



# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen 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	1/28/2019 at 3:21:37 PM
Convergence at slot	0.06° East	Database/Source file	WA_MPL_EasternUS_Defn/Karen_Unit_1H_AWP_Proj_19850 .xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	1668936.99	14224850.13	39°10'21.880"N	80°53'57.720"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 #05)	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	161.11°

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWP
Facility	Ireland North Pad		

WELLPATH DATA (244 stations) † = interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
0.00	0.00	265.730	0.00	0.00	0.00	0.00	1668936.99	14224850.13	39°10'21.880"N	80°53'57.720"W	0.00	0.000	0.00	0.00	0.00	
30.00	0.000	265.730	30.00	0.00	0.00	0.00	1668936.99	14224850.13	39°10'21.880"N	80°53'57.720"W	0.00	0.000	0.00	0.00	0.00	
115.00	1.050	265.730	115.00	-0.20	-0.06	-0.78	1668936.22	14224850.07	39°10'21.879"N	80°53'57.730"W	0.78	265.730	1.24	1.24	-110.91	Gyrodata MS Gyro <17-1/2">(100'-455')
140.00	0.670	253.400	139.99	-0.26	-0.12	-1.15	1668935.85	14224850.01	39°10'21.879"N	80°53'57.735"W	1.15	264.176	1.68	-1.52	-49.32	
165.00	0.560	249.510	164.99	-0.26	-0.20	-1.40	1668935.59	14224849.92	39°10'21.878"N	80°53'57.738"W	1.41	261.815	0.47	-0.44	-15.56	
190.00	0.530	236.170	189.99	-0.23	-0.31	-1.61	1668935.38	14224849.82	39°10'21.877"N	80°53'57.740"W	1.64	259.155	0.52	-0.12	-53.36	
215.00	0.530	237.640	214.99	-0.17	-0.43	-1.80	1668935.19	14224849.69	39°10'21.876"N	80°53'57.743"W	1.86	256.451	0.05	0.00	5.88	
240.00	0.500	244.380	239.99	-0.13	-0.54	-2.00	1668934.99	14224849.58	39°10'21.875"N	80°53'57.745"W	2.07	254.789	0.27	-0.12	26.96	
265.00	0.470	238.410	264.99	-0.10	-0.64	-2.19	1668934.81	14224849.48	39°10'21.874"N	80°53'57.748"W	2.28	253.566	0.23	-0.12	-23.88	
290.00	0.400	235.650	289.99	-0.05	-0.75	-2.35	1668934.65	14224849.38	39°10'21.873"N	80°53'57.750"W	2.46	252.317	0.29	-0.28	-11.04	
315.00	0.390	235.130	314.99	-0.01	-0.85	-2.49	1668934.51	14224849.28	39°10'21.872"N	80°53'57.752"W	2.63	251.223	0.04	-0.04	-2.08	
340.00	0.420	229.420	339.98	0.05	-0.95	-2.63	1668934.37	14224849.17	39°10'21.871"N	80°53'57.753"W	2.79	250.041	0.20	0.12	-22.84	
365.00	0.450	236.960	364.98	0.11	-1.07	-2.78	1668934.22	14224849.06	39°10'21.869"N	80°53'57.755"W	2.98	248.992	0.26	0.12	30.16	
390.00	0.340	236.760	389.98	0.15	-1.16	-2.92	1668934.07	14224848.97	39°10'21.869"N	80°53'57.757"W	3.14	248.333	0.44	-0.44	-0.80	
415.00	0.380	226.770	414.98	0.20	-1.26	-3.04	1668933.95	14224848.87	39°10'21.868"N	80°53'57.759"W	3.29	247.544	0.30	0.16	-39.96	
440.00	0.300	229.170	439.98	0.26	-1.36	-3.15	1668933.84	14224848.77	39°10'21.867"N	80°53'57.760"W	3.43	246.710	0.32	-0.32	9.60	
465.00	0.370	234.110	464.98	0.31	-1.45	-3.27	1668933.72	14224848.68	39°10'21.866"N	80°53'57.762"W	3.58	246.111	0.30	0.28	19.76	
