



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

April 10, 2015

WELL WORK PERMIT


Horizontal 6A Well

This permit, API Well Number: 47-8510205, 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: LEFT FORK UNIT 3H
Farm Name: O'NEILL FAMILY TRUST ET AL
API Well Number: 47-8510205
Permit Type: Horizontal 6A Well
Date Issued: 04/10/2015

Promoting a healthy environment.

04/10/2015

PERMIT CONDITIONS

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

CONDITIONS

1. Operator shall take additional measures with this permitted activity to avoid communication with offset wells. Such additional measures are described in the attached addendum. This addendum is part of the terms of the well work permit, and includes a description of depth and completed formations of offset wells. Also included is a description of monitoring activities that will take place during fracturing operations of the permitted well work.
1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

PERMIT CONDITIONS

6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

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WW-6B
(9/13)

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

1) Well Operator: Antero Resources Corporation 494488557 085- Ritchie Union Pullman 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Left Fork Unit 3H Well Pad Name: Lockhart Heirs West Pad

3) Farm Name/Surface Owner: O'Neill Family Trust, et al Public Road Access: CR 9

4) Elevation, current ground: -1040' Elevation, proposed post-construction: 1019'

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

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus Shale: 6500' TVD, Anticipated Thickness- 50 ft., Associated Pressure- 3000#

8) Proposed Total Vertical Depth: 6500' TVD

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 15000' MD

11) Proposed Horizontal Leg Length: 8038'

12) Approximate Fresh Water Strata Depths: 12', 52', 124', 258'

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

14) Approximate Saltwater Depths: 1712', 2040'

15) Approximate Coal Seam Depths: None Identified

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

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

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(9/13)

18)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20"	New	H-40	94#	105'	105'	CTS, 101 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	315'	315'	CTS, 438 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2410'	2410'	CTS, 981 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	15000'	15000'	3745 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

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

PACKERS

Kind:	N/A				Received Office of Oil & Gas FEB 27 2015
Sizes:	N/A				
Depths Set:	N/A				

S. Wilcox
2-25-15

WW-6B
(9/13)

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.

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): 19.30 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.54 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.

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.



Addendum for Antero pads in Ritchie County, WV

Left Fork Unit 1H	Lockhart Heirs West Pad
Left Fork Unit 3H	Lockhart Heirs West Pad
Left Fork Unit 4H	Lockhart Heirs West Pad

The following outlines the process to be undertaken by Antero Resources prior to and during completion process of wells in Ritchie County.

- Investigate all wells within 1320' of new wells - for all identified Marcellus vertical wells and any existing well(s) with an interval that is less than 1500 feet from the deepest formation drilled (including, but not specific to the Alexander formation) to the top of Marcellus:
 - Contact operator of all wells
 - Confirm well status, producing horizon, well completion/stimulation information
 - Discuss plans to stimulate the horizontal Marcellus wells and the plans for monitoring potential impact on shallow wells
 - Make sure all vertical wells (with an interval that is less than 1500 feet from the deepest formation drilled to the top of Marcellus) have adequate wellhead equipment, including pressure gauges
 - Provide shallow well operator with frac dates and develop plan for monitoring during stimulation
 - If well waters out during frac, shut it in until after stimulation, and install adequate well control equipment prior to swabbing in the impacted shallow well
- Control fracturing parameters during job to limit fracture height growth
 - Limit rate and limit pressures for each segment of fracturing stages

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WW-9
(9/13)

API Number 47 - 085
Operator's Well No. Left Fork Unit 3H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494488557

Watershed (HUC 10) South Fork Hughes River Quadrangle Pullman 7.5'

Elevation 1019' County Ritchie District Union

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 offsite).

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 _____)

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/Duff 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)

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 *Cole Kilstrom*

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager

Subscribed and sworn before me this 11 day of February, 20 15

Kara Quackenbush Notary Public

My commission expires July 21, 2018



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Form WW-9

Operator's Well No. Left Fork Unit 3H

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 19.30 Acres Prevegetation pH 6.0

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

Well Pad (6.54) + Water Containment Pad (2.51) + Access Road 1 (5.24) + Access Road 3 (0.86) + Diversion Ditches (1.15) + Topsoil Spoil Area (0.94) + Material Spoil Area 1 (1.20) + Material Spot Area 2 (0.86) = 19.50 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: Paul W. Lewis

Comments: proseed & mulch all dirt areas no less than 2 tons per acre maintain all O&G during operation

Title: air gas inspector Date: 2-25-15

Field Reviewed? Yes No

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Form WW-9 Additives Attachment**SURFACE INTERVAL**

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

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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911 ADDRESS
1132 Oxford Rd.
Pullman, WV 26421

Well Site Safety Plan

Antero Resources

Well Name: Left Fork Unit 1H, Left Fork Unit 2H, Left Fork Unit 3H, Left Fork Unit 4H, Harris Unit 1H & Harris Unit 2H

Pad Location: LOCKHART HEIRS WEST PAD
Ritchie County/ Union District

GPS Coordinates: Lat 39°11'23.4996"/Long 80°55'40.7532" (NAD83)

Driving Directions:

FROM EAST - From the intersection of I-79 and Hwy 50 near Bridgeport WV, head west on Hwy 50 for ~39.6 miles. Turn LEFT onto W Virginia 74 S, and follow for ~7.4 miles. Turn LEFT onto Co Rd 9/Main St and continue for ~1.1 miles onto Co Rd 9/Harrisville-Pullman Oxford. Look for rig signs and location on the left. Drill site is right off the road.

