

ANTERO RESOURCES CORPORATION

Location: Ritchie County, WV
 Facility: Ritchie
 Slot: Slot #10
 Well: Christopher Unit 2H
 Wellbore: Christopher Unit 2H PWB

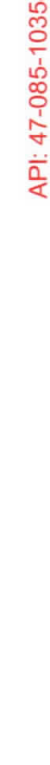
Grid System: MAD27 / UTM Zone 17 North, US feet
 North Reference: Grid north
 Scale: True distance
 Measured depths are referenced to H&P 317 (RKB)
 H&P 317 (RKB) to Mean Sea Level: 995.5 feet
 Mean Sea Level to Ground level (At Slot: Slot #10): -970 feet
 Coordinates are in feet referenced to Slot

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Lettie Pad	1666674.089	14294790.024	80°54'38.200"W
Slot	Local N (ft)	Grid North (US ft)	Longitude
Slot #10	-4.98	1666754.174	80°54'37.270"W
Comment	Christopher Unit 2H		
H&P 317 (RKB) to Ground level (At Slot: Slot #10)			25.5ft
Mean Sea Level to Ground level (At Slot: Slot #10)			-970ft
H&P 317 (RKB) to Mean Sea Level			995.5ft

Well Data			
Slot	Well	Wellbore	Wellpath
Slot #10	Christopher Unit 2H	Christopher Unit 2H AMB	Christopher Unit 2H AMB Proj. 17827
Slot #10	Christopher Unit 2H	Christopher Unit 2H PWB	Christopher Unit 2H PWB Rev.A.0

Well Profile Data			
Design Comment	MD (ft)	Az (°)	TVD (ft)
Tie On	6363.50	29.420	36.360
Proj. To Bottom	6435.50	33.290	21.460
End of 3D Arc	6652.43	35.572	5.800
POE	7154.63	74.770	340.241
Landing Pt.	7328.71	90.000	340.241
BHL	17834.11	90.000	340.241

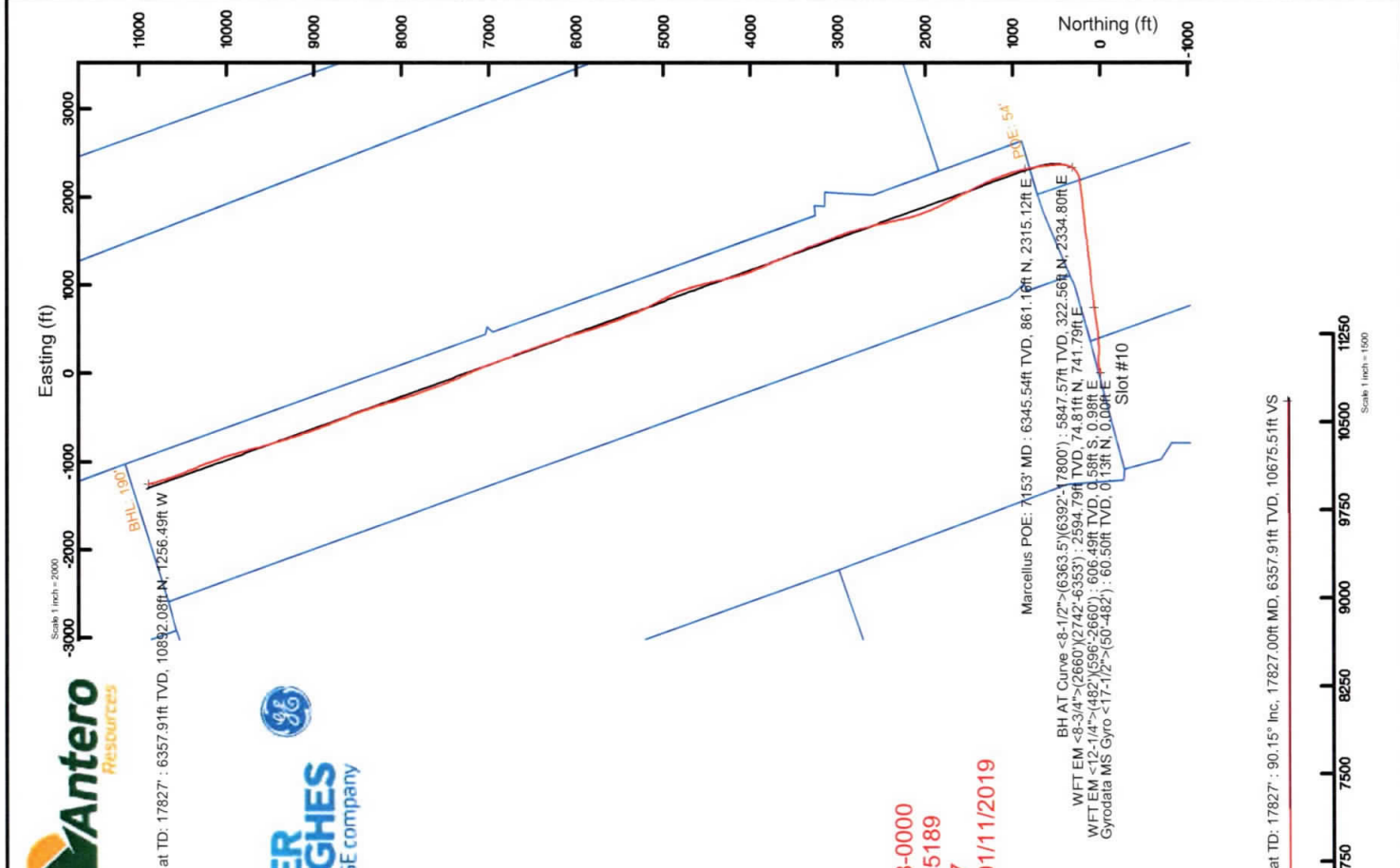
WFT EM <12-1/4">(482)596-2660 : 0.33° Inc, 606.50ft MD, 606.49ft TVD, -0.87ft VS
 Gyrodatta MS Gyro <17-1/2">(50-482) : 0.43° Inc, 60.50ft MD, 60.50ft TVD, 0.12R VS



Design Comment	MD (ft)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (7/100ft)	VS (ft)
Tie On	6363.50	29.420	36.360	310.80	2326.79	8.22	-494.15
Proj. To Bottom	6435.50	33.290	21.460	5884.45	343.49	2344.54	-460.38
End of 3D Arc	6652.43	35.572	5.800	6063.72	461.92	2372.76	-367.46
POE	7154.63	74.770	340.241	6348.00	854.70	2302.11	26.08
Landing Pt.	7328.71	90.000	340.241	6371.00	1016.61	2243.96	198.11
BHL	17834.11	90.000	340.241	6371.00	10993.45	-1307.63	10703.51

User specified (HDGM) Dip: 66.48° Field: 51826 nT
 Magnetic North is 7.66 degrees West of True North (at 17/2019)
 Grid North is 0.06 degrees East of True North
 To correct azimuth from True to Grid subtract 0.06 degrees
 To correct azimuth from Magnetic to Grid subtract 7.72 degrees

BH AT Curve <8-1/2">(6363.5)6392-17800 : 30.53° Inc, 6392.00ft MD, 5847.57ft TVD, -485.78ft VS
 Marcellus POE: 7153° MD : 72.38° Inc, 7153.00ft MD, 6345.54ft TVD, 27.76ft VS



Projected MD at TD: 17827 : 6357.91ft TVD, 10892.08ft LA, 1256.49ft W
 Scale: 1 inch = 2000

Projected MD at TD: 17827 : 90.15° Inc, 17827.00ft MD, 6357.91ft TVD, 10675.51ft VS
 Scale: 1 inch = 1500

API: 47-085-10358-0000
 BHI Job #: 109575189
 Rig: H&P 317
 Duration: 01/08/2019-01/11/2019





Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827
Page 1 of 12



REFERENCE WELLPATH IDENTIFICATION		
Operator	ANTERO RESOURCES CORPORATION	Slot #10
Area	Ritchie County, WV	Well
Field	Ritchie	Christopher Unit 2H
Facility	Lettie Pad	Christopher Unit 2H AWB

