

JUN 01 2015

WR-35
Rev. 8/23/13

WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Page ___ of ___

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-017-06301 County Doddridge District Grant
Quad Smithburg 7.5' Pad Name Moore Pad Field/Pool Name _____
Farm name Moore, Dwight E. & Tina M. Well Number Heflin Unit 2H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,352,105m Easting 525,863m
Landing Point of Curve Northing 4,352,119.56m Easting 525,411.41m
Bottom Hole Northing 4,354,493m Easting 524,619m

Elevation (ft) 1,237' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
Air- Foam & 4% KCL
Mud- Polymer

Date permit issued 07/30/2013 Date drilling commenced 08/06/2013 Date drilling ceased 12/04/2013
Date completion activities began 01/21/2014 Date completion activities ceased 03/18/2014
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 262', 315' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1179', 2557' Void(s) encountered (Y/N) depths None
Coal depth(s) ft None Available Cavern(s) encountered (Y/N) depths None
Is coal being mined in area (Y/N) No

Reviewed by: _____

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API 47-017 - 06301 Farm name Moore, Dwight E. & Tina M. Well number Heflin Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	26"	20"	40'	New	94#; H-40	N/A	Yes
Surface	17 1/2"	13 3/8"	365'	New	48#; H-40	N/A	Yes*
Coal							
Intermediate 1	12 1/4"	9 5/8"	2,535'	New	36#; J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	15,874'	New	23#; P-110	N/A	Yes
Tubing		2 3/8"	7,346'		4.7#; N-80	N/A	
Packer type and depth set	N/A						

Comment Details *Initial surface casing cement (439 sx) did not return to surface. Inspector Doug Newlon notified on 09/24/2013. Cement top job was performed (200 sx) which brought cement to surface.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ²)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	108 sx	15.6	1.18	65	0'	8 Hrs.
Surface	Class A	639 sx	15.6	1.18	417	0'	8 Hrs.
Coal							
Intermediate 1	Class A	935 sx	15.6	1.18	998	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1,154 sx (Lead) 1,317 sx (Tail)	14.5 (Lead) 15.2 (Tail)	1.30 (Lead) 1.86 (Tail)	4,062	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15,874' MD; 7,098' TVD (BHL); 7,108' TVD (Deepest Point Drilled) Loggers TD (ft) 15,826'

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6,918'

**This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Moore Unit 1H, API #47-017-06128). Please reference the wireline logs submitted with Form WR-35 for the Moore Unit 1H. A Cement Bond Log has been included with this submittal.

Check all wireline logs run ** caliper density deviated/directional induction neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Conductor- 0

Surface- 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate- 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production- 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED

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MORGANTOWN, WV

API 47-017-06301 Farm Name Moore, Dwight E. & Tina M. Well Number Heflin Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	21-Jan-14	15,613	15,781	60	Marcellus
2	31-Jan-14	15,414	15,582	60	Marcellus
3	31-Jan-14	15,215	15,383	60	Marcellus
4	31-Jan-14	15,016	15,184	60	Marcellus
5	1-Feb-14	14,817	14,985	60	Marcellus
6	1-Feb-14	14,618	14,786	60	Marcellus
7	1-Feb-14	14,419	14,587	60	Marcellus
8	2-Feb-14	14,220	14,388	60	Marcellus
9	2-Feb-14	14,021	14,189	60	Marcellus
10	2-Feb-14	13,822	13,990	60	Marcellus
11	3-Feb-14	13,623	13,791	60	Marcellus
12	3-Feb-14	13,424	13,592	60	Marcellus
13	4-Feb-14	13,225	13,393	60	Marcellus
14	4-Feb-14	13,026	13,194	60	Marcellus
15	4-Feb-14	12,827	12,995	60	Marcellus
16	5-Feb-14	12,628	12,796	60	Marcellus
17	5-Feb-14	12,244	12,414	60	Marcellus
18	5-Feb-14	12,043	12,213	60	Marcellus
19	5-Feb-14	11,842	12,012	60	Marcellus
20	6-Feb-14	11,641	11,810	60	Marcellus
21	6-Feb-14	11,439	11,609	60	Marcellus
22	6-Feb-14	11,238	11,408	60	Marcellus
23	6-Feb-14	11,037	11,207	60	Marcellus
24	7-Feb-14	10,836	11,005	60	Marcellus
25	7-Feb-14	10,634	10,804	60	Marcellus
26	7-Feb-14	10,433	10,603	60	Marcellus
27	7-Feb-14	10,232	10,402	60	Marcellus
28	7-Feb-14	10,031	10,200	60	Marcellus
29	8-Feb-14	9,829	9,999	60	Marcellus
30	8-Feb-14	9,628	9,798	60	Marcellus
31	9-Feb-14	9,427	9,597	60	Marcellus
32	9-Feb-14	9,226	9,395	60	Marcellus
33	9-Feb-14	9,024	9,194	60	Marcellus
34	9-Feb-14	8,823	8,993	60	Marcellus
35	9-Feb-14	8,622	8,792	60	Marcellus
36	10-Feb-14	8,421	8,590	60	Marcellus
37	10-Feb-14	8,219	8,389	60	Marcellus
38	10-Feb-14	8,018	8,188	60	Marcellus
39	10-Feb-14	7,817	7,987	60	Marcellus
40	11-Feb-14	7,616	7,785	60	Marcellus
41	11-Feb-14	7,415	7,584	60	Marcellus

