

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

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:  
\_\_\_\_\_

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 <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	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

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)
<b>*PLEASE SEE ATTACHED EXHIBIT 1</b>					

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)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

Please insert additional pages as applicable.

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

PRODUCING FORMATION(S)	DEPTHS		
	6454' (TOP)	TVD	6919' (TOP) MD
Marcellus			

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	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> 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

API 47-017-06812 Farm Name Antero Resources Corp Well Number Michels Unit 2H

**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

## 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

**EXHIBIT 3**

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	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.

# 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	Water	7732-18-5	60.00000	0.04168	None
KFR-16FW	Keane	Friction Reducer	Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	11.03646	None
			Water	7732-18-5	20.00000	0.01389	None
			Distillates (petroleum), hydrotreated light	64742-47-8	1.50000	0.00104	None
			ammonium chloride	12125-02-9	1.50000	0.00104	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00104	None
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00069	None
KWG-11TLS	Keane	Gel	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					





			Water	7732-18-5	56.70000	0.00501	None	
			Glutaral	111-30-8	26.70000	0.00236	None	
			didecyltrimethylammonium 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		
			didecyltrimethylammonium 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		

			soproyl alcohol	67-63-0	5.00000	0.00003	
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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)

# ANTERO RESOURCES CORPORATION

Location: Doddridge Co., WV  
 Field: Doddridge  
 Facility: Addie Pad

Slot: Slot #03  
 Well: Michels Unit 2H  
 Wellbore: Michels Unit 2H PWB



API: 47-017-06812-0000  
 BHI Job #: 8819608  
 Rig: Frontier 22  
 Duration: 10/24/2017-10/27/2017

Plot reference wellbore is Michels Unit 2H PWB Rev-A.0		Grid System: NAD27 / UTM Zone 17 North, US feet	
True vertical depths are referenced to Frontier 22 (RKB)		North Reference: Grid north	
Measured depths are referenced to Frontier 22 (RKB)		Scale: True distance	
Frontier 22 (RKB) to Mean Sea Level: 914.5 feet		Depths are in feet	
Mean Sea Level to Mud line (At Slot: Slot #03): -890 feet		Created by: delatet on 2018-01-10	
Coordinates are in feet referenced to Slot		Database: WA_MPL_EasemtlS_Defn	

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude
Addie Pad	1695325.147	14283415.126	39°20'00.530"N
Slot	Local N (ft)	Grid East (US ft)	Latitude
Slot #03	-0.99	14283414.137	39°20'00.520"N
Comment: 1. Michels Unit 2H			
Frontier 22 (RKB) to Mud line (At Slot: Slot #03)			24.5ft
Mean Sea Level to Mud line (At Slot: Slot #03)			-890ft
Frontier 22 (RKB) to Mean Sea Level			914.5ft

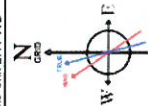
Gyrodata MS Gyro <17-112> (100-477) : 0.21° Inc, 109.50ft TWD, 109.50ft TVD, -0.10ft VS  
 Gyrodata MS Gyro <12-114> (477)(531) : 1.21° Inc, 540.50ft MD, 540.49ft TVD, -0.33ft VS  
 WFT EM <12-114> (531)(611-2524) : 2.68° Inc, 620.50ft MD, 620.45ft TVD, -2.86ft VS

### Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TWD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	6614.50	46.060	140.320	6290.05	439.60	1246.10	7.64	74.87
Proj. To Bottom	6699.50	90.730	145.030	6339.85	394.99	1280.01	7.80	129.11
POE	6919.04	67.930	160.158	6457.00	220.08	1368.07	9.37	324.45
Landing Pt.	7139.82	90.000	160.158	6499.00	17.50	1441.18	10.00	539.55
On Azimuth	7281.63	90.000	157.324	6499.00	-114.65	1492.59	2.00	681.30
BHL	19115.54	90.000	157.324	6499.00	-11033.83	6054.72	0.00	12515.21

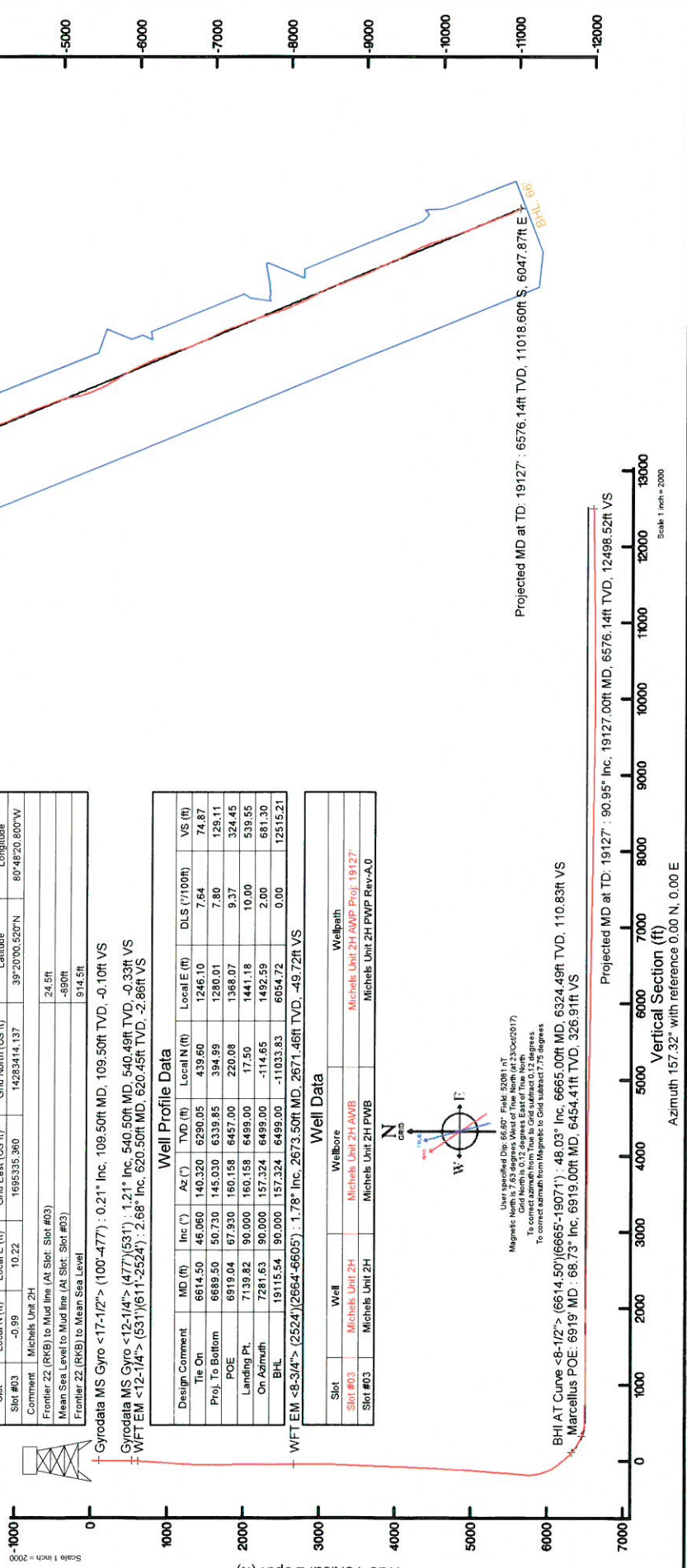
WFT EM <8-3/4> (2524)(2664-6605) : 1.78° Inc, 2673.50ft MD, 2671.46ft TVD, -49.72ft VS

Well Data		
Slot	Well	Wellbore
Slot #03	Michels Unit 2H	Michels Unit 2H AWB
Slot #03	Michels Unit 2H	Michels Unit 2H PWB
Slot #03	Michels Unit 2H	Michels Unit 2H PWB Rev-A.0



User specified Dip: 66.60° Field: 52941.1° T  
 Magnetic North is 7.93 degrees West of True North (at 23/04/2017)  
 Grid North is 0.12 degrees East of True North  
 To correct Azimuth from Magnetic to Grid subtract 7.75 degrees  
 To correct Azimuth from Magnetic to Grid subtract 7.75 degrees

BHI AT Curve <8-1/2> (6614.50)(6665-19071) : 48.03° Inc, 6665.00ft MD, 6324.49ft TVD, 110.83ft VS  
 Marcellus POE: 6919° MD : 68.73° Inc, 6919.00ft MD, 6454.41ft TVD, 326.91ft VS