470.00	0.380	233.020	469.98	0.32	-1.47	-3.30	1668933.70	14224848.66	39°10'21.866"N	80°53'57.762"W	3.61	245.998	0.25	0.20	-21.80	
510.00	0.120	74.320	509.98	0.36	-1.54	-3.36	1668933.63	14224848.59	39°10'21.865"N	80°53'57.763"W	3.70	245.443	1.23	-0.65	-396.75	WFT EM <12-1/4">(455')(495'-2668')
602.00	0.710	225.290	601.98	0.62	-1.91	-3.67	1668933.32	14224848.22	39°10'21.861"N	80°53'57.767"W	4.14	242.519	0.89	0.64	164.10	
694.00	2.570	247.720	693.94	0.99	-3.09	-5.99	1668931.01	14224847.03	39°10'21.849"N	80°53'57.796"W	6.74	242.673	2.10	2.02	24.36	
786.00	5.100	255.290	785.73	0.81	-4.91	-11.85	1668925.15	14224845.21	39°10'21.832"N	80°53'57.871"W	12.83	247.478	2.80	2.75	8.23	
880.00	6.780	261.130	879.22	-0.46	-6.83	-21.38	1668915.63	14224843.30	39°10'21.813"N	80°53'57.992"W	22.44	252.277	1.90	1.79	6.21	
975.00	8.380	262.400	973.39	-2.79	-8.61	-33.78	1668903.23	14224841.52	39°10'21.795"N	80°53'58.149"W	34.86	255.698	1.69	1.68	1.34	
1070.00	10.270	263.530	1067.13	-5.97	-10.48	-49.06	1668887.96	14224839.65	39°10'21.777"N	80°53'58.343"W	50.17	257.939	2.00	1.99	1.19	
1165.00	11.860	264.260	1160.36	-10.01	-12.41	-67.19	1668869.83	14224837.72	39°10'21.758"N	80°53'58.573"W	68.32	259.533	1.68	1.67	0.77	
1260.00	13.200	263.830	1253.09	-14.62	-14.55	-87.69	1668849.34	14224835.58	39°10'21.737"N	80°53'58.834"W	88.89	260.575	1.41	1.41	-0.45	
1355.00	14.650	262.470	1345.30	-19.37	-17.30	-110.38	1668826.66	14224832.84	39°10'21.710"N	80°53'59.122"W	111.73	261.095	1.56	1.53	-1.43	
1450.00	16.570	264.310	1436.79	-24.83	-20.21	-135.77	1668801.28	14224829.92	39°10'21.682"N	80°53'59.444"W	137.27	261.532	2.09	2.02	1.94	
1545.00	19.090	266.780	1527.22	-32.12	-22.43	-164.77	1668772.29	14224827.71	39°10'21.660"N	80°53'59.812"W	166.29	262.248	2.77	2.65	2.60	

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Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
1640.00	21.350	268.280	1616.36	-41.43	-23.82	-197.57	1668739.51	14224826.31	39°10'21.647"N	80°54'00.229"W	199.00	263.125	2.44	2.38	1.58	
1735.00	23.810	268.780	1704.07	-52.35	-24.75	-234.03	1668703.06	14224825.39	39°10'21.638"N	80°54'00.692"W	235.33	263.964	2.60	2.59	0.53	
1830.00	25.470	267.690	1790.42	-64.00	-25.98	-273.61	1668663.49	14224824.16	39°10'21.626"N	80°54'01.195"W	274.85	264.576	1.81	1.75	-1.15	
1924.00	25.990	262.910	1875.11	-73.98	-29.34	-314.25	1668622.87	14224820.80	39°10'21.593"N	80°54'01.711"W	315.62	264.667	2.28	0.55	-5.09	
2019.00	27.550	261.990	1959.92	-82.39	-34.97	-356.67	1668580.47	14224815.17	39°10'21.538"N	80°54'02.249"W	358.38	264.401	1.70	1.64	-0.97	
2114.00	30.860	264.070	2042.84	-92.00	-40.55	-402.67	1668534.48	14224809.59	39°10'21.484"N	80°54'02.833"W	404.71	264.250	3.64	3.48	2.19	
2209.00	28.160	264.490	2125.51	-102.66	-45.22	-449.23	1668487.95	14224804.93	39°10'21.438"N	80°54'03.425"W	451.50	264.252	2.85	-2.84	0.44	
