

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

API 47 - 095 - 02375 County Tyler District Meade
Quad Pennsboro 7.5' Pad Name Terry Snider Pad Field/Pool Name -----
Farm name Terry L. Snider Well Number Tinker 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 4357616m Easting 503105m
Landing Point of Curve Northing 4357744.03m Easting 503257.11m
Bottom Hole Northing 4360098m Easting 502332m

Elevation (ft) 1146.5' 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 5/6/2016 Date drilling commenced 8/4/2016 Date drilling ceased 11/26/2016
Date completion activities began 10/4/2017 Date completion activities ceased N/A
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A
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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug *WV Department of Environmental Protection*

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths No
Salt water depth(s) ft N/A 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: JCB
9/12/2016

API 47- 095 - 02375 Farm name Terry L. Snider Well number Tinker 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"	65'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	499'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2585'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15116'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6552'		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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	102 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	496 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	949 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	795 sx (Lead) 1196 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3774	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15116' MD, 6421' TVD (BHL), 6420' (Deepest Point Drilled) Loggers TD (ft) 15116' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5934'

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

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

API 47- 095 - 02375 Farm name Terry L. Snider Well number Tinker Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Marcellus	6402' (TOP) TVD	6619' (TOP) MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

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 7450 mcfpd Oil 85 bpd NGL --- bpd Water 425 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 Patterson - UTI Drilling Company LLC
 Address 207 Carlton Drive City Eighty Four State PA Zip 15330

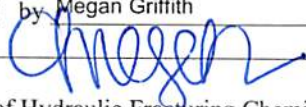
Logging Company Kodiak Services Int'l
 Address 2219 Sawdust Road, Unit 1604-1605 City The Woodlands State TX Zip 77380

Cementing Company BJ Services
 Address 1036 East Main Street City Bridgeport State WV Zip 26330

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

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Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223
Signature  Title Permitting Agent Date 8/20/2018

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

API 47-095-02375 Farm Name Terry L. Snider Well Number Tinker Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	11/25/2017	14845	15014	60	Marcellus
2	11/25/2017	14645	14814	60	Marcellus
3	11/26/2017	14445	14614	60	Marcellus
4	11/27/2017	14245	14414	60	Marcellus
5	11/28/2017	14045	14213	60	Marcellus
6	11/28/2017	13844	14013	60	Marcellus
7	11/29/2017	13644	13813	60	Marcellus
8	11/29/2017	13444	13613	60	Marcellus
9	11/29/2017	13244	13413	60	Marcellus
10	11/30/2017	13044	13213	60	Marcellus
11	12/1/2017	12844	13012	60	Marcellus
12	12/1/2017	12643	12812	60	Marcellus
13	12/1/2017	12443	12612	60	Marcellus
14	12/2/2017	12243	12412	60	Marcellus
15	12/3/2017	12043	12212	60	Marcellus
16	12/3/2017	11843	12012	60	Marcellus
17	12/4/2017	11643	11811	60	Marcellus
18	12/4/2017	11442	11611	60	Marcellus
19	12/4/2017	11242	11411	60	Marcellus
20	12/5/2017	11042	11211	60	Marcellus
21	12/5/2017	10842	11011	60	Marcellus
22	12/6/2017	10642	10811	60	Marcellus
23	12/7/2017	10442	10610	60	Marcellus
24	12/8/2017	10242	10410	60	Marcellus
25	12/10/2017	10041	10210	60	Marcellus
26	12/10/2017	9841	10010	60	Marcellus
27	12/12/2017	9641	9810	60	Marcellus
28	12/13/2017	9441	9610	60	Marcellus
29	12/15/2017	9241	9410	60	Marcellus
30	12/16/2017	9041	9209	60	Marcellus
31	12/17/2017	8840	9009	60	Marcellus
32	12/17/2017	8640	8809	60	Marcellus
33	12/18/2017	8440	8609	60	Marcellus
34	12/19/2017	8240	8409	60	Marcellus
35	12/20/2017	8040	8209	60	Marcellus
36	12/22/2017	7840	8008	60	Marcellus
37	12/23/2017	7639	7808	60	Marcellus
38	12/24/2017	7439	7608	60	Marcellus
39	12/26/2017	7239	7408	60	Marcellus
40	12/28/2017	7039	7208	60	Marcellus
41	12/30/2017	6839	7008	60	Marcellus
42	12/30/2017	6639	6807	60	Marcellus

