



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320
Page 1 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

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	2/12/2019 at 1:59:17 PM
Convergence at slot	0.06° East	Database/Source file	WA_MPL_EasternUS_Defn/Hughes_River_Unit_1H_AWP_Proj_19320_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-12.11	27.58	1668964.56	14224838.02	39°10'21.760"N	80°53'57.370"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 #08)	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	161.23°

PROCESSED
Oilfield and Gas
FEB 18 2020
Well Path of
ENRIP Well Protection



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320'
Page 2 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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	173.070	0.00	0.00	0.00	0.00	1668964.56	14224838.02	39°10'21.760"N	80°53'57.370"W	0.00	0.000	0.00	0.00	0.00	
30.00	0.000	173.070	30.00	0.00	0.00	0.00	1668964.56	14224838.02	39°10'21.760"N	80°53'57.370"W	0.00	0.000	0.00	0.00	0.00	
115.00	0.680	173.070	115.00	0.49	-0.50	0.06	1668964.62	14224837.52	39°10'21.755"N	80°53'57.369"W	0.50	173.070	0.80	0.80	203.61	Gyrodata MS Gyro <17-1/2">(100'-454')
140.00	0.660	171.750	140.00	0.78	-0.79	0.10	1668964.66	14224837.23	39°10'21.752"N	80°53'57.369"W	0.80	172.831	0.10	-0.08	-5.28	
165.00	0.650	165.826	164.99	1.06	-1.07	0.15	1668964.72	14224836.95	39°10'21.749"N	80°53'57.368"W	1.08	171.770	0.27	-0.04	-23.72	
190.00	0.710	167.040	189.99	1.36	-1.36	0.22	1668964.78	14224836.66	39°10'21.747"N	80°53'57.367"W	1.38	170.627	0.25	0.24	4.88	
215.00	0.640	166.560	214.99	1.65	-1.65	0.29	1668964.85	14224836.38	39°10'21.744"N	80°53'57.366"W	1.67	169.956	0.28	-0.28	-1.92	
240.00	0.640	160.770	239.99	1.93	-1.91	0.37	1668964.93	14224836.11	39°10'21.741"N	80°53'57.365"W	1.95	169.057	0.26	0.00	-23.16	
265.00	0.490	161.440	264.99	2.18	-2.15	0.45	1668965.01	14224835.87	39°10'21.739"N	80°53'57.364"W	2.19	168.161	0.60	-0.60	2.68	
290.00	0.490	148.210	289.99	2.39	-2.34	0.54	1668965.10	14224835.68	39°10'21.737"N	80°53'57.363"W	2.40	166.992	0.45	0.00	-52.92	
315.00	0.560	169.620	314.99	2.61	-2.55	0.62	1668965.18	14224835.47	39°10'21.735"N	80°53'57.362"W	2.62	166.362	0.83	0.28	85.64	
340.00	0.510	172.860	339.99	2.84	-2.78	0.65	1668965.21	14224835.24	39°10'21.733"N	80°53'57.362"W	2.86	166.754	0.23	-0.20	12.96	
365.00	0.650	163.030	364.98	3.09	-3.03	0.71	1668965.27	14224835.00	39°10'21.730"N	80°53'57.361"W	3.11	166.803	0.69	0.56	-39.32	
390.00	0.600	169.790	389.98	3.36	-3.29	0.77	1668965.33	14224834.73	39°10'21.727"N	80°53'57.360"W	3.38	166.760	0.36	-0.20	27.04	
415.00	0.680	178.110	414.98	3.64	-3.57	0.80	1668965.36	14224834.45	39°10'21.725"N	80°53'57.360"W	3.66	167.326	0.49	0.32	33.28	
440.00	0.770	183.570	439.98	3.93	-3.88	0.80	1668965.36	14224834.14	39°10'21.722"N	80°53'57.360"W	3.96	168.406	0.45	0.36	21.84	
469.00	0.860	181.740	468.98	4.32	-4.30	0.78	1668965.34	14224833.73	39°10'21.718"N	80°53'57.360"W	4.37	169.734	0.32	0.31	-6.31	
519.00	0.680	189.920	518.97	4.93	-4.96	0.72	1668965.28	14224833.06	39°10'21.711"N	80°53'57.361"W	5.01	171.796	0.42	-0.36	16.36	WFT EM <12-1/4">(454')(504'-2479')
611.00	0.660	178.320	610.97	5.91	-6.03	0.64	1668965.20	14224831.99	39°10'21.700"N	80°53'57.362"W	6.06	173.970	0.15	-0.02	-12.61	
703.00	0.820	183.350	702.96	7.03	-7.22	0.61	1668965.17	14224830.81	39°10'21.689"N	80°53'57.362"W	7.24	175.137	0.19	0.17	5.47	
820.00	0.760	160.750	819.96	8.58	-8.79	0.82	1668965.38	14224829.24	39°10'21.673"N	80°53'57.360"W	8.82	174.661	0.27	-0.05	-19.32	
916.00	0.660	130.300	915.94	9.69	-9.74	1.45	1668966.01	14224828.28	39°10'21.664"N	80°53'57.352"W	9.85	171.521	0.40	-0.10	-31.72	
1011.00	0.600	133.400	1010.93	10.60	-10.44	2.23	1668966.79	14224827.58	39°10'21.657"N	80°53'57.342"W	10.68	167.936	0.07	-0.06	3.26	
1106.00	0.510	129.090	1105.93	11.40	-11.05	2.92	1668967.48	14224826.98	39°10'21.651"N	80°53'57.333"W	11.43	165.192	0.10	-0.09	-4.54	
1201.00	0.790	317.330	1200.93	11.16	-10.83	2.81	1668967.36	14224827.19	39°10'21.653"N	80°53'57.335"W	11.19	165.483	1.37	0.29	-180.80	
1296.00	2.040	314.100	1295.90	9.06	-9.18	1.15	1668965.71	14224828.85	39°10'21.669"N	80°53'57.356"W	9.25	172.875	1.32	1.32	-3.40	
1391.00	2.510	323.540	1390.82	5.57	-6.33	-1.30	1668963.26	14224831.70	39°10'21.697"N	80°53'57.387"W	6.46	191.645	0.63	0.49	9.94	
1485.00	1.800	328.640	1484.75	2.17	-3.41	-3.30	1668961.27	14224834.61	39°10'21.726"N	80°53'57.412"W	4.74	224.024	0.78	-0.76	5.43	
1580.00	1.540	321.360	1579.71	-0.49	-1.14	-4.87	1668959.69	14224836.88	39°10'21.749"N	80°53'57.432"W	5.00	256.843	0.35	-0.27	-7.66	
1675.00	1.760	322.550	1674.67	-3.07	1.02	-6.55	1668958.01	14224839.04	39°10'21.770"N	80°53'57.453"W	6.63	278.823	0.23	0.23	1.25	

RECEIVED
Division of Oil and Gas
MAY 15 2020
Division of Oil and Gas
Division of Oil and Gas



