

viewed 12/28/2018
Page 1 of 4
John A. ...

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

API 47-017-06812 County Doddridge District West Union
Quad West Union 7.5' Pad Name Addie Pad Field/Pool Name -----
Farm name Antero Resources Corporation Well Number Michels 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 4353811m Easting 516754m
Landing Point of Curve Northing 4353467m Easting 517324m
Bottom Hole Northing 4350454m Easting 518596m

Elevation (ft) 891' 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

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Date permit issued 5/11/2017 Date drilling commenced 7/6/2017 Date drilling ceased 10/29/2017
Date completion activities began 2/10/2018 Date completion activities ceased 7/21/2017
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 370' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1495', 1535' 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: _____

WR-35
Rev. 8/23/13

API 47-017 - 06812 Farm name Antero Resources Corporation Well number Michels 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	24"	20"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	492'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2607'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	19127'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6864'		4.7#, L-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	416sx	15.6	1.20	499	0'	8 Hrs.
Coal							
Intermediate 1	Class A	900 sx	15.6	1.18	1062	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	740sx (Lead) 1858sx (Tail)	13.5(Lead), 15.2 (Tail)	1.45 (Lead), 1.83 (Tail)	4473	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 19127' MD, 6576' TVD (BHL), 6606' (Deepest Point Drilled) Loggers TD (ft) 19127' MD

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

Plug back procedure N/A

Kick off depth (ft) 6141'

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

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API 47- 017 - 06812 Farm name Antero Resources Corporation Well number Michels Unit 2H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
*PLEASE 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)
*PLEASE SEE ATTACHED EXHIBIT 2								

Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	6454' (TOP)	TVD	6919' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 17203 mcfpd Oil 148 bpd NGL --- bpd Water 69 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	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	

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

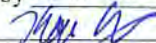
Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Allied Horizontal
Address 381 Colonial Manor Rd City North Huntington State PA Zip 15642

Cementing Company C&J Energy Services
Address 1650 Hackers Creek City Lane Jew State WV Zip 26378

Stimulating Company Keane Group
Address 5825 North Sam Houston Parkway West, Suite 600 City Houston State TX Zip 77086