REPORT SETUP INFORMATION	
Projection System	NAD27 / UTM Zone 17 North, US feet
North Reference	Grid
Scale	0.999601
Convergence at slot	0.06° East
Software System	WellArchitect® 5.1
User	Delaset
Report Generated	1/17/2019 at 3:30:17 PM
Database/Source file	WA_MPL_EasternUS_Defn/Christopher_Unit_2H_AWP_Proj_17827_.xml

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-4.98	80.12	1665754.17	14294785.05	39°21'53.410"N	80°54'37.270"W
Facility Reference Pt			1665674.09	14294790.02	39°21'53.460"N	80°54'38.290"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	H&P 317 (RKB)
MD Reference Pt	H&P 317 (RKB)
Field Vertical Reference	Mean Sea Level
	H&P 317 (RKB) to Facility Vertical Datum
	H&P 317 (RKB) to Mean Sea Level
	H&P 317 (RKB) to Ground Level at Slot (Slot #10)
	Section Origin
	Section Azimuth
	25.50ft
	995.50ft
	25.50ft
	N 0.00, E 0.00 ft
	340.24°

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827
Page 2 of 12



REFERENCE WELLPATH IDENTIFICATION		Slot #10
Operator	ANTERO RESOURCES CORPORATION	Christopher Unit 2H
Area	Ritchie County, WV	Christopher Unit 2H AWB
Field	Ritchie	
Facility	Lettie Pad	

WELLPATH DATA (225 stations) † = interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
0.00†	0.000	0.730	0.00	0.00	0.00	0.00	1665754.17	14294785.05	39°21'53.410"N	80°54'37.270"W	0.00	0.000	0.00	0.00	0.00	
25.50	0.000	0.730	25.50	0.00	0.00	0.00	1665754.17	14294785.05	39°21'53.410"N	80°54'37.270"W	0.00	0.000	0.00	0.00	0.00	
60.50	0.430	0.730	60.50	0.12	0.13	0.00	1665754.18	14294785.18	39°21'53.411"N	80°54'37.270"W	0.13	0.730	1.23	1.23	2.08	Gyrodatta MS Gyro <17-1/2">(50'-482')
85.50	0.490	357.560	85.50	0.31	0.33	0.00	1665754.17	14294785.38	39°21'53.413"N	80°54'37.270"W	0.33	359.710	0.26	0.24	-12.68	
110.50	0.440	343.630	110.50	0.51	0.53	-0.03	1665754.14	14294785.58	39°21'53.415"N	80°54'37.270"W	0.53	356.412	0.49	-0.20	-55.72	
135.50	0.460	24.170	135.50	0.68	0.71	-0.02	1665754.15	14294785.76	39°21'53.417"N	80°54'37.270"W	0.71	358.457	1.25	0.08	162.16	
160.50	0.400	47.500	160.50	0.78	0.87	0.09	1665754.26	14294785.91	39°21'53.419"N	80°54'37.269"W	0.87	5.689	0.73	-0.24	93.32	
185.50	0.320	57.450	185.50	0.83	0.96	0.21	1665754.38	14294786.01	39°21'53.420"N	80°54'37.267"W	0.98	12.284	0.40	-0.32	39.80	
210.50	0.350	62.650	210.50	0.86	1.03	0.34	1665754.51	14294786.08	39°21'53.420"N	80°54'37.266"W	1.09	18.001	0.17	0.12	20.80	
235.50	0.250	70.170	235.50	0.87	1.09	0.46	1665754.63	14294786.13	39°21'53.421"N	80°54'37.264"W	1.18	22.707	0.43	-0.40	30.08	
260.50	0.100	80.400	260.50	0.87	1.11	0.53	1665754.70	14294786.16	39°21'53.421"N	80°54'37.263"W	1.23	25.441	0.61	-0.60	40.92	
285.50	0.190	183.250	285.50	0.82	1.07	0.55	1665754.72	14294786.12	39°21'53.421"N	80°54'37.263"W	1.20	27.036	0.93	0.36	41.40	
310.50	0.240	174.420	310.50	0.74	0.98	0.65	1665754.72	14294786.02	39°21'53.420"N	80°54'37.263"W	1.12	29.331	0.24	0.20	-35.32	
335.50	0.170	145.370	335.49	0.65	0.90	0.58	1665754.75	14294785.94	39°21'53.419"N	80°54'37.263"W	1.07	32.737	0.49	-0.28	-116.20	
360.50	0.170	168.520	360.49	0.58	0.83	0.60	1665754.78	14294785.88	39°21'53.418"N	80°54'37.262"W	1.03	36.094	0.27	0.00	92.60	
385.50	0.220	167.940	385.49	0.49	0.75	0.62	1665754.80	14294785.79	39°21'53.417"N	80°54'37.262"W	0.97	39.822	0.20	0.20	-2.32	
410.50	0.270	167.360	410.49	0.39	0.64	0.64	1665754.82	14294785.69	39°21'53.416"N	80°54'37.262"W	0.91	45.150	0.20	0.20	-2.32	
435.50	0.320	181.580	435.49	0.26	0.51	0.66	1665754.83	14294785.56	39°21'53.415"N	80°54'37.262"W	0.83	51.901	0.35	0.20	56.88	
460.50	0.370	172.420	460.49	0.12	0.36	0.66	1665754.84	14294785.41	39°21'53.414"N	80°54'37.262"W	0.76	61.262	0.30	0.20	-36.64	
485.50	0.450	171.770	485.49	-0.06	0.19	0.69	1665754.86	14294785.23	39°21'53.412"N	80°54'37.261"W	0.71	74.803	0.32	0.32	-2.60	
492.50	0.470	171.590	492.49	-0.11	0.13	0.70	1665754.87	14294785.18	39°21'53.411"N	80°54'37.261"W	0.71	79.313	0.29	0.29	-2.57	
606.50	0.330	138.340	606.49	-0.87	-0.58	0.98	1665755.16	14294784.47	39°21'53.404"N	80°54'37.257"W	1.14	120.353	0.23	-0.12	-29.17	WFT EM <12-1/4">(482')(596'-2660')
698.50	2.710	74.960	698.45	-1.30	-0.21	3.26	1665757.43	14294784.84	39°21'53.408"N	80°54'37.228"W	3.27	93.680	2.80	2.59	-68.89	
790.50	5.680	70.400	790.20	-1.49	1.88	9.65	1665763.82	14294786.93	39°21'53.429"N	80°54'37.147"W	9.83	78.964	3.25	3.23	-4.96	
885.50	9.080	68.320	884.40	-1.25	6.23	21.05	1665775.22	14294791.27	39°21'53.471"N	80°54'37.002"W	21.95	73.513	3.59	3.58	-2.19	
1033.50	11.840	77.090	1029.93	-2.67	13.94	46.71	1665800.86	14294798.98	39°21'53.547"N	80°54'36.675"W	48.74	73.384	2.15	1.86	5.93	
1128.50	14.550	80.210	1122.42	-5.90	18.15	67.97	1665822.12	14294803.18	39°21'53.589"N	80°54'36.404"W	70.35	75.053	2.95	2.85	3.28	
1223.50	16.670	80.970	1213.91	-10.51	22.31	93.19	1665847.33	14294807.35	39°21'53.630"N	80°54'36.083"W	95.82	76.534	2.24	2.23	0.80	
1318.50	18.400	84.590	1304.49	-16.76	25.87	121.58	1665875.70	14294810.90	39°21'53.664"N	80°54'35.722"W	124.30	77.989	2.15	1.82	3.81	
1413.50	22.460	90.800	1393.51	-26.85	27.03	154.67	1665908.78	14294812.06	39°21'53.676"N	80°54'35.300"W	157.01	80.088	4.84	4.27	6.54	

RECEIVED
Office of Oil and Gas
OCT 23 2019
WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827'

Page 3 of 12



REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Christopher Unit 2H
Field	Ritchie	Wellbore	Christopher Unit 2H AWB
Facility	Lettie Pad		

