

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

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

API 47-095-02283 County Tyler District Centerville
Quad Shirley 7.5' Pad Name Edna Monroe Pad Field/Pool Name ---
Farm name Edna Monroe Well Number Leaseburg 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 4363693m Easting 510917m
Landing Point of Curve Northing 4363781.21m Easting 510902.32m
Bottom Hole Northing 4366271m Easting 510038m

Elevation (ft) 1044' 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 08/07/2015 Date drilling commenced 9/13/2016 Date drilling ceased 1/31/2017
Date completion activities began 5/6/2017 Date completion activities ceased 2/13/2018
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 337' Open mine(s) (Y/N) depths No
Salt water depth(s) ft None Identified Void(s) encountered (Y/N) depths No
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:

DMH

Reviewed

WR-35
Rev. 8/23/13

API 47-095 - 02283 Farm name Edna Monroe Well number Leaseburg Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	105'	New	94#, H-40	N/A	Y
Surface	17- 1/2"	13- 3/8"	564'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2617'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	15580'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6647'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	204 sx	15.6	1.18	241	0	8 Hrs.
Surface	Class A	713 sx	15.6	1.19	848	0	8 Hrs.
Coal							
Intermediate 1	Class A	1014 sx	15.6	1.18	1197	0	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	792 sx (Lead), 1254 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3485	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15580' MD, 6510' TVD (BHL), 6510' TVD (Deepest point drilled) Loggers TD (ft) 15580' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6062'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Bead Unit 2H API# 47-095-02362). Please reference the wireline logs submitted with Form WR-35 for the Bead Unit 2H. 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

RECEIVED
Office of Oil and Gas

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS JUN 19 2018

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS WV Department of Environmental Protection

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

WR-35
Rev. 8/23/13

API 47- 095 - 02283 Farm name Edna Monroe Well number Leaseburg Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>			
<u>Marcellus</u>	<u>6475' (Top)</u>	<u>TVD</u>	<u>6702' (Top)</u>	<u>MD</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 4100 psi Bottom Hole — psi DURATION OF TEST — hrs

OPEN FLOW Gas 8295 mcfpd Oil 0 bpd NGL — bpd Water 3.82 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	<u>0</u>		<u>0</u>		
* PLEASE SEE ATTACHED EXHIBIT 3					
					RECEIVED Office of Oil and Gas
					JUN 19 2018
					WV Department of Environmental Protection

Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Pro Oilfield Services LLC
Address 3141 Polaski Rd City New Castle State PA Zip 16105

Cementing Company BJ Services
Address 1036 East Main Street City Bridgeport State WV Zip 26330

Stimulating Company Halliburton
Address 121 Champion Way Suite 200 City Cannonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 6/19/2018

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-095-02283 Farm Name <u>Edna Monroe</u> Well Number <u>Leaseburg Unit 2H</u>					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	5/6/2017	15309	15377	90	Marcellus
2	6/5/2017	15110	15194	90	Marcellus
3	6/6/2017	14911	14995	90	Marcellus
4	6/6/2017	14712	14796	90	Marcellus
5	6/7/2017	14513	14597	90	Marcellus
6	6/7/2017	14313	14397	90	Marcellus
7	6/8/2017	14114	14198	90	Marcellus
8	6/8/2017	13915	13999	90	Marcellus
9	6/9/2017	13716	13800	90	Marcellus
10	6/9/2017	13517	13601	90	Marcellus
11	1/6/2018	13318	0	90	Marcellus
12	1/7/2018	13119	13203	90	Marcellus
13	1/7/2018	12920	13004	90	Marcellus
14	1/8/2018	12720	12804	90	Marcellus
15	1/8/2018	12521	12605	90	Marcellus
16	1/8/2018	12322	12406	90	Marcellus
17	1/9/2018	12123	12207	90	Marcellus
18	1/9/2018	11924	12008	90	Marcellus
19	1/10/2018	11725	11809	90	Marcellus
20	1/10/2018	11526	11610	90	Marcellus
21	1/10/2018	11327	11411	90	Marcellus
22	1/11/2018	11128	11212	90	Marcellus
23	1/11/2018	10928	11012	90	Marcellus
24	1/12/2018	10729	10813	90	Marcellus
25	1/12/2018	10530	10614	90	Marcellus
26	1/12/2018	10331	10415	90	Marcellus
27	1/13/2018	10132	10216	90	Marcellus
28	1/13/2018	9933	10017	90	Marcellus
29	1/14/2018	9734	9818	90	Marcellus
30	1/14/2018	9535	9619	90	Marcellus
31	1/15/2018	9336	9419	90	Marcellus
32	1/15/2018	9136	9220	90	Marcellus
33	1/16/2018	8937	9021	90	Marcellus
34	1/16/2018	8738	8822	90	Marcellus
35	1/16/2018	8539	8623	90	Marcellus
36	1/17/2018	8340	8424	90	Marcellus
37	1/18/2018	8141	8225	90	Marcellus
38	1/18/2018	7942	8026	90	Marcellus
39	1/19/2018	7743	7827	90	Marcellus
40	1/19/2018	7543	7627	90	Marcellus
41	1/20/2018	7344	7428	90	Marcellus
42	1/20/2018	7145	7229	90	Marcellus
43	1/20/2018	6946	7030	90	Marcellus
44	1/21/2018	6747	6831	90	Marcellus