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 11/9/2018

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

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EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/10/2018/	18858	19025	48	Marcellus
2	3/16/2018	18659	18827	48	Marcellus
3	3/17/2018	18460	18628	48	Marcellus
4	3/17/2018	18262	18429	48	Marcellus
5	3/17/2018	18063	18231	48	Marcellus
6	3/17/2018	17865	18032	48	Marcellus
7	3/18/2018	17666	17833	48	Marcellus
8	3/18/2018	17467	17635	48	Marcellus
9	3/18/2018	17269	17436	48	Marcellus
10	3/19/2018	17070	17238	48	Marcellus
11	3/19/2018	16871	17039	48	Marcellus
12	3/19/2018	16673	16840	48	Marcellus
13	3/20/2018	16474	16642	48	Marcellus
14	3/20/2018	16275	16443	48	Marcellus
15	3/20/2018	16077	16244	48	Marcellus
16	3/21/2018	15878	16046	48	Marcellus
17	3/21/2018	15679	15847	48	Marcellus
18	3/22/2018	15481	15648	48	Marcellus
19	3/22/2018	15282	15450	48	Marcellus
20	3/23/2018	15084	15251	48	Marcellus
21	3/23/2018	14885	15052	48	Marcellus
22	3/24/2018	14686	14854	48	Marcellus
23	3/24/2018	14488	14655	48	Marcellus
24	3/25/2018	14289	14457	48	Marcellus
25	3/25/2018	14090	14258	48	Marcellus
26	3/26/2018	13892	14059	48	Marcellus
27	3/26/2018	13693	13861	48	Marcellus
28	3/26/2018	13494	13662	48	Marcellus
29	3/27/2018	13296	13463	48	Marcellus
30	3/27/2018	13097	13265	48	Marcellus
31	3/29/2018	12899	13066	48	Marcellus
32	3/29/2018	12700	12867	48	Marcellus
33	3/30/2018	12501	12669	48	Marcellus
34	3/30/2018	12303	12470	48	Marcellus
35	3/31/2018	12104	12271	48	Marcellus
36	4/1/2018	11905	12073	48	Marcellus
37	4/1/2018	11707	11874	48	Marcellus
38	4/1/2018	11508	11676	48	Marcellus
39	4/2/2018	11309	11477	48	Marcellus
40	4/2/2018	11111	11278	48	Marcellus
41	4/2/2018	10912	11080	48	Marcellus
42	4/3/2018	10713	10881	48	Marcellus
43	4/4/2018	10515	10682	48	Marcellus
44	4/5/2018	10316	10484	48	Marcellus
45	4/5/2018	10118	10285	48	Marcellus
46	4/6/2018	9919	10086	48	Marcellus
47	4/6/2018	9720	9888	48	Marcellus
48	4/7/2018	9522	9689	48	Marcellus
49	4/8/2018	9323	9490	48	Marcellus
50	4/9/2018	9124	9292	48	Marcellus
51	4/9/2018	8926	9093	48	Marcellus
52	4/10/2018	8727	8895	48	Marcellus
53	4/10/2018	8528	8696	48	Marcellus
54	4/11/2018	8330	8497	48	Marcellus
55	4/11/2018	8131	8299	48	Marcellus
56	4/12/2018	7932	8100	48	Marcellus
57	4/13/2018	7734	7901	48	Marcellus
58	4/13/2018	7535	7703	48	Marcellus
59	4/14/2018	7337	7504	48	Marcellus
60	4/14/2018	7138	7305	48	Marcellus
61	4/14/2018	6939	7107	48	Marcellus