WELLPATH DATA (225 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
1507.50	26.430	94.160	1479.07	-41.65	25.26	193.50	1665947.60	14294810.29	39°21'53.658"N	80°54'34.806"W	195.14	82.563	4.47	4.22	3.57	
1602.50	26.260	91.660	1564.21	-57.90	23.12	235.60	1665989.68	14294808.15	39°21'53.636"N	80°54'34.270"W	236.73	84.396	1.18	-0.18	-2.63	
1697.50	26.200	88.930	1649.43	-72.29	22.90	277.57	1666031.64	14294807.94	39°21'53.634"N	80°54'33.736"W	278.52	85.284	1.27	-0.06	-2.87	
1792.50	27.370	86.960	1734.23	-85.30	24.45	320.35	1666074.40	14294809.48	39°21'53.648"N	80°54'33.191"W	321.28	85.636	1.55	1.23	-2.07	
1887.50	28.280	86.410	1818.25	-97.85	27.02	364.62	1666118.65	14294812.05	39°21'53.673"N	80°54'32.627"W	365.62	85.763	1.00	0.96	-0.58	
1981.50	28.400	84.970	1900.98	-109.73	30.37	409.11	1666163.12	14294815.40	39°21'53.706"N	80°54'32.061"W	410.24	85.755	0.74	0.13	-1.53	
2076.50	28.300	83.550	1984.59	-120.66	34.88	453.99	1666207.99	14294819.91	39°21'53.750"N	80°54'31.489"W	455.33	85.607	0.72	-0.11	-1.49	
2171.50	27.620	82.930	2068.50	-130.68	40.12	498.23	1666252.20	14294825.15	39°21'53.802"N	80°54'30.926"W	499.84	85.396	0.78	-0.72	-0.65	
2266.50	24.790	81.450	2153.73	-139.39	45.79	539.78	1666293.74	14294830.82	39°21'53.857"N	80°54'30.397"W	541.72	85.151	3.06	-2.98	-1.56	
2361.50	24.130	81.110	2240.20	-146.93	51.76	578.66	1666332.61	14294836.78	39°21'53.916"N	80°54'29.902"W	580.97	84.889	0.71	-0.69	-0.36	
2456.50	25.000	82.250	2326.60	-154.77	57.46	617.74	1666371.67	14294842.49	39°21'53.972"N	80°54'29.404"W	620.41	84.686	1.04	0.92	1.20	
2551.50	24.820	82.670	2412.77	-163.24	62.71	657.41	1666411.32	14294847.74	39°21'54.023"N	80°54'28.899"W	660.39	84.551	0.27	-0.19	0.44	
2645.50	24.940	81.970	2498.04	-171.51	68.00	696.60	1666450.49	14294853.02	39°21'54.075"N	80°54'28.400"W	699.91	84.425	0.34	0.13	-0.74	
2670.50	25.500	82.110	2520.66	-173.69	69.47	707.15	1666461.04	14294854.49	39°21'54.090"N	80°54'28.266"W	710.56	84.389	2.25	2.24	0.56	
2752.50	25.120	80.370	2594.79	-180.38	74.81	741.79	1666495.67	14294859.83	39°21'54.142"N	80°54'27.824"W	745.56	84.241	1.02	-0.46	-2.12	WFT EM <8-3/4">(2660)(2742'-6353')
2847.50	26.800	85.130	2680.21	-189.43	80.00	783.02	1666536.88	14294865.02	39°21'54.193"N	80°54'27.299"W	787.10	84.166	2.82	1.77	5.01	
2941.50	27.370	84.540	2763.90	-200.22	83.86	825.65	1666579.49	14294868.87	39°21'54.231"N	80°54'26.757"W	829.89	84.201	0.67	0.61	-0.63	
3042.50	27.990	82.970	2853.34	-211.17	88.97	872.28	1666626.11	14294873.98	39°21'54.281"N	80°54'26.163"W	876.81	84.176	0.95	0.61	-1.55	
3136.50	28.070	80.980	2936.32	-220.16	95.13	916.02	1666669.82	14294880.14	39°21'54.341"N	80°54'25.606"W	920.94	84.071	1.00	0.09	-2.12	
3231.50	27.980	81.600	3020.18	-228.71	101.89	960.14	1666713.93	14294886.90	39°21'54.407"N	80°54'25.044"W	965.53	83.942	0.32	-0.03	0.65	
3326.50	28.490	82.750	3103.87	-238.01	108.01	1004.66	1666758.43	14294893.01	39°21'54.467"N	80°54'24.477"W	1010.45	83.864	0.78	0.54	1.21	
3421.50	27.450	85.170	3187.78	-248.56	112.71	1048.96	1666802.71	14294897.71	39°21'54.513"N	80°54'23.913"W	1055.00	83.867	1.62	-1.09	2.55	
3515.50	25.800	86.460	3271.81	-259.85	115.80	1090.97	1666844.70	14294900.80	39°21'54.544"N	80°54'23.378"W	1097.10	83.941	1.86	-0.67	1.37	
3610.50	25.160	84.070	3357.57	-270.46	119.16	1131.69	1666885.41	14294904.16	39°21'54.576"N	80°54'22.860"W	1137.95	83.989	1.27	-0.67	-2.52	
3705.50	24.930	82.310	3443.64	-279.47	123.93	1171.62	1666925.32	14294908.92	39°21'54.623"N	80°54'22.351"W	1178.15	83.962	0.82	-0.24	-1.85	
3800.50	25.120	82.680	3529.72	-288.00	129.18	1211.46	1666965.15	14294914.17	39°21'54.675"N	80°54'21.844"W	1218.33	83.914	0.26	0.20	0.39	
3895.50	25.560	83.480	3615.58	-297.04	134.07	1251.82	1667005.49	14294919.07	39°21'54.723"N	80°54'21.330"W	1258.98	83.887	0.59	0.46	0.84	
3990.50	26.170	82.510	3701.06	-306.19	139.13	1292.96	1667046.61	14294924.12	39°21'54.772"N	80°54'20.806"W	1300.42	83.858	0.78	0.64	-1.02	
4084.50	26.820	82.390	3785.19	-315.05	144.64	1334.53	1667088.16	14294929.63	39°21'54.826"N	80°54'20.277"W	1342.34	83.814	0.69	0.63	-0.13	
4179.50	26.700	83.680	3870.02	-324.53	149.83	1376.98	1667130.60	14294934.82	39°21'54.877"N	80°54'19.736"W	1385.11	83.790	0.62	-0.13	1.36	

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827

Page 4 of 12



REFERENCE WELLPATH IDENTIFICATION		Slot	Slot #10
Operator	ANTERO RESOURCES CORPORATION	Well	Christopher Unit 2H
Area	Ritchie County, WV	Wellbore	Christopher Unit 2H AWB
Field	Ritchie		
Facility	Lettie Pad		