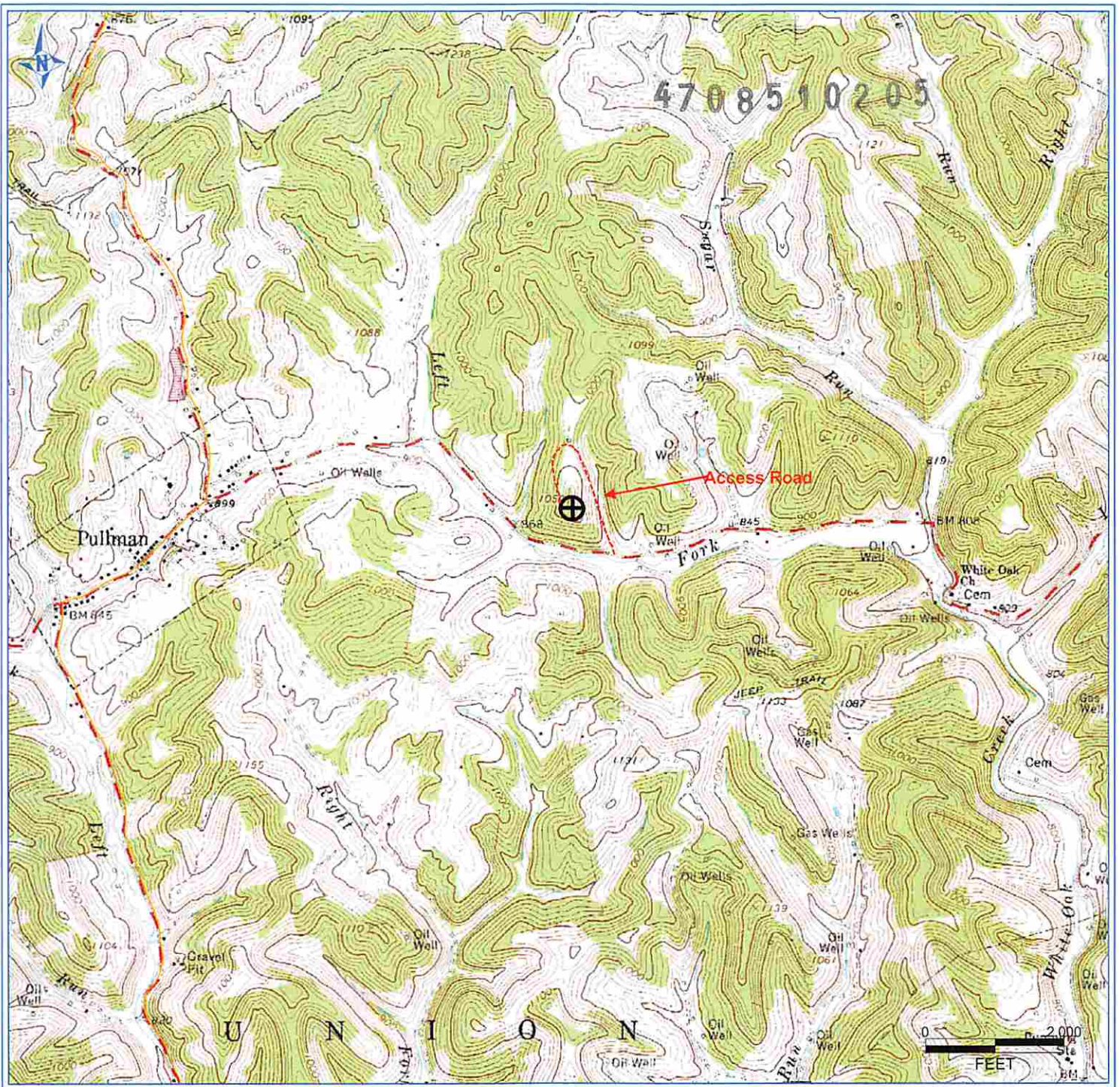
FROM WEST - From the intersection of I-77 and Hwy 50 near Parkersburg WV, head east on Hwy 50 for ~32.3 miles. Turn RIGHT onto W Virginia 74 S, and follow for ~7.4 miles. Turn LEFT onto Co Rd 9/Main St and continue for ~1.1 miles onto Co Rd 9/Harrisville-Pullman Oxford. Look for rig signs and location on the left. Drill site is right off the road.

