

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

OCT 12 2017

WV Department of  
Environmental Protection

API 47-095-02265 County Tyler District Centerville  
Quad Shirley 7.5' Pad Name Dale Pad Field/Pool Name ---  
Farm name Raymond Underwood Well Number Jug 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 4364731m Easting 511828m  
Landing Point of Curve Northing 4364855.613m Easting 511401.611m  
Bottom Hole Northing 4367076m Easting 510610m

Elevation (ft) 1017' 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 07/14/2015 Date drilling commenced 03/01/2016 Date drilling ceased 05/21/2016  
Date completion activities began 01/15/2017 Date completion activities ceased 07/10/2017  
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 55' 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 1166', 1331' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

**APPROVED**

NAME: Sen m  
DATE: 10-25-17

Reviewed by:

02/16/2018

API 47-095 - 02265 Farm name Raymond Underwood Well number Jug Unit 1H

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"	40'	New	94#, J-55	N/A	Y
Surface	17- 1/2"	13- 3/8"	533'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2572'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	15035'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6735'		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 <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	185 sx	15.6	1.18	218	0	8 Hrs.
Surface	Class A	654 sx	15.6	1.2	785	0	8 Hrs.
Coal							
Intermediate 1	Class A	926 sx	15.6	1.18	1093	0	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	876 sx (Lead) 1309 sx (Tail)	13.71 (Lead), 16.13 (Tail)	1.44 (Lead), 1.64 (Tail)	3670	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15034' MD, 6472' TVD (BHL) & 6499' TVD (Deepest Point Drilled) Loggers TD (ft) 15022' MD

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

Plug back procedure N/A

Kick off depth (ft) 6254'

\*\* There were no wireline logs run on this pad. Please reference the wireline logs submitted with Rymer Unit 4HD (API#47-095-02273). 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 N/A





API 47-095-02265 Farm Name Raymond Underwood Well Number Jug Unit 1H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/15/2017	14765	14932	60	Marcellus
2	3/22/2017	14567	14734	60	Marcellus
3	3/23/2017	14369	14536	60	Marcellus
4	3/24/2017	14171	14338	60	Marcellus
5	3/24/2017	13973	14140	60	Marcellus
6	3/25/2017	13775	13942	60	Marcellus
7	3/26/2017	13578	13744	60	Marcellus
8	3/26/2017	13380	13547	60	Marcellus
9	3/27/2017	13182	13349	60	Marcellus
10	3/27/2017	12984	13151	60	Marcellus
11	3/28/2017	12786	12953	60	Marcellus
12	3/28/2017	12588	12755	60	Marcellus
13	3/29/2017	12390	12557	60	Marcellus
14	3/30/2017	12193	12359	60	Marcellus
15	3/30/2017	11995	12162	60	Marcellus
16	3/31/2017	11797	11964	60	Marcellus
17	3/31/2017	11599	11766	60	Marcellus
18	4/1/2017	11401	11568	60	Marcellus
19	4/2/2017	11203	11370	60	Marcellus
20	4/2/2017	11005	11172	60	Marcellus
21	4/2/2017	10808	10975	60	Marcellus
22	4/3/2017	10610	10777	60	Marcellus
23	4/3/2017	10412	10579	60	Marcellus
24	4/4/2017	10214	10381	60	Marcellus
25	4/4/2017	10016	10183	60	Marcellus
26	4/5/2017	9818	9985	60	Marcellus
27	4/5/2017	9621	9787	60	Marcellus
28	4/6/2017	9423	9590	60	Marcellus
29	4/6/2017	9225	9392	60	Marcellus
30	4/7/2017	9027	9194	60	Marcellus
31	4/7/2017	8829	8996	60	Marcellus
32	4/8/2017	8631	8798	60	Marcellus
33	4/8/2017	8433	8600	60	Marcellus
34	4/9/2017	8236	8402	60	Marcellus
35	4/9/2017	8038	8205	60	Marcellus
36	4/10/2017	7840	8007	60	Marcellus
37	4/10/2017	7642	7809	60	Marcellus
38	4/10/2017	7444	7611	60	Marcellus
39	4/10/2017	7246	7413	60	Marcellus
40	4/11/2017	7048	7215	60	Marcellus
41	4/11/2017	6851	7017	60	Marcellus