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API 47-017-06301 Farm Name Moore, Dwight E. & Tina M. Well Number Heflin Unit 2H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	30-Jan-14	67.5	7,817	6,727	4,125	191,100	6,831	N/A
2	31-Jan-14	72.8	7,895	6,870	4,785	153,500	6,774	N/A
3	31-Jan-14	74.5	7,780	5,902	4,969	234,600	6,276	N/A
4	31-Jan-14	72.0	7,527	5,863	5,701	234,800	6,435	N/A
5	1-Feb-14	70.8	7,864	6,086	4,826	236,600	6,779	N/A
6	1-Feb-14	71.5	7,864	6,091	5,493	168,600	6,782	N/A
7	1-Feb-14	71.2	8,014	5,984	4,965	237,600	6,279	N/A
8	2-Feb-14	69.7	7,984	5,720	4,560	239,500	6,296	N/A
9	2-Feb-14	66.8	7,963	5,698	4,424	205,000	5,996	N/A
10	2-Feb-14	68.5	7,899	5,863	5,419	168,200	6,737	N/A
11	3-Feb-14	73.6	7,846	5,453	5,130	217,900	6,587	N/A
12	3-Feb-14	55.6	7,968	5,648	4,086	215,100	6,375	N/A
13	4-Feb-14	74.0	7,472	5,616	4,411	234,700	6,252	N/A
14	4-Feb-14	72.1	7,321	5,794	4,738	234,000	6,157	N/A
15	4-Feb-14	72.6	7,859	5,828	4,645	232,900	6,141	N/A
16	5-Feb-14	73.3	7,575	5,624	4,832	232,000	6,102	N/A
17	5-Feb-14	77.0	7,349	5,728	5,073	234,300	6,154	N/A
18	5-Feb-14	74.5	7,298	5,849	5,157	238,200	6,125	N/A
19	5-Feb-14	78.8	7,399	5,655	4,638	237,500	6,127	N/A
20	6-Feb-14	77.6	7,237	5,493	4,823	235,800	6,070	N/A
21	6-Feb-14	72.2	7,442	5,698	5,269	239,200	6,079	N/A
22	6-Feb-14	76.7	7,288	5,516	4,775	237,900	6,029	N/A
23	6-Feb-14	76.2	7,413	5,793	5,583	239,100	6,004	N/A
24	7-Feb-14	76.6	7,613	5,662	5,304	235,600	6,041	N/A
25	7-Feb-14	76.4	7,304	5,575	4,582	232,700	6,113	N/A
26	7-Feb-14	77.9	7,059	5,630	5,132	236,100	6,157	N/A
27	7-Feb-14	80.5	7,371	5,603	5,804	234,600	6,034	N/A
28	7-Feb-14	80.7	7,112	5,098	5,723	235,200	6,020	N/A
29	8-Feb-14	78.2	7,074	5,464	4,358	238,800	6,063	N/A
30	8-Feb-14	75.5	6,842	5,698	4,732	236,600	5,949	N/A
31	9-Feb-14	77.9	7,578	6,130	4,836	234,700	5,991	N/A
32	9-Feb-14	72.9	7,362	5,529	5,972	236,600	5,956	N/A
33	9-Feb-14	76.3	7,435	5,626	5,462	240,200	5,990	N/A
34	9-Feb-14	74.7	7,318	6,027	5,123	238,000	5,889	N/A
35	9-Feb-14	74.0	7,131	5,486	4,991	183,400	5,299	N/A
36	10-Feb-14	63.2	7,685	5,290	3,986	175,000	6,333	N/A
37	10-Feb-14	77.0	7,315	5,589	5,145	236,300	5,857	N/A
38	10-Feb-14	75.9	7,072	5,845	4,575	162,000	5,758	N/A
39	10-Feb-14	71.4	7,742	5,852	5,308	149,400	6,232	N/A
40	11-Feb-14	77.1	7,410	5,879	4,999	235,200	5,850	N/A
41	11-Feb-14	76.7	7,062	6,108	4,402	237,700	5,980	N/A
AVG=		73.7	7,501	5,770	4,948	9,076,200	252,899	TOTAL

