



# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

REPORT SETUP INFORMATION			
Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Delaset
Scale	0.999601	Report Generated	3/7/2019 at 1:43:07 PM
Convergence at slot	0.06° East	Database/Source file	WA_MPL_EasternUS_Defn/Hughes_River_Unit_3H_ST02_AWP_Proj_19531_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-20.18	45.70	1668982.68	14224829.95	39°10'21.680"N	80°53'57.140"W
Facility Reference Pt			1668936.99	14224850.13	39°10'21.880"N	80°53'57.720"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.301"W

WELLPATH DATUM			
Calculation method	Minimum curvature	H&P 519 (RKB) to Facility Vertical Datum	30.00ft
Horizontal Reference Pt	Slot	H&P 519 (RKB) to Mean Sea Level	975.50ft
Vertical Reference Pt	H&P 519 (RKB)	H&P 519 (RKB) to Ground Level at Slot (Slot #10)	30.00ft
MD Reference Pt	H&P 519 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	161.19°

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WELLPATH DATA (246 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	0.000	359.320	0.00	0.00	0.00	0.00	1668982.68	14224829.95	39°10'21.680"N	80°53'57.140"W	0.00	0.000	0.00	0.00	0.00	
30.00	0.000	359.320	30.00	0.00	0.00	0.00	1668982.68	14224829.95	39°10'21.680"N	80°53'57.140"W	0.00	0.000	0.00	0.00	0.00	
65.00	0.020	359.320	65.00	-0.01	0.01	0.00	1668982.68	14224829.96	39°10'21.680"N	80°53'57.140"W	0.01	359.320	0.06	0.06	-1.94	Gyrodata MS Gyro <17-1/2">(50'-450')
90.00	0.120	49.310	90.00	-0.02	0.03	0.02	1668982.70	14224829.98	39°10'21.680"N	80°53'57.140"W	0.03	35.614	0.43	0.40	199.96	
115.00	0.100	119.740	115.00	-0.01	0.03	0.06	1668982.73	14224829.98	39°10'21.680"N	80°53'57.139"W	0.07	60.001	0.51	-0.08	281.72	
140.00	0.250	137.980	140.00	0.05	-0.02	0.11	1668982.79	14224829.93	39°10'21.680"N	80°53'57.139"W	0.12	98.757	0.63	0.60	72.96	
165.00	0.220	119.870	165.00	0.14	-0.08	0.19	1668982.87	14224829.87	39°10'21.679"N	80°53'57.138"W	0.21	113.110	0.32	-0.12	-72.44	
190.00	0.240	150.780	190.00	0.23	-0.15	0.26	1668982.94	14224829.80	39°10'21.678"N	80°53'57.137"W	0.30	120.311	0.50	0.08	123.64	
215.00	0.210	116.850	215.00	0.31	-0.22	0.33	1668983.00	14224829.73	39°10'21.678"N	80°53'57.136"W	0.39	123.790	0.54	-0.12	-135.72	
240.00	0.310	120.810	240.00	0.40	-0.27	0.42	1668983.10	14224829.68	39°10'21.677"N	80°53'57.135"W	0.51	122.763	0.41	0.40	15.84	
265.00	0.240	137.220	265.00	0.50	-0.35	0.52	1668983.19	14224829.60	39°10'21.677"N	80°53'57.133"W	0.62	123.753	0.42	-0.28	65.64	
290.00	0.260	124.330	290.00	0.59	-0.42	0.60	1668983.28	14224829.53	39°10'21.676"N	80°53'57.132"W	0.73	124.753	0.24	0.08	-51.56	
315.00	0.130	132.280	315.00	0.66	-0.47	0.67	1668983.34	14224829.48	39°10'21.675"N	80°53'57.132"W	0.82	124.985	0.53	-0.52	31.80	
340.00	0.370	134.010	340.00	0.76	-0.54	0.75	1668983.42	14224829.41	39°10'21.675"N	80°53'57.131"W	0.92	125.993	0.96	0.96	6.92	
365.00	0.370	134.700	365.00	0.90	-0.66	0.86	1668983.54	14224829.29	39°10'21.674"N	80°53'57.129"W	1.08	127.234	0.02	0.00	2.76	
390.00	0.310	141.630	390.00	1.04	-0.77	0.96	1668983.64	14224829.18	39°10'21.672"N	80°53'57.128"W	1.23	128.506	0.29	-0.24	27.72	
415.00	0.380	158.580	415.00	1.18	-0.90	1.03	1668983.71	14224829.05	39°10'21.671"N	80°53'57.127"W	1.37	130.889	0.49	0.28	67.80	
440.00	0.350	159.030	440.00	1.34	-1.04	1.09	1668983.77	14224828.91	39°10'21.670"N	80°53'57.126"W	1.51	133.716	0.12	-0.12	1.80	
465.00	0.480	159.380	465.00	1.52	-1.21	1.16	1668983.83	14224828.74	39°10'21.668"N	80°53'57.125"W	1.68	136.383	0.52	0.52	1.40	
520.00	0.260	144.990	519.99	1.87	-1.53	1.31	1668983.98	14224828.42	39°10'21.665"N	80°53'57.123"W	2.01	139.475	0.43	-0.40	-26.16	Gyrodata MS Gyro <12-1/4">(450')(505'-689')
612.00	1.110	121.210	611.99	2.76	-2.16	2.19	1668984.87	14224827.79	39°10'21.659"N	80°53'57.112"W	3.08	134.647	0.95	0.92	-25.85	
704.00	3.150	115.850	703.92	5.21	-3.73	5.23	1668987.90	14224826.22	39°10'21.643"N	80°53'57.074"W	6.42	125.492	2.23	2.22	-5.83	
821.00	6.250	109.360	820.51	11.41	-7.24	14.13	1668996.80	14224822.71	39°10'21.608"N	80°53'56.961"W	15.88	117.133	2.68	2.65	-5.55	WFT EM <12-1/4">(689')(806'-2627')
916.00	8.490	106.140	914.72	18.63	-10.91	25.75	1669008.41	14224819.05	39°10'21.572"N	80°53'56.813"W	27.96	112.956	2.40	2.36	-3.39	
1011.00	11.220	103.610	1008.31	27.60	-15.03	41.47	1669024.13	14224814.92	39°10'21.531"N	80°53'56.614"W	44.11	109.923	2.91	2.87	-2.66	
1106.00	14.860	103.750	1100.85	39.11	-20.10	62.29	1669044.94	14224809.85	39°10'21.481"N	80°53'56.349"W	65.46	107.886	3.83	3.83	0.15	
1200.00	17.620	102.280	1191.09	52.95	-26.00	87.91	1669070.55	14224803.97	39°10'21.422"N	80°53'56.024"W	91.67	106.473	2.97	2.94	-1.56	
1295.00	21.280	101.340	1280.65	69.04	-32.45	118.87	1669101.50	14224797.52	39°10'21.358"N	80°53'55.631"W	123.22	105.267	3.87	3.85	-0.99	
1390.00	24.070	101.870	1368.30	87.59	-39.82	154.74	1669137.35	14224790.14	39°10'21.285"N	80°53'55.176"W	159.78	104.432	2.94	2.94	0.56	
1485.00	26.180	101.490	1454.31	108.05	-47.98	194.24	1669176.84	14224781.99	39°10'21.204"N	80°53'54.674"W	200.08	103.876	2.23	2.22	-0.40	