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API 47-017-06812 Farm Name Antero Resources Corp Well Number Michels 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	2/10/2018	67.7	8096	5557	4058	402780	8881	N/A
2	3/16/2018	66.3	8063	5163	3655	405000	8650	N/A
3	3/17/2018	68.3	7917	6136	4309	405000	8479	N/A
4	3/17/2018	63.1	7872	5493	3727	404080	8534	N/A
5	3/17/2018	70.7	8003	4765	4081	406000	8554	N/A
6	3/17/2018	68.3	8077	5987	4302	406000	8556	N/A
7	3/18/2018	65	8135	6496	3573	403250	8828	N/A
8	3/18/2018	66.3	7943	6679	3612	403780	8508	N/A
9	3/18/2018	68.2	7860	6516	4552	404000	8450	N/A
10	3/19/2018	62	7862	6008	3570	403820	8690	N/A
11	3/19/2018	67.6	8054	5969	3582	403190	9030	N/A
12	3/19/2018	73.9	8061	4993	4144	403000	8824	N/A
13	3/20/2018	75.4	7815	4318	3920	403000	8607	N/A
14	3/20/2018	68.9	7784	5547	3728	403450	8524	N/A
15	3/20/2018	71.9	8012	5635	4260	403205	11137	N/A
16	3/21/2018	69	7785	5273	4825	403690	10236	N/A
17	3/21/2018	79.7	7916	4846	5039	402902	8750	N/A
18	3/22/2018	69.2	7470	5157	3741	402880	8775	N/A
19	3/22/2018	77.4	7727	4675	3907	409000	9918	N/A
20	3/23/2018	75.3	7671	4599	4488	403480	9798	N/A
21	3/23/2018	79.8	7573	5110	5116	406060	8778	N/A
22	3/24/2018	80.8	7719	5270	5219	409000	8559	N/A
23	3/24/2018	77.3	7458	5632	3606	404200	8561	N/A
24	3/25/2018	74	7331	5369	4036	402913	8555	N/A
25	3/25/2018	71.2	7423	5766	3657	403500	8255	N/A
26	3/26/2018	76.6	7660	5742	4499	412861	8693	N/A
27	3/26/2018	73.3	7473	5263	3972	402860	8789	N/A
28	3/26/2018	71.4	7874	6063	4679	405752	11315	N/A
29	3/27/2018	72.8	7466	5731	4176	403000	8584	N/A
30	3/27/2018	75.3	7845	5292	4036	402835	10473	N/A
31	3/29/2018	72.8	7314	5629	5158	408000	10554	N/A
32	3/29/2018	77.5	7227	5747	4978	413244	8212	N/A
33	3/30/2018	76	7414	5729	4458	402700	8456	N/A
34	3/30/2018	78.4	7467	5658	4711	395400	8861	N/A
35	3/31/2018	76.6	7253	4933	5437	405000	8499	N/A
36	4/1/2018	70	7290	5446	5827	402000	9226	N/A
37	4/1/2018	79	7237	5614	5044	411278	8824	N/A
38	4/1/2018	77.5	7090	5565	4222	407000	8829	N/A
39	4/2/2018	77.6	7100	5824	4289	406000	8347	N/A
40	4/2/2018	75.8	7219	5604	4923	404000	8377	N/A
41	4/2/2018	75.9	7197	5482	3911	409117	9945	N/A
42	4/3/2018	61.7	7539	5518	4759	402000	10888	N/A
43	4/4/2018	75.1	7190	5531	5070	403250	8701	N/A
44	4/5/2018	78.4	7285	5643	4721	407000	8861	N/A
45	4/5/2018	78.9	7112	6064	3756	403100	8456	N/A
46	4/6/2018	72.3	7697	6271	5083	380000	9728	N/A
47	4/6/2018	78	7112	6081	5181	403280	8595	N/A
48	4/7/2018	76.1	6884	5375	5227	365000	8158	N/A
49	4/8/2018	77.1	7066	6010	4786	402000	8320	N/A
50	4/9/2018	78.9	7017	5804	3807	403240	8227	N/A
51	4/9/2018	78.5	6916	5590	4257	405000	8914	N/A
52	4/10/2018	77.5	6984	5707	5126	403000	8203	N/A
53	4/10/2018	77.5	6863	6217	4135	403120	8248	N/A
54	4/11/2018	78	6802	5758	3781	402700	8398	N/A
55	4/11/2018	76.1	6857	6028	4100	403470	8876	N/A
56	4/12/2018	77	6809	5907	4159	402700	8455	N/A
57	4/13/2018	78.7	6725	5850	4378	403145	8179	N/A
58	4/13/2018	79.1	6677	5979	4117	403340	8091	N/A
59	4/14/2018	79	6521	5936	4178	404679	8207	N/A
60	4/14/2018	80	6614	5978	4045	402700	8321	N/A
61	4/14/2018	79.5	6224	5868	4147	403640	9277	N/A
	AVG=	74	7,420	5,629	4,358	24,604,591	541,524	TOTAL

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API 47-017-06812 Farm Name Antero Resources Corp Well Number Michels Unit 2H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Shale	0	197	0	197
Sandy shale	197	357	197	357
Sandstone	357	417	357	417
Sandstone tr coal	417	437	417	437
Sandy shale	437	537	437	537
Shale	537	737	537	737
Silty sandstone	737	817	737	817
Silty shale	817	997	817	997
Sandstone	997	1,017	997	1,017
Silty shale	1,017	1,277	1,017	1,277
Sandstone	1,277	1,417	1,277	1,417
Sandy shale	1,417	1,677	1,417	1,677
Silty shale	1,677	1,743	1,677	1,745
Big Lime	1,743	2,303	1,745	2,305
Fifty Foot Sandstone	2,303	2,514	2,305	2,516
Gordon	2,514	2,711	2,516	2,713
Fifth Sandstone	2,711	2,773	2,713	2,775
Bayard	2,773	3,566	2,775	3,585
Speechley	3,566	3,750	3,585	3,779
Balltown	3,750	4,369	3,779	4,451
Bradford	4,369	4,793	4,451	4,915
Benson	4,793	5,087	4,915	5,236
Alexander	5,087	6,039	5,236	6,289
Sycamore	6,039	6,226	6,289	6,534
Middlesex	6,226	6,357	6,534	6,734
Burkett	6,357	6,386	6,734	6,790
Tully	6,386	6,429	6,790	6,894
Marcellus	6,429	NA	6,894	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.

