

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

API 47-017-06811 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 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4353811m Easting 516750m
Landing Point of Curve Northing 4353288m Easting 517182m
Bottom Hole Northing 4350385m Easting 518391m

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 10/24/2017
Date completion activities began 2/9/2018 Date completion activities ceased 7/7/2018
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 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 - 06811 Farm name Antero Resources Corporation Well number Michels Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	489'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2603'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	19040'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6748'		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	427 sx	15.6	1.19	508	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)	1.53 (Lead), 1.83 (Tail)	4352	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 19040' MD, 6582' TVD (BHL), 6603' (Deepest Point Drilled) Loggers TD (ft) 19040' MD

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

Plug back procedure N/A

Kick off depth (ft) 5825'

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 - 06811 Farm name Antero Resources Corporation Well number Michels Unit 1H

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.

API 47- 017 - 06811 Farm name Antero Resources Corporation Well number Michels Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>			
<u>Marcellus</u>	<u>6449' (TOP)</u>	<u>TVD</u>	<u>6818' (TOP)</u>	<u>MD</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

OPEN FLOW Gas 18448 mcfpd Oil 150 bpd NGL --- bpd Water 39 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	

***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

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

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/9/2018	18754	18839	48	Marcellus
2	3/15/2018	18556	18639	48	Marcellus
3	3/15/2018	18357	18441	48	Marcellus
4	3/16/2018	18158	18242	48	Marcellus
5	3/16/2018	17960	18044	48	Marcellus
6	3/16/2018	17761	17845	48	Marcellus
7	3/17/2018	17563	17646	48	Marcellus
8	3/17/2018	17364	17448	48	Marcellus
9	3/17/2018	17165	17249	48	Marcellus
10	3/18/2018	16967	17051	48	Marcellus
11	3/18/2018	16768	16852	48	Marcellus
12	3/18/2018	16570	16653	48	Marcellus
13	3/19/2018	16371	16455	48	Marcellus
14	3/19/2018	16172	16256	48	Marcellus
15	3/19/2018	15974	16058	48	Marcellus
16	3/19/2018	15775	15859	48	Marcellus
17	3/20/2018	15577	15660	48	Marcellus
18	3/20/2018	15378	15462	48	Marcellus
19	3/21/2018	15179	15263	48	Marcellus
20	3/21/2018	14981	15065	48	Marcellus
21	3/22/2018	14782	14866	48	Marcellus
22	3/22/2018	14584	14667	48	Marcellus
23	3/23/2018	14385	14469	48	Marcellus
24	3/23/2018	14186	14270	48	Marcellus
25	3/23/2018	13988	14072	48	Marcellus
26	3/24/2018	13789	13873	48	Marcellus
27	3/24/2018	13591	13674	48	Marcellus
28	3/25/2018	13392	13476	48	Marcellus
29	3/25/2018	13193	13277	48	Marcellus
30	3/26/2018	12995	13079	48	Marcellus
31	3/26/2018	12796	12880	48	Marcellus
32	3/27/2018	12598	12681	48	Marcellus
33	3/27/2018	12399	12483	48	Marcellus
34	3/28/2018	12200	12284	48	Marcellus
35	3/29/2018	12002	12086	48	Marcellus
36	3/29/2018	11803	11887	48	Marcellus
37	3/30/2018	11605	11688	48	Marcellus
38	3/31/2018	11406	11490	48	Marcellus
39	3/31/2018	11207	11291	48	Marcellus
40	4/1/2018	11009	11093	48	Marcellus
41	4/1/2018	10810	10894	48	Marcellus
42	4/2/2018	10612	10695	48	Marcellus
43	4/2/2018	10413	10497	48	Marcellus
44	4/2/2018	10214	10298	48	Marcellus
45	4/3/2018	10016	10100	48	Marcellus
46	4/5/2018	9817	9901	48	Marcellus
47	4/5/2018	9619	9702	48	Marcellus
48	4/6/2018	9420	9504	48	Marcellus
49	4/7/2018	9221	9305	48	Marcellus
50	4/7/2018	9023	9107	48	Marcellus
51	4/8/2018	8824	8908	48	Marcellus
52	4/8/2018	8626	8709	48	Marcellus
53	4/9/2018	8427	8511	48	Marcellus
54	4/9/2018	8228	8312	48	Marcellus
55	4/10/2018	8030	8114	48	Marcellus
56	4/11/2018	7831	7915	48	Marcellus
57	4/11/2018	7633	7716	48	Marcellus
58	4/12/2018	7434	7518	48	Marcellus
59	4/12/2018	7235	7319	48	Marcellus
60	4/13/2018	7037	7121	48	Marcellus
61	4/14/2018	6838	6922	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 (bbbls)	Amount of Nitrogen/ other (units)
1	2/9/2018	64.1	7660	5230	4581	404900	8528	N/A
2	3/15/2018	68.4	8014	5599	4717	396670	8702	N/A
3	3/15/2018	64.6	7672	6067	4257	405000	8664	N/A
4	3/16/2018	66.6	8054	6195	4916	404000	8764	N/A
5	3/16/2018	67.7	8192	6087	3972	402730	8501	N/A
6	3/16/2018	69.3	8106	6581	5633	409000	8689	N/A
7	3/17/2018	68.6	7705	5199	5509	404370	8591	N/A
8	3/17/2018	69.8	7926	5300	5171	403210	8853	N/A
9	3/17/2018	73.9	7998	6018	4141	406000	8463	N/A
10	3/18/2018	76.1	7973	5430	4385	408000	8753	N/A
11	3/18/2018	69.5	7823	5401	4492	404330	8741	N/A
12	3/18/2018	77.5	7913	5495	5041	402000	9698	N/A
13	3/19/2018	75.3	7714	5236	4265	405000	9090	N/A
14	3/19/2018	74.7	7988	5442	3791	403470	8762	N/A
15	3/19/2018	77.4	8006	5507	4398	404000	8456	N/A
16	3/19/2018	77.8	7894	5521	4287	403000	8581	N/A
17	3/20/2018	73.3	7699	5212	3415	403130	8706	N/A
18	3/20/2018	76.5	7777	5437	4230	403300	8677	N/A
19	3/21/2018	74.8	7586	5434	3835	403080	8670	N/A
20	3/21/2018	80.2	7629	5089	5373	402810	8770	N/A
21	3/22/2018	80.1	7568	5309	3882	404443	8556	N/A
22	3/22/2018	77.6	7380	5339	3949	403270	8565	N/A
23	3/23/2018	77.7	7299	5196	5090	402750	8913	N/A
24	3/23/2018	77.2	7412	5639	4197	402780	8536	N/A
25	3/23/2018	80	7433	5525	4242	411412	8561	N/A
26	3/24/2018	76.7	7212	5165	4285	402700	8527	N/A
27	3/24/2018	79	7402	4994	3959	402818	8520	N/A
28	3/25/2018	76.9	7033	5446	3772	403400	8479	N/A
29	3/25/2018	80	7429	5505	3985	402757	8480	N/A
30	3/26/2018	76.7	7466	5418	5171	403600	8446	N/A
31	3/26/2018	74.3	7171	5234	4113	405708	8938	N/A
32	3/27/2018	77	7489	5373	3704	403100	8704	N/A
33	3/27/2018	76.3	7408	5472	4017	402950	8295	N/A
34	3/28/2018	78.5	7276	5554	5141	407791	10220	N/A
35	3/29/2018	78.1	7374	5464	5044	407000	8477	N/A
36	3/29/2018	78.7	7112	5284	5378	412182	8418	N/A
37	3/30/2018	78.2	6933	5354	5387	405000	8577	N/A
38	3/31/2018	76.3	7018	5443	5467	402700	8441	N/A
39	3/31/2018	75.4	7492	5997	5289	410295	8512	N/A
40	4/1/2018	76.4	7059	5580	4802	407000	8431	N/A
41	4/1/2018	80	7009	5633	4778	405474	8375	N/A
42	4/2/2018	78.5	7018	6136	5022	413418	8460	N/A
43	4/2/2018	77.9	6799	4965	3895	402000	8301	N/A
44	4/2/2018	79.3	6915	5641	4133	412914	8194	N/A
45	4/3/2018	80	7020	5719	4089	408134	8342	N/A
46	4/5/2018	79.6	6989	5267	3800	403550	8121	N/A
47	4/5/2018	79.7	6851	4985	5394	404000	8276	N/A
48	4/6/2018	79.7	6730	5428	3969	406000	8223	N/A
49	4/7/2018	81.5	6717	5175	5500	403250	8206	N/A
50	4/7/2018	80	6872	5738	4731	402950	8209	N/A
51	4/8/2018	79.2	6987	5715	3597	402000	8583	N/A
52	4/8/2018	80.1	7103	5415	4674	403650	8443	N/A
53	4/9/2018	79.3	6805	5673	4512	402000	8728	N/A
54	4/9/2018	80.9	6703	5291	4207	403100	8376	N/A
55	4/10/2018	78.7	6636	5121	4956	406000	8183	N/A
56	4/11/2018	78.8	6716	5332	4836	403440	8181	N/A
57	4/11/2018	79	6488	5683	3804	402700	8414	N/A
58	4/12/2018	79	6768	5242	3988	403296	8202	N/A
59	4/12/2018	77.8	6657	5540	3981	402880	8062	N/A
60	4/13/2018	80	7007	5172	4921	402700	8172	N/A
61	4/14/2018	78.9	6606	5989	3818	403120	8033	N/A
	AVG=	76	7,323	5,486	4,490	24,678,232	521,339	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	1,738	1,677	1,738
Big Lime	1,738	2,300	1,738	2,300
Fifty Foot Sandstone	2,300	2,507	2,300	2,507
Gordon	2,507	2,707	2,507	2,707
Fifth Sandstone	2,707	2,774	2,707	2,774
Bayard	2,774	3,557	2,774	3,564
Speechley	3,557	3,746	3,564	3,759
Balltown	3,746	4,367	3,759	4,401
Bradford	4,367	4,789	4,401	4,839
Benson	4,789	5,085	4,839	5,145
Alexander	5,085	6,040	5,145	6,141
Sycamore	6,040	6,219	6,141	6,357
Middlesex	6,219	6,352	6,357	6,582
Burkett	6,352	6,382	6,582	6,654
Tully	6,382	6,424	6,654	6,793
Marcellus	6,424	NA	6,793	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:	3/14/2018
Job End Date:	4/14/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06811-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Michels 1H
Latitude:	39.33348056
Longitude:	-80.80583333
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,603
Total Base Water Volume (gal):	22,845,354
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Ascent	Carrier/Base Fluid	Water	7732-18-5	100.00000	88.20455	None
Sand (Proppant)	Keane	Proppant	Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	11.41776	None
KFR-16FW	Keane	Friction Reducer	Water	7732-18-5	60.00000	0.03925	None
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01308	None
			ammonium chloride	12125-02-9	1.50000	0.00098	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00098	None
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00065	None
Hydrochloric Acid (15%)	Keane	Acidizing					
KWG-111LS	Keane	Gel	Hydrochloric Acid	7647-01-0	15.00000	0.03872	None
			Guar gum	9000-30-0	55.00000	0.01612	None
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.01612	None
MBC-516W	Keane	Biocide					