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320'
Page 3 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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
1770.00	0.900	313.700	1769.65	-5.12	2.69	-7.98	1668956.58	14224840.71	39°10'21.787"N	80°53'57.471"W	8.42	288.635	0.93	-0.91	-9.32	
1865.00	0.380	163.230	1864.65	-5.46	2.90	-8.43	1668956.14	14224840.92	39°10'21.789"N	80°53'57.477"W	8.91	289.017	1.31	-0.55	-158.39	
1960.00	0.380	166.860	1959.64	-4.83	2.30	-8.27	1668956.30	14224840.32	39°10'21.783"N	80°53'57.475"W	8.58	285.526	0.03	0.00	3.82	
2055.00	0.280	166.940	2054.64	-4.29	1.76	-8.14	1668956.42	14224839.78	39°10'21.778"N	80°53'57.473"W	8.33	282.221	0.11	-0.11	0.08	
2150.00	0.150	192.850	2149.64	-3.95	1.42	-8.12	1668956.45	14224839.44	39°10'21.774"N	80°53'57.473"W	8.24	279.896	0.17	-0.14	27.27	
2245.00	0.130	242.620	2244.64	-3.83	1.25	-8.24	1668956.32	14224839.27	39°10'21.772"N	80°53'57.475"W	8.33	278.593	0.13	-0.02	52.39	
2339.00	0.240	265.450	2338.64	-3.86	1.18	-8.53	1668956.03	14224839.20	39°10'21.772"N	80°53'57.478"W	8.61	277.879	0.14	0.12	24.29	
2434.00	0.350	286.220	2433.64	-4.08	1.25	-9.01	1668955.56	14224839.27	39°10'21.772"N	80°53'57.484"W	9.09	277.874	0.16	0.12	21.86	
2494.00	0.520	283.870	2493.64	-4.33	1.36	-9.45	1668955.12	14224839.38	39°10'21.774"N	80°53'57.490"W	9.55	278.205	0.28	0.28	-3.92	
2635.00	0.400	320.920	2634.63	-5.14	1.90	-10.38	1668954.19	14224839.92	39°10'21.779"N	80°53'57.502"W	10.55	280.361	0.22	-0.09	26.28	WFT EM <8-3/4">(2479')(2620'-5975')
2729.00	0.430	340.670	2728.63	-5.80	2.49	-10.70	1668953.86	14224840.50	39°10'21.785"N	80°53'57.506"W	10.99	283.072	0.15	0.03	21.01	
2824.00	1.780	0.030	2823.61	-7.55	4.30	-10.82	1668953.74	14224842.32	39°10'21.803"N	80°53'57.507"W	11.64	291.660	1.45	1.42	20.38	
2919.00	1.890	1.700	2918.56	-10.41	7.34	-10.77	1668953.79	14224845.36	39°10'21.833"N	80°53'57.507"W	13.04	304.262	0.13	0.12	1.76	
3013.00	3.510	0.060	3012.45	-14.59	11.77	-10.72	1668953.84	14224849.78	39°10'21.876"N	80°53'57.506"W	15.92	317.652	1.73	1.72	-1.74	
3113.00	5.200	359.450	3112.16	-21.79	19.36	-10.76	1668953.80	14224857.37	39°10'21.951"N	80°53'57.506"W	22.15	330.924	1.69	1.69	-0.61	
3208.00	7.140	7.550	3206.61	-31.18	29.52	-10.03	1668954.53	14224867.53	39°10'22.052"N	80°53'57.497"W	31.18	341.233	2.23	2.04	8.53	
3303.00	9.070	1.040	3300.66	-43.51	42.86	-9.12	1668955.45	14224880.86	39°10'22.184"N	80°53'57.485"W	43.82	347.989	2.25	2.03	-6.85	
3398.00	10.940	358.320	3394.21	-59.18	59.36	-9.25	1668955.32	14224897.35	39°10'22.347"N	80°53'57.487"W	60.07	351.146	2.03	1.97	-2.86	
3493.00	12.390	359.190	3487.25	-77.49	78.56	-9.65	1668954.91	14224916.55	39°10'22.537"N	80°53'57.491"W	79.15	352.994	1.54	1.53	0.92	
3587.00	12.040	357.990	3579.12	-96.47	98.44	-10.14	1668954.42	14224936.42	39°10'22.733"N	80°53'57.497"W	98.96	354.118	0.46	-0.37	-1.28	
3682.00	11.680	355.680	3672.09	-115.27	117.93	-11.21	1668953.35	14224955.91	39°10'22.926"N	80°53'57.511"W	118.46	354.569	0.63	-0.38	-2.43	
3777.00	11.270	353.940	3765.19	-133.64	136.75	-12.92	1668951.65	14224974.72	39°10'23.112"N	80°53'57.532"W	137.36	354.604	0.56	-0.43	-1.83	
3872.00	11.580	0.610	3858.31	-151.69	155.52	-13.80	1668950.77	14224993.48	39°10'23.297"N	80°53'57.543"W	156.13	354.931	1.43	0.33	7.02	
3967.00	11.890	1.510	3951.33	-169.86	174.84	-13.44	1668951.13	14225012.79	39°10'23.488"N	80°53'57.538"W	175.35	355.605	0.38	0.33	0.95	
4062.00	11.390	0.520	4044.37	-187.90	194.00	-13.09	1668951.47	14225031.94	39°10'23.678"N	80°53'57.534"W	194.44	356.139	0.57	-0.53	-1.04	
4157.00	11.380	359.850	4137.50	-205.63	212.75	-13.03	1668951.53	14225050.69	39°10'23.863"N	80°53'57.532"W	213.15	356.494	0.14	-0.01	-0.71	
4252.00	11.220	359.840	4230.66	-223.27	231.37	-13.08	1668951.48	14225069.30	39°10'24.047"N	80°53'57.533"W	231.74	356.763	0.17	-0.17	-0.01	
4346.00	11.010	359.570	4322.90	-240.46	249.49	-13.18	1668951.39	14225087.41	39°10'24.226"N	80°53'57.534"W	249.84	356.977	0.23	-0.22	-0.29	
4441.00	10.870	359.510	4416.17	-257.58	267.52	-13.32	1668951.24	14225105.43	39°10'24.404"N	80°53'57.535"W	267.85	357.149	0.15	-0.15	-0.06	
4536.00	10.820	0.090	4509.48	-274.52	285.39	-13.38	1668951.18	14225123.30	39°10'24.581"N	80°53'57.536"W	285.71	357.315	0.13	-0.05	0.61	

RECORDED
Office of the State Auditor
FEB 18 2020
WV Division of Environmental Protection