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/16/2018
Job End Date:	4/14/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06812-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Michels 2H
Latitude:	39.33347778
Longitude:	-80.80583333
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,606
Total Base Water Volume (gal):	23,663,262
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	Ascent	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	88.57571	None
Sand (Proppant)	Keane	Proppant					
			Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	11.03646	None
KFR-16FW	Keane	Friction Reducer					
			Water	7732-18-5	60.00000	0.04168	None
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01389	None
			ammonium chloride	12125-02-9	1.50000	0.00104	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00104	None
KWG-111LS	Keane	Gel					
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00069	None
			Guar gum	9000-30-0	55.00000	0.01997	None
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.01997	None
Hydrochloric Acid (15%)	Keane	Acidizing					
			Hydrochloric Acid	7647-01-0	15.00000	0.03853	None
MBC-516W	Keane	Biocide					

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			Water	7732-18-5	56.70000	0.00501	None
			Glutaral	111-30-8	26.70000	0.00236	None
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00070	None
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00047	None
			ethonal	64-17-5	2.80000	0.00025	None
KSI-19	Keane	Scale Inhibitor					
			Methanol	67-56-1	30.00000	0.00400	None
KWBO-2	Keane	Breaker					
			Sodium persulfate	7775-27-1	99.00000	0.00081	None
KAI-12	Keane	Acid Inhibitor					
			Ethylene glycol	107-21-1	40.00000	0.00023	None
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00011	None
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00006	None
			formic acid	64-18-6	10.00000	0.00006	None
			Ethoxylated alcohol	68131-39-5	10.00000	0.00006	None
			Cinnamaldehyde	104-55-2	10.00000	0.00006	None
			isoproyl alcohol	67-63-0	5.00000	0.00003	None
KFEAC-30	Keane	Iron Control					
			Citric acid	77-92-9	30.00000	0.00048	None
			Acetic acid	64-19-7	5.00000	0.00008	None
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 Chemical(s)	Listed Above	See Trade Name(s) List					
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.01997	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01389	
			Glutaral	111-30-8	26.70000	0.00236	
			ammonium chloride	12125-02-9	1.50000	0.00104	
			oleic acid diethanolamide	93-83-4	1.50000	0.00104	
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00070	
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00069	
			Citric acid	77-92-9	30.00000	0.00048	
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00047	
			ethonal	64-17-5	2.80000	0.00025	
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00011	
			formic acid	64-18-6	10.00000	0.00006	
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00006	
			Ethoxylated alcohol	68131-39-5	10.00000	0.00006	
			Cinnamaldehyde	104-55-2	10.00000	0.00006	

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* 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)

		soproyl alcohol	67-63-0	5.00000	0.00003	
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RECEIVED
Office of Oil and Gas

NOV 14 2018

9,912' to Bottom Hole

4,209' to Top Hole

TOP HOLE LATITUDE 39 - 22 - 30
BTM HOLE LATITUDE 39 - 20 - 00

Antero Resources
Well No. Michels Unit 2H
As-Drilled Plat
Antero Resources Corporation

Bearing	Dist.
L1 S 75°39' E	1060.7'
L2 N 21°13' E	1162.9'
L3 S 67°52' W	525.0'
L4 S 49°57' W	690.9'

Top Hole Coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

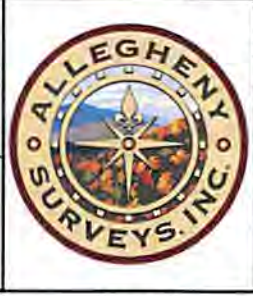
Scale: 1" = 2000'



Note: It appears 13 water wells, 7 springs and a pond were found within 2000' of proposed well. No occupied dwellings and no buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad. See well location references for details.