2304.00	27.730	264.020	2209.43	-112.78	-49.67	-493.52	1668443.67	14224800.47	39°10'21.394"N	80°54'03.987"W	496.02	264.252	0.51	-0.45	-0.49	
2399.00	30.980	264.630	2292.22	-123.44	-54.27	-539.86	1668397.35	14224795.88	39°10'21.350"N	80°54'04.576"W	542.58	264.260	3.44	3.42	0.64	
2494.00	31.750	265.000	2373.34	-135.15	-58.73	-589.10	1668348.13	14224791.42	39°10'21.306"N	80°54'05.201"W	592.02	264.307	0.84	0.81	0.39	
2588.00	31.110	264.760	2453.55	-146.82	-63.11	-637.93	1668299.32	14224787.05	39°10'21.263"N	80°54'05.821"W	641.04	264.350	0.69	-0.68	-0.26	
2683.00	31.780	264.790	2534.59	-158.53	-67.62	-687.28	1668249.99	14224782.53	39°10'21.219"N	80°54'06.448"W	690.60	264.381	0.71	0.71	0.03	
2858.00	31.050	264.990	2683.94	-180.26	-75.75	-778.13	1668159.17	14224774.41	39°10'21.140"N	80°54'07.601"W	781.81	264.440	0.42	-0.42	0.11	WFT EM <8-3/4">(2668'(2843'-6138')
2921.00	32.100	265.260	2737.61	-188.25	-78.55	-811.00	1668126.32	14224771.61	39°10'21.112"N	80°54'08.019"W	814.79	264.468	1.68	1.67	0.43	
3016.00	34.060	265.640	2817.21	-201.09	-82.66	-862.69	1668074.65	14224767.50	39°10'21.072"N	80°54'08.675"W	866.64	264.527	2.07	2.06	0.40	
3116.00	35.290	264.920	2899.45	-215.01	-87.34	-919.38	1668017.98	14224762.82	39°10'21.027"N	80°54'09.395"W	923.52	264.573	1.30	1.23	-0.72	
3211.00	34.900	264.240	2977.18	-227.74	-92.50	-973.76	1667963.63	14224757.66	39°10'20.976"N	80°54'10.085"W	978.14	264.574	0.58	-0.41	-0.72	
3306.00	33.200	263.800	3055.89	-239.63	-98.04	-1026.66	1667910.75	14224752.13	39°10'20.922"N	80°54'10.757"W	1031.33	264.545	1.81	-1.79	-0.46	
3400.00	32.300	262.840	3134.94	-250.38	-103.95	-1077.16	1667860.26	14224746.22	39°10'20.864"N	80°54'11.399"W	1082.17	264.488	1.11	-0.96	-1.02	
3495.00	32.450	262.880	3215.18	-260.74	-110.27	-1127.64	1667809.81	14224739.90	39°10'20.802"N	80°54'12.040"W	1133.01	264.415	0.16	0.16	0.04	
3590.00	31.290	263.520	3295.85	-271.24	-116.21	-1177.44	1667760.03	14224733.96	39°10'20.744"N	80°54'12.672"W	1183.16	264.363	1.27	-1.22	0.67	
3685.00	29.070	263.930	3377.97	-281.67	-121.44	-1224.91	1667712.58	14224728.74	39°10'20.693"N	80°54'13.275"W	1230.91	264.338	2.35	-2.34	0.43	
3780.00	27.360	265.790	3461.68	-292.32	-125.48	-1269.63	1667667.87	14224724.69	39°10'20.653"N	80°54'13.843"W	1275.82	264.356	2.02	-1.80	1.96	
3875.00	27.420	267.100	3546.03	-303.88	-128.19	-1313.25	1667624.27	14224721.99	39°10'20.627"N	80°54'14.397"W	1319.49	264.425	0.64	0.06	1.38	
3970.00	28.300	268.150	3630.02	-316.51	-130.02	-1357.61	1667579.93	14224720.15	39°10'20.609"N	80°54'14.960"W	1363.82	264.529	1.06	0.93	1.11	
4065.00	29.420	267.500	3713.22	-329.69	-131.77	-1403.43	1667534.13	14224718.41	39°10'20.593"N	80°54'15.542"W	1409.60	264.636	1.22	1.18	-0.68	
4160.00	31.080	267.400	3795.28	-343.15	-133.90	-1451.23	1667486.34	14224716.28	39°10'20.572"N	80°54'16.149"W	1457.40	264.728	1.75	1.75	-0.11	