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320*

Page 4 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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
4630.00	10.710	1.110	4601.82	-291.08	302.95	-13.20	1668951.37	14225140.85	39°10'24.754"N	80°53'57.533"W	303.24	357.505	0.23	-0.12	1.09	
4725.00	11.020	358.760	4695.12	-308.04	320.85	-13.23	1668951.34	14225158.74	39°10'24.931"N	80°53'57.533"W	321.12	357.639	0.57	0.33	-2.47	
4820.00	11.100	359.660	4788.35	-325.38	339.07	-13.48	1668951.09	14225176.96	39°10'25.112"N	80°53'57.536"W	339.34	357.724	0.20	0.08	0.95	
4915.00	11.110	355.500	4881.58	-342.92	357.34	-14.25	1668950.32	14225195.22	39°10'25.292"N	80°53'57.546"W	357.63	357.717	0.84	0.01	-4.38	
5010.00	10.890	355.470	4974.83	-360.49	375.41	-15.68	1668948.89	14225213.28	39°10'25.471"N	80°53'57.564"W	375.74	357.609	0.23	-0.23	-0.03	
5105.00	11.030	356.130	5068.10	-377.97	393.43	-17.00	1668947.57	14225231.29	39°10'25.649"N	80°53'57.580"W	393.79	357.526	0.20	0.15	0.69	
5200.00	10.950	353.580	5161.36	-395.57	411.46	-18.62	1668945.95	14225249.32	39°10'25.827"N	80°53'57.601"W	411.88	357.409	0.52	-0.08	-2.68	
5295.00	11.150	358.200	5254.60	-413.17	429.61	-19.92	1668944.65	14225267.46	39°10'26.006"N	80°53'57.617"W	430.07	357.345	0.96	0.21	4.86	
5390.00	11.290	359.440	5347.78	-430.79	448.09	-20.30	1668944.27	14225285.93	39°10'26.189"N	80°53'57.621"W	448.55	357.406	0.29	0.15	1.31	
5485.00	12.310	356.730	5440.77	-449.38	467.50	-20.97	1668943.60	14225305.33	39°10'26.381"N	80°53'57.630"W	467.97	357.432	1.22	1.07	-2.85	
5580.00	10.390	4.710	5533.92	-467.00	486.15	-20.84	1668943.73	14225323.97	39°10'26.565"N	80°53'57.628"W	486.59	357.545	2.61	-2.02	8.40	
5611.00	9.500	14.260	5564.45	-471.71	491.41	-19.98	1668944.59	14225329.24	39°10'26.617"N	80°53'57.617"W	491.82	357.672	6.04	-2.87	30.81	
5643.00	8.980	27.010	5596.04	-475.66	496.20	-18.20	1668946.37	14225334.02	39°10'26.665"N	80°53'57.594"W	496.53	357.900	6.59	-1.62	39.84	
5674.00	9.100	42.230	5626.66	-478.54	500.17	-15.45	1668949.12	14225337.99	39°10'26.704"N	80°53'57.559"W	500.41	358.231	7.70	0.39	49.10	
5706.00	10.180	56.450	5658.21	-480.49	503.61	-11.39	1668953.17	14225341.43	39°10'26.738"N	80°53'57.508"W	503.74	358.704	8.14	3.37	44.44	
5738.00	10.630	70.690	5689.69	-481.24	506.15	-6.25	1668958.32	14225343.96	39°10'26.763"N	80°53'57.442"W	506.19	359.293	8.14	1.41	44.50	
5769.00	10.830	87.660	5720.16	-480.44	507.21	-0.64	1668963.92	14225345.03	39°10'26.773"N	80°53'57.371"W	507.21	359.928	10.18	0.65	54.74	
5801.00	11.470	103.770	5751.56	-477.88	506.58	5.46	1668970.02	14225344.39	39°10'26.767"N	80°53'57.294"W	506.61	0.617	9.90	2.00	50.34	
5832.00	12.820	120.100	5781.88	-473.63	504.12	11.43	1668975.99	14225341.94	39°10'26.743"N	80°53'57.218"W	504.25	1.299	11.86	4.35	52.68	
5864.00	14.860	132.260	5812.95	-467.36	499.58	17.54	1668982.09	14225337.40	39°10'26.698"N	80°53'57.140"W	499.88	2.011	11.07	6.37	38.00	
5896.00	17.680	139.450	5843.67	-459.26	493.12	23.74	1668988.29	14225330.95	39°10'26.634"N	80°53'57.062"W	493.69	2.756	10.81	8.81	22.47	
5927.00	20.560	145.940	5872.96	-449.63	485.03	29.85	1668994.40	14225322.86	39°10'26.554"N	80°53'56.984"W	485.95	3.521	11.53	9.29	20.94	
5959.00	23.020	152.240	5902.68	-438.03	474.84	35.91	1669000.46	14225312.67	39°10'26.453"N	80°53'56.907"W	476.19	4.325	10.60	7.69	19.69	
5990.00	25.770	157.610	5930.91	-425.31	463.24	41.30	1669005.85	14225301.08	39°10'26.338"N	80°53'56.839"W	465.08	5.095	11.39	8.87	17.32	
6034.00	28.750	162.160	5970.02	-405.18	444.32	48.19	1669012.73	14225282.16	39°10'26.151"N	80°53'56.752"W	446.92	6.190	8.26	6.77	10.34	SH AT Curve <8-1/2">(5990')(6034'-19289)
6076.00	30.730	162.800	6006.49	-384.35	424.45	54.46	1669019.00	14225262.30	39°10'25.955"N	80°53'56.673"W	427.93	7.311	4.77	4.71	1.52	
6123.00	34.700	163.860	6046.02	-358.98	400.12	61.73	1669026.27	14225237.98	39°10'25.714"N	80°53'56.581"W	404.85	8.771	8.53	8.45	2.26	
6170.00	38.500	165.150	6083.75	-331.01	373.12	69.20	1669033.74	14225210.99	39°10'25.447"N	80°53'56.486"W	379.48	10.507	8.25	8.03	2.74	
6218.00	41.540	165.670	6120.51	-300.23	343.25	76.97	1669041.50	14225181.13	39°10'25.152"N	80°53'56.388"W	351.77	12.639	6.37	6.33	1.08	
6265.00	44.550	164.870	6154.85	-268.23	312.23	85.13	1669049.66	14225150.12	39°10'24.845"N	80°53'56.285"W	323.63	15.252	6.51	6.40	-1.70	

Approved by:
 [Signature]
 Date: 1/8/2020
 [Signature]
 Title: [Title]



