

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

API 47-085-10046 County Ritchie District Union
Quad Pullman 7.5' Pad Name Ness Pad Field/Pool Name ---
Farm name Ness, Ashley E., Jr. Well Number Rufus Unit 1H
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 4338468m Easting 508353m
Landing Point of Curve Northing 4338580.98m Easting 508408.32m
Bottom Hole Northing 4341407.82m Easting 507164.67m

Elevation (ft) 1075' 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 7/23/2013 Date drilling commenced 8/31/2013 Date drilling ceased 10/28/2013
Date completion activities began 4/12/2014 Date completion activities ceased 12/26/2014
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 62' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1620', 1838' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 456' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Office of Oil and Gas
WV Dept. of Environmental Protection

Reviewed by:
AL 5/26/15
W.S. 06/12/2015

API 47-085 - 10046 Farm name Ness, Ashley E., Jr. Well number Rufus Unit 1H

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	24"	20"	40'	New	94# H-40	N/A	Y
Surface	12-1/4	13-3/8"	415'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	8-3/4	9-5/8"	2527'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2	5-1/2"	17014'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6537'		4.7# N-80	N/A	
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	122 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	480 sx	15.6	1.18	288	0'	8 Hrs.
Coal							
Intermediate 1	Class A	766 sx	15.6	1.18	791	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	963 sx lead 1610 sx tail	13.5 lead 15.2 tail	1.30 lead 1.8 tail	3434	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17014' MD, 6483' TVD (BHL); 6512' TVD (Deepest point drilled) Loggers TD (ft) 16976' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5984'

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

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____
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API 47- 085 - 10046 Farm name Ness, Ashley E., Jr. Well number Rufus Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
SEE ATTACHED EXHIBIT 1					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
SEE ATTACHED EXHIBIT 2								
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Please insert additional pages as applicable.

API 47- 085 - 10046 Farm name Ness, Ashley E., Jr. Well number Rufus Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6462' (TOP)</u> TVD	<u>6713' (TOP)</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 7621 mcfpd Oil 44 bpd NGL --- bpd Water 437 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
					SEE ATTACHED EXHIBIT 3
					<i>Received</i>
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					<i>Office of Oil and Gas WV Dept. of Environmental Protection</i>

Please insert additional pages as applicable.

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

Logging Company Cased Hole Solutions
Address 100 Arentzen Blvd. City Charleroi State PA Zip 15022

Cementing Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature *Kara Quackenbush* Title Permit Representative Date 2/11/2015