02/16/2018

**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	3/21/2017	79.4	7203	3648	4675	339000	8623	N/A
2	3/22/2017	77.5	7624	4681	4526	346629	8471	N/A
3	3/23/2017	78.9	7352	4862	3926	346629	7241	N/A
4	3/24/2017	78.1	7253	4523	3484	372600	7651	N/A
5	3/24/2017	78.3	7129	5184	3616	347780	7304	N/A
6	3/25/2017	78.4	7236	5052	3628	344350	7249	N/A
7	3/26/2017	76.7	7517	5070	4821	319880	6628	N/A
8	3/26/2017	79.3	7243	4867	4881	346180	7436	N/A
9	3/27/2017	78.5	7308	5302	4348	347280	7256	N/A
10	3/27/2017	78.0	7337	5115	3477	354450	9216	N/A
11	3/28/2017	79.8	7142	5156	3287	343290	9505	N/A
12	3/28/2017	79.7	7176	5143	3591	344710	8894	N/A
13	3/29/2017	75.9	6782	5314	3636	361720	7508	N/A
14	3/30/2017	77.1	6776	4961	3707	361060	7506	N/A
15	3/30/2017	76.8	6958	5712	3241	349830	7441	N/A
16	3/31/2017	73.3	6710	5835	3387	361720	7324	N/A
17	3/31/2017	77.1	6738	5424	3383	360660	7496	N/A
18	4/1/2017	76.7	6759	5099	3363	346620	7461	N/A
19	4/2/2017	76.4	7154	5176	3331	345290	10031	N/A
20	4/2/2017	76.1	6896	4996	3392	343980	7539	N/A
21	4/2/2017	76.8	6724	5078	3635	362750	7562	N/A
22	4/3/2017	78.6	6789	4563	3672	345080	7447	N/A
23	4/3/2017	75.2	6841	5133	3435	357870	7619	N/A
24	4/4/2017	77.1	6616	5015	3459	361800	7442	N/A
25	4/4/2017	75.0	6553	4950	3233	352240	7424	N/A
26	4/5/2017	77.7	6498	5107	3312	342950	7284	N/A
27	4/5/2017	76.5	6769	5250	3372	357370	7393	N/A
28	4/6/2017	77.5	6580	5124	3470	362590	7446	N/A
29	4/6/2017	75.3	6162	5142	3211	340940	7352	N/A
30	4/7/2017	76.9	6381	5076	3391	359670	7394	N/A
31	4/7/2017	70.6	6479	5205	4770	352860	9044	N/A
32	4/8/2017	75.3	6507	4669	3131	342070	7244	N/A
33	4/8/2017	76.7	6477	5392	3376	360790	7268	N/A
34	4/9/2017	78.0	6265	5269	3414	361320	7375	N/A
35	4/9/2017	76.9	6488	5266	3251	361100	7257	N/A
36	4/10/2017	77.2	6583	4975	3265	361790	7421	N/A
37	4/10/2017	75.0	6069	5131	3298	361040	7309	N/A
38	4/10/2017	77.5	6209	5066	3352	357170	7293	N/A
39	4/10/2017	77.0	6003	5147	3464	356360	7209	N/A
40	4/11/2017	78.4	6299	5567	3953	358240	7310	N/A
41	4/11/2017	74.6	6301	5432	3121	341060	7183	N/A
	AVG=	77.0	6,778	5,090	3,617	14,440,718	314,057	TOTAL