			Water	7732-18-5	56.70000	0.00504	None
			Glutaral	111-30-8	26.70000	0.00237	None
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00071	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	0.00394	None
KWBO-2	Keane		Breaker				
			Sodium persulfate	7775-27-1	99.00000	0.00067	None
KAI-12	Keane		Acid Inhibitor				
			Ethylene glycol	107-21-1	40.00000	0.00022	None
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00011	None
			Cinnamaldehyde	104-55-2	10.00000	0.00006	None
			Ethoxylated alcohol	68131-39-5	10.00000	0.00006	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
			isoproyl alcohol	67-63-0	5.00000	0.00003	None
KFEAC-30	Keane		Iron Control				
			Citric acid	77-92-9	30.00000	0.00047	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	0.01612	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01308	
			Glutaral	111-30-8	26.70000	0.00237	
			ammonium chloride	12125-02-9	1.50000	0.00098	
			oleic acid diethanolamide	93-83-4	1.50000	0.00098	
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00071	
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00065	
			Citric acid	77-92-9	30.00000	0.00047	
			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	
			Ethoxylated alcohol	68131-39-5	10.00000	0.00006	
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00006	
			Cinnamaldehyde	104-55-2	10.00000	0.00006	
			formic acid	64-18-6	10.00000	0.00006	

ANTERO RESOURCES CORPORATION

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

Slot: Slot #02
 Well: Michels Unit 1H
 Wellbore: Michels Unit 1H PWB



API: 47-017-06811-0000

BHI Job #: 8819583

Rig: Frontier 22

Duration: 10/17/2017-10/21/2017

Location Information	
Facility Name	Grid East (US ft)
Addie Pad	14283415.126
Slot	Grid East (US ft)
Slot #02	14283415.126
Comment	Michels Unit 1H
Frontier 22 (RKB) to Ground level (At Slot: Slot #02)	24.5R
Mean Sea Level to Ground level (At Slot: Slot #02)	-890R
Frontier 22 (RKB) to Mean Sea Level	914.5R

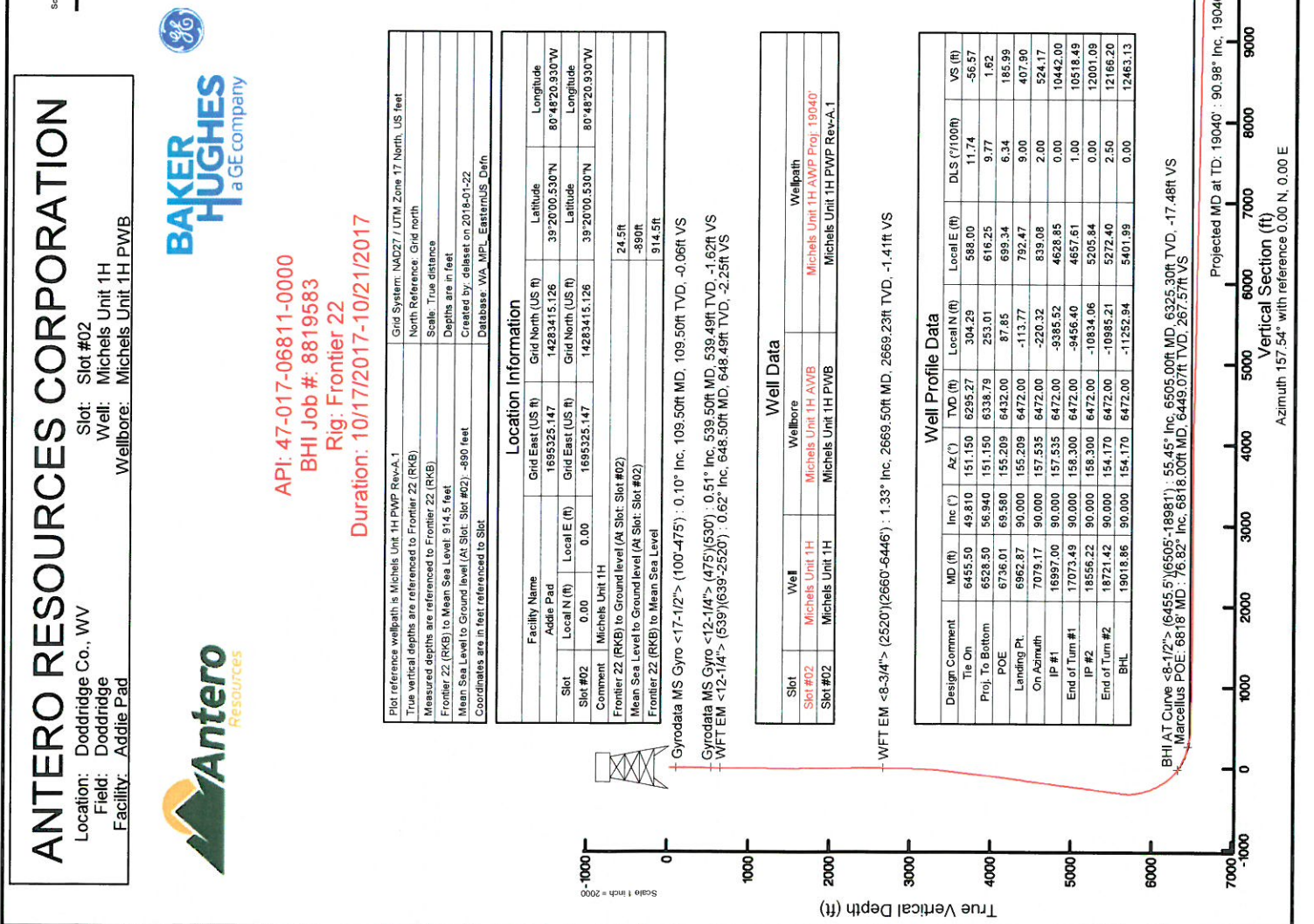
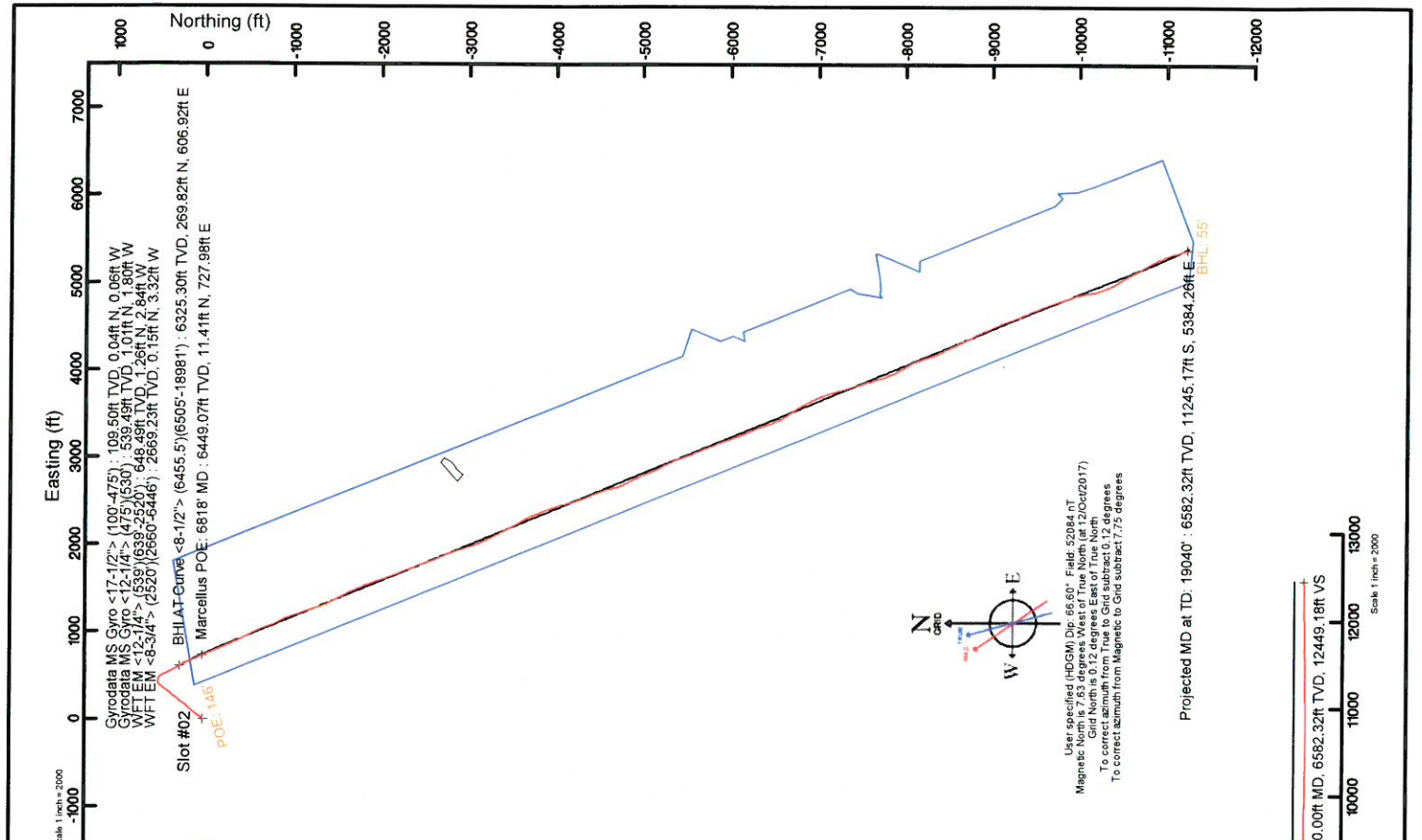
Well Data		
Slot	Wellbore	Wellpath
Slot #02	Michels Unit 1H	Michels Unit 1H AWP Proj: 19040
Slot #02	Michels Unit 1H	Michels Unit 1H PWB Rev-A.1

Well Profile Data								
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
The On	6455.50	49.810	151.150	6295.27	304.29	588.00	11.74	-56.57
Proj. To Bottom	6528.50	56.940	151.150	6338.79	253.01	616.25	9.77	1.62
POE	6736.01	69.580	155.209	6432.00	87.85	699.34	6.34	185.99
Landing Pt.	6962.87	90.000	155.209	6472.00	-113.77	792.47	9.00	407.90
On Azimuth	7079.17	90.000	157.535	6472.00	-220.32	839.08	2.00	524.17
IP #1	16997.00	90.000	157.535	6472.00	-9456.40	4628.85	0.00	10442.00
End of Turn #1	17073.49	90.000	158.300	6472.00	-9456.40	4657.61	1.00	10518.49
IP #2	18556.22	90.000	158.300	6472.00	-10834.06	5205.84	0.00	12001.09
End of Turn #2	18721.42	90.000	154.170	6472.00	-10985.21	5272.40	2.50	12166.20
BHL	19018.86	90.000	154.170	6472.00	-11252.94	5401.99	0.00	12463.13