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Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
1580.00	26.710	101.670	1539.36	129.45	-56.47	235.68	1669218.27	14224773.50	39°10'21.119"N	80°53'54.148"W	242.36	103.475	0.56	0.56	0.19	
1674.00	25.770	100.180	1623.68	150.07	-64.36	276.49	1669259.05	14224765.62	39°10'21.041"N	80°53'53.630"W	283.88	103.104	1.22	-1.00	-1.59	
1769.00	26.190	100.410	1709.08	170.31	-71.80	317.43	1669299.98	14224758.18	39°10'20.967"N	80°53'53.110"W	325.45	102.745	0.45	0.44	0.24	
1864.00	26.070	100.060	1794.37	190.63	-79.23	358.60	1669341.14	14224750.75	39°10'20.893"N	80°53'52.588"W	367.25	102.459	0.21	-0.13	-0.37	
1958.00	25.870	100.110	1878.88	210.52	-86.44	399.13	1669381.65	14224743.54	39°10'20.821"N	80°53'52.073"W	408.38	102.220	0.21	-0.21	0.05	
2053.00	27.220	100.400	1963.86	231.14	-94.00	440.91	1669423.41	14224735.99	39°10'20.746"N	80°53'51.543"W	450.82	102.035	1.43	1.42	0.31	
2148.00	27.320	99.680	2048.30	252.14	-101.59	483.77	1669466.25	14224728.40	39°10'20.671"N	80°53'50.999"W	494.32	101.859	0.36	0.11	-0.76	
2243.00	25.010	98.540	2133.66	271.77	-108.24	525.12	1669507.59	14224721.76	39°10'20.604"N	80°53'50.474"W	536.16	101.647	2.49	-2.43	-1.20	
2338.00	23.690	99.490	2220.11	290.05	-114.37	563.81	1669546.26	14224715.63	39°10'20.543"N	80°53'49.983"W	575.29	101.467	1.45	-1.39	1.00	
2433.00	23.910	100.450	2307.03	308.51	-121.00	601.56	1669584.00	14224708.99	39°10'20.477"N	80°53'49.503"W	613.61	101.373	0.47	0.23	1.01	
2527.00	23.360	101.100	2393.15	327.11	-128.05	638.58	1669621.00	14224701.95	39°10'20.407"N	80°53'49.033"W	651.30	101.338	0.65	-0.59	0.69	
2642.00	23.810	100.460	2498.54	349.83	-136.65	683.78	1669666.19	14224693.35	39°10'20.322"N	80°53'48.460"W	697.31	101.301	0.45	0.39	-0.56	
2790.00	23.440	101.510	2634.14	379.29	-147.95	742.01	1669724.39	14224682.06	39°10'20.209"N	80°53'47.721"W	756.61	101.276	0.38	-0.25	0.71	WFT EM <8-3/4">(2627')(2775'-6415')
2885.00	25.880	100.660	2720.54	398.96	-155.53	780.76	1669763.12	14224674.48	39°10'20.134"N	80°53'47.229"W	796.10	101.266	2.39	2.36	-0.89	
2980.00	28.060	100.630	2805.27	420.07	-163.46	822.95	1669805.30	14224666.56	39°10'20.055"N	80°53'46.693"W	839.03	101.234	2.51	2.51	-0.03	
3080.00	28.240	101.870	2893.44	443.71	-172.66	869.22	1669851.55	14224657.36	39°10'19.964"N	80°53'46.106"W	886.20	101.235	0.61	0.18	1.24	
3175.00	27.980	99.450	2977.24	465.73	-180.95	913.20	1669895.51	14224649.08	39°10'19.881"N	80°53'45.547"W	930.95	101.208	1.23	-0.27	-2.55	
3269.00	27.280	101.270	3060.52	486.96	-188.78	956.08	1669938.37	14224641.25	39°10'19.803"N	80°53'45.003"W	974.54	101.169	1.17	-0.74	1.94	
3364.00	27.080	102.760	3145.03	509.20	-197.81	998.52	1669980.80	14224632.22	39°10'19.714"N	80°53'44.464"W	1017.92	101.205	0.75	-0.21	1.57	
3459.00	26.700	103.690	3229.76	531.98	-207.63	1040.35	1670022.61	14224622.40	39°10'19.616"N	80°53'43.933"W	1060.86	101.287	0.60	-0.40	0.98	
3554.00	26.200	101.160	3314.82	553.93	-216.74	1081.66	1670063.90	14224613.29	39°10'19.526"N	80°53'43.409"W	1103.16	101.331	1.30	-0.53	-2.66	
3649.00	25.150	101.370	3400.44	574.55	-224.78	1122.03	1670104.25	14224605.26	39°10'19.446"N	80°53'42.896"W	1144.32	101.329	1.11	-1.11	0.22	
3744.00	24.760	99.480	3486.57	594.13	-232.04	1161.44	1670143.65	14224598.00	39°10'19.374"N	80°53'42.396"W	1184.39	101.298	0.93	-0.41	-1.99	
3838.00	24.700	99.440	3571.95	612.76	-238.50	1200.23	1670182.42	14224591.54	39°10'19.309"N	80°53'41.904"W	1223.70	101.239	0.07	-0.06	-0.04	
3933.00	25.750	102.230	3657.89	632.79	-246.13	1239.98	1670222.16	14224583.92	39°10'19.233"N	80°53'41.399"W	1264.17	101.227	1.67	1.11	2.94	
4028.00	26.520	101.830	3743.18	654.24	-254.85	1280.91	1670263.07	14224575.20	39°10'19.147"N	80°53'40.880"W	1306.01	101.253	0.83	0.81	-0.42	
4123.00	25.890	101.630	3828.42	675.56	-263.38	1321.98	1670304.13	14224566.68	39°10'19.062"N	80°53'40.358"W	1347.96	101.268	0.67	-0.66	-0.21	
4218.00	25.270	101.830	3914.10	696.40	-271.72	1362.14	1670344.27	14224558.34	39°10'18.979"N	80°53'39.848"W	1388.98	101.281	0.66	-0.65	0.21	
4312.00	24.380	101.780	3999.42	716.50	-279.79	1400.77	1670382.89	14224550.27	39°10'18.899"N	80°53'39.358"W	1428.44	101.296	0.95	-0.95	-0.05	
4407.00	25.140	101.470	4085.68	736.66	-287.81	1439.74	1670421.84	14224542.26	39°10'18.819"N	80°53'38.863"W	1468.23	101.305	0.81	0.80	-0.33	