WELLPATH DATA (225 stations)																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
4274.50	26.610	85.100	3954.92	-334.94	154.00	1419.39	1667173.00	14294938.98	39°21'54.918"N	80°54'19.196"W	1427.72	83.808	0.68	-0.09	1.49	
4369.50	27.760	84.140	4039.43	-345.71	158.07	1462.60	1667216.19	14294943.06	39°21'54.958"N	80°54'18.646"W	1471.12	83.832	1.30	1.21	-1.01	
4464.50	27.470	82.620	4123.61	-355.73	163.15	1506.34	1667259.91	14294948.13	39°21'55.007"N	80°54'18.089"W	1515.15	83.819	0.80	-0.31	-1.60	
4558.50	27.030	81.140	4207.17	-364.41	169.22	1548.95	1667302.50	14294954.20	39°21'55.067"N	80°54'17.546"W	1558.16	83.765	0.86	-0.47	-1.57	
4653.50	27.380	82.150	4291.67	-373.00	175.53	1591.92	1667345.45	14294960.50	39°21'55.129"N	80°54'16.999"W	1601.56	83.708	0.61	0.37	1.06	
4748.50	26.470	84.030	4376.37	-382.56	180.71	1634.62	1667388.13	14294965.69	39°21'55.180"N	80°54'16.455"W	1644.57	83.691	1.31	-0.96	1.98	
4843.50	27.120	86.310	4461.17	-393.60	184.31	1677.28	1667430.78	14294969.28	39°21'55.215"N	80°54'15.912"W	1687.38	83.729	1.28	0.68	2.40	
4938.50	27.480	85.580	4545.59	-405.39	187.39	1720.74	1667474.23	14294972.36	39°21'55.245"N	80°54'15.359"W	1730.92	83.785	0.52	0.38	-0.77	
5033.50	27.340	84.460	4629.92	-416.55	191.19	1764.31	1667517.78	14294976.16	39°21'55.282"N	80°54'14.804"W	1774.64	83.815	0.56	-0.15	-1.18	
5128.50	27.250	83.580	4714.35	-426.93	195.73	1807.64	1667561.09	14294980.69	39°21'55.326"N	80°54'14.252"W	1818.20	83.820	0.44	-0.09	-0.93	
5223.50	26.620	82.080	4799.04	-436.31	201.09	1850.33	1667603.76	14294986.06	39°21'55.379"N	80°54'13.709"W	1861.23	83.798	0.98	-0.66	-1.58	
5318.50	26.410	82.870	4884.05	-445.30	206.65	1892.38	1667645.79	14294991.61	39°21'55.433"N	80°54'13.173"W	1903.63	83.768	0.43	-0.22	0.83	
5412.50	26.960	84.760	4968.04	-455.21	211.19	1934.34	1667687.74	14294996.15	39°21'55.478"N	80°54'12.639"W	1945.83	83.769	1.08	0.59	2.01	
5507.50	26.400	84.140	5052.92	-465.69	215.31	1976.80	1667730.18	14295000.27	39°21'55.518"N	80°54'12.098"W	1988.49	83.784	0.66	-0.59	-0.65	
5602.50	26.600	82.400	5137.94	-475.24	220.28	2018.89	1667772.25	14295005.24	39°21'55.567"N	80°54'11.562"W	2030.87	83.773	0.84	0.21	-1.83	
5697.50	26.280	81.190	5223.01	-483.71	226.31	2060.75	1667814.10	14295011.27	39°21'55.626"N	80°54'11.029"W	2073.14	83.733	0.66	-0.34	-1.27	
5792.50	26.490	82.670	5308.11	-492.27	232.24	2102.55	1667855.88	14295017.19	39°21'55.684"N	80°54'10.497"W	2115.34	83.697	0.73	0.22	1.56	
5887.50	26.580	83.610	5393.11	-501.74	237.31	2144.69	1667898.00	14295022.26	39°21'55.734"N	80°54'09.960"W	2157.77	83.686	0.45	0.09	0.99	
5982.50	26.740	83.500	5478.01	-511.56	242.09	2187.04	1667940.34	14295027.04	39°21'55.780"N	80°54'09.421"W	2200.40	83.683	0.18	0.17	-0.12	
6109.50	24.400	77.080	5592.88	-521.24	251.19	2241.02	1667994.29	14295036.14	39°21'55.870"N	80°54'08.734"W	2255.05	83.604	2.85	-1.84	-5.06	
6141.50	23.470	71.240	5621.83	-522.14	254.72	2253.49	1668006.76	14295039.67	39°21'55.904"N	80°54'08.575"W	2267.84	83.551	7.95	-2.91	-18.25	
6172.50	22.410	65.560	5650.38	-521.77	259.15	2264.72	1668017.99	14295044.09	39°21'55.948"N	80°54'08.432"W	2279.50	83.472	7.91	-3.42	-18.32	
6204.50	22.880	61.160	5679.92	-520.29	264.68	2275.72	1668028.98	14295049.62	39°21'56.003"N	80°54'08.292"W	2291.06	83.366	5.49	1.47	-13.75	
6236.50	23.840	56.100	5709.30	-517.73	271.29	2286.54	1668039.80	14295056.22	39°21'56.068"N	80°54'08.154"W	2302.58	83.234	6.95	3.00	-15.81	
6268.50	25.130	51.370	5738.42	-513.95	279.14	2297.22	1668050.47	14295064.07	39°21'56.145"N	80°54'08.018"W	2314.12	83.072	7.33	4.03	-14.78	
6299.50	26.410	45.160	5766.35	-508.89	288.11	2307.25	1668060.50	14295073.04	39°21'56.234"N	80°54'07.890"W	2325.17	82.882	9.63	4.13	-20.03	
6331.50	27.970	40.930	5794.81	-502.20	298.80	2317.22	1668070.46	14295083.72	39°21'56.339"N	80°54'07.633"W	2336.40	82.652	7.76	4.87	-13.22	
6363.50	29.420	36.360	5822.88	-494.15	310.80	2326.79	1668080.03	14295095.72	39°21'56.458"N	80°54'07.641"W	2347.46	82.392	8.22	4.53	-14.28	
6392.00	30.530	32.200	5847.57	-485.78	322.56	2334.80	1668088.04	14295107.48	39°21'56.574"N	80°54'07.539"W	2356.98	82.134	8.27	3.89	-14.60	BH AT Curve <8-1/2">(6363.5)(6392'-17800')
6439.00	33.240	25.080	5887.49	-469.28	344.34	2346.63	1668099.86	14295129.25	39°21'56.789"N	80°54'07.388"W	2371.76	81.652	9.85	5.77	-15.15	

RECEIVED
Office of Oil and Gas
OCT 23 2019
WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827'

Page 5 of 12



REFERENCE WELLPATH IDENTIFICATION

Operator	Slot #10
ANTERO RESOURCES CORPORATION	Christopher Unit 2H
Area	Ritchie County, WV
Field	Ritchie
Facility	Lettie Pad