Location Information	
Grid System	NAD27 / UTM Zone 17 North, US feet
True vertical depths are referenced to	Frontier 22 (RKB)
Measured depths are referenced to	Frontier 22 (RKB)
Frontier 22 (RKB) to Mean Sea Level	914.5 feet
Mean Sea Level to Ground level (At Slot: Slot #02)	-890 feet
Coordinates are in feet referenced to Slot	

Well Data		
Slot	Wellbore	Wellpath
Slot #02	Michels Unit 1H	Michels Unit 1H AWP Proj: 19040
Slot #02	Michels Unit 1H	Michels Unit 1H PWB Rev-A.1

Well Profile Data								
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
The On	6455.50	49.810	151.150	6295.27	304.29	588.00	11.74	-56.57
Proj. To Bottom	6528.50	56.940	151.150	6338.79	253.01	616.25	9.77	1.62
POE	6736.01	69.580	155.209	6432.00	87.85	699.34	6.34	185.99
Landing Pt.	6962.87	90.000	155.209	6472.00	-113.77	792.47	9.00	407.90
On Azimuth	7079.17	90.000	157.535	6472.00	-220.32	839.08	2.00	524.17
IP #1	16997.00	90.000	157.535	6472.00	-9456.40	4628.85	0.00	10442.00
End of Turn #1	17073.49	90.000	158.300	6472.00	-9456.40	4657.61	1.00	10518.49
IP #2	18556.22	90.000	158.300	6472.00	-10834.06	5205.84	0.00	12001.09
End of Turn #2	18721.42	90.000	154.170	6472.00	-10985.21	5272.40	2.50	12166.20
BHL	19018.86	90.000	154.170	6472.00	-11252.94	5401.99	0.00	12463.13



Scale: 1 inch = 2000
 Scale: 1 inch = 2000
 Azimuth 157.54° with reference 0.00 N, 0.00 E
 Projected MD at TD: 19040° : 90.98° Inc, 19040.00ft MD, 6582.32ft TVD, 12449.18ft VS
 BHI AT Curve <8-1/2"> (6455.5)(6505-18981) : 55.45° Inc, 6505.00ft MD, 6325.30ft TVD, -17.48ft VS
 Marcellus POE: 6818° MD : 76.82° Inc, 6818.00ft MD, 6449.07ft TVD, 267.57ft VS

REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Doddridge Co., WV
Field	Doddridge
Facility	Addie Pad
Slot	Slot #02
Well	Michels Unit 1H
Wellbore	Michels Unit 1H AWB

REPORT SETUP INFORMATION	
Projection System	NAD27 / UTM Zone 17 North, US feet
North Reference	Grid
Scale	0.999603
Convergence at slot	0.12° East
Software System	WellArchitect® 5.1
User	Delaset
Report Generated	22/Jan/2018 at 14:04
Database/Source file	WA_MPL_EasternUS_Defn/Michels_Unit_1H_AWP_Proj_19040_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	1695325.15	14283415.13	39°20'00.530"N	80°48'20.930"W
Facility Reference Pt			1695325.15	14283415.13	39°20'00.530"N	80°48'20.930"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.301"W

WELLPATH DATUM	
Calculation method	Minimum curvature
Horizontal Reference Pt	Slot
Vertical Reference Pt	Frontier 22 (RKB)
MD Reference Pt	Frontier 22 (RKB)
Field Vertical Reference	Mean Sea Level
	Frontier 22 (RKB) to Facility Vertical Datum
	Frontier 22 (RKB) to Mean Sea Level
	Frontier 22 (RKB) to Ground Level at Slot (Slot #02)
	Section Origin
	Section Azimuth
	24.50ft
	914.50ft
	24.50ft
	N 0.00, E 0.00 ft
	157.54°



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot #02
ANTERO RESOURCES CORPORATION	Michels Unit 1H
Doddridge Co., WV	Michels Unit 1H AWB
Doddridge	
Addie Pad	

WELLPATH DATA (228 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
0.00†	0.000	305.580	0.00	0.00	0.00	0.00	1695325.15	14283415.13	39°20'00.530"N	80°48'20.930"W	0.00	0.000	0.00	0.00	0.00	
24.50	0.000	305.580	24.50	0.00	0.00	0.00	1695325.15	14283415.13	39°20'00.530"N	80°48'20.930"W	0.00	0.000	0.00	0.00	0.00	
109.50	0.100	305.580	109.50	-0.06	0.04	-0.06	1695325.09	14283415.17	39°20'00.530"N	80°48'20.931"W	0.07	305.580	0.12	0.12	-64.02	Gyrodatta MS Gyro <17-1/2"> (100'-475')
209.50	0.170	295.740	209.50	-0.25	0.16	-0.26	1695324.88	14283415.28	39°20'00.532"N	80°48'20.933"W	0.31	300.868	0.07	0.07	-9.84	
309.50	0.220	320.920	309.50	-0.54	0.37	-0.52	1695324.63	14283415.50	39°20'00.534"N	80°48'20.937"W	0.64	305.587	0.10	0.05	25.18	
409.50	0.280	288.640	409.50	-0.89	0.60	-0.87	1695324.27	14283415.72	39°20'00.536"N	80°48'20.941"W	1.06	304.479	0.15	0.06	-32.28	
484.50	0.520	299.670	484.50	-1.28	0.83	-1.34	1695323.81	14283415.95	39°20'00.538"N	80°48'20.947"W	1.58	301.621	0.33	0.32	14.71	
648.50	0.620	283.160	648.49	-2.25	1.26	-2.84	1695323.35	14283416.13	39°20'00.540"N	80°48'20.953"W	2.06	299.288	0.26	-0.02	-29.05	Gyrodatta MS Gyro <12-1/4"> (475'-530')
738.50	0.700	299.510	738.48	-2.96	1.64	-3.79	1695321.35	14283416.76	39°20'00.542"N	80°48'20.966"W	3.11	293.854	0.10	0.10	-0.49	WFT EM <12-1/4"> (539')(639'-2520')
828.50	0.560	300.960	828.48	-3.75	2.14	-4.65	1695320.50	14283417.26	39°20'00.551"N	80°48'20.978"W	4.13	293.352	0.23	0.09	18.17	
923.50	0.630	296.770	923.47	-4.52	2.61	-5.51	1695319.63	14283417.73	39°20'00.556"N	80°48'21.000"W	5.12	294.665	0.16	-0.16	1.61	
1017.50	0.790	309.690	1017.47	-5.48	3.26	-6.47	1695318.67	14283418.38	39°20'00.562"N	80°48'21.012"W	7.25	296.698	0.24	0.17	13.74	
1112.50	0.830	306.810	1112.46	-6.65	4.09	-7.53	1695317.62	14283419.21	39°20'00.571"N	80°48'21.026"W	8.57	298.491	0.06	0.04	-3.03	
1207.50	0.540	304.160	1207.45	-7.62	4.75	-8.45	1695316.70	14283419.87	39°20'00.577"N	80°48'21.037"W	9.69	299.340	0.31	-0.31	-2.79	
1301.50	0.560	312.530	1301.44	-8.40	5.31	-9.16	1695315.99	14283420.43	39°20'00.583"N	80°48'21.046"W	10.58	300.109	0.09	0.02	8.90	
1396.50	0.250	9.630	1396.44	-9.00	5.83	-9.46	1695315.69	14283420.95	39°20'00.588"N	80°48'21.050"W	11.11	301.625	0.50	-0.33	60.11	
1490.50	0.650	87.370	1490.44	-8.99	6.05	-8.90	1695316.25	14283421.18	39°20'00.590"N	80°48'21.043"W	10.76	304.237	0.69	0.43	82.70	
1585.50	1.080	97.920	1585.43	-8.36	5.96	-7.47	1695317.68	14283421.08	39°20'00.589"N	80°48'21.025"W	9.55	308.560	0.48	0.45	11.11	
1679.50	1.360	99.590	1679.41	-7.32	5.65	-5.49	1695319.66	14283420.77	39°20'00.586"N	80°48'21.000"W	7.88	315.798	0.30	0.30	1.71	
1774.50	1.680	101.660	1774.37	-5.94	5.18	-3.02	1695322.13	14283420.30	39°20'00.581"N	80°48'20.968"W	6.00	329.778	0.34	0.34	2.24	
1869.50	1.890	100.830	1869.33	-4.30	4.60	-0.12	1695325.03	14283419.73	39°20'00.576"N	80°48'20.931"W	4.61	358.565	0.22	0.22	-0.87	
1964.50	1.020	109.480	1964.30	-2.87	4.03	2.22	1695327.37	14283419.15	39°20'00.570"N	80°48'20.902"W	4.60	28.864	0.94	-0.92	9.11	
2059.50	0.280	140.940	2059.29	-2.09	3.57	3.16	1695328.31	14283418.69	39°20'00.565"N	80°48'20.890"W	4.77	41.579	0.84	-0.78	33.12	
2154.50	0.320	213.830	2154.29	-1.72	3.17	3.16	1695328.31	14283418.29	39°20'00.561"N	80°48'20.890"W	4.47	44.972	0.38	0.04	76.73	
2249.50	0.490	218.080	2249.29	-1.37	2.63	2.76	1695327.91	14283417.75	39°20'00.556"N	80°48'20.895"W	3.81	46.475	0.18	0.18	4.47	
2343.50	0.790	226.150	2343.28	-0.94	1.86	2.05	1695327.20	14283416.99	39°20'00.548"N	80°48'20.904"W	2.77	47.766	0.33	0.32	8.59	
2437.50	0.950	233.890	2437.27	-0.52	0.95	0.95	1695326.10	14283416.08	39°20'00.539"N	80°48'20.918"W	1.35	45.005	0.21	0.17	8.23	
2529.50	1.020	259.450	2529.26	-0.51	0.35	-0.47	1695324.68	14283415.48	39°20'00.533"N	80°48'20.936"W	0.59	306.941	0.48	0.08	27.78	
2669.50	1.330	270.930	2669.23	-1.41	0.15	-3.32	1695321.83	14283415.28	39°20'00.532"N	80°48'20.972"W	3.32	272.603	0.28	0.22	8.20	WFT EM <8-3/4"> (2520')(2660'-6446')



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #02
Area	Doddridge Co., WV	Well	Michels Unit 1H
Field	Doddridge	Wellbore	Michels Unit 1H AWB
Facility	Addie Pad		