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

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12-Apr-14	16,800	16,927	60	Marcellus
2	6-Oct-14	16,650	16,777	60	Marcellus
3	6-Oct-14	16,499	16,626	60	Marcellus
4	7-Oct-14	16,349	16,476	60	Marcellus
5	7-Oct-14	16,199	16,326	60	Marcellus
6	8-Oct-14	16,049	13,176	60	Marcellus
7	8-Oct-14	15,898	16,025	60	Marcellus
8	9-Oct-14	15,748	15,875	60	Marcellus
9	9-Oct-14	15,598	15,725	60	Marcellus
10	10-Oct-14	15,448	15,575	60	Marcellus
11	10-Oct-14	15,297	15,424	60	Marcellus
12	10-Oct-14	15,147	15,274	60	Marcellus
13	11-Oct-14	14,997	15,124	60	Marcellus
14	11-Oct-14	14,847	14,974	60	Marcellus
15	11-Oct-14	14,696	14,823	60	Marcellus
16	11-Oct-14	14,546	14,673	60	Marcellus
17	12-Oct-14	14,396	14,523	60	Marcellus
18	12-Oct-14	14,246	14,373	60	Marcellus
19	12-Oct-14	14,095	14,222	60	Marcellus
20	12-Oct-14	13,945	14,072	60	Marcellus
21	13-Oct-14	13,795	13,922	60	Marcellus
22	13-Oct-14	13,644	13,772	60	Marcellus
23	14-Oct-14	13,494	13,621	60	Marcellus
24	14-Oct-14	13,344	13,471	60	Marcellus
25	14-Oct-14	13,194	13,321	60	Marcellus
26	15-Oct-14	13,043	13,171	60	Marcellus
27	15-Oct-14	12,893	13,020	60	Marcellus
28	15-Oct-14	12,743	12,870	60	Marcellus
29	16-Oct-14	12,593	12,720	60	Marcellus
30	16-Oct-14	12,442	12,570	60	Marcellus
31	16-Oct-14	12,292	12,419	60	Marcellus
32	16-Oct-14	12,142	12,269	60	Marcellus
33	17-Oct-14	11,992	12,119	60	Marcellus
34	17-Oct-14	11,841	11,969	60	Marcellus
35	17-Oct-14	11,691	11,818	60	Marcellus
36	17-Oct-14	11,541	11,668	60	Marcellus
37	18-Oct-14	11,391	11,518	60	Marcellus
38	18-Oct-14	11,240	11,368	60	Marcellus
39	18-Oct-14	11,090	11,217	60	Marcellus
40	18-Oct-14	10,940	11,067	60	Marcellus
41	19-Oct-14	10,790	10,917	60	Marcellus
42	19-Oct-14	10,639	10,767	60	Marcellus
43	19-Oct-14	10,489	10,616	60	Marcellus
44	19-Oct-14	10,339	10,466	60	Marcellus
45	20-Oct-14	10,189	10,316	60	Marcellus
46	20-Oct-14	10,038	10,166	60	Marcellus
47	20-Oct-14	9,888	10,015	60	Marcellus
48	20-Oct-14	9,738	9,865	60	Marcellus
49	20-Oct-14	9,587	9,715	60	Marcellus
50	21-Oct-14	9,437	9,565	60	Marcellus
51	21-Oct-14	9,287	9,414	60	Marcellus
52	21-Oct-14	9,137	9,264	60	Marcellus
53	21-Oct-14	8,987	9,114	60	Marcellus
54	21-Oct-14	8,836	8,964	60	Marcellus
55	22-Oct-14	8,686	8,813	60	Marcellus
56	22-Oct-14	8,536	8,663	60	Marcellus
57	22-Oct-14	8,386	8,513	60	Marcellus
58	22-Oct-14	8,235	8,363	60	Marcellus
59	22-Oct-14	8,085	8,212	60	Marcellus
60	23-Oct-14	7,935	8,062	60	Marcellus
61	23-Oct-14	7,785	7,912	60	Marcellus
62	23-Oct-14	7,634	7,762	60	Marcellus
63	23-Oct-14	7,484	7,611	60	Marcellus
64	23-Oct-14	7,334	7,461	60	Marcellus
65	24-Oct-14	7,184	7,311	60	Marcellus
66	24-Oct-14	7,033	7,161	60	Marcellus
67	24-Oct-14	6,883	7,010	60	Marcellus
68	24-Oct-14	6,733	6,860	60	Marcellus