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API 47-095-02375 Farm Name Terry L. Snider Well Number Tinker Unit 1H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	11/25/2017	70.4	7353		3159	10512	10552.2	N/A
2	11/25/2017	73.2	7297	6074	3365	16736	11016	N/A
3	11/26/2017	68.7	7397	5840	3713	16950	10742.7	N/A
4	11/27/2017	70.9	7289	6070	3654	17013	12337.4	N/A
5	11/28/2017	74.3	7051	5352	3572	15975	10686.7	N/A
6	11/28/2017	73.2	7320	5314	3714	16348	11586.9	N/A
7	11/29/2017	70.8	7285	5522	3695	16502	10762.5	N/A
8	11/29/2017	76.2	7406	5401	3902	16709	10477.7	N/A
9	11/29/2017	75.1	7260	5935	3913	17108	10361.2	N/A
10	11/30/2017	75	7161	5906	3796	16863	10245.6	N/A
11	12/1/2017	71.7	6848	5599	4108	16555	10103	N/A
12	12/1/2017	69.5	7111	6277	4175	17563	11027	N/A
13	12/1/2017	74.6	7086	5504	3938	16528	10336.6	N/A
14	12/2/2017	75	7022	5470	3953	16445	11541.7	N/A
15	12/3/2017	72.5	6821	5940	4089	16850	10647.2	N/A
16	12/3/2017	69.5	7017	5527	4028	16572	10454.1	N/A
17	12/4/2017	73.4	7084	5527	3818	16429	10612.9	N/A
18	12/4/2017	75.5	6995	5393	4296	16684	11248.6	N/A
19	12/4/2017	74.7	6764	5806	4009	16579	10347.7	N/A
20	12/5/2017	70.5	6764	5473	4107	16344	10356.8	N/A
21	12/5/2017	76.2	7089	5564	4032	16685	10555.6	N/A
22	12/6/2017	72.8	7204	5319	4169	16692	12270.4	N/A
23	12/7/2017	71.6	7570	5282	3836	16688	11863.6	N/A
24	12/8/2017	73.7	7025	5080	3857	15962	11508	N/A
25	12/10/2017	56.9	7473	5143	3919	16535	15151.6	N/A
26	12/10/2017	74.4	7022	5313	4004	16339	10041.1	N/A
27	12/12/2017	71.1	6717	5208	4128	16053	10162.2	N/A
28	12/13/2017	76	7354	5850	3791	16995	10284.4	N/A
29	12/15/2017	77.8	6956	5466	3798	16220	10276.4	N/A
30	12/16/2017	79.6	6953	5262	3828	16043	10495.2	N/A
31	12/17/2017	79.3	6733	5279	3834	15846	10274.7	N/A
32	12/17/2017	80.4	6904	5512	3981	16397	10331.4	N/A
33	12/18/2017	76.8	6862	5609	4045	16516	10653.8	N/A
34	12/19/2017	79.4	6785	5678	3907	16370	10504.9	N/A
35	12/20/2017	79.4	7039	6312	3784	17135	10659.4	N/A
36	12/22/2017	80.4	6889	5771	3819	16479	10635.2	N/A
37	12/23/2017	80.1	6684	6183	3937	16804	10623.1	N/A
38	12/24/2017	80.3	6816	5416	3730	15962	10504.8	N/A
39	12/26/2017	51.9	7241	6093	6000	19334	10396.6	N/A
40	12/28/2017	79.6	6602	5319	4141	16062	11631.1	N/A
41	12/30/2017	80	6233	5151	3907	15291	10942.4	N/A
42	12/30/2017	79.9	6369	6083	3707	16159	10856.8	N/A
	AVG=	74.1	7,020	5,605	3,932	689,837	456,067	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
Sandstone	0	N/A	0	N/A
Silty Sandstone	260	N/A	260	N/A
Shale w/trace Coal	560	N/A	560	N/A
Silty Sandstone	740	N/A	740	N/A
Limey Shale	880	N/A	880	N/A
Silty Shale w/trace Coal	1,080	N/A	1,080	N/A
Silty Sandstone	1,240	N/A	1,240	N/A
Silty Shale w/trace Coal	1,380	N/A	1,380	N/A
Silty Sandstone	1,520	N/A	1,520	N/A
Sandstone w/trace Coal	1,600	N/A	1,600	N/A
Silty Sandstone	1,680	N/A	1,680	N/A
Shale w/trace Coal	1,740	N/A	1,740	N/A
Silty Sandstone	1,840	N/A	1,840	N/A
Big Lime	2,016	N/A	2,017	N/A
Big Injun	2,154	N/A	2,156	N/A
Gantz Sand	2,558	N/A	2,559	N/A
Fifty Foot Sandstone	2,821	N/A	2,823	N/A
Gordon	2,933	N/A	2,934	N/A
Fifth Sandstone	3,213	N/A	3,215	N/A
Bayard	3,277	N/A	3,279	N/A
Warren	3,669	N/A	3,677	N/A
Speechley	4,020	N/A	4,038	N/A
Balltown	4,309	N/A	4,336	N/A
Bradford	4,694	N/A	4,731	N/A
Benson	5,028	N/A	5,076	N/A
Alexander	5,275	N/A	5,332	N/A
Rhinestreet	5,844	N/A	5,919	N/A
Sycamore	6,184	N/A	6,284	N/A
Middlesex	6,277	N/A	6,399	N/A
Burkett	6,370	N/A	6,546	N/A
Tully	6,393	N/A	6,597	N/A
Marcellus	6,402	N/A	6,619	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
 Field: Tyler
 Facility: Terry Snider Pad