WELLPATH DATA (228 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 (F/100ft)	Build Rate (F/100ft)	Turn Rate (F/100ft)	Comments
2768.50	1.300	61.470	2768.22	-1.98	0.71	-3.48	1695321.67	14283415.83	39°20'00.537"N	80°48'20.974"W	3.55	281.465	2.57	3.03	152.06	
2862.50	4.200	58.570	2862.10	-2.63	3.01	0.39	1695325.54	14283418.14	39°20'00.560"N	80°48'20.925"W	3.04	7.457	3.09	3.09	3.09	-3.09
2957.50	5.730	45.630	2956.74	-4.94	6.14	6.75	1695331.90	14283423.26	39°20'00.610"N	80°48'20.844"W	10.58	39.674	1.99	1.99	1.61	-13.62
3053.50	5.700	43.670	3052.27	-8.66	14.94	13.47	1695338.61	14283430.06	39°20'00.677"N	80°48'20.758"W	20.12	42.037	0.21	-0.03	-2.04	
3147.50	5.450	45.180	3145.82	-12.25	21.46	19.86	1695345.00	14283436.58	39°20'00.742"N	80°48'20.677"W	29.24	42.777	0.31	-0.27	1.61	
3242.50	6.940	35.600	3240.27	-17.00	29.31	26.40	1695351.54	14283444.43	39°20'00.819"N	80°48'20.593"W	39.45	42.011	1.90	1.57	-10.08	
3337.50	8.370	30.260	3334.42	-24.23	39.95	33.23	1695358.26	14283468.18	39°20'00.924"N	80°48'20.506"W	51.96	39.751	1.68	1.51	-5.62	
3431.50	10.380	31.570	3427.16	-33.35	53.08	41.11	1695366.24	14283484.19	39°20'01.054"N	80°48'20.405"W	67.14	37.759	2.15	2.14	1.39	
3526.50	12.820	34.150	3520.21	-44.17	69.09	51.51	1695376.63	14283484.19	39°20'01.212"N	80°48'20.273"W	86.18	36.704	2.63	2.57	2.72	
3620.50	14.360	39.400	3611.58	-55.41	86.73	64.76	1695389.88	14283501.83	39°20'01.386"N	80°48'20.103"W	108.24	36.748	2.10	1.64	5.59	
3715.50	14.180	39.700	3703.65	-66.40	104.79	79.67	1695404.79	14283519.87	39°20'01.564"N	80°48'19.913"W	131.64	37.246	0.20	-0.19	0.32	
3809.50	13.520	39.360	3794.92	-76.97	122.14	94.00	1695419.11	14283537.22	39°20'01.735"N	80°48'19.730"W	154.12	37.580	0.71	-0.70	-0.36	
3904.50	14.400	40.490	3887.11	-87.58	139.71	108.71	1695433.81	14283554.78	39°20'01.909"N	80°48'19.543"W	177.02	37.886	0.97	0.93	1.19	
3998.50	13.970	40.120	3978.24	-98.13	157.28	123.61	1695448.71	14283572.34	39°20'02.082"N	80°48'19.353"W	200.04	38.165	0.47	-0.46	-0.39	
4093.50	14.800	42.620	4070.26	-108.52	174.98	139.22	1695464.31	14283590.03	39°20'02.256"N	80°48'19.153"W	223.60	38.507	1.09	0.87	2.63	
4188.50	14.470	41.350	4162.18	-118.87	192.82	155.27	1695480.36	14283607.87	39°20'02.432"N	80°48'18.949"W	247.56	38.844	0.48	-0.35	-1.34	
4282.50	15.880	38.350	4252.90	-130.33	211.72	171.01	1695496.09	14283626.76	39°20'02.619"N	80°48'18.748"W	272.16	38.929	1.72	1.50	-3.19	
4377.50	15.840	36.980	4344.29	-143.26	232.27	186.88	1695511.95	14283647.30	39°20'02.822"N	80°48'18.545"W	298.11	38.819	0.40	-0.04	-1.44	
4471.50	15.600	35.140	4434.77	-156.55	252.85	201.87	1695526.93	14283667.88	39°20'03.025"N	80°48'18.354"W	323.55	38.602	0.59	-0.26	-1.96	
4566.50	15.910	40.640	4526.21	-169.29	273.18	217.70	1695542.76	14283688.20	39°20'03.225"N	80°48'18.152"W	349.32	38.552	1.60	0.33	5.79	
4660.50	15.580	39.730	4616.68	-181.01	292.67	234.16	1695559.22	14283707.68	39°20'03.418"N	80°48'17.942"W	374.81	38.663	0.44	-0.35	-0.97	
4755.50	14.800	37.710	4708.36	-193.00	312.08	249.74	1695574.79	14283727.08	39°20'03.609"N	80°48'17.743"W	399.70	38.668	0.99	-0.82	-2.13	
4849.50	14.540	35.720	4799.30	-205.19	331.16	263.97	1695589.01	14283746.15	39°20'03.797"N	80°48'17.561"W	423.49	38.559	0.60	-0.28	-2.12	
4943.50	14.820	41.740	4890.23	-216.64	349.71	278.86	1695603.90	14283764.69	39°20'03.980"N	80°48'17.371"W	447.28	38.570	1.65	0.30	6.40	
5037.50	14.360	40.730	4881.20	-227.13	367.51	294.47	1695619.50	14283782.49	39°20'04.156"N	80°48'17.172"W	470.93	38.704	0.56	-0.49	-1.07	
5132.50	14.560	38.490	5073.19	-238.24	385.78	309.59	1695634.62	14283800.76	39°20'04.336"N	80°48'16.979"W	494.65	38.747	0.63	0.21	-2.36	
5226.50	14.310	36.010	5164.23	-250.06	404.43	323.78	1695648.79	14283819.39	39°20'04.520"N	80°48'16.798"W	518.07	38.680	0.71	-0.27	-2.64	
5321.50	14.350	33.610	5256.27	-262.77	423.73	337.20	1695662.21	14283838.69	39°20'04.711"N	80°48'16.627"W	541.53	38.512	0.63	0.04	-2.53	
5415.50	14.030	39.800	5347.41	-274.57	442.19	350.94	1695675.95	14283857.14	39°20'04.893"N	80°48'16.452"W	564.52	38.437	1.65	-0.34	6.59	
5510.50	14.140	36.950	5439.56	-285.84	460.31	365.29	1695690.29	14283875.25	39°20'05.072"N	80°48'16.269"W	587.64	38.434	0.74	0.12	-3.00	



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #02
Area	Doddridge Co., WV	Well	Michels Unit 1H
Field	Doddridge	Wellbore	Michels Unit 1H AWB
Facility	Addie Pad		

WELLPATH DATA (228 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
5604.50	14.530	37.510	5530.63	-297.58	478.84	379.37	1695704.36	14283893.77	39°20'05.255"N	80°48'16.089"W	610.91	38.389	0.44	0.41	0.60	
5698.50	14.240	40.810	5621.68	-308.69	496.94	394.10	1695719.09	14283911.87	39°20'05.433"N	80°48'15.901"W	634.25	38.416	0.92	-0.31	3.51	
5781.50	12.270	53.600	5683.01	-313.78	506.78	404.56	1695729.54	14283921.71	39°20'05.530"N	80°48'15.767"W	648.46	38.600	5.59	-3.13	20.30	
5793.50	12.510	65.240	5714.27	-314.74	510.25	410.44	1695735.43	14283925.18	39°20'05.564"N	80°48'15.692"W	654.85	38.813	7.83	0.75	36.37	
5825.50	13.850	75.460	5745.43	-314.35	512.67	417.30	1695742.28	14283927.59	39°20'05.588"N	80°48'15.605"W	661.03	39.145	8.38	4.19	31.94	
5856.50	15.260	85.280	5775.44	-312.60	513.93	424.96	1695749.94	14283928.86	39°20'05.600"N	80°48'15.508"W	666.87	39.586	9.15	4.55	31.68	
5888.50	16.740	91.890	5806.21	-309.42	514.13	433.76	1695758.74	14283929.05	39°20'05.602"N	80°48'15.396"W	672.66	40.154	7.33	4.62	20.66	
5919.50	18.270	99.560	5835.71	-305.00	513.17	443.02	1695767.99	14283928.10	39°20'05.593"N	80°48'15.278"W	677.95	40.804	8.92	4.94	24.74	
5981.50	19.650	106.800	5866.04	-298.93	510.79	453.12	1695778.08	14283925.71	39°20'05.569"N	80°48'15.149"W	682.80	41.576	8.51	4.31	22.62	
5992.50	20.290	113.000	5895.18	-291.80	507.18	463.06	1695788.02	14283922.10	39°20'05.533"N	80°48'15.023"W	686.77	42.396	7.13	2.06	20.00	
6014.50	20.740	119.470	5925.15	-283.39	502.22	473.10	1695798.06	14283917.15	39°20'05.484"N	80°48'14.895"W	689.96	43.290	7.22	1.41	20.22	
6046.50	20.620	129.120	5955.10	-273.97	495.88	482.40	1695807.36	14283910.81	39°20'05.421"N	80°48'14.777"W	691.82	44.211	10.65	-0.38	30.16	
6077.50	21.070	139.240	5984.08	-263.87	488.21	490.28	1695815.23	14283903.14	39°20'05.345"N	80°48'14.677"W	691.90	45.121	11.69	1.45	32.65	
6108.50	22.830	147.050	6012.84	-252.66	478.94	497.19	1695822.14	14283893.88	39°20'05.253"N	80°48'14.589"W	690.35	46.071	10.98	5.68	25.19	
6140.50	25.870	150.780	6041.99	-239.62	467.63	503.98	1695828.92	14283882.57	39°20'05.141"N	80°48'14.503"W	687.51	47.142	10.64	9.50	11.66	
6171.50	28.210	152.940	6069.60	-225.60	455.21	510.81	1695835.56	14283870.15	39°20'05.018"N	80°48'14.419"W	684.06	48.283	8.18	7.55	6.97	
6203.50	29.780	154.520	6097.59	-210.13	441.29	517.47	1695842.41	14283856.25	39°20'04.881"N	80°48'14.332"W	680.09	49.543	5.46	4.91	4.94	
6234.50	31.020	154.550	6124.33	-194.46	427.13	524.22	1695849.16	14283842.09	39°20'04.740"N	80°48'14.247"W	676.20	50.827	4.00	4.00	0.10	
6266.50	32.340	153.850	6151.56	-177.68	412.00	531.53	1695856.47	14283826.97	39°20'04.591"N	80°48'14.154"W	672.51	52.220	4.28	4.13	-2.19	
6297.50	34.730	153.260	6177.40	-160.60	396.67	539.16	1695864.09	14283811.64	39°20'04.439"N	80°48'14.057"W	669.36	53.657	7.78	7.71	-1.90	
6329.50	36.900	152.640	6203.34	-141.94	380.00	547.68	1695868.19	14283794.97	39°20'04.274"N	80°48'13.950"W	666.60	55.246	6.88	6.78	-1.94	
6361.50	39.820	152.120	6228.47	-122.21	362.44	556.87	1695881.79	14283777.42	39°20'04.100"N	80°48'13.833"W	664.43	56.942	8.56	8.50	-1.63	
6376.00†	41.196	152.091	6239.51	-112.85	354.14	561.27	1695886.19	14283769.12	39°20'04.018"N	80°48'13.777"W	663.65	57.750	10.87	10.87	-0.20	Middlesex: 6376 MD
6392.50	42.990	152.060	6251.75	-101.84	344.36	566.45	1695891.37	14283759.35	39°20'03.921"N	80°48'13.712"W	662.91	58.703	10.87	10.87	-0.19	
6424.50	46.210	151.870	6274.54	-79.48	324.53	577.01	1695901.92	14283739.53	39°20'03.725"N	80°48'13.578"W	662.01	60.645	10.07	10.06	-0.59	
6455.50	49.810	151.150	6295.27	-56.57	304.29	588.00	1695912.91	14283719.29	39°20'03.525"N	80°48'13.438"W	662.07	62.638	11.74	11.61	-2.32	
6505.00	55.450	151.330	6325.30	-17.48	269.82	606.92	1695931.82	14283684.83	39°20'03.184"N	80°48'13.199"W	664.19	66.032	11.40	11.39	0.36	BHI AT Curve <8-1/2"> (6455.5)(6505-18981)
6585.00	61.940	152.620	6366.85	50.51	209.50	638.99	1695963.88	14283624.54	39°20'02.587"N	80°48'12.792"W	672.46	71.848	8.23	8.11	1.61	
6607.00†	63.098	153.434	6377.00	69.97	192.10	647.84	1695982.73	14283607.15	39°20'02.415"N	80°48'12.680"W	675.72	73.483	6.21	5.26	3.70	Burkett: 6607 MD
6632.00	64.420	154.340	6388.06	92.34	171.97	657.71	1695982.59	14283587.03	39°20'02.216"N	80°48'12.555"W	679.82	75.347	6.21	5.29	3.62	



