

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

API 47-095-02356 County Tyler District Centerville  
Quad Middlebourne 7.5' Pad Name Vera Pad Field/Pool Name -----  
Farm name Vera O. Thomas Well Number Emerger Unit 4H  
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 4363967m Easting 508280m  
Landing Point of Curve Northing 4364028.86m Easting 509089.00m  
Bottom Hole Northing 4361756m Easting 509930m

Elevation (ft) 1148.1' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
Air - Foam & 4% KCL  
Mud - Polymer

Date permit issued 7/14/2016 Date drilling commenced 3/22/2017 Date drilling ceased 8/5/2017  
Date completion activities began 1/26/2018 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 65', 215', 261', 399' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 620', 1614', 1974' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 620', 879' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed

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API 47-095 - 02356 Farm name Vera O. Thomas Well number Emerger Unit 4H

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"	714'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2520'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15912'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7327'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	200 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	596 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	928 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	740 sx (Lead) 1585 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)		-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15912' MD, 6593' TVD (BHL), 6599' (Deepest Point Drilled) Loggers TD (ft) 15912' MD

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

Plug back procedure N/A

Kick off depth (ft) 6516'

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED N/A

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API 47- 095 - 02356 Farm name Vera O. Thomas Well number Emerger Unit 4H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>			
<u>Marcellus</u>	<u>6568' (TOP)</u>	<u>TVD</u>	<u>7384' (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 2800 psi Bottom Hole — psi DURATION OF TEST — hrs

OPEN FLOW Gas 6498 mcfpd Oil 144 bpd NGL — bpd Water 15 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.

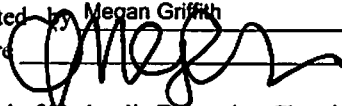
Drilling Contractor Frontier Drilling LLC  
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Schlumberger  
Address 5599 San Felipe Street City Houston State TX Zip 77056

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

Stimulating Company Baker Hughes  
Address 837 Phillippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223  
Signature  Title Permitting Agent Date 2/8/2019

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

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**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	5/14/2018	15648	15813	60	Marcellus
2	5/15/2018	15451	15617	60	Marcellus
3	5/15/2018	15255	15421	60	Marcellus
4	5/15/2018	15059	15224	60	Marcellus
5	5/16/2018	14862	15028	60	Marcellus
6	5/16/2018	14666	14832	60	Marcellus
7	5/17/2018	14470	14635	60	Marcellus
8	5/17/2018	14274	14439	60	Marcellus
9	5/17/2018	14077	14243	60	Marcellus
10	5/18/2018	13881	14047	60	Marcellus
11	5/19/2018	13685	13850	60	Marcellus
12	5/19/2018	13488	13654	60	Marcellus
13	5/19/2018	13292	13458	60	Marcellus
14	5/20/2018	13096	13261	60	Marcellus
15	5/20/2018	12900	13065	60	Marcellus
16	5/20/2018	12703	12869	60	Marcellus
17	5/21/2018	12507	12673	60	Marcellus
18	5/21/2018	12311	12476	60	Marcellus
19	5/21/2018	12115	12280	60	Marcellus
20	5/22/2018	11918	12084	60	Marcellus
21	5/22/2018	11722	11888	60	Marcellus
22	5/22/2018	11526	11691	60	Marcellus
23	5/23/2018	11329	11495	60	Marcellus
24	5/23/2018	11133	11299	60	Marcellus
25	5/25/2018	10937	11102	60	Marcellus
26	5/25/2018	10741	10906	60	Marcellus
27	5/26/2018	10544	10710	60	Marcellus
28	5/26/2018	10348	10514	60	Marcellus
29	5/26/2018	10152	10317	60	Marcellus
30	5/27/2018	9955	10121	60	Marcellus
31	5/27/2018	9759	9925	60	Marcellus
32	5/27/2018	9563	9728	60	Marcellus
33	5/28/2018	9367	9532	60	Marcellus
34	5/28/2018	9170	9336	60	Marcellus
35	5/28/2018	8974	9140	60	Marcellus
36	5/29/2018	8778	8943	60	Marcellus
37	5/30/2018	8582	8747	60	Marcellus
38	5/30/2018	8385	8551	60	Marcellus
39	5/31/2018	8189	8355	60	Marcellus
40	5/31/2018	7993	8158	60	Marcellus
41	5/31/2018	7796	7962	60	Marcellus
42	5/31/2018	7600	7766	60	Marcellus
43	6/1/2018	7404	7569	60	Marcellus

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EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)	Amount of Nitrogen/ other (units)
1	5/14/2018	75.6	7279	5587	3776	16642	10722	N/A
2	5/15/2018	78.4	7589	6297	3833	17719	10041	N/A
3	5/15/2018	75	7553	2760	3767	14080	10427	N/A
4	5/15/2018	76.4	7481	4472	3932	15885	10354	N/A
5	5/16/2018	75.9	7759	6050	3951	17760	10237	N/A
6	5/16/2018	49.9	8204	5796	4017	18017	14501	N/A
7	5/17/2018	76.2	7599	6044	3888	17531	9722	N/A
8	5/17/2018	74.7	7598	4751	4089	16438	10201	N/A
9	5/17/2018	74.8	6354	6354	4119	16827	10978	N/A
10	5/18/2018	75	7660	4890	4107	16657	11999	N/A
11	5/19/2018	75.3	7701	4870	4021	16592	10452	N/A
12	5/19/2018	73	8051	4464	4160	16675	10401	N/A
13	5/19/2018	58.4	8045	5062	3957	17064	13049	N/A
14	5/20/2018	73.7	7288	4907	4080	16275	10268	N/A
15	5/20/2018	75.9	7507	5818	3949	17274	9687	N/A
16	5/20/2018	75.5	7428	4643	3929	16000	10346	N/A
17	5/21/2018	80	7346	4910	3997	16253	10009	N/A
18	5/21/2018	80	7448	5725	4117	17290	10414	N/A
19	5/21/2018	78	7360	4625	4035	16020	9947	N/A
20	5/22/2018	80.4	7526	4788	3937	16251	9926	N/A
21	5/22/2018	76.8	7026	4597	4016	15639	10006	N/A
22	5/22/2018	72.7	6926	4377	4218	15521	13352	N/A
23	5/23/2018	76.2	7160	5896	4082	17138	9887	N/A
24	5/23/2018	76	7011	5869	3871	16751	9674	N/A
25	5/25/2018	76.4	6901	5483	4068	16452	10210	N/A
26	5/25/2018	76.2	6946	4905	4133	15984	9484	N/A
27	5/26/2018	78.7	6767	6119	4020	16906	9553	N/A
28	5/26/2018	77.5	6771	5851	4110	16732	10015	N/A
29	5/26/2018	78.4	7015	6283	4091	17389	9667	N/A
30	5/27/2018	76.5	6800	5860	4068	16728	9738	N/A
31	5/27/2018	75.7	6813	5711	4041	16565	9632	N/A
32	5/27/2018	78.3	6993	6023	4121	17137	9592	N/A
33	5/28/2018	78	6783	5862	4244	16889	9533	N/A
34	5/28/2018	79.2	6809	5792	4160	16761	9789	N/A
35	5/28/2018	78.3	6881	5820	4267	16968	9609	N/A
36	5/29/2018	79.4	6859	5770	4309	16938	9802	N/A
37	5/30/2018	75.9	6582	6267	4224	17073	9571	N/A
38	5/30/2018	76.2	6842	6315	4221	17378	9517	N/A
39	5/31/2018	77.3	6524	5761	4204	16489	9517	N/A
40	5/31/2018	75.2	6514	6377	4306	17197	9669	N/A
41	5/31/2018	75.5	6468	5997	4211	16676	9463	N/A
42	5/31/2018	77	6382	5976	4222	16580	9357	N/A
43	6/1/2018	78.9	6068	5682	4144	15894	9612	N/A
		75.6	7,131	5,475	4,070	717,035	439,930	TOTAL