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4502.00	25.960	100.320	4171.39	756.95	-295.55	1479.98	1670462.06	14224534.52	39°10'18.742"N	80°53'38.353"W	1509.20	101.293	1.01	0.86	-1.21	
4597.00	26.280	101.960	4256.69	777.83	-303.63	1521.01	1670503.08	14224526.44	39°10'18.662"N	80°53'37.832"W	1551.02	101.289	0.83	0.34	1.73	
4692.00	24.750	101.840	4342.42	798.73	-312.07	1561.05	1670543.10	14224518.01	39°10'18.578"N	80°53'37.323"W	1591.94	101.305	1.61	-1.61	-0.13	
4787.00	25.700	103.200	4428.36	819.79	-320.85	1600.57	1670582.60	14224509.23	39°10'18.491"N	80°53'36.822"W	1632.41	101.335	1.17	1.00	1.43	
4881.00	26.040	102.310	4512.94	841.26	-329.91	1640.57	1670622.59	14224500.18	39°10'18.401"N	80°53'36.314"W	1673.41	101.370	0.55	0.36	-0.95	
4976.00	25.090	99.380	4598.65	861.55	-337.63	1680.82	1670662.82	14224492.45	39°10'18.324"N	80°53'35.803"W	1714.40	101.358	1.66	-1.00	-3.08	
5071.00	24.810	100.630	4684.78	880.86	-344.59	1720.28	1670702.27	14224485.49	39°10'18.255"N	80°53'35.302"W	1754.46	101.327	0.63	-0.29	1.32	
5150.00†	24.935	101.055	4756.45	897.30	-350.84	1752.92	1670734.89	14224479.25	39°10'18.192"N	80°53'34.888"W	1787.68	101.318	0.28	0.16	0.54	Benson: 5150' MD
5166.00	24.960	101.140	4770.96	900.67	-352.14	1759.54	1670741.51	14224477.95	39°10'18.180"N	80°53'34.804"W	1794.43	101.317	0.28	0.16	0.53	
5261.00	26.580	101.690	4856.51	921.46	-360.32	1800.02	1670781.97	14224469.77	39°10'18.098"N	80°53'34.290"W	1835.73	101.320	1.72	1.71	0.58	
5355.00	25.550	102.070	4940.95	942.54	-368.82	1840.44	1670822.38	14224461.27	39°10'18.014"N	80°53'33.777"W	1877.03	101.332	1.11	-1.10	0.40	
5450.00	25.480	101.590	5026.68	963.39	-377.21	1880.49	1670862.41	14224452.89	39°10'17.930"N	80°53'33.268"W	1917.95	101.343	0.23	-0.07	-0.51	
5497.00†	25.574	101.570	5069.10	973.64	-381.28	1900.33	1670882.25	14224448.82	39°10'17.890"N	80°53'33.016"W	1938.20	101.345	0.20	0.20	-0.04	Alexander: 5497' MD
5545.00	25.670	101.550	5112.38	984.14	-385.44	1920.67	1670902.57	14224444.67	39°10'17.849"N	80°53'32.758"W	1958.96	101.347	0.20	0.20	-0.04	
5640.00	25.620	101.640	5198.02	1004.94	-393.70	1960.94	1670942.83	14224436.41	39°10'17.766"N	80°53'32.247"W	2000.08	101.352	0.07	-0.05	0.09	
5753.00	25.420	103.820	5299.99	1030.40	-404.42	2008.42	1670990.29	14224425.69	39°10'17.660"N	80°53'31.644"W	2048.74	101.385	0.85	-0.18	1.93	3H AT Curve <8-1/2">(5640')(5753'-19506')
5847.00	26.130	102.600	5384.64	1052.07	-413.76	2048.22	1671030.07	14224416.36	39°10'17.567"N	80°53'31.139"W	2089.59	101.421	0.94	0.76	-1.30	
5894.00	28.010	104.700	5426.49	1063.56	-418.82	2068.99	1671050.84	14224411.30	39°10'17.517"N	80°53'30.876"W	2110.96	101.444	4.49	4.00	4.47	
5942.00	29.220	108.290	5468.63	1076.85	-425.36	2091.02	1671072.86	14224404.76	39°10'17.452"N	80°53'30.596"W	2133.85	101.498	4.38	2.52	7.48	
5989.00	28.840	112.730	5509.73	1091.29	-433.34	2112.37	1671094.20	14224396.79	39°10'17.373"N	80°53'30.325"W	2156.36	101.593	4.65	-0.81	9.45	
6037.00	29.190	116.220	5551.71	1107.25	-442.98	2133.55	1671115.37	14224387.15	39°10'17.277"N	80°53'30.056"W	2179.05	101.729	3.60	0.73	7.27	
6084.00	30.510	121.480	5592.48	1124.54	-454.28	2154.01	1671135.83	14224375.85	39°10'17.165"N	80°53'29.797"W	2201.40	101.909	6.24	2.81	11.19	
6132.00	31.940	125.270	5633.53	1144.20	-467.97	2174.77	1671156.58	14224362.16	39°10'17.030"N	80°53'29.533"W	2224.55	102.144	5.06	2.98	7.90	
6179.00	34.670	130.070	5672.82	1165.72	-483.76	2195.16	1671176.96	14224346.38	39°10'16.873"N	80°53'29.275"W	2247.83	102.428	8.07	5.81	10.21	
6226.00	36.840	132.830	5710.96	1189.56	-501.95	2215.73	1671197.52	14224328.20	39°10'16.693"N	80°53'29.014"W	2271.87	102.764	5.75	4.62	5.87	
6273.00	39.390	136.120	5747.94	1215.48	-522.29	2236.40	1671218.18	14224307.87	39°10'16.492"N	80°53'28.751"W	2296.58	103.145	6.93	5.43	7.00	
6321.00	42.150	138.910	5784.29	1244.18	-545.41	2257.55	1671239.32	14224284.76	39°10'16.263"N	80°53'28.483"W	2322.50	103.582	6.89	5.75	5.81	
6368.00	45.270	141.030	5818.26	1274.46	-570.28	2278.42	1671260.19	14224259.90	39°10'16.017"N	80°53'28.219"W	2348.71	104.052	7.33	6.64	4.51	
6416.00	48.300	143.160	5851.12	1307.51	-597.89	2299.90	1671281.65	14224232.30	39°10'15.744"N	80°53'27.946"W	2376.34	104.572	7.09	6.31	4.44	
6463.00	49.350	144.480	5882.07	1341.28	-626.44	2320.78	1671302.52	14224203.76	39°10'15.462"N	80°53'27.682"W	2403.84	105.106	3.08	2.23	2.81	