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #02
ANTERO RESOURCES CORPORATION	Well	Michels Unit 1H
Doddridge Co., WV	Wellbore	Michels Unit 1H AWB
Doddridge		
Addie Pad		

WELLPATH DATA (228 stations) † = interpolated/extrapolated station

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
6679.00	67.380	156.340	6407.25	135.21	132.98	675.60	1696000.48	14283548.06	39°20'01.830"N	80°48'12.328"W	688.56	78.864	7.40	6.30	4.26	Tully: 6679' MD
6726.00	70.750	156.830	6424.04	179.09	92.71	693.04	1696017.91	14283507.80	39°20'01.431"N	80°48'12.108"W	699.21	82.381	7.24	7.17	1.04	
6774.00	74.760	156.720	6438.26	224.92	50.59	711.11	1696035.98	14283465.69	39°20'01.015"N	80°48'11.879"W	712.91	85.931	8.36	8.35	-0.23	
6780.00†	75.041	156.717	6439.83	230.71	45.27	713.40	1696038.27	14283460.37	39°20'00.962"N	80°48'11.850"W	714.84	86.369	4.68	4.68	-0.04	Hamilton: 6780' MD
6818.00†	76.820	156.701	6449.07	267.57	11.41	727.98	1696052.83	14283426.53	39°20'00.627"N	80°48'11.665"W	728.07	89.102	4.68	4.68	-0.04	Marcellus POE: 6818' MD
6821.00	76.960	156.700	6449.75	270.49	8.73	729.13	1696053.99	14283423.85	39°20'00.601"N	80°48'11.651"W	729.18	89.314	4.68	4.68	-0.04	
6869.00	76.960	156.550	6460.62	317.24	-34.19	747.68	1696072.53	14283380.95	39°20'00.176"N	80°48'11.416"W	748.46	92.618	0.37	-0.21	-0.31	
6916.00	77.220	156.500	6471.16	363.03	-76.20	765.93	1696090.77	14283338.96	39°19'59.760"N	80°48'11.195"W	759.71	95.681	0.77	0.77	-0.11	
6964.00	81.160	156.760	6480.16	410.17	-119.47	784.82	1696109.46	14283295.70	39°19'59.332"N	80°48'10.948"W	793.67	98.658	8.23	8.21	0.54	
7011.00	85.190	156.430	6485.74	456.82	-162.29	803.16	1696127.99	14283252.90	39°19'58.908"N	80°48'10.713"W	819.39	101.424	8.60	8.57	-0.70	
7058.00	88.740	157.000	6488.23	503.74	-205.39	821.71	1696146.53	14283209.81	39°19'58.482"N	80°48'10.478"W	846.99	104.034	7.65	7.55	1.21	
7154.00	90.180	156.110	6489.14	599.72	-293.46	859.90	1696184.71	14283121.78	39°19'57.611"N	80°48'09.995"W	908.60	108.843	1.76	1.50	-0.93	
7249.00	89.910	154.620	6489.06	694.65	-379.81	899.50	1696224.29	14283035.47	39°19'56.757"N	80°48'09.493"W	976.40	112.892	1.59	-0.28	-1.57	
7344.00	89.850	153.270	6489.26	789.46	-465.16	941.23	1696266.00	14282950.16	39°19'55.912"N	80°48'08.965"W	1049.89	116.299	1.42	-0.06	-1.42	
7439.00	89.110	152.710	6490.12	884.15	-549.79	984.37	1696309.12	14282865.56	39°19'55.075"N	80°48'08.418"W	1127.50	119.184	0.98	-0.78	-0.59	
7534.00	89.350	158.450	6491.40	979.05	-636.25	1023.62	1696348.36	14282779.13	39°19'54.220"N	80°48'07.921"W	1205.24	121.864	6.05	0.25	6.04	
7630.00	89.200	160.890	6492.61	1074.97	-726.25	1058.97	1696381.70	14282689.16	39°19'53.329"N	80°48'07.499"W	1282.43	124.493	2.55	-0.16	2.54	
7724.00	89.290	153.420	6493.85	1168.89	-812.81	1093.44	1696418.15	14282602.64	39°19'52.473"N	80°48'07.037"W	1362.45	126.625	7.95	0.10	-7.95	
7820.00	89.170	154.130	6495.14	1264.67	-896.92	1135.85	1696460.55	14282516.56	39°19'51.621"N	80°48'06.500"W	1448.52	128.358	0.75	-0.12	0.74	
7915.00	89.260	158.410	6496.45	1359.62	-985.86	1174.07	1696498.75	14282429.66	39°19'50.761"N	80°48'06.016"W	1533.09	130.020	4.51	0.09	4.51	
8010.00	89.690	162.930	6497.32	1454.45	-1075.48	1205.51	1696530.17	14282340.08	39°19'49.875"N	80°48'05.618"W	1615.52	131.737	4.78	0.45	4.76	
8105.00	89.660	161.460	6497.86	1549.13	-1165.92	1234.56	1696559.21	14282249.67	39°19'48.980"N	80°48'05.251"W	1698.09	133.362	1.55	-0.03	-1.55	
8199.00	89.820	160.290	6498.28	1642.97	-1254.73	1265.35	1696589.99	14282160.89	39°19'48.102"N	80°48'04.862"W	1781.98	134.759	1.26	0.17	-1.24	
8293.00	89.660	159.420	6498.71	1736.89	-1342.98	1297.72	1696622.35	14282072.68	39°19'47.229"N	80°48'04.452"W	1867.53	135.982	0.94	-0.17	-0.93	
8388.00	89.880	154.660	6499.09	1831.86	-1430.43	1334.77	1696659.39	14281985.27	39°19'46.364"N	80°48'03.983"W	1956.46	136.981	5.02	0.23	-5.01	
8483.00	89.600	153.360	6499.52	1926.68	-1515.82	1376.40	1696701.00	14281899.91	39°19'45.519"N	80°48'03.456"W	2047.48	137.760	1.40	-0.29	-1.37	
8578.00	89.850	152.190	6499.98	2021.34	-1600.29	1419.86	1696744.44	14281815.47	39°19'44.683"N	80°48'02.905"W	2139.38	138.419	1.26	0.26	-1.23	
8672.00	90.220	153.740	6499.92	2115.04	-1684.02	1462.59	1696787.15	14281731.78	39°19'43.854"N	80°48'02.364"W	2230.49	139.025	1.70	0.39	1.65	
8767.00	89.820	156.750	6499.83	2209.92	-1769.93	1503.12	1696827.66	14281645.90	39°19'43.004"N	80°48'01.850"W	2322.07	139.660	2.16	-0.42	2.12	
8862.00	90.340	159.700	6499.76	2304.90	-1857.82	1539.12	1696863.65	14281558.04	39°19'42.135"N	80°48'01.395"W	2412.55	140.360	4.19	0.55	4.16	



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'

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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #02
ANTERO RESOURCES CORPORATION	Well	Michels Unit 1H
Doddridge Co., WV	Wellbore	Michels Unit 1H AWP
Doddridge		
Addie Pad		