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## EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	227'	N/A	227'	N/A
Sandstone	100	N/A	100	N/A
Sandy Siltstone	120	N/A	120	N/A
Sandy Shale	740	N/A	740	N/A
Calcareous Shale	880	N/A	880	N/A
Shaly Sandstone	920	N/A	920	N/A
Shaly Siltstone	1,020	N/A	1,020	N/A
Silty Shale	1,180	N/A	1,180	N/A
Sandstone	1,360	N/A	1,360	N/A
Sandy Shale	1,400	N/A	1,400	N/A
Shaly Sandstone	1,640	N/A	1,640	N/A
Silty Shale	1,700	N/A	1,700	N/A
Sandy Shale	1,780	N/A	1,780	N/A
Sandy Shale/Coal	1,920	N/A	1,920	N/A
Big Lime	2,066	N/A	2,115	N/A
Big Injun	2,242	N/A	2,304	N/A
Gantz Sand	2,684	N/A	2,768	N/A
Fifty Foot Sandstone	2,786	N/A	2,879	N/A
Gordon	2,940	N/A	3,052	N/A
Fifth Sandstone	3,118	N/A	3,250	N/A
Bayard	3,386	N/A	3,552	N/A
Warren	3,693	N/A	3,900	N/A
Speechley	4,023	N/A	4,276	N/A
Balltown	4,556	N/A	4,877	N/A
Bradford	4,736	N/A	5,083	N/A
Benson	4,994	N/A	5,378	N/A
Alexander	5,369	N/A	5,805	N/A
Rhinestreet	5,923	N/A	6,436	N/A
Sycamore	6,248	N/A	6,807	N/A
Middlesex	6,415	N/A	7,029	N/A
Burkett	6,510	N/A	7,211	N/A
Tully	6,540	N/A	7,288	N/A
Marcellus	6,568	N/A	7,384	N/A

\*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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# ANTERO RESOURCES CORPORATION

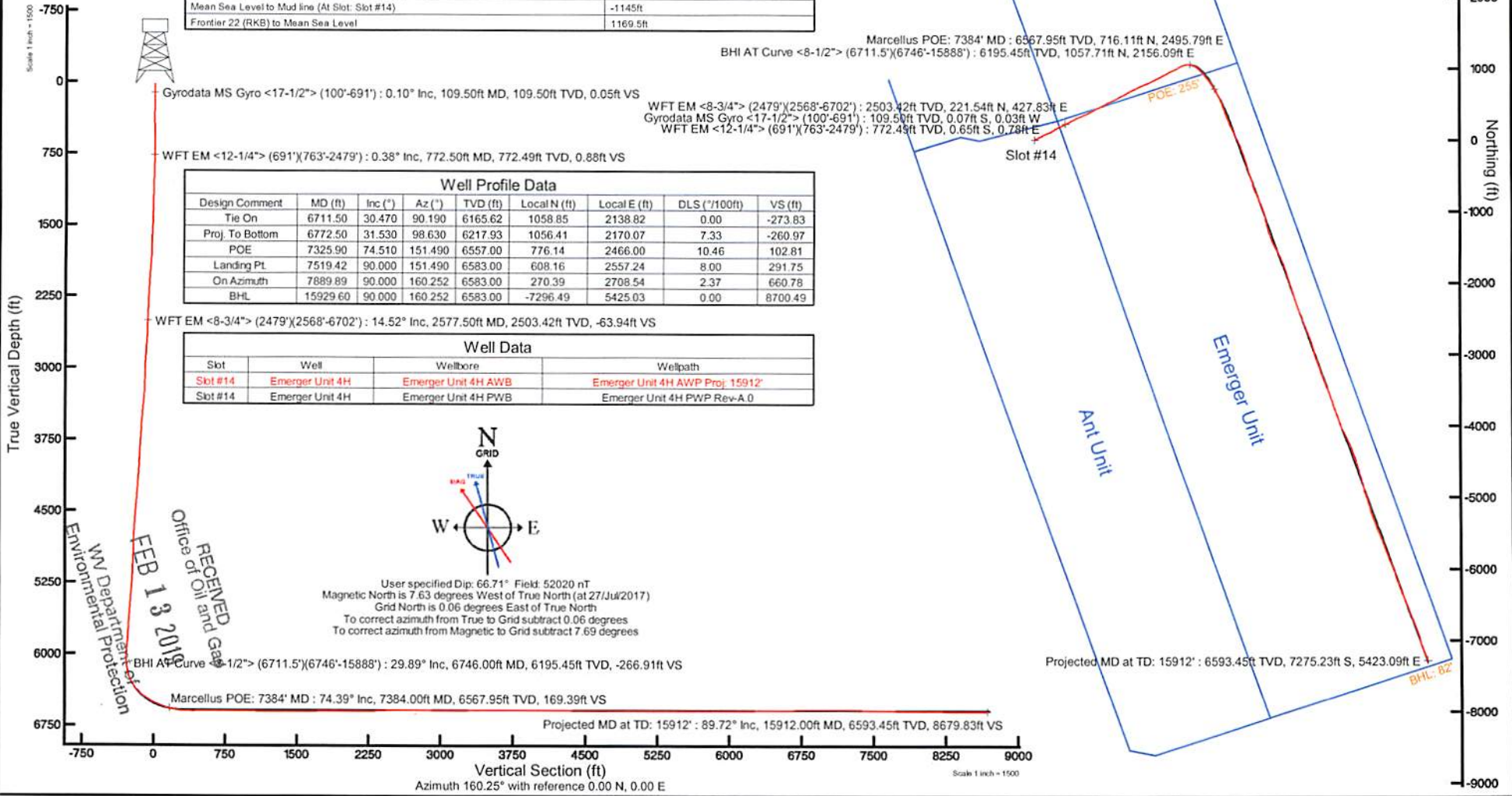


Location: Tyler County, WV Slot: Slot #14  
 Field: Tyler Well: Emerger Unit 4H  
 Facility: Vera Pad Wellbore: Emerger Unit 4H PWB

Plot reference wellpath is Emerger Unit 4H PWP Rev-A.0	Grid System: NAD27 / UTM Zone 17 North, US feet
True vertical depths are referenced to Frontier 22 (RKB)	* = Wellpath was transformed from a different geodetic datum
Measured depths are referenced to Frontier 22 (RKB)	North Reference: Grid north
Frontier 22 (RKB) to Mean Sea Level: 1160.5 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot #14): -1145 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: delaset on 2017-08-11
	Database: WA MPL EasternUS Defn

Location Information					
Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Vera Pad		1667510.600	14316799.487	39°25'31.060"N	80°54'14.600"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Longitude
Slot #14	-66.75	22.83	1667533.419	14316732.760	80°54'14.310"W
Comment: Emerger Unit 4H					
Frontier 22 (RKB) to Mud line (At Slot: Slot #14)				24.5ft	
Mean Sea Level to Mud line (At Slot: Slot #14)				-1145ft	
Frontier 22 (RKB) to Mean Sea Level				1169.5ft	

API: 47-095-02356-0000  
 BHI Job #: 8692045  
 Rig: Frontier 22  
 Duration: 07/31/2017-08/04/2017







# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #14
Area	Tyler County, WV	Well	Emerger Unit 4H
Field	Tyler	Wellbore	Emerger Unit 4H AWB
Facility	Vera Pad		

REPORT SETUP INFORMATION			
Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Delaset
Scale	0.999601	Report Generated	11/Aug/2017 at 11:34
Convergence at slot	0.06° East	Database/Source file	WA_MPL_EasternUS_Defn/Emerger_Unit_4H_AWP_Proj_15912_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-66.75	22.83	1667533.42	14316732.76	39°25'30.400"N	80°54'14.310"W
Facility Reference Pt			1667510.60	14316799.49	39°25'31.060"N	80°54'14.600"W
Field Reference Pt			0.00	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	1169.50ft
Vertical Reference Pt	Frontier 22 (RKB)	Frontier 22 (RKB) to Mud Line at Slot (Slot #14)	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	160.25°

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912



Operator	Area	Field	Facility
ANTERO RESOURCES CORPORATION	Tyler County, WV	Tyler	Vera Pad
		Well	Emerger Unit 4H
		Wellbore	Emerger Unit 4H AWB
		Slot	Slot #14