Projected MD at TD: 19127 : 90.95° Inc, 19127.00ft MD, 6576.14ft TVD, 12498.52ft VS  
 Vertical Section (ft)  
 Azimuth 157.32° with reference 0.00 N, 0.00 E  
 Scale: 1 inch = 2000



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #03
Area	Doddridge Co., WV	Well	Michels Unit 2H
Field	Doddridge	Wellbore	Michels Unit 2H AWB
Facility	Addie Pad		

## REPORT SETUP INFORMATION

Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Delaset
Scale	0.999603	Report Generated	10/Jan/2018 at 15:50
Convergence at slot	0.12° East	Database/Source file	WA_MPL_EasternUS_DefnMichels_Unit_2H_AWP_Proj_19127_.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Northing[US ft]	Latitude	Longitude	
Slot Location	-0.99	10.22	14283414.14	39°20'00.520"N	80°48'20.800"W	
Facility Reference Pt			1695325.15	39°20'00.530"N	80°48'20.930"W	
Field Reference Pt			0.00	0°00'00.000"	85°29'19.301"W	

## WELLPATH DATUM

Calculation method	Minimum curvature	Frontier 22 (RKB) to Facility Vertical Datum	24.50ft
Horizontal Reference Pt	Slot	Frontier 22 (RKB) to Mean Sea Level	914.50ft
Vertical Reference Pt	Frontier 22 (RKB)	Frontier 22 (RKB) to Mud Line at Slot (Slot #03)	24.50ft
MD Reference Pt	Frontier 22 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	157.32°



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #03
Area	Doddridge Co., WV	Well	Michels Unit 2H
Field	Doddridge	Wellbore	Michels Unit 2H AWB
Facility	Addie Pad		

WELLPATH DATA (230 stations) † = interpolated/extrapolated station																
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid North [ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
0.00	0.00	26.180	0.00	0.00	0.00	0.00	1695335.36	14283414.14	39°20'00.520"N	80°48'20.800"W	0.00	0.000	0.00	0.00	0.00	
24.50	0.000	26.180	24.50	0.00	0.00	0.00	1695335.36	14283414.14	39°20'00.520"N	80°48'20.800"W	0.00	0.000	0.00	0.00	0.00	
109.50	0.210	26.180	109.50	-0.10	0.14	0.07	1695335.43	14283414.28	39°20'00.521"N	80°48'20.799"W	0.16	26.180	0.25	0.25	30.80	Gyrodata MS Gyro <17-1/2"> (100-477')
209.50	0.290	43.730	209.50	-0.32	0.49	0.32	1695335.68	14283414.62	39°20'00.525"N	80°48'20.796"W	0.59	33.671	0.11	0.08	17.55	
309.50	0.290	100.440	309.50	-0.29	0.62	0.75	1695336.11	14283414.76	39°20'00.526"N	80°48'20.790"W	0.97	50.171	0.28	0.00	56.71	
409.50	0.150	203.310	409.50	-0.06	0.46	0.95	1695336.30	14283414.59	39°20'00.525"N	80°48'20.788"W	1.05	64.150	0.35	-0.14	102.87	
486.50	0.220	199.600	486.50	0.12	0.23	0.86	1695336.22	14283414.36	39°20'00.522"N	80°48'20.789"W	0.89	75.195	0.09	0.09	-4.82	
540.50	1.210	358.250	540.49	-0.33	0.70	0.80	1695336.16	14283414.84	39°20'00.527"N	80°48'20.790"W	1.06	49.009	2.62	1.83	293.80	Gyrodata MS Gyro <12-1/4"> (477')(531')
620.50	2.680	359.150	620.45	-2.86	3.41	0.75	1695336.11	14283414.75	39°20'00.554"N	80°48'20.790"W	3.49	12.397	1.84	1.13	1.13	WFT EM <12-1/4"> (531')(611'-2524)
710.50	3.760	359.520	710.30	-7.55	8.47	0.69	1695336.05	14283422.60	39°20'00.604"N	80°48'20.791"W	8.50	4.687	1.20	1.20	0.41	
740.50	4.190	1.140	740.23	-9.46	10.35	0.71	1695336.07	14283424.68	39°20'00.624"N	80°48'20.791"W	10.57	3.839	1.48	1.43	5.40	
830.50	4.380	358.070	829.98	-15.68	17.27	0.66	1695336.02	14283431.40	39°20'00.691"N	80°48'20.791"W	17.28	2.180	0.33	0.21	-3.41	
926.50	4.610	352.870	925.68	-22.83	24.76	0.06	1695335.41	14283348.89	39°20'00.765"N	80°48'20.799"W	24.76	0.128	0.49	0.24	-5.42	
1021.50	4.860	346.640	1020.36	-30.47	32.46	-1.35	1695334.01	14283446.59	39°20'00.841"N	80°48'20.816"W	32.49	357.621	0.60	0.26	-6.56	
1116.50	4.960	342.180	1115.01	-38.54	40.29	-3.54	1695331.83	14283454.41	39°20'00.918"N	80°48'20.844"W	40.44	354.985	0.42	0.11	-4.69	
1210.50	3.600	341.550	1208.75	-45.53	46.96	-5.71	1695329.65	14283461.08	39°20'00.984"N	80°48'20.871"W	47.30	353.064	1.45	-1.45	-0.67	
1305.50	1.760	345.470	1303.64	-49.95	51.20	-7.02	1695328.34	14283465.32	39°20'01.026"N	80°48'20.888"W	51.68	352.190	1.95	-1.94	4.13	
1401.50	0.660	20.960	1399.62	-51.81	53.14	-7.20	1695328.17	14283467.26	39°20'01.045"N	80°48'20.890"W	53.63	352.290	1.33	-1.15	36.97	
1590.50	1.140	68.280	1588.60	-52.24	54.57	-4.89	1695330.47	14283468.69	39°20'01.053"N	80°48'20.880"W	54.32	353.260	0.61	0.18	46.59	
1685.50	0.670	87.710	1683.58	-52.03	54.95	-3.45	1695331.91	14283469.06	39°20'01.063"N	80°48'20.842"W	55.05	356.402	0.58	-0.49	20.45	
1780.50	0.390	169.710	1778.58	-51.52	54.65	-2.84	1695332.52	14283468.77	39°20'01.060"N	80°48'20.835"W	54.72	357.023	0.77	-0.29	86.32	
1875.50	0.450	183.030	1873.58	-50.87	53.96	-2.80	1695332.56	14283468.08	39°20'01.053"N	80°48'20.834"W	54.03	357.025	0.12	0.06	14.02	
1969.50	0.330	143.550	1967.58	-50.27	53.37	-2.66	1695332.70	14283467.49	39°20'01.048"N	80°48'20.832"W	53.44	357.144	0.30	-0.13	-42.00	
2064.50	0.450	108.590	2062.57	-49.76	53.03	-2.15	1695333.21	14283467.15	39°20'01.044"N	80°48'20.826"W	53.08	357.682	0.27	0.13	-36.80	
2159.50	0.500	90.090	2157.57	-49.35	52.91	-1.38	1695333.98	14283467.03	39°20'01.043"N	80°48'20.816"W	52.93	358.508	0.17	0.05	-19.47	
2253.50	0.600	73.280	2251.57	-49.14	53.06	-0.50	1695334.86	14283467.17	39°20'01.044"N	80°48'20.805"W	53.06	359.463	0.20	0.11	-17.88	
2347.50	0.770	67.990	2345.56	-49.09	53.43	0.56	1695335.92	14283467.55	39°20'01.048"N	80°48'20.791"W	53.44	0.600	0.19	0.18	-5.63	
2442.50	1.060	63.920	2440.55	-49.13	54.06	1.94	1695337.30	14283468.17	39°20'01.054"N	80°48'20.774"W	54.09	2.056	0.31	0.31	-4.28	
2533.50	1.550	63.320	2531.52	-49.27	54.98	3.80	1695339.16	14283469.10	39°20'01.063"N	80°48'20.750"W	55.11	3.950	0.54	0.54	-0.66	



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot #03
ANTERO RESOURCES CORPORATION	Michels Unit 2H
Doddridge Co., WV	Well
Doddridge	Wellbore
Facility	Michels Unit 2H AWB

