



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

PERMIT MODIFICATION APPROVAL

October 16, 2013

ANTERO RESOURCES APPALACHIAN CORPORATION
1625 17TH STREET, SUITE 300
DENVER, CO 80202

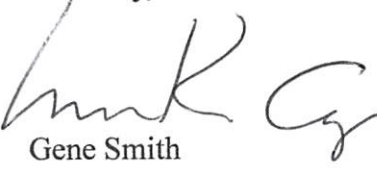
Re: Permit Modification Approval for API Number 1706227 , Well #: GOLDEN UNIT 1H
Extended Lateral

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,


Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas

17-06227 MOD



September 20, 2013

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

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Ms. Laura Cooper
601 57th Street
Charleston, WV 25304

Ms. Laura Cooper:

Antero Resources Corporation (Antero) would like to submit the following permit modifications for three approved wells on the existing Marsden Pad. We are requesting to modify the horizontal lateral orientation which will change the bottom hole locations of the Golden Unit 1H (API# 47-017-06227), Golden Unit 2H (API# 47-017-06230) and Welling Unit 2H (API# 47-017-06183).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the revised MD and Production Casing/Cement program
- REVISED Form WW-6A1, which shows the new leases we will be drilling into
- REVISED Mylar Plat, which shows the new bottom hole location

If you have any questions please feel free to contact me at (303) 357-7323.

Thank you in advance for your consideration.

Sincerely,

Ashlie Mihalcin
Permit Representative
Antero Resources Corporation

Enclosures

Received

SEP 24 2013

Office of Oil and Gas
WV Dept. of Environmental Protection

WW - 6B
(3/13)

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

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

2) Operator's Well Number: Golden Unit 1H Well Pad Name: Marsden Pad

3 Elevation, current ground: -975' Elevation, proposed post-construction: 971'

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

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7,200' TVD, Anticipated Thickness- 50' feet, Associated Pressure- 3,200#

7) Proposed Total Vertical Depth: 7,200' TVD

8) Formation at Total Vertical Depth: Marcellus Shale

9) Proposed Total Measured Depth: 17,600' MD

10) Approximate Fresh Water Strata Depths: 29', 40'

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

12) Approximate Saltwater Depths: 427', 1131'

13) Approximate Coal Seam Depths: 92', 136', 686'

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

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

16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale

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

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 6.13 acres

19) Area to be disturbed for well pad only, less access road (acres): 3.32 acres

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20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	90'	90'	CTS, 86 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	300'	300'	CTS, 417 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2550'	2550'	CTS, 1038 Cu Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17600'	17600'	4420 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

LKc
10/7/13

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

PACKERS

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

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WV Department of
Environmental Protection

21) Describe centralizer placement for each casing string. Conductor: no centralizers
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