WELLPATH DATA (194 stations) + = Interpolated/extrapolated station																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/100ft)	(ft/100ft)	(ft/100ft)
0.00	0.00	0.00	204.966	0.00	0.00	0.00	1667533.42	14316732.76	39°25'30.400"N	80°54'14.310"W	0.00	0.00	0.00	0.00	0.00	
24.50	0.00	0.00	204.966	0.00	0.00	0.00	1667533.42	14316732.76	39°25'30.400"N	80°54'14.310"W	0.00	0.00	0.00	0.00	0.00	
109.50	0.100	204.966	109.50	0.05	-0.07	-0.03	1667533.39	14316732.69	39°25'30.399"N	80°54'14.310"W	0.07	0.12	204.960	0.12	-182.40	Gyrodata MS Gyro <17-1/2"> (100°-691)
209.50	0.150	60.060	209.50	0.09	-0.08	0.05	1667533.46	14316732.68	39°25'30.399"N	80°54'14.309"W	0.09	0.24	150.791	0.24	-144.90	
309.50	0.230	17.120	309.50	-0.09	0.18	0.22	1667533.64	14316732.94	39°25'30.402"N	80°54'14.307"W	0.28	0.16	51.043	0.16	-42.94	
409.50	0.220	99.470	409.50	-0.16	0.34	0.47	1667533.88	14316733.10	39°25'30.403"N	80°54'14.304"W	0.57	0.30	54.195	0.30	-0.01	
499.50	0.290	111.850	509.50	0.10	0.21	0.89	1667534.31	14316732.97	39°25'30.402"N	80°54'14.299"W	0.92	0.09	76.996	0.09	12.38	
609.50	0.300	198.160	700.50	-0.13	1.04	1.04	1667534.46	14316732.63	39°25'30.399"N	80°54'14.297"W	1.05	0.40	97.227	0.40	86.31	
700.50	0.400	202.370	700.50	-0.50	0.90	0.85	1667534.27	14316732.11	39°25'30.394"N	80°54'14.299"W	1.07	0.11	127.554	0.11	4.63	
772.50	0.380	7.510	772.49	0.88	-0.65	0.78	1667534.20	14316732.11	39°25'30.394"N	80°54'14.300"W	1.02	1.07	129.574	1.07	229.36	WFT EM <12-1/4"> (691)/(63°-2479)
802.50	1.150	32.930	802.49	0.60	-0.30	0.96	1667534.38	14316732.46	39°25'30.397"N	80°54'14.298"W	1.01	1.01	107.169	2.74	84.73	
828.50	3.140	44.250	862.45	-0.48	1.39	1.39	1667535.85	14316734.14	39°25'30.414"N	80°54'14.279"W	2.80	2.80	60.356	3.37	18.87	
928.50	5.960	50.840	928.23	-2.41	4.86	6.35	1667539.77	14316737.60	39°25'30.448"N	80°54'14.229"W	7.99	4.34	52.674	4.34	9.98	
991.50	8.000	56.260	990.76	-4.56	9.35	12.54	1667545.95	14316742.10	39°25'30.492"N	80°54'14.150"W	15.64	3.40	53.295	3.40	8.60	
1054.50	9.020	64.870	1053.07	-6.08	13.88	20.65	1667554.06	14316746.63	39°25'30.537"N	80°54'14.047"W	24.88	56.100	56.100	2.59	13.67	
1149.50	11.180	60.870	1146.69	-8.28	21.53	35.44	1667568.85	14316754.28	39°25'30.612"N	80°54'13.858"W	41.47	58.728	58.728	2.39	-4.21	
1243.50	13.400	61.490	1238.43	-11.43	31.16	52.98	1667586.37	14316763.91	39°25'30.702"N	80°54'13.634"W	61.46	59.535	59.535	2.37	0.66	
1338.50	15.990	65.410	1330.32	-14.21	41.86	74.55	1667607.94	14316774.61	39°25'30.813"N	80°54'13.359"W	85.50	60.685	60.685	2.92	4.13	
1432.50	19.100	63.790	1419.94	-17.03	54.05	100.13	1667633.51	14316786.78	39°25'30.933"N	80°54'13.033"W	113.78	61.642	61.642	3.35	-1.72	
1526.50	20.090	62.160	1508.49	-21.03	68.38	128.20	1667661.57	14316801.11	39°25'31.074"N	80°54'12.675"W	145.30	61.926	61.926	1.20	-1.73	
1621.50	19.200	65.080	1597.97	-24.74	82.58	156.80	1667690.16	14316815.31	39°25'31.215"N	80°54'12.311"W	177.22	62.226	62.226	1.39	-0.94	
1715.50	18.220	68.850	1766.65	-28.08	106.50	213.54	1667746.88	14316839.22	39°25'31.450"N	80°54'11.587"W	238.63	63.493	63.493	1.33	-3.28	
1810.50	16.460	65.730	1877.20	-32.25	120.02	238.86	1667772.18	14316852.73	39°25'31.584"N	80°54'11.265"W	267.32	63.322	63.322	3.10	-8.46	
1905.50	16.790	67.690	1867.20	-32.25	120.02	238.86	1667772.18	14316852.73	39°25'31.584"N	80°54'11.265"W	267.32	63.322	63.322	3.10	-1.76	
2000.50	18.350	69.380	1957.76	-38.05	134.97	263.32	1667796.64	14316867.68	39°25'31.731"N	80°54'10.953"W	295.90	62.862	62.862	1.73	1.78	
2095.50	18.660	68.770	2047.85	-43.90	150.47	289.19	1667822.49	14316883.17	39°25'31.884"N	80°54'10.623"W	325.99	62.512	62.512	0.38	-0.64	
2189.50	21.030	61.980	2136.27	-49.31	166.19	316.94	1667850.23	14316898.88	39°25'32.039"N	80°54'10.269"W	357.87	62.329	62.329	2.77	3.41	
2284.50	27.630	63.280	2224.76	-53.89	182.07	347.63	1667880.91	14316914.76	39°25'32.196"N	80°54'09.878"W	392.42	62.357	62.357	0.80	1.37	
2379.50	20.560	64.770	2313.39	-57.61	197.06	378.36	1667911.63	14316929.74	39°25'32.344"N	80°54'09.486"W	426.60	62.489	62.489	1.26	-1.57	
2488.50	14.560	64.100	2417.27	-60.91	211.21	408.03	1667941.28	14316943.89	39°25'32.483"N	80°54'09.108"W	459.45	62.632	62.632	5.51	-5.50	

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #14
Area	Tyler County, WV	Well	Emerger Unit 4H
Field	Tyler	Wellbore	Emerger Unit 4H AWB
Facility	Vera Pad		