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# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
6510.00	49.000	143.420	5912.79	1375.24	-655.20	2341.71	1671323.44	14224175.02	39°10'15.177"N	80°53'27.416"W	2431.64	105.631	1.86	-0.74	-2.26	
6557.00	48.870	142.040	5943.67	1408.85	-683.40	2363.16	1671344.89	14224146.83	39°10'14.898"N	80°53'27.144"W	2459.99	106.129	2.23	-0.28	-2.94	
6606.00	48.860	141.140	5975.90	1443.62	-712.31	2386.09	1671367.81	14224117.92	39°10'14.612"N	80°53'26.854"W	2490.15	106.622	1.38	-0.02	-1.84	
6701.00	48.840	139.730	6038.42	1510.51	-767.46	2431.65	1671413.35	14224062.80	39°10'14.067"N	80°53'26.276"W	2549.89	107.516	1.12	-0.02	-1.48	
6725.00†	48.860	139.332	6054.21	1527.31	-781.20	2443.38	1671425.08	14224049.06	39°10'13.931"N	80°53'26.127"W	2565.23	107.730	1.25	0.08	-1.66	Sycamore: 6725' MD
6748.00	48.880	138.950	6069.34	1543.36	-794.31	2454.72	1671436.41	14224035.96	39°10'13.801"N	80°53'25.984"W	2580.03	107.931	1.25	0.09	-1.66	
6796.00	48.850	139.650	6100.92	1576.91	-821.71	2478.29	1671459.97	14224008.56	39°10'13.530"N	80°53'25.685"W	2610.96	108.344	1.10	-0.06	1.46	
6843.00	48.790	141.580	6131.87	1610.02	-849.05	2500.73	1671482.41	14223981.24	39°10'13.259"N	80°53'25.400"W	2640.94	108.753	3.09	-0.13	4.11	
6890.00	48.880	142.170	6162.80	1643.41	-876.89	2522.58	1671504.24	14223953.41	39°10'12.984"N	80°53'25.123"W	2670.64	109.168	0.96	0.19	1.26	
6937.00	49.940	143.190	6193.38	1677.26	-905.27	2544.21	1671525.87	14223925.04	39°10'12.703"N	80°53'24.849"W	2700.47	109.586	2.79	2.26	2.17	
6985.00	51.440	145.340	6223.79	1712.78	-935.42	2565.90	1671547.54	14223894.91	39°10'12.405"N	80°53'24.574"W	2731.09	110.030	4.67	3.12	4.48	
6987.00†	51.523	145.460	6225.04	1714.29	-936.71	2566.78	1671548.43	14223893.62	39°10'12.392"N	80°53'24.563"W	2732.36	110.049	6.29	4.17	6.02	Middlesex: 6987' MD
7032.00	53.430	148.100	6252.45	1748.85	-966.56	2586.32	1671567.96	14223863.77	39°10'12.097"N	80°53'24.315"W	2761.04	110.492	6.29	4.24	5.87	
7080.00	56.660	151.940	6279.95	1787.44	-1000.64	2605.95	1671587.58	14223829.71	39°10'11.760"N	80°53'24.067"W	2791.46	111.006	9.39	6.73	8.00	
7127.00	59.500	155.640	6304.81	1826.98	-1036.42	2623.55	1671605.17	14223793.94	39°10'11.406"N	80°53'23.844"W	2820.85	111.556	9.01	6.04	7.87	
7175.00	62.860	157.890	6327.94	1868.91	-1075.06	2640.12	1671621.74	14223755.32	39°10'11.024"N	80°53'23.634"W	2850.61	112.156	8.12	7.00	4.69	
7195.00†	63.437	158.545	6336.98	1886.72	-1091.63	2646.74	1671628.36	14223738.75	39°10'10.860"N	80°53'23.550"W	2863.02	112.413	4.11	2.88	3.28	Burkett: 7195' MD
7222.00	64.220	159.420	6348.89	1910.94	-1114.25	2655.43	1671637.04	14223716.14	39°10'10.636"N	80°53'23.440"W	2879.74	112.764	4.11	2.90	3.24	
7270.00	67.660	159.430	6368.45	1954.74	-1155.28	2670.83	1671652.44	14223675.13	39°10'10.231"N	80°53'23.245"W	2909.99	113.391	7.17	7.17	0.02	
7272.00†	67.918	159.454	6369.21	1956.59	-1157.02	2671.48	1671653.09	14223673.40	39°10'10.213"N	80°53'23.237"W	2911.27	113.417	12.96	12.91	1.21	Tully: 7272' MD
7317.00	73.730	159.980	6383.98	1999.06	-1196.87	2686.21	1671667.81	14223633.56	39°10'09.819"N	80°53'23.051"W	2940.78	114.016	12.96	12.91	1.17	
7331.00†	74.947	160.520	6387.76	2012.54	-1209.55	2690.76	1671672.36	14223620.88	39°10'09.694"N	80°53'22.993"W	2950.12	114.205	9.45	8.69	3.86	Marcellus POE: 7331' MD
7364.00	77.820	161.770	6395.53	2044.61	-1239.90	2701.12	1671682.72	14223590.54	39°10'09.394"N	80°53'22.862"W	2972.11	114.657	9.45	8.71	3.79	
7411.00	81.790	165.080	6403.85	2090.81	-1284.22	2714.31	1671695.89	14223546.24	39°10'08.956"N	80°53'22.695"W	3002.78	115.320	10.93	8.45	7.04	
7459.00	85.410	168.080	6409.20	2138.29	-1330.61	2725.37	1671706.95	14223499.87	39°10'08.497"N	80°53'22.555"W	3032.85	116.023	9.77	7.54	6.25	
7506.00	89.350	167.140	6411.35	2184.94	-1376.46	2735.44	1671717.02	14223454.04	39°10'08.044"N	80°53'22.428"W	3062.24	116.711	8.62	8.38	-2.00	
7553.00	89.910	166.110	6411.65	2231.72	-1422.18	2746.31	1671727.89	14223408.34	39°10'07.592"N	80°53'22.291"W	3092.71	117.377	2.49	1.19	-2.19	
7648.00	89.780	163.320	6411.91	2326.54	-1513.81	2771.36	1671752.92	14223316.74	39°10'06.686"N	80°53'21.974"W	3157.85	118.645	2.94	-0.14	-2.94	
7744.00	90.460	157.840	6411.71	2422.49	-1604.32	2803.26	1671784.81	14223226.28	39°10'05.791"N	80°53'21.571"W	3229.88	119.783	5.75	0.71	-5.71	
7838.00	89.910	156.810	6411.41	2516.28	-1691.05	2839.50	1671821.04	14223139.58	39°10'04.933"N	80°53'21.112"W	3304.91	120.776	1.24	-0.59	-1.10	

Prepared by  
WV Division of Oil and Gas  
February 9, 2020  
WV Division of Environmental Protection