**EXHIBIT 3**

<b>LITHOLOGY/ FORMATION</b>	<b>TOP DEPTH (TVD) From Surface</b>	<b>BOTTOM DEPTH (TVD) From Surface</b>	<b>TOP DEPTH (MD) From Surface</b>	<b>BOTTOM DEPTH (MD) From Surface</b>
Fresh Water	55'	N/A	55'	N/A
Shale	est. -19	341	est. -19	341
Sandstone	est. 341	521	est. 341	521
Siltstone	est. 521	701	est. 521	701
Limestone	est. 701	751	est. 701	751
Shale	est. 751	1166	est. 751	1166
Trace Coal	est. 1166	1171	est. 1166	1171
Shale	est. 1171	1331	est. 1171	1331
Trace Coal	est. 1331	1336	est. 1331	1336
Sandstone	est. 1336	1631	est. 1336	1631
Shale	est. 1631	1908	est. 1631	1908
Big Lime	1908	2012	1908	2017
Big Injun	2012	2523	2017	2529
Gantz Sand	2523	2651	2529	2657
Fifty Foot Sandstone	2651	2748	2657	2754
Gordon	2748	3101	2754	3107
Fifth Sandstone	3101	3154	3107	3160
Bayard	3154	3502	3160	3508
Warren	3502	3858	3508	3866
Speechley	3858	4596	3866	4644
Bradford	4596	5008	4644	5082
Benson	5008	5233	5082	5324
Alexander	5233	5406	5324	5511
Elk	5406	5804	5511	5939
Rhinestreet	5804	6394	5939	6283
Sycamore	6394	6298	6283	6497
Middlesex	6298	6395	6497	6658
Burkett	6395	5423	6658	6715
Tully	5423	6457	6715	6813
Marcellus	6457	NA	6813	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.



**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE CERTIFICATION**

Date of Notice Certification: 10/12/2017

API No. 47- 095  
Operator's Well No. Centerville Unit 2H  
Well Pad Name: Hichman Pad

**Notice has been given:**

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83	Easting: <u>509973m</u>
County: <u>Tyler</u>		Northing: <u>4354367m</u>
District: <u>Clay</u>	Public Road Access: <u>CR-74/4 (Bond Run)</u>	
Quadrangle: <u>Pennsboro 7.5'</u>	Generally used farm name: <u>Radall Bond et al</u>	
Watershed: <u>North Fork Hughes River</u>		

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY		<b>OOG OFFICE USE ONLY</b>
<input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED		<input type="checkbox"/> RECEIVED/ NOT REQUIRED
<input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED		<input type="checkbox"/> RECEIVED
<input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or  <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)		<input type="checkbox"/> RECEIVED/ NOT REQUIRED
<input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION		<input type="checkbox"/> RECEIVED
<input checked="" type="checkbox"/> 5. PUBLIC NOTICE		<input type="checkbox"/> RECEIVED
<input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION		<input type="checkbox"/> RECEIVED

**Required Attachments:**

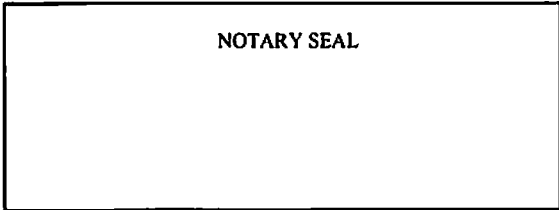
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.



**Certification of Notice is hereby given:**

THEREFORE, I Kevin Kilstrom, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all 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. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator:	<u>Antero Resources Corporation</u>	Address:	<u>1615 Wynkoop Street</u>
By:	<u>Kevin Kilstrom</u>		<u>Denver, CO 80202</u>
Its:	<u>Senior VP - Production</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>kquackenbush@anteroresources.com</u>



Subscribed and sworn before me this \_\_\_\_ day of \_\_\_\_\_.  
\_\_\_\_\_  
Notary Public  
My Commission Expires \_\_\_\_\_

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/22/2017
Job End Date:	4/11/2017
State:	West Virginia
County:	Tyler
API Number:	47-095-02265-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Jug 1H
Latitude:	39.43196111
Longitude:	-80.86273611
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,472
Total Base Water Volume (gal):	13,598,928
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	88.46720	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.23363	

MC S-2510T	Halliburton	Scale Inhibitor					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			

FR-76	Halliburton	Friction Reducer					
				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	11.25040	
			Hydrochloric acid	7647-01-0	15.00000	0.02758	
			Guar gum	9000-30-0	100.00000	0.01857	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01705	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01705	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01705	
			Ethylene Glycol	107-21-1	60.00000	0.00806	
			Glutaraldehyde	111-30-8	30.00000	0.00276	
			Neutralized Polyacrylic Emulsion	Proprietary	10.00000	0.00134	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00046	
			Sodium persulfate	7775-27-1	100.00000	0.00038	
			Methanol	67-56-1	60.00000	0.00010	
			Ethanol	64-17-5	1.00000	0.00009	
			Ethoxylated alcohols	Proprietary	30.00000	0.00004	
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1	30.00000	0.00004	
			Fatty acids, tall oil	Proprietary	30.00000	0.00004	
			Olefins	Proprietary	5.00000	0.00002	
			Propargyl alcohol	107-19-7	10.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	



