Unit 2H, Alliance Unit 1H, Alliance
Unit 2H

Pad Location: ZINN PAD
Ritchie County/Clay District

Michael Gaff
3/1/2016

GPS Coordinates: Lat 39°19'12.87"/Long -80°56'17.55" (NAD83)

Driving Directions:

From Clarksburg, travel approximately 25 miles west on US-50 West. Turn right onto WV-18 North and go 0.6 miles. Turn left onto Davis Street/Old US-50 West and go 0.4 miles. Take the second right onto WV-18 North/Sistersville Pike. Go 12.2 miles and take a sharp left onto WV-74 South. Go 9.4 miles and take a sharp left onto CO Road 74/9. Go 2 miles and the Access Road will be on your left.

EMERGENCY (24 HOUR) CONTACT 1-800-878-1373

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LATITUDE 39°20'00"

6,110'

7,371' TO BOTTOM HOLE

LATITUDE 39°22'30"

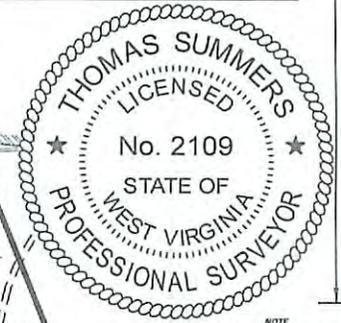
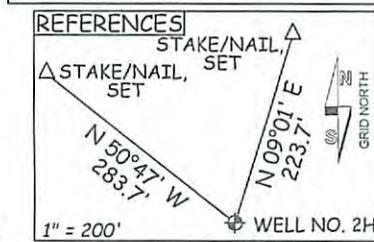
LONGITUDE 80°55'00" 12,721' TO BOTTOM HOLE

4,811' LONGITUDE 80°55'00"

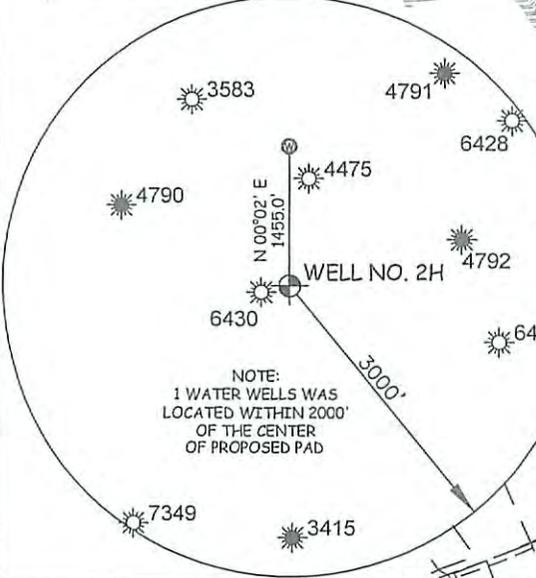
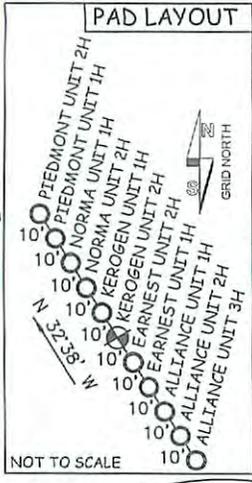
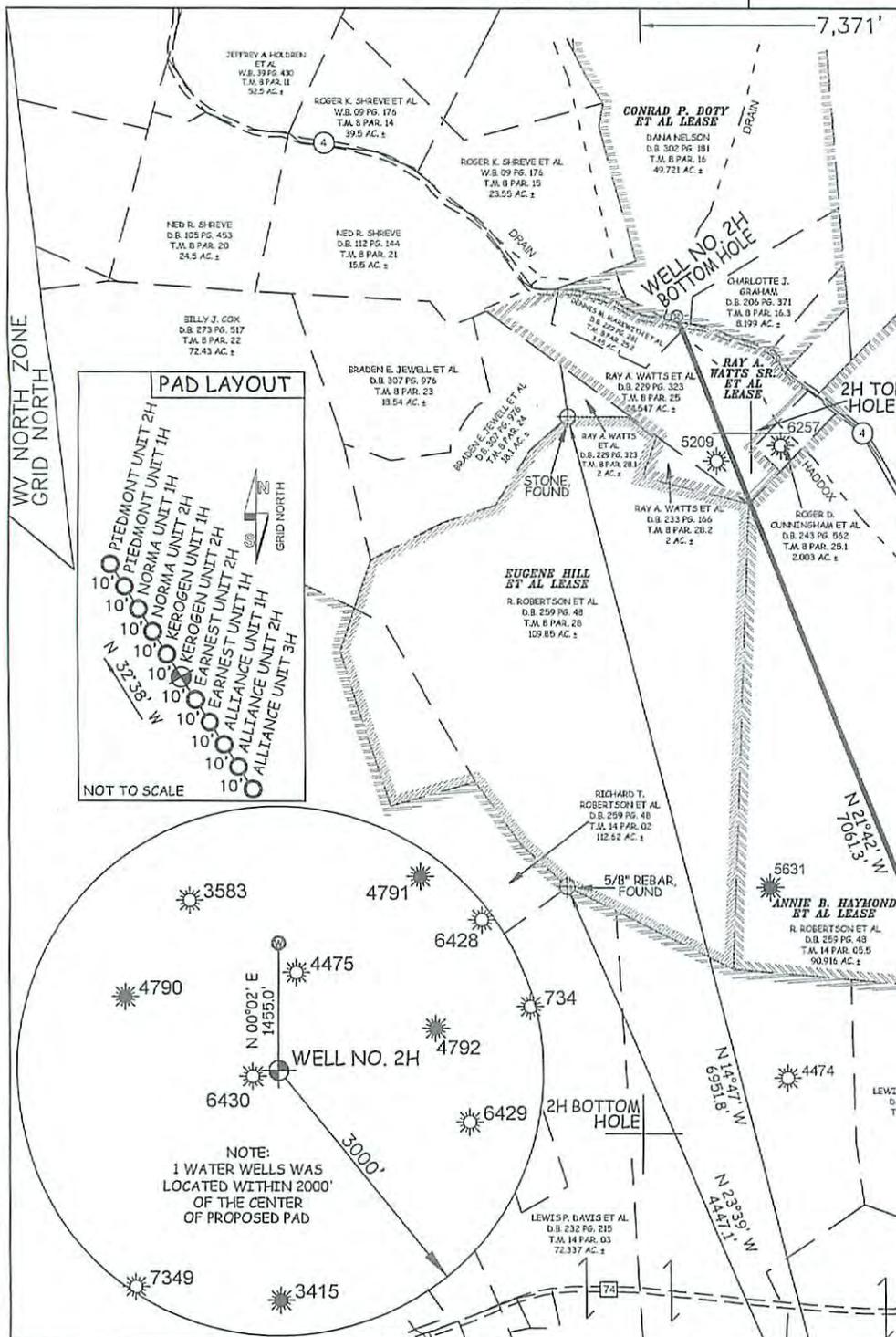
Antero Resources Corporation
Well No. Kerogen Unit 2H

NOTES:
WELL 2H TOP HOLE INFORMATION:
N: 301,963ft E: 1,593,109ft
LAT: 39°19'12.45" LON: 80°56'17.75"
BOTTOM HOLE INFORMATION:
N: 309,249ft E: 1,591,963ft
LAT: 39°20'24.27" LON: 80°56'33.82"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
N: 4,352,313m E: 505,336m
BOTTOM HOLE INFORMATION:
N: 4,354,527m E: 504,950m



NOTE: NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.



NOTE: 1 WATER WELLS WAS LOCATED WITHIN 2000' OF THE CENTER OF PROPOSED PAD

LEGEND

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

JOB # 12-131WA
DRAWING # KEROGEN2H
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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 RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WILLOW LAND SURVEYING PLLC
266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415

WELL NO. 2H
HAROLD H. BLOCH ET UX LEASE

THOMAS SUMMERS P.S. 2109
DATE 02/02/16
OPERATOR'S WELL # KEROGEN UNIT #2H

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ API WELL #
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X 47 - 085 - 10281 WGA
LOCATION: ELEVATION ORIG 1,135' - PROPOSED 1,119' WATERSHED NORTH FORK HUGHES RIVER STATE COUNTY PERMIT
QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE
SURFACE OWNER ERNEST E. ZINN ET AL ACREAGE 129.5 ACRES +/-
OIL & GAS ROYALTY OWNER HAROLD H. BLOCH ET UX; W.J. COLLINS ET UX; LEASE ACREAGE 131.5 ACRES +/-; 575 ACRES +/-
ANNIE B. HAYMOND ET AL; RAY A WATTS SR. ET AL; CONRAD P. DOTY ET AL 639.06 ACRES +/-; 27.997 ACRES +/-; 60 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 ___ ESTIMATED DEPTH 6,700' TVD 14,100' MD
TARGET FORMATION MARCELLUS
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Harold H. Bloch, et ux Lease</u>			
Harold H. Bloch, et ux	Harvey K. Haymond	1/8	0131/0670
Harvey K. Haymond	J & J Enterprises, Inc.	Assignment	0156/0715
J & J Enterprises, Inc.	Eastern American Energy Corporation	Assignment	0231/0732
Eastern American Energy Corporation	Energy Corporation of America	Assignment	0306/0836
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0257/0377
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>W.J. Collins, et ux Lease</u>			
William J. Collins, et ux	E.D. Willis	Flat Rate	0042/0055
E.D. Willis	E. M. Treat Oil & Gas Company	Memorandum of Agreement	0058/0447
E.M. Treat Oil & Gas Company	Consumers Gas Utility Company	Assignment	0058/0450
Consumers Gas Utility Company	W.C.P. Partnership	Assignment	0148/0522
W.C.P. Partnership	Crude Oil & Gas, Inc.	Assignment & Agreement	0169/0509
Crude Oil & Gas, Inc.	Clarence E. Sigley, Sr.	Assignment	0260/0232
Clarence E. Sigley, Sr.	Antero Resources Appalachian Corporation	Assignment of Oil & Gas Lease	0262/0486
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Annie B. Haymond, et al Lease</u>			
Annie B. Haymond, et vir	Antero Resources Appalachian Corporation	1/8+	0254/0950
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Eugene Hill, et al Lease</u>			
Eugene Hill, et al	Harvey K. Haymond	1/8	0172/0562
Harvey K. Haymond	Kepco, Inc.	Assignment	0165/0116
Kepco, Inc.	Eastern Pennsylvania Exploration Company	Assignment	0176/0095
Eastern Pennsylvania Exploration Company	Eastern American Energy Corporation	Assignment	0218/0187
Eastern American Energy Corporation	Seneca-Upshur Petroleum, Inc.	Assignment	0243/0839
Seneca-Upshur Petroleum, Inc.	Seneca-Upshur Petroleum, LLC	Assignment	DB 0311/0863
Seneca-Upshur Petroleum, LLC	Antero Resources Appalachian Corporation	Assignment	0258/0987
Antero Resources Appalachian Corporation	Antero Resources Corporation	1/8	0271/0121
<u>Ray A. Watts, Sr., et al Lease</u>			
Ray A. Watts, Sr., et al	Antero Resources Appalachian Corporation	1/8+	0259/1039
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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Office of Oil and Gas
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West Virginia Department of Environmental Protection