## WELLPATH DATA (230 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (IUS ft)	Grid North (IUS ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
2673.50	1.780	58.840	2671.46	-49.72	56.96	7.35	1695342.71	14283471.07	39°20'01.083"N	80°48'20.705"W	57.43	7.352	0.19	4.16	-3.20	WFT EM <-8.3/4"> (2524)(2664-6605)
2736.50	4.360	68.660	2734.37	-49.81	58.34	10.42	1695345.77	14283472.45	39°20'01.096"N	80°48'20.666"W	59.26	10.125	4.16	4.10	15.59	
2831.50	7.550	74.110	2828.85	-48.99	61.36	19.79	1695355.14	14283475.47	39°20'01.126"N	80°48'20.547"W	64.47	17.873	3.41	3.36	5.74	
2925.50	8.170	72.460	2821.96	-47.66	65.06	32.09	1695367.44	14283479.17	39°20'01.162"N	80°48'20.390"W	72.55	26.256	0.70	0.66	-1.76	
3022.50	7.870	69.520	3018.01	-46.78	69.46	44.89	1695380.23	14283483.57	39°20'01.206"N	80°48'20.227"W	82.70	32.871	0.52	-0.31	-3.03	
3116.50	9.310	60.560	3110.96	-47.43	75.45	57.54	1695392.88	14283489.56	39°20'01.265"N	80°48'20.066"W	94.89	37.329	2.09	1.53	-9.53	
3210.50	10.760	57.380	3203.52	-49.84	83.92	71.55	1695406.88	14283498.02	39°20'01.348"N	80°48'19.887"W	110.28	40.451	1.65	1.54	-3.38	
3305.50	12.520	55.370	3296.56	-53.51	94.55	87.50	1695422.82	14283508.65	39°20'01.453"N	80°48'19.684"W	128.83	42.780	1.90	1.85	-2.12	
3399.50	14.130	56.900	3388.03	-57.69	106.61	105.49	1695440.81	14283520.70	39°20'01.571"N	80°48'19.455"W	149.98	44.698	1.75	1.71	1.63	
3494.50	16.400	58.480	3479.67	-61.85	119.96	126.64	1695461.95	14283534.05	39°20'01.703"N	80°48'19.185"W	174.44	46.553	2.43	2.39	1.66	
3588.50	17.650	60.800	3569.55	-65.51	133.85	150.39	1695485.69	14283547.93	39°20'01.840"N	80°48'18.882"W	201.33	48.332	1.51	1.33	2.47	
3682.50	19.240	61.560	3658.72	-68.68	148.18	176.45	1695511.74	14283562.25	39°20'01.981"N	80°48'18.550"W	230.42	49.979	1.71	1.69	0.81	
3777.50	21.070	63.080	3747.90	-71.51	163.36	205.45	1695540.72	14283577.43	39°20'02.130"N	80°48'18.181"W	282.48	51.510	2.00	1.93	1.60	
3871.50	20.650	61.910	3835.74	-74.33	178.82	235.14	1695570.40	14283592.88	39°20'02.282"N	80°48'17.803"W	295.41	52.748	0.63	-0.45	-1.24	
3966.50	21.780	62.110	3924.30	-77.51	194.95	265.49	1695600.75	14283609.01	39°20'02.441"N	80°48'17.416"W	329.38	53.710	1.19	1.19	0.21	
4060.50	23.710	65.090	4010.99	-79.82	211.07	298.05	1695633.29	14283625.12	39°20'02.600"N	80°48'17.001"W	365.22	54.695	2.39	2.05	3.17	
4155.50	23.220	63.700	4098.13	-81.75	227.41	332.16	1695667.39	14283641.46	39°20'02.761"N	80°48'16.566"W	402.55	55.603	0.78	-0.52	-1.46	
4249.50	22.350	60.810	4184.80	-84.95	244.34	364.38	1695699.59	14283658.38	39°20'02.927"N	80°48'16.156"W	438.72	56.156	1.51	-0.93	-3.07	
4343.50	23.940	60.360	4271.23	-89.28	262.49	396.56	1695731.76	14283676.52	39°20'03.106"N	80°48'15.746"W	475.56	56.499	1.70	1.69	-0.48	
4438.50	25.250	62.440	4357.61	-93.34	281.40	431.28	1695766.47	14283695.42	39°20'03.292"N	80°48'15.304"W	514.96	56.877	1.65	1.38	2.19	
4532.50	25.070	61.610	4442.69	-97.03	300.14	466.57	1695801.75	14283714.16	39°20'03.477"N	80°48'14.854"W	554.77	57.247	0.42	-0.19	-0.88	
4627.50	24.340	58.820	4529.00	-101.93	319.85	501.03	1695836.19	14283733.86	39°20'03.671"N	80°48'14.415"W	594.42	57.447	1.45	-0.77	-2.94	
4722.50	23.280	56.610	4615.92	-108.31	340.32	533.45	1695868.60	14283754.32	39°20'03.872"N	80°48'14.002"W	632.76	57.464	1.46	-1.12	-2.33	
4816.50	23.060	58.930	4702.34	-114.45	360.04	564.73	1695899.87	14283774.03	39°20'04.066"N	80°48'13.603"W	669.74	57.481	1.00	-0.23	2.47	
4911.50	23.520	62.080	4789.60	-118.89	378.52	597.42	1695932.54	14283792.51	39°20'04.248"N	80°48'13.187"W	707.24	57.642	1.40	0.48	3.32	
5005.50	23.410	61.470	4875.82	-122.51	396.22	630.40	1695965.51	14283810.20	39°20'04.423"N	80°48'12.766"W	744.58	57.850	0.28	-0.12	-0.65	
5100.50	22.430	59.700	4963.32	-126.84	414.38	662.63	1695997.72	14283828.35	39°20'04.601"N	80°48'12.356"W	781.53	57.980	1.26	-1.03	-1.86	
5194.50	24.000	59.140	5049.71	-131.94	433.23	694.52	1696029.61	14283847.20	39°20'04.787"N	80°48'11.949"W	818.57	58.045	1.69	1.67	-0.60	
5289.50	24.130	57.400	5136.45	-138.03	453.61	727.47	1696062.54	14283867.56	39°20'04.988"N	80°48'11.529"W	857.30	58.055	0.76	0.14	-1.83	
5383.50	23.540	55.980	5222.44	-145.03	474.46	759.21	1696094.27	14283888.41	39°20'05.193"N	80°48'11.125"W	895.28	57.997	0.88	-0.63	-1.51	



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127  
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REFERENCE WELLPATH IDENTIFICATION		Slot	Slot #03
Operator	ANTERO RESOURCES CORPORATION	Well	Michels Unit 2H
Area	Doddridge Co., WV	Wellbore	Michels Unit 2H AWB
Field	Doddridge		
Facility	Addie Pad		