Slot: Slot #09
 Well: Tinker Unit 1H
 Wellbore: Tinker Unit 1H PWB

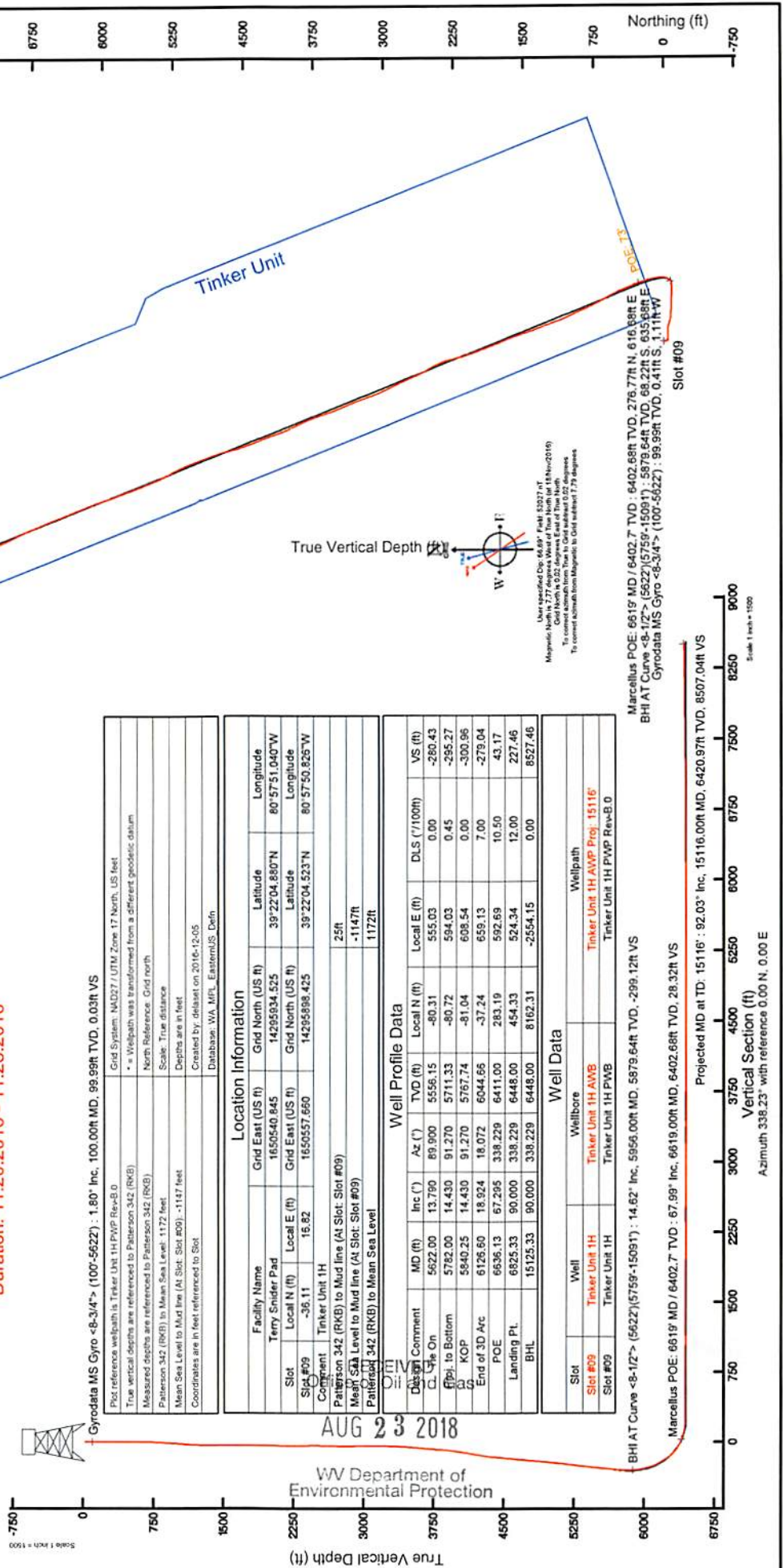


API: 47-095-02375-0000

BHI Job #: 8261509

Rig: Patterson 342

Duration: 11.20.2016 - 11.23.2016



Gyrodata MS Gyro <8-3/4" > (100°-5622Z) : 1.80° Inc, 100.00R MD, 99.99R TVD, 0.03R VS

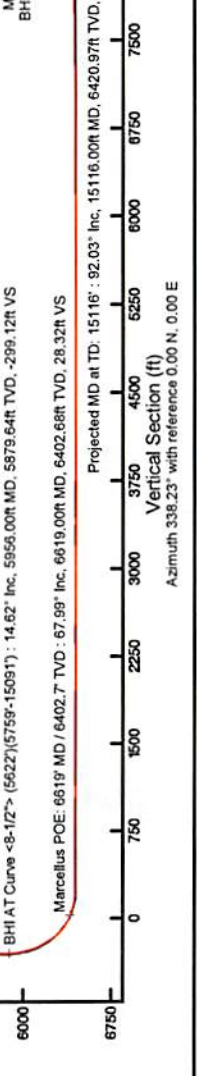
Plot reference wellpath is Tinker Unit 1H PWP Rev-B 0
 Grid System: NAD27 / UTM Zone 17 North, US feet
 * * Wellpath was transformed from a different geoidic datum

Measured depths are referenced to Patterson 342 (RKB)
 Patterson 342 (RKB) to Mean Sea Level: 1172 feet
 Mean Sea Level to Mud line (At Slot: Slot #09) : -1147 feet
 Depths are in feet
 Scale: True distance
 North Reference: Grid north
 Created by: default on 2016-12-05
 Database: WA_MPL_EasternUS_Dein