WELLPATH DATA (228 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 (1/100ft)	Build Rate (1/100ft)	Turn Rate (1/100ft)	Comments
8957.00	89.780	160.960	6499.66	2399.79	-1947.28	1571.09	1695895.61	14281468.62	39°19'41.250"N	80°48'00.990"W	2502.05	141.103	1.45	-0.59	1.33	
9052.00	90.060	161.830	6499.79	2494.57	-2037.31	1601.40	1696925.91	14281378.83	39°19'40.359"N	80°48'00.607"W	2591.36	141.831	0.96	0.29	0.92	
9146.00	90.460	157.450	6499.36	2588.49	-2125.42	1634.10	1696958.59	14281290.56	39°19'39.488"N	80°48'00.194"W	2680.98	142.446	4.68	0.43	-4.66	
9241.00	90.400	158.120	6498.65	2683.48	-2213.36	1670.02	1696994.50	14281202.65	39°19'38.618"N	80°47'59.739"W	2772.71	142.965	0.71	-0.06	0.71	
9336.00	90.280	158.240	6498.09	2778.47	-2301.56	1705.33	1697029.79	14281114.49	39°19'37.746"N	80°47'59.292"W	2864.49	143.464	0.18	-0.13	0.13	
9431.00	90.710	158.950	6497.26	2873.45	-2390.00	1739.99	1697064.45	14281026.08	39°19'36.871"N	80°47'58.854"W	2956.29	143.944	0.87	0.45	0.75	
9526.00	89.970	158.230	6496.70	2968.43	-2478.44	1774.67	1697099.11	14280937.67	39°19'35.996"N	80°47'58.415"W	3048.30	144.396	1.09	-0.78	-0.76	
9621.00	89.940	160.770	6496.78	3063.37	-2567.42	1807.94	1697132.37	14280848.73	39°19'35.116"N	80°47'57.994"W	3140.11	144.847	2.67	-0.03	2.67	
9716.00	89.880	157.940	6496.92	3158.31	-2656.31	1841.43	1697165.84	14280759.88	39°19'34.236"N	80°47'57.570"W	3232.16	145.269	2.98	-0.06	-2.98	
9810.00	90.250	154.210	6496.82	3252.27	-2742.21	1879.54	1697203.94	14280674.00	39°19'33.386"N	80°47'57.088"W	3324.52	145.573	3.99	0.39	-3.97	
9905.00	89.940	160.680	6496.66	3347.22	-2829.90	1915.96	1697240.35	14280586.35	39°19'32.519"N	80°47'56.263"W	3417.49	145.900	6.82	-0.33	6.81	
10000.00	89.940	164.010	6496.76	3441.87	-2920.41	1944.77	1697269.14	14280495.88	39°19'31.624"N	80°47'55.922"W	3508.70	146.339	3.51	0.00	3.51	
10094.00	89.910	162.660	6496.88	3535.39	-3010.46	1971.73	1697296.09	14280405.86	39°19'30.733"N	80°47'55.521"W	3598.70	146.777	1.44	-0.03	-1.44	
10190.00	89.880	158.770	6497.06	3631.22	-3101.06	2003.43	1697327.78	14280315.30	39°19'29.837"N	80°47'55.055"W	3691.92	147.136	4.05	-0.03	-4.05	
10284.00	89.940	155.020	6497.21	3725.20	-3187.50	2040.31	1697364.64	14280228.89	39°19'28.982"N	80°47'54.529"W	3784.58	147.377	3.99	0.06	-3.99	
10379.00	89.630	153.140	6497.56	3820.02	-3272.94	2081.83	1697406.15	14280143.49	39°19'28.136"N	80°47'54.000"W	3878.94	147.641	2.01	-0.33	-1.98	
10474.00	89.820	153.630	6498.02	3914.77	-3357.88	2124.39	1697448.69	14280058.59	39°19'27.296"N	80°47'53.589"W	3973.46	147.880	0.55	0.20	0.52	
10569.00	89.910	151.760	6498.24	4009.42	-3442.29	2167.97	1697492.25	14279974.21	39°19'26.461"N	80°47'53.177"W	4068.10	147.797	1.97	0.09	-1.97	
10664.00	89.260	153.490	6498.93	4104.07	-3526.64	2211.65	1697535.91	14279889.89	39°19'25.626"N	80°47'52.884"W	4162.76	147.907	1.95	-0.68	1.82	
10759.00	88.680	150.170	6500.64	4198.57	-3610.36	2256.48	1697580.73	14279806.20	39°19'24.798"N	80°47'52.316"W	4257.52	147.995	3.55	-0.61	-3.49	
10854.00	88.460	151.510	6503.01	4292.89	-3693.30	2302.76	1697626.98	14279723.30	39°19'23.977"N	80°47'51.729"W	4352.37	148.057	1.43	-0.23	1.41	
10949.00	88.520	157.770	6505.57	4387.68	-3779.07	2343.41	1697667.62	14279637.57	39°19'23.128"N	80°47'51.215"W	4446.67	148.197	6.59	0.00	6.59	
11043.00	88.680	159.240	6508.04	4481.64	-3866.50	2377.84	1697702.04	14279550.17	39°19'22.263"N	80°47'50.779"W	4539.15	148.409	1.56	0.06	1.56	
11137.00	88.680	160.370	6510.34	4575.53	-3954.69	2410.28	1697734.47	14279462.01	39°19'21.391"N	80°47'50.369"W	4631.31	148.639	1.21	0.17	1.20	
11232.00	89.110	160.410	6512.17	4670.40	-4044.16	2442.16	1697766.33	14279372.58	39°19'20.506"N	80°47'49.966"W	4724.34	148.873	0.45	0.45	0.04	
11327.00	89.480	165.860	6513.34	4764.90	-4135.04	2469.71	1697793.87	14279281.74	39°19'19.607"N	80°47'49.618"W	4816.43	149.152	5.75	0.39	5.74	
11422.00	88.920	165.320	6514.67	4858.96	-4227.04	2493.35	1697817.50	14279189.77	39°19'18.697"N	80°47'49.319"W	4907.61	149.465	0.82	-0.59	-0.57	
11517.00	89.450	159.750	6516.02	4953.55	-4317.61	2521.84	1697845.98	14279099.23	39°19'17.802"N	80°47'48.959"W	5000.15	149.712	5.89	0.56	-5.86	
11611.00	89.080	155.690	6517.23	5047.52	-4404.57	2557.47	1697881.60	14278925.36	39°19'16.941"N	80°47'48.509"W	5093.22	149.859	4.34	-0.39	-4.32	
11706.00	89.020	156.940	6518.80	5142.48	-4491.55	2595.63	1697919.74	14278825.36	39°19'16.081"N	80°47'48.026"W	5187.61	149.977	1.32	-0.06	1.32	



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #02
Area	Doddridge Co., WV	Well	Michels Unit 1H
Field	Doddridge	Wellbore	Michels Unit 1H AWB
Facility	Addie Pad		

WELLPATH DATA (228 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
11801.00	88.980	164.760	6520.46	5237.24	-4581.21	2626.76	1697950.86	14278835.74	39°19'15.194"N	80°47'47.632"W	5280.85	150.171	8.23	-0.04	8.23	
11896.00	89.080	166.760	6522.07	5331.24	-4673.28	2650.13	1697974.22	14278743.71	39°19'14.283"N	80°47'47.337"W	5372.40	150.443	2.11	0.11	2.11	
11991.00	89.080	159.330	6523.60	5425.73	-4764.07	2677.81	1698001.89	14278652.95	39°19'13.385"N	80°47'46.988"W	5465.07	150.660	7.82	0.00	-7.82	
12085.00	89.050	153.050	6525.13	5519.64	-4850.02	2715.73	1698039.80	14278567.04	39°19'12.535"N	80°47'46.508"W	5558.58	150.754	6.68	-0.03	-6.68	
12180.00	89.140	153.340	6526.63	5614.35	-4934.80	2758.57	1698082.61	14278482.29	39°19'11.696"N	80°47'45.965"W	5653.49	150.795	0.32	0.09	0.31	
12275.00	88.950	157.650	6528.22	5709.26	-5021.21	2797.96	1698121.99	14278395.92	39°19'10.841"N	80°47'45.466"W	5748.14	150.872	4.54	-0.20	4.54	
12370.00	89.050	157.420	6529.88	5804.24	-5108.99	2834.25	1698158.27	14278308.18	39°19'09.973"N	80°47'45.007"W	5842.49	150.980	0.26	0.11	-0.24	
12466.00	89.080	153.510	6531.44	5900.15	-5196.29	2874.10	1698198.10	14278220.91	39°19'09.109"N	80°47'44.502"W	5938.17	151.053	4.07	0.03	-4.07	
12561.00	89.170	151.140	6532.89	5994.74	-5280.40	2918.22	1698242.20	14278136.83	39°19'08.277"N	80°47'43.944"W	6033.13	151.073	2.50	0.09	-2.49	
12655.00	88.980	155.620	6534.41	6088.45	-5364.41	2960.32	1698284.29	14278052.86	39°19'07.446"N	80°47'43.410"W	6127.02	151.108	4.77	-0.20	4.77	
12749.00	89.050	160.850	6536.03	6182.40	-5451.66	2995.16	1698319.11	14277965.63	39°19'06.582"N	80°47'42.970"W	6220.26	151.215	5.56	0.07	5.56	
12844.00	89.140	158.860	6537.53	6277.31	-5540.84	3027.87	1698351.81	14277876.50	39°19'05.700"N	80°47'42.556"W	6314.18	151.345	2.10	0.09	-2.09	
12939.00	89.080	156.600	6539.01	6372.29	-5628.73	3063.87	1698387.79	14277788.64	39°19'04.831"N	80°47'42.100"W	6408.58	151.439	2.38	-0.06	-2.38	
13034.00	89.020	158.130	6540.58	6467.27	-5716.40	3100.42	1698424.33	14277701.00	39°19'03.963"N	80°47'41.638"W	6503.07	151.526	1.61	-0.06	1.61	
13129.00	89.110	158.680	6542.13	6562.25	-5804.72	3135.38	1698459.28	14277612.72	39°19'03.090"N	80°47'41.196"W	6597.38	151.625	0.59	0.09	0.58	
13223.00	89.170	157.090	6543.54	6656.23	-5891.79	3170.76	1698494.65	14277525.68	39°19'02.228"N	80°47'40.748"W	6690.81	151.712	1.69	0.06	-1.69	
13318.00	89.050	159.330	6545.02	6751.21	-5979.99	3206.02	1698529.89	14277437.52	39°19'01.356"N	80°47'40.302"W	6785.19	151.803	2.36	-0.13	2.36	
13413.00	89.050	161.050	6546.59	6846.09	-6069.35	3238.21	1698562.07	14277348.19	39°19'00.472"N	80°47'39.895"W	6879.17	151.919	1.81	0.00	1.81	
13508.00	89.170	159.780	6548.07	6940.96	-6158.84	3270.05	1698593.89	14277258.74	39°18'59.587"N	80°47'39.492"W	6973.13	152.034	1.34	0.13	-1.34	
13602.00	89.170	155.600	6549.43	7034.93	-6245.78	3305.72	1698629.55	14277171.84	39°18'58.727"N	80°47'39.041"W	7066.65	152.109	4.45	0.00	-4.45	
13696.00	89.080	157.120	6550.87	7128.89	-6331.88	3343.41	1698667.23	14277085.77	39°18'57.875"N	80°47'38.564"W	7160.38	152.165	1.62	-0.10	1.62	
13792.00	89.110	161.080	6552.38	7224.83	-6421.53	3377.65	1698701.45	14276996.15	39°18'56.988"N	80°47'38.131"W	7255.66	152.256	4.12	0.03	4.13	
13886.00	89.170	159.020	6553.79	7318.72	-6509.88	3409.71	1698733.50	14276907.84	39°18'56.114"N	80°47'37.726"W	7348.79	152.356	2.19	0.06	-2.19	
13981.00	88.920	152.600	6555.38	7413.61	-6596.48	3448.62	1698772.39	14276821.28	39°18'55.257"N	80°47'37.233"W	7443.55	152.400	6.76	-0.26	-6.76	
14076.00	88.980	145.070	6557.12	7507.44	-6677.69	3497.73	1698821.49	14276740.09	39°18'54.453"N	80°47'36.611"W	7538.29	152.355	7.93	0.06	-7.93	
14171.00	88.980	146.480	6558.81	7600.42	-6756.23	3551.16	1698874.89	14276661.59	39°18'53.676"N	80°47'35.933"W	7632.65	152.273	1.48	0.00	1.48	
14265.00	89.020	149.660	6560.46	7693.12	-6835.98	3600.86	1698924.57	14276581.87	39°18'52.867"N	80°47'35.303"W	7726.37	152.222	3.38	0.04	3.38	
14360.00	88.860	152.940	6562.21	7787.53	-6919.29	3646.47	1698970.16	14276498.60	39°18'52.062"N	80°47'34.725"W	7821.33	152.211	3.46	-0.17	3.45	
14455.00	88.950	156.390	6564.03	7882.37	-7005.12	3687.10	1699010.78	14276412.80	39°18'51.213"N	80°47'34.211"W	7916.22	152.240	3.63	0.09	3.63	
14550.00	88.980	161.340	6565.75	7977.30	-7093.69	3721.34	1699045.10	14276324.26	39°18'50.337"N	80°47'33.776"W	8010.54	152.319	5.21	0.03	5.21	



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #02
Area	Doddridge Co., WV	Well	Michels Unit 1H
Field	Doddridge	Wellbore	Michels Unit 1H AWB
Facility	Addie Pad		