WELLPATH DATA (230 stations) † = interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
5478.50	24.570	58.040	5309.19	-151.95	495.53	791.70	1696126.74	14283909.47	39°20'05.401"N	80°48'10.711"W	933.99	57.957	1.40	1.08	2.17	
5572.50	25.480	60.600	5394.37	-157.46	515.80	825.89	1696160.93	14283929.73	39°20'05.600"N	80°48'10.275"W	973.73	58.014	1.50	0.97	2.72	
5667.50	25.320	57.720	5480.19	-163.24	536.68	860.87	1696195.89	14283950.61	39°20'05.806"N	80°48'09.829"W	1014.46	58.060	1.31	-0.17	-3.03	
5762.50	24.550	54.280	5566.33	-171.09	559.06	894.07	1696229.08	14283972.97	39°20'06.026"N	80°48'09.406"W	1054.47	57.983	1.73	-0.81	-3.62	
5857.50	23.140	55.710	5653.22	-179.30	581.10	925.52	1696260.51	14283995.00	39°20'06.244"N	80°48'09.005"W	1092.82	57.877	1.60	-1.48	-1.51	
5889.50	23.100	55.420	5682.65	-181.85	588.20	935.88	1696270.87	14284002.10	39°20'06.314"N	80°48'08.873"W	1105.38	57.851	0.38	-0.13	-0.91	
5952.50	22.570	59.520	5740.60	-186.08	601.49	956.72	1696291.69	14284015.38	39°20'06.444"N	80°48'08.608"W	1130.08	57.842	2.55	0.02	6.51	
5983.50	22.110	67.820	5769.18	-186.86	606.82	967.47	1696302.44	14284020.72	39°20'06.497"N	80°48'08.471"W	1142.03	57.903	10.53	-1.74	26.77	
6015.50	23.350	74.700	5798.65	-185.99	610.81	979.28	1696314.25	14284024.71	39°20'06.536"N	80°48'08.320"W	1154.16	58.047	8.73	2.44	21.50	
6047.50	24.330	80.230	5827.92	-183.70	613.61	991.89	1696326.86	14284027.50	39°20'06.577"N	80°48'08.160"W	1166.34	58.258	7.62	3.06	17.28	
6078.50	24.780	87.240	5856.13	-180.06	615.00	1004.68	1696339.64	14284028.89	39°20'06.577"N	80°48'07.997"W	1177.97	58.528	9.50	1.45	22.61	
6110.50	24.980	93.910	5885.16	-174.75	614.86	1018.12	1696353.07	14284028.76	39°20'06.575"N	80°48'07.826"W	1189.38	58.871	8.79	0.63	20.84	
6141.50	25.350	101.140	5913.23	-168.12	613.14	1031.16	1696366.11	14284027.03	39°20'06.558"N	80°48'07.660"W	1199.68	59.264	9.98	1.19	23.32	
6173.50	26.390	106.680	5942.02	-159.80	609.77	1044.70	1696379.64	14284023.66	39°20'06.524"N	80°48'07.488"W	1209.63	59.729	8.22	3.25	17.31	
6204.50	27.320	112.500	5969.68	-150.38	605.07	1057.87	1696392.81	14284018.96	39°20'06.478"N	80°48'07.320"W	1218.69	60.232	8.99	3.00	18.77	
6236.50	28.320	116.720	5997.99	-139.41	598.85	1071.44	1696406.37	14284012.74	39°20'06.416"N	80°48'07.148"W	1227.44	60.798	6.90	3.12	13.19	
6267.50	30.030	120.340	6025.06	-127.63	591.62	1084.70	1696419.63	14284005.52	39°20'06.344"N	80°48'06.979"W	1235.56	61.391	7.92	5.52	11.68	
6299.50	32.410	124.140	6052.42	-114.05	582.76	1098.72	1696433.64	14283996.66	39°20'06.256"N	80°48'06.801"W	1243.70	62.058	9.65	7.44	11.88	
6330.50	35.490	126.770	6078.14	-99.34	572.71	1112.80	1696447.72	14283986.62	39°20'06.157"N	80°48'06.622"W	1251.53	62.767	11.01	9.94	8.48	
6362.50	38.630	129.220	6103.67	-82.53	560.83	1127.99	1696462.90	14283974.74	39°20'06.039"N	80°48'06.429"W	1259.72	63.564	10.84	9.81	7.66	
6393.50	40.420	132.910	6127.59	-64.84	547.86	1142.85	1696477.75	14283961.78	39°20'05.910"N	80°48'06.240"W	1267.38	64.388	9.52	5.77	11.90	
6425.50	40.940	133.850	6151.85	-45.77	533.54	1158.01	1696492.91	14283947.46	39°20'05.768"N	80°48'06.048"W	1275.01	65.263	2.51	1.62	2.94	
6456.50	41.270	134.150	6175.21	-27.06	519.38	1172.67	1696505.56	14283933.31	39°20'05.628"N	80°48'05.862"W	1282.54	66.111	1.24	1.06	0.97	
6488.50	42.650	135.600	6199.01	-7.28	504.28	1187.83	1696522.71	14283918.22	39°20'05.479"N	80°48'05.669"W	1290.44	66.997	5.27	4.31	4.53	
6519.50	42.750	137.440	6221.79	12.37	489.03	1202.29	1696537.17	14283902.97	39°20'05.328"N	80°48'05.485"W	1297.94	67.866	4.04	0.32	5.94	
6551.00†	43.685	138.090	6244.75	32.70	473.06	1216.79	1696551.66	14283887.01	39°20'05.169"N	80°48'05.301"W	1305.51	68.755	3.29	2.97	2.06	Middlesex: 6551' MD
6551.50	43.700	138.100	6245.11	33.02	472.80	1217.02	1696551.89	14283886.75	39°20'05.167"N	80°48'05.298"W	1305.63	68.769	3.29	2.97	2.03	
6582.50	44.070	138.310	6267.45	53.33	456.78	1231.34	1696566.21	14283870.73	39°20'05.008"N	80°48'05.117"W	1313.34	69.647	1.28	1.19	0.68	
6614.50	46.060	140.320	6290.05	74.87	439.60	1246.10	1696580.97	14283853.56	39°20'04.838"N	80°48'04.929"W	1321.37	70.568	7.64	6.22	6.28	
6665.00	48.030	148.180	6324.49	110.83	409.63	1267.63	1696602.48	14283823.60	39°20'04.541"N	80°48'04.656"W	1332.17	72.092	12.03	3.90	15.56	BH/AT Curve <8-1/2"> (6614.50)/(6665-1907.1)



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127'

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REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Doddridge Co., WV
Field	Doddridge
Facility	Addie Pad
Slot #03	Michels Unit 2H
Well	Michels Unit 2H AWB
Wellbore	Michels Unit 2H AWB