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Conrad P. Doty, et al Lease</u>	Conrad Doty, et al	J & J Enterprises, Inc.	1/8	0150/0718
	J & J Enterprises, Inc.	Eastern American Energy Corp.	Assignment	0231/0732
	Eastern American Energy Corp.	Energy Corporation of America	Assignment	0306/0836
	Energy Corporation of America	Antero Resources Appalachian Corp.	Assignment	0257/0377
	Antero Resources Appalachian Corp.	Antero Resources Corporation	Name Change	Exhibit 1

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

4708510287

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation
 By: Kevin Kilstrom
 Its: Senior Vice President of Production

Office of Oil and Gas
 FEB 04 2016
 Department of Environmental Protection

WW-60
(7-01)

DATE: February 3, 20 16
OPERATOR'S
WELL NO. Kerogen Unit 2H

API NO: 47- 085
State County Permit No.

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

A F F I D A V I T 4708510281

State of Colorado
County of Denver

I, Thomas Kuhn (the designated owner or operator, or authorized representative thereof), after being duly sworn, do declare that the undersigned is authorized by the owner of the working interest in the well permit application to which this affidavit is attached to state that (he, she, or it) shall tender to the owner of the oil and gas in place not less than one-eighth of the total amount paid to or received by or allowed to the owner of the working interest at the wellhead for the oil or gas so extracted, produced, or marketed before deducting the amount to be paid or set aside for the owner of the oil or gas in place, or all such oil or gas to be extracted, produced, or marketed from the well. West Virginia Code 22-6-8(e).

Signed: [Signature]

Taken, subscribed and sworn to before me this 3rd day of February, 20 16.

[Signature]
Notary Public

My Commission expires: July 21, 2018

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Office of Oil and Gas

KARA QUACKENBUSH 2016
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028297
MY COMMISSION EXPIRES JULY 21, 2018

FORM WW-6A1
EXHIBIT 1

FILED

JUN 10 2013

Natalie E. Tennant
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305



Penny Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvscos.com
E-mail: business@wvscos.com

APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY

Office Hours: Monday - Friday
8:30 a.m. - 5:00 p.m. ET

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ****
applies for an Amended Certificate of Authority and submits the following statement:

4708510281

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/26/2008
- Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: _____
(attach additional pages if necessary)
- Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)
Alvyn A. Schopp (303) 367-7310
Contact Name Phone Number
- Signature information (See below *Important Legal Notice Regarding Signature*):
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person
Signature: [Signature] Date: June 10, 2013

***Important Legal Notice Regarding Signature:** For West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

Form CF-4

Issued by the Office of the Secretary of State

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Office of Oil and Gas

FEB 04 2016



Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

February 2, 2016

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

4708510281

RE: Kerogen Unit 2H
Quadrangle: Pennsboro 7.5'
Ritchie County/Clay District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Kerogen Unit 2H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas for all leases through which the Kerogen Unit 2H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

A handwritten signature in blue ink, appearing to read "Thomas Kuhn", with a long horizontal flourish extending to the right.

Thomas Kuhn
Landman

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Office of Oil and Gas

FEB 04 2016

WV Department of
Environmental Protection

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

Date of Notice Certification: 02/02/2016

API No. 47- 085 -
Operator's Well No. Kerogen Unit 2H
Well Pad Name: Zinn Pad

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: West Virginia
County: Ritchie
District: Clay
Quadrangle: Pennsboro 7.5'
Watershed: North Fork Hughes River

UTM NAD 83 Easting: 470 505336m
Northing: 857 4352673m
Public Road Access: CR 74/9
Generally used farm name: Earnest E. Zinn, et al

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:

*PLEASE CHECK ALL THAT APPLY

- 1. NOTICE OF SEISMIC ACTIVITY or NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED
- 2. NOTICE OF ENTRY FOR PLAT SURVEY or NO PLAT SURVEY WAS CONDUCTED
- 3. NOTICE OF INTENT TO DRILL or NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or
 WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)
- 4. NOTICE OF PLANNED OPERATION
- 5. PUBLIC NOTICE
- 6. NOTICE OF APPLICATION

OOG OFFICE USE ONLY

- RECEIVED/ NOT REQUIRED
- RECEIVED
- RECEIVED/ NOT REQUIRED
- RECEIVED
- RECEIVED
- RECEIVED

RECEIVED
Office of Oil and Gas

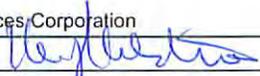
Required Attachments:

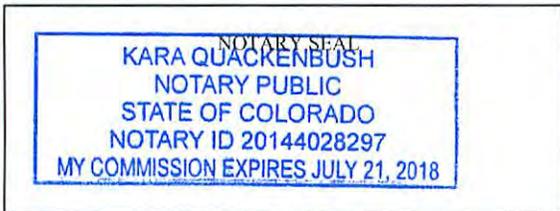
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

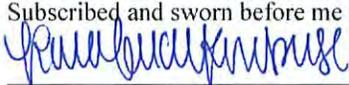
FEB 04 2016
WV Dept. of Environmental Protection

Certification of Notice is hereby given:

THEREFORE, I Kevin Kilstrom, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, 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 and imprisonment.

Well Operator:	<u>Antero Resources Corporation</u>	Address:	<u>1615 Wynkoop Street</u>
By:	<u>Kevin Kilstrom</u> 		<u>Denver, CO 80202</u>
Its:	<u>Senior Vice President of Production</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>asteele@anteroresources.com</u>



Subscribed and sworn before me this 2 day of February 2016

 _____ Notary Public
 My Commission Expires July 21, 2018

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

4708510281

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 Office of Oil and Gas
 FEB 04 2016
 WV Department of
 Environmental Protection

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

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**

Date of Notice: 2/3/2016 **Date Permit Application Filed:** 2/3/2016

Notice of:

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

4708510281

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
Name: PLEASE SEE ATTACHMENT
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: PLEASE SEE ATTACHMENT
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

COAL OWNER OR LESSEE
Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

COAL OPERATOR
Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE
Name: Lewis P. & Norma J. Davis
Address: 4146 Mountain Dr. Pennsboro, WV 26415

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
Address: _____

*Please attach additional forms if necessary

Office of Oil and Gas
FEB 04 2016
WV Department of Environmental Protection

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

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Environmental Protection

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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(8-13)

API NO. 47- 085 -
OPERATOR WELL NO. Kerogen Unit 2H
Well Pad Name: Zinn Pad

Notice is hereby given by:

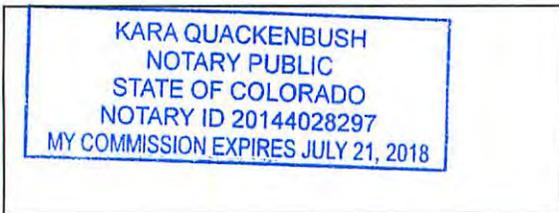
Well Operator: Antero Resources Corporation
Telephone: (303) 357-7310
Email: asteale@anteroresources.com



Address: 1615 Wynkoop Street
Denver, CO 80202
Facsimile: 303-357-7315

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.



Subscribed and sworn before me this 3 day of February, 2016.
Kara Quackenbush Notary Public
My Commission Expires July 21, 2018

4708510281

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WW-6A Notice of Application Attachment (ZINN PAD):

List of Surface Owner(s) with Proposed Disturbance associated with Zinn Well Pad:

WELL PAD – All owners were notified of all well work permit applications, and have executed signed Surface Use Agreements with Antero Resources Corporation.

TM 14 PCL 12

Owner: Lewis P. & Norma J. Davis ✓
Address: 4146 Mountain Drive
Pennsboro, WV 26415

TM 14 PCL 13 & 18

Owner: D & M Powell LLC (Purchased Ernest E. Zinn, et al Property) ✓
Address: 124 Stuart Ave. (UPDATED ADDRESS)
West Union, WV 26456

ROAD AND/OR OTHER DISTURBANCE – All owners have executed signed Surface Use and/or Road Agreements with Antero Resources Corporation. However, they were only notified if their tracts were overlying the oil and gas leasehold being developed by the proposed well work.