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

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2-25-15

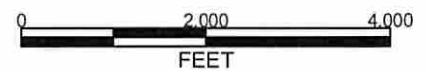


PETRA 6/26/2012 2:36:01 PM

Antero Resources Corporation

APPALACHIAN BASIN

Left Fork Unit 3H
Ritchie County



REMARKS
 QUADRANGLE: PULLMAN
 WATERSHED: SOUTH FORK HUGHES RIVER
 DISTRICT: UNION

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 Environmental Protection

Date: 7/05/2012 **04/10/2015**



200 EXECUTIVE DRIVE, SUITE 100
CHERRY CREEK, VA 22626
WWW.KLEINFELDER.COM



ISSUED BY: JBC
REVISIONS:
DATE

ISSUED FOR CONSTRUCTION

SCALE VERIFICATION
1"=200'
ADJUST SCALE
FACTS DIFFERENTIALLY

COVER PAGE & LOCATION MAP
LOCKHART HEIRS WEST WELLS & W.C. PAD
PULLMAN DISTRICT, RITCHIE COUNTY
WEST VIRGINIA



CONSTRUCTION
PROJECT NO.: 2015008
SCALE DATE: 03/30/2015
CURRENT REVISION: 8
DESIGNED BY: JBC
DRAWN BY: JBC
CHECKED BY: JBC
APPROVED BY: JBC

APPROVED
WVDEP OOG
3/30/2015
API# 8510204
API# 8510205
API# 8510206

LOCKHART HEIRS WEST WELL AND WATER CONTAINMENT PAD SITE DESIGN & CONSTRUCTION PLAN, EROSION & SEDIMENT CONTROL PLANS

ANTERO RESOURCES CORPORATION



WELL HEAD LAYOUT
NAD 83 (WV NORTH ZONE)

WELL NAME	NORTHING	EASTING	LATITUDE	LONGITUDE
HARRIS UNIT 2H	254359.8028	1563766.7066	36.189522	-80.828004
HARRIS UNIT 2I	254359.7898	1563766.2167	36.189549	-80.828003
LEFT FORK UNIT 4H	254370.7767	1563766.7277	36.186577	-80.828002
LEFT FORK UNIT 3H	254398.7635	1563767.2386	36.189044	-80.828001
LEFT FORK UNIT 1H	254398.7056	1563767.7498	36.189032	-80.828000
LEFT FORK UNIT 2H	254400.7375	1563768.2609	36.189059	-80.827998

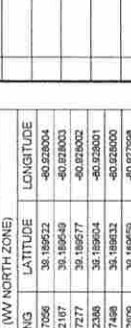
WELL HEAD LAYOUT
UTM ZONE 17 (METERS)

WELL NAME	NORTHING	EASTING	NORTHING	EASTING
HARRIS UNIT 2H	254325.5506	1562026.6145	4337910.8439	506217.5530
HARRIS UNIT 2I	254325.5375	1562027.1256	4337911.3550	506217.0420
LEFT FORK UNIT 4H	254346.5246	1562027.6366	4337915.8670	506217.5530
LEFT FORK UNIT 3H	254358.5114	1562028.1476	4337919.8700	506217.0420
LEFT FORK UNIT 1H	254358.4684	1562028.6586	4337920.3810	506217.5530
LEFT FORK UNIT 2H	254370.4654	1562029.1691	4337924.8930	506217.0420

SHEET INDEX

PAGE NO.	DESCRIPTION
1	COVER PAGE & LOCATION MAP
2	SCHEDULE OF QUANTITIES
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5	OVERALL PLAN
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7-8	SITE PLAN
9	WELL PAD GRADING PLAN
10	WATER CONTAINMENT PAD GRADING PLAN
11	WELL PAD CROSS SECTIONS AND PROFILE
12	WATER CONTAINMENT PAD CROSS SECTIONS AND PROFILE
13	ACCESS ROAD 1 CROSS SECTIONS AND PROFILE
14	ACCESS ROAD 2 CROSS SECTIONS AND PROFILE
15-20	DETAILS
21-22	RECLAMATION PLAN

WELL LOCATION RESTRICTIONS
WELL PADS TO BE COMPLY WITH WELL LOCATION RESTRICTIONS OF WV DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) PERMITS:
• 50' 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 POLTRY OR DAIRY MEASURED FROM THE CENTER OF THE STREAM, NATURAL OR ARTIFICIAL LAKE, POND OR RESERVOIR
• 300' FROM EDGE OF DISTURBANCE TO NATURALLY REPRODUCING SUPPLY
• 100' OF SURFACE OR GROUND WATER INTAKE TO A PUBLIC WATER SUPPLY



PLAN REPRODUCTION WARNING
THE PLANS HAVE BEEN GENERATED ON ARIAS D-GENESIS FOR REDUCED RESOLUTION TO SHIPING SCALE.
ANY REPRODUCTION OF THESE PLANS MUST BE FOR CONSTRUCTION PURPOSES ONLY.
ANTERO RESOURCES CORPORATION

PROJECT OWNER
ANTERO RESOURCES
1615 WYNKOPF STREET
DENVER, CO 80202

PROJECT CONTACTS
CONTACT: ANTHONY SMITH
FIELD ENGINEER
34-873/1916 OFFICE
34-873/1916 CELL

LOCATION SURVEYOR
WHITE BROTHERS CONSULTING, LLC
CONTACT: JENNIE SMITH, LSC
447 CALL ROAD, SUITE 210
CHARLES TOWN, WV 26030
304.520.3404

ENVIRONMENTAL/ DELINEATION BOUNDARY
ALLSTAR ECOLOGY, LLC
CONTACT: JENNIE SMITH, LSC
1102 BIRCHWOOD DRIVE, SUITE 200
BUNTON, WV 26032
304.813.8900 CELL

TOPO SURVEYOR
BLUE MOUNTAIN AERIAL MAPPING
CONTACT: JENNIE SMITH, LSC
3000 GARDEN WAY, SUITE 300
MORRISTOWN, NC 27560
910.755.5011 OFFICE
910.755.1474 FAX

ENGINEER OF RECORD
KLEINFELDER ENGINEERING, PC
CONTACT: JOHN KAWCAK
ENGINEER
817.386.1553

ENGINEER OF RECORD
CONTACT: AARON KUNZLER
CIVIL ENGINEER
SURREYSBORO
405.227.6344

DESIGN CERTIFICATION
THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE DESIGN STANDARDS, RULES, AND REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF CIVIL AND GAS ENGINEERING.