WELLPATH DATA (230 stations) † = interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert.Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
6744.00	54.490	154.620	6373.93	172.04	355.53	1296.95	1696631.79	14283769.53	39°20'04.006"N	80°48'04.285"W	1344.79	74.670	10.35	8.18	8.15	
6759.00†	56.097	155.400	6382.47	184.36	344.35	1302.15	1696636.99	14283758.35	39°20'03.895"N	80°48'04.219"W	1346.92	75.187	11.53	10.71	5.20	Burkett: 6759' MD
6791.00	59.540	156.970	6399.52	211.44	319.58	1313.08	1696647.92	14283733.59	39°20'03.650"N	80°48'04.080"W	1351.41	76.321	11.53	10.76	4.91	
6815.00†	61.714	157.548	6411.29	232.35	300.29	1321.16	1696656.00	14283714.31	39°20'03.460"N	80°48'03.978"W	1354.86	77.195	9.30	9.06	2.41	Jully: 6815' MD
6838.00	63.800	158.080	6421.92	252.80	281.36	1328.88	1696663.72	14283695.38	39°20'03.272"N	80°48'03.880"W	1358.34	78.046	9.30	9.07	2.31	
6885.00	66.650	158.310	6441.51	295.46	241.74	1344.73	1696679.56	14283655.78	39°20'02.880"N	80°48'03.580"W	1366.29	79.809	6.08	6.06	0.49	
6893.00†	67.140	158.393	6444.65	302.82	234.90	1347.45	1696682.27	14283648.94	39°20'02.813"N	80°48'03.645"W	1367.77	80.111	6.20	6.13	1.04	Hamilton: 6893' MD
6919.00†	68.733	158.659	6454.41	326.91	212.48	1356.27	1696691.09	14283626.53	39°20'02.591"N	80°48'03.534"W	1372.81	81.096	6.20	6.13	1.02	Marcellus POE: 6919' MD
6932.00	69.530	158.790	6459.05	339.05	201.16	1360.68	1696695.49	14283615.22	39°20'02.479"N	80°48'03.478"W	1375.47	81.590	6.20	6.13	1.01	
6979.00	74.230	159.280	6473.66	383.69	159.46	1376.65	1696711.46	14283573.53	39°20'02.066"N	80°48'03.276"W	1385.86	83.993	10.05	10.00	1.04	
7027.00	79.920	160.610	6484.39	430.40	115.53	1382.68	1696727.49	14283529.62	39°20'01.632"N	80°48'03.073"W	1397.47	85.258	12.16	11.85	2.77	
7074.00	83.960	160.310	6490.98	476.86	71.68	1408.24	1696743.04	14283485.79	39°20'01.198"N	80°48'02.876"W	1410.07	87.086	8.62	8.60	-0.64	
7122.00	88.250	159.690	6494.24	524.68	26.69	1424.62	1696759.41	14283440.82	39°20'00.753"N	80°48'02.669"W	1424.87	88.927	9.03	8.94	-1.29	
7216.00	89.720	156.810	6495.91	618.64	-60.59	1459.44	1696794.22	14283353.57	39°19'59.890"N	80°48'02.228"W	1460.70	92.377	3.44	1.56	-3.06	
7311.00	89.780	158.920	6496.32	713.63	-148.58	1495.24	1696830.00	14283265.61	39°19'59.019"N	80°48'01.775"W	1502.60	95.675	2.22	0.06	2.22	
7406.00	89.910	157.530	6496.58	808.62	-236.80	1530.48	1696865.23	14283177.43	39°19'58.147"N	80°48'01.329"W	1548.69	98.795	1.47	0.14	-1.46	
7501.00	89.820	165.450	6496.80	903.29	-326.82	1560.61	1696895.35	14283087.45	39°19'57.256"N	80°48'00.948"W	1594.46	101.828	8.34	-0.09	8.34	
7596.00	89.690	162.620	6497.21	997.63	-418.14	1586.74	1696921.47	14282996.16	39°19'56.353"N	80°48'00.518"W	1640.91	104.763	2.98	-0.14	-2.98	
7691.00	89.660	156.050	6497.75	1092.52	-506.98	1620.25	1696954.96	14282907.36	39°19'55.474"N	80°48'00.194"W	1697.71	107.375	6.92	-0.03	-6.92	
7786.00	89.630	150.470	6498.34	1187.24	-591.79	1662.97	1696997.67	14282822.59	39°19'54.635"N	80°47'59.653"W	1765.13	109.569	5.87	-0.03	-5.87	
7880.00	89.720	148.680	6498.87	1280.38	-672.84	1710.57	1697045.25	14282741.57	39°19'53.833"N	80°47'59.050"W	1838.14	111.472	1.91	0.10	-1.90	
7976.00	89.020	147.980	6499.92	1375.19	-754.53	1760.97	1697095.63	14282659.90	39°19'53.024"N	80°47'58.410"W	1915.81	113.194	1.03	-0.73	-0.73	
8071.00	89.660	154.450	6501.02	1469.59	-837.75	1806.69	1697141.33	14282576.73	39°19'52.201"N	80°47'57.831"W	1991.47	114.877	6.84	0.67	6.81	
8166.00	89.380	155.060	6501.82	1564.50	-923.67	1847.20	1697181.83	14282490.84	39°19'51.351"N	80°47'57.318"W	2065.27	116.567	0.71	-0.29	0.64	
8260.00	89.140	157.390	6503.03	1658.46	-1009.68	1885.09	1697219.70	14282404.86	39°19'50.500"N	80°47'56.838"W	2138.46	118.174	2.49	-0.26	2.48	
8354.00	90.220	161.230	6503.56	1752.39	-1097.60	1918.30	1697252.89	14282316.98	39°19'49.630"N	80°47'56.418"W	2210.11	119.777	4.24	1.15	4.09	
8450.00	91.050	158.730	6502.49	1848.27	-1187.78	1951.16	1697285.74	14282226.83	39°19'48.738"N	80°47'56.002"W	2284.26	121.331	2.74	0.86	-2.60	
8544.00	89.110	156.920	6502.36	1942.26	-1274.82	1986.63	1697321.20	14282139.82	39°19'47.877"N	80°47'55.553"W	2360.48	122.888	2.82	-2.06	-1.93	
8639.00	89.630	161.040	6503.40	2037.19	-1363.48	2020.70	1697355.25	14282051.22	39°19'47.000"N	80°47'55.122"W	2437.68	124.010	4.37	0.55	4.34	
8735.00	89.750	162.790	6503.92	2132.88	-1454.73	2050.50	1697385.04	14281959.99	39°19'46.098"N	80°47'54.746"W	2514.12	125.354	1.83	0.13	1.82	





# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #03
ANTERO RESOURCES CORPORATION	Well	Michels Unit 2H
Doddridge Co., WV	Wellbore	Michels Unit 2H AWB
Doddridge		
Addie Pad		

## WELLPATH DATA (230 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
8830.00	89.480	161.750	6504.56	2227.52	-1545.21	2079.43	1697413.96	14281869.54	39°19'45.203"N	80°47'54.380"W	2590.69	126.616	1.13	-0.28	-1.09	
8925.00	89.630	157.140	6505.30	2322.43	-1634.14	2112.77	1697447.29	14281780.65	39°19'44.323"N	80°47'53.958"W	2670.99	127.720	4.86	0.16	-4.85	
9019.00	89.540	153.460	6505.98	2416.35	-1719.52	2152.04	1697486.55	14281695.30	39°19'43.478"N	80°47'53.461"W	2754.64	128.625	3.92	-0.10	-3.91	
9115.00	89.540	151.010	6506.75	2511.96	-1804.46	2196.76	1697531.25	14281610.40	39°19'42.638"N	80°47'52.894"W	2842.86	129.400	2.55	0.00	-2.55	
9210.00	89.510	149.270	6507.54	2606.21	-1886.84	2244.06	1697578.52	14281528.05	39°19'41.823"N	80°47'52.295"W	2931.89	130.058	1.83	-0.03	-1.83	
9305.00	89.110	151.960	6508.68	2700.54	-1969.60	2290.66	1697625.11	14281445.32	39°19'41.004"N	80°47'51.704"W	3021.01	130.690	2.86	-0.42	2.83	
9400.00	89.510	157.780	6509.83	2795.41	-2055.57	2330.99	1697665.42	14281359.39	39°19'40.153"N	80°47'51.194"W	3107.87	131.407	6.14	0.42	6.13	
9494.00	89.570	160.220	6510.58	2889.36	-2143.32	2364.67	1697699.09	14281271.68	39°19'39.285"N	80°47'50.767"W	3191.47	132.189	2.60	0.06	2.60	
9589.00	89.540	157.790	6511.32	2984.31	-2232.00	2398.70	1697733.11	14281193.03	39°19'38.408"N	80°47'50.337"W	3276.52	132.938	2.56	-0.03	-2.56	
9684.00	89.540	161.530	6512.09	3079.21	-2321.06	2431.72	1697766.11	14281094.00	39°19'37.527"N	80°47'49.919"W	3361.63	133.666	3.94	0.00	3.94	
9779.00	89.380	165.510	6512.98	3173.63	-2412.13	2458.66	1697793.04	14281002.97	39°19'36.626"N	80°47'49.579"W	3444.33	134.453	4.19	-0.17	4.19	
9874.00	89.720	158.660	6513.73	3268.24	-2502.47	2487.86	1697822.23	14280912.66	39°19'35.733"N	80°47'49.210"W	3528.71	135.168	7.22	0.36	-7.21	
9968.00	89.480	154.930	6514.38	3362.22	-2588.85	2524.89	1697859.25	14280826.32	39°19'34.878"N	80°47'48.741"W	3616.24	135.717	3.98	-0.26	-3.97	
10064.00	89.570	156.510	6515.18	3458.17	-2676.35	2564.37	1697898.70	14280738.85	39°19'34.012"N	80°47'48.241"W	3706.59	136.224	1.65	0.09	1.65	
10159.00	89.600	155.080	6515.87	3553.14	-2762.99	2603.32	1697937.64	14280652.24	39°19'33.155"N	80°47'47.748"W	3796.23	136.704	1.51	0.03	-1.51	
10254.00	89.510	156.030	6516.61	3648.09	-2849.47	2642.63	1697976.93	14280565.80	39°19'32.299"N	80°47'47.251"W	3886.25	137.157	1.00	-0.09	1.00	
10349.00	89.480	155.560	6517.44	3743.05	-2936.12	2681.58	1698015.87	14280479.19	39°19'31.442"N	80°47'46.757"W	3976.38	137.594	0.50	-0.03	-0.49	
10444.00	89.380	156.800	6518.39	3838.02	-3023.02	2719.94	1698054.22	14280392.32	39°19'30.582"N	80°47'46.272"W	4066.54	138.021	1.31	-0.11	1.31	
10539.00	89.320	156.170	6519.47	3933.01	-3110.12	2757.84	1698092.10	14280305.25	39°19'29.721"N	80°47'45.792"W	4156.75	138.436	0.67	-0.06	-0.66	
10634.00	89.380	163.000	6520.55	4027.87	-3199.10	2790.96	1698126.20	14280216.31	39°19'28.841"N	80°47'45.373"W	4245.43	138.898	7.19	0.06	7.19	
10728.00	89.690	164.310	6521.31	4121.29	-3289.30	2817.41	1698151.65	14280126.15	39°19'27.948"N	80°47'45.039"W	4330.96	139.419	1.43	0.33	1.39	
10823.00	89.380	155.030	6522.08	4216.10	-3378.28	2850.38	1698184.60	14280037.21	39°19'27.068"N	80°47'44.622"W	4420.11	139.844	9.77	-0.33	-9.77	
10918.00	88.740	151.650	6523.64	4310.85	-3463.15	2892.99	1698227.20	14279952.36	39°19'26.228"N	80°47'44.082"W	4512.52	140.126	3.62	-0.67	-3.56	
11012.00	88.770	153.600	6525.68	4404.51	-3548.60	2936.20	1698270.39	14279868.95	39°19'25.403"N	80°47'43.535"W	4604.31	140.379	2.07	0.03	2.07	
11106.00	88.860	158.250	6527.63	4498.43	-3632.38	2974.53	1698308.70	14279783.20	39°19'24.554"N	80°47'43.050"W	4694.89	140.686	4.95	0.10	4.95	
11200.00	88.920	157.890	6529.45	4592.41	-3719.57	3009.63	1698343.79	14279696.05	39°19'23.692"N	80°47'42.606"W	4784.67	141.022	0.39	0.06	-0.38	
11294.00	89.020	155.110	6531.14	4686.37	-3805.75	3047.10	1698381.25	14279609.91	39°19'22.839"N	80°47'42.131"W	4875.30	141.317	2.96	0.11	-2.96	
11389.00	89.020	155.130	6532.76	4781.29	-3891.92	3087.06	1698421.19	14279523.77	39°19'21.986"N	80°47'41.625"W	4967.59	141.579	0.02	0.00	0.02	
11483.00	89.050	155.810	6534.35	4875.23	-3977.42	3126.08	1698460.20	14279438.30	39°19'21.140"N	80°47'41.131"W	5058.88	141.834	0.72	0.03	0.72	
11578.00	89.200	156.670	6535.80	4970.20	-4064.36	3164.35	1698498.45	14279351.40	39°19'20.280"N	80°47'40.647"W	5150.94	142.097	0.92	0.16	0.91	