WELLPATH DATA (225 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)	(US ft)	(US ft)	(°)	(°)	(ft)	(°)	(ft/100ft)	(ft/100ft)	(°/100ft)	
6487.00	33.760	17.050	5927.54	-449.27	369.02	2356.12	1668109.35	14295153.92	39°21'57.033"N	80°54'07.266"W	2384.85	81.099	9.29	1.08	-16.73	
6534.00	34.310	9.530	5966.51	-427.25	394.58	2362.15	1668115.37	14295179.47	39°21'57.286"N	80°54'07.189"W	2394.88	80.517	9.03	1.17	-16.00	
6581.00	34.960	3.120	6005.19	-403.28	421.10	2365.07	1668118.30	14295205.98	39°21'57.548"N	80°54'07.152"W	2402.27	79.904	7.87	1.38	-13.64	
6628.00	36.460	359.430	6043.36	-377.68	448.51	2365.67	1668118.89	14295233.38	39°21'57.819"N	80°54'07.144"W	2407.81	79.265	5.58	3.19	-7.85	
6676.00	37.920	358.330	6081.59	-350.19	477.52	2365.10	1668118.32	14295262.38	39°21'58.105"N	80°54'07.151"W	2412.82	78.585	3.34	3.04	-2.29	
6723.00	40.170	357.810	6118.09	-322.01	507.11	2364.10	1668117.32	14295291.95	39°21'58.398"N	80°54'07.163"W	2417.87	77.893	4.84	4.79	-1.11	
6771.00	43.650	355.920	6153.81	-291.29	539.11	2362.33	1668115.55	14295323.94	39°21'58.714"N	80°54'07.185"W	2423.06	77.144	7.71	7.25	-3.94	
6812.00†	47.679	354.819	6182.46	-262.98	568.34	2359.95	1668113.18	14295353.16	39°21'59.003"N	80°54'07.215"W	2427.42	76.460	10.01	9.83	-2.69	Middlesex: 6812' MD
6818.00	48.270	354.670	6186.48	-258.67	572.78	2359.54	1668112.77	14295357.59	39°21'59.411"N	80°54'07.220"W	2428.07	76.355	10.01	9.84	-2.49	
6866.00	52.700	354.050	6217.01	-222.76	609.62	2355.90	1668109.12	14295394.42	39°21'59.411"N	80°54'07.220"W	2433.49	75.492	9.28	9.23	-1.29	
6913.00	56.720	353.940	6244.16	-185.51	647.76	2351.88	1668105.11	14295432.55	39°21'59.788"N	80°54'07.317"W	2439.46	74.601	8.56	8.55	-0.23	
6961.00	60.230	353.340	6269.25	-145.71	688.42	2347.35	1668100.58	14295473.19	39°22'00.190"N	80°54'07.374"W	2446.21	73.655	7.39	7.31	-1.25	
6990.00†	62.429	352.003	6283.16	-120.87	713.65	2344.10	1668097.33	14295498.41	39°22'00.439"N	80°54'07.415"W	2450.33	73.067	8.59	7.58	-4.61	Burkett: 6990' MD
7008.00	63.800	351.200	6291.30	-105.13	729.53	2341.75	1668094.99	14295514.29	39°22'00.596"N	80°54'07.444"W	2452.76	72.696	8.59	7.62	-4.46	
7056.00	66.340	348.520	6311.54	-62.22	772.37	2334.08	1668087.32	14295557.11	39°22'01.020"N	80°54'07.542"W	2458.55	71.690	7.32	5.29	-5.58	
7075.00†	67.621	348.274	6318.97	-44.91	789.50	2330.56	1668083.80	14295574.23	39°22'01.189"N	80°54'07.586"W	2460.66	71.286	6.85	6.74	-1.29	Tully: 7075' MD
7103.00	69.510	347.920	6329.20	-19.09	815.00	2325.19	1668078.43	14295599.72	39°22'01.441"N	80°54'07.654"W	2463.88	70.684	6.85	6.75	-1.26	
7151.00	72.210	347.500	6344.94	25.87	859.30	2315.53	1668068.78	14295644.01	39°22'01.879"N	80°54'07.776"W	2469.84	69.640	5.69	5.62	-0.87	
7153.00†	72.384	347.449	6345.54	27.76	861.16	2315.12	1668068.37	14295645.86	39°22'01.898"N	80°54'07.782"W	2470.10	69.596	9.03	8.70	-2.54	Marcellus POE: 7153' MD
7198.00	76.300	346.330	6357.69	70.79	903.35	2305.29	1668058.54	14295688.04	39°22'02.315"N	80°54'07.906"W	2475.97	68.602	9.03	8.70	-2.48	
7246.00	81.470	344.270	6366.94	117.69	948.89	2293.34	1668046.59	14295733.56	39°22'02.765"N	80°54'08.058"W	2481.89	67.522	11.56	10.77	-4.29	
7293.00	86.860	344.120	6371.71	164.31	993.86	2280.61	1668033.87	14295778.51	39°22'03.210"N	80°54'08.219"W	2487.76	66.453	11.47	11.47	-0.32	
7341.00	90.770	343.910	6372.71	212.19	1039.99	2267.39	1668020.66	14295824.62	39°22'03.666"N	80°54'08.387"W	2494.52	65.360	8.16	8.15	-0.44	
7436.00	91.660	340.100	6370.69	307.10	1130.30	2238.06	1667991.33	14295914.90	39°22'04.559"N	80°54'08.759"W	2507.29	63.204	4.12	0.94	-4.01	
7453.00	92.920	337.350	6366.90	401.98	1218.75	2203.62	1667956.91	14296003.31	39°22'05.433"N	80°54'09.197"W	2518.19	61.054	3.18	1.33	-2.89	
7626.00	92.000	335.620	6362.82	496.69	1305.78	2165.75	1667919.06	14296090.30	39°22'06.294"N	80°54'09.677"W	2528.94	58.913	2.06	-0.97	-1.82	
7721.00	89.510	332.700	6361.57	591.13	1391.25	2124.36	1667877.68	14296175.74	39°22'07.139"N	80°54'10.203"W	2539.38	56.779	4.04	-2.62	-3.07	
7816.00	89.780	333.450	6362.15	685.38	1475.95	2081.34	1667834.68	14296260.41	39°22'07.976"N	80°54'10.750"W	2551.55	54.658	0.84	0.28	0.79	
7910.00	89.820	334.810	6362.48	778.85	1560.53	2040.32	1667793.68	14296344.95	39°22'08.813"N	80°54'11.271"W	2568.69	52.590	1.45	0.04	1.45	
8005.00	89.660	332.790	6362.91	873.24	1645.76	1998.38	1667751.76	14296430.15	39°22'09.656"N	80°54'11.804"W	2588.84	50.527	2.13	-0.17	-2.13	

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827

Page 6 of 12



REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot #10
Area	Ritchie County, WV	Christopher Unit 2H
Field	Ritchie	Christopher Unit 2H AWB
Facility	Lettie Pad	

WELLPATH DATA (225 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
8100.00	89.720	332.300	6363.43	967.38	1730.06	1954.59	1667707.97	14296514.42	39°22'10.489"N	80°54'12.360"W	2610.27	48.487	0.52	0.06	-0.52	
8195.00	89.050	333.220	6384.45	1061.57	1814.52	1911.11	1667664.51	14296598.84	39°22'11.325"N	80°54'12.913"W	2635.30	46.485	1.20	-0.71	0.97	
8290.00	88.460	336.100	6366.51	1156.09	1900.35	1870.46	1667623.88	14296684.64	39°22'12.173"N	80°54'13.429"W	2666.45	44.546	3.09	-0.62	3.03	
8384.00	88.920	338.320	6388.66	1249.92	1986.98	1834.06	1667587.50	14296771.23	39°22'13.030"N	80°54'13.892"W	2704.05	42.708	2.41	0.49	2.36	
8479.00	88.120	340.800	6371.12	1344.88	2075.97	1800.90	1667554.35	14296860.18	39°22'13.910"N	80°54'14.313"W	2748.25	40.942	2.74	-0.84	2.61	
8574.00	89.450	343.910	6373.13	1439.78	2166.46	1772.11	1667525.58	14296950.64	39°22'14.804"N	80°54'14.678"W	2798.92	39.282	3.56	1.40	3.27	
8669.00	89.600	347.700	6373.92	1534.31	2258.54	1748.82	1667502.29	14297042.68	39°22'15.715"N	80°54'14.973"W	2856.47	37.751	3.99	0.16	3.98	
8763.00	91.200	349.310	6373.26	1627.32	2350.65	1730.09	1667483.57	14297134.75	39°22'16.625"N	80°54'15.211"W	2918.69	36.353	2.41	1.70	1.71	
8858.00	89.380	346.610	6372.78	1721.45	2443.55	1710.28	1667463.76	14297227.61	39°22'17.544"N	80°54'15.462"W	2982.61	34.989	3.43	-1.92	-2.84	
8953.00	89.780	346.260	6373.48	1815.89	2535.89	1688.00	1667441.49	14297319.92	39°22'18.457"N	80°54'15.744"W	3046.32	33.649	0.56	0.42	-0.37	
9048.00	90.860	346.750	6372.95	1910.32	2628.27	1665.83	1667419.33	14297412.26	39°22'19.370"N	80°54'16.025"W	3111.71	32.367	1.25	1.14	0.52	
9143.00	89.820	345.580	6372.38	2004.81	2720.51	1643.11	1667396.63	14297504.46	39°22'20.282"N	80°54'16.313"W	3178.20	31.131	1.65	-1.09	-1.23	
9237.00	89.940	344.490	6372.58	2098.48	2811.32	1618.84	1667372.36	14297595.23	39°22'21.179"N	80°54'16.621"W	3244.09	29.935	1.17	0.13	-1.16	
9332.00	89.570	341.330	6372.99	2193.36	2902.11	1590.92	1667344.46	14297685.99	39°22'22.077"N	80°54'16.975"W	3309.57	28.731	3.35	-0.39	-3.33	
9427.00	89.720	338.410	6373.57	2288.35	2991.29	1558.23	1667311.78	14297775.14	39°22'22.959"N	80°54'17.390"W	3372.82	27.516	3.08	0.16	-3.07	
9521.00	89.540	339.450	6374.18	2382.32	3079.01	1524.44	1667278.00	14297862.82	39°22'23.826"N	80°54'17.819"W	3435.72	26.340	1.12	-0.19	1.11	
9616.00	89.630	340.260	6374.87	2477.32	3168.19	1491.72	1667245.30	14297951.97	39°22'24.708"N	80°54'18.235"W	3501.81	25.213	0.86	0.09	0.85	
9711.00	90.030	340.260	6375.15	2572.31	3257.61	1459.64	1667213.23	14298041.35	39°22'25.592"N	80°54'18.642"W	3569.67	24.136	0.42	0.42	0.00	
9806.00	90.090	338.820	6375.05	2667.31	3346.61	1426.43	1667180.03	14298130.32	39°22'26.472"N	80°54'19.064"W	3637.93	23.085	1.52	0.06	-1.52	
9901.00	89.600	336.740	6375.31	2762.21	3434.55	1390.51	1667144.12	14298218.22	39°22'27.342"N	80°54'19.520"W	3705.36	22.041	2.25	-0.52	-2.19	
9995.00	90.030	337.740	6375.61	2856.08	3521.23	1354.14	1667107.77	14298304.87	39°22'28.199"N	80°54'19.982"W	3772.64	21.035	1.16	0.46	1.06	
10090.00	90.460	338.000	6375.21	2951.00	3609.23	1318.36	1667072.00	14298392.83	39°22'29.069"N	80°54'20.437"W	3842.48	20.066	0.53	0.45	0.27	
10185.00	91.350	337.110	6373.71	3045.88	3697.02	1282.09	1667035.75	14298480.59	39°22'29.937"N	80°54'20.897"W	3913.02	19.126	1.32	0.94	-0.94	
10279.00	88.800	335.690	6373.58	3139.66	3783.15	1244.46	1666998.14	14298566.68	39°22'30.789"N	80°54'21.375"W	3982.58	18.209	3.10	-2.71	-1.51	
10374.00	89.880	337.100	6374.68	3234.44	3870.79	1206.43	1666960.12	14298653.69	39°22'31.649"N	80°54'21.858"W	4053.87	17.313	1.87	1.14	1.48	
10469.00	89.850	338.960	6374.90	3329.36	3958.29	1170.89	1666924.59	14298741.75	39°22'32.520"N	80°54'22.310"W	4127.84	16.479	1.96	-0.03	1.96	
10564.00	89.880	340.720	6375.12	3424.35	4047.47	1138.15	1666891.86	14298830.89	39°22'33.402"N	80°54'22.726"W	4204.45	15.706	1.85	0.03	1.85	
10659.00	89.820	342.560	6375.37	3519.32	4137.63	1108.22	1666861.95	14298921.01	39°22'34.293"N	80°54'23.105"W	4283.47	14.994	1.94	-0.06	1.94	
10754.00	89.820	345.640	6375.67	3614.09	4228.98	1082.20	1666835.94	14299012.33	39°22'35.197"N	80°54'23.436"W	4365.25	14.354	3.24	0.00	3.24	
10849.00	90.090	348.470	6375.75	3708.41	4321.56	1060.92	1666814.67	14299104.87	39°22'36.112"N	80°54'23.705"W	4449.88	13.793	2.99	0.28	2.98	