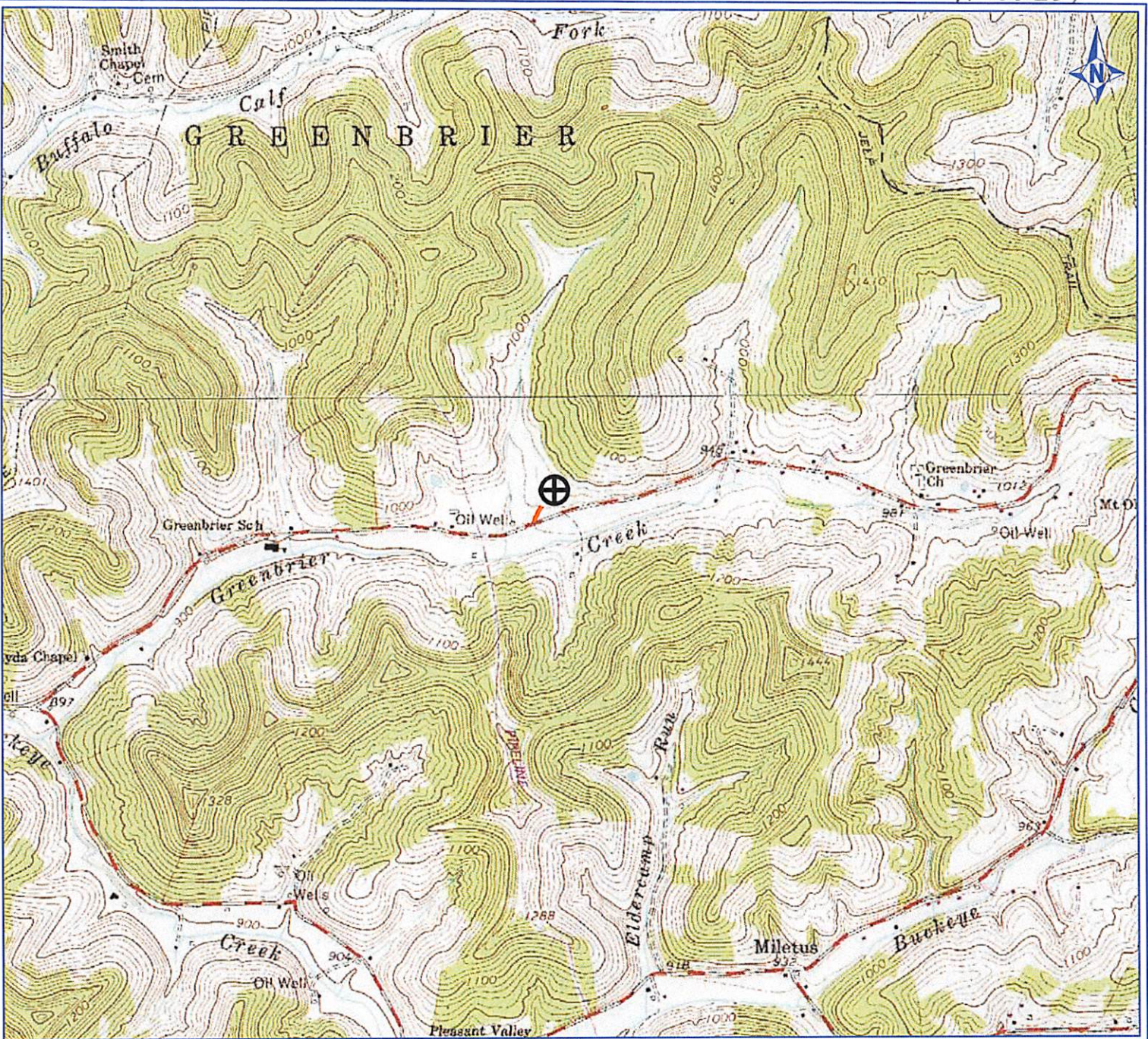
22) Describe all cement additives associated with each cement type. _____
Conductor: no additives, Class A cement.
Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures. Conductor: blowhole clean with air, run casing, 10 bbls fresh water.
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

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PETRA 7/24/2012 1:53:29 PM

17-06277 H6A GOLDEN UNIT 1H
ANTERO RESOURCES

FARM NAME: MARSDEN

Antero Resources Corporation

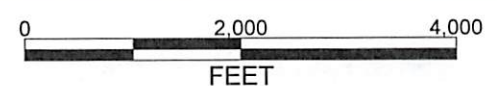
APPALACHIAN BASIN

Golden Unit 1H

Doddridge County

REMARKS

QUADRANGLE: BIG ISAAC
 WATERSHED: UPPER MIDDLE ISL. CR.
 DISTRICT: GREENBRIER



July 24, 2012

11,318' to Bottom Hole

4,391' to Top Hole

LATITUDE 39 - 15 - 00

Top Hole 7.5' Spot

TOP HOLE LONGITUDE 80 - 35 - 00
BTM HOLE LONGITUDE 80 - 32 - 30

1,014' to Top Hole
9,672' to Bottom Hole

Antero Resources
Well No. Golden Unit 1H
Antero Resources
Corporation

Wellhead Layout
Detail Not to Scale

(*) Denotes Location of Well on
United States Topographical Maps

Richard E. & Wilma
J. Marsden
229 / 54 386 Ac.

Proposed Well No.
Golden Unit 1H
L5

Rodney L. &
Crystal Clark
(Rosalie Clark LE)
287/593
57.34 Ac.