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320*

Page 5 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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
6312.00	47.560	164.130	6187.46	-234.45	279.62	94.18	1669058.70	14225117.53	39°10'24.523"N	80°53'56.170"W	295.06	18.615	6.50	6.40	-1.57	
6335.00†	49.072	163.960	6202.76	-217.29	263.11	98.90	1669063.42	14225101.02	39°10'24.359"N	80°53'56.110"W	281.08	20.602	6.60	6.57	-0.74	Middlesex: 6335' MD
6359.00	50.650	163.790	6218.23	-198.96	245.48	104.00	1669068.52	14225083.40	39°10'24.185"N	80°53'56.046"W	266.60	22.960	6.60	6.57	-0.71	
6407.00	53.900	163.730	6247.60	-161.04	209.04	114.62	1669079.13	14225046.97	39°10'23.825"N	80°53'55.912"W	238.40	28.736	6.77	6.77	-0.12	
6454.00	57.680	164.280	6274.02	-122.22	171.68	125.32	1669089.83	14225009.63	39°10'23.455"N	80°53'55.776"W	212.55	36.128	8.10	8.04	1.17	
6501.00	61.660	165.450	6297.75	-81.75	132.53	135.90	1669100.41	14224970.49	39°10'23.068"N	80°53'55.643"W	189.82	45.721	8.74	8.47	2.49	
6538.00†	64.683	165.569	6314.44	-48.83	100.56	144.16	1669108.67	14224938.54	39°10'22.752"N	80°53'55.538"W	175.77	55.102	8.18	8.17	0.32	Burkett: 6538' MD
6548.00	65.500	165.600	6318.65	-39.78	91.78	146.42	1669110.92	14224929.76	39°10'22.666"N	80°53'55.510"W	172.81	57.920	8.18	8.17	0.31	
6596.00	68.410	166.340	6337.44	4.23	48.93	157.12	1669121.62	14224886.93	39°10'22.242"N	80°53'55.374"W	164.57	72.703	6.23	6.06	1.54	
6625.00†	70.631	165.855	6347.59	31.30	22.56	163.65	1669128.15	14224860.57	39°10'21.981"N	80°53'55.292"W	165.20	82.151	7.82	7.66	-1.67	Tully: 6625' MD
6643.00	72.010	165.560	6353.35	48.30	6.04	167.86	1669132.35	14224844.06	39°10'21.818"N	80°53'55.239"W	167.97	87.940	7.82	7.66	-1.64	
6688.00†	75.504	163.452	6365.94	91.42	-35.59	179.41	1669143.90	14224802.45	39°10'21.406"N	80°53'55.092"W	182.90	101.219	8.97	7.76	-4.68	Marcellus POE: 6688' MD
6690.00	75.660	163.360	6366.44	93.36	-37.44	179.96	1669144.45	14224800.59	39°10'21.388"N	80°53'55.086"W	183.81	101.753	8.97	7.79	-4.60	
6737.00	79.010	162.280	6376.74	139.19	-81.24	193.51	1669157.99	14224756.81	39°10'20.955"N	80°53'54.914"W	209.87	112.775	7.47	7.13	-2.30	
6785.00	83.710	162.150	6383.95	186.62	-126.42	208.00	1669172.47	14224711.65	39°10'20.508"N	80°53'54.731"W	243.40	121.291	9.80	9.79	-0.27	
6832.00	87.940	162.300	6387.37	233.48	-171.05	222.30	1669186.78	14224667.04	39°10'20.067"N	80°53'54.550"W	280.49	127.576	9.01	9.00	0.32	
6879.00	90.340	162.130	6388.08	280.46	-215.79	236.66	1669201.12	14224622.32	39°10'19.625"N	80°53'54.368"W	320.27	132.360	5.12	5.11	-0.36	
6974.00	90.370	160.280	6387.49	375.46	-305.72	267.26	1669231.72	14224532.42	39°10'18.735"N	80°53'53.981"W	406.07	138.840	1.95	0.03	-1.95	
7068.00	90.430	158.290	6386.83	469.40	-393.64	300.51	1669264.95	14224444.54	39°10'17.866"N	80°53'53.560"W	495.23	142.641	2.12	0.06	-2.12	
7163.00	90.370	154.670	6386.17	564.05	-480.73	338.41	1669302.84	14224357.49	39°10'17.005"N	80°53'53.080"W	587.90	144.856	3.81	-0.06	-3.81	
7257.00	89.970	151.780	6385.89	657.13	-564.64	380.76	1669345.16	14224273.61	39°10'16.175"N	80°53'52.543"W	681.02	146.007	3.10	-0.43	-3.07	
7352.00	90.950	153.180	6385.13	751.01	-648.88	424.65	1669389.04	14224189.40	39°10'15.342"N	80°53'51.987"W	775.48	146.798	1.80	1.03	1.47	
7446.00	91.630	153.250	6383.01	844.07	-732.78	467.00	1669431.37	14224105.54	39°10'14.512"N	80°53'51.451"W	868.94	147.491	0.73	0.72	0.07	
7541.00	90.950	151.580	6380.87	937.92	-816.95	510.98	1669475.33	14224021.40	39°10'13.680"N	80°53'50.894"W	963.59	147.975	1.90	-0.72	-1.76	
7636.00	89.320	151.040	6380.65	1031.50	-900.29	556.58	1669520.92	14223938.10	39°10'12.855"N	80°53'50.316"W	1058.44	148.275	1.81	-1.72	-0.57	
7730.00	88.830	153.430	6382.16	1124.32	-983.45	600.36	1669564.68	14223854.97	39°10'12.033"N	80°53'49.761"W	1152.22	148.597	2.60	-0.52	2.54	
7824.00	89.080	157.120	6383.88	1217.78	-1068.80	639.66	1669603.97	14223769.65	39°10'11.189"N	80°53'49.263"W	1245.59	149.100	3.93	0.27	3.93	
7919.00	88.580	161.010	6385.82	1312.68	-1157.49	673.60	1669637.89	14223680.99	39°10'10.312"N	80°53'48.834"W	1339.22	149.803	4.13	-0.53	4.09	
8014.00	88.890	163.350	6387.92	1407.63	-1247.91	702.66	1669666.94	14223590.61	39°10'09.418"N	80°53'48.466"W	1432.13	150.617	2.48	0.33	2.46	
8108.00	88.740	165.690	6389.86	1501.45	-1338.47	727.74	1669692.01	14223500.09	39°10'08.523"N	80°53'48.149"W	1523.52	151.467	2.49	-0.16	2.49	