			Sodium sulfate	7757-82-6	0.10000	0.00000
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\* 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)

LATITUDE 39°27'30"

8,305'

523' TO BOTTOM HOLE  
LATITUDE 39°27'30"

1,906' TO BOTTOM HOLE

LONGITUDE 80°52'30"

9,606'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Jug Unit 1H  
47-095-02265 (AS DRILLED)

STATE OF WV DNR  
D.B. 215 PG. 520  
T.M. 27 PAR. 02  
405.81 AC. ±

DAVID L. MAPLE LEASE  
STATE OF WV DNR  
D.B. 227 PG. 141  
T.M. 27 PAR. 28  
88.75 AC. ±

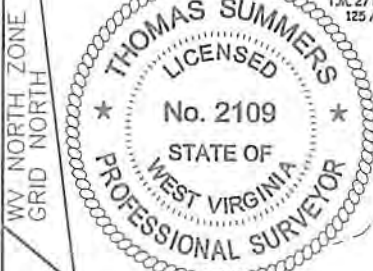
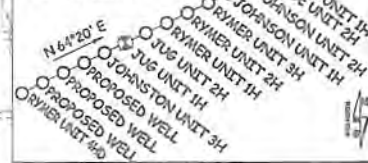
STATE OF WV DNR  
D.B. 307 PG. 217  
T.M. 27 PAR. 25  
100 AC. ±

AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 342,359ft E: 1,615,093ft  
LAT: 39°25'55.06" LON: 80°51'45.85"  
BOTTOM HOLE INFORMATION:  
N: 350,118ft E: 1,611,224ft  
LAT: 39°27'11.16" LON: 80°52'36.66"  
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 1H TOP HOLE INFORMATION:  
N: 4,364,731m E: 511,828m  
BOTTOM HOLE INFORMATION:  
N: 4,367,076m E: 510,610m

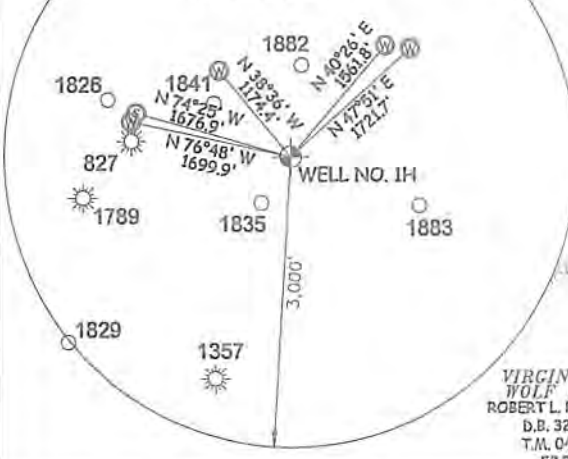
PAD LAYOUT

NOT TO SCALE



- NOTE:
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.
6. UNIT BOUNDARY SHOWN HEREON IS GREATER THAN 400' FROM THE AS-DRILLED WELLBORE. AS-DRILLED WELLBORE CONFORMS TO THE 400' UNIT BOUNDARY SETBACK REQUIREMENTS.

NOTE: 4 WATER WELLS AND 1 SPRING WERE LOCATED WITHIN 2000' OF CENTER OF PAD



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 RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

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

JOB # 13-102WA
DRAWING # JUG1HAD
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

LEGEND
- - - Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
o Proposed Well Path
o As Drilled Well Path
THOMAS SUMMERS P.S. 2109
DATE 09/28/17
OPERATOR'S WELL# JUG UNIT #1H