Fence
Cor.

Loretta Marsh,
et al Lease
47-017-2358

M.T. Williams, et al
Lease 003636

Greenbrier
Creek

Capped Well (No Tag) 47-017-2357

William B. &
Melissa Clark
(Rosalie Clark LE)
287/595 98.13 Ac.

Okey Clark,
et ux Lease

Chad W. Johnson
Lease
253/105
0.72 Ac.

Robert W. &
Loretta C. Kelly
156/387
50 Ac.

Lease 21574
Well (no tag)

Nicholas A.
& Linda Chirikos
174/157 31.5 Ac.

Ora Virginia White
Lease DAD61820/002

Shawn K. & Penny J.
Dahlheimer
249/217 30.38 Ac.

Ora Virginia White
Lease DAD37957/002

47-017-1807

Scale: 1" = 2000'

47-017-1867

47-017-1371

8 Gas Wells. See
Wellhead Layout
Detail Above

3000'

Proposed Well No.
Golden Unit 1H

Water Wells

47-017-2278

Well (No Tag)

Water Wells

47-017-2358

47-017-3566

Note: It appears 6 water wells were found
within 2000' of proposed well. No occupied
dwellings or buildings 2,500 square feet or
larger used to house or shelter dairy cattle
or poultry husbandry are located within
625' of the center of the well pad.

White Unit 1H (47-17-6182)
Welling Unit 1H (47-17-6181)
Welling Unit 2H (47-17-6183)
Proposed Golden Unit 1H (47-17-6227)
Golden Unit 2H (47-17-6230)
Perkins Unit 1H (47-17-6229)
Flossie Unit 1H (47-17-6180)
Flossie Unit 2H (47-17-6144)

N 44°41'W
10.0'

260/403
2.22 Ac.

47-017-3619

John & Betty
Prusakowski
Lease 248/896 45.399 Ac.

Jennings A.
Snider, et ux
Lease 21814

47-017-3202

Lease 21574
Well (no tag)

156/387
116.57 Ac.

47-017-4268

47-017-3509

249/650
1.70 Ac.

47-017-3214

249/650
1.70 Ac.

47-017-5807

224/672
43.35 Acres

47-017-3000

Vanessa Richter
249/635 82.6 Ac.

47-017-3394

Water Wells

47-017-62

47-017-2357

47-017-3424

WB 11/556
33 Ac.

47-017-3424

47-017-3461

Thomas E.
Hickman
Lease

47-017-2943

Joseph E.
Richards
Lease

John K.
Davis
177/714
94.75 Ac.

47-017-2594

Jimmy D. Clevenger
262/152 1.01 Acres

Gladys & Raymond
Yerkey Lease 21675

5/8" Rebar w/ Cap
AZ113°
185'

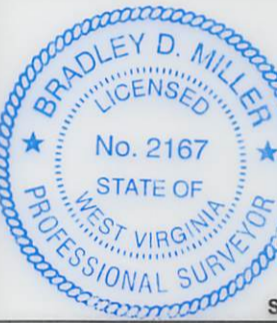
Proposed Well No.
Golden Unit 1H
Bottom Hole

Scale: 1" = 300'

Marsden
Pad
5/8" Rebar w/ Cap

M	Isaac Eddy, et ux Lease L012454 and James Romine Lease DV011162		
L	Franklin Maxwell Heirs, et ux Lease DAD41038/001		
K	Charles W. Wellings Jr., et ux Lease 21312		
J	Leo G. King, et ux, Memorandum of Oil and Gas Lease		
I	Pamela D. Clevenger, Memorandum of Oil and Gas Lease		
H	Timothy J. Goldsmith, et ux, Memorandum of Oil and Gas Lease		
G	Glennville State College Foundation Lease		
F	Eddy Cemetery Assoc. Public Burying Ground, Memorandum of Oil and Gas Lease		
E	Robert E. Currey, et ux, Memorandum of Oil and Gas Lease		
D	Gregory M. Pigg, et ux, Memorandum of Oil and Gas Lease		
C	Charles W. Wellings Jr., et ux, Memorandum of Oil and Gas Lease		
B	Charles W. Wellings Jr., et ux, Memorandum of Oil and Gas Lease		
A	Richard William Bond II, et ux Lease DAD36472/001		