19320_1H_AWB
 08/18/2020
 Environmental Protection



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320'
Page 6 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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
8203.00	88.520	166.540	6392.13	1596.08	-1430.67	750.53	1669714.79	14223407.93	39°10'07.611"N	80°53'47.861"W	1615.58	152.318	0.92	-0.23	0.89	
8297.00	89.110	169.180	6394.08	1689.42	-1522.54	770.29	1669734.54	14223316.09	39°10'06.703"N	80°53'47.611"W	1706.30	153.164	2.88	0.63	2.81	
8392.00	89.110	171.580	6395.55	1783.20	-1616.18	786.17	1669750.41	14223222.49	39°10'05.777"N	80°53'47.411"W	1797.25	154.060	2.53	0.00	2.53	
8486.00	89.200	172.840	6396.94	1875.46	-1709.30	798.91	1669763.15	14223129.40	39°10'04.856"N	80°53'47.251"W	1886.79	154.949	1.34	0.10	1.34	
8580.00	89.140	172.610	6398.30	1967.57	-1802.54	810.81	1669775.04	14223036.21	39°10'03.935"N	80°53'47.101"W	1976.50	155.781	0.25	-0.06	-0.24	
8675.00	89.940	172.980	6399.06	2060.64	-1896.78	822.72	1669786.95	14222942.00	39°10'03.003"N	80°53'46.951"W	2067.52	156.551	0.93	0.84	0.39	
8769.00	89.940	172.360	6399.16	2152.77	-1990.01	834.71	1669798.94	14222848.80	39°10'02.082"N	80°53'46.800"W	2157.99	157.244	0.66	0.00	-0.66	
8864.00	90.090	170.130	6399.14	2246.31	-2083.90	849.17	1669813.39	14222754.95	39°10'01.153"N	80°53'46.618"W	2250.28	157.829	2.35	0.16	-2.35	
8958.00	90.090	166.530	6398.99	2339.58	-2175.94	868.18	1669832.40	14222662.95	39°10'00.243"N	80°53'46.378"W	2342.75	158.248	3.83	0.00	-3.83	
9053.00	90.150	161.890	6398.79	2434.42	-2267.33	894.03	1669858.23	14222571.60	39°09'59.340"N	80°53'46.051"W	2437.23	158.480	4.88	0.06	-4.88	
9147.00	90.310	156.310	6398.41	2528.32	-2355.11	927.55	1669891.74	14222483.85	39°09'58.472"N	80°53'45.627"W	2531.19	158.503	5.94	0.17	-5.94	
9241.00	90.180	153.410	6398.01	2621.73	-2440.20	967.48	1669931.65	14222398.80	39°09'57.630"N	80°53'45.121"W	2624.99	158.373	3.09	-0.14	-3.09	
9336.00	90.220	153.340	6397.68	2715.84	-2525.12	1010.05	1669974.21	14222313.91	39°09'56.791"N	80°53'44.582"W	2719.64	158.199	0.08	0.04	-0.07	
9430.00	90.180	154.520	6397.35	2809.07	-2609.56	1051.36	1670015.50	14222229.51	39°09'55.956"N	80°53'44.059"W	2813.39	158.056	1.26	-0.04	1.26	
9525.00	90.430	156.540	6396.85	2903.60	-2696.02	1090.71	1670054.83	14222143.08	39°09'55.101"N	80°53'43.560"W	2908.29	157.974	2.14	0.26	2.13	
9619.00	89.380	155.770	6397.00	2997.23	-2781.99	1128.71	1670092.82	14222057.14	39°09'54.250"N	80°53'43.079"W	3002.24	157.917	1.39	-1.12	-0.82	
9714.00	89.910	158.190	6397.59	3091.96	-2869.42	1165.85	1670129.95	14221969.75	39°09'53.386"N	80°53'42.609"W	3097.22	157.888	2.61	0.56	2.55	
9809.00	90.060	159.900	6397.61	3186.88	-2958.13	1199.83	1670163.91	14221881.07	39°09'52.509"N	80°53'42.179"W	3192.20	157.922	1.81	0.16	1.80	
9903.00	90.520	161.040	6397.14	3280.87	-3046.72	1231.25	1670195.32	14221792.52	39°09'51.633"N	80°53'41.781"W	3286.11	157.995	1.31	0.49	1.21	
9998.00	91.080	165.140	6395.81	3375.79	-3137.59	1258.88	1670222.93	14221701.69	39°09'50.734"N	80°53'41.432"W	3380.71	158.138	4.36	0.59	4.32	
10092.00	90.920	168.650	6394.17	3469.30	-3229.11	1280.18	1670244.23	14221610.20	39°09'49.829"N	80°53'41.163"W	3473.62	158.374	3.74	-0.17	3.73	
10186.00	90.520	168.560	6392.99	3562.52	-3321.25	1298.75	1670262.79	14221518.10	39°09'48.918"N	80°53'40.928"W	3566.16	158.642	0.44	-0.43	-0.10	
10280.00	91.050	166.750	6391.70	3655.92	-3413.06	1318.85	1670282.88	14221426.33	39°09'48.011"N	80°53'40.674"W	3659.01	158.873	2.01	0.56	-1.93	
10374.00	90.590	163.380	6390.36	3749.68	-3503.87	1343.07	1670307.09	14221335.56	39°09'47.113"N	80°53'40.368"W	3752.45	159.028	3.62	-0.49	-3.59	
10468.00	88.090	160.420	6391.44	3843.65	-3593.19	1372.26	1670336.27	14221246.27	39°09'46.230"N	80°53'39.999"W	3846.31	159.098	4.12	-2.66	-3.16	
10562.00	91.570	164.380	6391.72	3937.60	-3682.76	1400.67	1670364.67	14221156.74	39°09'45.344"N	80°53'39.640"W	3940.13	159.177	5.61	3.70	4.21	
10656.00	91.780	163.250	6388.97	4031.46	-3772.99	1426.86	1670390.85	14221066.54	39°09'44.452"N	80°53'39.308"W	4033.79	159.284	1.22	0.22	-1.20	
10750.00	88.770	161.620	6388.52	4125.42	-3862.60	1455.23	1670419.20	14220976.97	39°09'43.566"N	80°53'38.950"W	4127.63	159.356	3.64	-3.20	-1.73	
10844.00	91.290	161.750	6388.47	4219.41	-3951.83	1484.76	1670448.73	14220887.78	39°09'42.684"N	80°53'38.576"W	4221.55	159.408	2.68	2.68	0.14	
10938.00	91.110	157.900	6386.50	4313.35	-4040.02	1517.17	1670481.12	14220799.62	39°09'41.812"N	80°53'38.166"W	4315.51	159.417	4.10	-0.19	-4.10	

APPROVED BY
 [Signature] 10/11/2020
 [Signature] 10/11/2020
 [Signature] 10/11/2020