TM 14 PCL 24

Owner: Joseph R. & Valerie A. Michels ✓
Address: 19 Cattle Run Road
Pennsboro, WV 26415

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 5/23/2014 **Date of Planned Entry:** 6/2/2014

Delivery method pursuant to West Virginia Code § 22-6A-10a

- PERSONAL SERVICE
 REGISTERED MAIL
 METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Lewis P. & Norma J. Davis ✓
Address: 4146 Mountain Dr.
Pennsboro, WV 26415 (Tax Map 14 Parcel 12)

Name: D & M Powell LLC (Purchased Ernest E. Zinn, et al property) ✓
Address: 356 Cattle Run Road
Pennsboro, WV 26415 (Tax Map 14 Parcel 13 & 18)

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: NO DECLARATIONS ON RECORD WITH THE COUNTY
Address: _____

MINERAL OWNER(s)

Name: PLEASE SEE ATTACHMENT
Address: _____

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: West Virginia
County: Ritchie
District: Clay
Quadrangle: Pennsboro 7.5'

Approx. Latitude & Longitude: 39.249797, -80.659192 (NAD 83)
Public Road Access: CR 74/9
Watershed: North Fork Hughes River
Generally used farm name: Zinn, Ernest E., et al

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Antero Resources Corporation
Telephone: (303) 357- 7310
Email: asteelle@anteroresources.com

Address: 1615 Wynkoop Street
Denver, CO 80202
Facsimile: (303) 357-7315

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Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

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Tax Map 14 Parcel 12
Tax Map 14 Parcel 13
Tax Map 14 Parcel 18

WW-6A3 Notice of Entry For Plat Survey Attachment:

Mineral Owners:

Located on TM 14/PCL 12 & 13

Owner: Mary Maxine Welch ✓
Address: P.O. Box 4308
Parkersburg, WV 26104

Owner: Linda A. Perkins ✓
Address: 803 Bell Ave
Greenwood, MS 38930

Owner: Diana B. Benedum ✓
Address: 1577 River Rd.
Pennsboro, WV 26415

Owner: Norman Folger ✓
Address: 416 Hardman St.
Middlebourne, WV 26149

Owner: Naomi Loy ✓
Address: 527 Fallen Timber Ln.
Moundsville, WV 26041

Owner: Arlene Folger ✓
Address: 435 White Gables Ln. Apt 101
Charlottesville, VA 22903

Owner: Azra Folger ✓
Address: 435 White Gables Ln. Apt 101
Charlottesville, VA 22903

Owner: Holmes Lemon ✓
Address: RR 2 Box 146A
Harrisville, WV 26362

Owner: Vada J. Lemon ✓
Address: RR 2 Box 146A
Harrisville, WV 26362

Owner: Haught Family Trust; Barry D. Haught; Ira M. ✓
Haught; Robin J. Cook (Trustees)
Address: 210 E. Main St.
Harrisville, WV 26362

Owner: Alfred Glenn Spencer ✓
Address: 537 Linden Ave.
Sistersville, WV 26175

Located on TM 14/PCL 12 & 13

Owner: Twyla J. Minor ✓
Address: 3605 Tompkins Dr.
Baytown, TX 77521

Owner: Paul I. Folger ✓
Address: 35116 Carnation Ln.
Indian Land, SC 29707

Owner: Donald R. Ash ✓
Address: RR 2 Box 225A
West Union, WV 26456

Owner: Lewis Phillip Davis Subject to the ✓
Life Estate of Deloris Ann Davis
Address: P.O. Box 545
West Hamlin, WV 25571

Located on TM 14/PCL 18

Owner: Harold H. Bloch and Laura F. Bloch ✓
Address: 2413 Quartz Peak Street
Las Vegas, NV 89134

Owner: William H. Muntzing II and L. Manning ✓
Muntzing Revocable Trust
Address: 8305 Turnberry Court
Potomac, MD 20854

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Earl Ray Tomblin
Governor

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

February 2, 2016

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

4708510281

Subject: DOH Permit for the Zinn Pad, Ritchie County
Kerogen Unit 2H Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #03-2014-0223 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Ritchie County Route 74/9 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.
Regional Maintenance Engineer
Central Office O&G Coordinator

Cc: Ashlie Steele
Antero Resources Corporation
CH, OM, D-3
File

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List of Anticipated Additives Used for Fracturing or Stimulating Well

Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	proprietary
Anionic polymer	proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	(Proprietary)
Demulsifier Base	(Proprietary)
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7

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**Antero Resources Corporation Site Construction Plan for
Zinn Well and Water Containment Pad**

4708510281

Antero Resources Corporation (Antero) is submitting the following Site Construction Plan in compliance with §35-8-5.5. This plan is submitted in conjunction with the Zinn Well and Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Kleinfelder., a West Virginia registered professional engineer.

Requirement §5.5.a. *The plan should describe the nature and purpose of the construction project and identify the procedures for construction that will be used to achieve site stability. The plan shall be considered conditions of the permit and be enforceable as such.*

Antero Response

The nature and purpose of the subject project is to perforate, fracture, and complete one or more horizontal shallow wells. Procedures to achieve site stability include seeding and mulching of earth disturbed areas and implementation of erosion and sediment best management practices (BMPs). Details of seeding and mulching rates as well as procedures for installation and maintenance of erosion and sediment BMPs are outlined on pages 3 of "Zinn Well Pad and Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans" (Site Design) prepared and certified by Kleinfelder. of West Virginia.

These procedures will be considered as conditions of the permit and shall be inspected and maintained for continual compliance measures outlined in §35-8-5.5.

Requirement §5.5.b.1. *A vicinity map location the site in relation to the surrounding area and roads;*

Antero Response

Please refer to the vicinity map on page 1 for the location the site in relation to the surrounding area and roads.

Requirement §5.5.b.2. *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater that shows appropriate detail of all site features and:*

Requirement §5.5.b.A. *Clearly identifies the limit of disturbance for the project;*

Antero Response

The limit of disturbance for the Zinn Well Pad and Water Containment Pad can be found on "Site Plan" on page 6-8 of the Site Design.

Requirement §5.5.b.2.B. *Provides existing topographic information on a contour interval that affords sufficient detail to illustrate site terrain conditions*

Antero Response

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Environmental Protection

Please refer to the "Existing Conditions" map on page 4 of the Site Design for the current topographic conditions for the constructed pad on a contour interval that affords sufficient detail to illustrate site terrain conditions.

Requirement §5.5.b.2.C. *Identifies proposed cut and fill areas with grading contours at an interval that provides sufficient detail to accurately depict slope ratios, indicating top and bottom of slopes; and*

Antero Response

Please refer to the "Site Plan" on page 6-8 as well as the "Well Pad Cross Sections and Profile," "Water Containment Pad Cross Section and Profile," and "Access Road Cross Sections and Profile," on pages 9-13 of the Site Design for proposed cut and fill areas with grading contours.

Requirement §5.5.b.2.D. *Identifies*

**Antero Resources Corporation Site Construction Plan for
Zinn Well and Water Containment Pad**

4708510281

Antero Resources Corporation (Antero) is submitting the following Site Construction Plan in compliance with §35-8-5.5. This plan is submitted in conjunction with the Zinn Well and Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Kleinfelder., a West Virginia registered professional engineer.

Requirement §5.5.a. *The plan should describe the nature and purpose of the construction project and identify the procedures for construction that will be used to achieve site stability. The plan shall be considered conditions of the permit and be enforceable as such.*

Antero Response

The nature and purpose of the subject project is to perforate, fracture, and complete one or more horizontal shallow wells. Procedures to achieve site stability include seeding and mulching of earth disturbed areas and implementation of erosion and sediment best management practices (BMPs). Details of seeding and mulching rates as well as procedures for installation and maintenance of erosion and sediment BMPs are outlined on pages 3 of "Zinn Well Pad and Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans" (Site Design) prepared and certified by Kleinfelder. of West Virginia.

These procedures will be considered as conditions of the permit and shall be inspected and maintained for continual compliance measures outlined in §35-8-5.5.

Requirement §5.5.b.1. *A vicinity map location the site in relation to the surrounding area and roads;*

Antero Response

Please refer to the vicinity map on page 1 for the location the site in relation to the surrounding area and roads.

Requirement §5.5.b.2. *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater that shows appropriate detail of all site features and:*

Requirement §5.5.b.A.. *Clearly identifies the limit of disturbance for the project;*

Antero Response

The limit of disturbance for the Zinn Well Pad and Water Containment Pad can be found on "Site Plan" on page 6-8 of the Site Design.

Requirement §5.5.b.2.B. *Provides existing topographic information on a contour interval that affords sufficient detail to illustrate site terrain conditions*

Antero Response

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Environmental Protection

Please refer to the "Existing Conditions" map on page 4 of the Site Design for the current topographic conditions for the constructed pad on a contour interval that affords sufficient detail to illustrate site terrain conditions.

Requirement §5.5.b.2.C. *Identifies proposed cut and fill areas with grading contours, at an interval that provides sufficient detail to accurately depict slope ratios, indicating top and bottom of slopes; and*

Antero Response

Please refer to the "Site Plan" on page 6-8 as well as the "Well Pad Cross Sections and Profile," "Water Containment Pad Cross Section and Profile," and "Access Road Cross Sections and Profile," on pages 9-13 of the Site Design for proposed cut and fill areas with grading contours.

Requirement §5.5.b.2.D. *Identifies any existing structures, roads, water bodies, and other critical areas within the area that would most likely be affected by the construction.*

Antero Response

Please refer to "Site Plan" of the Site Design on page 6-8 for the map identifying any structures, roads, water bodies, and other critical areas within the area of interest that would be most likely affected by construction.