(*) Denotes Location of Well on United States Topographic Maps

TM/Par	Owner	Bk/Pg	Acres
1 3/17	Antero Resources Corp.	349/553	25.90
2 3/17.1	Antero Resources Corp.	358/562	9.90
3 3/21.1	Charles & Carol Cottrill	256/479	3.00
4 3/21	Addie Marie Leadmon	250/84	19.84
5 7/1	Mason Memorial Park	96/487	6.54
6 7/4	Robert P. Holden & Sherri M. Bailey	301/464	6.14
7 7/21	Elizabeth Anne Spencer, et al	AP 41/583	14.00
8 29/22	Imogen E. Lynch	WB 40/123	Lot 180
9 29/23	Imogen E. Lynch	WB 40/123	Lot 179
10 29/24	James L. & Martha Williams	182/265	Lot 178
11 29/25	James L. & Martha Williams	160/443	Lot 177
12 29/26	James L. & Martha Williams	182/265	Lot 176
13 29/72	Joseph L. & Maria B. McConnell	301/507	Lot 27
14 29/73	James & Charlotte Marsden	266/195	Lot 28
15 29/74	James & Charlotte Marsden	266/195	Lot 29
16 7/33	Freeman Cemetery	79/39	1.90
17 7/3.1	Masonic Memorial Park, Inc.	237/371	8.78
18 7/3.2	Andrew E. & Loria A. Lett	297/311	12.00
19 35/2,31-35	Rebecca H. Nicholson	248/185	2.29 Total
20 35/3,90-95	Barbara Travis & Sharon Weekley	WB 62/674	1.74 Total
21 35/6,13,36,37	Brandon Rogers	264/421	2.31 Total
22 11/2	Sharon K. & Paul D. Weekley	220/499	12.00
23 11/3	Genevieve V. Freeman	228/15	16.50



Legend

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

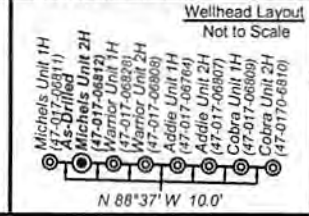
Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Michels Unit 2H Top Hole coordinates are
N: 306,253.88' Latitude: 39°20'00.52"
E: 1,630,657.60' Longitude: 80°48'20.80"
Bottom Hole coordinates are
N: 295,135.92' Latitude: 39°18'11.48"
E: 1,636,520.82' Longitude: 80°47'04.18"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N: 4,353,811.243m N: 4,350,453.985m
E: 516,753.566m E: 518,596.302m
Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

- Leases**
- A. Champion Agate Co., Inc. Lease
 - B. Champion Agate Co., Inc. Lease
 - C. Andrew Lett, et ux Lease
 - D. Champion Agate Co., Inc. Lease
 - E. Claude L. Smith, et ux Lease



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 prescribed by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167



FILE NO: 53-30-WU-15
DRAWING NO: Michels 2H As-Drilled Well Plat
SCALE: 1" = 1500'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: October 5 20 18
OPERATOR'S WELL NO. Michels Unit 2H
API WELL NO
47 - 017 - 06812
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: 891' As-Drilled WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
DISTRICT: West Union COUNTY: Doddridge
SURFACE OWNER: Antero Resources Corp. ACREAGE: 25.9
ROYALTY OWNER: J.C. Smith, Agent for Jacob Smith Estate; Ida F. Ford (2); Joseph Freeman, et ux; LEASE NO: ACREAGE: 58.70; 112; 82.21

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 19,127' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313

