



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

November 21, 2013

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

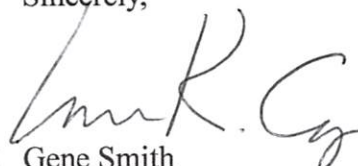
Re: Permit Modification Approval for API Number 3305708 , Well #: ONEACRE UNIT 1H
Added additional target formation

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,


for Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas



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

October 21, 2013

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 would like to submit the following permit modification for an approved well on the existing Corder East Pad. We are requesting to add the Hamilton formation as a proposed target (in addition to the Marcellus Shale) for the Oneacre Unit 1H well (API# 47-033-05708). All appropriate parties have been notified of the proposed change, and all other drilling plans will stay that same as originally permitted.

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the additional Hamilton formation
- Form WW-6A Notice of Application & Attachment
- Certified Mail Receipts to Coal Operator, Owner or Lessee(s)

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

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11/22/2013

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

1) Well Operator:	Antero Resources Corporation	494488557	033- Harrison	Union	Big Isaac
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Oneacre Unit 1H Well Pad Name: Corder East

3 Elevation, current ground: 1405' Elevation, proposed post-construction: 1405'

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

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Hamilton: 7,300' TVD, Anticipated Thickness- 60' feet, Associated Pressure- 2,700#
Marcellus Shale: 7,700' TVD, Anticipated Thickness- 50' feet, Associated Pressure- 3,200#

7) Proposed Total Vertical Depth: 7,700' TVD

8) Formation at Total Vertical Depth: Marcellus Shale

9) Proposed Total Measured Depth: 17,200' MD

10) Approximate Fresh Water Strata Depths: 190', 219'

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

12) Approximate Saltwater Depths: 797', 900'

13) Approximate Coal Seam Depths: 595', 905'

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

15) Does land contain coal seams tributary or adjacent to, active mine? No

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

17) Describe fracturing/stimulating methods in detail:
Antero plans to pump Slickwater into the Hamilton and Marcellus Shale formations 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."

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18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 0.58 acres 11/22/2013

19) Area to be disturbed for well pad only, less access road (acres): 4.08 acres

WV Department of
Environmental Protection

20)

CASING AND TUBING PROGRAM

TYPE	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill -up (Cu. Ft.)</u>
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	300'	300'	CTS, 417 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2450'	2450'	CTS, 998 Cu Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17200'	17200'	4346 Cu Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

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

PACKERS

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

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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.

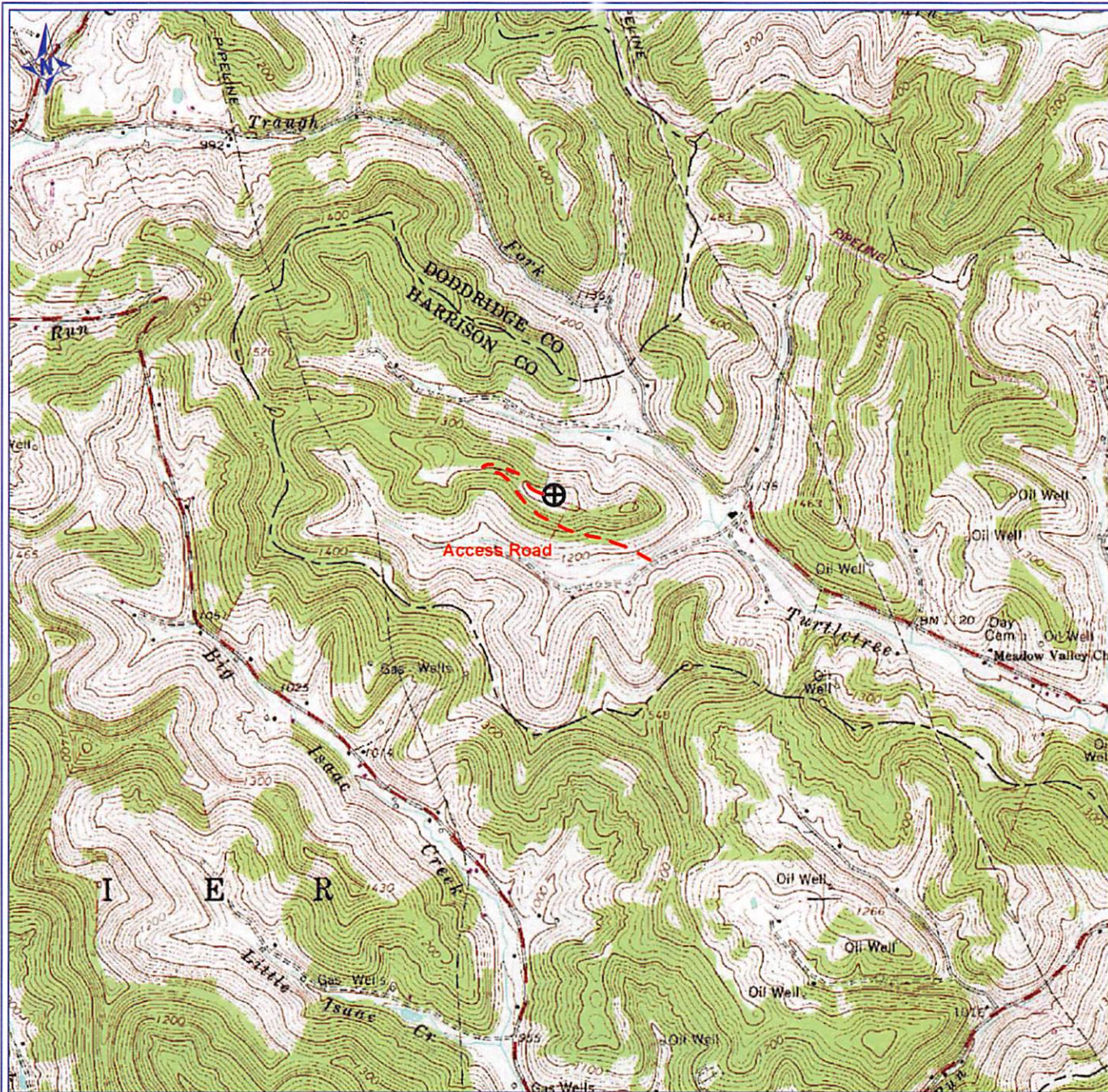
*Note: Attach additional sheets as needed.