Requirement §5.5.b.3. *A cross-section of the length and width of the location, providing cut and fill volumes; and*

Antero Response

Please refer to the "Overall Site Plan" on page 7-9 as well as the "Well Pad Cross Sections and Profile," "Water Containment Pad Cross Section and Profile," and "Access Road Cross Sections and Profile," on pages 9-13 for a cross-section of the location. The cut and fill volumes can be found in "Schedule of Quantities" on page 2.

Requirement §5.5.b.4. *Any other engineering designs or drawings necessary to construct the project.*

Antero Response

All other engineering designs and drawings necessary to construct this project are included in the Site Design.

Requirement §5.5.c. *At a minimum, site construction shall be conducted in accordance with the following criteria:*

Antero Response

All Antero contractors shall be notified of and comply with the measures outlined in Section 5.5.c. of §35-8.

Requirement §5.5.c.1. *All woody material, brush, and trees shall be cleared from the site area and kept to the minimum necessary for proper construction, including the installation of necessary sediment controls. Trees six inches in diameter and larger shall be cut and logs stacked;*

Antero Response

The Site Design outlines measures to maintain compliance with Section 201 of the WVDOH Specifications which outlines clearing and grubbing measures. Please refer to Notes on pages 3 of the Site Design.

Requirement §5.5.c.2. Topsoil shall be removed from construction areas and stockpiled for reuse during reclamation. In woodland areas, tree stumps, large roots, large rocks, tree and leaf debris, and ground vegetation shall be removed prior to actual site constructions;

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Antero Response

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to Notes on pages 3 of the Site Design. In addition, soil for stockpiling and use as fill shall be further compliant with measures outlined in Section 5.5.c.2. of §35-8-5.5.

Requirement §5.5.c.3. No embankment fill shall be placed on frozen material;

Antero Response

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.3. of §35-8-5.5.

Requirement §5.5.c.4. The fill material shall be clean mineral soil, free of roots, woody vegetation, stumps, sod, large rocks, frozen soil or other objectionable material;

Antero Response

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to Notes on page 3 of the Site Design. In addition, soil shall be further defined to the measures outlined in Section 5.5.c.4. of §35-8-5.5.

Requirement §3.2.b.5. Embankment material shall exhibit adequate soil strength and contain the proper amount of moisture to ensure that compaction will be achieved;

Antero Response

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.5. of §35-8-5.5.

Requirement §5.5.c.6 Earthen fill slopes should be constructed with slopes no steeper than a ratio of two to one (2:1);

Antero Response

The Site Design outlines all earthen fill slopes to be constructed with slopes no steeper than a ratio of two to one (2:1).

Requirement §5.5.c.7. Fill material will be placed in lifts or layers over the length of the fill. Lift thickness of soil shall be as thin as the suitable random excavated material will permit, typically from six to twelve (12) inches; and

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Antero Response

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Please refer to the Notes on pages 3 of the Site Design. Fill shall be placed in horizontal lifts of maximum loose depth of 12 inches. Compaction will be performed with a compactor with a minimum of five ton static drum weight vibratory roller or five ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the Engineer.

Requirement §5.5.c.8. The size of rock lifts shall not exceed thirty-six (36) inches. The rock shall not be greater in any dimension than thirty-six (36) inches;

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Antero Response

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.8. of §35-8-5.5.

Requirement §5.5.c.9. Compaction shall be obtained by compaction equipment or by routing the hauling equipment over the fill so that the entire surface of each fill lift is compacted by at least one wheel or tread track of equipment or by a compactor. Each lift shall be compacted before beginning the next lift;

Antero Response

Compaction compliance measures are outlined in the Notes on pages 3. Compaction is required with a compactor with a minimum of five ton static drum weight vibratory roller or five ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the Engineer.

Requirement §5.5.c.10. Surface water diversion ditches shall be constructed above the disturbed area to intercept water and to divert surface water runoff around the site; and

Antero Response

"Notes," and "Site Plans" on pages 3 and 6-8 of the Site Design identifies the surface diversions used to prevent surface water and subsurface water from flowing on to the well pad and coming into contact with the stormwater associated with the well pad. Additional Erosion & Sediment BMPs will be used to prevent sediment discharges from the project.

Requirement §5.5.c.11. In areas of steep terrain, a terraced bench shall be constructed at the base of the slope where fill is to be placed, creating a toe foundation and aid in holding fill material. Additional terracing shall be constructed from each additional fifty (50) vertical feet of slope and shall be a minimum of ten (10) feet wide.

Antero Response

All Antero contractors shall be notified of and comply with the measures outlined in Section 5.5.c.11. of §35-8-5.5.

Antero Resources Corporation Erosion and Sediment Control Plan for Zinn Well and Water Containment Pad

Antero Resources Corporation (Antero) is submitting the following narrative and set of drawings in compliance with §35-8-5.4. This plan is submitted in conjunction with the Zinn Well and Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Kleinfelder., a West Virginia registered professional engineer.

Requirement §5.4.b.1. *A general sequence of events that describe in relative terms how and when each construction phase (i.e. clearing and grubbing, mass grading, stabilization) will occur and when each erosion and sediment control best management practice ("BMP") will be installed;*

Antero Response:

The following includes a general sequence of events that describe in relative terms how and when each construction phase is anticipated to occur and erosion and sediment control BMPs to be installed. Please refer to the Zinn Well and Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans (Site Design) prepared and certified by Kelnfelder. for specific construction measures. Compliance with the measures outlined in the Site Construction Plan (§35-8-5.4) submitted in conjunction with this plan will also be maintained.

1. A pre-construction conference will be held on site with contractor to review the construction drawings and provide any requested guidance.
2. Stake/Flag distributed work area, clearly identifying wetland and stream edges and buffers. Install signs to designate the area and orange safety fence to identify important project attributes such as approved access roads, no refueling zones, wetland/stream bounds, ETC.
3. Construct the construction entrance.
4. Construct all proposed sediment control devices as soon as clearing and grubbing operations allow. Diversions and sediment basins shall be seeded and mulched immediately.
5. Prior to grading or other earth disturbance on the parcel, permanent down slope BMPs are to be installed.
6. Clear and grub, remove topsoil and place as shown on the plans. Topsoil stockpile to be seeded and mulched. E&S BMPs shall be constructed around topsoil stockpiles as shown.
7. Grading operations as required. Cut slopes and all slopes shall be topsoiled as needed. Ditch lines shall be cleaned. All ditches will have at least grass lining protection or as specified in site calculations on sheet 4.
8. The access road shall be constructed up to the proposed pads. The access road shall receive a stone surface.
9. Install proposed equipment pad and equipment pad berms.
10. 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.
11. Side slope stabilization matting and stabilization shall occur as soon as possible.
12. At the end of each work day, where the parcel has been graded, including any stripping, stumping, leveling, 2:1 on side slopes, ETC. BMPs are to be installed. In no case is the contractor

to leave the job site at the end of the work day without temporary or permanent BMPs being installed. The contractor is not required to maintain waterbars during the work day unless the environmental inspector determines that there is a risk of a rain event that warrants their immediate installation.

13. 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 45 lbs. Per acre of tall fescue and 20 lbs. per acre of perennial rye grass.
14. Lime, fertilizer, and seed will be applied. Hydro-mulch products shall be mixed and installed in accordance with manufacturer's specifications, or erosion control blanket shall be installed per plans & specifications.
15. Final seeding must occur within 7 days of final grading.
16. When site is stabilized, all erosion and sediment control measures can be removed and repair/stabilize those areas in accordance with state standards.
17. Make modifications for permanent stormwater management.
18. Final site inspection. A notice of termination should be filed with DEP upon final stabilization.

Requirement §5.4.b.2. *A description of the stabilization methods to be used, including the application rates for temporary and permanent seeding and mulching, and provide the timeframes for establishing stabilization*

Antero Response:

Stabilization methods used include seeding and mulching of disturbed areas as well as the implementation of erosion and sediment control BMPs. Please refer to Notes on page 3 as well as "Details" on page 14-19 for detailed descriptions of the different stabilization methods to be used. Seeding and mulching is to be in accordance with the WVDOT Standard Specifications unless specified otherwise in the plans or unless specified otherwise by the construction engineer or Antero representative. Please refer to number 11 under General Erosion & Sediment Control Notes on page 3 of the Site Design for more specific information regarding application, liming, and mulching rates.

Erosion and sediment BMPs will be constructed, stabilized, and functional before site disturbance begins within the tributary areas of those BMPs. In a timely manner after earth disturbance activities cease, Antero shall stabilize any areas disturbed by the activities. During non-germination periods, mulch must be applied at the specified rates. Disturbed areas which are not at finish grade and which will be re-disturbed within 1 year will be stabilized in accordance with the temporary vegetative stabilization and specifications. Disturbed areas which are finished grade or which will not be re-disturbed within 1 year will be stabilized in accordance with the permanent vegetative stabilization specification. Please refer to "Notes" on page 3 for more information regarding timeframes for establishing stabilization and erosion and sediment BMPs.

The site shall be considered to have achieved full stabilization when it has a minimum uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics to resist sliding and other movements. Until the site achieves final stabilization, Antero will assure that the best management practices (BMPs) are implemented, inspected, operated, and maintained. As such, Antero will maintain written inspection logs. All maintenance work, including cleaning, repair, replacement, regarding, and re-stabilization shall be performed immediately upon discovery of deficiency. After final stabilization has been achieved,

temporary erosion and sediment BMPs controls will be removed. Areas disturbed during removal of the BMPs will be stabilized immediately.

Requirement §5.4.b.3. *Details of specifications for the erosion and sediment control BMPs employed on the project.*

Antero Response:

Please refer to the "Notes" on pages 3 and "Details" on pages 14-19 in the Site Design for specifications including instructions for installation, inspection, and maintenance for erosion and sediment control BMPs employed at this site.