WELLPATH DATA (228 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 (F/100ft)	Build Rate (F/100ft)	Turn Rate (F/100ft)	Comments
14645.00	89.170	165.100	6567.28	8071.81	-7184.62	3748.76	1699072.41	14276233.37	39°18'49.438"N	80°47'33.432"W	8103.82	152.446	3.96		0.20	3.96
14739.00	89.020	163.740	6568.77	8165.12	-7275.15	3774.00	1699097.64	14276142.88	39°18'48.542"N	80°47'33.113"W	8195.78	152.582	1.46		-0.16	-1.45
14834.00	89.110	162.310	6570.32	8259.67	-7366.00	3801.73	1699125.36	14276052.07	39°18'47.644"N	80°47'32.763"W	8289.21	152.701	1.51		0.09	-1.51
14928.00	89.020	163.170	6571.85	8353.27	-7455.75	3829.62	1699153.24	14275962.35	39°18'46.756"N	80°47'32.411"W	8381.78	152.813	0.92		-0.10	0.91
15023.00	89.080	163.110	6573.42	8447.80	-7546.65	3857.17	1699180.78	14275871.48	39°18'45.857"N	80°47'32.063"W	8475.24	152.928	0.09		0.06	-0.06
15117.00	89.140	164.260	6574.88	8541.25	-7636.86	3883.57	1699207.17	14275781.31	39°18'44.965"N	80°47'31.730"W	8567.60	153.045	1.22		0.06	1.22
15211.00	89.260	162.470	6576.20	8634.75	-7726.91	3910.48	1699234.07	14275691.30	39°18'44.074"N	80°47'31.390"W	8660.08	153.157	1.91		0.13	-1.90
15306.00	89.140	158.200	6577.52	8729.60	-7816.34	3942.44	1699266.01	14275601.90	39°18'43.189"N	80°47'30.986"W	8754.31	153.234	4.50		-0.13	-4.49
15399.00	89.110	153.170	6578.95	8822.52	-7901.05	3980.71	1699304.27	14275517.22	39°18'42.351"N	80°47'30.501"W	8847.19	153.260	5.41		-0.03	-5.41
15494.00	89.080	149.350	6580.45	8916.92	-7984.32	4026.38	1699349.92	14275433.98	39°18'41.527"N	80°47'29.923"W	8942.10	153.239	4.02		-0.03	-4.02
15589.00	89.110	150.200	6581.95	9011.03	-8066.40	4074.19	1699397.72	14275351.94	39°18'40.715"N	80°47'29.317"W	9036.92	153.202	0.90		0.03	0.89
15684.00	89.230	161.470	6583.33	9105.83	-8152.93	4113.02	1699436.52	14275265.45	39°18'39.859"N	80°47'28.826"W	9131.65	153.230	11.86		0.13	11.86
15779.00	89.110	163.040	6584.70	9200.49	-8243.39	4141.97	1699465.46	14275175.02	39°18'38.964"N	80°47'28.460"W	9225.48	153.322	1.66		-0.13	1.65
15873.00	89.980	157.400	6586.27	9294.34	-8331.80	4173.76	1699497.24	14275086.65	39°18'38.090"N	80°47'28.058"W	9318.75	153.332	6.00		-0.14	-6.00
15968.00	89.080	154.020	6587.88	9389.26	-8418.36	4212.83	1699536.30	14275000.12	39°18'37.233"N	80°47'27.564"W	9413.65	153.415	3.56		0.11	-3.56
16062.00	89.080	155.480	6589.39	9483.14	-8503.37	4252.92	1699576.37	14274915.15	39°18'36.392"N	80°47'27.056"W	9507.61	153.428	1.55		0.00	1.55
16157.00	89.050	156.910	6590.94	9578.10	-8590.27	4291.26	1699614.69	14274828.28	39°18'35.532"N	80°47'26.571"W	9602.48	153.456	1.51		-0.03	1.51
16252.00	89.950	154.990	6592.60	9673.04	-8677.01	4329.97	1699653.39	14274741.58	39°18'34.674"N	80°47'26.081"W	9697.38	153.480	2.02		-0.11	-2.02
16348.00	89.980	152.030	6594.33	9768.78	-8762.91	4372.77	1699696.18	14274655.71	39°18'33.824"N	80°47'25.539"W	9793.35	153.480	3.08		0.03	-3.08
16442.00	89.950	153.450	6596.03	9862.43	-8846.45	4415.82	1699739.21	14274572.20	39°18'32.997"N	80°47'24.994"W	9887.32	153.473	1.51		-0.03	1.51
16536.00	89.920	158.450	6597.78	9956.35	-8932.25	4454.11	1699777.48	14274486.44	39°18'32.148"N	80°47'24.509"W	9981.19	153.487	5.32		-0.03	5.32
16630.00	89.080	155.830	6599.42	10050.32	-9018.85	4490.62	1699813.98	14274399.88	39°18'31.292"N	80°47'24.047"W	10074.98	153.531	2.79		0.17	-2.79
16724.00	89.110	157.300	6600.90	10144.29	-9105.08	4528.00	1699851.34	14274313.68	39°18'30.439"N	80°47'23.574"W	10168.84	153.559	1.56		0.03	1.56
16818.00	89.320	159.230	6602.19	10238.27	-9192.38	4562.80	1699886.13	14274226.41	39°18'29.575"N	80°47'23.134"W	10262.51	153.602	2.07		0.22	2.05
16912.00	89.630	160.400	6603.05	10332.19	-9280.60	4595.23	1699918.55	14274138.22	39°18'28.702"N	80°47'22.724"W	10355.95	153.658	1.29		0.33	1.24
17006.00	90.030	156.210	6603.33	10426.16	-9367.93	4629.98	1699953.28	14274050.93	39°18'27.838"N	80°47'22.285"W	10449.63	153.700	4.48		0.43	-4.46
17100.00	90.030	156.780	6603.28	10520.15	-9454.13	4667.47	1699990.75	14273964.77	39°18'26.986"N	80°47'21.810"W	10543.52	153.725	0.61		0.00	0.61
17194.00	89.880	158.950	6603.36	10614.14	-9541.19	4702.88	1700026.15	14273877.74	39°18'26.124"N	80°47'21.362"W	10637.27	153.761	2.31		-0.16	2.31
17288.00	90.030	158.590	6603.43	10708.12	-9628.84	4736.84	1700060.10	14273790.12	39°18'25.257"N	80°47'20.933"W	10730.90	153.805	0.32		0.16	-0.28
17382.00	90.150	160.240	6603.28	10802.06	-9716.87	4769.82	1700093.06	14273702.13	39°18'24.386"N	80°47'20.516"W	10824.45	153.855	1.65		0.13	1.65



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'

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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #02
ANTERO RESOURCES CORPORATION	Well	Michels Unit 1H
Doddridge Co., WV	Wellbore	Michels Unit 1H AWP
Doddridge		
Addie Pad		

WELLPATH DATA (228 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 F/100ft	Build Rate F/100ft	Turn Rate F/100ft	Comments
17476.00	89.970	161.940	6603.19	10895.88	-9805.79	4800.28	1700123.51	14273613.24	39°18'23.507"N	80°47'20.131"W	10917.70	153.917	1.82	-0.19	1.81	
17570.00	90.090	159.630	6603.14	10989.72	-9894.55	4831.21	1700154.43	14273524.52	39°18'22.629"N	80°47'19.740"W	11011.03	153.975	2.46	0.13	-2.46	
17664.00	90.400	163.680	6602.73	11083.46	-9983.75	4860.79	1700184.00	14273435.35	39°18'21.746"N	80°47'19.367"W	11104.17	154.040	4.32	0.33	4.31	
17758.00	90.520	169.720	6601.98	11176.21	-10075.18	4882.41	1700205.61	14273343.96	39°18'20.842"N	80°47'19.094"W	11195.86	154.145	6.43	0.13	6.43	
17852.00	90.860	171.210	6600.85	11267.82	-10167.88	4897.98	1700221.17	14273251.30	39°18'19.926"N	80°47'18.899"W	11286.09	154.279	1.63	0.36	1.59	
17946.00	90.920	160.280	6599.38	11360.71	-10258.83	4921.08	1700244.27	14273160.38	39°18'19.026"N	80°47'18.608"W	11378.08	154.373	11.63	0.06	-11.63	
18040.00	90.800	154.640	6597.97	11454.66	-10345.61	4957.10	1700280.27	14273073.64	39°18'18.168"N	80°47'18.152"W	11471.90	154.399	6.00	-0.13	-6.00	
18134.00	90.830	149.280	6596.63	11548.17	-10428.54	5001.27	1700324.42	14272990.75	39°18'17.347"N	80°47'17.593"W	11565.77	154.379	5.70	0.03	-5.70	
18229.00	90.980	148.800	6595.13	11642.11	-10509.99	5050.13	1700373.27	14272909.33	39°18'16.541"N	80°47'16.974"W	11660.35	154.335	0.53	0.16	-0.51	
18323.00	90.860	153.200	6593.62	11735.47	-10592.17	5095.69	1700418.80	14272827.17	39°18'15.728"N	80°47'16.396"W	11754.15	154.309	4.68	-0.13	4.68	
18417.00	90.890	151.550	6592.19	11829.07	-10675.44	5139.27	1700462.36	14272743.94	39°18'14.904"N	80°47'15.845"W	11848.09	154.293	1.76	0.03	-1.76	
18511.00	90.890	149.190	6590.73	11922.32	-10757.14	5185.73	1700508.81	14272662.28	39°18'14.095"N	80°47'15.256"W	11941.85	154.263	2.51	0.00	-2.51	
18605.00	90.830	151.490	6589.31	12015.56	-10838.81	5232.24	1700555.50	14272580.64	39°18'13.287"N	80°47'14.667"W	12035.62	154.232	2.45	-0.06	2.45	
18699.00	90.770	155.120	6588.00	12109.28	-10922.76	5274.46	1700597.50	14272496.71	39°18'12.456"N	80°47'14.132"W	12129.58	154.225	3.86	-0.06	3.86	
18793.00	90.800	159.620	6586.71	12203.25	-11009.50	5310.61	1700633.64	14272410.02	39°18'11.598"N	80°47'13.675"W	12223.40	154.249	4.79	0.03	4.79	
18887.00	91.170	164.210	6585.10	12296.93	-11098.82	5339.78	1700662.80	14272320.73	39°18'10.714"N	80°47'13.307"W	12316.53	154.307	4.90	0.39	4.88	
18981.00	90.980	162.600	6583.33	12390.42	-11188.88	5366.62	1700689.63	14272230.70	39°18'09.824"N	80°47'12.968"W	12409.34	154.376	1.72	-0.20	-1.71	
19040.00	90.980	162.600	6582.32	12449.18	-11245.17	5394.26	1700707.26	14272174.43	39°18'09.267"N	80°47'12.745"W	12467.73	154.415	0.00	0.00	0.00	Projected MD at TD: 19040'



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Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #02
Area	Doddridge Co., WV	Well	Michels Unit 1H
Field	Doddridge	Wellbore	Michels Unit 1H AWB
Facility	Addie Pad		