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827'

Page 7 of 12



REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #10
ANTERO RESOURCES CORPORATION		Christopher Unit 2H
Area	Well	Christopher Unit 2H AWP
Field	Wellbore	
Facility		

WELLPATH DATA (225 stations)

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
10944.00	90.950	347.510	6374.88	3802.54	4414.47	1041.15	1666794.91	14299197.75	39°22'37.030"N	80°54'23.956"W	4535.59	13.271	1.36	0.91	-1.01	
11038.00	88.920	345.270	6374.99	3895.99	4505.82	1019.04	1666772.80	14299289.06	39°22'37.933"N	80°54'24.236"W	4619.62	12.744	3.22	-2.16	-2.38	
11133.00	89.850	346.450	6376.01	3990.52	4597.93	995.83	1666749.61	14299381.14	39°22'38.844"N	80°54'24.531"W	4704.54	12.221	1.58	0.98	1.24	
11228.00	90.000	343.320	6376.14	4085.20	4689.64	971.06	1666724.85	14299472.80	39°22'39.751"N	80°54'24.845"W	4789.12	11.699	3.30	0.16	-3.29	
11323.00	90.030	340.410	6376.11	4180.15	4779.91	941.50	1666695.29	14299563.04	39°22'40.643"N	80°54'25.220"W	4871.75	11.143	3.06	0.03	-3.06	
11417.00	89.820	337.370	6376.23	4274.11	4867.59	907.65	1666661.46	14299650.68	39°22'41.510"N	80°54'25.650"W	4951.49	10.562	3.24	-0.22	-3.23	
11512.00	89.970	333.610	6376.41	4368.77	4954.01	868.24	1666622.07	14299737.07	39°22'42.365"N	80°54'26.151"W	5029.52	9.941	3.96	0.16	-3.96	
11607.00	89.320	332.330	6377.00	4463.00	5038.63	825.07	1666578.91	14299821.66	39°22'43.201"N	80°54'26.699"W	5105.74	9.300	1.51	-0.68	-1.35	
11702.00	89.910	332.360	6377.63	4557.10	5122.78	780.98	1666534.84	14299905.77	39°22'44.034"N	80°54'27.260"W	5181.97	8.668	0.62	0.62	0.03	
11797.00	90.090	332.710	6377.63	4651.24	5207.07	737.16	1666491.04	14300000.00	39°22'44.867"N	80°54'27.817"W	5258.99	8.058	0.41	0.19	0.37	
11892.00	89.940	336.460	6377.61	4745.76	5292.86	696.40	1666450.29	14300075.78	39°22'45.715"N	80°54'28.335"W	5338.48	7.496	3.95	-0.16	3.95	
11986.00	90.120	338.780	6377.56	4839.66	5379.77	660.61	1666414.52	14300162.66	39°22'46.575"N	80°54'28.789"W	5420.18	7.001	2.48	0.19	2.47	
12081.00	90.090	338.560	6377.39	4934.62	5468.27	626.06	1666379.98	14300251.12	39°22'47.450"N	80°54'29.228"W	5503.99	6.531	0.23	-0.03	-0.23	
12176.00	89.630	338.660	6377.62	5029.58	5556.72	591.41	1666345.35	14300339.54	39°22'48.324"N	80°54'29.668"W	5588.11	6.075	0.50	-0.48	0.11	
12271.00	90.060	341.080	6377.88	5124.57	5645.91	558.72	1666312.67	14300428.69	39°22'49.206"N	80°54'30.083"W	5673.49	5.652	2.59	0.45	2.55	
12366.00	90.150	341.460	6377.70	5219.56	5735.88	528.21	1666282.17	14300518.63	39°22'50.096"N	80°54'30.471"W	5760.15	5.261	0.41	0.09	0.40	
12461.00	90.090	342.300	6377.50	5314.52	5826.17	498.67	1666252.64	14300608.88	39°22'50.988"N	80°54'30.846"W	5847.47	4.892	0.89	-0.06	0.88	
12556.00	90.060	343.930	6377.38	5408.39	5916.11	471.37	1666225.35	14300698.79	39°22'51.878"N	80°54'31.192"W	5934.86	4.555	1.73	-0.03	1.73	
12650.00	90.060	343.460	6377.28	5503.22	6007.29	444.69	1666198.69	14300789.93	39°22'52.779"N	80°54'31.531"W	6023.73	4.234	0.49	0.00	-0.49	
12745.00	90.000	343.280	6377.23	5598.08	6098.32	417.51	1666171.51	14300880.92	39°22'53.679"N	80°54'31.876"W	6112.59	3.917	0.20	-0.06	-0.19	
12840.00	90.030	342.550	6377.21	5692.98	6189.13	389.60	1666143.61	14300971.69	39°22'54.577"N	80°54'32.230"W	6201.38	3.602	0.77	0.03	-0.77	
12935.00	90.060	340.200	6377.13	5787.95	6279.14	359.26	1666113.29	14301061.67	39°22'55.467"N	80°54'32.615"W	6289.41	3.275	2.47	0.03	-2.47	
13030.00	90.400	340.280	6376.75	5882.95	6368.55	327.14	1666081.18	14301151.04	39°22'56.351"N	80°54'33.023"W	6376.95	2.941	0.37	0.36	0.08	
13125.00	90.460	340.820	6376.04	5977.95	6458.12	295.51	1666049.56	14301240.58	39°22'57.236"N	80°54'33.425"W	6464.88	2.620	0.57	0.06	0.57	
13219.00	91.570	341.430	6374.37	6071.92	6547.05	265.10	1666019.17	14301329.47	39°22'58.116"N	80°54'33.811"W	6552.42	2.319	1.35	1.18	0.65	
13314.00	90.710	338.260	6372.48	6166.88	6636.21	232.38	1665986.46	14301418.59	39°22'58.997"N	80°54'34.227"W	6640.27	2.006	3.46	-0.91	-3.34	
13409.00	90.370	339.540	6371.59	6261.85	6724.83	198.18	1665952.28	14301507.18	39°22'59.873"N	80°54'34.661"W	6727.75	1.688	1.39	-0.36	1.35	
13504.00	89.940	339.820	6371.33	6356.85	6813.92	165.19	1665919.30	14301596.23	39°23'00.754"N	80°54'35.080"W	6815.92	1.389	0.54	-0.45	0.29	
13598.00	90.000	339.870	6371.38	6450.84	6902.16	132.81	1665886.93	14301684.44	39°23'01.627"N	80°54'35.491"W	6903.44	1.102	0.08	0.06	0.05	
13693.00	89.970	339.310	6371.40	6545.84	6991.20	99.68	1665853.81	14301773.44	39°23'02.507"N	80°54'35.912"W	6991.91	0.817	0.59	-0.03	-0.59	