Requirement §5.4.b.3. *A vicinity map locating the site in relation to the surrounding area and roads;*

4708510284

Antero Response:

A "Vicinity Map" locating the site in relation to the surrounding area and roads is included on page 1 the Site Design.

Requirement §5.4.c.2 *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater, showing appropriate detail of all site features, including the identification of site access that provides for a stabilized construction entrance and exit to reduce tracking of sediment onto public or private roads; and*

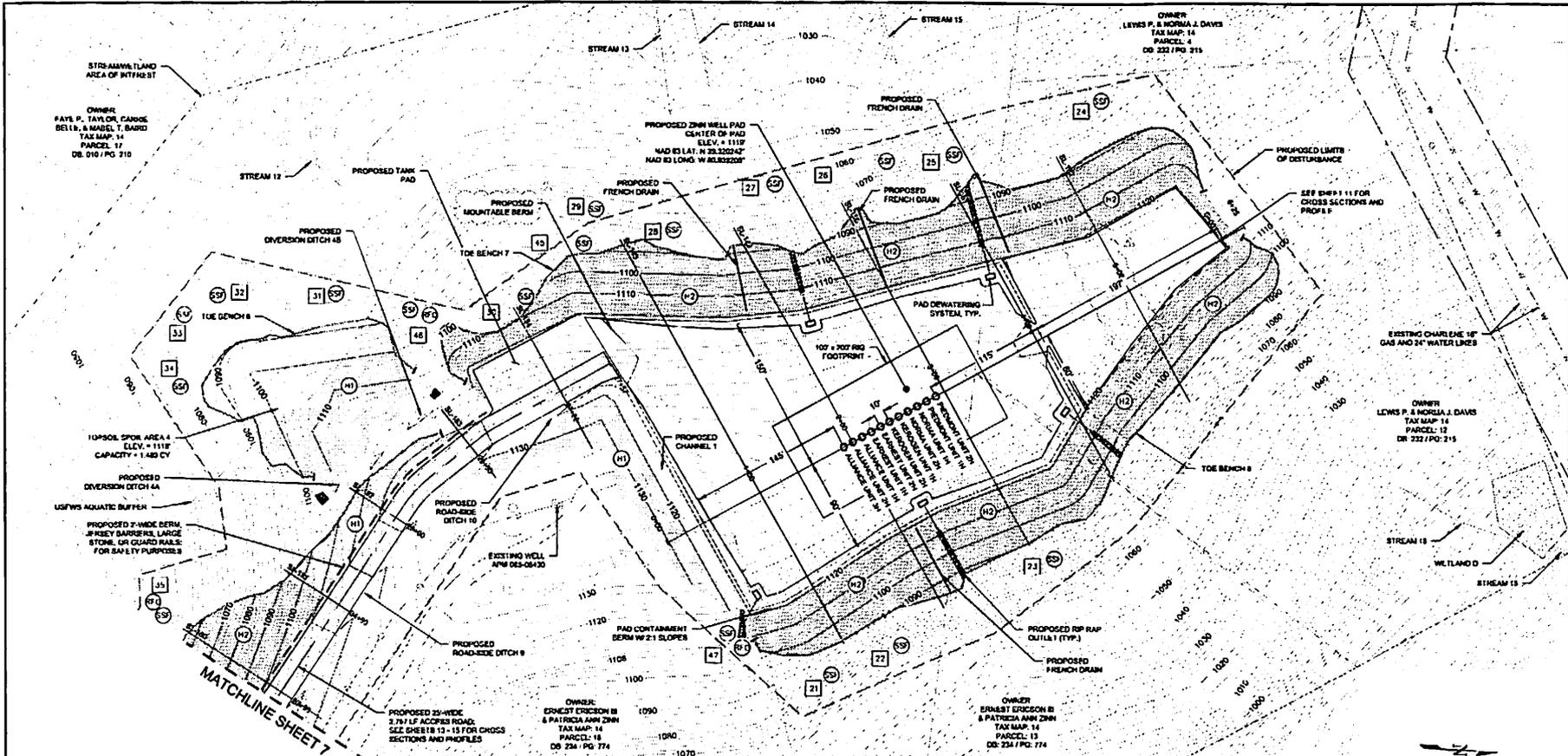
Antero Response:

"Site plan" maps are included on page 6-8 of the Site Design. Specific design and layout and inspection and maintenance notes for a stabilized construction entrance are included in the "Notes" verbiage on pages 3.

Requirement §5.4.c.3. *The location of all proposed erosion and sediment control BMPs*

Antero Response:

"Notes" and "Site Plan" maps included on pages 3 and 6-8 of the Site Design locate all proposed erosion and sediment control BMPs.



NO.	REVISION	BY	DATE
1	CORPORATE ADDRESS	KLF	05-23-14
2	QUANTITIES REVISION	KLF	11-08-14
3	WELL PAD GRADING & EQUIP REVISION	KLF	11-28-14
4	DESIGN & PLAN UPDATES	KLF	06-01-15
5	WELL PAD EXPANSION & QUANTITIES	KLF	06-24-15

KLEINFELDER
Bright People. Bright Solutions.
CORPORATE OFFICE: 10000 CHANCELLERY LANE, SUITE 1000
FALLS CHURCH, VA 22034
TEL: 703-779-9777 FAX: 703-779-9779
WWW.KLEINFELDER.COM

4526 N.E. SITE PLAN/ENG
WEST VIRGINIA 15003

**ZINN WELL & W.C. PAD
SITE PLAN**

ANTERO RESOURCES CORPORATION
ZINN WELL & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY

- NOTES**
- THE GRADES SHOWN REPRESENT FINISH GRADE ELEVATIONS.
 - PIPE MATERIALS SHALL BE AS NOTED ON THE PLAN AND IN THE STORM DRAINAGE COMPUTATION TABLE. PIPES SHALL BE INSTALLED PER DETAILS 4 & 5 ON SHEET 15.
 - CUT AND FILL SLOPES SHALL BE AT 3H:1V UNLESS NOTED OTHERWISE. TOPSOIL SPOIL AREA FILL SLOPES SHALL BE AT 3H:1V.
 - FILL SHALL BE PLACED IN 12" LIFTS AND BE COMPACTED TO 95% STANDARD PROCTOR.
 - INTERMEDIATE TOE BENCHES SHALL BE INSTALLED ON FILL SLOPES PER GEOTECHNICAL DRAWINGS AND DETAIL 5 ON SHEET 15.
 - ALL FILL SLOPES SHALL BE TOE KEYED PER GEOTECHNICAL DRAWINGS AND DETAIL 8 ON SHEET 15.
 - POSITIVE FLOW FROM PAD TO SWAMP. SEDIMENTS AND MATERIAL REMOVED FROM THE PAD SWAMPS SHALL BE PUMPED TO ON-SITE HOLDING/STORAGE TANKS AND SUBSEQUENTLY REMOVED FROM SITE BY AN APPROVED COMMERCIAL VENDOR. SEE DETAIL 1, SHEET 20.
 - ALL STORMWATER CONVEYANCES ON THE SITE HAVE BEEN DESIGNED TO ACCOMMODATE THE 10-YEAR STORM EVENT.
 - A 10-YEAR STORM EVENT RAIN FALL INTENSITY OF 4.48 INHR WAS USED FOR STORM SEWER AND ROAD-SIDE DITCH, CHANNEL, AND DIVERSION DITCH CALCULATIONS PER THE NOAA PRECIPITATION FREQUENCY DATA SERVER FOR RITCHIE COUNTY.
 - CONTRACTOR TO INSTALL ROCK CHECK DAMS WITHIN ROAD-SIDE DITCHES. SEE DETAIL 4 ON SHEET 18 FOR SPACING REQUIREMENTS. ROCK CHECK DAMS WILL BE INSTALLED DURING CONSTRUCTION AS EROSION CONTROL MEASURES AND REMAIN IN PLACE AS PERMANENT CHECK DAMS AFTER CONSTRUCTION IS COMPLETE.
 - ALL FILTER SOCK TO BE 18" UNLESS OTHERWISE NOTED.
 - IN TOPSOIL PLACEMENT AREAS, CONTRACTOR TO INSTALL PROPER BAMPS TO ENSURE NO OFF-SITE EROSION & SEDIMENTATION RUNOFF.
 - INSTALL ROCK FILTER OUTLITS ALONG EROSION BARRIERS AS SHOWN AND AT LOW POINTS AS IDENTIFIED IN THE FIELD.
 - TOP OF SPOIL AREA FILL SLOPES TO BE GRADED AT A MINIMUM OF 2% FROM CENTER TO PROMOTE POSITIVE DRAINAGE.
 - SITE SHALL BE HYDRO-SEDED WITHIN 7 DAYS OF FINAL GRADING.