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #03
Area	Doddridge Co., WV	Well	Michels Unit 2H
Field	Doddridge	Wellbore	Michels Unit 2H AWB
Facility	Addie Pad		

## WELLPATH DATA (230 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US, ft)	Grid North (US, ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
11673.00	89.050	159.060	6537.25	5065.17	-4152.34	3200.14	1698534.23	14279263.45	39°19'19.410"N	80°47'40.194"W	5242.41	142.379	2.52	-0.16	2.52	
11767.00	88.620	160.190	6539.16	5159.08	-4240.44	3232.86	1698566.93	14279175.39	39°19'18.538"N	80°47'39.780"W	5332.23	142.679	1.29	-0.46	1.29	
11862.00	88.250	155.550	6541.76	5254.01	-4328.38	3268.63	1698602.68	14279087.48	39°19'17.668"N	80°47'39.328"W	5423.91	142.941	4.90	-0.39	-4.88	
11957.00	88.980	158.200	6544.05	5348.97	-4415.72	3305.92	1698639.96	14279000.18	39°19'16.804"N	80°47'38.855"W	5516.13	143.179	2.89	0.77	2.79	
12052.00	89.780	157.120	6545.08	5443.96	-4503.58	3342.03	1698676.06	14278912.35	39°19'15.935"N	80°47'38.398"W	5608.15	143.422	1.41	0.84	-1.14	
12147.00	88.520	153.520	6546.49	5538.88	-4589.88	3381.68	1698715.70	14278826.09	39°19'15.081"N	80°47'37.897"W	5701.12	143.618	4.01	-1.33	-3.79	
12242.00	89.660	159.910	6548.00	5633.81	-4677.08	3419.21	1698753.21	14278738.92	39°19'14.219"N	80°47'37.422"W	5793.63	143.831	6.83	1.20	6.73	
12337.00	89.110	161.210	6549.02	5728.65	-4766.66	3450.83	1698784.81	14278649.38	39°19'13.333"N	80°47'37.022"W	5884.66	144.097	1.49	-0.58	1.37	
12432.00	89.320	157.020	6550.32	5823.57	-4855.39	3484.68	1698818.65	14278560.68	39°19'12.455"N	80°47'36.594"W	5976.44	144.333	4.42	0.22	-4.41	
12527.00	88.980	158.170	6551.73	5918.56	-4943.20	3520.89	1698854.84	14278472.90	39°19'11.586"N	80°47'36.136"W	6068.93	144.539	1.26	-0.36	1.21	
12622.00	89.320	167.370	6553.14	6013.02	-5033.83	3548.99	1698892.97	14278382.31	39°19'10.690"N	80°47'35.781"W	6159.13	144.815	9.69	0.36	9.68	
12716.00	89.880	172.850	6553.80	6104.65	-5126.40	3565.13	1698929.13	14278289.78	39°19'09.774"N	80°47'35.578"W	6244.21	145.183	5.86	0.60	5.83	
12811.00	89.660	166.080	6554.18	6197.47	-5219.74	3582.49	1698964.41	14278196.47	39°19'08.851"N	80°47'35.360"W	6330.87	145.537	7.13	-0.23	-7.13	
12905.00	89.450	159.750	6554.91	6290.97	-5309.55	3610.09	1698994.01	14278106.71	39°19'07.963"N	80°47'35.011"W	6420.60	145.787	6.74	-0.22	-6.73	
13000.00	89.140	157.080	6556.08	6385.93	-5397.87	3645.04	1699028.42	14278018.42	39°19'07.089"N	80°47'34.569"W	6513.32	145.970	2.83	-0.33	-2.81	
13095.00	89.080	156.350	6557.56	6480.92	-5485.12	3682.59	1699061.48	14277931.20	39°19'06.226"N	80°47'34.094"W	6606.66	146.123	0.77	-0.06	-0.77	
13190.00	89.380	150.280	6558.84	6575.63	-5569.95	3725.22	1699099.10	14277846.40	39°19'05.387"N	80°47'33.554"W	6700.87	146.225	6.40	0.32	-6.39	
13285.00	89.080	149.150	6560.11	6669.79	-5651.98	3773.13	1699106.98	14277764.41	39°19'04.575"N	80°47'32.947"W	6795.69	146.274	1.23	-0.32	-1.19	
13380.00	88.950	148.320	6561.75	6763.71	-5733.17	3822.42	1699156.26	14277683.25	39°19'03.771"N	80°47'32.322"W	6890.59	146.308	0.88	-0.14	-0.87	
13474.00	89.320	149.340	6563.16	6856.66	-5813.59	3871.07	1699204.89	14277602.86	39°19'02.976"N	80°47'31.705"W	6984.49	146.342	1.15	0.39	1.09	
13569.00	88.980	151.270	6564.57	6950.94	-5896.10	3918.13	1699251.92	14277520.38	39°19'02.159"N	80°47'31.109"W	7079.25	146.395	2.06	-0.36	2.03	
13664.00	89.540	155.560	6565.80	7045.69	-5981.03	3960.63	1699294.41	14277435.49	39°19'01.319"N	80°47'30.571"W	7173.51	146.488	4.55	0.59	4.52	
13759.00	88.740	152.650	6567.23	7140.52	-6066.47	4002.11	1699336.87	14277350.08	39°19'00.473"N	80°47'30.046"W	7267.66	146.587	3.18	-0.84	-3.06	
13853.00	89.020	156.710	6569.07	7234.38	-6151.41	4042.29	1699376.04	14277265.18	39°18'59.633"N	80°47'29.537"W	7360.70	146.690	4.33	0.30	4.32	
13948.00	89.350	161.760	6570.42	7329.29	-6240.20	4075.96	1699409.69	14277176.42	39°18'58.754"N	80°47'29.111"W	7453.42	146.848	5.33	0.35	5.32	
14042.00	89.110	157.280	6571.68	7423.18	-6328.23	4108.83	1699442.56	14277088.43	39°18'57.884"N	80°47'28.695"W	7545.13	147.005	4.77	-0.26	-4.77	
14138.00	88.280	156.040	6573.87	7519.15	-6416.35	4146.86	1699480.56	14277000.35	39°18'57.012"N	80°47'28.214"W	7639.76	147.126	1.55	-0.86	-1.29	
14233.00	89.380	164.620	6575.81	7613.91	-6505.70	4178.80	1699512.49	14276911.03	39°18'56.128"N	80°47'27.810"W	7732.17	147.286	9.10	1.16	9.03	
14327.00	89.600	163.380	6576.65	7707.27	-6596.05	4204.70	1699538.39	14276820.71	39°18'55.234"N	80°47'27.483"W	7822.24	147.484	1.34	0.23	-1.32	
14422.00	89.140	156.670	6577.69	7802.10	-6685.28	4237.14	1699570.81	14276731.52	39°18'54.352"N	80°47'27.073"W	7914.94	147.633	7.08	-0.48	-7.06	