# Actual Wellpath Report

## Hughes River Unit 3H ST02 AWP Proj: 19531'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
7933.00	90.120	157.280	6411.38	2811.03	-1778.52	2876.55	1671858.07	14223052.14	39°10'04.068"N	80°53'20.643"W	3381.97	121.728	0.54	0.22	0.49	
8027.00	90.060	155.740	6411.23	2704.71	-1864.73	2914.02	1671895.52	14222965.97	39°10'03.215"N	80°53'20.169"W	3459.58	122.616	1.64	-0.06	-1.64	
8122.00	90.090	155.310	6411.11	2799.25	-1951.20	2953.37	1671934.87	14222879.54	39°10'02.360"N	80°53'19.670"W	3539.71	123.451	0.45	0.03	-0.45	
8216.00	90.250	157.240	6410.83	2892.90	-2037.25	2991.19	1671972.67	14222793.52	39°10'01.509"N	80°53'19.191"W	3619.06	124.258	2.06	0.17	2.05	
8310.00	90.830	159.820	6409.94	2986.78	-2124.71	3025.59	1672007.06	14222706.09	39°10'00.645"N	80°53'18.756"W	3697.11	125.078	2.81	0.62	2.74	
8404.00	89.970	160.220	6409.29	3080.76	-2213.05	3057.71	1672039.16	14222617.79	39°09'59.771"N	80°53'18.350"W	3774.55	125.896	1.01	-0.91	0.43	
8498.00	90.950	163.720	6408.53	3174.73	-2302.42	3086.80	1672068.24	14222528.46	39°09'58.887"N	80°53'17.982"W	3850.90	126.719	3.87	1.04	3.72	
8592.00	90.830	165.620	6407.07	3268.54	-2393.06	3111.65	1672093.08	14222437.85	39°09'57.991"N	80°53'17.668"W	3925.44	127.563	2.03	-0.13	2.02	
8686.00	90.830	166.080	6405.71	3362.22	-2484.20	3134.62	1672116.04	14222346.75	39°09'57.090"N	80°53'17.377"W	3999.64	128.397	0.49	0.00	0.49	
8779.00	90.860	165.470	6404.34	3454.91	-2574.33	3157.47	1672138.88	14222256.65	39°09'56.199"N	80°53'17.089"W	4073.92	129.191	0.66	0.03	-0.66	
8873.00	90.740	162.730	6403.03	3548.77	-2664.72	3183.22	1672164.62	14222166.30	39°09'55.305"N	80°53'16.763"W	4151.34	129.933	2.92	-0.13	-2.91	
8966.00	90.890	160.670	6401.70	3641.76	-2753.00	3212.42	1672193.81	14222078.05	39°09'54.432"N	80°53'16.394"W	4230.68	130.596	2.22	0.16	-2.22	
9060.00	90.830	158.510	6400.29	3735.70	-2841.09	3245.19	1672226.57	14221990.00	39°09'53.561"N	80°53'15.979"W	4313.13	131.201	2.30	-0.06	-2.30	
9155.00	90.710	160.820	6399.02	3830.66	-2930.15	3278.20	1672259.56	14221900.97	39°09'52.681"N	80°53'15.561"W	4396.86	131.791	2.43	-0.13	2.43	
9249.00	90.550	162.890	6397.98	3924.64	-3019.47	3307.47	1672288.82	14221811.69	39°09'51.797"N	80°53'15.191"W	4478.45	132.394	2.21	-0.17	2.20	
9342.00	90.860	160.530	6396.84	4017.62	-3107.76	3336.65	1672317.99	14221723.44	39°09'50.924"N	80°53'14.822"W	4559.76	132.966	2.56	0.33	-2.54	
9436.00	90.680	158.160	6395.58	4111.56	-3195.70	3369.81	1672351.13	14221635.53	39°09'50.055"N	80°53'14.403"W	4644.15	133.481	2.53	-0.19	-2.52	
9530.00	90.770	158.500	6394.39	4205.43	-3283.05	3404.51	1672385.82	14221548.22	39°09'49.191"N	80°53'13.963"W	4729.60	133.959	0.37	0.10	0.36	
9624.00	90.800	159.760	6393.10	4299.36	-3370.87	3438.00	1672419.29	14221460.43	39°09'48.323"N	80°53'13.540"W	4814.83	134.435	1.34	0.03	1.34	
9718.00	90.890	159.260	6391.71	4393.31	-3458.92	3470.90	1672452.18	14221372.42	39°09'47.452"N	80°53'13.123"W	4900.12	134.901	0.54	0.10	-0.53	
9812.00	91.230	161.450	6389.97	4487.28	-3547.42	3502.49	1672483.76	14221283.95	39°09'46.577"N	80°53'12.724"W	4985.14	135.365	2.36	0.36	2.33	
9906.00	91.080	159.660	6388.08	4581.25	-3636.04	3533.78	1672515.04	14221195.37	39°09'45.700"N	80°53'12.328"W	5070.34	135.817	1.91	-0.16	-1.90	
10000.00	91.170	158.970	6386.23	4675.18	-3723.96	3566.97	1672548.22	14221107.48	39°09'44.831"N	80°53'11.908"W	5156.67	136.233	0.74	0.10	-0.73	
10094.00	91.020	158.610	6384.44	4769.08	-3811.58	3600.98	1672582.21	14221019.90	39°09'43.965"N	80°53'11.478"W	5243.58	136.627	0.41	-0.16	-0.38	
10188.00	91.080	158.720	6382.71	4862.97	-3899.12	3635.17	1672616.39	14220932.39	39°09'43.099"N	80°53'11.045"W	5330.82	137.006	0.13	0.06	0.12	
10282.00	91.170	159.000	6380.87	4956.88	-3986.78	3669.06	1672650.27	14220844.77	39°09'42.232"N	80°53'10.616"W	5418.16	137.376	0.31	0.10	0.30	
10376.00	91.230	160.820	6378.90	5050.83	-4075.04	3701.34	1672682.54	14220756.55	39°09'41.359"N	80°53'10.208"W	5505.08	137.751	1.94	0.06	1.94	
10469.00	91.260	162.350	6376.88	5143.80	-4163.25	3730.71	1672711.89	14220668.37	39°09'40.487"N	80°53'09.836"W	5590.25	138.136	1.65	0.03	1.65	
10563.00	89.290	163.990	6376.43	5237.74	-4253.22	3757.93	1672739.10	14220578.44	39°09'39.598"N	80°53'09.492"W	5675.55	138.538	2.73	-2.10	1.74	
10657.00	90.830	167.080	6376.33	5331.45	-4344.22	3781.40	1672762.56	14220487.47	39°09'38.698"N	80°53'09.195"W	5759.45	138.962	3.67	1.64	3.29	

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# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION				
Operator	ANTERO RESOURCES CORPORATION		Slot	Slot #10
Area	Ritchie County, WV		Well	Hughes River Unit 3H ST02
Field	Ritchie		Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad		Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
10751.00	90.650	168.900	6375.11	5424.78	-4436.15	3900.96	1672782.11	14220395.58	39°09'37.789"N	80°53'08.949"W	5841.81	139.410	1.95	-0.19	1.94	
10845.00	90.860	170.200	6373.88	5517.77	-4528.58	3818.01	1672799.15	14220303.18	39°09'36.875"N	80°53'08.734"W	5923.28	139.866	1.40	0.22	1.38	
10939.00	90.800	169.280	6372.51	5610.72	-4621.07	3834.75	1672815.89	14220210.73	39°09'35.961"N	80°53'08.523"W	6004.97	140.313	0.98	-0.06	-0.98	
11032.00	90.920	166.680	6371.12	5703.04	-4712.01	3854.11	1672835.24	14220119.83	39°09'35.062"N	80°53'08.278"W	6087.47	140.719	2.80	0.13	-2.80	
11126.00	91.110	162.520	6369.45	5796.84	-4802.60	3879.07	1672860.19	14220029.27	39°09'34.166"N	80°53'07.963"W	6173.51	141.072	4.43	0.20	-4.43	
11220.00	90.710	156.300	6367.96	5890.74	-4890.55	3912.10	1672893.21	14219941.37	39°09'33.296"N	80°53'07.545"W	6262.75	141.343	6.63	-0.43	-6.62	
11314.00	90.740	154.330	6366.77	5984.23	-4975.94	3951.36	1672932.45	14219856.00	39°09'32.452"N	80°53'07.048"W	6353.99	141.547	2.10	0.03	-2.10	
11407.00	90.400	153.540	6365.84	6076.48	-5059.48	3992.22	1672973.29	14219772.50	39°09'31.626"N	80°53'06.531"W	6444.85	141.725	0.92	-0.37	-0.85	
11501.00	90.920	156.700	6364.76	6169.94	-5144.74	4031.76	1673012.82	14219687.27	39°09'30.782"N	80°53'06.030"W	6536.32	141.915	3.41	0.55	3.36	
11594.00	90.490	160.570	6363.61	6262.82	-5231.33	4065.63	1673046.67	14219600.72	39°09'29.926"N	80°53'05.601"W	6625.41	142.147	4.19	-0.46	4.16	
11688.00	90.980	164.900	6362.41	6356.76	-5321.06	4093.52	1673074.55	14219511.02	39°09'29.039"N	80°53'05.249"W	6713.46	142.429	4.64	0.52	4.61	
11782.00	89.630	161.080	6361.91	6450.69	-5410.93	4121.01	1673102.03	14219421.19	39°09'28.150"N	80°53'04.901"W	6801.54	142.707	4.31	-1.44	-4.06	
11876.00	90.800	159.660	6361.56	6544.67	-5499.46	4152.59	1673133.60	14219332.69	39°09'27.275"N	80°53'04.502"W	6891.16	142.944	1.96	1.24	-1.51	
11971.00	90.860	157.180	6360.18	6639.55	-5587.79	4187.52	1673168.52	14219244.40	39°09'26.401"N	80°53'04.060"W	6982.74	143.152	2.61	0.06	-2.61	
12065.00	90.740	159.440	6358.87	6733.41	-5675.12	4222.26	1673203.24	14219157.11	39°09'25.538"N	80°53'03.620"W	7073.50	143.351	2.41	-0.13	2.40	
12159.00	90.030	159.970	6358.23	6827.38	-5763.28	4254.86	1673235.83	14219068.98	39°09'24.666"N	80°53'03.208"W	7163.74	143.563	0.94	-0.76	0.56	
12253.00	88.220	158.740	6359.67	6921.31	-5851.23	4288.00	1673268.95	14218981.07	39°09'23.796"N	80°53'02.789"W	7254.22	143.765	2.33	-1.93	-1.31	
12347.00	90.250	163.520	6360.93	7015.27	-5940.14	4318.39	1673299.33	14218892.20	39°09'22.917"N	80°53'02.404"W	7343.95	143.983	5.52	2.16	5.09	
12440.00	90.340	165.880	6360.45	7108.09	-6029.83	4342.92	1673323.86	14218802.54	39°09'22.030"N	80°53'02.094"W	7431.01	144.237	2.54	0.10	2.54	
12534.00	90.370	164.240	6359.86	7201.87	-6120.65	4367.16	1673348.08	14218711.75	39°09'21.132"N	80°53'01.788"W	7518.94	144.492	1.74	0.03	-1.74	
12629.00	90.280	163.740	6359.33	7296.76	-6211.96	4393.36	1673374.27	14218620.48	39°09'20.229"N	80°53'01.457"W	7608.55	144.730	0.53	-0.09	-0.53	
12722.00	90.430	164.320	6358.75	7389.64	-6301.37	4418.94	1673399.85	14218531.11	39°09'19.345"N	80°53'01.134"W	7696.39	144.959	0.64	0.16	0.62	
12817.00	90.680	161.760	6357.83	7484.58	-6392.23	4446.65	1673427.54	14218440.29	39°09'18.447"N	80°53'00.783"W	7786.74	145.176	2.71	0.26	-2.69	
12911.00	90.980	156.130	6356.47	7578.46	-6479.91	4480.41	1673461.28	14218352.64	39°09'17.580"N	80°53'00.356"W	7878.02	145.339	6.00	0.32	-5.99	
13004.00	90.150	149.650	6355.55	7670.43	-6562.64	4522.76	1673503.62	14218269.94	39°09'16.762"N	80°52'59.820"W	7970.17	145.427	7.02	-0.89	-6.97	
13098.00	90.340	151.000	6355.15	7762.74	-6644.31	4569.30	1673550.14	14218188.30	39°09'15.954"N	80°52'59.231"W	8063.83	145.484	1.45	0.20	1.44	
13192.00	90.400	158.250	6354.54	7856.06	-6729.18	4609.55	1673590.38	14218103.47	39°09'15.115"N	80°52'58.721"W	8156.58	145.588	7.71	0.06	7.71	
13286.00	89.940	161.280	6354.26	7950.02	-6817.37	4642.06	1673622.87	14218015.31	39°09'14.242"N	80°52'58.310"W	8247.74	145.748	3.26	-0.49	3.22	
13380.00	90.520	160.180	6353.88	8044.01	-6906.10	4673.08	1673653.88	14217926.62	39°09'13.365"N	80°52'57.917"W	8338.58	145.915	1.32	0.62	-1.17	
13474.00	90.340	160.130	6353.18	8138.00	-6994.52	4704.99	1673685.78	14217838.24	39°09'12.491"N	80°52'57.514"W	8429.72	146.073	0.20	-0.19	-0.05	