ZINN STORM DRAINAGE COMPUTATIONS

ACCESS ROAD	CROSS-SECTION	Q TOTAL FLOW (cfs)	SLOPE (PER)	SIZE	LENGTH (FT)	UPPER INVERT (DG)	LOWER INVERT (DG)	PIPE MATERIAL
PIPE 1	0+30	0.32	0.0222	18"	45.00	836.00	835.00	HDPE
PIPE 2	2+80	1.56	0.0444	18"	45.00	884.00	882.00	HDPE
PIPE 3	7+05	0.00	0.0200	18"	50.00	898.00	965.00	HDPE
PIPE 4	19+10	1.85	0.0200	18"	50.00	1008.00	1008.00	HDPE
PIPE 5	22+00	1.84	0.0222	18"	45.00	1067.00	1068.00	HDPE

DOUBLE WALL CORRUGATED PIPE

0 25 50
SCALE: 1"=50'-0" FEET

STORM DRAINAGE I FOUND
YES FLARED END SECTION

ISSUED FOR CONSTRUCTION

APPROVED
WVDEP OOG
Modification
1/11/2016



SEAL

LEGEND

1:36:00	EL BENCH 1 LANDFILL	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL INFILTRATION CONTOUR	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL PROPERTY LINE	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL MOUNTAIN BERM	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL FOG	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL STREAM	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL OLD VIEW	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL OVERFLOW POWER LINE	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL UTILITY POLE	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL ROAD	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL FENCE	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL FENCE TYPED	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	PROF. GAS LINE OF BURST	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	EL HIGH CLEAR PLACEMENT	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	USFWS AQUATIC BUFFER	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	PROF. LIMITS OF DISTURBANCE	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB
---	PROF. TOE BENCH	PROF. 2" WIDE BERM WITH 12" HIGH CURB	PROF. 2" WIDE BERM WITH 12" HIGH CURB



PROJECT CONTACTS

PROJECT OWNER

ANTERO RESOURCES
1615 WYNKOOP STREET
DENVER, CO 80202

CONTACT: ANTHONY SMITH
FIELD ENGINEER
304.869.3405 OFFICE
304.673.6196 CELL

CONTACT: JOHN KAWCAK
ENGINEER
817.368.1553

CONTACT: ELI WAGONER
ENVIRONMENTAL
ENGINEER
304.622.3842, EXT 311
OFFICE

CONTACT: AARON KUNZLER
CONSTRUCTION
SUPERVISOR
405.227.8344

LOCATION SURVEYOR

TRIPLE H ENTERPRISES
CONTACT: DARELL BOICE, PS
204 NEELEY AVE
WEST UNION, WV 26456
304.873.3360

ENGINEER OF RECORD

KLEINFELDER EAST, INC.
CONTACT: JEFFERY B. CRISP, PE
WV PE #20354
3500 GATEWAY CENTRE BLVD, SUITE 200
MORRISVILLE, NC 27560
919.755.5011 OFFICE
919.755.1414 FAX

ENVIRONMENTAL/ DELINEATION BOUNDARY

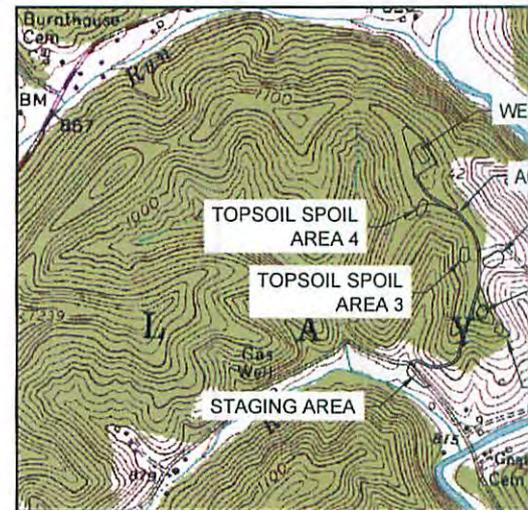
KLEINFELDER EAST, INC.
CONTACT: RUSSELL PERKINS
1340 CHARWOOD ROAD, SUITE 1
HANOVER, MD 21076
410.850.0404 OFFICE
410.850.0049 FAX

TOPO SURVEYOR

BLUE MOUNTAIN AERIAL MAPPING
CONTACT: CRAIG FRY
11023 MASON DIXON HIGHWAY
BURTON, WV 26562
304.662.2626 OFFICE
304.815.4890 CELL

ZINN WELL AND WATER CONTAINMENT SITE DESIGN & CONSTRUCTION EROSION & SEDIMENT CONTROL PLAN ANTERO RESOURCES CORPORATION

**APPROVED
WVDEP OOG**
[Signature] 12/16/2014

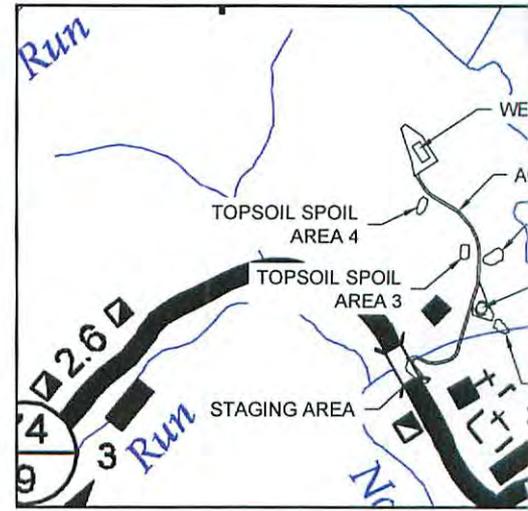


NORTH MERIDIAN REFERENCED TO NAD83 WEST VIRGINIA STATE PLANE NORTH ZONE
AFFECTED TAX PARCELS: SEE SHEET 2
PENNSBORO

DESCRIPTION	NAD 83 (WV NORTH)		UTM ZONE 17 (METERS)	
	LATITUDE	LONGITUDE	NORTHING	EASTING
CENTER OF WELL PAD	39° 19' 12.87"	80° 56' 17.55"	4352316.94	505326.45
CENTER OF WATER CONTAINMENT PAD	39° 18' 56.76"	80° 56' 08.42"	4351820.47	505545.41
ACCESS ROAD ENTRANCE	39° 18' 51.00"	80° 56' 18.21"	4351642.75	505311.10
STAGING AREA	39° 18' 49.62"	80° 56' 17.40"	4351600.22	505330.53

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:	54085C0125C
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A

ACCESS ROAD LENGTH (FEET)	
DESCRIPTION	FEET
ACCESS ROAD	2,788
TOTAL	2,788



811
Know what's Below.
Call before you dig.
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1-800-245-4848
WEST VIRGINIA STATE LAW
REQUIRES THAT YOU CALL TWO
BUSINESS DAYS BEFORE YOU
DIG IN THE STATE OF WEST
VIRGINIA. IT'S THE LAW!!

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

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

Electronic version of these plans may be

ATTACHED IMAGES: Antero, New Address, RUS Perkins, 08/11, 10/11, 11/11, 12/11, 1/12, 2/12, 3/12, 4/12, 5/12, 6/12, 7/12, 8/12, 9/12, 10/12, 11/12, 12/12, 1/13, 2/13, 3/13, 4/13, 5/13, 6/13, 7/13, 8/13, 9/13, 10/13, 11/13, 12/13, 1/14, 2/14, 3/14, 4/14, 5/14, 6/14, 7/14, 8/14, 9/14, 10/14, 11/14, 12/14, 1/15, 2/15, 3/15, 4/15, 5/15, 6/15, 7/15, 8/15, 9/15, 10/15, 11/15, 12/15, 1/16, 2/16, 3/16, 4/16, 5/16, 6/16, 7/16, 8/16, 9/16, 10/16, 11/16, 12/16, 1/17, 2/17, 3/17, 4/17, 5/17, 6/17, 7/17, 8/17, 9/17, 10/17, 11/17, 12/17, 1/18, 2/18, 3/18, 4/18, 5/18, 6/18, 7/18, 8/18, 9/18, 10/18, 11/18, 12/18, 1/19, 2/19, 3/19, 4/19, 5/19, 6/19, 7/19, 8/19, 9/19, 10/19, 11/19, 12/19, 1/20, 2/20, 3/20, 4/20, 5/20, 6/20, 7/20, 8/20, 9/20, 10/20, 11/20, 12/20, 1/21, 2/21, 3/21, 4/21, 5/21, 6/21, 7/21, 8/21, 9/21, 10/21, 11/21, 12/21, 1/22, 2/22, 3/22, 4/22, 5/22, 6/22, 7/22, 8/22, 9/22, 10/22, 11/22, 12/22, 1/23, 2/23, 3/23, 4/23, 5/23, 6/23, 7/23, 8/23, 9/23, 10/23, 11/23, 12/23, 1/24, 2/24, 3/24, 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CONTAINMENT PAD CONSTRUCTION PLAN, CONTROL PLANS CORPORATION

PLAN REPRODUCTION WARNING

THE PLANS HAVE BEEN CREATED ON ANSI D (22"x34") SHEETS. FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

THE PLANS HAVE BEEN CREATED FOR FULL COLOR PLOTTING. ANY SET OF THE PLANS THAT IS NOT PLOTTED IN FULL COLOR SHALL NOT BE CONSIDERED ADEQUATE FOR CONSTRUCTION PURPOSES.

WARNING: INFORMATION MAY BE LOST IN COPYING AND/OR GRAY SCALE PLOTTING

470 8510281

API # 8510169
API # 8510170
API # 8510171

ro
urces



7.5 QUAD
SCALE: 1 INCH = 1000 FEET



*Michael Goff
3/1/2016*

WELL HEAD LAYOUT				
WELL NAME	NAD 83 (WV NORTH ZONE)			
	NORTHING	EASTING	LATITUDE	LONGITUDE
ALLIANCE UNIT 3H	301955.3356	1561694.6400	39° 19' 12.33"	80° 56' 16.79"
ALLIANCE UNIT 2H	301963.7998	1561689.3148	39° 19' 12.41"	80° 56' 16.88"
ALLIANCE UNIT 1H	301972.2640	1561683.9896	39° 19' 12.49"	80° 56' 16.93"
EARNEST UNIT 1H	301980.7281	1561678.6644	39° 19' 12.58"	80° 56' 17.00"
EARNEST UNIT 2H	301989.1923	1561673.3392	39° 19' 12.66"	80° 56' 17.07"
KEROGEN UNIT 2H	301997.6565	1561668.0141	39° 19' 12.74"	80° 56' 17.14"
KEROGEN UNIT 1H	302006.1207	1561662.6889	39° 19' 12.82"	80° 56' 17.21"
NORMA UNIT 2H	302014.5849	1561657.3637	39° 19' 12.91"	80° 56' 17.28"
NORMA UNIT 1H	302023.0491	1561652.0385	39° 19' 12.99"	80° 56' 17.35"
PIEDMONT UNIT 1H	302031.5133	1561646.7133	39° 19' 13.07"	80° 56' 17.42"
PIEDMONT UNIT 2H	302039.9774	1561641.3882	39° 19' 13.15"	80° 56' 17.49"