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827'



REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Christopher Unit 2H
Field	Ritchie	Wellbore	Christopher Unit 2H AWB
Facility	Lettie Pad		

WELLPATH DATA (225 stations)

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
13788.00	90.920	338.430	6370.66	6640.81	7079.31	65.43	1665819.58	14301862.01	39°23'03.383"N	80°54'36.347"W	7080.11	0.530	1.36	1.00	-0.93	
13883.00	91.230	336.700	6368.88	6735.68	7167.60	29.18	1665783.35	14301949.77	39°23'04.251"N	80°54'36.808"W	7167.66	0.233	1.85	0.33	-1.82	
13977.00	90.340	335.400	6367.59	6829.42	7253.49	-8.97	1665745.21	14302035.63	39°23'05.101"N	80°54'37.293"W	7253.50	359.929	1.68	-0.95	-1.38	
14072.00	89.940	335.520	6367.36	6924.09	7339.91	-48.43	1665705.77	14302122.01	39°23'05.955"N	80°54'37.794"W	7340.07	359.622	0.44	-0.42	0.13	
14166.00	89.820	337.540	6367.56	7017.89	7426.13	-85.86	1665668.35	14302208.20	39°23'06.808"N	80°54'38.270"W	7426.63	359.338	2.15	-0.13	2.15	
14261.00	89.970	340.420	6367.73	7112.85	7514.80	-119.93	1665634.29	14302296.83	39°23'07.684"N	80°54'38.702"W	7515.76	359.086	3.04	0.16	3.03	
14356.00	91.260	341.300	6366.71	7207.84	7604.54	-151.08	1665603.16	14302386.53	39°23'08.571"N	80°54'39.098"W	7606.04	358.862	1.64	1.36	0.93	
14451.00	90.180	339.220	6365.52	7302.82	7693.94	-183.16	1665571.09	14302475.90	39°23'09.455"N	80°54'39.505"W	7696.12	358.636	2.47	-1.14	-2.19	
14546.00	89.910	339.700	6365.45	7397.81	7782.90	-216.49	1665537.77	14302564.83	39°23'10.335"N	80°54'39.929"W	7785.91	358.407	0.58	-0.28	0.51	
14641.00	89.910	341.080	6365.59	7492.81	7872.39	-248.38	1665505.90	14302654.28	39°23'11.220"N	80°54'40.334"W	7876.31	358.193	1.45	0.00	1.45	
14736.00	89.910	342.660	6365.74	7587.77	7962.87	-277.94	1665476.35	14302744.52	39°23'12.112"N	80°54'40.709"W	7967.52	358.001	1.66	0.00	1.66	
14831.00	90.180	343.330	6365.67	7682.66	8053.52	-305.72	1665448.58	14302835.33	39°23'13.010"N	80°54'41.062"W	8059.32	357.826	0.76	0.28	0.71	
14926.00	89.940	344.410	6365.57	7777.47	8144.78	-332.11	1665422.20	14302926.55	39°23'13.913"N	80°54'41.397"W	8151.54	357.665	1.16	-0.25	1.14	
15020.00	90.180	342.570	6365.47	7871.31	8234.90	-358.82	1665395.49	14303016.64	39°23'14.804"N	80°54'41.736"W	8242.71	357.505	1.97	0.26	-1.96	
15115.00	90.430	340.640	6364.97	7966.28	8325.04	-388.80	1665365.53	14303106.74	39°23'15.695"N	80°54'42.117"W	8334.11	357.326	2.05	0.26	-2.03	
15210.00	89.850	341.850	6364.73	8061.26	8414.99	-419.34	1665335.00	14303196.66	39°23'16.584"N	80°54'42.505"W	8425.43	357.147	1.41	-0.61	1.27	
15305.00	90.460	340.460	6364.48	8156.25	8504.89	-450.03	1665304.33	14303286.53	39°23'17.473"N	80°54'42.894"W	8516.79	356.971	1.60	0.64	-1.46	
15400.00	90.400	338.730	6363.76	8251.24	8593.93	-483.15	1665271.22	14303375.53	39°23'18.353"N	80°54'43.315"W	8607.50	356.782	1.82	-0.06	-1.82	
15495.00	90.430	337.900	6363.08	8346.18	8682.20	-518.25	1665236.13	14303463.76	39°23'19.226"N	80°54'43.761"W	8697.66	356.584	0.87	0.03	-0.87	
15589.00	89.820	338.960	6362.87	8440.13	8769.62	-552.81	1665201.59	14303551.14	39°23'20.090"N	80°54'44.200"W	8787.02	356.393	1.30	-0.65	1.13	
15684.00	89.320	338.910	6363.58	8535.10	8858.27	-586.95	1665167.46	14303639.76	39°23'20.967"N	80°54'44.634"W	8877.69	356.209	0.53	-0.53	-0.05	
15779.00	89.540	340.320	6364.53	8630.09	8947.31	-620.04	1665134.38	14303728.77	39°23'21.847"N	80°54'45.054"W	8968.77	356.036	1.50	0.23	1.48	
15874.00	89.450	341.820	6365.37	8725.07	9037.17	-650.86	1665103.58	14303818.59	39°23'22.736"N	80°54'45.445"W	9060.57	355.881	1.58	-0.09	1.58	
15969.00	89.510	339.910	6366.23	8820.06	9126.91	-682.00	1665072.45	14303908.29	39°23'23.623"N	80°54'45.841"W	9152.35	355.727	2.01	0.06	-2.01	
16064.00	90.370	341.950	6366.38	8915.05	9216.69	-713.03	1665041.43	14303998.04	39°23'24.511"N	80°54'46.235"W	9244.23	355.576	2.31	0.84	2.15	
16159.00	90.340	342.970	6365.84	9009.97	9307.27	-741.66	1665012.81	14304088.58	39°23'25.406"N	80°54'46.599"W	9336.77	355.444	1.07	0.03	1.07	
16254.00	90.280	342.990	6365.32	9104.86	9398.11	-769.47	1664985.01	14304179.38	39°23'26.304"N	80°54'46.952"W	9429.56	355.319	0.07	-0.06	0.02	
16349.00	90.280	343.470	6364.86	9199.73	9489.07	-796.88	1664957.62	14304270.30	39°23'27.204"N	80°54'47.300"W	9522.47	355.200	0.51	0.00	0.51	
16443.00	90.340	344.200	6364.35	9293.54	9579.35	-823.05	1664931.46	14304360.55	39°23'28.096"N	80°54'47.632"W	9614.64	355.089	0.78	0.06	0.78	
16538.00	90.370	344.910	6363.76	9388.27	9670.91	-848.35	1664906.17	14304452.08	39°23'29.001"N	80°54'47.953"W	9708.05	354.987	0.75	0.03	0.75	