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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-Oct-14	62.6	6,972	5,403	4,893	80,700	6,683	N/A
2	5-Oct-14	61.3	6,893	5,635	4,871	141,300	6,899	N/A
3	6-Oct-14	64.0	6,848	6,442	5,275	209,600	6,531	N/A
4	7-Oct-14	63.8	6,824	5,423	5,180	205,300	6,253	N/A
5	8-Oct-14	59.2	6,540	5,405	5,124	44,000	5,826	N/A
6	9-Oct-14	62.9	7,164	5,654	5,237	143,500	6,971	N/A
7	9-Oct-14	65.5	6,838	5,574	5,260	211,000	6,298	N/A
8	9-Oct-14	66.7	6,689	5,370	4,963	207,900	6,743	N/A
9	10-Oct-14	64.3	6,758	5,445	5,085	209,500	6,254	N/A
10	10-Oct-14	64.8	6,794	5,487	5,237	207,300	6,140	N/A
11	10-Oct-14	65.7	6,919	5,692	5,253	208,500	6,204	N/A
12	11-Oct-14	65.7	6,914	5,559	4,997	211,500	6,221	N/A
13	11-Oct-14	65.1	7,140	5,755	5,313	212,600	6,217	N/A
14	11-Oct-14	63.0	7,610	5,947	5,353	213,800	6,197	N/A
15	11-Oct-14	65.7	7,232	5,825	5,440	209,400	6,205	N/A
16	12-Oct-14	63.7	6,972	5,730	5,687	213,100	6,152	N/A
17	12-Oct-14	64.7	6,623	5,400	5,021	212,700	6,144	N/A
18	12-Oct-14	66.4	6,870	5,711	4,953	210,100	6,110	N/A
19	12-Oct-14	66.7	6,681	5,351	5,017	210,100	6,070	N/A
20	13-Oct-14	63.7	6,700	5,373	4,952	210,700	6,133	N/A
21	13-Oct-14	66.1	6,799	5,445	4,912	211,000	6,103	N/A
22	14-Oct-14	66.0	6,748	5,407	5,237	210,500	6,017	N/A
23	14-Oct-14	64.1	6,676	5,370	5,028	210,200	6,018	N/A
24	14-Oct-14	65.6	6,832	5,749	5,156	210,600	5,988	N/A
25	15-Oct-14	65.6	6,720	5,237	5,067	209,200	6,003	N/A
26	15-Oct-14	64.5	6,831	5,426	4,857	209,600	5,908	N/A
27	15-Oct-14	62.0	7,160	5,654	4,971	210,800	5,945	N/A
28	15-Oct-14	66.1	7,004	5,483	5,408	209,000	5,921	N/A
29	16-Oct-14	64.2	6,906	5,654	5,275	210,700	5,893	N/A
30	16-Oct-14	64.7	7,131	5,787	4,689	210,400	5,923	N/A
31	16-Oct-14	63.8	6,831	5,625	5,233	214,200	5,929	N/A
32	16-Oct-14	63.1	7,039	5,940	5,148	212,800	5,997	N/A
33	17-Oct-14	65.0	6,582	5,616	5,218	211,700	5,970	N/A
34	17-Oct-14	63.9	6,827	5,787	5,203	211,000	5,860	N/A
35	17-Oct-14	64.4	7,031	5,616	5,237	210,900	5,863	N/A
36	17-Oct-14	61.2	6,686	5,440	5,449	180,000	5,516	N/A
37	18-Oct-14	64.5	6,541	5,341	5,324	207,200	5,750	N/A
38	18-Oct-14	64.6	6,875	5,887	4,168	211,200	5,835	N/A
39	18-Oct-14	64.8	6,991	5,874	5,751	208,500	5,783	N/A
40	18-Oct-14	63.5	6,701	5,394	5,051	211,000	5,763	N/A
41	19-Oct-14	68.6	6,513	5,313	4,888	210,300	5,795	N/A
42	19-Oct-14	66.5	6,432	5,295	5,109	210,000	5,683	N/A
43	19-Oct-14	65.3	6,289	5,092	4,844	210,900	5,725	N/A
44	19-Oct-14	65.5	6,003	5,039	4,962	207,300	5,682	N/A
45	20-Oct-14	64.8	6,025	5,251	4,524	210,100	5,673	N/A
46	20-Oct-14	67.0	6,252	5,407	4,693	210,300	5,613	N/A
47	20-Oct-14	65.6	6,300	5,870	4,766	209,400	5,591	N/A
48	20-Oct-14	68.5	6,292	5,786	4,977	210,600	5,605	N/A
49	20-Oct-14	64.9	6,075	5,405	4,948	208,400	5,555	N/A
50	21-Oct-14	65.8	6,150	5,351	5,001	208,800	5,462	N/A
51	21-Oct-14	66.2	6,503	5,962	5,186	210,600	5,521	N/A
52	21-Oct-14	65.4	6,328	5,629	4,856	210,500	5,493	N/A
53	21-Oct-14	64.8	6,074	5,515	4,877	210,800	5,522	N/A
54	22-Oct-14	64.8	6,044	5,616	4,754	209,500	5,479	N/A
55	22-Oct-14	65.1	6,227	5,537	5,183	210,300	5,462	N/A
56	22-Oct-14	65.1	6,184	5,481	5,086	211,000	5,448	N/A
57	22-Oct-14	63.7	6,352	5,870	5,314	209,700	5,422	N/A
58	22-Oct-14	66.1	6,147	5,777	4,783	216,900	5,592	N/A
59	23-Oct-14	63.6	6,420	5,259	4,944	210,000	5,411	N/A
60	23-Oct-14	64.9	6,463	5,759	4,977	210,300	5,395	N/A
61	23-Oct-14	65.1	6,115	5,648	4,946	210,200	5,364	N/A
62	23-Oct-14	64.9	6,206	5,574	5,070	209,800	5,317	N/A
63	23-Oct-14	63.7	6,206	5,296	5,277	209,700	5,327	N/A
64	23-Oct-14	64.6	6,105	6,037	5,166	209,400	5,312	N/A
65	24-Oct-14	63.6	5,948	5,698	5,211	210,300	5,299	N/A
66	24-Oct-14	63.0	5,943	5,969	4,877	210,900	5,409	N/A
67	24-Oct-14	63.3	6,466	7,318	4,029	210,900	5,316	N/A
68	24-Oct-14	63.8	6,589	6,074	4,907	210,300	5,255	N/A
AVG=		65	6,611	5,614	5,054	13,840,300	397,964	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	62	--	--	--
Siltstone	0	456	0	456
Coal	est. 456	486	est. 456	486
Sand	est. 486	516	est. 486	516
Shale	est. 516	1266	est. 516	1266
Sandstone	est. 1266	1296	est. 1266	1296
Shale	est. 1296	1356	est. 1296	1356
Sandstone	est. 1356	1386	est. 1356	1386
Shale	est. 1386	1506	est. 1386	1506
Sandstone	est. 1506	1906	est. 1506	1906
Limestone	est. 1906	2010	est. 1906	2010
Big Lime	2010	2068	2010	2068
Big Injun	2068	2317	2068	2317
Gantz Sand	2317	2488	2317	2488
Fifty Foot Sandstone	2488	2696	2488	2696
Gordon	2696	2488	2696	2488
Fifth Sandstone	2488	3075	2488	3075
Bayard	3075	3444	3075	3444
Warren	3444	3827	3444	3827
Speechley	3827	4034	3827	4034
Baltown	4034	4537	4034	4537
Bradford	4537	4913	4537	4914
Benson	4913	5150	4914	5150
Alexander	5150	5369	5150	5370
Elk	5369	5753	5370	5755
Rhinestreet	5753	6118	5755	6128
Sycamore	6118	6278	6128	3623
Middlesex	6278	6387	3623	6522
Burkett	6387	6420	6522	6613
Tully	6420	6438	6613	6689
Marcellus	6438	NA	6689	16990