WELLPATH DATA (194 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
2577.50	14.520	60.790	2503.42	-63.94	221.54	427.83	1667961.07	14316954.21	39°25'32.585"N	80°54'08.855"W	481.79	62.623	0.93	-0.04	-3.72	WFT EM <8-3/4"> (2479')(2568'-6702')
2671.50	17.680	64.460	2593.72	-67.32	233.45	451.00	1667984.24	14316966.12	39°25'32.703"N	80°54'08.560"W	507.84	62.633	3.53	3.36	3.90	
2766.50	21.180	63.720	2683.30	-70.73	247.27	479.41	1668012.64	14316979.93	39°25'32.839"N	80°54'08.197"W	539.42	62.716	3.69	3.68	-0.78	
2860.50	26.370	58.680	2769.30	-76.85	265.66	512.50	1668045.71	14316998.31	39°25'33.020"N	80°54'07.776"W	577.26	62.600	5.92	5.52	-5.36	
2955.50	26.640	60.110	2854.31	-84.83	287.24	548.99	1668082.18	14317019.88	39°25'33.233"N	80°54'07.310"W	619.59	62.381	0.73	0.28	1.51	
3050.50	26.130	65.260	2939.43	-90.40	306.61	586.46	1668119.64	14317039.25	39°25'33.424"N	80°54'06.832"W	661.77	62.399	2.47	-0.54	5.42	
3144.50	26.360	68.140	3023.74	-92.97	323.04	624.62	1668157.79	14317055.67	39°25'33.586"N	80°54'06.346"W	703.22	62.653	1.38	0.24	3.06	
3239.50	27.010	67.950	3108.62	-94.61	338.99	664.19	1668197.35	14317071.62	39°25'33.743"N	80°54'05.841"W	745.70	62.961	0.69	0.68	-0.20	
3334.50	26.760	65.980	3193.36	-97.07	355.80	703.72	1668236.86	14317088.42	39°25'33.909"N	80°54'05.337"W	788.56	63.179	0.97	-0.26	-2.07	
3428.50	27.940	63.900	3276.85	-101.08	374.10	742.83	1668275.95	14317106.71	39°25'34.090"N	80°54'04.839"W	831.72	63.269	1.62	1.26	-2.21	
3523.50	28.420	61.330	3360.59	-107.05	394.74	782.65	1668315.76	14317127.34	39°25'34.293"N	80°54'04.331"W	876.57	63.235	1.37	0.51	-2.71	
3617.50	29.390	60.550	3442.88	-114.40	416.81	822.37	1668355.46	14317149.41	39°25'34.511"N	80°54'03.825"W	921.97	63.122	1.11	1.03	-0.83	
3712.50	28.100	60.710	3526.17	-122.04	439.22	862.18	1668395.25	14317171.80	39°25'34.732"N	80°54'03.317"W	967.61	63.004	1.36	-1.36	0.17	
3806.50	26.760	65.910	3609.61	-127.31	458.69	900.81	1668433.87	14317191.27	39°25'34.924"N	80°54'02.824"W	1010.87	63.015	2.92	-1.43	5.53	
3900.50	27.950	62.960	3693.11	-131.71	477.35	939.76	1668472.80	14317209.91	39°25'35.108"N	80°54'02.328"W	1054.04	63.072	1.92	1.27	-3.14	
3995.50	28.410	62.240	3776.85	-137.68	497.99	979.58	1668512.61	14317230.55	39°25'35.311"N	80°54'01.820"W	1098.90	63.052	0.60	0.48	-0.76	
4089.50	28.690	62.550	3859.41	-143.82	518.81	1019.40	1668552.41	14317251.36	39°25'35.517"N	80°54'01.312"W	1143.82	63.027	0.34	0.30	0.33	
4184.50	28.500	64.900	3942.83	-148.99	538.94	1060.16	1668593.15	14317271.48	39°25'35.715"N	80°54'00.793"W	1189.28	63.053	1.20	-0.20	2.47	
4279.50	28.690	63.060	4026.24	-153.96	558.88	1101.01	1668633.99	14317291.42	39°25'35.912"N	80°54'00.272"W	1234.74	63.087	0.95	0.20	-1.94	
4373.50	28.320	63.560	4108.85	-159.38	579.03	1141.09	1668674.05	14317311.56	39°25'36.111"N	80°53'59.761"W	1279.60	63.095	0.47	-0.39	0.53	
4468.50	27.190	61.260	4192.92	-165.40	599.50	1180.30	1668713.25	14317332.02	39°25'36.313"N	80°53'59.261"W	1323.83	63.073	1.64	-1.19	-2.42	
4563.50	27.700	60.620	4277.23	-172.48	620.77	1218.57	1668751.50	14317353.28	39°25'36.522"N	80°53'58.773"W	1367.58	63.004	0.62	0.54	-0.67	
4657.50	26.090	63.340	4361.06	-178.62	640.77	1256.09	1668789.00	14317373.27	39°25'36.720"N	80°53'58.294"W	1410.08	62.972	2.16	-1.71	2.89	
4752.50	28.540	58.860	4445.47	-185.62	661.88	1294.19	1668827.09	14317394.38	39°25'36.928"N	80°53'57.809"W	1453.62	62.914	3.36	2.58	-4.72	
4847.50	27.770	62.150	4529.23	-193.22	683.96	1333.18	1668866.07	14317416.45	39°25'37.146"N	80°53'57.311"W	1498.39	62.841	1.82	-0.81	3.46	
4941.50	28.810	64.020	4612.01	-198.76	704.11	1372.91	1668905.78	14317436.59	39°25'37.344"N	80°53'56.805"W	1542.94	62.848	1.45	1.11	1.99	
5036.50	29.540	64.040	4694.95	-203.78	724.39	1414.54	1668947.39	14317456.86	39°25'37.544"N	80°53'56.274"W	1589.24	62.883	0.77	0.77	0.02	
5131.50	29.930	62.110	4777.45	-209.67	745.73	1456.55	1668989.38	14317478.19	39°25'37.755"N	80°53'55.738"W	1636.35	62.888	1.09	0.41	-2.03	
5225.50	27.050	69.810	4860.08	-213.16	764.09	1497.36	1669030.18	14317496.54	39°25'37.936"N	80°53'55.218"W	1681.04	62.965	4.96	-3.06	8.19	
5320.50	28.490	67.730	4944.14	-214.32	780.13	1538.60	1669071.40	14317512.58	39°25'38.094"N	80°53'54.692"W	1725.08	63.113	1.83	1.52	-2.19	

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912'  
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REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Tyler County, WV
Field	Tyler
Facility	Vera Pad
Slot	Slot #14
Well	Emerger Unit 4H
Wellbore	Emerger Unit 4H AWB

WELLPATH DATA (194 stations) $r =$ 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 (F/100ft)	Build Rate (F/100ft)	Turn Rate (F/100ft)	Comments
5414.50	29.500	64.760	5026.38	-217.52	798.50	1580.29	1669113.07	14317530.94	39°25'38.275"N	80°53'54.161"W	1770.57	63.193	1.87	1.07	-3.16	
5509.50	28.070	65.210	5109.62	-221.72	817.84	1621.74	1669154.51	14317550.27	39°25'38.466"N	80°53'53.632"W	1816.29	63.238	1.52	-1.51	0.47	
5604.50	27.750	64.140	5193.57	-226.04	836.86	1661.93	1669194.68	14317569.29	39°25'38.653"N	80°53'53.120"W	1860.74	63.273	0.63	-0.34	-1.13	
5698.50	29.270	62.720	5276.17	-231.38	856.94	1702.05	1669234.79	14317589.36	39°25'38.851"N	80°53'52.608"W	1905.60	63.276	1.77	1.62	-1.51	
5793.50	29.570	61.550	5358.92	-237.97	878.75	1743.30	1669276.02	14317611.16	39°25'39.066"N	80°53'52.082"W	1952.26	63.249	0.68	0.32	-1.23	
5888.50	29.400	63.140	5441.62	-244.40	900.45	1784.71	1669317.42	14317632.85	39°25'39.280"N	80°53'51.554"W	1999.01	63.227	0.84	-0.18	1.67	
5983.50	29.380	62.260	5524.39	-250.53	921.84	1826.14	1669358.83	14317654.23	39°25'39.491"N	80°53'51.026"W	2045.62	63.215	0.46	-0.02	-0.93	
6077.50	28.250	63.140	5606.75	-256.49	942.62	1866.40	1669399.07	14317675.00	39°25'39.696"N	80°53'50.513"W	2090.93	63.204	1.28	-1.20	0.94	
6172.50	28.030	65.300	5690.53	-261.19	962.11	1906.74	1669439.39	14317694.48	39°25'39.888"N	80°53'49.998"W	2135.72	63.225	1.10	-0.23	2.27	
6267.50	27.940	62.200	5774.42	-266.24	981.82	1946.70	1669479.34	14317714.18	39°25'40.083"N	80°53'49.489"W	2180.28	63.236	1.53	-0.09	-3.26	
6362.50	28.150	59.950	5858.27	-273.36	1003.42	1985.79	1669518.41	14317735.78	39°25'40.296"N	80°53'48.990"W	2224.91	63.193	1.14	0.22	-2.37	
6425.50	27.750	58.640	5913.92	-278.97	1018.49	2011.18	1669543.79	14317750.84	39°25'40.444"N	80°53'48.667"W	2254.37	63.142	1.16	-0.63	-2.08	
6457.50	27.400	60.100	5942.29	-281.77	1026.04	2023.92	1669566.53	14317758.39	39°25'40.519"N	80°53'48.504"W	2269.15	63.117	2.38	-1.09	4.56	
6488.50	27.300	62.180	5969.82	-284.02	1032.91	2036.39	1669569.00	14317765.26	39°25'40.587"N	80°53'48.345"W	2283.38	63.105	3.10	-0.32	6.71	
6520.50	27.370	66.630	5998.25	-285.52	1039.26	2049.64	1669582.23	14317771.60	39°25'40.649"N	80°53'48.176"W	2298.06	63.113	6.39	0.22	13.91	
6552.50	26.960	69.910	6026.72	-286.02	1044.67	2063.20	1669595.80	14317777.01	39°25'40.702"N	80°53'48.003"W	2312.60	63.145	4.85	-1.28	10.25	
6584.50	27.070	73.590	6055.23	-285.84	1049.22	2077.00	1669609.59	14317781.56	39°25'40.747"N	80°53'47.827"W	2326.97	63.199	5.23	0.34	11.50	
6616.50	29.330	76.820	6083.44	-284.32	1053.06	2091.62	1669624.20	14317785.40	39°25'40.785"N	80°53'47.641"W	2341.75	63.276	8.52	7.06	10.09	
6647.50	30.330	80.380	6110.33	-282.08	1056.10	2106.73	1669639.31	14317789.44	39°25'40.815"N	80°53'47.448"W	2356.62	63.375	6.56	3.23	11.48	
6679.50	30.330	84.890	6137.98	-278.63	1058.17	2122.70	1669655.27	14317790.50	39°25'40.835"N	80°53'47.245"W	2371.83	63.504	7.12	-0.62	14.09	
6711.50	30.470	90.190	6165.62	-279.83	1058.85	2138.82	1669671.38	14317791.19	39°25'40.842"N	80°53'47.039"W	2386.57	63.662	8.42	1.06	16.56	
6746.00	29.890	97.480	6195.45	-269.91	1057.71	2156.09	1669688.65	14317790.04	39°25'40.830"N	80°53'46.819"W	2401.56	63.869	10.75	-1.68	21.13	BHI AT Curve <8-1/2"> (6711.5')(6746'-15888')
6772.00	30.220	101.510	6217.96	-260.55	1055.56	2168.93	1669701.48	14317787.89	39°25'40.809"N	80°53'46.656"W	2412.15	64.049	7.86	1.27	15.50	
6819.00	32.590	111.670	6258.10	-248.02	1048.52	2192.30	1669724.84	14317780.86	39°25'40.739"N	80°53'46.358"W	2430.14	64.439	12.33	5.04	21.62	
6868.00	36.550	119.480	6298.46	-226.23	1036.45	2217.29	1669749.82	14317768.80	39°25'40.619"N	80°53'46.040"W	2447.57	64.947	12.12	8.08	15.94	
6915.00	40.600	125.450	6335.21	-203.05	1020.68	2241.95	1669774.47	14317753.03	39°25'40.463"N	80°53'45.726"W	2463.36	65.522	11.70	8.62	12.70	
6962.00	44.220	130.970	6369.91	-176.18	1001.05	2266.80	1669799.31	14317733.41	39°25'40.269"N	80°53'45.409"W	2478.00	66.173	11.04	7.70	11.74	
7009.00	48.210	135.140	6402.44	-146.00	977.87	2291.55	1669824.05	14317710.24	39°25'40.040"N	80°53'45.094"W	2491.47	66.891	10.63	8.49	8.87	
7029.00T	50.199	136.267	6415.50	-132.23	967.04	2302.12	1669834.61	14317699.41	39°25'39.932"N	80°53'44.960"W	2496.98	67.214	10.82	9.94	5.64	Middlesex, 7029' MD
7057.00	53.000	137.740	6432.90	-112.07	950.99	2317.08	1669849.57	14317683.36	39°25'39.774"N	80°53'44.769"W	2504.64	67.686	10.82	10.00	5.26	