WELL HEAD LAYOUT				
WELL NAME	NAD 27 (WV NORTH ZONE)		UTM ZONE 17 (METERS)	
	NORTHING	EASTING	NORTHING	EASTING
ALLIANCE UNIT 3H	301921.54	1593135.98	4352300.20	505344.57
ALLIANCE UNIT 2H	301929.73	1593130.61	4352302.75	505342.90
ALLIANCE UNIT 1H	301937.91	1593125.24	4352305.30	505341.24
EARNEST UNIT 1H	301947.10	1593119.88	4352307.85	505339.57
EARNEST UNIT 2H	301955.28	1593114.51	4352310.40	505337.91
KEROGEN UNIT 2H	301963.46	1593109.14	4352312.95	505336.24
KEROGEN UNIT 1H	301971.64	1593103.77	4352315.50	505334.58
NORMA UNIT 2H	301980.84	1593098.42	4352318.06	505332.91
NORMA UNIT 1H	301989.02	1593093.05	4352320.61	505331.24
PIEDMONT UNIT 1H	301997.20	1593087.68	4352323.16	505329.58
PIEDMONT UNIT 2H	302005.38	1593082.30	4352325.71	505327.91

SHEET INDEX	
PAGE NO.	DESCRIPTION
1	COVER PAGE & LOCATION MAP
2	SCHEDULE OF QUANTITIES
3	NOTES
4	EXISTING CONDITIONS
5	OVERALL PLAN
6-8	SITE PLAN
9	WELL PAD GRADING PLAN
10	WELL PAD CROSS SECTIONS AND PROFILE
11	WATER CONTAINMENT PAD CROSS SECTIONS AND PROFILE
12-14	ACCESS ROAD CROSS SECTIONS AND PROFILE
15-20	DETAILS
22-23	RECLAMATION PLAN

WELL LOCATION RESTRICTIONS

WELL PAD IS TO COMPLY WITH WELL LOCATION RESTRICTIONS OF WV CODE 22-6A-12. THE PADS COMPLY WITH THE FOLLOWING RESTRICTIONS:

- 250' FROM AN EXISTING WELL OR DEVELOPED SPRING USED FOR HUMAN OR DOMESTIC ANIMALS
- 625' FROM AN 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 NATURALLY REPRODUCING TROUT STREAMS
- 1000' OF SURFACE OR GROUND WATER INTAKE TO A PUBLIC WATER SUPPLY

ISSUED FOR
CONSTRUCTION



RECEIVED
Office of Oil and Gas

DESIGNED BY: JTS

MODIFIED BY: -

CHECKED BY: JBC

DATE: 05-09-2014

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

CONSTRUCTION

WV Department of
Environmental Protection

25 sheets

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Bright People. Right Solutions.
230 EXECUTIVE DRIVE, SUITE 122
CRANBERRY TOWNSHIP, PA 16666
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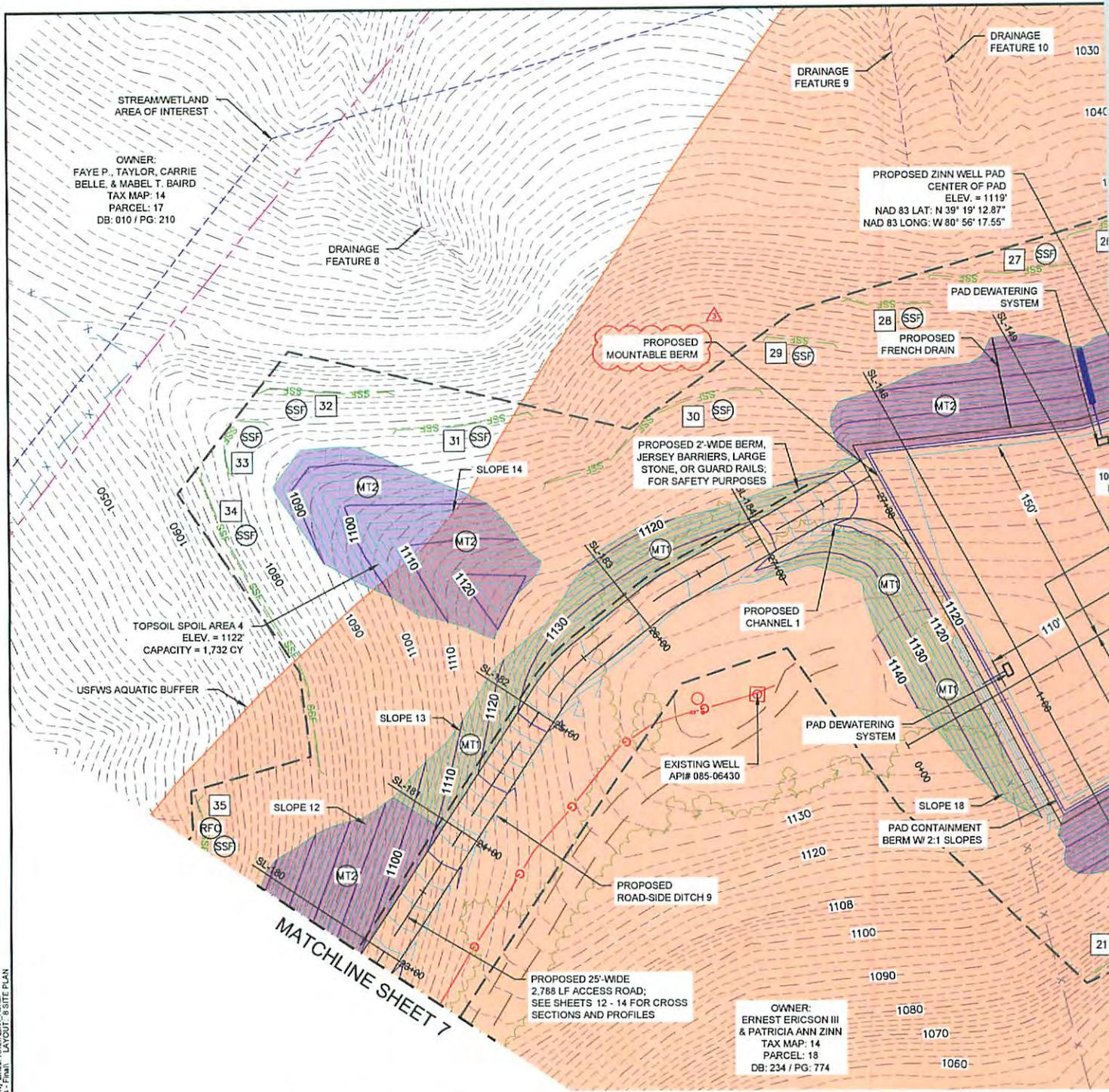
**ZINN WELL & W.C. PAD
COVER PAGE & LOCATION MAP**

ANTERO RESOURCES CORPORATION
ZINN WELL & WATER CONTAINMENT PAD
CLAY DISTRICT

WEST VIRGINIA
RITCHIE COUNTY

ACAD FILE: COVER.dwg
PROJ. NO. 135302

PLOTTED: 25 Nov 2014, 12:25pm, RP/anker



OWNER:
 FAYE P. TAYLOR, CARRIE
 BELLE, & MABEL T. BAIRD
 TAX MAP: 14
 PARCEL: 17
 DB: 010 / PG: 210

PROPOSED ZINN WELL PAD
 CENTER OF PAD
 ELEV. = 1119'
 NAD 83 LAT: N 39° 19' 12.87"
 NAD 83 LONG: W 80° 56' 17.55"