TOP HOLE LONGITUDE 80 - 47 - 30
BTM HOLE LONGITUDE 80 - 45 - 00

10,841' to Bottom Hole

15,064' to Top Hole

12/28/2018

12/28/2018



9,912' to Bottom Hole

4,209' to Top Hole
TOP HOLE LATITUDE 39 - 22 - 30
BTM HOLE LATITUDE 39 - 20 - 00

Antero Resources
Well No. Michels Unit 2H
As-Drilled Plat
Antero Resources Corporation

Bearing	Dist.
L1 S 75°39' E	1060.7'
L2 N 21°13' E	1162.9'
L3 S 67°52' W	525.0'
L4 S 49°57' W	690.9'

Top Hole Coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

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Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

Leases

A	Champion Agate Co., Inc. Lease
B	Champion Agate Co., Inc. Lease
C	Andrew Lett, et ux Lease
D	Champion Agate Co., Inc. Lease
E	Claude L. Smith, et ux Lease



Note: It appears 13 water wells, 7 springs and a pond were found within 2000' of proposed well. No occupied dwellings and no buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad. See well location references for details.

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TM/Par	Owner	Bk/Pg	Acres
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2	Antero Resources Corp.	358/562	9.90
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4	Addie Marie Leadmon	250/84	19.84
5	Mason Memorial Park	96/487	6.54
6	Robert P. Holden & Sherri M. Bailey	301/464	6.14
7	Elizabeth Anne Spencer, et al	AP 41/583	14.00
8	Imogen E. Lynch	WB 40/123	Lot 180
9	Imogen E. Lynch	WB 40/123	Lot 179
10	James L. & Martha Williams	182/265	Lot 178
11	James L. & Martha Williams	160/443	Lot 177
12	James L. & Martha Williams	182/265	Lot 176
13	Joseph L. & Marla B. McConnell	301/507	Lot 27
14	James & Charlotte Marsden	266/195	Lot 28
15	James & Charlotte Marsden	266/195	Lot 29
16	Freeman Cemetery	79/39	1.90
17	Masonic Memorial Park, Inc.	237/371	8.78
18	Andrew E. & Loria A. Lett	297/311	12.00
19	Rebecca H. Hicholson	248/185	2.29 Total
20	Barbara Travis & Sharon Weekley	WB 62/674	1.74 Total
21	Brandon Rogers	264/421	2.31 Total
22	Sharon K. & Paul D. Weekley	220/499	12.00
23	Genevieve V. Freeman	228/15	16.50

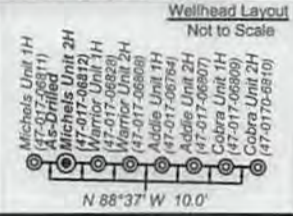


Legend

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

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 prescribed by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167



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PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: October 5 20 18
OPERATOR'S WELL NO. Michels Unit 2H
API WELL NO
47 - 017 - 06812
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: 891' As-Drilled WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
DISTRICT: West Union COUNTY: Doddridge
SURFACE OWNER: Antero Resources Corp. ACREAGE: 25.9
ROYALTY OWNER: J.C. Smith, Agent for Jacob Smith Estate; Ida F. Ford (2); Joseph Freeman, et ux; LEASE NO: ACREAGE: 58.70; 112; 82.21