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912

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Operator	Area	Field	Facility
ANTERO RESOURCES CORPORATION	Tyler County, WV	Tyler	Vera Pad
	Emerger Unit 4H	Well	Wellbore
	Emerger Unit 4H AWB		
	Slot #14		

WELLPATH DATA (194 stations)														
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir		
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]		
Turn Rate	Comments	Turn Rate	Comments	Turn Rate	Comments	Turn Rate	Comments	Turn Rate	Comments	Turn Rate	Comments	Turn Rate		
[°/100ft]		[°/100ft]		[°/100ft]		[°/100ft]		[°/100ft]		[°/100ft]		[°/100ft]		
9142.00	90.120	158.100	6595.88	1919.77	-912.85	3138.70	1670670.86	14315820.28	39°25'21.343"N	80°53'34.327"W	3268.75	106.216	-0.23	1.32
9237.00	90.150	162.170	6595.65	2014.75	-1002.17	3170.98	1670703.12	14315730.99	39°25'20.460"N	80°53'33.917"W	3325.57	107.539	0.03	4.28
9332.00	90.220	167.680	6595.35	2109.39	-1093.87	3195.67	1670727.81	14315639.33	39°25'19.563"N	80°53'33.604"W	3377.70	108.896	0.07	5.80
9426.00	90.710	167.090	6594.58	2202.66	-1185.60	3216.20	1670748.33	14315547.64	39°25'18.646"N	80°53'33.344"W	3427.77	110.236	0.52	-0.63
9522.00	91.540	163.310	6592.70	2298.27	-1278.38	3240.72	1670772.83	14315454.90	39°25'17.729"N	80°53'33.033"W	3483.74	111.528	4.03	-3.94
9616.00	92.650	158.550	6589.26	2392.17	-1367.13	3271.40	1670803.50	14315366.18	39°25'16.852"N	80°53'32.643"W	3545.57	112.680	5.20	-1.18
9711.00	93.020	154.040	6584.56	2486.80	-1453.99	3309.53	1670841.62	14315279.36	39°25'15.993"N	80°53'32.159"W	3614.84	113.717	4.76	-4.75
9806.00	93.550	151.030	6582.60	2580.90	-1538.24	3353.33	1670885.40	14315195.14	39°25'15.159"N	80°53'31.602"W	3689.30	114.642	5.00	-3.17
9900.00	98.860	154.420	6584.06	2674.06	-1621.76	3396.39	1670928.45	14315111.65	39°25'14.333"N	80°53'31.054"W	3763.72	115.524	3.64	-0.52
9995.00	88.920	158.150	6585.90	2768.80	-1708.71	3434.58	1670966.63	14315024.74	39°25'13.474"N	80°53'30.569"W	3836.15	116.450	3.93	3.93
10089.00	89.940	162.080	6588.84	2862.77	-1797.08	3466.55	1670998.58	14314936.40	39°25'12.600"N	80°53'30.163"W	3904.67	117.403	4.32	4.18
10184.00	89.660	161.500	6587.17	2957.74	-1887.32	3496.24	1671028.25	14314846.19	39°25'11.708"N	80°53'29.786"W	3973.12	118.361	0.68	-0.61
10280.00	90.120	160.650	6587.36	3053.73	-1978.10	3527.45	1671059.45	14314755.45	39°25'10.810"N	80°53'29.390"W	4044.23	119.283	1.10	-0.99
10374.00	89.690	161.920	6587.51	3147.71	-2067.11	3557.69	1671089.68	14314666.48	39°25'09.930"N	80°53'29.006"W	4114.62	120.158	1.53	1.46
10470.00	90.460	164.380	6587.39	3243.58	-2158.98	3585.51	1671117.49	14314574.65	39°25'09.022"N	80°53'28.653"W	4185.34	121.054	2.69	2.56
10565.00	90.520	160.860	6586.57	3338.48	-2249.62	3613.88	1671145.85	14314484.04	39°25'08.125"N	80°53'28.293"W	4256.87	121.902	3.71	-3.71
10660.00	90.120	159.140	6586.04	3433.48	-2338.89	3646.37	1671178.33	14314394.81	39°25'07.243"N	80°53'27.880"W	4332.02	122.677	1.86	-1.81
10754.00	90.150	160.010	6585.82	3527.47	-2426.98	3679.18	1671211.12	14314306.76	39°25'06.372"N	80°53'27.463"W	4407.56	123.411	0.93	0.93
10849.00	90.150	159.270	6585.57	3622.46	-2516.04	3712.23	1671244.16	14314217.73	39°25'05.491"N	80°53'27.044"W	4484.54	124.128	0.78	0.00
10944.00	90.520	159.130	6585.02	3717.44	-2604.85	3745.96	1671277.88	14314128.96	39°25'04.613"N	80°53'26.615"W	4562.62	124.814	0.42	-0.15
11039.00	90.060	157.350	6584.54	3812.38	-2693.07	3781.18	1671313.08	14314040.77	39°25'03.741"N	80°53'26.168"W	4642.19	125.460	1.94	-1.87
11133.00	89.420	161.080	6584.96	3906.35	-2780.94	3814.53	1671346.42	14313952.94	39°25'02.872"N	80°53'25.744"W	4720.62	126.093	4.03	3.97
11228.00	89.540	164.190	6585.83	4001.25	-2871.59	3842.88	1671374.76	14313862.32	39°25'01.975"N	80°53'25.384"W	4797.27	126.769	3.28	3.27
11322.00	90.340	163.430	6585.92	4095.07	-2961.86	3869.09	1671400.96	14313772.08	39°25'01.083"N	80°53'25.052"W	4872.63	127.435	1.17	-0.81
11417.00	90.030	160.390	6585.62	4190.01	-3052.16	3898.58	1671430.44	14313681.83	39°25'00.190"N	80°53'24.617"W	4951.22	128.057	3.22	-3.20
11511.00	89.260	159.840	6586.20	4284.01	-3140.55	3930.56	1671462.40	14313593.47	39°24'59.316"N	80°53'24.271"W	5031.14	128.625	1.01	-0.59
11606.00	89.660	162.520	6587.10	4378.99	-3230.46	3961.20	1671493.03	14313503.60	39°24'58.427"N	80°53'23.882"W	5111.45	129.198	2.85	-2.82
11701.00	89.510	161.210	6587.78	4473.94	-3320.73	3990.77	1671522.58	14313413.36	39°24'57.534"N	80°53'23.507"W	5191.68	129.764	1.39	-1.38
11797.00	89.200	158.550	6588.86	4569.93	-3410.86	4023.78	1671555.59	14313323.27	39°24'56.643"N	80°53'23.088"W	5274.92	130.287	2.79	-2.77
11892.00	89.450	157.540	6589.98	4664.85	-3498.97	4059.30	1671591.09	14313235.20	39°24'55.772"N	80°53'22.637"W	5359.17	130.760	1.10	0.26