TOPSOIL SPOIL AREA 4
 ELEV. = 1122'
 CAPACITY = 1,732 CY

PROPOSED MOUNTABLE BERM
 PROPOSED 2'-WIDE BERM,
 JERSEY BARRIERS, LARGE
 STONE, OR GUARD RAILS;
 FOR SAFETY PURPOSES

PROPOSED 25'-WIDE
 2,788 LF ACCESS ROAD;
 SEE SHEETS 12 - 14 FOR CROSS
 SECTIONS AND PROFILES

OWNER:
 ERNEST ERICSON III
 & PATRICIA ANN ZINN
 TAX MAP: 14
 PARCEL: 18
 DB: 234 / PG: 774

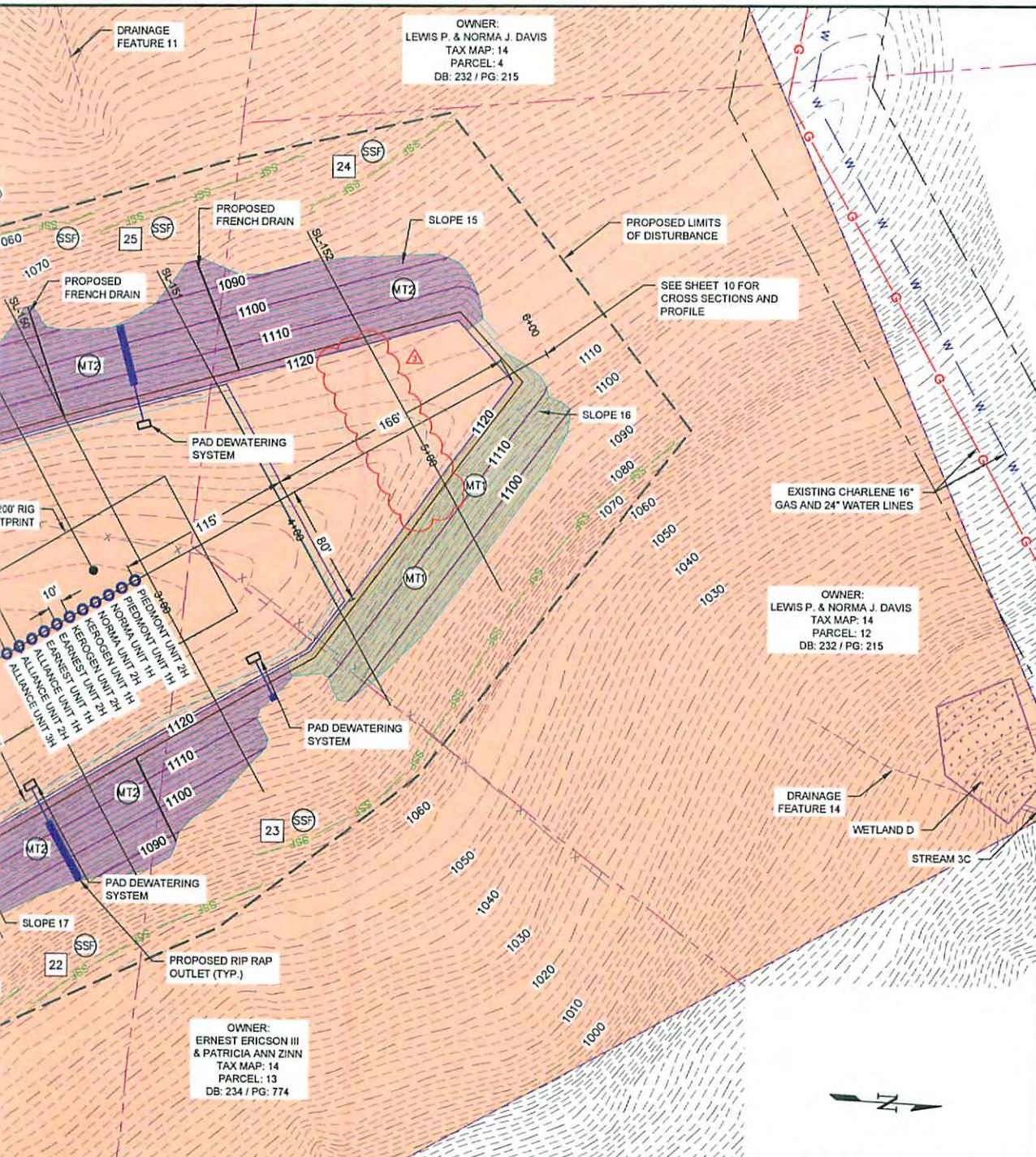
MATCHLINE SHEET 7

LEGEND			
1360	EX INDEX CONTOUR	---	PROP LIMITS OF DISTURBANCE
---	EX INTERMEDIATE CONTOUR	---	PROP FRENCH DRAIN
---	EX TREE LINE	---	PROP INDEX CONTOUR
---	EX PROPERTY LINE	---	PROP INTERMEDIATE CONTOUR
---	EX WETLAND	---	PROP ROAD CENTERLINE
---	EX POND	---	PROP PADS & ROAD EDGE
---	EX STREAM	---	PROP 2'-WIDE BERM, JERSEY BARRIER, LARGE STONE, OR GUARD RAILS FOR SAFETY PURPOSES
---	EX DRAINAGE FEATURE	---	PROP GAS LINE REROUTE
---	EX CULVERT	---	PROP SUPER SILT FENCE AND FILTER SOCK INDICATION (SEE SHEET 11 FOR SUPER SILT FENCE AND FILTER SOCK TABLE)
G	EX GAS LINE	---	PROP SUPER SILT FENCE
OHW	EX OVERHEAD POWER LINE	---	PROP NAG SC150 EROSION CONTROL MATTING*
U	EX UTILITY POLE	---	PROP NAG C125N EROSION CONTROL MATTING*
X	EX FENCE	---	PROP CONSTRUCTION ENTRANCE
---	EX ROAD	---	PROP OUTLET PROTECTION
---	EX STRUCTURE	---	PROP INLET PROTECTION
---	STREAMWETLAND AREA OF INTEREST	---	PROP ROCK FILTER OUTLET
---	EX 100-YEAR FLOODPLAIN	---	
---	USFWS AQUATIC BUFFER	---	

- NOTES:
- THE GRADES SHOWN REPRESENT FINISH GRADE ELEVATIONS.
 - PIPE MATERIALS SHALL BE AS NOTED ON THE PLAN AND IN THE STORM DRAINAGE COMPUTATION T
 - CUT AND FILL SLOPES SHALL BE AT 2H:1V UNLESS NOTED OTHERWISE.
 - FILL SHALL BE PLACED IN 12" LIFTS AND BE COMPACTED TO 95% STANDARD PROCTOR.
 - INTERMEDIATE TOE BENCHES SHALL BE INSTALLED ON FILL SLOPES AT INTERVALS OF 50' VERTICAL SOILS CONDITIONS WARRANT ADDITIONAL SLIP PRECAUTIONS.
 - ALL FILL SLOPES SHALL BE TOE KEYED PER THE DETAIL SHOWN ON SHEET 18.
 - POSITIVE FLOW FROM PAD TO SUMPS. SEDIMENTS AND MATERIAL REMOVED FROM THE PAD SHALL TO ON-SITE HOLDING/STORAGE TANKS AND SUBSEQUENTLY REMOVED FROM SITE BY AN APPROVED VENDOR.
 - ALL STORMWATER CONVEYANCES ON THE SITE HAVE BEEN DESIGNED TO ACCOMMODATE THE 10-
 - SEE DETAIL ON SHEET 16 FOR RIP RAP OUTLET PROTECTION SIZING AND DESIGN.
 - CONTRACTOR TO INSTALL ROCK CHECK DAMS WITHIN ROADSIDE DITCHES. SEE DETAIL ON PAGE REQUIREMENTS. ROCK CHECK DAMS WILL BE INSTALLED DURING CONSTRUCTION AS EROSION CONTROL REMAIN IN PLACE AS PERMANENT CHECK DAMS AFTER CONSTRUCTION IS COMPLETE.
 - ALL FILTER SOCK TO BE 18" UNLESS OTHERWISE NOTED.
 - IN TOPSOIL PLACEMENT AREAS, CONTRACTOR TO INSTALL PROPER BMPS TO ENSURE NO OFFSITE SEDIMENTATION RUNOFF.
 - INSTALL ROCK FILTER OUTLETS ALONG SEDIMENT BARRIERS AS SHOWN AND AT LOW POINTS AS I

ATTACHED IMAGES: Refer ANTERO 11x17 TITLE BLOCK; VBA; Zinn; Berra; VBA; Zinn; Super; XRef; Zinn; Property; Lines; XRef; Zinn; Detail; LAYOUT; @ SITE PLAN
 ATTACHED XREFS: Refer ANTERO 11x17 TITLE BLOCK; VBA; Zinn; Berra; VBA; Zinn; Super; XRef; Zinn; Property; Lines; XRef; Zinn; Detail; LAYOUT; @ SITE PLAN

*HYDROMULCHING MAY BE USED IN LIEU OF MATTING PER MANUFACTURERS SPECIFICATIONS



OWNER:
LEWIS P. & NORMA J. DAVIS
TAX MAP: 14
PARCEL: 4
DB: 232 / PG: 215

OWNER:
LEWIS P. & NORMA J. DAVIS
TAX MAP: 14
PARCEL: 12
DB: 232 / PG: 215

OWNER:
ERNEST ERICSON III
& PATRICIA ANN ZINN
TAX MAP: 14
PARCEL: 13
DB: 234 / PG: 774

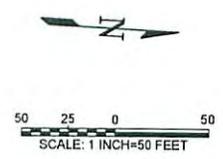
NO.	REVISION	BY	DATE
△	CORPORATE ADDRESS	KLF	05-23-14
△	QUANTITIES REVISION	KLF	11-06-14
△	WELL PAD GRADING & SUMP REVISION	KLF	11-25-14
△			
△			

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ACAD FILE: SITE PLAN.dwg
PROJ. NO. 136302

**ZINN WELL & W.C. PAD
SITE PLAN**

ANTERO RESOURCES CORPORATION
ZINN WELL & WATER CONTAINMENT PAD
CLAY DISTRICT
WEST VIRGINIA
RITCHIE COUNTY



STORM DRAINAGE LEGEND	
FES	FLARED END SECTION

**ISSUED FOR
CONSTRUCTION**

ZINN STORM DRAINAGE COMPUTATIONS								
ACCESS ROAD CROSS-DRAINS		Q TOTAL FLOW (cfs)	SLOPE (ft/ft)	SIZE	LENGTH (ft)	UPPER INVERT (ft)	LOWER INVERT (ft)	PIPE MATERIAL
PIPE 1	0+50	0.32	0.0111	15"	45.00	836.00	835.50	HDPE*
PIPE 2	3+05	2.38	0.0333	15"	45.00	888.50	887.00	HDPE*
PIPE 3	7+05	0.90	0.0889	15"	45.00	969.00	965.00	HDPE*
PIPE 4	19+05	4.18	0.1263	15"	95.00	1062.00	1050.00	HDPE*

*DOUBLE WALL CORRUGATED PIPE

MAG
3/1/2014

**APPROVED
WVDEP OOG**
12/16/2014

JEFFERY B. CRISP
REGISTERED PROFESSIONAL ENGINEER
20354
STATE OF WEST VIRGINIA
RECEIVED
Office of Oil and Gas
MAR 03 2016

DESIGNED BY:	JTS
MODIFIED BY:	-
CHECKED BY:	JBC
DATE:	05-09-2014
SCALE:	AS SHOWN
CONSTRUCTION	8 of 23 sheets

WV Department of Environmental Protection