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	262'	N/A	262'	N/A
Fresh Water	315'	N/A	315'	N/A
Shale	0	1,577	0	1,577
Sandstone/Shale	Est. 1577	1,697	Est. 1577	1,697
Shale	Est. 1697	1,787	Est. 1697	1,787
Shale/Siltstone	Est. 1787	2,020	Est. 1787	2,020
Big Lime	2,020	2,140	Est. 2018	2,138
Big Injun	2,140	2,574	2,138	2,572
Gantz Sand	2,574	2,703	2,572	2,701
Fifty Foot Sandstone	2,703	2,775	2,701	2,773
Gordon	2,775	3,115	2,773	3,113
Fifth Sandstone	3,115	3,133	3,113	3,131
Bayard	3,133	3,511	3,131	3,509
Warren	3,511	3,869	3,509	3,867
Speechley	3,869	4,126	3,867	4,124
Baltown	4,126	4,657	4,124	4,655
Bradford	4,657	5,210	4,655	5,208
Benson	5,210	5,403	5,208	5,501
Alexander	5,403	5,594	5,501	5,712
Elk	5,594	6,168	5,712	6,354
Rhinstreet	6,168	6,515	6,354	6,744
Sycamore	6,515	6,741	6,744	6,992
Middlesex	6,741	6,889	6,992	7,177
Burkett	6,889	6,917	7,177	7,221
Tully	6,917	6,995	7,221	7,370
Marcellus	6,995	NA	7,370	NA

*Please note Antero determines shallow formation tops based on mud and/or wireline logs that are only run on one well on a multi-well pad (please reference Wireline Logs submitted for the Moore Unit 1H, API # 47-017-06128). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/30/2014
Job End Date:	2/11/2014
State:	West Virginia
County:	Doddridge
API Number:	47-017-06301-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Heflin Unit 2H
Longitude:	-80.70015280
Latitude:	39.31788610
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,108
Total Base Water Volume (gal):	10,621,758
Total Base Non Water Volume:	0

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	ANTERO RESOURCES	Water					
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia	Water	7732-18-5	100.00000	90.52432	
			Crystalline Silica, quartz	14808-60-7	99.90000	5.34219	
			Aluminum Oxide	1344-28-1	1.10000	0.05882	
			Iron Oxide	1309-37-1	0.10000	0.00535	
			Titanium Oxide	13463-67-7	0.10000	0.00535	
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia					
			Crystalline Silica, quartz	14808-60-7	99.90000	3.11435	
			Aluminum Oxide	1344-28-1	1.10000	0.03428	
			Titanium Oxide	13463-67-7	0.10000	0.00312	
			Iron Oxide	1309-37-1	0.10000	0.00312	
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia					
			Crystalline Silica, quartz	14808-60-7	99.90000	0.64264	
			Aluminum Oxide	1344-28-1	1.10000	0.00708	