# Actual Wellpath Report

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## REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility	Slot	Slot #03
ANTERO RESOURCES CORPORATION	Doddridge Co., WV	Doddridge	Addie Pad	Well	Michels Unit 2H
				Wellbore	Michels Unit 2H AWB

## WELLPATH DATA (230 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
14515.00	89.230	156.130	6579.03	7896.08	-6771.41	4274.76	1699608.42	14276645.42	39°18'53.500"N	80°47'26.597"W	8007.85	147.736	0.58	0.10	-0.57	
14612.00	89.290	157.300	6580.27	7992.06	-6859.58	4312.71	1699646.35	14276557.29	39°18'52.627"N	80°47'26.117"W	8102.68	147.842	1.22	0.06	1.22	
14707.00	89.290	153.330	6581.45	8086.98	-6945.88	4352.37	1699686.00	14276471.03	39°18'51.773"N	80°47'25.615"W	8196.85	147.928	4.18	0.00	-4.18	
14802.00	89.020	152.940	6582.85	8181.71	-7030.62	4395.30	1699728.91	14276386.32	39°18'50.935"N	80°47'25.071"W	8291.45	147.988	0.50	-0.28	-0.41	
14897.00	89.200	154.740	6584.33	8276.52	-7115.87	4437.18	1699770.77	14276301.10	39°18'50.091"N	80°47'24.541"W	8385.95	148.054	1.90	0.19	1.89	
14991.00	89.050	159.790	6585.76	8370.48	-7202.53	4473.49	1699807.06	14276214.48	39°18'49.234"N	80°47'24.081"W	8478.71	148.156	5.37	-0.16	5.37	
15086.00	89.170	161.290	6587.24	8465.32	-7292.09	4505.13	1699838.70	14276124.96	39°18'48.348"N	80°47'23.682"W	8571.51	148.292	1.58	0.13	1.58	
15181.00	89.140	158.320	6588.64	8560.21	-7381.23	4537.92	1699871.47	14276035.85	39°18'47.466"N	80°47'23.267"W	8664.60	148.417	3.13	-0.03	-3.13	
15276.00	89.260	159.040	6589.97	8655.17	-7469.72	4572.46	1699905.99	14275947.40	39°18'46.591"N	80°47'22.830"W	8758.08	148.528	0.77	0.13	0.76	
15370.00	88.890	161.490	6591.48	8749.03	-7558.18	4604.19	1699937.72	14275858.97	39°18'45.716"N	80°47'22.429"W	8850.12	148.652	2.64	-0.39	2.61	
15464.00	89.380	162.510	6592.90	8842.70	-7647.57	4633.23	1699966.75	14275769.62	39°18'44.832"N	80°47'22.062"W	8941.60	148.791	1.20	0.52	1.09	
15559.00	89.320	164.170	6593.98	8937.17	-7738.57	4660.47	1699993.97	14275678.65	39°18'43.932"N	80°47'21.718"W	9033.57	148.942	1.75	-0.06	1.75	
15653.00	89.140	160.400	6595.24	9030.79	-7828.09	4689.06	1700022.55	14275589.17	39°18'43.046"N	80°47'21.357"W	9125.03	149.078	4.01	-0.19	-4.01	
15748.00	89.230	157.610	6596.60	9125.73	-7916.76	4723.09	1700056.57	14275500.53	39°18'42.169"N	80°47'20.927"W	9218.61	149.180	2.94	0.09	-2.94	
15843.00	89.290	157.190	6597.82	9220.72	-8004.46	4759.60	1700093.06	14275412.87	39°18'41.301"N	80°47'20.465"W	9312.63	149.264	0.45	0.06	-0.44	
15938.00	89.140	156.250	6599.12	9315.71	-8091.72	4797.14	1700130.59	14275325.65	39°18'40.438"N	80°47'19.990"W	9406.83	149.339	1.00	-0.16	-0.99	
16033.00	89.200	153.840	6600.50	9410.61	-8177.83	4837.21	1700170.85	14275239.56	39°18'39.586"N	80°47'19.483"W	9501.35	149.396	2.54	0.06	-2.54	
16123.00	89.630	151.280	6601.47	9505.27	-8262.13	4880.99	1700214.40	14275155.30	39°18'38.752"N	80°47'18.928"W	9596.19	149.427	2.73	0.45	-2.69	
16223.00	89.110	151.730	6602.51	9599.78	-8345.62	4926.31	1700259.70	14275071.85	39°18'37.926"N	80°47'18.354"W	9691.12	149.447	0.72	-0.55	0.47	
16318.00	89.230	152.670	6603.89	9694.39	-8429.64	4970.61	1700303.99	14274987.85	39°18'37.094"N	80°47'17.793"W	9786.00	149.474	1.00	0.13	0.99	
16413.00	89.750	157.850	6604.74	9789.29	-8515.89	5010.35	1700343.71	14274901.64	39°18'36.241"N	80°47'17.290"W	9880.49	149.529	5.48	0.55	5.45	
16503.00	89.750	163.900	6605.15	9884.06	-8605.60	5041.46	1700374.81	14274811.96	39°18'35.353"N	80°47'16.897"W	9973.60	149.637	6.37	0.00	6.37	
16603.00	89.940	159.680	6605.41	9978.75	-8695.83	5071.14	1700404.48	14274721.78	39°18'34.461"N	80°47'16.522"W	10066.47	149.751	4.45	0.20	-4.44	
16693.00	89.450	157.850	6605.92	10073.72	-8784.37	5105.55	1700438.87	14274633.27	39°18'33.585"N	80°47'16.087"W	10160.30	149.835	1.99	-0.52	-1.93	
16793.00	90.310	160.920	6606.11	10168.64	-8873.28	5138.99	1700472.30	14274544.40	39°18'32.706"N	80°47'15.664"W	10253.99	149.923	3.36	0.91	3.23	
16883.00	91.050	158.530	6604.99	10263.54	-8962.38	5171.91	1700505.20	14274455.33	39°18'31.824"N	80°47'15.248"W	10347.60	150.012	2.63	0.78	-2.52	
16983.00	90.120	154.140	6604.02	10358.50	-9049.36	5210.03	1700543.31	14274368.38	39°18'30.964"N	80°47'14.766"W	10442.00	150.069	4.72	-0.98	-4.62	
17078.00	90.580	151.790	6603.44	10453.22	-9133.97	5253.20	1700586.47	14274283.80	39°18'30.126"N	80°47'14.219"W	10536.87	150.096	2.52	0.48	-2.47	
17174.00	89.970	152.480	6602.92	10548.82	-9218.84	5298.07	1700631.32	14274198.97	39°18'29.286"N	80°47'13.651"W	10632.81	150.114	0.96	-0.64	0.72	
17268.00	90.580	156.550	6602.52	10642.69	-9303.67	5338.51	1700671.74	14274114.17	39°18'28.447"N	80°47'13.139"W	10726.51	150.153	4.38	0.65	4.33	



# Actual Wellpath Report

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## REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility	Slot	Slot #03
ANTERO RESOURCES CORPORATION	Doddrige Co., WV	Doddrige	Addie Pad	Well	Michels Unit 2H
				Wellbore	Michels Unit 2H AWB