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33-05708

Antero Resources Corporation

Appalachian Basin

Oneacre Unit 1H

Harrison County



REMARKS
 QUADRANGLE: BIG ISSAC
 WATERSHED: TURTLE TREE FORK OF
 TENMILE CREEK
 DISTRICT: UNION

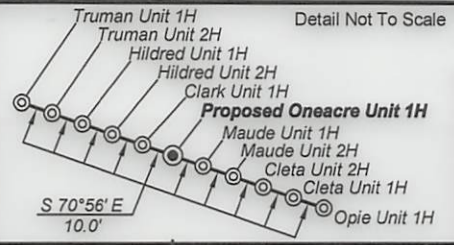
June 6, 2012

11/22/2013

Antero Resources
Well No. Oneacre Unit 1H
Antero Resources
Appalachian Corporation

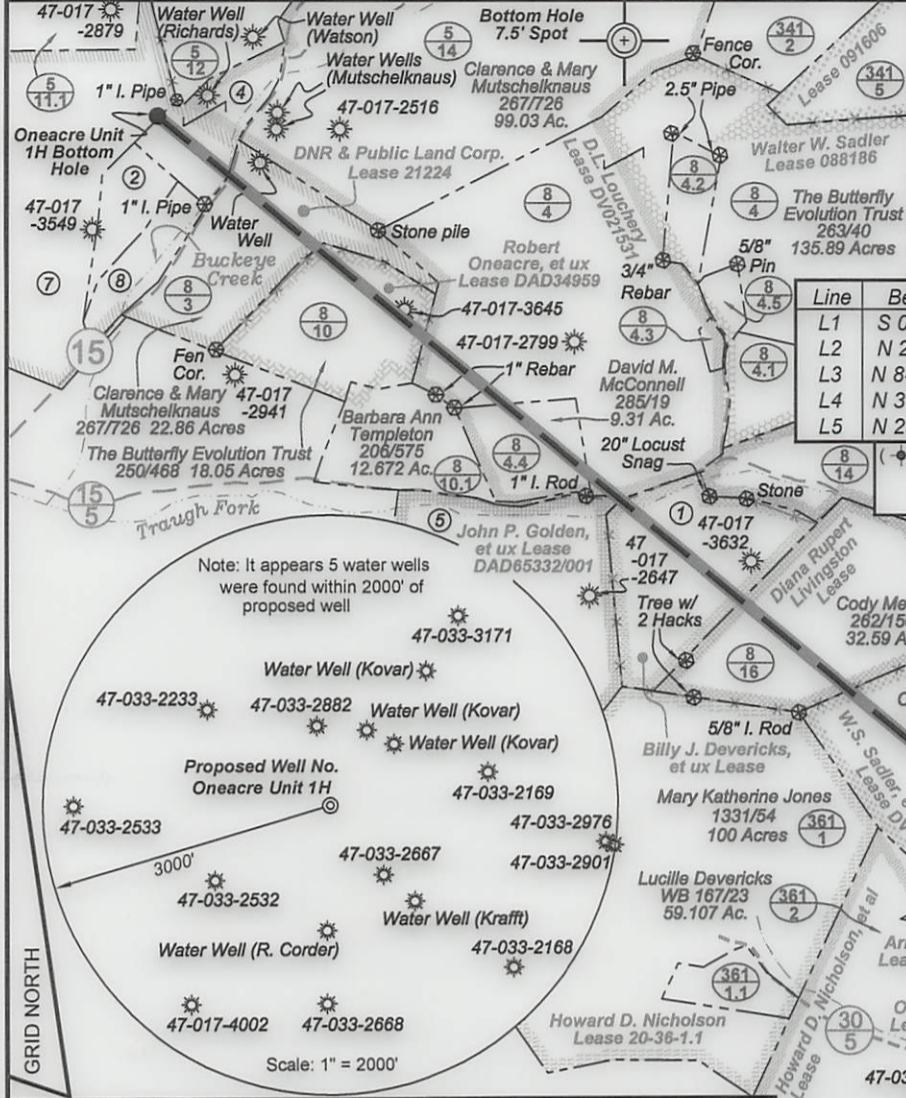
Tax Map 361 Parcels

Par	4	Owner	DB/Pg	Acres
9	4	Lucille Devericks	WB167/23	9.84
10	3	Lucille Devericks	WB167/23	9.70
11	11	Roger M. Corder	1206/364	110.0

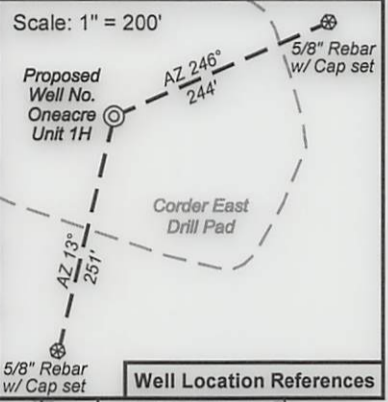


9,558' to Top Hole
 3,518' to Top Hole
 LATITUDE 39 - 15 - 00
 LONGITUDE 80 - 32 - 30

Notes:
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
 Well No. Oneacre Unit 1H Top Hole coordinates are
 N: 264,846.05 Latitude: 39°13'20.47"
 E: 1,701,488.31 Longitude: 80°33'13.22"
 Bottom Hole coordinates are
 N: 271,965.19 Latitude: 39°14'30.12"
 E: 1,695,448.17 Longitude: 80°34'31.05"
UTM Zone 17, NAD 1983
 Top Hole Coordinates: Bottom Hole Coordinates:
 N: 4,341,556.567m N: 4,343,694.726m
 E: 538,542.769m E: 536,666.448m
 Plat orientation and corner and well references are based upon the grid north meridian.
 Well location references are based upon the magnetic meridian.

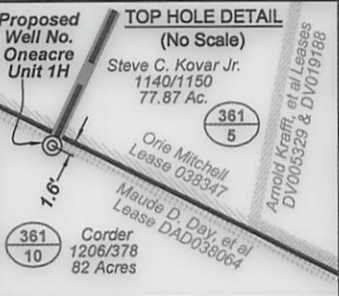


Line	Bearing	Distance
L1	S 09°05' E	834.4'
L2	N 25°12' E	1688.3'
L3	N 84°45' W	989.2'
L4	N 37°47' W	917.5'
L5	N 23°15' E	1297.3'



Tax Map 8 Parcels

Par	13	Owner	DB/Pg	Acres
1	13	Lucille Devericks	WB42/159	23.0
2	2.2	Don & Charlotte Henrey	294/83	5.55