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 19,127' MD

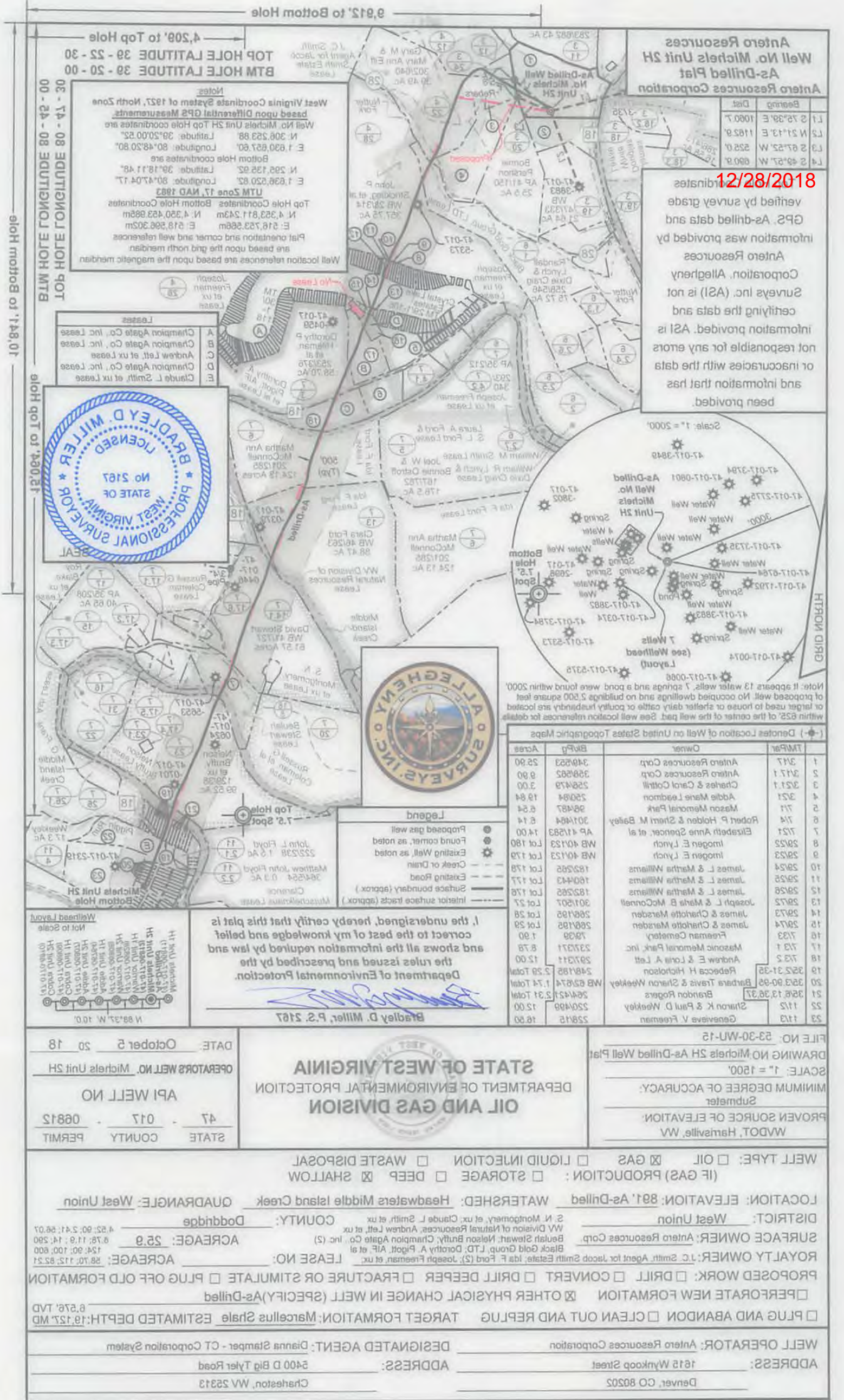
WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313

TOP HOLE LONGITUDE 80 - 47 - 30
BTM HOLE LONGITUDE 80 - 45 - 00

10,841' to Bottom Hole

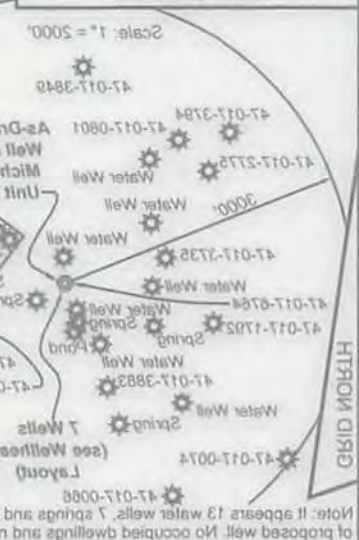
15,064' to Top Hole

12/28/2018



Antero Resources
Well No. Michels Unit 2H
As-Dilled Plat
Antero Resources Corporation