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Terry Snider Pad	1650540.845	14295034.525	80° 57' 51.040" W
Slot	Local N (ft)	Local E (ft)	Latitude
Slot #09	-36.11	16.82	39° 22' 04.880" N
Comment	Tinker Unit 1H		Longitude
Patterson 342 (RKB) to Mud line (At Slot: Slot #09)			80° 57' 50.826" W
Mean Sea Level to Mud line (At Slot: Slot #09)			
Patterson 342 (RKB) to Mean Sea Level			

Well Profile Data									
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)	
C. Use On	5622.00	13.790	89.900	5556.15	-80.31	555.03	0.00	-280.43	
Top to Bottom	5782.00	14.430	91.270	5711.33	-80.72	594.03	0.45	-295.27	
KOP	5840.25	14.430	91.270	5767.74	-81.04	608.54	0.00	-300.86	
End of 3D Arc	6126.60	18.924	16.072	6044.66	-37.24	659.13	7.00	-279.04	
POE	6636.13	67.295	338.229	6411.00	283.19	592.69	10.50	43.17	
Landing Pt.	6925.33	90.000	338.229	6448.00	454.33	524.34	12.00	227.46	
BHL	15125.33	90.000	338.229	6448.00	8162.31	-2554.15	0.00	8527.46	

Well Data		
Slot	Well	Wellbore
Slot #09	Tinker Unit 1H	Tinker Unit 1H AWP Proj: 15116'
Slot #09	Tinker Unit 1H	Tinker Unit 1H PWB Rev-B 0



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Azimuth 338.23° with reference 0.00 N, 0.00 E

Scale 1 inch = 1000



Actual Wellpath Report

Tinker Unit 1H AWP Proj: 15116'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Tyler County, WV	Well	Tinker Unit 1H
Field	Tyler	Wellbore	Tinker Unit 1H AWB
Facility	Terry Snider Pad		

REPORT SETUP INFORMATION			
Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Delaset
Scale	0.999600	Report Generated	05/Dec/2016 at 16:54
Convergence at slot	0.03° East	Database/Source file	WA_MPL_EasternUS_Defn/Tinker_Unit_1H_AWP_Proj_15116_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-36.11	16.82	1650557.66	14295898.43	39°22'04.523"N	80°57'50.826"W
Facility Reference Pt			1650540.85	14295934.53	39°22'04.880"N	80°57'51.040"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.301"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Patterson 342 (RKB) to Facility Vertical Datum	25.00ft
Horizontal Reference Pt	Slot	Patterson 342 (RKB) to Mean Sea Level	1172.00ft
Vertical Reference Pt	Patterson 342 (RKB)	Patterson 342 (RKB) to Mud Line at Slot (Slot #09)	25.00ft
MD Reference Pt	Patterson 342 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	338.23°

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Actual Wellpath Report

Tinker Unit 1H AWP Proj: 15116'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Tyler County, WV	Well	Tinker Unit 1H
Field	Tyler	Wellbore	Tinker Unit 1H AWB
Facility	Terry Snider Pad		