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# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
13569.00	90.220	162.450	6352.71	8232.99	-7084.49	4735.46	1673716.24	14217748.30	39°09'11.601"N	80°52'57.128"W	8521.42	146.240	2.45	-0.13	2.44	
13663.00	90.060	164.770	6352.48	8326.90	-7174.66	4761.98	1673742.75	14217658.16	39°09'10.709"N	80°52'56.793"W	8611.17	146.427	2.47	-0.17	2.47	
13756.00	90.770	169.700	6351.81	8419.35	-7265.33	4782.53	1673763.28	14217567.53	39°09'09.813"N	80°52'56.534"W	8698.14	146.644	5.36	0.76	5.30	
13850.00	90.550	167.270	6350.73	8512.57	-7357.43	4801.29	1673782.04	14217475.47	39°09'08.903"N	80°52'56.297"W	8785.45	146.872	2.60	-0.23	-2.59	
13944.00	89.420	164.180	6350.75	8606.27	-7448.51	4824.46	1673805.21	14217384.42	39°09'08.002"N	80°52'56.005"W	8874.45	147.069	3.50	-1.20	-3.29	
14038.00	90.030	165.850	6351.20	8700.05	-7539.31	4848.77	1673829.50	14217293.66	39°09'07.104"N	80°52'55.698"W	8963.92	147.254	1.89	0.65	1.78	
14131.00	89.600	165.990	6351.50	8792.74	-7629.52	4871.39	1673852.11	14217203.49	39°09'06.212"N	80°52'55.412"W	9052.07	147.442	0.49	-0.46	0.15	
14224.00	89.480	166.370	6352.25	8885.38	-7719.82	4893.61	1673874.32	14217113.22	39°09'05.319"N	80°52'55.131"W	9140.19	147.629	0.43	-0.13	0.41	
14318.00	89.570	162.750	6353.03	8979.20	-7810.41	4918.63	1673899.33	14217022.67	39°09'04.424"N	80°52'54.815"W	9230.14	147.799	3.85	0.10	-3.85	
14412.00	89.570	159.640	6353.73	9073.18	-7899.38	4948.92	1673929.61	14216933.74	39°09'03.544"N	80°52'54.432"W	9321.59	147.933	3.31	0.00	-3.31	
14506.00	89.660	159.250	6354.37	9167.14	-7987.39	4981.93	1673962.60	14216845.76	39°09'02.674"N	80°52'54.015"W	9413.72	148.047	0.43	0.10	-0.41	
14600.00	89.600	158.940	6354.97	9261.07	-8075.20	5015.47	1673996.13	14216757.98	39°09'01.805"N	80°52'53.591"W	9505.99	148.156	0.34	-0.06	-0.33	
14694.00	89.540	158.680	6355.68	9354.99	-8162.85	5049.44	1674030.09	14216670.38	39°09'00.939"N	80°52'53.161"W	9598.38	148.260	0.28	-0.06	-0.28	
14788.00	89.720	158.970	6356.28	9448.91	-8250.50	5083.40	1674064.03	14216582.76	39°09'00.072"N	80°52'52.731"W	9690.80	148.361	0.36	0.19	0.31	
14882.00	89.820	158.360	6356.66	9542.82	-8338.05	5117.60	1674098.22	14216495.24	39°08'59.206"N	80°52'52.299"W	9783.30	148.460	0.66	0.11	-0.65	
14975.00	89.720	158.230	6357.04	9635.70	-8424.46	5151.99	1674132.60	14216408.87	39°08'58.352"N	80°52'51.863"W	9874.94	148.552	0.18	-0.11	-0.14	
15070.00	89.940	158.720	6357.32	9730.59	-8512.83	5186.85	1674167.44	14216320.53	39°08'57.478"N	80°52'51.422"W	9968.54	148.646	0.57	0.23	0.52	
15164.00	89.820	160.250	6357.51	9824.54	-8600.87	5219.79	1674200.37	14216232.53	39°08'56.607"N	80°52'51.006"W	10060.87	148.747	1.63	-0.13	1.63	
15258.00	89.630	161.250	6357.97	9918.54	-8689.61	5250.78	1674231.35	14216143.82	39°08'55.729"N	80°52'50.614"W	10152.83	148.857	1.08	-0.20	1.06	
15351.00	89.880	162.560	6358.36	10011.53	-8778.01	5279.66	1674260.22	14216055.46	39°08'54.855"N	80°52'50.249"W	10243.45	148.975	1.43	0.27	1.41	
15445.00	89.910	164.650	6358.54	10105.44	-8868.18	5306.19	1674286.74	14215965.32	39°08'53.964"N	80°52'49.913"W	10334.42	149.106	2.22	0.03	2.22	
15540.00	89.690	166.260	6358.87	10200.17	-8960.13	5330.05	1674310.59	14215873.41	39°08'53.055"N	80°52'49.612"W	10425.61	149.253	1.71	-0.23	1.69	
15633.00	89.850	166.070	6359.24	10292.82	-9050.43	5352.29	1674332.82	14215783.14	39°08'52.162"N	80°52'49.331"W	10514.63	149.401	0.27	0.17	-0.20	
15728.00	89.630	166.790	6359.67	10387.42	-9142.78	5374.58	1674355.10	14215690.84	39°08'51.249"N	80°52'49.050"W	10605.50	149.551	0.79	-0.23	0.76	
15821.00	89.820	165.970	6360.12	10480.04	-9233.16	5396.48	1674376.99	14215600.49	39°08'50.355"N	80°52'48.774"W	10694.54	149.695	0.91	0.20	-0.88	
15915.00	89.750	163.460	6360.47	10573.85	-9323.83	5421.26	1674401.76	14215509.86	39°08'49.459"N	80°52'48.461"W	10785.35	149.825	2.67	-0.07	-2.67	
16009.00	89.820	160.890	6360.82	10667.83	-9413.31	5450.03	1674430.52	14215420.41	39°08'48.574"N	80°52'48.097"W	10877.19	149.930	2.74	0.07	-2.73	
16103.00	89.970	159.210	6361.00	10761.81	-9501.67	5482.10	1674462.58	14215332.09	39°08'47.700"N	80°52'47.691"W	10969.73	150.017	1.79	0.16	-1.79	
16197.00	89.880	159.560	6361.12	10855.76	-9589.65	5515.19	1674495.66	14215244.15	39°08'46.830"N	80°52'47.273"W	11062.49	150.096	0.38	-0.10	0.37	
16291.00	89.820	158.310	6361.36	10949.69	-9677.36	5548.98	1674529.43	14215156.47	39°08'45.963"N	80°52'46.845"W	11155.38	150.170	1.33	-0.06	-1.33	