MIN-109 PERMIT
ANTERO RESOURCES MUST OBTAIN AN ENVIRONMENTAL PERMIT FROM THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF HIGHWAYS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

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PROJECT OWNER
ANTERO RESOURCES
1615 WYNKOPF STREET
DENVER, CO 80202

PROJECT CONTACTS
CONTACT: ANTHONY SMITH
FIELD ENGINEER
34-873/1916 OFFICE
34-873/1916 CELL

LOCATION SURVEYOR
WHITE BROTHERS CONSULTING, LLC
CONTACT: JENNIE SMITH, LSC
447 CALL ROAD, SUITE 210
CHARLES TOWN, WV 26030
304.520.3404

ENVIRONMENTAL/ DELINEATION BOUNDARY
ALLSTAR ECOLOGY, LLC
CONTACT: JENNIE SMITH, LSC
1102 BIRCHWOOD DRIVE, SUITE 200
BUNTON, WV 26032
304.813.8900 CELL

TOPO SURVEYOR
BLUE MOUNTAIN AERIAL MAPPING
CONTACT: JENNIE SMITH, LSC
3000 GARDEN WAY, SUITE 300
MORRISTOWN, NC 27560
910.755.5011 OFFICE
910.755.1474 FAX

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WW-6A1

Operator's Well Number Left Fork Unit 3H

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>O'Neill Family Trust, et al Lease</u>			
Daniel J. O'Neill, Trustee for the O'Neill Family Trust, et al	Key Oil Company	1/8	0252/1053
Key Oil Company	Antero Resources Appalachian Corporation	*Partial Assignment of Oil & Gas Leases	0253/0747
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>W.G. Burgan, et al Lease</u>			
W. G. Burgan, et al	Key Oil Company	1/8	0224/0649
Key Oil Company	Antero Resources Appalachian Corporation	*Partial Assignment of Oil & Gas Leases	0253/0747
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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WV 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.

CONTINUED ON NEXT PAGE

04/10/2015

**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)**

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- (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>J.B. Elliot, et ux Lease</u>	J.B. Elliot, et ux Carnegie Natural Gas Company	Carnegie Natural Gas Company Carnegie Production Company	1/8 Assignment, Bill of Sale	0041/0184 0228/0859
	Carnegie Production Company EQT Production Company Antero Resources Appalachian Corporation	EQT Production Company Antero Resources Appalachian Corporation Antero Resources Corporation	Name Change Assignment Name Change	Exhibit 2 0267/0477 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.

**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.

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Office of Oil and Gas

FEB 18 2015

WV Department of
Environmental Protection

Well Operator: Antero Resources Corporation
 By: Kevin Kilstrom
 Its: VP of Production

FORM WV-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



Penney Barker, Manager
IN THE OFFICE OF Corporations Division
SECRETARY OF STATE Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvssos.com
E-mail: business@wvssos.com

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

APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY

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

**** 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:

- 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: 6/25/2008
 - 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)
6. 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.)
- Alwyn A. Schopp (303) 367-7310
Contact Name Phone Number
7. Signature information (See below *Important Legal Notice Regarding Signature*):
- Print Name of Signer: Alwyn A. Schopp Title/Capacity: Authorized Person
- Signature: [Handwritten Signature] Date: June 10, 2013

***Important Legal Notice Regarding Signature:** Per 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.

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Office of Oil and Gas

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WV Department of
Environmental Protection

04/10/2015

State of West Virginia



Certificate

*I, Natalie E. Tennant, Secretary of State of the
State of West Virginia, hereby certify that*

EQT PRODUCTION COMPANY

has filed a "Certificate of Registration of Trade Name" in my office according to the provisions of Chapter 47 of the West Virginia Code and was found to conform to law.

Therefore, I hereby issue this

CERTIFICATE OF REGISTRATION OF TRADE NAME

authorizing it to transact business in West Virginia under the assumed name of

CARNEGIE PRODUCTION COMPANY



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Office of Oil and Gas

FEB 13 2015

WV Department of
Environmental Protection

*Given under my hand and the
Great Seal of the State of
West Virginia on this day of
April 9, 2009*

Secretary of State

4708510205



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

February 11, 2015

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

RE: Left Fork Unit 3H
Quadrangle: Pullman 7.5'
Ritchie County/Union District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Left Fork Unit 3H 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 Left Fork Unit 3H 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 that reads "H West".

Haley West
Landman

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WV Department of
Environmental Protection

04/10/2015

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

4708510205

Date of Notice Certification: 02/10/2015

API No. 47- 085
Operator's Well No. Left Fork Unit 3H
Well Pad Name: Lockhart Heirs West 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: <u>West Virginia</u>	UTM NAD 83	Easting: <u>506218m</u>
County: <u>Ritchie</u>		Northing: <u>4337820m</u>
District: <u>Union</u>	Public Road Access: <u>CR 9</u>	
Quadrangle: <u>Pullman 7.5'</u>	Generally used farm name: <u>O'Neill Family Trust, et al</u>	
Watershed: <u>South Fork Hughes River</u>		

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.