*Please note Antero determines formation tops based on mud and wireline logs that are only run on one well on a multi-well pad (Please reference Rufus Unit 1H API# 47-085-10046). 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:	10/5/2014
Job End Date:	10/24/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10046-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Rufus Unit 1H
Longitude:	-80.90133600
Latitude:	39.19534400
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,512
Total Base Water Volume (gal):	16,714,488
Total Base Non Water Volume:	0



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	ANTERO RESOURCES	Water	Water	7732-18-5	100.00000	90.52898	
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia	Crystalline Silica, quartz	14808-60-7	99.90000	5.12188	
			Aluminum Oxide	1344-28-1	1.10000	0.05640	
			Titanium Oxide	13463-67-7	0.10000	0.00513	
			Iron Oxide	1309-37-1	0.10000	0.00513	
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia	Crystalline Silica, quartz	14808-60-7	99.90000	1.96559	
			Aluminum Oxide	1344-28-1	1.10000	0.02164	
			Titanium Oxide	13463-67-7	0.10000	0.00197	
			Iron Oxide	1309-37-1	0.10000	0.00197	
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia	Crystalline Silica, quartz	14808-60-7	99.90000	1.28840	
			Aluminum Oxide	1344-28-1	1.10000	0.01419	

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					Iron Oxide	1309-37-1	0.10000	0.00129	
					Titanium Oxide	13463-67-7	0.10000	0.00129	
Sand	Nabors Completion and Production Services	Sand - Bulk - West Virginia							
					Crystalline Silica, quartz	14808-60-7	99.90000	0.60369	
					Aluminum Oxide	1344-28-1	1.10000	0.00665	
					Iron Oxide	1309-37-1	0.10000	0.00060	
					Titanium Oxide	13463-67-7	0.10000	0.00060	
HCl Acid (12.5-18.0%) 22 Baume	Nabors Completion and Production Services	Bulk Acid							
					Water	7732-18-5	87.50000	0.18661	
LSG-100L	Nabors Completion and Production Services	Gelling Agents			Hydrochloric Acid	7647-01-0	18.00000	0.03839	
WFR-6W	Nabors Completion and Production Services	Friction Reducer			Petroleum Distillates	64742-47-8	70.00000	0.11834	
AQUICAR DB 20	Nabors Completion and Production Services	Biocides			Anionic Water-Soluble Polymer Emulsion	Proprietary	100.00000	0.06725	
					Polyethylene glycol	25322-68-3	54.50000	0.00763	
					2,2-Dibromo-3-nitropropionamide (DBNPA)	10222-01-2	20.00000	0.00280	
					Sodium bromide	7647-15-6	4.00000	0.00056	
					Dibromoacetamide	3252-43-5	3.00000	0.00042	
Super TSC 2 LT	Nabors Completion and Production Services	Paraffin & Scale Additives							
					Bis(hexamethylene triaminepenta(methylenephosphonic acid))	Proprietary	10.00000	0.00159	
OB-2 LT	Nabors Completion and Production Services	Gel Breakers							
					Ammonium Persulfate	7727-54-0	85.00000	0.00126	
					Crystalline Silica (in the form of quartz)	14808-60-7	10.00000	0.00015	
Super GREEN SOLV-M	Nabors Completion and Production Services	Paraffin & Scale Additives							
					Aliphatic Hydrocarbons	Proprietary	95.00000	0.00067	
					Dodecane	Proprietary	14.00000	0.00010	
					tetradecane	Proprietary	11.00000	0.00008	
					Tridecane	Proprietary	9.00000	0.00006	
					Undecane	Proprietary	8.00000	0.00006	