				Titanium Oxide	13463-67-7	0.10000	0.00064
				Iron Oxide	1309-37-1	0.10000	0.00064
HCl Acid (12.5%-18.0%)	Nabors Completion and Production Services	Bulk Acid					
WFR-3B	Nabors Completion and Production Services	Friction Reducer		Hydrogen Chloride	7647-01-0	18.00000	0.03866
				Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8	30.00000	0.01922
				Ethoxylated alcohols	68002-97-1	15.00000	0.00961
LSG-100L	Nabors Completion and Production Services	Gelling Agents		Ethoxylated oleylamine	26635-93-8	5.00000	0.00320
				Petroleum Distillates	64742-47-8	70.00000	0.02972
Super GREEN SOLV-M	Nabors Completion and Production Services	Paraffin & Scale Additives		Aliphatic Hydrocarbons	Proprietary	95.00000	0.00905
				Dodecane	Proprietary	14.00000	0.00133
				Tetradecane	Proprietary	11.00000	0.00105
				Tridecane	Proprietary	9.00000	0.00086
				Undecane	Proprietary	8.00000	0.00076
KR-153SL	Nabors Completion and Production Services	Biocides					
				Polyethylene-Glycol	25322-68-3	50.00000	0.00641
				2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00256
OB-2 LT	Nabors Completion and Production Services	Gel Breakers					
				Ammonium Persulfate	7727-54-0	85.00000	0.00578
				Crystalline Silica (in the form of quartz)	14808-60-7	10.00000	0.00068
Acid Inhibitor 2 (AI-2)	Nabors Completion and Production Services	Acid Corrosion Inhibitors					
				Glycol Ethers	111-46-6	40.00000	0.00016
				Isopropyl Alcohol	67-63-0	40.00000	0.00016
				Propargyl Alcohol	107-19-7	40.00000	0.00016
				Ethoxylated Nonylphenol	68412-54-4	13.00000	0.00005
				Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	10.00000	0.00004
EB-4L	Nabors Completion and Production Services	Gel Breakers		Ethylene Glycol	107-21-1	40.00000	0.00019

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

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Other Ingredients	Nabors Completion and Production Services	Other Ingredients					
		Water	7732-18-5		87.50000		0.18792
		Anionic Polyacrylamide	910644-97-2		40.00000		0.02563
		Water	7732-18-5		40.00000		0.02563
		guar gum	9000-30-0		50.00000		0.02123
		Water	7732-18-5		80.00000		0.01026
		Water	7732-18-5		60.00000		0.00965
		Propylene glycol	57-55-6		15.00000		0.00961
		Proprietary	Proprietary		50.00000		0.00804
		Proprietary	Proprietary		15.00000		0.00241
		Proprietary	Proprietary		15.00000		0.00241
		Proprietary	Proprietary		15.00000		0.00241
		Proprietary	Proprietary		2.00000		0.00128
		Alkali Chloride salt	Proprietary		15.00000		0.00102
		Surfactant	68439-51-0		2.00000		0.00085
		Crystalline Silica (in the form of quartz)	14808-60-7		2.00000		0.00085
		Sugar	57-50-1		100.00000		0.00047
		Proprietary	Proprietary		100.00000		0.00047
		Water	7732-18-5		100.00000		0.00023
		Water	7732-18-5		48.00000		0.00019
		2-Butoxyethanol	111-76-2		13.00000		0.00005
		Proprietary	Proprietary		1.00000		0.00001
		Proprietary	Proprietary		1.00000		0.00001
		Proprietary	Proprietary		1.00000		0.00001
		Proprietary	Proprietary		1.00000		0.00001
		Dioxane	123-91-1		1.00000		0.00000
		Organophylic Clay	68953-58-2				

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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LATITUDE 39°20'00"

9,474'

1,742' TO BOTTOM HOLE
LATITUDE 39°22'30"

LONGITUDE 80°42'30"

5,630'

12,955' TO BOTTOM HOLE

LONGITUDE 80°40'00"

Antero Resources Corporation
Well No. Heflin Unit 2H
47-017-06301 (AS DRILLED)

AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 300,156ft E: 1,660,457ft
LAT: 39°19'04.36" LON: 80°42'00.55"
BOTTOM HOLE INFORMATION:
N: 308,060ft E: 1,656,506ft
LAT: 39°20'21.95" LON: 80°42'52.18"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.
ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT.
PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
N: 4,352,105m E: 525,863m
BOTTOM HOLE INFORMATION:
N: 4,354,493m E: 524,619m

- NOTES
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
 4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
 5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