<p>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:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input checked="" type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
---	--

RECEIVED
Office of Oil and Gas
FEB 13 2015
WV Department of
Environmental Protection

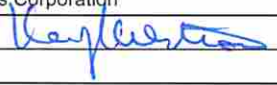
Required Attachments:

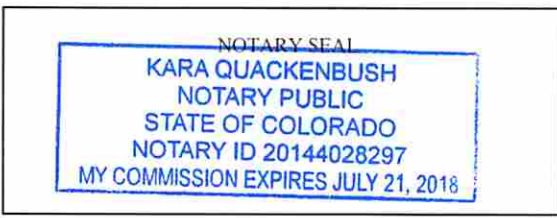
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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.

4708510205

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>VP 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 10 day of February 2015.
Kara Quackenbush 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 deprivacyofficer@wv.gov.

RECEIVED
 Office of Oil and Gas
 FEB 13 2015
 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: 2/11/2015 **Date Permit Application Filed:** 2/11/2015

Notice of:

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

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: (O'Neill Family Trust, et al)

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: _____
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: John A. and Linda J. Campbell
Address: 505 Oxford Road
Pullman, WV 26421

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
Address: _____

*Please attach additional forms if necessary

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Office of Oil and Gas

FEB 13 2015

WV Department of
Environmental Protection

04/10/2015

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.

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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

WV Department of
Environmental Protection

WW-6A
(8-13)

4708510205
API NO. 47-085 -
OPERATOR WELL NO. Left Fork Unit 3H
Well Pad Name: Lockhart Heirs West Pad

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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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.**

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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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WW-6A
(8-13)

API NO. 47- 085 -
OPERATOR WELL NO. Left Fork Unit 3H
Well Pad Name: Lockhart Heirs West Pad

Notice is hereby given by:

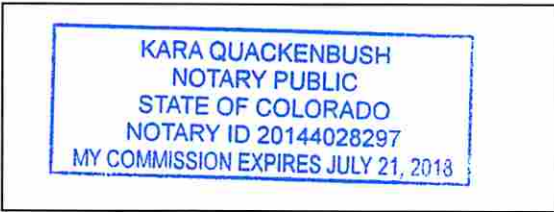
Well Operator: Antero Resources Corporation
Telephone: (303) 357-7310
Email: asteele@anteroresources.com



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 deprivacyofficer@wv.gov.



Subscribed and sworn before me this 11 day of February 2015
Kara Quackenbush Notary Public

My Commission Expires July 21, 2018

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WW-6A Notice of Application Attachment:

4708510205

Surface Owners:

Owner: Nancy Louise Antill ✓
Address: 114 Melinda Dr.
Wintersville, OH 43953

Owner: Mary Frances Harms ✓
Address: 4368 Steuben Woods Dr.
Steubenville, OH 43953

Owner: Kathleen R. Hooven ✓
Address: 4 Amador
Newport Beach, CA 92657

Owner: Karah L. Loftin ✓
Address: 226 Surrey Court
O Fallon, MO 63366

Owner: Kelcie J. Loftin ✓
Address: 226 Surrey Court
O Fallon, MO 63366

Owner: Daniel J. O'Neill ✓
Address: 30640 Rapids Hollow
Gravois Mills, MO 65037

Owner: Sean T. O'Neill ✓
Address: 30640 Rapids Hollow
Gravois Mills, MO 65037

Owner: Timothy R. O'Neill ✓
Address: P. O. Box 5063
Fort Myers Beach, FL 33932

Owner: Romarlo, LLC ✓
Address: 757 SE 17th Street
Suite 1085
Fort Lauderdale, FL 33316

Owner: Sharon S. O'Neill ✓
Address: 696 San Ramon Valley Blvd, #510
Danville, CA 94526

Owner: O'Neill Family Trust c/o Betty O'Neill ✓
Newsom, Trustee & Daniel O'Neill
Address: 30640 Rapids Hollow
Gravois Mills, MO 65037