WELLPATH DATA (177 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
0.00	0.00	249.890	0.00	0.00	0.00	0.00	1650557.66	14295898.43	39°22'04.523"N	80°57'50.826"W	0.00	0.000	0.00	0.00	0.00	
25.00	0.000	249.890	25.00	0.00	0.00	0.00	1650557.66	14295898.43	39°22'04.523"N	80°57'50.826"W	0.00	0.000	0.00	0.00	0.00	
100.00	1.800	249.890	99.99	0.03	-0.41	-1.11	1650556.55	14295898.02	39°22'04.519"N	80°57'50.840"W	1.18	249.890	2.40	2.40	-146.81	Gyrodata MS Gyro <8-3/4"> (100'-5622')
200.00	1.060	252.270	199.96	0.14	-1.23	-3.46	1650554.20	14295897.20	39°22'04.511"N	80°57'50.870"W	3.67	250.489	0.74	-0.74	2.38	
300.00	0.510	253.490	299.95	0.25	-1.63	-4.77	1650552.89	14295896.79	39°22'04.507"N	80°57'50.887"W	5.04	251.081	0.55	-0.55	1.22	
400.00	0.240	201.580	399.94	0.14	-1.96	-5.27	1650552.39	14295896.47	39°22'04.504"N	80°57'50.893"W	5.62	249.649	0.41	-0.27	-51.91	
500.00	0.240	200.480	499.94	-0.17	-2.35	-5.42	1650552.24	14295896.08	39°22'04.500"N	80°57'50.895"W	5.91	246.600	0.00	0.00	-1.10	
600.00	0.530	219.380	599.94	-0.55	-2.90	-5.79	1650551.87	14295895.53	39°22'04.494"N	80°57'50.900"W	6.48	243.392	0.31	0.29	18.90	
700.00	1.440	181.660	699.93	-1.92	-4.51	-6.12	1650551.54	14295893.91	39°22'04.478"N	80°57'50.904"W	7.61	233.588	1.07	0.91	-37.72	
800.00	2.640	171.990	799.86	-5.31	-8.05	-5.84	1650551.83	14295890.38	39°22'04.443"N	80°57'50.900"W	9.94	215.937	1.24	1.20	-9.67	
900.00	3.650	155.940	899.71	-10.73	-13.24	-4.22	1650553.44	14295885.19	39°22'04.392"N	80°57'50.880"W	13.89	197.670	1.33	1.01	-16.05	
1000.00	4.400	147.390	999.46	-17.68	-19.38	-0.85	1650556.81	14295879.06	39°22'04.331"N	80°57'50.837"W	19.39	182.518	0.96	0.75	-8.55	
1100.00	4.630	142.360	1099.15	-25.33	-25.80	3.68	1650561.34	14295872.63	39°22'04.268"N	80°57'50.779"W	26.06	171.883	0.46	0.23	-5.03	
1200.00	3.250	134.780	1198.92	-31.81	-31.00	8.16	1650565.81	14295867.44	39°22'04.217"N	80°57'50.722"W	32.05	165.256	1.47	-1.38	-7.58	
1300.00	1.810	127.980	1298.82	-35.78	-33.97	11.41	1650569.07	14295864.47	39°22'04.187"N	80°57'50.681"W	35.83	161.425	1.47	-1.44	-6.80	
1400.00	0.340	93.310	1398.80	-37.27	-34.95	12.96	1650570.61	14295863.49	39°22'04.177"N	80°57'50.661"W	37.28	159.663	1.54	-1.47	-34.67	
1500.00	1.160	284.820	1498.79	-36.79	-34.71	12.27	1650569.93	14295863.73	39°22'04.180"N	80°57'50.670"W	36.82	160.528	1.49	0.82	-168.49	
1600.00	1.510	271.110	1598.76	-35.67	-34.43	9.98	1650567.63	14295864.01	39°22'04.183"N	80°57'50.699"W	35.84	163.839	0.47	0.35	-13.71	
1700.00	0.310	238.920	1698.75	-35.20	-34.54	8.43	1650566.08	14295863.90	39°22'04.182"N	80°57'50.719"W	35.56	166.288	1.26	-1.20	-32.19	
1800.00	0.940	85.950	1798.75	-35.50	-34.62	9.01	1650566.67	14295863.82	39°22'04.181"N	80°57'50.711"W	35.78	165.407	1.22	0.63	-152.97	
1900.00	2.400	71.840	1898.70	-35.88	-33.91	11.82	1650569.48	14295864.53	39°22'04.188"N	80°57'50.676"W	35.91	160.781	1.51	1.46	-14.11	
2000.00	2.510	81.190	1998.61	-36.50	-32.93	15.98	1650573.63	14295865.51	39°22'04.198"N	80°57'50.623"W	36.60	154.117	0.41	0.11	9.35	
2100.00	2.170	134.930	2098.54	-38.73	-33.93	19.48	1650577.13	14295864.51	39°22'04.188"N	80°57'50.578"W	39.12	150.136	2.14	-0.34	53.74	
2200.00	1.610	210.220	2198.50	-41.34	-36.48	20.11	1650577.77	14295861.96	39°22'04.162"N	80°57'50.570"W	41.66	151.128	2.35	-0.56	75.29	
2300.00	1.300	319.050	2298.48	-41.13	-36.84	18.66	1650576.32	14295861.60	39°22'04.159"N	80°57'50.589"W	41.29	153.131	2.37	-0.31	108.83	
2400.00	1.850	321.430	2398.44	-38.51	-34.72	16.91	1650574.57	14295863.72	39°22'04.180"N	80°57'50.611"W	38.62	154.026	0.55	0.55	2.38	
2500.00	2.230	226.760	2498.40	-37.68	-34.79	14.49	1650572.14	14295863.65	39°22'04.179"N	80°57'50.642"W	37.68	157.389	3.01	0.38	-94.67	
2600.00	2.470	203.320	2598.32	-39.91	-38.10	12.22	1650569.87	14295860.34	39°22'04.146"N	80°57'50.671"W	40.01	162.219	0.98	0.24	-23.44	
2700.00	2.040	199.290	2698.24	-42.78	-41.76	10.78	1650568.43	14295856.68	39°22'04.110"N	80°57'50.689"W	43.13	165.528	0.46	-0.43	-4.03	
2800.00	0.890	95.940	2798.22	-44.48	-43.52	10.96	1650568.62	14295854.92	39°22'04.093"N	80°57'50.687"W	44.88	165.862	2.41	-1.15	-103.35	

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Operator	Area	Field	Facility
ANTERO RESOURCES CORPORATION	Tyler County, WV	Tyler	Terry Snider Pad
Slot	Well	Wellbore	
Slot #09	Tinker Unit 1H	Tinker Unit 1H AWP	