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

API 47-095-02283 Farm Name Edna Monroe Well Number Leaseburg 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	5/6/2017	77.1	7042	5901	3331	403,400	8282	N/A
2	6/5/2017	77	6959	5499	3486	403,400	8620	N/A
3	6/6/2017	79.6	6997	5508	3687	403,400	9701	N/A
4	6/6/2017	78.7	7005	5611	3773	403,400	9781	N/A
5	6/7/2017	72.7	6972	5377	3241	402,750	9037	N/A
6	6/7/2017	73.8	7000	5579	3436	403,400	9670	N/A
7	6/8/2017	69.2	6774	5391	3768	403,400	9327	N/A
8	6/8/2017	72.2	6903	5129	3744	403,400	8754	N/A
9	6/9/2017	74	6680	5518	3609	403,400	10465	N/A
10	6/9/2017	66.5	6335	5434	9477	403,400	7728	N/A
11	1/6/2018	71.4	7279	0	3813	403,500	8443.6	N/A
12	1/7/2018	71.1	7512	4241	4046	403,500	8301.4	N/A
13	1/7/2018	70	7161	4957	4169	403,500	8689.1	N/A
14	1/8/2018	70.2	7249	5255	4230	403,500	8500.2	N/A
15	1/8/2018	71.7	7233	5296	4191	403,500	8423.9	N/A
16	1/8/2018	69.7	7353	5527	4197	403,500	8674.8	N/A
17	1/9/2018	73	7367	5202	4125	403,500	8328.8	N/A
18	1/9/2018	72.9	7015	5259	4213	403,500	8415.7	N/A
19	1/10/2018	76.8	7203	5764	4146	403,500	8547.8	N/A
20	1/10/2018	78.5	7523	4690	4172	403,500	9589.2	N/A
21	1/10/2018	74	7309	5262	4390	403,500	8324.5	N/A
22	1/11/2018	75.9	7225	5214	4245	403,500	8527.3	N/A
23	1/11/2018	76.5	7154	5268	4023	403,500	8395	N/A
24	1/12/2018	73.6	6943	5533	4051	403,500	8451.1	N/A
25	1/12/2018	75.9	7190	5116	4199	403,500	8448.8	N/A
26	1/12/2018	74.3	7119	5256	4236	403,500	8680.4	N/A
27	1/13/2018	78.5	7412	4907	3980	403,500	8347.5	N/A
28	1/13/2018	72.6	6872	5150	3933	403,500	8784.9	N/A
29	1/14/2018	76.8	7389	4861	4081	403,500	9226.1	N/A
30	1/14/2018	72.9	6799	5258	4075	403,500	8804.8	N/A
31	1/15/2018	72.5	7251	5071	4059	403,500	8485	N/A
32	1/15/2018	74.2	6996	5388	4159	403,500	8306	N/A
33	1/16/2018	71.6	7255	5397	4217	403,500	10271.2	N/A
34	1/16/2018	70.6	6642	5224	3934	403,500	8197.7	N/A
35	1/16/2018	74.2	6525	4909	4260	403,500	8667.6	N/A
36	1/17/2018	66.7	6326	5161	4184	403,500	7965.3	N/A
37	1/18/2018	66	6392	4741	3625	403,500	8336.9	N/A
38	1/18/2018	64.8	6455	5113	3974	403,500	9679	N/A
39	1/19/2018	71.5	6470	4735	4065	403,500	8434.4	N/A
40	1/19/2018	66.2	6573	4829	4028	403,500	8164.4	N/A
41	1/20/2018	72.5	6755	4972	3894	403,500	7889.6	N/A
42	1/20/2018	71	6528	5228	3900	403,500	8155.7	N/A
43	1/20/2018	64.4	7062	5039	4034	403,500	10616.5	N/A
44	1/21/2018	66.6	6452	5055	3187	403,500	8335	N/A