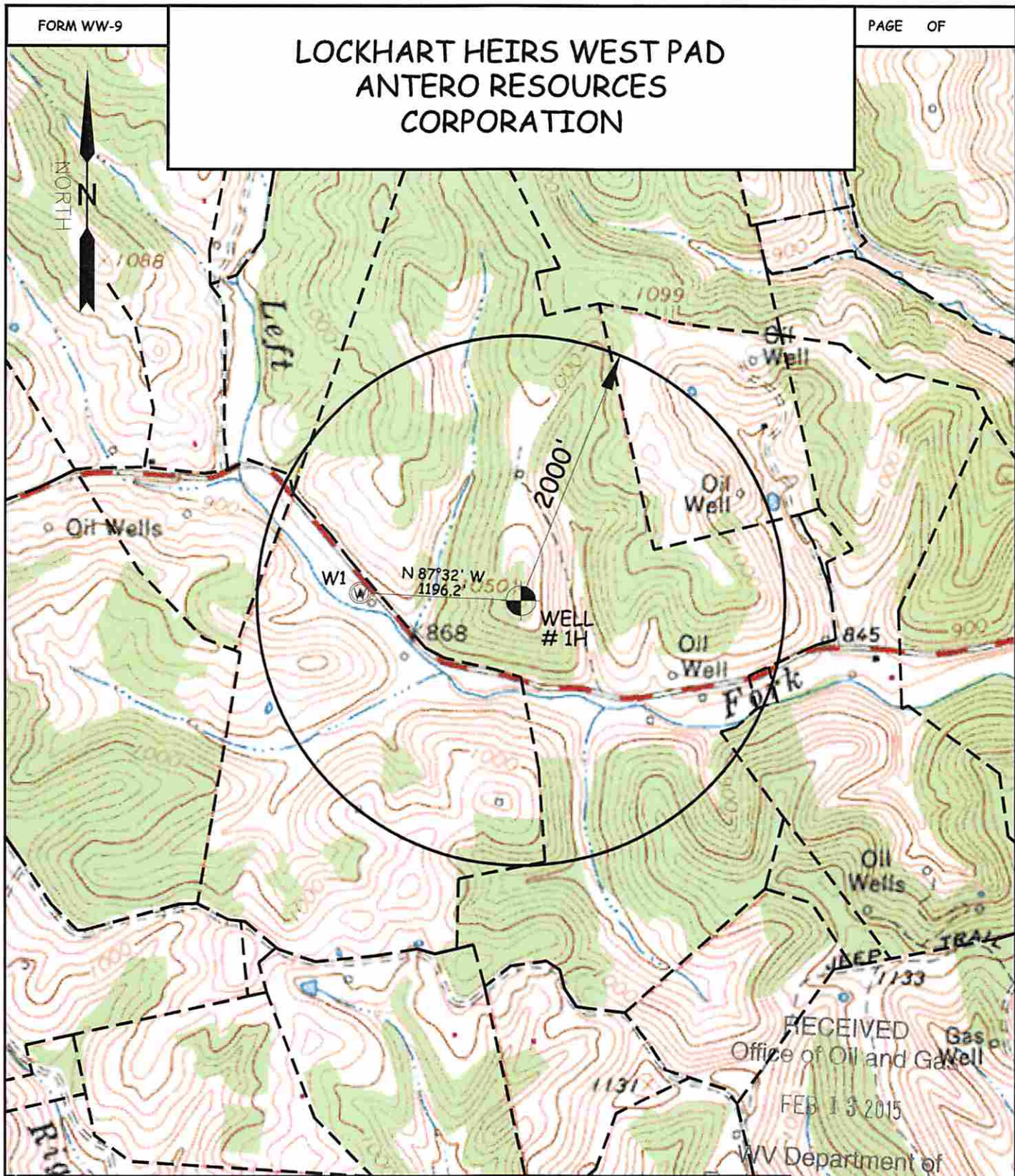
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**LOCKHART HEIRS WEST PAD
ANTERO RESOURCES
CORPORATION**



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WELL	SURFACE OWNER	ADDRESS
W1	John A. & Linda J. Campbell	505 Oxford Rd. Pullman, WV 26421
WILLOW LAND SURVEYING PLLC P.O. BOX 17, PENNSBORO, WV 26415 (304) 659-1717		TOPO SECTION(S) OF ; PULLMAN 7.5' QUAD
DATE: 01/09/15	DRAWN BY: D.L.P.	
		SCALE : 1-INCH = 1000-FEET 0' 1000' 2000' 3000'

WW-6A4 Notice of Intent to Drill Attachment:**Surface Owners:**

Owner: Nancy Louise Antill
Address: 114 Melinda Dr.
 Wintersville, OH 43953

Owner: Mary Frances Harms
Address: 4368 Steuben Woods Dr.
 Steubenville, OH 43953

Owner: Kathleen R. Hooven
Address: 4 Amador
 Newport Beach, CA 92657

Owner: Karah L. Loftin
Address: 226 Surrey Court
 O Fallon, MO 63366

Owner: Kelcie J. Loftin
Address: 226 Surrey Court
 O Fallon, MO 63366

Owner: Daniel J. O'Neill
Address: 30640 Rapids Hollow.
 Gravois Mills, MO 65037

Owner: Sean T. O'Neill
Address: 30640 Rapids Hollow.
 Gravois Mills, MO 65037

Owner: Timothy R. O'Neill
Address: P. O. Box 5063
 Fort Myers Beach, FL 33932

Owner: Romarlo, LLC
Address: 757 SE 17th Street
 Fort Lauderdale, FL 33316

Owner: Sharon S. O'Neill
Address: 696 San Ramon Valley Blvd, #510
 Danville, CA 94526

Owner: O'Neill Family Trust c/o Betty O'Neill
 Newsom, Trustee & Daniel O'Neill, Trustee
Address: 30640 Rapids Hollow
 Gravois Mills, MO 65037

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WW-6A5 Notice of Planned Operations Attachment:

4708510205

Surface Owners:

Owner: Nancy Louise Antill
Address: 114 Melinda Dr.
Wintersville, OH 43953

Owner: Mary Frances Harms
Address: 4368 Steuben Woods Dr.
Steubenville, OH 43953

Owner: Kathleen R. Hooven
Address: 4 Amador
Newport Beach, CA 92657

Owner: Karah L. Loftin
Address: 226 Surrey Court
O Fallon, MO 63366

Owner: Kelcie J. Loftin
Address: 226 Surrey Court
O Fallon, MO 63366

Owner: Daniel J. O'Neill
Address: 30640 Rapids Hollow.
Gravois Mills, MO 65037

Owner: Sean T. O'Neill
Address: 30640 Rapids Hollow.
Gravois Mills, MO 65037

Owner: Timothy R. O'Neill
Address: P. O. Box 5063
Fort Myers Beach, FL 33932

Owner: Romarlo, LLC
Address: 757 SE 17th Street
Suite 1085
Fort Lauderdale, FL 33316

Owner: Sharon S. O'Neill
Address: 696 San Ramon Valley Blvd, #510
Danville, CA 94526

Owner: O'Neill Family Trust c/o Betty O'Neill
Newsom, Trustee & Daniel O'Neill
Address: 30640 Rapids Hollow
Gravois Mills, MO 65037

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4708510205

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

December 12, 2014

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

Subject: DOH Permit for the Lockhart Heirs West Pad, Ritchie County
Left Fork Unit 3H Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #03-2013-0010 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Ritchie County Route 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: Megan Darling
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 Appalachian Corporation Site Construction Plan for Lockhart Heirs West Pad

Antero Resources Appalachian Corporation (Antero) is submitting the following Site Construction Plan in compliance with §35-8-5.5. This plan is submitted in conjunction with the Lockhart Heirs West Site Design, Construction Plan, & Erosion and 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 Allegheny Surveys, Inc., 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 page 3 of "Lockhart Heirs West Site Design, Construction Plan, & Erosion and Sediment Control Plans" (Site Design) prepared and certified by Allegheny Surveys, Inc. 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.1 *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 John Campbell South Pad can be found on "Site Plans" on pages 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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Please refer to the "Existing Conditions" maps 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 Plans" in pages 6-8 as well as the "Drill Pad Profile & Cross Sections" on page 9 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 Plans" of the Site Design on pages 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 "Drill Pad Profile & Cross Sections" and "Access Road Cross Sections" on pages 9-11 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 on page 6-8.

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 §35-8-5.5.

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

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The Site Design outlines measures to maintain compliance with Section 201 of the WVDOH Specifications which outlines clearing and grubbing measures. Please refer to Construction Specifications on page 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;

Antero Response

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to Construction Specifications on page 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 Construction Specifications 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 §5.5.c.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

Antero Response

Please refer to the Construction Specifications on page 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

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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;

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 Construction Specifications on page 4. 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

Construction, Erosion and Sediment Notes on page 3 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.

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Antero Resources Appalachian Corporation Erosion and Sediment Control Plan for Lockhart Heirs West Pad

Antero Resources Appalachian 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 Lockhart Heirs West Pad Site Design, Construction Plan, & Erosion & Sediment Control Plan prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Allegheny Surveys, Inc., 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 Lockhart Heirs West Site Design, Construction Plan, and Erosion & Sediment Control Plan (Site Design) prepared and certified by Allegheny Surveys, Inc. 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 drawing and provide any requested guidance.
- 2) Construct the construction entrance.
- 3) Construct all proposed sediment control devices as soon as clearing and grubbing operations allow. Diversions and sediment basins shall be seeded and mulched immediately.
- 4) Clear and grub, remove topsoil and place at an area determined in the field where erosion will not take place. Topsoil stockpile to be seed and mulched. Silt fence shall be constructed around topsoil stockpiles.
- 5) Grading operations as required. Cut slopes and fill slopes shall be top soiled if needed. Ditch lines shall be cleaned. All ditches will have at least grass lining protection or greater based on ditch slope with the following determination; 0 to 3% - grass lined, 3 to 9% - jute matting, and 9% or greater -TRM.
- 6) 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.
- 7) When final grade is achieved, topsoil to be placed on all disturbed areas not lined. Hydro-seed all disturbed areas as required. A soil sample should be taken and tested to determine recommended 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.
- 8) Lime, fertilizer, and seed will be applied by hand or using a hydro-seeder. Slope matting shall be installed in accordance with manufacturer's specifications.
- 9) Final seeding must occur within 7 days of final grading.
- 10) When site is stabilized, all erosion and sediment control measures can be removed and repair/stabilize those areas in accordance with state standards.

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- 11) Make modifications for permanent storm water management.
- 12) Final site inspection.

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 Construction, Erosion and Sediment Notes on page 3 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 Erosion 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 "Construction, Erosion and Sediment 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 "Construction, Erosion and Sediment Notes" on page 3 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.c.1. *A vicinity map locating the site in relation to the surrounding area and roads;*

Antero Response:

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

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

Antero Response:

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

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WEST VIRGINIA

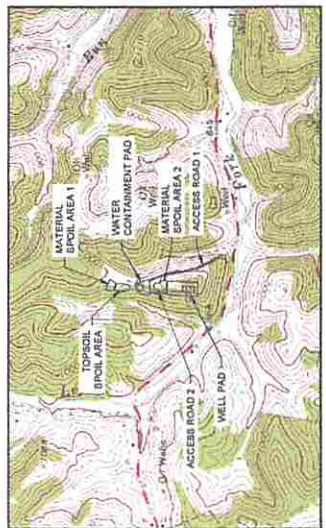


LOCKHART HEIRS WEST WELL AND WATER CONTAINMENT PAD SITE DESIGN & CONSTRUCTION PLAN, EROSION & SEDIMENT CONTROL PLANS

ANTERO RESOURCES CORPORATION

APPROVED WVDEP OOG
3/30/2015

API# 8510204
API# 8510205
API# 8510206



WELL HEAD LAYOUT

WELL NAME	NORTHING	EASTING	LATITUDE	LONGITUDE
HARRIS UNIT 1H	25403.8028	1583785.7055	38.186652	-80.829004
HARRIS UNIT 2H	25408.7588	1583786.2167	38.186658	-80.829003
LEFT FORK UNIT 4H	25407.7787	1583787.7277	38.186677	-80.829002
LEFT FORK UNIT 3H	25408.7536	1583787.2386	38.186684	-80.829001
LEFT FORK UNIT 1H	25408.7508	1583787.7485	38.186682	-80.829000
LEFT FORK UNIT 2H	25403.7375	1583788.2589	38.186659	-80.827998

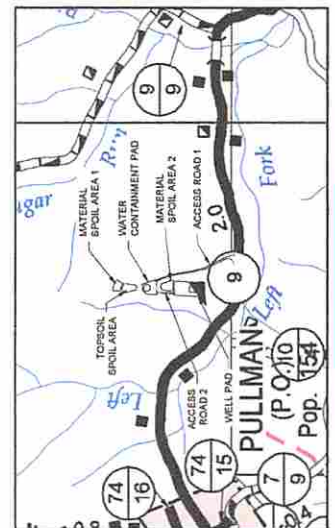
WELL HEAD LAYOUT

WELL NAME	NAD 27 (WV NORTH ZONE)	UTM ZONE 17 (METERS)
HARRIS UNIT 1H	1585200.8166	437918.8428
HARRIS UNIT 2H	1585207.1255	437918.8479
LEFT FORK UNIT 4H	1585207.0355	437918.8430
LEFT FORK UNIT 3H	1585206.4275	437918.8370
LEFT FORK UNIT 1H	1585206.8550	437920.1031
LEFT FORK UNIT 2H	1585206.1701	437920.1062

NORTH AMERICAN REFERENCED TO NAD83 WEST VIRGINIA STATE PLANE NORTH ZONE

AFFECTED TAX PARCEL: SEE SHEET 2

PULLMAN T.S. QUAD LITTLE KANAWHA WATERSHED



PLAN REPRODUCTION WARNING

THE PLANS HAVE BEEN LAMINATED ON A 60 GPM 40 LB WEIGHT 50% RECYCLED PAPER. REPRODUCTION OF THESE PLANS FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN PERMISSION OF ANTERO RESOURCES CORPORATION IS STRICTLY PROHIBITED.

PROJECT CONTACTS

PROJECT OWNER
ANTERO RESOURCES
1615 WYNKOPF STREET
DENVER, CO 80202

CONTACT: ANTHONY SMITH
304.893.3400 OFFICE
304.673.6196 CELL

CONTACT: ELM WAGNER
ENVIRONMENTAL ENGINEER
304.622.2842, EXT 311 OFFICE

CONTACT: JOHN SAWCOK
817.265.1553

CONTACT: AARON KUNZLER
CONSTRUCTION SUPERVISOR
405.527.8344

ENGINEER OF RECORD
KLEINFELDER EAST, INC.
CONTACT: WYATT CRISP, PE
3000 GATEWAY CENTRE BLDG. SUITE 200
DENVER, CO 80202
303.733.9011 OFFICE
303.733.1414 FAX

LOCATION SURVEYOR
WHITE BROTHERS CONSULTING, LLC
CONTACT: ERNE SMITH, SLS
441 CALLOWAY DRIVE, SUITE 118
CHARLESTON, WV 25312
304.320.8864

ENVIRONMENTAL/ DELINEATION BOUNDARY
BLUE MOUNTAIN AERIAL MAPPING
CONTACT: CRAIG FRY
11023 BURLINGTON DRIVE, SUITE 200
FARMINGTON, WV 25924
304.812.7854 OFFICE
304.812.7854 CELL

SITE LOCATIONS

DESCRIPTION	NAD 83 (WV NORTH)	UTM ZONE 17 (METERS)
CENTER OF WELL PAD	38.188851	-80.827887
CENTER OF WATER CONTAINMENT PAD	38.181857	-80.827889
ACCESS ROAD ENTRANCE	38.187765	-80.825981
	437918.8354	50930.6700
	437918.8354	50935.6710

FLOODPLAIN CONDITIONS

DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR	N/A
FLOODPLAIN SHOWN ON DRAWINGS	N/A
FIRM MAP NUMBER(S) FOR SITE	E-4085C2255
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	
ACCESS ROAD 1 LENGTH (FEET)	1,422
ACCESS ROAD 2	295
TOTAL	1,717



DESIGN CERTIFICATION
THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES AND CHAPTER 63-2A.

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



REV	DESCRIPTION	DATE

ISSUED FOR CONSTRUCTION



COVER PAGE & LOCATION MAP
LOCKHART HEIRS WEST WELL & W.C. PAD
PULLMAN DISTRICT, RITCHIE COUNTY
WEST VIRGINIA



CONSTRUCTION

PROJECT NO.	225024
ISSUE DATE	3/30/2015
DRAWN BY	WAGNER
CHECKED BY	SMITH
APPROVED BY	CRISP