## WELLPATH DATA (230 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (°/100ft)	Comments
17364.00	91.140	158.000	6601.08	10738.68	-9392.21	5375.59	1700708.81	14274025.67	39°18'27.571"N	80°47'12.670"W	10821.76	150.216	1.62	0.58	1.51	
17459.00	90.580	152.170	6599.66	10833.55	-9478.32	5415.39	1700748.79	14273939.59	39°18'26.719"N	80°47'12.164"W	10916.37	150.258	6.16	-0.59	-6.14	
17553.00	90.490	149.120	6598.78	10926.90	-9560.24	5461.66	1700794.84	14273857.71	39°18'25.908"N	80°47'11.580"W	11010.35	150.261	3.25	-0.10	-3.24	
17648.00	90.490	152.820	6597.96	11021.30	-9643.28	5507.75	1700840.92	14273774.70	39°18'25.086"N	80°47'10.996"W	11105.33	150.267	3.89	0.00	3.89	
17743.00	90.280	156.870	6597.33	11116.19	-9729.25	5548.12	1700881.27	14273688.76	39°18'24.236"N	80°47'10.485"W	11200.00	150.306	4.27	-0.22	4.26	
17838.00	90.430	160.070	6596.74	11211.15	-9817.61	5582.98	1700916.12	14273600.44	39°18'23.362"N	80°47'10.044"W	11294.03	150.374	3.37	0.16	3.37	
17933.00	90.890	162.060	6595.64	11305.94	-9907.46	5613.81	1700946.93	14273510.62	39°18'22.473"N	80°47'09.655"W	11387.39	150.463	2.15	0.48	2.09	
18028.00	90.950	160.540	6594.12	11400.69	-9997.43	5644.26	1700977.37	14273420.69	39°18'21.583"N	80°47'09.270"W	11480.69	150.552	1.60	0.06	-1.60	
18123.00	90.980	161.340	6592.52	11495.49	-10087.21	5675.28	1701008.38	14273330.95	39°18'20.695"N	80°47'08.878"W	11574.13	150.637	0.84	0.03	0.84	
18218.00	90.800	160.600	6591.04	11590.29	-10177.01	5706.25	1701039.34	14273241.19	39°18'19.807"N	80°47'08.487"W	11667.59	150.721	0.80	-0.19	-0.78	
18312.00	90.740	158.570	6589.78	11684.20	-10265.09	5739.03	1701072.11	14273153.14	39°18'18.935"N	80°47'08.073"W	11760.47	150.791	2.16	-0.06	-2.16	
18407.00	91.230	160.940	6588.15	11779.09	-10354.20	5771.90	1701104.96	14273064.06	39°18'18.054"N	80°47'07.657"W	11854.30	150.863	2.55	0.52	2.49	
18501.00	90.860	156.480	6586.43	11873.02	-10441.75	5806.02	1701139.06	14272976.55	39°18'17.188"N	80°47'07.226"W	11947.38	150.924	4.76	-0.39	-4.74	
18596.00	91.020	155.690	6584.87	11967.99	-10528.58	5844.52	1701177.55	14272889.75	39°18'16.329"N	80°47'06.739"W	12041.99	150.965	0.85	0.17	-0.83	
18692.00	90.920	160.990	6583.25	12063.93	-10617.76	5879.94	1701212.95	14272800.61	39°18'15.446"N	80°47'06.291"W	12137.15	151.023	5.52	-0.10	5.52	
18787.00	90.950	158.990	6581.69	12158.81	-10707.01	5912.44	1701245.44	14272711.40	39°18'14.564"N	80°47'05.880"W	12230.98	151.092	2.11	0.03	-2.11	
18882.00	91.020	158.450	6580.06	12253.76	-10795.52	5948.91	1701279.90	14272622.92	39°18'13.688"N	80°47'05.444"W	12325.13	151.151	0.57	0.07	-0.57	
18977.00	90.830	156.480	6578.53	12348.75	-10883.25	5983.31	1701316.29	14272535.23	39°18'12.820"N	80°47'04.984"W	12419.55	151.199	2.08	-0.20	-2.07	
19071.00	90.950	153.600	6577.07	12442.65	-10968.45	6022.97	1701355.93	14272450.06	39°18'11.977"N	80°47'04.482"W	12513.31	151.228	3.07	0.13	-3.06	
19127.00	90.950	153.600	6576.14	12498.52	-11018.60	6047.87	1701380.82	14272399.93	39°18'11.481"N	80°47'04.167"W	12569.26	151.239	0.00	0.00	0.00	Projected MD at TD: 19127



# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #03
Area	Doddridge Co., WV	Well	Michels Unit 2H
Field	Doddridge	Wellbore	Michels Unit 2H AWB
Facility	Addie Pad		

String/Diameter	Start MD [ft]				End MD [ft]				Interval [ft]				Start TVD [ft]				End TVD [ft]				Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]	
	24.50	104.50	501.50	80.00	104.50	501.50	397.00	80.00	24.50	104.50	501.50	104.50	501.50	397.00	80.00	24.50	104.50	501.50	104.50	501.50					0.00
20in Conductor																									
17.5in Open Hole																									
13.375in Casing Surface																									
12.25in Open Hole																									
9.625in Casing Intermediate																									
8.75in Open Hole																									
8.5in Open Hole																									
5.5in Casing Production																									

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Michels Unit 2H POE - Rev-2	6457.00	220.08	1368.07	1696702.89	14283634.13	39°20'02.666"N	80°48'03.383"W	point
Michels Unit 2H BHL - Rev-2	6499.00	-11033.83	6054.72	1701387.66	14272384.71	39°18'11.330"N	80°47'04.080"W	point
Michels Unit 2H LP - Rev-1	6499.00	17.50	1441.18	1696775.96	14283431.63	39°20'00.662"N	80°48'02.459"W	point





# Actual Wellpath Report

Michels Unit 2H AWP Proj: 19127  
Page 12 of 12



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #03
Area	Doddridge Co., WV	Well	Michels Unit 2H
Field	Doddridge	Wellbore	Michels Unit 2H AWB
Facility	Addie Pad		

## COMMENTS

Wellpath general comments  
 API: 47-017-06812-0000  
 BHI Job #: 8819608  
 Rig: Frontier 22  
 Duration: 10/24/2017-10/27/2017  
 Gyrodatta MS Gyro <17-1/2"> (100'-477')  
 Gyrodatta MS Gyro <12-1/4"> (477')(531')  
 WFT EM <12-1/4"> (531')(611'-2524')  
 WFT EM <8-3/4"> (2524')(2664'-6605')  
 BHI AT Curve <8-1/2"> (6614.50')(6665'-19071')  
 Middlesex: 6551' MD  
 Burkett: 6759' MD  
 Tully: 6815' MD  
 Hamilton: 6893' MD  
 Marcellus POE: 6919' MD  
 Projected MD at TD: 19127'

9,912' to Bottom Hole

4,209' to Top Hole

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

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

10,841' to Bottom Hole

15,064' to Top Hole

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

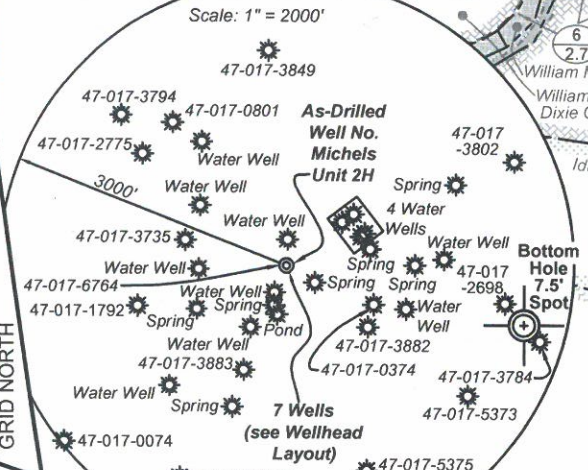
	Bearing	Dist.
L1	S 75°39' E	1060.7'
L2	N 21°13' E	1162.9'
L3	S 67°52' W	525.0'
L4	S 49°57' W	690.9'

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.

**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°47'04.17"  
**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**

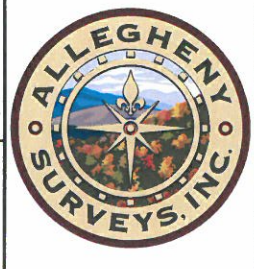
A.	Champion Agate Co., Inc. Lease
B.	Champion Agate Co., Inc. Lease
C.	Andrew Lett, et ux Lease
D.	Champion Agate Co., Inc. Lease
E.	Claude L. Smith, et ux Lease



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. & Marla 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. Hicholson	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

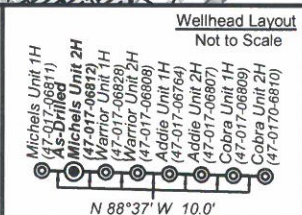


**Legend**

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

**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