WELLPATH DATA (177 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	ft	ft	
7096.00	89.350	6440.43	499.10	703.69	476.33	1650973.82	14296601.84	39°22'11.47"N	80°57'45.52"W	817.63	30.610	1.81	
7190.00	88.650	6442.07	592.74	787.75	374.31	1650931.82	14296685.86	39°22'12.30"N	80°57'46.05"W	872.16	25.415	3.26	
7285.00	90.520	6442.76	687.65	874.42	335.44	1650892.96	14296772.50	39°22'13.16"N	80°57'46.55"W	936.55	20.987	2.75	
7379.00	90.340	6442.05	781.50	959.74	296.01	1650853.55	14296857.78	39°22'14.00"N	80°57'47.05"W	1004.35	17.141	3.34	
7473.00	89.630	6442.08	875.35	1044.94	256.33	1650813.89	14296942.95	39°22'14.85"N	80°57'47.55"W	1075.92	13.783	3.07	
7567.00	89.630	6442.69	969.33	1131.83	220.50	1650778.07	14297029.81	39°22'15.70"N	80°57'48.03"W	1153.11	11.024	2.47	
7661.00	89.600	6443.32	1063.30	1219.93	187.71	1650745.30	14297117.86	39°22'16.57"N	80°57'48.43"W	1234.28	8.748	1.78	
7755.00	91.200	6442.81	1157.26	1308.14	155.26	1650712.86	14297206.04	39°22'17.45"N	80°57'48.84"W	1317.32	6.769	2.00	
7849.00	90.180	6441.82	1251.24	1395.92	121.65	1650679.26	14297293.78	39°22'18.31"N	80°57'49.27"W	1401.21	4.981	0.95	
7944.00	89.230	6442.31	1346.18	1485.26	89.38	1650647.00	14297383.09	39°22'19.20"N	80°57'49.68"W	1487.95	3.444	2.80	
8038.00	90.920	6442.19	1440.01	1574.48	59.79	1650617.42	14297472.27	39°22'20.08"N	80°57'50.05"W	1575.61	2.175	1.89	
8132.00	90.710	6440.85	1533.94	1662.74	27.53	1650585.18	14297560.50	39°22'20.95"N	80°57'50.45"W	1662.97	0.949	4.25	
8227.00	89.290	6440.85	1628.93	1750.52	-8.79	1650548.88	14297644.24	39°22'21.82"N	80°57'50.92"W	1750.54	359.712	1.72	
8321.00	89.660	6441.71	1722.92	1837.75	-43.78	1650513.90	14297735.44	39°22'22.68"N	80°57'51.37"W	1838.27	358.635	2.21	
8416.00	89.340	6441.71	1817.90	1926.75	-77.01	1650480.68	14297824.40	39°22'23.56"N	80°57'51.79"W	1928.29	357.711	1.05	
8510.00	88.920	6442.32	1911.88	2014.51	-110.67	1650447.04	14297912.13	39°22'24.43"N	80°57'52.22"W	2017.55	356.856	2.39	
8604.00	88.890	6444.12	2005.78	2102.97	-142.33	1650415.39	14298000.55	39°22'25.30"N	80°57'52.62"W	2107.79	356.128	4.58	
8698.00	89.600	6445.36	2099.22	2193.45	-167.74	1650389.98	14298090.99	39°22'26.20"N	80°57'52.95"W	2199.85	355.627	4.01	
8793.00	90.460	6445.31	2193.41	2285.52	-191.14	1650366.59	14298183.03	39°22'27.11"N	80°57'53.24"W	2293.50	355.219	1.27	
8887.00	91.020	6444.09	2287.11	2375.07	-219.57	1650338.18	14298272.54	39°22'27.98"N	80°57'53.61"W	2385.19	354.718	6.26	
8982.00	90.250	6443.04	2381.89	2461.23	-259.35	1650298.42	14298358.67	39°22'28.85"N	80°57'54.11"W	2474.86	353.985	8.96	
9076.00	89.750	6443.04	2475.00	-305.81	1650251.98	14298440.35	39°22'29.65"N	80°57'54.70"W	2561.27	353.143	1.38	-0.53	
9170.00	89.600	6443.57	2568.47	2626.15	-349.48	1650208.32	14298523.52	39°22'30.48"N	80°57'55.26"W	2649.30	352.420	5.37	
9264.00	89.750	6444.10	2662.40	2712.16	-387.38	1650170.44	14298609.50	39°22'31.33"N	80°57'55.74"W	2739.69	351.871	2.96	
9358.00	89.510	6444.71	2756.32	2798.01	-425.62	1650132.21	14298695.32	39°22'32.17"N	80°57'56.23"W	2830.20	351.351	3.46	
9452.00	89.610	6445.52	2850.10	-466.32	1650091.52	14298780.01	39°22'33.01"N	80°57'56.75"W	2920.22	350.811	0.06	-0.26	
9546.00	89.630	6446.22	2943.94	2967.89	-506.14	1650051.72	14298865.12	39°22'33.85"N	80°57'57.25"W	3010.73	350.322	1.34	0.13
9639.00	89.480	6446.94	3036.86	3052.79	-544.09	1650013.79	14298949.99	39°22'34.69"N	80°57'57.73"W	3100.90	349.894	0.79	-0.16
9733.00	89.540	6447.75	3130.84	3139.97	-579.19	1649978.71	14299037.13	39°22'35.55"N	80°57'58.18"W	3192.94	349.549	3.81	0.06
9828.00	89.720	6448.36	3225.77	3229.40	-611.22	1649946.69	14299126.53	39°22'36.44"N	80°57'58.59"W	3286.74	349.283	0.94	0.19

Turn Rate Comments

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Actual Wellpath Report

Tinker Unit 1H AWP Proj: 15116
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Operator	ANTERO RESOURCES CORPORATION
Area	Tyler County, WV
Field	Tyler
Facility	Terry Snider Pad
Slot	Slot #09
Well	Tinker Unit 1H
Wellbore	Tinker Unit 1H AWB