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827
Page 9 of 12



REFERENCE WELLPATH IDENTIFICATION

Operator	Slot #10
ANTERO RESOURCES CORPORATION	Christopher Unit 2H
Area	Well
Ritchie County, WV	Christopher Unit 2H AWB
Field	Wellbore
Ritchie	
Facility	Lettie Pad

WELLPATH DATA (225 stations)

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
16633.00	90.310	345.130	6363.20	9482.94	9762.68	-872.90	1664881.62	14304543.81	39°23'29.909"N	80°54'48.265"W	9801.63	354.891	0.24	-0.06	0.23	
16728.00	90.340	344.910	6362.66	9577.61	9854.45	-897.46	1664857.08	14304635.55	39°23'30.816"N	80°54'48.576"W	9895.24	354.796	0.23	0.03	-0.23	
16823.00	90.340	344.030	6362.10	9672.35	9945.98	-922.89	1664831.65	14304727.04	39°23'31.721"N	80°54'48.899"W	9988.71	354.699	0.93	0.00	-0.93	
16917.00	90.250	341.810	6361.61	9766.24	10035.83	-950.50	1664804.06	14304816.85	39°23'32.609"N	80°54'49.250"W	10080.74	354.590	2.36	-0.10	-2.36	
17012.00	90.310	340.120	6361.15	9861.22	10125.63	-981.48	1664773.09	14304906.62	39°23'33.497"N	80°54'49.643"W	10173.09	354.464	1.78	0.06	-1.78	
17107.00	90.280	339.250	6360.66	9956.22	10214.72	-1014.46	1664740.12	14304995.67	39°23'34.378"N	80°54'50.062"W	10264.97	354.328	0.92	-0.03	-0.92	
17202.00	90.400	337.460	6360.09	10051.16	10303.02	-1049.50	1664705.09	14305083.93	39°23'35.251"N	80°54'50.507"W	10356.33	354.184	1.89	0.13	-1.88	
17297.00	90.220	337.080	6359.58	10146.03	10390.64	-1086.21	1664668.40	14305171.51	39°23'36.117"N	80°54'50.974"W	10447.26	354.032	0.44	-0.19	-0.40	
17392.00	90.180	338.720	6359.25	10240.95	10478.65	-1121.95	1664632.68	14305259.50	39°23'36.987"N	80°54'51.428"W	10538.55	353.889	1.73	-0.04	1.73	
17486.00	90.180	339.920	6358.95	10334.93	10566.60	-1155.14	1664599.49	14305347.40	39°23'37.857"N	80°54'51.850"W	10629.55	353.761	1.28	0.00	1.28	
17581.00	90.180	341.660	6358.66	10429.93	10656.30	-1186.40	1664568.25	14305437.07	39°23'38.744"N	80°54'52.247"W	10722.14	353.647	1.83	0.00	1.83	
17676.00	90.150	343.330	6358.38	10524.85	10746.90	-1214.97	1664539.69	14305527.63	39°23'39.639"N	80°54'52.610"W	10815.36	353.550	1.76	-0.03	1.76	
17771.00	90.220	344.550	6358.08	10619.65	10838.19	-1241.25	1664513.42	14305618.89	39°23'40.542"N	80°54'52.943"W	10909.04	353.467	1.29	0.07	1.28	
17800.00	90.150	344.100	6357.98	10648.57	10866.11	-1249.09	1664505.59	14305646.80	39°23'40.818"N	80°54'53.043"W	10937.67	353.442	1.57	-0.24	-1.55	
17827.00	90.150	344.100	6357.91	10675.51	10892.08	-1256.49	1664498.19	14305672.75	39°23'41.075"N	80°54'53.137"W	10964.31	353.420	0.00	0.00	0.00	Projected MD at ID: 17827

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827
Page 10 of 12



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Christopher Unit 2H
Field	Ritchie	Wellbore	Christopher Unit 2H AWB
Facility	Lettie Pad		

HOLE & CASING SECTIONS - Ref Wellbore: Christopher Unit 2H AWB Ref Wellpath: Christopher Unit 2H AWP Proj: 17827										
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]
20in Conductor	25.50	105.50	80.00	25.50	105.50	0.00	0.00	0.49	0.49	-0.02
17.5in Open Hole	105.50	516.50	411.00	105.50	516.49	0.49	-0.02	-0.05	-0.05	0.73
13.375in Casing Surface	25.50	516.50	491.00	25.50	516.49	0.00	0.00	-0.05	-0.05	0.73
12.25in Open Hole	516.50	2711.00	2194.50	516.49	2557.24	-0.05	0.73	71.99	71.99	724.34
9.625in Casing Intermediate	25.50	2711.00	2685.50	25.50	2557.24	0.00	0.00	71.99	71.99	724.34
8.75in Open Hole	2711.00	6435.50	3724.50	2557.24	5884.56	71.99	724.34	342.61	342.61	2345.81
8.5in Open Hole	6435.50	17827.00	11391.50	5884.56	6357.91	342.61	2345.81	10892.08	10892.08	-1256.49
5.5in Casing Production	25.50	17827.00	17801.50	25.50	6357.91	0.00	0.00	10892.08	10892.08	-1256.49

TARGETS										
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape		
Christopher Unit 2H - POE - Rev-2	6348.00	854.70	2302.11	1668055.36	14295639.41	39°22'01.834"N	80°54'07.947"W	point		
Christopher Unit 2H - BHL - Rev-2	6371.00	10903.45	-1307.63	1664447.07	14305684.12	39°23'41.187"N	80°54'53.788"W	point		
Christopher Unit 2H - LP - Rev-2	6371.00	1016.61	2243.96	1667997.23	14295801.24	39°22'03.435"N	80°54'08.686"W	point		

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827'
Page 11 of 12



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Christopher Unit 2H
Field	Ritchie	Wellbore	Christopher Unit 2H AWB
Facility	Lettie Pad		

WELLPATH COMPOSITION - Ref Wellbore: Christopher Unit 2H AWB Ref Wellpath: Christopher Unit 2H AWP Proj: 17827'			
Start MD (ft)	End MD (ft)	Positional Uncertainty Model	Log Name/Comment
25.50	492.50	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-1/2">(50'-482')
492.50	2670.50	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12-1/4">(482')(596'-2660')
2670.50	6363.50	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4">(2660')(2742'-6353')
6363.50	17800.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8-1/2">(6363.5')(6392'-17800')
17800.00	17827.00	Blind Drilling (std)	Projection to bit

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection



Actual Wellpath Report

Christopher Unit 2H AWP Proj: 17827'

Page 12 of 12



REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #10
ANTERO RESOURCES CORPORATION	Well	Christopher Unit 2H
Ritchie County, WV	Wellbore	Christopher Unit 2H AWB
Ritchie		
Lettie Pad		

COMMENTS

Wellpath general comments

API: 47-085-10358-0000
 BHI Job #: 109575189
 Rig: H&P 317
 Duration: 01/08/2019-01/11/2019
 Gyrodatta MS Gyro <17-1/2">(50'-482')
 WFT EM <12-1/4">(482')(596'-2660')
 WFT EM <8-3/4">(2660')(2742'-6353')
 BH AT Curve <8-1/2">(6363.5')(6392'-17800')
 Middlesex: 6812' MD
 Burkett: 6990' MD
 Tully: 7075' MD
 Marcellus POE: 7153' MD
 Projected MD at TD: 17827'

RECEIVED
Office of Oil and Gas

OCT 23 2019

WV Department of
Environmental Protection