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320*

Page 7 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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
11032.00	91.260	157.290	6384.56	4407.14	-4126.91	1552.99	1670516.93	14220712.77	39°09'40.952"N	80°53'37.712"W	4409.44	159.378	0.67	0.16	-0.65	
11126.00	90.830	155.390	6382.84	4500.78	-4212.99	1590.71	1670554.63	14220626.72	39°09'40.101"N	80°53'37.235"W	4503.29	159.315	2.07	-0.46	-2.02	
11220.00	91.080	153.730	6381.28	4594.12	-4297.86	1631.08	1670594.98	14220541.88	39°09'39.262"N	80°53'36.724"W	4596.96	159.218	1.79	0.27	-1.77	
11313.00	91.170	155.950	6379.45	4686.52	-4382.02	1670.61	1670634.50	14220457.76	39°09'38.430"N	80°53'36.223"W	4689.67	159.131	2.39	0.10	2.39	
11407.00	90.550	157.250	6378.04	4780.20	-4468.27	1707.93	1670671.81	14220371.54	39°09'37.577"N	80°53'35.750"W	4783.57	159.081	1.53	-0.66	1.38	
11501.00	90.490	158.860	6377.19	4874.05	-4555.45	1743.06	1670706.92	14220284.39	39°09'36.714"N	80°53'35.306"W	4877.54	159.062	1.71	-0.06	1.71	
11594.00	91.020	162.640	6375.96	4967.02	-4643.23	1773.71	1670737.56	14220196.65	39°09'35.847"N	80°53'34.918"W	4970.48	159.093	4.10	0.57	4.06	
11687.00	90.860	163.290	6374.43	5059.97	-4732.14	1800.95	1670764.79	14220107.78	39°09'34.967"N	80°53'34.573"W	5063.26	159.164	0.72	-0.17	0.70	
11781.00	91.570	162.040	6372.44	5153.91	-4821.85	1828.96	1670792.78	14220018.11	39°09'34.081"N	80°53'34.219"W	5157.06	159.228	1.53	0.76	-1.33	
11875.00	90.800	157.800	6370.50	5247.85	-4910.09	1861.21	1670825.03	14219929.90	39°09'33.208"N	80°53'33.811"W	5251.01	159.240	4.58	-0.82	-4.51	
11969.00	90.120	159.660	6369.74	5341.75	-4997.68	1895.31	1670859.11	14219842.34	39°09'32.342"N	80°53'33.380"W	5345.00	159.231	2.11	-0.72	1.98	
12063.00	89.820	163.410	6369.79	5435.73	-5086.83	1925.08	1670888.87	14219753.23	39°09'31.460"N	80°53'33.003"W	5438.91	159.271	4.00	-0.32	3.99	
12156.00	91.050	167.370	6369.08	5528.46	-5176.80	1948.53	1670912.31	14219663.30	39°09'30.571"N	80°53'32.707"W	5531.37	159.374	4.46	1.32	4.26	
12251.00	90.920	167.720	6367.45	5622.87	-5269.55	1969.02	1670932.79	14219570.59	39°09'29.654"N	80°53'32.448"W	5625.40	159.511	0.39	-0.14	0.37	
12346.00	91.260	167.590	6365.64	5717.26	-5362.33	1989.32	1670953.09	14219477.84	39°09'28.736"N	80°53'32.192"W	5719.44	159.646	0.38	0.36	-0.14	
12439.00	91.750	164.340	6363.20	5809.90	-5452.51	2011.87	1670975.62	14219387.69	39°09'27.845"N	80°53'31.907"W	5811.84	159.747	3.53	0.53	-3.49	
12533.00	91.850	161.470	6360.25	5903.80	-5542.31	2039.48	1671003.22	14219297.94	39°09'26.957"N	80°53'31.558"W	5905.65	159.797	3.05	0.11	-3.05	
12627.00	90.920	158.380	6357.97	5997.74	-5630.56	2071.73	1671035.46	14219209.72	39°09'26.084"N	80°53'31.149"W	5999.61	159.799	3.43	-0.99	-3.29	
12721.00	90.280	157.940	6356.99	6091.60	-5717.81	2106.70	1671070.42	14219122.51	39°09'25.222"N	80°53'30.707"W	6093.56	159.774	0.83	-0.68	-0.47	
12815.00	90.090	159.280	6356.69	6185.49	-5805.33	2140.98	1671104.69	14219035.02	39°09'24.356"N	80°53'30.273"W	6187.54	159.756	1.44	-0.20	1.43	
12909.00	90.890	159.600	6355.88	6279.44	-5893.34	2173.99	1671137.68	14218947.05	39°09'23.486"N	80°53'29.855"W	6281.54	159.751	0.92	0.85	0.34	
13003.00	90.430	159.240	6354.80	6373.39	-5981.33	2207.03	1671170.71	14218859.09	39°09'22.616"N	80°53'29.437"W	6375.53	159.747	0.62	-0.49	-0.38	
13097.00	89.690	160.330	6354.70	6467.36	-6069.54	2239.51	1671203.18	14218770.91	39°09'21.744"N	80°53'29.026"W	6469.52	159.747	1.40	-0.79	1.16	
13191.00	90.310	163.700	6354.70	6561.34	-6158.93	2268.53	1671232.18	14218681.56	39°09'20.860"N	80°53'28.659"W	6563.44	159.780	3.65	0.66	3.59	
13285.00	90.520	163.120	6354.02	6655.26	-6249.02	2295.37	1671259.01	14218591.51	39°09'19.969"N	80°53'28.320"W	6657.25	159.831	0.66	0.22	-0.62	
13379.00	90.710	158.850	6353.01	6749.24	-6337.86	2325.99	1671289.62	14218502.70	39°09'19.090"N	80°53'27.933"W	6751.20	159.847	4.55	0.20	-4.54	
13472.00	90.490	158.560	6352.04	6842.14	-6424.51	2359.76	1671323.38	14218416.09	39°09'18.234"N	80°53'27.505"W	6844.18	159.831	0.39	-0.24	-0.31	
13565.00	90.430	160.900	6351.29	6935.10	-6511.74	2391.98	1671355.58	14218328.89	39°09'17.371"N	80°53'27.098"W	6937.17	159.830	2.52	-0.06	2.52	
13660.00	90.400	161.320	6350.60	7030.10	-6601.62	2422.73	1671386.32	14218239.05	39°09'16.482"N	80°53'26.709"W	7032.14	159.847	0.44	-0.03	0.44	
13754.00	90.770	160.070	6349.64	7124.09	-6690.33	2453.81	1671417.38	14218150.37	39°09'15.605"N	80°53'26.315"W	7126.13	159.859	1.39	0.39	-1.33	