WELLPATH DATA (177 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	
(m)	(°)	(m)	(°)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(°)	(°)	(m)	(°)	(m)	(°/100ft)	(°/100ft)		
12749.00	90.520	6443.60	6142.79	5946.81	-1671.97	1648886.36	14301842.85	39°23'03.305"N	80°58'12.090"W	6177.38	344.296	1.28	0.16	1.27	0.00	0.00	0.00	12749.00	
12844.00	90.370	6442.86	6237.88	6036.61	-1702.96	1648855.39	14301932.61	39°23'04.192"N	80°58'12.484"W	6272.22	344.246	1.54	-0.16	1.54	0.00	0.00	0.00	12844.00	
12938.00	90.310	6442.50	6331.61	6124.99	-1734.94	1648823.42	14302020.95	39°23'05.056"N	80°58'12.891"W	6365.96	344.185	3.37	-0.06	3.37	0.00	0.00	0.00	12938.00	
13032.00	90.310	6441.79	6425.61	6212.41	-1769.49	1648788.88	14302108.34	39°23'05.930"N	80°58'13.330"W	6459.50	344.101	0.18	0.00	0.18	0.00	0.00	0.00	13032.00	
13126.00	90.310	6441.29	6519.61	6299.61	-1804.57	1648753.81	14302195.51	39°23'06.792"N	80°58'13.777"W	6552.98	344.015	0.56	0.00	0.56	0.00	0.00	0.00	13126.00	
13220.00	90.490	6440.63	6613.61	6386.79	-1839.72	1648718.67	14302282.65	39°23'07.654"N	80°58'14.224"W	6646.48	343.931	0.51	0.19	0.47	-0.56	0.00	0.00	13220.00	
13314.00	90.280	6440.00	6707.60	6474.11	-1874.53	1648683.89	14302369.93	39°23'08.517"N	80°58'14.667"W	6740.02	343.852	0.22	-0.22	0.02	0.02	0.00	0.00	13314.00	
13408.00	89.820	6439.92	6801.60	6561.68	-1908.69	1648649.73	14302457.47	39°23'09.383"N	80°58'15.102"W	6833.65	343.781	0.99	-0.49	0.86	0.00	0.00	0.00	13408.00	
13503.00	89.750	6440.27	6896.59	6649.69	-1944.42	1648614.02	14302545.45	39°23'10.253"N	80°58'15.557"W	6928.15	343.701	2.50	-0.07	-2.49	0.00	0.00	0.00	13503.00	
13597.00	89.880	6440.58	6990.56	6736.13	-1981.37	1648577.08	14302631.85	39°23'11.107"N	80°58'16.027"W	7021.49	343.609	0.32	0.14	0.29	0.00	0.00	0.00	13597.00	
13691.00	90.580	6440.20	7084.53	6822.55	-2018.34	1648540.13	14302718.23	39°23'11.961"N	80°58'16.497"W	7114.84	343.520	0.81	0.74	-0.32	0.00	0.00	0.00	13691.00	
13785.00	90.650	6439.19	7178.40	6908.00	-2057.49	1648501.00	14302803.65	39°23'12.806"N	80°58'16.995"W	7207.89	343.414	2.78	0.07	-2.78	0.00	0.00	0.00	13785.00	
13880.00	90.400	6438.32	7273.11	6993.18	-2099.53	1648458.98	14302888.80	39°23'13.648"N	80°58'17.531"W	7301.55	343.289	0.77	-0.26	-0.73	0.00	0.00	0.00	13880.00	
13974.00	90.430	6437.64	7366.92	7078.17	-2139.66	1648418.86	14302973.75	39°23'14.488"N	80°58'18.041"W	7394.50	343.180	2.83	0.03	2.83	0.00	0.00	0.00	13974.00	
14068.00	90.830	6436.60	7460.84	7164.04	-2177.89	1648380.64	14303059.59	39°23'15.337"N	80°58'18.528"W	7487.77	343.091	0.44	-0.11	-0.11	0.00	0.00	0.00	14068.00	
14162.00	90.580	6435.45	7554.73	7249.62	-2216.75	1648341.80	14303145.14	39°23'16.183"N	80°58'19.023"W	7580.97	342.998	0.83	-0.27	-0.79	0.00	0.00	0.00	14162.00	
14256.00	90.740	6434.36	7648.69	7336.57	-2252.39	1648306.17	14303232.04	39°23'17.042"N	80°58'19.476"W	7674.53	342.933	5.32	0.17	5.32	0.00	0.00	0.00	14256.00	
14350.00	90.920	6433.00	7742.66	7424.62	-2285.26	1648273.32	14303320.06	39°23'17.913"N	80°58'19.894"W	7768.36	342.892	1.46	-0.19	-1.45	0.00	0.00	0.00	14350.00	
14445.00	90.580	6431.76	7837.65	7512.94	-2320.24	1648238.35	14303408.34	39°23'18.786"N	80°58'20.340"W	7863.06	342.838	1.02	-0.36	-0.96	0.00	0.00	0.00	14445.00	
14539.00	90.680	6430.72	7931.64	7599.88	-2355.97	1648202.64	14303495.25	39°23'19.645"N	80°58'20.794"W	7956.68	342.777	0.61	-0.60	-0.60	0.00	0.00	0.00	14539.00	
14633.00	90.580	6429.69	8025.61	7687.58	-2389.73	1648168.89	14303582.92	39°23'20.512"N	80°58'21.224"W	8050.45	342.732	3.33	-0.11	3.33	0.00	0.00	0.00	14633.00	
14727.00	90.710	6428.63	8119.21	7777.55	-2416.84	1648141.79	14303672.85	39°23'21.401"N	80°58'21.569"W	8144.41	342.738	5.79	0.14	5.79	0.00	0.00	0.00	14727.00	
14821.00	90.740	6427.44	8212.46	7868.52	-2440.45	1648118.19	14303763.79	39°23'22.301"N	80°58'21.869"W	8238.29	342.769	1.06	0.03	-1.06	0.00	0.00	0.00	14821.00	
14915.00	91.350	6425.73	8306.16	7958.12	-2468.74	1648089.92	14303853.35	39°23'23.186"N	80°58'22.229"W	8332.25	342.765	5.29	0.65	-5.26	0.00	0.00	0.00	14915.00	
15010.00	90.860	6423.90	8401.12	8047.06	-2502.08	1648056.59	14303942.25	39°23'24.065"N	80°58'22.653"W	8427.07	342.728	1.29	-0.52	-1.18	0.00	0.00	0.00	15010.00	
15091.00	92.030	6421.85	8482.07	8122.91	-2530.41	1648028.26	14304018.07	39°23'24.815"N	80°58'23.014"W	8507.92	342.697	2.11	1.44	1.54	0.00	0.00	0.00	15091.00	Projected MD at TD: 15116'