Tag	LESSOR	ACREAGE	OWNER	BK / PG	AC.
32	8/25.5	Leo G. & Martha L. King	260/596		0.71
31	4/13.5	Rodney G. & Bonnie Kelly	229/439		21.59
30	8/17	Jason T. Powell	285/347		10.24
29	8/32.2	Jimmy D. Clevenger	262/152		0.75
28	8/25.2	Timothy J. & Julie R. Goldsmith	273/129		4.61
27	8/18.8	Kevin L. & Lisa A. Swann	276/364		2.01
26	8/25.1	Thomas Edward & Mary Jo Hickman	282/83		1.00
25	8/25.4	Thomas Edward & Mary Jo Hickman	282/83		7.00
24	8/25	Pamela Clevenger	WB 40/199		1.16
23	8/6.1	August J. & Rhonie L. Jordan	240/680		2.29
22	8/34	Gregory M. & Tessa M. Pigg	281/276		0.83
21	8/34.1	D. Duane & Leah L. Perkins	273/298		0.14
20	8/7.1	Rebecca S. Choco	254/537		15.78
19	8/18.7	Kevin L. & Lisa A. Swann	268/673		5.82
18	8/33	D. Duane & Leah Perkins	227/200		1.10
17	8/35	Robert E. & Dian C. Currey	174/703		0.83
16	7/8	Nicholas A. & Linda Chirikos (Tract 2)	174/157		28.0
15	4/13	Clifford D. & Polly F. Wilfong	218/1		24.54
14	8/18.3	Kevin Swann	197/262		10.64
13	7/14.3	Judy D. Martin (Tract 2)	204/518		1.27
12	4/13.2	Stephen W. & Remonda L. Trent	211/459		5.56
11	4/9.1	James M. & Cathy Sue Clark	179/777		1.50
10	7/14.3	Judy D. Martin (Tract 1)	204/518		10.39
9	4/27.1	Ronnie & Betty Perkins	152/295		0.86
8	8/6	Jason C. Ridenour (Tract 1)	244/613		55.67
7	7/14.8	William & Lanita Stewart	281/311		1.00
6	7/47	Judith K. Mohr & Rocky L. Romanello	254/459		Lot #6
5	4/19	J.D. Tinsley (Rosalie Clark LE)	287/598		4.00
4	7/49	Howard & Muriel Van Buren	191/192		Lot #4
3	7/48	Carrie J. & William J. Curran II	273/399		Lot #5
2	7/14-1	Jason C. Ridenour	244/613		23.26
1	4/27.3	Ronnie & Betty Perkins	173/259		40.2



I, the undersigned, hereby certify that
this plat is correct to the best of my knowledge
and belief and shows all the information required
by law and the regulations issued and prescribed
by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167

Legend

- Proposed gas well
- Found Monument (as noted)
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)



Bearing	Distance
L1	N 51°12' E 1,341.6'
L2	N 45°58' E 617.3'
L3	N 03°57' E 395.8'
L4	N 16°15' W 541.9'
L5	N 80°07' E 1,861.3'

FILE NO: 229-30-G-12
DRAWING NO: 229-12 Golden 1H Well
SCALE: 1" = 1200'
MINIMUM DEGREE OF ACCURACY:
Submeter
PROVEN SOURCE OF ELEVATION:
WVDOT, Bridgeport, WV

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

DATE: September 18 2013
OPERATOR'S WELL NO. Golden Unit 1H
API WELL NO MOD
47 - 017 - 06227 H2A
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: 971'
DISTRICT: Greenbrier
SURFACE OWNER: Richard E. & Wilma J. Marsden
ROYALTY OWNER: M.T. Williams, et al; Ruby Sadler, et al; Chad W. Johnson; Okey Clark, et ux
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) Modification - BHL
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,200' TVD
17,200' MD

WELL OPERATOR: Antero Resources Corporation
ADDRESS: 1625 17th Street
Denver, CO 80202
DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 5400 D Big Tyler Road
Charleston, WV 25313