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Acid Inhibitor 2 (AI-2)	Nabors Completion and Production Services	Acid Corrosion Inhibitors						
			Glycol Ethers	111-46-6		40.00000	0.00016	
			Propargyl Alcohol	107-19-7		40.00000	0.00016	
			Isopropyl Alcohol	67-63-0		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.								
Other Ingredients	Nabors Completion and Production Services	Other Ingredients						
			guar gum	9000-30-0		50.00000	0.08453	
			Copolymer	Proprietary		100.00000	0.06725	
			Water	7732-18-5		40.00000	0.02690	
			Isoparaffinic Solvent	64742-47-8		26.00000	0.01749	
			Water	7732-18-5		90.00000	0.01427	
			Water	7732-18-5		32.00000	0.00448	
			Surfactant	68439-51-0		2.00000	0.00338	
			Crystalline Silica (in the form of quartz)	14808-60-7		2.00000	0.00338	
			Ethylene Glycol	107-21-1		4.00000	0.00269	
			Ethoxylated alcohols	Proprietary		4.00000	0.00269	
			Surfactant Blend	Proprietary		3.00000	0.00202	
			Sugar	57-50-1		100.00000	0.00046	
			Proprietary	Proprietary		100.00000	0.00046	
			Water	7732-18-5		100.00000	0.00023	
			Alkali Chloride salt	Proprietary		15.00000	0.00022	
			Water	7732-18-5		48.00000	0.00020	
			Sodium Hydroxide	1310-73-2		1.00000	0.00016	
			Monobromo-3-nitropropionamide	1113-55-9		1.00000	0.00014	
			2,2-Dibromomalonamide	73003-80-2		1.00000	0.00014	
			2-Propenamide as residual	79-06-1		0.10000	0.00007	
			2-Butoxyethanol	1111-76-2		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	0.00001	
			Organophylic Clay	68953-58-2		1.00000	0.00000	

Received
APR 27 2015
Office of Oil and Gas
Wy Dept. of Environmental Protection

* 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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Office of Oil and Gas
WV Dept. of Environmental Protection

06/12/2015

LATITUDE 39°12'30"

7,464'

143' TO BOTTOM HOLE
LATITUDE 39°15'00"

Antero Resources Corporation
Well No. Rufus Unit 1H
47-085-10046 (AS DRILLED)

AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 256,356ft E: 1,602,847ft
LAT: 39°11'43.24" LON: 80°54'04.81"
BOTTOM HOLE INFORMATION:
N: 266,077ft E: 1,598,511ft
LAT: 39°13'18.64" LON: 80°55'01.81"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE 6PS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

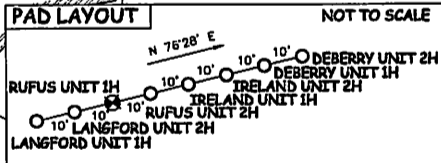
(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 4,338,468m E: 508,535m
BOTTOM HOLE INFORMATION:
N: 4,341,408m E: 507,165m