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Operator	Area	Field	Facility
ANTERO RESOURCES CORPORATION	Tyler County, WV	Tyler	Vera Pad
Slot #14	Well	Wellbore	Emerger Unit 4H AWB

## WELLPATH DATA (194 stations)

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft/100ft	ft/100ft	
11987.00	89.880	159.090	6590.54	4759.79	-3587.24	4094.40	1671626.18	14313146.96	39°24'54.89"N	80°53'22.19"W	5443.56	131.223	1.69	0.45	1.63	
12081.00	90.150	161.720	6590.51	4853.78	-3675.79	4125.92	1671667.69	14313058.45	39°24'54.024"N	80°53'21.79"W	5525.82	131.698	2.81	0.29	2.80	
12176.00	90.710	162.830	6589.80	4948.72	-3766.27	4154.84	1671686.60	14312968.00	39°24'53.129"N	80°53'21.423"W	5607.81	132.192	1.31	0.59	1.17	
12272.00	89.910	160.530	6589.28	5044.68	-3857.40	4185.02	1671716.76	14312876.91	39°24'52.228"N	80°53'21.040"W	5691.56	132.667	2.54	-0.83	-2.40	
12366.00	90.000	159.280	6589.36	5138.67	-3945.67	4217.31	1671749.04	14312788.67	39°24'51.355"N	80°53'20.630"W	5775.30	133.094	1.33	0.10	-1.33	
12461.00	90.430	153.740	6589.00	5233.43	-4032.77	4255.16	1671766.87	14312701.61	39°24'50.044"N	80°53'20.149"W	5862.56	133.463	5.85	0.45	-5.83	
12556.00	89.820	152.810	6588.79	5327.73	-4117.62	4297.88	1671829.58	14312616.79	39°24'49.655"N	80°53'19.606"W	5952.02	133.773	1.17	-0.64	-0.98	
12650.00	89.820	155.480	6589.09	5421.19	-4202.20	4338.87	1671870.55	14312532.25	39°24'48.818"N	80°53'19.086"W	6040.22	134.083	2.84	0.00	2.84	
12744.00	89.880	157.420	6589.33	5514.98	-4288.37	4376.43	1671908.09	14312446.11	39°24'47.966"N	80°53'18.608"W	6127.25	134.418	2.06	0.06	2.06	
12838.00	90.030	160.650	6589.41	5608.94	-4376.13	4410.06	1671941.71	14312358.38	39°24'47.098"N	80°53'18.181"W	6212.82	134.779	3.44	0.16	3.44	
12932.00	90.000	163.620	6589.38	5702.88	-4465.59	4438.89	1671970.53	14312268.96	39°24'46.214"N	80°53'17.815"W	6296.45	135.172	3.16	-0.03	3.16	
13027.00	90.120	163.800	6589.28	5797.71	-4556.77	4465.54	1671997.17	14312177.81	39°24'45.312"N	80°53'17.477"W	6380.07	135.579	0.23	0.13	0.19	
13122.00	90.250	163.010	6588.98	5892.56	-4647.82	4492.67	1672024.29	14312086.81	39°24'44.412"N	80°53'17.133"W	6464.23	135.972	0.84	0.14	-0.83	
13217.00	90.180	165.690	6588.62	5987.31	-4739.29	4518.30	1672049.90	14311995.38	39°24'43.508"N	80°53'16.808"W	6547.96	136.367	2.82	-0.07	2.82	
13313.00	90.280	165.010	6588.23	6082.90	-4832.25	4542.25	1672073.85	14311902.45	39°24'42.589"N	80°53'16.504"W	6631.94	136.772	0.31	0.10	-0.29	
13408.00	90.340	165.000	6587.72	6177.54	-4924.10	4566.51	1672098.10	14311810.64	39°24'41.681"N	80°53'16.197"W	6715.63	137.158	0.44	0.06	-0.43	
13502.00	90.680	160.520	6586.88	6271.42	-5013.85	4594.36	1672125.94	14311720.92	39°24'40.793"N	80°53'15.843"W	6800.50	137.500	4.78	0.36	-4.77	
13597.00	90.770	164.510	6585.68	6366.32	-5104.43	4622.90	1672154.46	14311630.38	39°24'39.898"N	80°53'15.481"W	6886.68	137.834	4.20	0.09	4.20	
13692.00	90.120	164.270	6584.94	6461.07	-5195.92	4648.46	1672180.01	14311538.92	39°24'38.993"N	80°53'15.157"W	6971.79	138.183	0.73	-0.68	-0.25	
13787.00	90.920	158.210	6584.08	6556.01	-5285.83	4678.99	1672210.54	14311449.05	39°24'38.104"N	80°53'14.769"W	7059.25	138.485	6.43	0.84	-6.38	
13883.00	90.860	161.410	6582.59	6651.98	-5375.91	4712.12	1672243.65	14311359.01	39°24'37.213"N	80°53'14.349"W	7148.74	138.765	3.33	-0.06	3.33	
13978.00	91.080	157.320	6580.98	6746.94	-5464.78	4745.59	1672277.10	14311270.17	39°24'36.335"N	80°53'13.924"W	7237.71	139.029	4.31	0.23	-0.66	
14073.00	90.580	156.690	6579.60	6841.77	-5552.23	4782.69	1672314.19	14311182.76	39°24'35.470"N	80°53'13.452"W	7328.12	139.258	0.85	-0.53	-0.66	
14168.00	90.800	158.430	6578.46	6936.66	-5640.02	4818.95	1672350.44	14311095.00	39°24'34.602"N	80°53'12.992"W	7418.37	139.489	1.85	0.23	1.83	
14262.00	89.540	160.070	6578.18	7030.64	-5727.92	4852.25	1672383.73	14311007.14	39°24'33.733"N	80°53'12.569"W	7506.89	139.731	2.20	-1.34	1.74	
14358.00	89.660	160.510	6578.85	7126.64	-5818.29	4884.63	1672416.09	14310916.80	39°24'32.839"N	80°53'12.158"W	7596.85	139.986	0.48	0.12	0.46	
14453.00	89.940	157.330	6579.18	7221.60	-5906.92	4918.79	1672450.24	14310828.21	39°24'31.963"N	80°53'11.724"W	7686.76	140.215	3.36	0.29	-3.35	
14547.00	88.490	158.540	6580.47	7315.51	-5994.03	4954.10	1672485.53	14310741.14	39°24'31.101"N	80°53'11.276"W	7776.34	140.426	2.01	-1.54	1.29	
14642.00	89.380	161.980	6582.24	7410.48	-6083.41	4986.18	1672517.60	14310651.79	39°24'30.217"N	80°53'10.868"W	7865.74	140.661	3.74	0.94	3.62	
14736.00	88.520	161.680	6583.96	7504.42	-6172.71	5015.48	1672546.89	14310562.53	39°24'29.334"N	80°53'10.496"W	7953.45	140.905	0.97	-0.91	-0.32	