Antero
 Resources
 19320*



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320*

Page 8 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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
13848.00	90.830	156.680	6348.33	7217.95	-6777.69	2488.44	1671452.00	14218063.05	39°09'14.741"N	80°53'25.877"W	7220.07	159.839	3.61	0.06	-3.61	
13942.00	90.120	155.820	6347.55	7311.59	-6863.73	2526.30	1671489.85	14217977.05	39°09'13.890"N	80°53'25.398"W	7313.89	159.793	1.19	-0.76	-0.91	
14036.00	90.340	159.910	6347.17	7405.40	-6950.78	2561.71	1671525.24	14217890.03	39°09'13.030"N	80°53'24.950"W	7407.81	159.769	4.36	0.23	4.35	
14130.00	90.370	160.190	6346.59	7499.38	-7039.14	2593.78	1671557.30	14217801.71	39°09'12.156"N	80°53'24.544"W	7501.81	159.772	0.30	0.03	0.30	
14223.00	90.340	159.310	6346.01	7592.35	-7126.39	2625.97	1671589.48	14217714.49	39°09'11.293"N	80°53'24.137"W	7594.61	159.772	0.95	-0.03	-0.95	
14317.00	90.280	159.720	6345.51	7686.30	-7214.44	2658.66	1671622.36	14217626.47	39°09'10.422"N	80°53'23.720"W	7688.81	159.769	0.44	-0.06	0.44	
14411.00	90.430	161.800	6344.92	7780.29	-7303.18	2689.84	1671653.32	14217537.77	39°09'09.545"N	80°53'23.329"W	7782.78	159.781	2.22	0.16	2.21	
14504.00	90.680	162.520	6344.02	7873.28	-7391.71	2718.33	1671681.80	14217449.28	39°09'08.670"N	80°53'22.968"W	7875.70	159.809	0.82	0.27	0.77	
14598.00	90.800	160.980	6342.81	7967.26	-7480.97	2747.76	1671711.22	14217360.05	39°09'07.787"N	80°53'22.596"W	7969.64	159.832	1.64	0.13	-1.64	
14691.00	91.350	158.680	6341.06	8060.21	-7568.24	2779.82	1671743.27	14217272.81	39°09'06.924"N	80°53'22.191"W	8062.61	159.832	2.54	0.59	-2.47	
14785.00	89.510	157.880	6340.36	8154.08	-7655.56	2814.60	1671778.04	14217185.53	39°09'06.061"N	80°53'21.750"W	8156.57	159.814	2.13	-1.96	-0.85	
14880.00	90.490	163.180	6340.36	8249.04	-7745.10	2846.26	1671809.68	14217096.03	39°09'05.175"N	80°53'21.350"W	8251.53	159.822	5.67	1.03	5.58	
14973.00	90.460	166.040	6339.59	8341.86	-7834.75	2870.94	1671834.34	14217006.41	39°09'04.289"N	80°53'21.038"W	8344.20	159.875	3.08	-0.03	3.08	
15067.00	90.680	167.260	6338.65	8435.44	-7926.20	2892.64	1671856.04	14216914.99	39°09'03.385"N	80°53'20.764"W	8437.54	159.951	1.32	0.23	1.30	
15161.00	91.720	165.540	6336.68	8529.03	-8017.54	2914.74	1671878.13	14216823.69	39°09'02.481"N	80°53'20.485"W	8530.93	160.022	2.14	1.11	-1.83	
15255.00	89.820	161.900	6335.42	8622.91	-8107.75	2941.08	1671904.46	14216733.52	39°09'01.590"N	80°53'20.152"W	8624.70	160.062	4.37	-2.02	-3.87	
15349.00	90.340	162.160	6335.29	8716.90	-8197.16	2970.08	1671933.45	14216644.15	39°09'00.705"N	80°53'19.785"W	8718.65	160.083	0.62	0.55	0.28	
15443.00	90.740	163.770	6334.40	8810.85	-8287.03	2997.62	1671960.97	14216554.31	39°08'59.817"N	80°53'19.437"W	8812.52	160.114	1.76	0.43	1.71	
15537.00	90.580	163.780	6333.32	8904.75	-8377.28	3023.88	1671987.23	14216464.10	39°08'58.925"N	80°53'19.105"W	8906.33	160.152	0.17	-0.17	0.01	
15631.00	90.890	164.600	6332.11	8998.62	-8467.72	3049.49	1672012.82	14216373.70	39°08'58.030"N	80°53'18.782"W	9000.09	160.194	0.93	0.33	0.87	
15725.00	90.620	165.200	6330.87	9092.42	-8558.46	3073.97	1672037.30	14216282.99	39°08'57.133"N	80°53'18.472"W	9093.77	160.243	0.70	-0.29	0.64	
15819.00	91.350	163.780	6329.26	9186.25	-8649.02	3099.10	1672062.42	14216192.47	39°08'56.238"N	80°53'18.155"W	9187.49	160.286	1.70	0.78	-1.51	
15913.00	90.280	160.260	6327.92	9280.21	-8738.41	3128.11	1672091.42	14216103.12	39°08'55.354"N	80°53'17.788"W	9281.43	160.304	3.91	-1.14	-3.74	
16007.00	90.220	156.780	6327.51	9374.09	-8825.86	3162.53	1672125.82	14216015.70	39°08'54.489"N	80°53'17.352"W	9375.36	160.286	3.70	-0.06	-3.70	
16101.00	89.750	158.080	6327.54	9467.88	-8912.66	3198.60	1672161.88	14215928.93	39°08'53.631"N	80°53'16.896"W	9469.25	160.258	1.47	-0.50	1.38	
16195.00	90.000	158.060	6327.74	9561.74	-8999.86	3233.71	1672196.97	14215841.77	39°08'52.768"N	80°53'16.451"W	9563.18	160.236	0.27	0.27	-0.02	
16289.00	90.030	155.010	6327.72	9655.41	-9086.08	3271.14	1672234.38	14215755.59	39°08'51.916"N	80°53'15.978"W	9656.97	160.200	3.24	0.03	-3.24	
16383.00	89.140	153.530	6328.40	9748.72	-9170.75	3311.94	1672275.17	14215670.95	39°08'51.078"N	80°53'15.461"W	9750.47	160.143	1.84	-0.95	-1.57	
16476.00	89.320	157.450	6329.65	9841.22	-9255.35	3350.51	1672313.73	14215586.38	39°08'50.242"N	80°53'14.973"W	9843.14	160.099	4.22	0.19	4.22	
16570.00	89.380	161.340	6330.71	9935.15	-9343.31	3383.58	1672346.79	14215498.46	39°08'49.372"N	80°53'14.555"W	9937.11	160.093	4.14	0.06	4.14	

ANTERO RESOURCES CORPORATION
 10000 Antero Drive
 Denver, CO 80201
 Phone: 303.425.1000
 Fax: 303.425.1001
 www.antero.com



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320'
Page 9 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (240 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)	Buld Rate (°/100ft)	Turn Rate (°/100ft)	Comments
16665.00	88.800	162.490	6332.22	10030.13	-9433.61	3413.07	1672376.26	14215408.20	39°08'48.479"N	80°53'14.182"W	10032.05	160.110	1.36	-0.61	1.21	
16758.00	89.230	163.870	6333.82	10123.06	-9522.61	3439.98	1672403.16	14215319.23	39°08'47.599"N	80°53'13.842"W	10124.90	160.138	1.55	0.46	1.48	
16852.00	88.830	161.700	6335.41	10217.01	-9612.38	3467.79	1672430.96	14215229.49	39°08'46.711"N	80°53'13.490"W	10218.78	160.162	2.35	-0.43	-2.31	
16946.00	89.540	161.660	6336.75	10310.99	-9701.61	3497.33	1672460.49	14215140.30	39°08'45.829"N	80°53'13.116"W	10312.74	160.176	0.76	0.76	-0.04	
17039.00	89.420	160.310	6337.59	10403.99	-9789.53	3527.63	1672490.78	14215052.42	39°08'44.960"N	80°53'12.733"W	10405.72	160.183	1.46	-0.13	-1.45	
17133.00	88.980	161.760	6338.91	10497.97	-9878.41	3558.18	1672521.31	14214963.57	39°08'44.081"N	80°53'12.347"W	10499.70	160.191	1.61	-0.47	1.54	
17227.00	88.800	164.100	6340.73	10591.91	-9968.25	3585.76	1672548.89	14214873.77	39°08'43.193"N	80°53'11.998"W	10593.57	160.215	2.50	-0.19	2.49	
17320.00	88.890	163.700	6342.60	10684.79	-10057.58	3611.55	1672574.66	14214784.47	39°08'42.309"N	80°53'11.672"W	10686.36	160.247	0.44	0.10	-0.43	
17414.00	88.830	165.290	6344.47	10778.61	-10148.14	3636.67	1672599.77	14214693.95	39°08'41.414"N	80°53'11.355"W	10780.08	160.284	1.69	-0.06	1.69	
17508.00	89.450	167.450	6345.88	10872.22	-10239.48	3658.82	1672621.91	14214602.65	39°08'40.511"N	80°53'11.075"W	10873.54	160.337	2.39	0.66	2.30	
17602.00	89.630	165.230	6346.64	10965.84	-10330.81	3681.02	1672644.10	14214511.35	39°08'39.608"N	80°53'10.795"W	10967.02	160.388	2.37	0.19	-2.36	
17696.00	90.060	159.400	6346.89	11059.78	-10420.33	3709.56	1672672.63	14214421.87	39°08'38.723"N	80°53'10.434"W	11060.93	160.405	6.22	0.46	-6.20	
17791.00	89.750	157.340	6347.05	11154.65	-10508.63	3744.57	1672707.63	14214333.60	39°08'37.850"N	80°53'09.991"W	11155.86	160.387	2.19	-0.33	-2.17	
17885.00	89.660	159.430	6347.53	11248.53	-10596.02	3779.20	1672742.24	14214246.25	39°08'36.985"N	80°53'09.553"W	11249.80	160.371	2.23	-0.10	2.22	
17978.00	89.750	161.560	6348.01	11341.52	-10683.68	3810.25	1672773.28	14214158.63	39°08'36.119"N	80°53'09.160"W	11342.79	160.372	2.29	0.10	2.29	
18072.00	89.750	163.300	6348.42	11435.49	-10773.29	3838.62	1672801.64	14214069.06	39°08'35.233"N	80°53'08.802"W	11436.73	160.389	1.85	0.00	1.85	
18166.00	90.000	161.850	6348.63	11529.46	-10862.97	3866.77	1672829.78	14213979.41	39°08'34.346"N	80°53'08.446"W	11530.66	160.406	1.57	0.27	-1.54	
18259.00	90.000	159.690	6348.63	11622.46	-10950.78	3897.40	1672860.40	14213891.64	39°08'33.478"N	80°53'08.059"W	11623.65	160.409	2.32	0.00	-2.32	
18353.00	89.380	159.560	6349.14	11716.42	-11038.89	3930.13	1672893.11	14213803.56	39°08'32.606"N	80°53'07.645"W	11717.64	160.403	0.67	-0.66	-0.14	
18447.00	89.820	162.970	6349.79	11810.40	-11127.90	3960.31	1672923.29	14213714.59	39°08'31.726"N	80°53'07.263"W	11811.61	160.410	3.66	0.47	3.63	
18541.00	89.820	163.750	6350.09	11904.33	-11217.96	3987.23	1672950.19	14213624.56	39°08'30.836"N	80°53'06.923"W	11905.49	160.433	0.83	0.00	0.83	
18634.00	89.750	162.090	6350.44	11997.29	-11306.85	4014.54	1672977.49	14213535.70	39°08'29.957"N	80°53'06.577"W	11998.40	160.452	1.79	-0.08	-1.78	
18728.00	89.880	161.540	6350.74	12091.28	-11396.16	4043.88	1673006.82	14213446.43	39°08'29.074"N	80°53'06.207"W	12092.37	160.463	0.60	0.14	-0.59	
18821.00	89.750	161.310	6351.04	12184.28	-11484.31	4073.50	1673036.43	14213358.31	39°08'28.202"N	80°53'05.832"W	12185.35	160.470	0.28	-0.14	-0.25	
18914.00	90.000	161.310	6351.24	12277.28	-11572.41	4103.31	1673066.22	14213270.25	39°08'27.331"N	80°53'05.455"W	12278.34	160.477	0.27	0.27	0.00	
19008.00	89.820	159.750	6351.39	12371.27	-11661.03	4134.64	1673097.54	14213181.67	39°08'26.454"N	80°53'05.059"W	12372.34	160.477	1.67	-0.19	-1.66	
19102.00	90.030	156.790	6351.52	12465.14	-11748.34	4169.43	1673132.32	14213094.39	39°08'25.591"N	80°53'04.619"W	12466.26	160.460	3.16	0.22	-3.15	
19196.00	89.350	156.720	6352.02	12558.85	-11834.71	4206.53	1673169.41	14213008.06	39°08'24.737"N	80°53'04.149"W	12560.06	160.433	0.73	-0.72	-0.07	
19289.00	88.650	160.080	6353.65	12651.71	-11921.15	4240.76	1673203.62	14212921.65	39°08'23.882"N	80°53'03.716"W	12652.98	160.418	3.69	-0.75	3.61	
19320.00	88.650	160.080	6354.38	12682.69	-11950.29	4251.32	1673214.17	14212892.53	39°08'23.594"N	80°53'03.583"W	12683.97	160.417	0.00	0.00	0.00	Projected MD at TD: 19320'