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS



WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

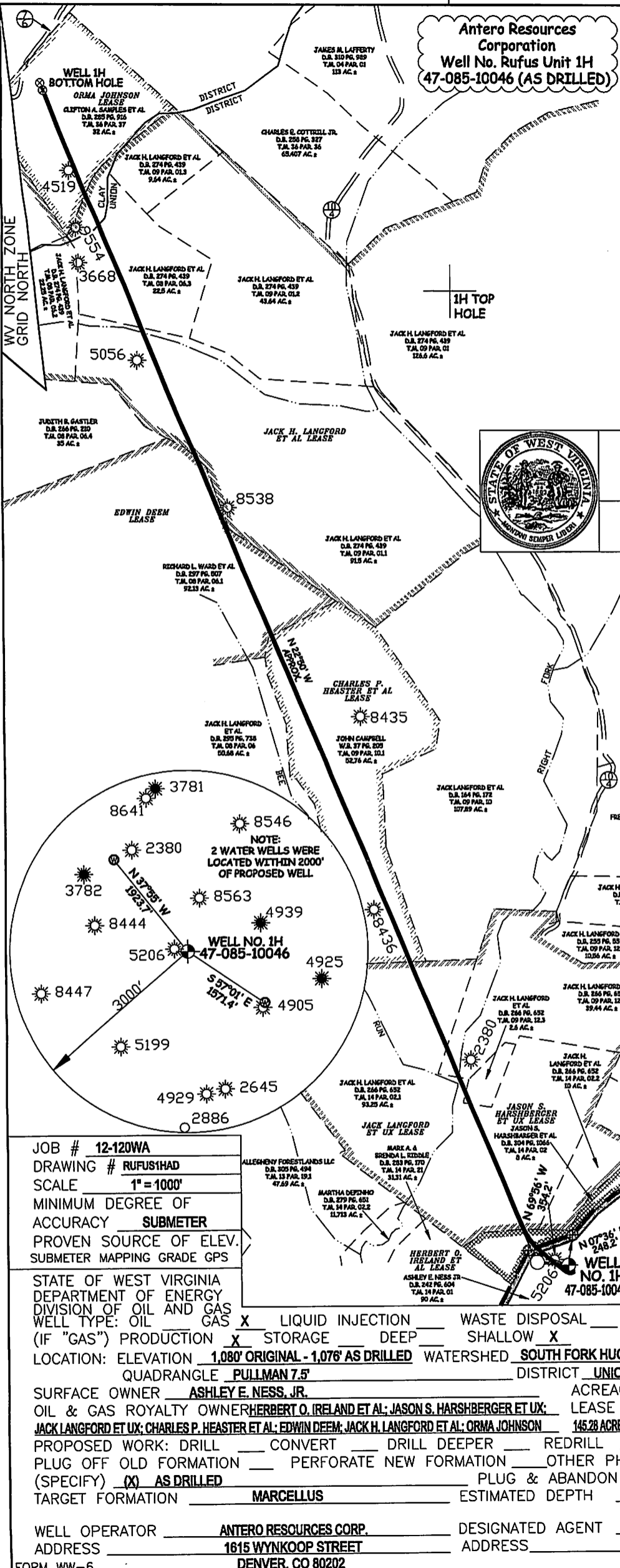
NOTES
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, 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.



LEGEND
- - - Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
X Existing Fence
⊕ Found monument, as noted
○ Proposed Well Path
⊗ As Drilled Well Path

DATE 03/30/15
OPERATOR'S WELL # RUFUS UNIT #1H
API WELL # 47 - 085 - 10046
STATE COUNTY PERMIT

DATE 06/12/2015
COUNTY NAME RITCHIE
PERMIT



JOB # 12-120WA
DRAWING # RUFUSHAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,080' ORIGINAL - 1,076' AS DRILLED WATERSHED SOUTH FORK HUGHES RIVER
QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE

SURFACE OWNER ASHLEY E. NESS, JR. ACREAGE 90 ACRES +/-
OIL & GAS ROYALTY OWNER HERBERT O. IRELAND ET AL; JASON S. HARSHBERGER ET UX; LEASE ACREAGE 90 ACRES +/-; 8 ACRES +/-
JACK LANGFORD ET UX; CHARLES P. HEASTER ET AL; EDWIN DEEM; JACK H. LANGFORD ET AL; ORMA JOHNSON 145.28 ACRES +/-; 52.76 ACRES +/-; 92.13 ACRES +/-; 448.5 ACRES +/-; 32 ACRES +/-
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,483' TVD 17,014' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313