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912



Operator	ANTERO RESOURCES CORPORATION
Area	Tyler County, WV
Field	Tyler
Facility	Vera Pad
Slot	Slot #14
Well	Emerger Unit 4H
Wellbore	Emerger Unit 4H AWB

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
14831.00	159.700	6586.03	7599.39	-6262.34	5046.89	1672578.28	14310472.93	39°24'28.44"N	80°53'10.09"W	8042.89	141.134	2.14	0.48	-2.08		
14926.00	90.000	6586.88	7694.33	-6350.63	5081.92	1672613.30	14310384.68	39°24'27.57"N	80°53'09.65"W	8133.66	141.332	3.02	1.07	-2.82		
15021.00	89.290	6587.47	7789.23	-6438.51	5117.99	1672649.35	14310296.83	39°24'26.70"N	80°53'09.19"W	8224.86	141.519	1.59	0.75	-1.40		
15116.00	89.450	6588.51	7884.21	-6527.47	5151.31	1672682.66	14310207.91	39°24'25.82"N	80°53'08.77"W	8315.27	141.720	2.35	0.17	2.35		
15211.00	89.420	6589.45	7979.20	-6616.60	5184.14	1672715.48	14310118.81	39°24'24.94"N	80°53'08.35"W	8405.64	141.921	1.68	-0.03	-1.68		
15307.00	89.480	6590.37	8075.10	-6705.47	5220.42	1672751.74	14310029.98	39°24'24.06"N	80°53'07.89"W	8498.01	142.098	2.47	0.06	-2.47		
15402.00	89.260	6591.41	8170.00	-6793.42	5256.31	1672787.62	14309942.07	39°24'23.19"N	80°53'07.43"W	8589.49	142.270	2.51	-0.23	2.49		
15496.00	89.780	6592.20	8263.98	-6882.13	5287.35	1672818.64	14309853.39	39°24'22.31"N	80°53'07.04"W	8678.69	142.466	3.74	0.55	3.70		
15591.00	89.780	6592.57	8358.91	-6972.68	5316.08	1672847.36	14309762.88	39°24'21.42"N	80°53'06.68"W	8768.06	142.678	0.14	0.00	-0.14		
15686.00	90.150	6592.62	8453.86	-7063.10	5345.21	1672876.48	14309672.49	39°24'20.53"N	80°53'06.31"W	8857.69	142.882	0.55	0.39	-0.39		
15781.00	89.690	6592.76	8548.84	-7152.59	5377.07	1672908.33	14309583.04	39°24'19.64"N	80°53'05.90"W	8948.32	143.065	3.32	-0.48	-3.28		
15875.00	89.690	6593.27	8642.83	-7240.49	5410.36	1672941.61	14309495.18	39°24'18.77"N	80°53'05.48"W	9038.62	143.232	0.88	0.00	0.88		
15888.00	89.720	6593.33	8655.83	-7252.69	5414.85	1672946.10	14309482.98	39°24'18.65"N	80°53'05.42"W	9051.09	143.255	2.01	0.23	2.00		
15912.00	89.720	6593.45	8679.83	-7275.23	5423.09	1672954.33	14309460.45	39°24'18.43"N	80°53'05.32"W	9074.08	143.298	0.00	0.00	0.00		Projected MD at TD: 15912

String/Diameter	Start MD	End MD	Interval	Start TVD	End TVD	Start N/S	Start EW	End N/S	End EW
20in Conductor	24.50	104.50	80.00	24.50	104.50	0.00	0.00	0.00	-0.06
17.5in Open Hole	104.50	723.70	619.20	104.50	723.69	-0.06	-0.03	-0.75	0.80
13.37in Casing Surface	24.50	723.70	699.20	24.50	723.69	0.00	0.00	-0.75	0.80
12.25in Open Hole	723.70	2530.00	1806.30	723.69	2457.43	-0.75	0.80	215.89	417.34
9.625in Casing Intermediate	24.50	2530.00	2505.50	24.50	2457.43	0.00	0.00	215.89	417.34

Ref Wellbore: Emerger Unit 4H AWB	Ref Wellpath: Emerger Unit 4H AWP Proj: 15912
String/Diameter	(ft)
Start MD	(ft)
End MD	(ft)
Interval	(ft)
Start TVD	(ft)
End TVD	(ft)
Start N/S	(ft)
Start EW	(ft)
End N/S	(ft)
End EW	(ft)

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #14
Area	Tyler County, WV	Well	Emerger Unit 4H
Field	Tyler	Wellbore	Emerger Unit 4H AWB
Facility	Vera Pad		

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Emerger Unit 4H POE - Rev-2	6557.00	776.14	2466.00	1669998.42	14317508.59	39°25'38.044"N	80°53'42.874"W	point
Emerger Unit 4H BHL - Rev-2	6583.00	-7296.49	5425.03	1672956.27	14309439.20	39°24'18.222"N	80°53'05.297"W	point
Emerger Unit 4H LP - Rev-1	6583.00	608.16	2557.24	1670089.64	14317340.67	39°25'36.383"N	80°53'41.714"W	point

WELLPATH COMPOSITION - Ref Wellbore: Emerger Unit 4H AWB Ref Wellpath: Emerger Unit 4H AWP Proj: 15912'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
24.50	700.50	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-1/2">(100'-691')	Emerger Unit 4H AWB
700.50	2488.50	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12-1/4">(691')(763'-2479')	Emerger Unit 4H AWB
2488.50	6711.50	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4">(2479')(2568'-6702')	Emerger Unit 4H AWB
6711.50	15888.00	BHI AutoTrak Curve (Short)	04 BHI AT Curve <8-1/2"> (6711.5')(6746'-15888')	Emerger Unit 4H AWB
15888.00	15912.00	Blind Drilling (std)	Projection to bit	Emerger Unit 4H AWB

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# Actual Wellpath Report

Emerger Unit 4H AWP Proj: 15912'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #14
Area	Tyler County, WV	Well	Emerger Unit 4H
Field	Tyler	Wellbore	Emerger Unit 4H AWB
Facility	Vera Pad		

## COMMENTS

### Wellpath general comments

API: 47-095-02356-0000  
BHI Job #: 8692045  
Rig: Frontier 22  
Duration: 07/31/2017-08/04/2017  
Gyrodata MS Gyro <17-1/2"> (100'-691')  
WFT EM <12-1/4"> (691')(763'-2479')  
WFT EM <8-3/4"> (2479')(2568'-6702')  
BHI AT Curve <8-1/2"> (6711.5')(6746'-15888')  
Middlesex: 7029' MD  
Burket: 7211' MD  
Tully: 7288' MD  
Marcellus POE: 7384' MD  
Projected MD at TD: 15912'

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/14/2018
Job End Date:	6/2/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02356-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Emerger Unit 4H
Latitude:	39.40503300
Longitude:	-80.88479200
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,599
Total Base Water Volume (gal):	18,875,218
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.82868	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.11241	

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SAND-PREMIUM WHITE-30/50, BULK	Halliburton	Proppant					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
SCALECHEK LP-70	Halliburton	Scale Inhibitor					
				Listed Below			
HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			

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SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica, quartz	14808-60-7	100.00000	12.01688	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01607	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01607	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01607	
			Guar gum	9000-30-0	100.00000	0.01328	
			Hydrochloric acid	7647-01-0	15.00000	0.00976	
			Ethylene glycol	107-21-1	60.00000	0.00797	
			Glutaraldehyde	111-30-8	30.00000	0.00261	
			Telmer	Proprietary	10.00000	0.00133	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00043	
			Sodium persulfate	7775-27-1	100.00000	0.00042	
			Sodium polyacrylate	9003-04-7	1.00000	0.00013	
			Ethanol	64-17-5	1.00000	0.00009	
			Methanol	67-56-1	60.00000	0.00008	
			Ethoxylated alcohols	Proprietary	30.00000	0.00003	
			Fatty acids, tall oil	Proprietary	30.00000	0.00003	
			Modified thiourea polymer	Proprietary	30.00000	0.00003	