3	24.1	Wm & Bertha Bland	257/389	0.46
4	3.1	Darrell R. Richards	281/289	9.35
5	12	Mark E. Golden	250/596	35.53
6	24.2	Wm. & Leslie Westfall	244/355	0.91
7	2.1	Don & Charlotte Henrey	294/81	69.57
8	2	Mikasa T. Ash	263/294	4.88



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.

Kenneth J. Plum
 Kenneth J. Plum, P.S. 2216

- Legend**
- ⊙ Proposed gas well
 - ⊕ Found corner, as noted
 - Creek or Drain
 - Existing Road
 - Surface boundary (approx.)
 - Interior surface tracts (approx.)
 - Existing Fenceline



FILE NO: 132-30-G-12
 DRAWING NO: 132-12 Oneacre 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
OFFICE OF OIL AND GAS

DATE: October 15 20 12
 OPERATOR'S WELL NO. Oneacre Unit 1H
 API WELL NO:
47 - 033 - 05708 H64
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
 LOCATION: ELEVATION: 1405' WATERSHED: Turtletree Fork of Tenmile Creek QUADRANGLE: Big Isaac
 DISTRICT: Union Diana Rupert Livingston DAD65332/001 COUNTY: Harrison
 SURFACE OWNER: Gerald & Louella Corder Orphia Stephens; DNR & Public Land Corp. DV021531; DV19215 COUNTY: Harrison
 ROYALTY OWNER: Maude D. Day, et al; Orie Mitchell; Arnold Krafft, et al; W. S. Sadler, et al Robert Oneacre, et ux; Billy J. Devericks, et ux DVO19225; DAD34959 ACREAGE: 82 172; 35.5; 54
 D. L. Louchery; John P. Golden, et ux DV005329 & DV019188 ACREAGE: 147; 48.69; 79; 130
 LEASE NO: DAD038064; 038347; 21224
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____ TVD 7,700'
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: MD 17,200'

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