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# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
16385.00	89.880	156.520	6361.61	11043.48	-9764.15	5585.08	1674565.52	14215069.72	39°08'45.104"N	80°52'46.389"W	11248.63	150.231	1.91	0.06	-1.90	
16478.00	89.910	156.240	6361.78	11136.15	-9849.36	5622.34	1674602.76	14214984.54	39°08'44.262"N	80°52'45.917"W	11341.10	150.281	0.30	0.03	-0.30	
16572.00	89.630	156.960	6362.16	11229.85	-9935.63	5659.67	1674640.08	14214898.31	39°08'43.409"N	80°52'45.445"W	11434.53	150.333	0.82	-0.30	0.77	
16666.00	89.880	155.670	6362.56	11323.51	-10021.71	5697.43	1674677.82	14214812.26	39°08'42.557"N	80°52'44.967"W	11528.02	150.381	1.40	0.27	-1.37	
16760.00	89.720	154.820	6362.89	11417.00	-10107.07	5736.79	1674717.17	14214726.94	39°08'41.713"N	80°52'44.469"W	11621.69	150.421	0.92	-0.17	-0.90	
16853.00	89.820	157.710	6363.26	11509.64	-10192.19	5774.22	1674754.58	14214641.85	39°08'40.871"N	80°52'43.995"W	11714.20	150.467	3.11	0.11	3.11	
16947.00	90.030	160.560	6363.39	11603.57	-10280.02	5807.70	1674788.04	14214554.06	39°08'40.003"N	80°52'43.572"W	11807.12	150.536	3.04	0.22	3.03	
17041.00	89.880	161.250	6363.46	11697.57	-10368.84	5838.45	1674818.78	14214465.26	39°08'39.124"N	80°52'43.183"W	11899.60	150.617	0.75	-0.16	0.73	
17135.00	89.940	161.260	6363.61	11791.57	-10457.86	5868.66	1674848.98	14214376.29	39°08'38.244"N	80°52'42.801"W	11991.99	150.700	0.06	0.06	0.01	
17229.00	90.000	161.980	6363.66	11885.57	-10547.06	5898.30	1674878.61	14214287.12	39°08'37.362"N	80°52'42.426"W	12084.31	150.785	0.77	0.06	0.77	
17322.00	89.910	163.720	6363.73	11978.53	-10635.92	5925.72	1674906.02	14214198.29	39°08'36.483"N	80°52'42.080"W	12175.26	150.876	1.87	-0.10	1.87	
17417.00	89.780	168.310	6363.99	12073.16	-10728.08	5948.67	1674928.96	14214106.17	39°08'35.572"N	80°52'41.790"W	12266.97	150.992	4.83	-0.14	4.83	
17511.00	89.850	170.940	6364.29	12166.14	-10820.54	5965.60	1674945.88	14214013.75	39°08'34.658"N	80°52'41.577"W	12356.07	151.131	2.80	0.07	2.80	
17605.00	90.090	169.740	6364.34	12258.94	-10913.20	5981.37	1674961.65	14213921.12	39°08'33.742"N	80°52'41.378"W	12444.87	151.273	1.30	0.26	-1.26	
17699.00	90.180	166.410	6364.12	12352.25	-11005.16	6000.79	1674981.06	14213829.20	39°08'32.833"N	80°52'41.133"W	12534.87	151.398	3.54	0.10	-3.54	
17793.00	90.180	166.280	6363.82	12445.87	-11096.50	6022.98	1675003.24	14213737.90	39°08'31.930"N	80°52'40.853"W	12625.72	151.508	0.14	0.00	-0.14	
17886.00	90.400	166.540	6363.35	12538.48	-11186.90	6044.83	1675025.09	14213647.54	39°08'31.036"N	80°52'40.577"W	12715.61	151.615	0.37	0.24	0.28	
17980.00	90.150	162.690	6362.90	12632.29	-11277.51	6069.77	1675050.01	14213556.96	39°08'30.140"N	80°52'40.263"W	12807.20	151.710	4.10	-0.27	-4.10	
18074.00	90.180	160.260	6362.63	12726.29	-11366.63	6099.63	1675079.86	14213467.87	39°08'29.259"N	80°52'39.885"W	12899.84	151.781	2.59	0.03	-2.59	
18168.00	90.250	157.250	6362.28	12820.19	-11454.24	6133.69	1675113.90	14213380.31	39°08'28.392"N	80°52'39.454"W	12993.14	151.831	3.20	0.07	-3.20	
18261.00	90.090	154.580	6362.00	12912.79	-11539.13	6171.64	1675151.84	14213295.45	39°08'27.553"N	80°52'38.974"W	13085.89	151.860	2.88	-0.17	-2.87	
18354.00	90.120	152.460	6361.83	13004.95	-11622.37	6213.10	1675193.29	14213212.24	39°08'26.730"N	80°52'38.449"W	13178.85	151.872	2.28	0.03	-2.28	
18448.00	90.250	154.280	6361.53	13098.07	-11706.39	6255.23	1675235.40	14213128.25	39°08'25.898"N	80°52'37.916"W	13272.81	151.882	1.94	0.14	1.94	
18541.00	90.120	155.600	6361.23	13190.52	-11790.64	6294.62	1675274.78	14213044.04	39°08'25.065"N	80°52'37.418"W	13365.68	151.904	1.43	-0.14	1.42	
18635.00	90.340	157.940	6360.85	13284.23	-11877.01	6331.70	1675311.83	14212957.70	39°08'24.211"N	80°52'36.949"W	13459.34	151.938	2.50	0.23	2.49	
18729.00	90.250	159.200	6360.36	13378.13	-11964.51	6366.04	1675346.16	14212870.24	39°08'23.346"N	80°52'36.514"W	13552.71	151.984	1.34	-0.10	1.34	
18822.00	90.060	161.860	6360.11	13471.11	-12052.18	6397.03	1675377.15	14212782.60	39°08'22.479"N	80°52'36.122"W	13644.67	152.042	2.87	-0.20	2.86	
18916.00	90.180	163.750	6359.92	13565.07	-12141.98	6424.82	1675404.92	14212692.84	39°08'21.591"N	80°52'35.771"W	13737.03	152.115	2.01	0.13	2.01	
19010.00	90.180	164.980	6359.62	13658.92	-12232.50	6450.16	1675430.24	14212602.36	39°08'20.696"N	80°52'35.451"W	13828.90	152.197	1.31	0.00	1.31	
19104.00	90.250	168.070	6359.27	13752.51	-12323.90	6472.06	1675452.14	14212511.00	39°08'19.792"N	80°52'35.175"W	13919.98	152.293	3.29	0.07	3.29	