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Tinker Unit 1H AWP Proj: 15116'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Tyler County, WV	Well	Tinker Unit 1H
Field	Tyler	Wellbore	Tinker Unit 1H AWB
Facility	Terry Snider Pad		

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Tinker Unit 1H POE - Rev-3	6411.00	283.19	592.69	1651150.11	14296181.50	39°22'07.320"N	80°57'43.278"W	point
Tinker Unit 1H BHL - Rev-3	6448.00	8162.31	-2554.15	1648004.54	14304057.46	39°23'25.205"N	80°58'23.316"W	point
Tinker Unit 1H LP - Rev-3	6448.00	454.33	524.34	1651081.79	14296352.58	39°22'09.011"N	80°57'44.147"W	point

WELLPATH COMPOSITION - Ref Wellbore: Tinker Unit 1H AWB Ref Wellpath: Tinker Unit 1H AWP Proj: 15116'					
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore	
25.00	5622.00	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <8-3/4">(100-5622')	Tinker Unit 1H AWB	
5622.00	15091.00	BHI AutoTrak Curve (Short)	02 AT Curve <8-1/2">(5622')(5759'-15091')	Tinker Unit 1H AWB	
15091.00	15116.00	Blind Drilling (std)	Projection to bit	Tinker Unit 1H AWB	

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Actual Wellpath Report

Tinker Unit 1H AWP Proj: 15116'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Tyler County, WV	Well	Tinker Unit 1H
Field	Tyler	Wellbore	Tinker Unit 1H AWB
Facility	Terry Snider Pad		

COMMENTS
<p>Wellpath general comments API: 47-095-02375-0000 BHI Job #: 8261509 Rig: Patterson 342 Duration: 11.20.2016 - 11.23.2016 Gyrodata MS Gyro <8-3/4"> (100'-5622') BHI AT Curve <8-1/2"> (5622')(5759'-15091') Middlesex: 639' MD Burkett: 6546' MD Tully: 6597' MD Marcellus POE: 6619' MD Projected MD at TD: 15116'</p>

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Office of Oil and Gas
AUG 23 2018
WV Department of
Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/25/2017
Job End Date:	1/2/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02375-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Tinker Unit 1H
Latitude:	39.36792200
Longitude:	-80.96411900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,448
Total Base Water Volume (gal):	19,588,957
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	88.17535	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.28848	

WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
MC MX 2-2822	Halliburton	Scale Inhibitor					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			

SP BREAKER	Halliburton	Breaker					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica, quartz	14808-60-7	100.00000	11.48376	
			Hydrochloric acid	7647-01-0	15.00000	0.03426	
			Inorganic salt	Proprietary	30.00000	0.02120	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.02120	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02120	
			Guar gum	9000-30-0	100.00000	0.01922	
			Methanol	67-56-1	60.00000	0.00413	
			Amines, polyethylenepoly-, ethoxylated, phosphonomethylated, sodium salts	70900-16-2	30.00000	0.00399	
			Glutaraldehyde	111-30-8	30.00000	0.00262	
			Sodium chloride	7647-14-5	5.00000	0.00066	
			Sodium persulfate	7775-27-1	100.00000	0.00057	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00044	
			Ethanol	64-17-5	1.00000	0.00009	
			Modified thiourea polymer	Proprietary	30.00000	0.00006	
			Ethoxylated alcohols	Proprietary	30.00000	0.00006	
			Fatty acids, tall oil	Proprietary	30.00000	0.00006	
			Olefins	Proprietary	5.00000	0.00002	
			Propargyl alcohol	107-19-7	10.00000	0.00002	
			Formaldehyde	50-00-0	0.09000	0.00001	

			Phosphoric acid	7664-38-2	0.10000	0.00001	
			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(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)