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL 47 - 095 - 02265
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT
LOCATION: ELEVATION 1,017' AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK
QUADRANGLE SHIRLEY 7.5' - SHL MIDDLEBOURNE 7.5' - BHL DISTRICT CENTERVILLE COUNTY TYLER
SURFACE OWNER RAYMOND UNDERWOOD ACREAGE 23 ACRES +/-
OIL & GAS ROYALTY OWNER RAYMOND V. UNDERWOOD ET UX; W.V. DIVISION OF NATURAL RESOURCES; LEASE ACREAGE 96 ACRES +/-; 244.25 ACRES +/-;
NORMAN FLEMING ET UX; RAYMOND V. UNDERWOOD ET UX; VIRGINIA R. WOLF; CATHY JO ASH ET AL; MARK DOUGLAS FLETCHER 23.69 ACRES +/-; 76.5 AC +/-; 126 AC +/-; 315.25 AC +/-; 88 ACRES +/-
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,472' TVD 15,034' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

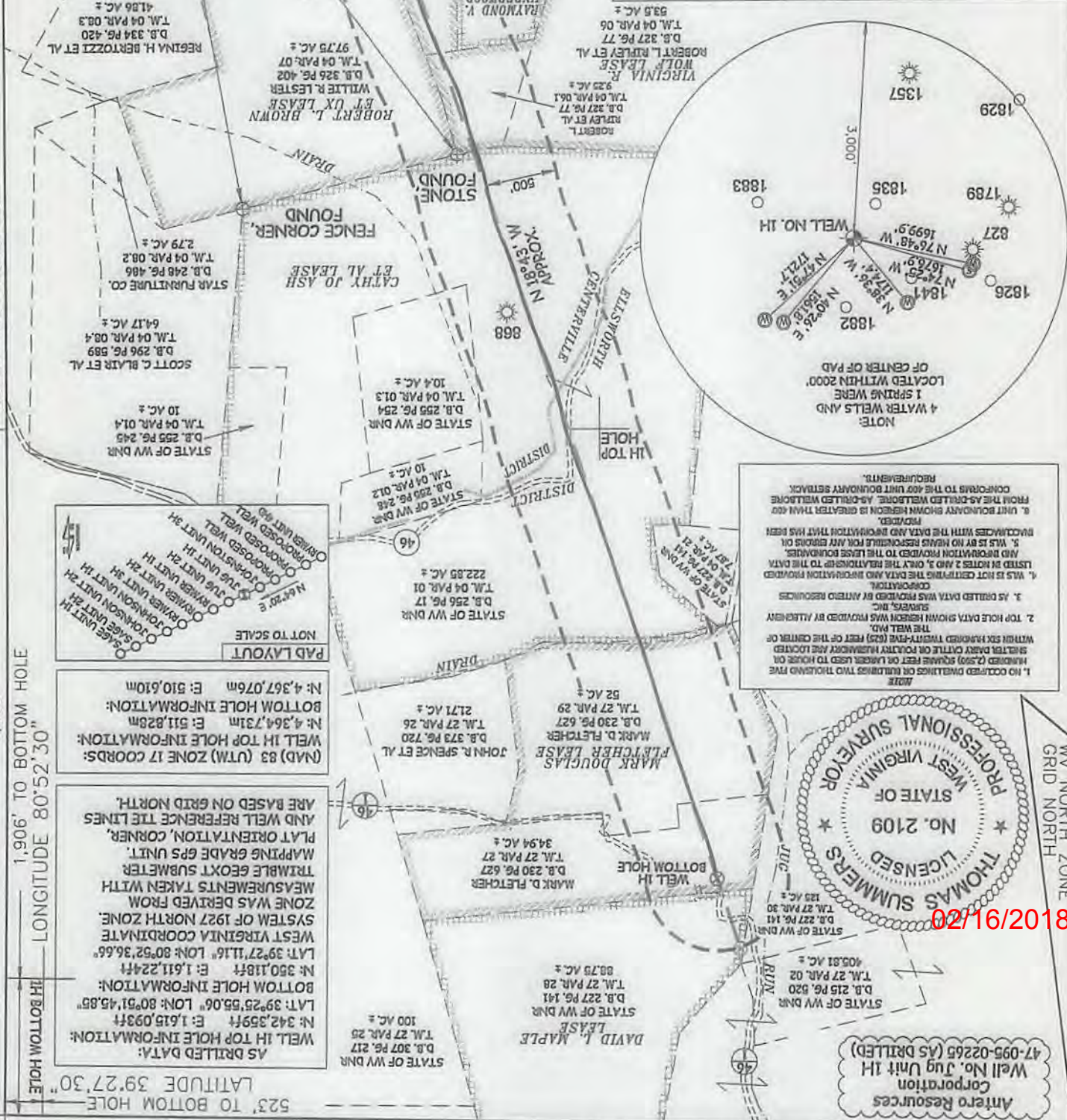
02/16/2018



WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL  
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X  
 COUNTY STATE PERMIT  
 47 095 02265  
 LOCATION: ELEVATION 1,017' AS DRILLED  
 QUADRANGLE SHIRLEY 7.5 - SHI. MIDDLEBOURNE 7.5 - BHI.  
 DISTRICT CENTERVILLE COUNTY TYLER  
 SURFACE OWNER RAYMOND UNDERWOOD  
 OIL & GAS ROYALTY OWNER RAYMOND V. UNDERWOOD ET UX; W.V. DIVISION OF NATURAL RESOURCES; LEASE ACREAGE 96 ACRES +/- 244.25 ACRES +/-  
 NORMAL FLEMING ET UX; RAYMOND V. UNDERWOOD ET UX; VIRGINIA R. WOLF; CATHY JO ASH ET AL; MARK DOUGLAS FLETCHER  
 23.89 ACRES +/- 76.5 ACRES +/- 126 ACRES +/- 316.25 ACRES +/- 86 ACRES +/-  
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL  
 FRACURE OR STIMULATE  
 PLUG OFF OLD FORMATION PERFORM NEW FORMATION OTHER PHYSICAL CHANGE IN WELL  
 (SPECIFY) AS DRILLED  
 PLUG & ABANDON CLEAN OUT & REFLUG  
 TARGET FORMATION MARCELLUS  
 WELL OPERATOR ANTERO RESOURCES CORP.  
 DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 ADDRESS 1616 WYNKOOP STREET DENVER, CO 80202  
 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

JOB # 13-102WA  
 DRAWING # JUG14H  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY  
 PROVEN SOURCE OF ELEV. SUBMETER  
 SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA  
 DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS  
 OPERATOR'S WELL# JUG UNIT #1H

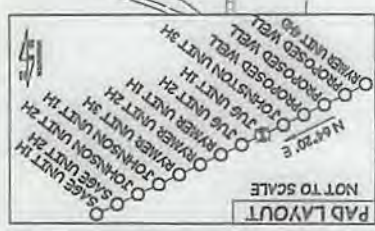
STATE OF WEST VIRGINIA  
 OFFICE OF ENVIRONMENTAL PROTECTION,  
 DIVISION OF OIL AND GAS  
 WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO  
 WEST VIRGINIA 26415



LONGITUDE 80°50'00"

1,906' TO BOTTOM HOLE

523' TO BOTTOM HOLE  
 LATITUDE 39.27'30"



(NAD) 83 (UTM) ZONE 17 COORDS:  
 WELL 1H TOP HOLE INFORMATION:  
 N: 4,364.731m E: 511.828m  
 BOTTOM HOLE INFORMATION:  
 N: 4,367.076m E: 510.610m

NOTE:  
 4 WATER WELLS AND 1 SPRING WERE LOCATED WITHIN 2000' OF CENTER OF PAD  
 1. NO OCCURRED DWELLING OR BUILDING TWO THOUSAND FIVE HUNDRED (2500) SQUARE FEET OR LARGER USED TO HOUSE OR HARBOR DAIRY CATTLE OR FOURTY HUSBANDRY AND LOCATED WITHIN 500' HORIZONTAL DISTANCE FROM THE CENTER OF THE WELL AND  
 2. TOP HOLE DATA SHOWS RESERVOIR WAS PROVIDED BY ALLEGHENY ENERGY INC.  
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.  
 4. WAS 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. WAS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR DISCREPANCIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.  
 6. UNIT BOUNDARY SHOWN HEREON IS GREATER THAN 100 FEET FROM THE AS DRILLED WELLBORE. AS DRILLED WELLBORE CONFORMS TO THE 400' UNIT BOUNDARY SETBACK REQUIREMENTS.



Antero Resources Corporation  
 Well No. Jug Unit 1H  
 47-095-02265 (AS DRILLED)  
 02/16/2018