12/28/2018
 verified by survey grade
 GPS. As-dilled data and
 information was provided by
 Antero Resources
 Corporation. Allegheny
 Surveys Inc. (ASI) is not
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Legend

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

Denotes Location of Well on United States Topographic Maps

TWP/Range	Owner	Acres
1	Antero Resources Corp	347
2	Antero Resources Corp	317.1
3	Chas & Carol Cottrell	321.1
4	Abbie Marie Leadmon	250.84
5	Mason Memorial Park	98.87
6	Robert P. Holden & Shari M. Bailey	307.84
7	Elizabeth Anne Spencer, et al	41.53
8	Imogen E. Lynch	40.123
9	Imogen E. Lynch	40.123
10	James L. & Martha Williams	182.58
11	James L. & Martha Williams	180.43
12	James L. & Martha Williams	182.58
13	Joseph L. & Maha B. McConnell	301.507
14	James & Charlotte Marsden	288.185
15	James & Charlotte Marsden	288.185
16	Freeman Cemetery	1.90
17	Mason Memorial Park, Inc.	237.371
18	Andrew E. & Lois A. Lett	237.371
19	Rebecca H. Nicholson	248.188
20	Barbara Travis & Sharon Weekley	62.674
21	Brandon Rogers	284.421
22	Sharon K. & Paul D. Weekley	220.488
23	Genevieve V. Freeman	228.15

4,200' to Top Hole
 TOP HOLE LATITUDE 39 - 22 - 30
 BTM HOLE LATITUDE 39 - 20 - 00

Notes:
 West Virginia Coordinates System of 1927, North Zone
 based upon Differential GPS Measurements
 Well No. Michels Unit 2H Top Hole coordinates are
 Latitude: 39°20'00.52"
 Longitude: 80°48'20.80"
 Bottom Hole coordinates are
 Latitude: 39°18'17.48"
 Longitude: 80°47'04.17"
 UTM Zone 17, NAD 1983
 Top Hole Coordinates Bottom Hole Coordinates
 N: 4,283,811.243m E: 418,288,302m
 N: 4,280,423.886m E: 418,288,302m
 Plat orientation and corner and well references
 are based upon the grid north meridian
 Well location references are based upon the magnetic meridian

Leases

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B	Champion Agate Co., Inc. Lease
C	Andrew Lett, et ux Lease
D	Champion Agate Co., Inc. Lease
E	Claude L. Smith, et ux Lease

BRADLEY D. MILLER
 LICENSED
 No. 2167
 STATE OF
 WEST VIRGINIA
 PROFESSIONAL SURVEYOR
 SEAL

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 prescribed by the
 Department of Environmental Protection.

Bradley D. Miller, P.S. 2167

DESIGNATED AGENT: Dianne Stampler - CT Corporation System
 ADDRESS: 1615 Wymkoop Street
 Denver, CO 80202

WELL OPERATOR: Antero Resources Corporation
 ADDRESS: 5400 D Big Tyler Road
 Chester, WV 25313

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: 881' As-Dilled WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union DISTRICT: West Union COUNTY: Doddridge

SURFACE OWNER: Antero Resources Corp. SURFACE OWNER: Antero Resources Corp.
 ROYALTY OWNER: J.C. Smith Agent for Jacob Smith Estate; Iab F. Ford (S); Joseph Freeman et ux; Black Gold Group, LTD; Dorothy A. Pigott, AIF, et al
 LEASE NO: ACRES: 25.9 ACRES: 25.9

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Dilled
 8.26' TVD
 TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 1912.7 MD
 PLUG AND ABANDON CLEAN OUT AND REPLUG CLEAN OUT AND REPLUG

STATE COUNTY PERMIT
 47 - 017 - 08812
 API WELL NO
 OPERATORS WELL NO. Michels Unit 2H
 DATE: October 5, 2018