HOLE & CASING SECTIONS - Ref Wellbore: Hughes River Unit 1H AWB Ref Wellpath: Hughes River Unit 1H AWP Proj: 19320'										
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	-0.44	0.05	
20in Conductor	30.00	110.00	80.00	30.00	110.00	0.00	0.00	-0.44	0.05	
17.5in Open Hole	110.00	483.30	373.30	110.00	483.27	-0.44	0.05	-4.50	0.77	
13.375in Casing Surface	30.00	483.30	453.30	30.00	483.27	0.00	0.00	-4.50	0.77	
12.25in Open Hole	483.30	2573.70	2090.40	483.27	2573.33	-4.50	0.77	1.61	-10.05	
9.625in Casing Intermediate	30.00	2573.70	2543.70	30.00	2573.33	0.00	0.00	1.61	-10.05	
8.75in Open Hole	2573.70	6062.00	3488.30	2573.33	5994.41	1.61	-10.05	431.21	52.35	
8.5in Open Hole	6062.00	19320.00	13258.00	5994.41	6354.38	431.21	52.35	-11950.29	4251.32	
5.5in Casing Production	30.00	19320.00	19290.00	30.00	6354.38	0.00	0.00	-11950.29	4251.32	

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Hughes River Unit 1H - POE - Rev-2	6380.00	-2.47	176.96	1669141.45	14224835.56	39°10'21.734"N	80°53'55.123"W	point
Hughes River Unit 1H - BHL - Rev-2	6384.00	-11842.12	4201.24	1673164.12	14213000.65	39°08'24.664"N	80°53'04.217"W	point
Hughes River Unit 1H - LP - Rev-2	6384.00	-171.25	234.33	1669198.80	14224666.84	39°10'20.065"N	80°53'54.397"W	point

Ervin & Associates
 DIRECTOR OF REGULATORY AFFAIRS

FEB 15 2020

Washington State Department of Ecology
 Environmental Protection Division



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320'
Page 10 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH COMPOSITION - Ref Wellbore: Hughes River Unit 1H AWB Ref Wellpath: Hughes River Unit 1H AWP Proj: 19320'				
Start MD (ft)	End MD (ft)	Positional Uncertainty Model	Log Name/Comment	Wellbore
30.00	469.00	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-1/2">(100'-454')	Hughes River Unit 1H AWB
469.00	2494.00	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12-1/4">(454')(504'-2479')	Hughes River Unit 1H AWB
2494.00	5990.00	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4">(2479')(2620'-5975')	Hughes River Unit 1H AWB
5990.00	19289.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8-1/2">(5990')(6034'-19289)	Hughes River Unit 1H AWB
19289.00	19320.00	Blind Drilling (std)	Projection to bit	Hughes River Unit 1H AWB

PROJECTED
 UNITS: FEET AND INCHES
 FEB 28 2020
 A COURTESY OF
 ENVIRO-TECH PROJECTIONS



Actual Wellpath Report

Hughes River Unit 1H AWP Proj: 19320'
Page 11 of 11



REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #08
Area	Ritchie County, WV	Well	Hughes River Unit 1H
Field	Ritchie	Wellbore	Hughes River Unit 1H AWB
Facility	Ireland North Pad		

COMMENTS
<p>Wellpath general comments API: 47-085-10369-0000 BHI Job #: 109636578 Rig: H&P 519 Duration: 02/05/2019-02/09/2019 Gyrodatta MS Gyro <17-1/2">(100'-454') WFT EM <12-1/4">(454')(504'-2479') WFT EM <8-3/4">(2479')(2620'-5975') BH AT Curve <8-1/2">(5990')(6034'-19289) Middlesex: 6335' MD Burkett: 6538' MD Tully: 6625' MD Marcellus POE: 6688' MD Projected MD at TD: 19320'</p>

Antero Resources Corporation
10000 Antero Way
Denver, CO 80201
www.anteroresources.com