HOLE & CASING SECTIONS - Ref Wellbore: Michels Unit 1H AWB Ref Wellpath: Michels Unit 1H AWP Proj: 19040'											
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]	End E/W [ft]	End E/W [ft]
20in Conductor	24.50	104.50	80.00	24.50	104.50	0.00	0.00	0.00	0.00	0.04	-0.05
17.5in Open Hole	104.50	498.50	394.00	104.50	498.50	0.04	-0.05	0.04	-0.05	0.88	-1.45
13.375in Casing Surface	24.50	498.50	474.00	24.50	498.50	0.00	0.00	0.00	0.00	0.88	-1.45
12.25in Open Hole	498.50	2612.60	2114.10	498.50	2612.34	0.88	-1.45	0.88	-1.45	0.17	-2.06
9.625in Casing Intermediate	24.50	2612.60	2588.10	24.50	2612.34	0.00	0.00	0.00	0.00	0.17	-2.06
8.75in Open Hole	2612.60	6528.50	3915.90	2612.34	6338.31	0.17	-2.06	0.17	-2.06	252.61	616.25
8.5in Open Hole	6528.50	19040.00	12511.50	6338.31	6582.32	252.61	616.25	-11245.17	616.25	-11245.17	5384.26
5.5in Casing Production	24.50	19040.00	19015.50	24.50	6582.32	0.00	0.00	0.00	0.00	-11245.17	5384.26

TARGETS						
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude Longitude Shape
Michels Unit 1H POE - Rev-2	6432.00	87.85	689.34	1696024.21	14283602.94	39°20'01.383"N 80°48'12.027"W point
Michels Unit 1H BHL - Rev-2	6472.00	-11252.94	5401.99	1700724.98	14272166.67	39°18'09.190"N 80°47'12.520"W point
Michels Unit 1H LP Rev-2	6472.00	-113.77	792.47	1696117.30	14283301.40	39°19'59.389"N 80°48'10.848"W point



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #02
Area	Doddridge Co., WV	Well	Michels Unit 1H
Field	Doddridge	Wellbore	Michels Unit 1H AWB
Facility	Addie Pad		

WELLPATH COMPOSITION - Ref Wellbore: Michels Unit 1H AWB				Ref Wellpath: Michels Unit 1H AWP Proj: 19040'	
Start MD (ft)	End MD (ft)	Positional Uncertainty Model	Log Name/Comment	Wellbore	
24.50	484.50	Gyrodata standard - Drop gyro or Multi-shot	01_Gyrodata MS Gyro <17-1/2'> (100'-475')	Michels Unit 1H AWB	
484.50	539.50	Gyrodata standard - Drop gyro or Multi-shot	02_Gyrodata MS Gyro <12-1/4'> (475') (530')	Michels Unit 1H AWB	
539.50	2529.50	ISCWSA MWD, Rev. 4 (Standard)	03_WFT EM <12-1/4'> (530') (639'-2520')	Michels Unit 1H AWB	
2529.50	6455.50	ISCWSA MWD, Rev. 4 (Standard)	04_WFT EM <8-3/4'> (2520') (2660'-6446')	Michels Unit 1H AWB	
6455.50	18981.00	BHI AutoTrak Curve (Short)	05_BHI AT Curve <8-1/2'> (6455.5') (6505'-18981')	Michels Unit 1H AWB	
18981.00	19040.00	Blind Drilling (std)	Projection to bit	Michels Unit 1H AWB	



Actual Wellpath Report

Michels Unit 1H AWP Proj: 19040'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	Slot	Slot #02	
ANTERO RESOURCES CORPORATION	Well	Michels Unit 1H	
Doddridge Co., WV	Wellbore	Michels Unit 1H AWB	
Doddridge			
Addie Pad			

COMMENTS
<p>Wellpath general comments</p> <p>API: 47-017-06811-0000 BHI Job #: 8819583 Rig: Frontier 22 Duration: 10/17/2017-10/21/2017 Gyrodatta MS Gyro <17-1/2"> (100'-475') Gyrodatta MS Gyro <12-1/4"> (475') (530') WFT EM <12-1/4"> (539') (639'-2520') WFT EM <8-3/4"> (2520') (2660'-6446') BHI AT Curve <8-1/2"> (6455.5') (6505'-18981') Middlesex: 6376' MD Burkett: 6607' MD Tully: 6679' MD Hamilton: 6780' MD Marcellus POE: 6818' MD Projected MD at TD: 19040'</p>

10,589' to Bottom Hole

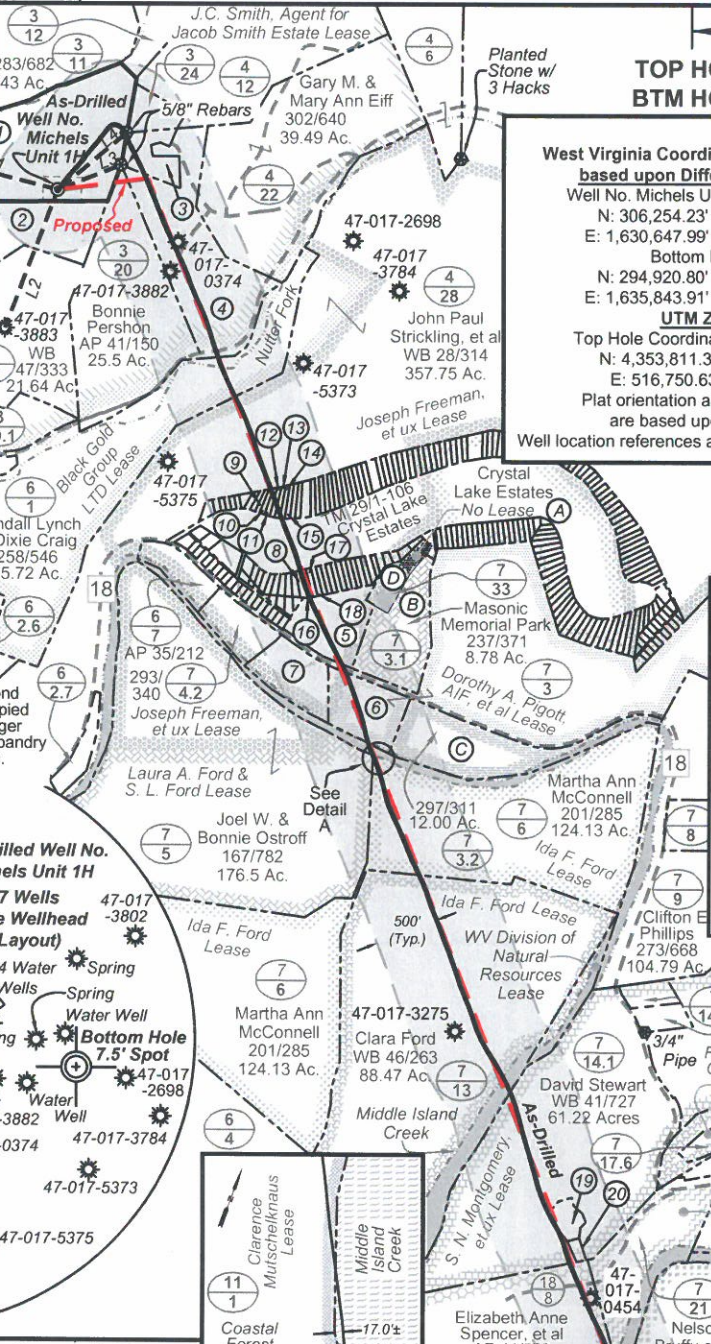
4,218' to Top Hole

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

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

GRID NORTH 11,056' to Bottom Hole

Antero Resources
Well No. Michels Unit 1H
As-Drilled Plat
Antero Resources Corporation

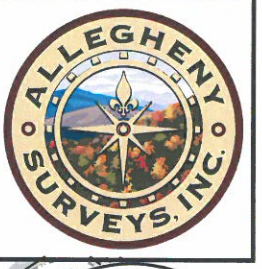


Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Michels Unit 1H Top Hole coordinates are
N: 306,254.23' Latitude: 39°20'00.52"
E: 1,630,647.99' Longitude: 80°48'20.93"
Bottom Hole coordinates are
N: 294,920.80' Latitude: 39°18'09.26"
E: 1,635,843.91' Longitude: 80°47'12.74"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N: 4,353,811.301m N: 4,350,385.003m
E: 516,750.637m E: 518,391.361m
Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

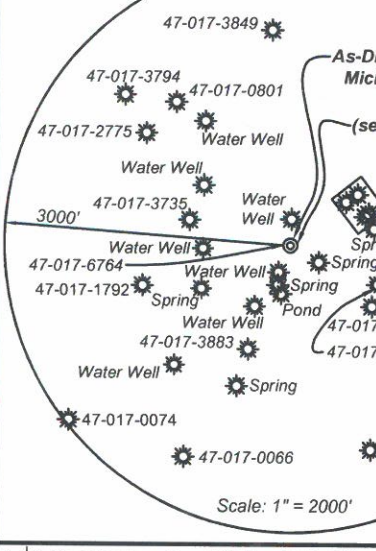
Leases

A.	Champion Agate Co., Inc. Lease
B.	Champion Agate Co., Inc. Lease
C.	Andrew Lett, et ux Lease
D.	Champion Agate Co., Inc. Lease

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.

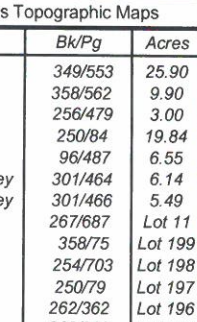


Note: It appears 13 water wells, 7 springs and a pond were found within 2000' of proposed well. No occupied dwellings and no buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad. See well location references 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	6.55
6 7/4	Robert P. Holden & Sherri M. Bailey	301/464	6.14
7 7/4.1	Robert P. Holden & Sherri M. Bailey	301/466	5.49
8 29/56	Lucia P. Anderson	267/687	Lot 11
9 29/4	Michael C. & Mildred R. Sheets	358/75	Lot 199
10 29/5	Jon, Sandra, Jared Bonnell	254/703	Lot 198
11 29/6	Richard David Williams	250/79	Lot 197
12 29/7	Saundra Sue Pristas	262/362	Lot 196
13 29/8	Saundra Sue Pristas	262/362	Lot 195
14 29/9	Jeffrey T. Harvey	287/338	Lot 194
15 29/10	Mark W. & Lisa D. Ball	355/648	Lot 193
16 29/57	Lucia P. Anderson	267/687	Lot 12
17 29/58	Ronald M. & Karen M. Owens	330/488	Lot 13
18 29/59	Ronald M. & Karen M. Owens	297/241	Lot 14
19 7/14.2	Elizabeth Anne Spencer, et al	AP 41/583	1.43
20 7/14.5	Elizabeth Anne Spencer, et al	AP 41/583	0.35



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 1H 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, 2018
OPERATOR'S WELL NO. Michels Unit 1H
API WELL NO
47 - 017 - 06811
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
S. N. Montgomery, et ux; Black Gold Group, LTD; Dorothy A. Pigott, AIF, et al; 180; 56.07
Royalty Owner: J.C. Smith, Agent for Jacob Smith Estate; Ida F. Ford (2); Joseph Freeman, et ux LEASE NO: 600; 58.70; 82.21
290; 124; 50; 90
112; 100; 102.85

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled 6,582' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 19,040' 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