72.497727 6969.455 5086.9318 4081.523 17,752,350 384,774 Total

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

API 47-095-02283 Farm Name <u>Edna Monroe</u> Well Number <u>Leaseburg Unit 2H</u>				
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	337'	N/A	337'	N/A
Sandy Siltstone	0	225	0	225
Sandstone	est. 225	325	est. 225	325
Shale/Siltstone	est. 325	605	est. 325	605
Silty Limestone	est. 605	805	est. 605	805
Sandy Siltstone	est. 805	1,025	est. 805	1,025
Silty Shale	est. 1025	1,065	est. 1025	1,065
Sandstone	est. 1065	1,445	est. 1065	1,445
Sandy Shale	est. 1445	1,545	est. 1445	1,545
Shale/Sandstone	est. 1545	1,705	est. 1545	1,705
Sandstone/Siltstone	est. 1705	1,745	est. 1705	1,745
Sandstone	est. 1745	1,810	est. 1745	1,810
Sandy Shale	est. 1810	1,938	est. 1810	1,939
Big Lime	1,938	2,020	1,939	2,021
Big Injun	2,020	2,609	2,021	2,610
Gantz Sand	2,609	2,752	2,610	2,753
Fifty Foot Sandstone	2,752	2,833	2,753	2,834
Gordon	2,833	3,158	2,834	3,159
Fifth Sandstone	3,158	3,309	3,159	3,311
Bayard	3,309	3,520	3,311	3,522
Warren	3,520	3,981	3,522	3,983
Speechley	3,981	4,364	3,983	4,370
Baltown	4,364	4,736	4,370	4,748
Bradford	4,736	5,130	4,748	5,149
Benson	5,130	5,286	5,149	5,308
Alexander	5,286	5,567	5,308	5,593
Elk	5,567	5,928	5,593	5,958
Rhinestreet	5,928	6,164	5,958	6,200
Sycamore	6,139	6,309	6,175	6,376
Middlesex	6,309	6,412	6,376	6,537
Burkett	6,412	6,449	6,537	6,618
Tully	6,449	6,475	6,618	6,702
Marcellus	6,475	NA	6,702	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

Job Start Date:	6/5/2017
Job End Date:	1/31/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02283-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Leaseburg Unit 2H
Latitude:	39.42261944
Longitude:	-80.87334444
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,523
Total Base Water Volume (gal):	16,713,880
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	88.05402	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.17191	

SAND- PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
HYDROCHLORI C ACID	Halliburton	Solvent					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
MC S-2510T	Halliburton	Scale Inhibitor					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
SCALECHEK LP-50	Halliburton	Scale Inhibitor					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica, quartz	14808-60-7	100.00000	11.72394	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01917	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01917	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01917	
			Hydrochloric acid	7647-01-0	15.00000	0.01776	
			Guar gum	9000-30-0	100.00000	0.01708	
			Ethylene Glycol	107-21-1	60.00000	0.00702	
			Glutaraldehyde	111-30-8	30.00000	0.00258	
			Neutralized Polyacrylic Emulsion	Proprietary	10.00000	0.00117	
			Methanol	67-56-1	60.00000	0.00067	
			Phosphate of a Diamine, Sodium Salt	Proprietary	30.00000	0.00051	
			Quaternary ammonium compounds, benzyl-C12- 16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00043	
			Sodium persulfate	7775-27-1	100.00000	0.00042	
			Ethanol	64-17-5	1.00000	0.00009	
			Modified thiourea polymer	Proprietary	30.00000	0.00008	

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

			Fatty acids, tall oil	Proprietary	30.00000	0.00008	
			Ethoxylated alcohols	Proprietary	30.00000	0.00008	
			Olefins	Proprietary	5.00000	0.00003	
			Propargyl alcohol	107-19-7	10.00000	0.00003	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Sodium sulfate	7757-82-6	0.10000	0.00000	

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)

RECEIVED
Office of Oil and Gas

JUN 19 2018

WV Department of
Environmental Protection

