

WR-35
Rev (9-11)

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

DATE: 1/7/2014
API #: 47-017-06194

JA

pm

Farm name: Kenneth E. Hamilton et al Operator Well No.: Costlow Unit 1H

LOCATION: Elevation: 1,157' Quadrangle: Smithburg 7.5'

District: Grant County: Doddridge
Latitude: 9.996' Feet South of 39 Deg. 22 Min. 30 Sec.
Longitude 2.641' Feet West of 80 Deg. 42 Min. 30 Sec.

Company: Antero Resources Corporation

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
1625 17th Street Denver, CO 80202	20" 51#	40'	40'	38 Cu. Ft. Class A
Agent: CT Corporation System	13 3/8" 48#	333'	333'	463 Cu. Ft. Class A
Inspector: Douglas Newlon	9 5/8" 36#	2,565'	2,565'	1,044 Cu. Ft. Class A
Date Permit Issued: 3/1/2013	5 1/2" 20#	17,207'	17,207'	4,304 Cu. Ft. Class H
Date Well Work Commenced: 6/2/2013				
Date Well Work Completed: 10/26/2013	2 3/8" 4.7#	7144'		
Verbal Plugging: N/A				
Date Permission granted on: N/A				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 7044' TVD (Deepest Point Drilled)				
Total Measured Depth (ft): 17,207' MD, 6991' TVD (BHL)				
Fresh Water Depth (ft.): 225'				
Salt Water Depth (ft.): None Available				
Is coal being mined in area (N/Y)? No				
Coal Depths (ft.): 840'				
Void(s) encountered (N/Y) Depth(s) None				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 6968' (TOP)

Gas: Initial open flow ---- MCF/d Oil: Initial open flow ---- Bbl/d

Final open flow 9,566 MCF/d Final open flow ---- Bbl/d

Time of open flow between initial and final tests ---- Hours

Static rock Pressure 3550 psig (surface pressure) after ---- Hours

Second producing formation _____ Pay zone depth (ft) _____

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

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Environmental Protection

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the 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.

Karen Buck
Signature

4/2/2014
Date

05/30/2014

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Were core samples taken? Yes _____ No

Were cuttings caught during drilling? Yes No _____

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list Yes- CBL,
Photo Density/ Compensated Neutron, Dual Laterolog.

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

Perforations: 7,568'- 17,153' (2820 Holes)

Frac'd w/ 28,000 gals 15% HCL Acid, 283,241 bbls Slick Water carrying 635,990# 100 mesh, 6,293,390# 40/70 sand and 3,620,520# 20/40 sand.

Plug Back Details Including Plug Type and Depth(s): N/A

Formations Encountered:	Top Depth	/	Bottom Depth
Surface:			
Big Lime	2142'		2254'
Big Injun	2255'		2683'
Gantz Sand	2684'		2828'
Fifty Foot Sandstone	2829'		2900'
Gordon	2901'		3270'
Fifth Sandstone	3271'		3286'
Bayard	3287'		4027'
Speechley	4028'		4274'
Balltown	4275'		4746'
Bradford	4747'		5224'
Benson	5225'		5484'
Alexander	5485'		6093'
Rhinestreet	6094'		6548'
Sycamore	6549'		6737'
Middlesex	6738'		6877'
Burkett	6878'		6907'
Tully	6908'		6954'
Hamilton	6955'		6967'
Marcellus	6968'		7044' TVD

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/13/2013
Job End Date:	10/26/2013
State:	West Virginia
County:	Doddridge
API Number:	47-017-06194-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Costlow Unit 1H
Longitude:	-80.74368900
Latitude:	39.33441700
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,044
Total Base Water Volume (gal):	0
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
Freshwater	Antero Resources	Water					
			Water	7732-18-5	100.00000	90.70898	
40/70 White	US Silica	Proppant					
			Sand	14808-60-7	100.00000	4.91440	
20/40 White	US Silica	Proppant					
			Sand	14808-60-7	100.00000	2.92370	
100 Mesh	US Silica	Proppant					
			Sand	14808-60-7	100.00000	1.26770	
CFS40	PQS	Guar Gel					
			Petroleum Distillate	64742-47-8	55.00000	0.04677	
			Guar Gum	9000-30-0	50.00000	0.04252	
			Clay	1302-78-9	5.00000	0.00425	
			Surfactant	154518-36-2	1.00000	0.00085	
Plexslick 953	Chemplex	Friction Reducer					
			Water	7732-18-5	35.00000	0.02152	
			Polyacrylamide-co-acrylic acid	9003-06-9	32.00000	0.01967	
			Hydrotreated Petroleum Distillate	64742-47-8	30.00000	0.01844	
			Alcohol Ethoxylate Surfactants	Proprietary	8.00000	0.00492	

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Hydrochloric Acid 10-15%	Reagent	Acid				
			Hydrochloric Acid	7647-01-0	15.00000	0.03424
Plexicide 15G	Chemplex	Biocide				
			Water	7732-18-5	90.00000	0.02285
			Glutaraldehyde	111-30-8	14.00000	0.00355
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	3.00000	0.00076
			Alkyl Dimethyl Benzyl Ammonium Chloride	68424-85-1	3.00000	0.00076
			Ethanol	64-17-5	3.00000	0.00076
Plexaid 673	Chemplex	Scale Inhibitor				
			Water	7732-18-5	85.00000	0.01335
			Methyl Alcohol	67-56-1	25.00000	0.00393
			Sodium Salt of Phosphonodimethylated Diamine	Proprietary	5.00000	0.00079
Sodium Persulfate	Chemplex	Breaker				
			Sodium Persulfate	7775-27-1	100.00000	0.00123
Plexhib 256	Chemplex	Corrosion				
			Methyl Alcohol	67-56-1	70.00000	0.00049
			Alcohol Ethoxylate Surfactants	Proprietary	30.00000	0.00021
			thiourea-formaldehyde copolymer	68527-49-1	30.00000	0.00021
			n-olefins	Proprietary	10.00000	0.00007
			Propargyl Alcohol	107-19-7	8.00000	0.00006
Plexbreak 145	Chemplex	Non-emulsifier				
			Water	732-18-5	66.00000	0.00052
			Ethylene Glycol Monobutyl Ether	111-76-2	15.00000	0.00012
			Methyl Alcohol	67-56-1	15.00000	0.00012
			Cocamide Diethanolamine Salt	68603-42-9	10.00000	0.00008
			Diethanolamine	111-42-2	5.00000	0.00004
Ferriplex 66	Chemplex	Iron Control				
			Acetic Acid	64-19-7	50.00000	0.00022
			Water	7732-18-5	35.00000	0.00016
			Citric Acid	77-92-9	30.00000	0.00013

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.

* 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)