Prepared by  
 Checked by  
 Date  
 Approved by  
 Date



# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

WELLPATH DATA (246 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
19198.00	90.120	167.830	6358.96	13845.85	-12415.82	6491.68	1675471.75	14212419.10	39°08'18.883"N	80°52'34.927"W	14010.52	152.397	0.29	-0.14	-0.26	
19292.00	90.180	165.340	6358.72	13939.43	-12507.25	6513.49	1675493.55	14212327.71	39°08'17.979"N	80°52'34.652"W	14101.66	152.491	2.65	0.06	-2.65	
19386.00	90.220	163.460	6358.39	14033.27	-12597.78	6538.76	1675518.82	14212237.22	39°08'17.084"N	80°52'34.333"W	14193.65	152.569	2.00	0.04	-2.00	
19480.00	90.180	162.500	6358.06	14127.23	-12687.67	6566.28	1675546.32	14212147.37	39°08'16.195"N	80°52'33.985"W	14286.11	152.637	1.02	-0.04	-1.02	
19506.00	90.150	161.810	6357.99	14153.22	-12712.42	6574.25	1675554.28	14212122.63	39°08'15.951"N	80°52'33.885"W	14311.75	152.654	2.66	-0.12	-2.65	
19531.00	90.150	161.810	6357.92	14178.22	-12736.17	6582.05	1675562.09	14212098.89	39°08'15.716"N	80°52'33.786"W	14336.43	152.670	0.00	0.00	0.00	Projected MD at TD  ST02 : 19531'

HOLE & CASING SECTIONS - Ref Wellbore: Hughes River Unit 3H ST02 AWB Ref Wellpath: Hughes River Unit 3H ST02 AWP Proj: 19531'									
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)
26in Open Hole	30.00	110.00	80.00	30.00	110.00	0.00	0.00	0.04	0.05
20in Conductor	30.00	110.00	80.00	30.00	110.00	0.00	0.00	0.04	0.05
17.5in Open Hole	110.00	490.00	380.00	110.00	489.99	0.04	0.05	-1.39	1.23
13.375in Casing Surface	30.00	490.00	460.00	30.00	489.99	0.00	0.00	-1.39	1.23
12.25in Open Hole	490.00	2737.00	2247.00	489.99	2585.53	-1.39	1.23	-143.80	721.28
9.625in Casing Intermediate	30.00	2737.00	2707.00	30.00	2585.53	0.00	0.00	-143.80	721.28
8.75in Open Hole	2737.00	5640.00	2903.00	2585.53	5198.02	-143.80	721.28	-393.70	1960.94
8.5in Open Hole	5640.00	19531.00	13891.00	5198.02	6357.92	-393.70	1960.94	-12736.17	6582.05
5.5in Casing Production	30.00	19531.00	19501.00	30.00	6357.92	0.00	0.00	-12736.17	6582.05

I hereby certify that the information contained herein is true and correct to the best of my knowledge and belief.  
 Date: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Title: \_\_\_\_\_



# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
Page 11 of 12



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Hughes River Unit 3H ST02 - POE - Rev-2	6379.00	-1169.49	2675.83	1671657.43	14223660.93	39°10'10.090"N	80°53'23.182"W	point
Hughes River Unit 3H ST02 - BHL - Rev-2	6410.00	-12718.06	6608.81	1675588.84	14212116.99	39°08'15.894"N	80°52'33.446"W	point
Hughes River Unit 3H ST02 - LP - Rev-2	6410.00	-1345.47	2735.76	1671717.34	14223485.02	39°10'08.350"N	80°53'22.424"W	point

WELLPATH COMPOSITION - Ref Wellbore: Hughes River Unit 3H ST02 AWB				Ref Wellpath: Hughes River Unit 3H ST02 AWP Proj: 19531'	
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore	
30.00	465.00	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-1/2">(50'-450')	Hughes River Unit 3H AWB	
465.00	704.00	Gyrodata standard - Drop gyro or Multi-shot	02 Gyrodata MS Gyro <12-1/4">(450')(505'-689')	Hughes River Unit 3H AWB	
704.00	2642.00	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <12-1/4">(689')(806'-2627')	Hughes River Unit 3H AWB	
2642.00	5640.00	ISCWSA MWD, Rev. 4 (Standard)	04 WFT EM <8-3/4">(2627')(2775'-6415')	Hughes River Unit 3H AWB	
5640.00	19506.00	BHI AutoTrak Curve (Short)	06 BH AT Curve <8-1/2">(5740')(5753'-19506')	Hughes River Unit 3H ST02 AWB	
19506.00	19531.00	Blind Drilling (std)	Projection to bit	Hughes River Unit 3H ST02 AWB	

APPROVED  
 [Signature]  
 [Date]  
 [Title]



# Actual Wellpath Report

Hughes River Unit 3H ST02 AWP Proj: 19531'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #10
Area	Ritchie County, WV	Well	Hughes River Unit 3H ST02
Field	Ritchie	Wellbore	Hughes River Unit 3H ST02 AWB
Facility	Ireland North Pad	Sidetrack from	Hughes River Unit 3H AWP Proj: 6504' at 5640.00 MD

## COMMENTS

### Wellpath general comments

API: 47-085-10265-0000  
 BHI Job #: 109653349A  
 Rig: H&P 519  
 Duration: 02/25/2019-02/28/2019  
 Gyrodata MS Gyro <17-1/2">(50'-450')  
 Gyrodata MS Gyro <12-1/4">(450')(505'-689')  
 WFT EM <12-1/4">(689')(806'-2627')  
 WFT EM <8-3/4">(2627')(2775'-6415')  
 Projected MD at TD [OPH]: 6504'  
 BH AT Curve <8-3/4">(5640')(5764'-6996')  
 Benson: 5150' MD  
 Alexander: 5497' MD  
 Elk: 5753' MD  
 Rhinestreet: 6158' MD  
 Sycamore: 6539' MD  
 Middlesex: 6712' MD  
 Burkett: 6828' MD  
 Tully: 6860' MD  
 Marcellus POE: 6879' MD  
 Purcell: 6885' MD  
 Purcell Base: 6892' MD  
 Cherry Valley: 6907' MD  
 Cherry Valley Base: 6912' MD  
 Onondoga: 6926' MD  
 Projected MD at TD [ST01]: 7021'  
 BH AT Curve <8-1/2">(5640')(5753'-19506')  
 Sycamore: 6725' MD  
 Middlesex: 6987' MD  
 Burkett: 7195' MD  
 Tully: 7272' MD  
 Marcellus POE: 7331' MD  
 Projected MD at TD [ST02]: 19531'

Onondoga  
 Middlesex  
 Burkett  
 Tully  
 Marcellus POE  
 Projected MD at TD [ST02]: 19531'