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			Olefins	Proprietary	5.00000	0.00001	
			Propargyl alcohol	107-19-7	10.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Acrylic acid	79-10-7	0.01000	0.00000	
			Sodium sulfate	7757-82-6	0.10000	0.00000	

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(l) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

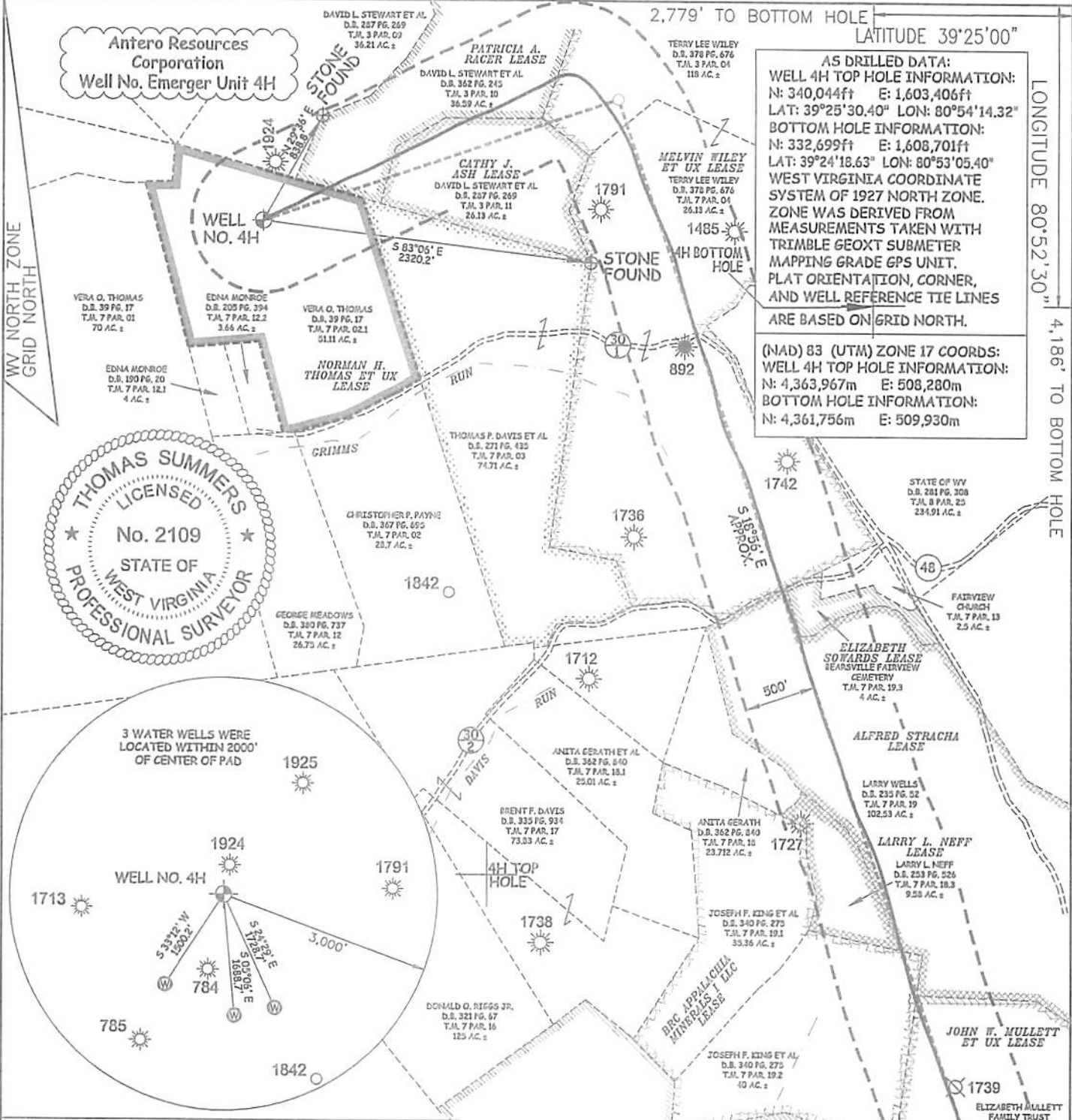
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LATITUDE 39°27'30"

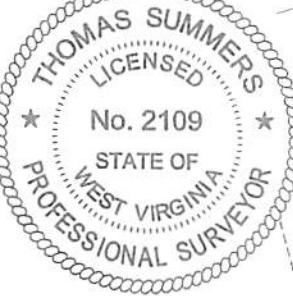
8,186'

LATITUDE 39°25'00"

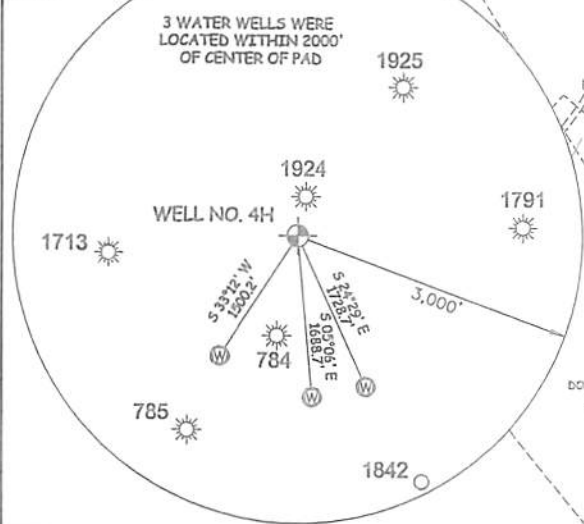


**AS DRILLED DATA:**  
 WELL 4H TOP HOLE INFORMATION:  
 N: 340,044ft E: 1,603,406ft  
 LAT: 39°25'30.40" LON: 80°54'14.32"  
 BOTTOM HOLE INFORMATION:  
 N: 332,699ft E: 1,608,701ft  
 LAT: 39°24'18.63" LON: 80°53'05.40"  
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD 83 (UTM) ZONE 17 COORDS:  
 WELL 4H TOP HOLE INFORMATION:  
 N: 4,363,967m E: 508,280m  
 BOTTOM HOLE INFORMATION:  
 N: 4,361,756m E: 509,930m



3 WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

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

**PAD LAYOUT**

- NOT TO SCALE
- 10' - MYSES UNIT 1H
  - 10' - MYSES UNIT 2H
  - 10' - MYSES UNIT 3H
  - 10' - ANT UNIT 1H
  - 10' - ANT UNIT 2H
  - 10' - ANT UNIT 3H
  - 10' - SAN JUAN UNIT 1H
  - 10' - SAN JUAN UNIT 2H
  - 10' - SAN JUAN UNIT 3H
  - 10' - SAN JUAN UNIT 4H
  - 10' - EMERGER UNIT 1H
  - 10' - EMERGER UNIT 2H
  - 10' - EMERGER UNIT 3H
  - 10' - EMERGER UNIT 4H

JOB # 16-020WA  
 DRAWING # EMERGER4HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

**LEGEND**  
 - - - - - Surface Owner Boundary Lines +/-  
 - - - - - Interior Surface Tracts +/-  
 ○ - - - - Proposed Well Path  
 ⊙ - - - - As Drilled Well Path

*Thomas Summers*  
 THOMAS SUMMERS P.S. 2109

DATE 10/12/18  
 OPERATOR'S WELL# EMERGER UNIT #4H

- NOTES**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
  3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
  4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
  5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  47 - 095 - 02356  
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION: ELEVATION 1,148.1 AS BUILT STATE COUNTY PERMIT  
 QUADRANGLE MIDDLEBOURNE 7.5' DISTRICT CENTERVILLE COUNTY TYLER  
 SURFACE OWNER VERA O. THOMAS ACREAGE 51.11 ACRES +/-  
 OIL & GAS ROYALTY OWNER NORMAN H. THOMAS ET UX; PATRICIA A. RACER; CATHY J. ASH; LEASE ACREAGE 125 AC.±; 36.59 AC.±; 30 AC.±;  
 MELVIN WILEY ET UX; ALFRED STRACHA; BRC APPALACHIA MINERALS I LLC; JOHN W. MULLETT ET UX; CARL W. ASH 553.16 AC.±; 101.2 AC.±; 79.74 AC.±; 45 AC.±; 362.8 AC.±  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
 PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED  
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,593' TVD 15,912' MD  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD  
 DENVER, CO 80202 CHARLESTON, WV 25313