4255.00	32.080	267.150	3876.21	-357.00	-136.27	-1500.93	1667436.67	14224713.91	39°10'20.549"N	80°54'16.780"W	1507.10	264.812	1.06	1.05	-0.26	
4350.00	31.420	266.190	3957.00	-370.41	-139.17	-1550.83	1667386.78	14224711.02	39°10'20.521"N	80°54'17.413"W	1557.06	264.872	0.87	-0.69	-1.01	
4445.00	30.990	265.360	4038.25	-382.88	-142.79	-1599.92	1667337.72	14224707.39	39°10'20.486"N	80°54'18.037"W	1606.28	264.900	0.64	-0.45	-0.87	

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 Antero Resources Corporation  
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REFERENCE WELLPATH IDENTIFICATION				
Operator	ANTERO RESOURCES CORPORATION		Slot	Slot #05
Area	Ritchie County, WV		Well	Karen Unit 1H
Field	Ritchie		Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad			

WELLPATH DATA (244 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
4540.00	31.290	264.140	4119.57	-394.46	-147.29	-1648.84	1667288.82	14224702.90	39°10'20.442"N	80°54'18.658"W	1655.40	264.895	0.74	0.32	-1.28	
4635.00	31.320	264.320	4200.73	-405.66	-152.25	-1697.95	1667239.73	14224697.94	39°10'20.393"N	80°54'19.282"W	1704.76	264.876	0.10	0.03	0.19	
4730.00	30.670	263.860	4282.17	-416.65	-157.29	-1746.61	1667191.09	14224692.90	39°10'20.344"N	80°54'19.899"W	1753.68	264.854	0.73	-0.68	-0.48	
4825.00	31.100	264.070	4363.70	-427.50	-162.41	-1795.10	1667142.61	14224687.78	39°10'20.294"N	80°54'20.515"W	1802.44	264.830	0.47	0.45	0.22	
4919.00	32.480	264.460	4443.59	-438.78	-167.36	-1844.37	1667093.36	14224682.84	39°10'20.245"N	80°54'21.141"W	1851.95	264.815	1.48	1.47	0.41	
5014.00	34.210	264.900	4522.95	-451.03	-172.19	-1896.37	1667041.39	14224678.00	39°10'20.198"N	80°54'21.801"W	1904.17	264.812	1.84	1.82	0.46	
5109.00	35.250	264.280	4601.03	-463.65	-177.30	-1950.25	1666987.53	14224672.90	39°10'20.148"N	80°54'22.485"W	1958.29	264.805	1.16	1.09	-0.65	
5204.00	34.910	261.550	4678.78	-474.82	-184.03	-2004.42	1666933.38	14224666.17	39°10'20.082"N	80°54'23.173"W	2012.85	264.754	1.69	-0.36	-2.87	
5299.00	34.020	259.990	4757.10	-483.85	-192.64	-2057.48	1666880.34	14224657.56	39°10'19.998"N	80°54'23.847"W	2066.48	264.651	1.32	-0.94	-1.64	
5394.00	32.500	258.800	4836.54	-491.36	-202.22	-2108.69	1666829.15	14224647.99	39°10'19.904"N	80°54'24.498"W	2118.36	264.522	1.74	-1.60	-1.25	
5489.00	31.550	259.840	4917.08	-498.55	-211.56	-2158.19	1666779.67	14224638.65	39°10'19.812"N	80°54'25.126"W	2168.53	264.401	1.16	-1.00	1.09	
5583.00	30.920	263.040	4997.46	-507.28	-218.83	-2206.37	1666731.51	14224631.39	39°10'19.740"N	80°54'25.738"W	2217.20	264.336	1.89	-0.67	3.40	
5678.00	30.400	266.640	5079.19	-518.76	-223.19	-2254.60	1666683.30	14224627.02	39°10'19.698"N	80°54'26.350"W	2265.62	264.346	2.01	-0.55	3.79	
5773.00	31.010	268.310	5160.87	-532.43	-225.32	-2303.06	1666634.86	14224624.89	39°10'19.677"N	80°54'26.966"W	2314.05	264.412	1.10	0.64	1.76	
5869.00	31.280	268.180	5243.03	-547.06	-226.84	-2352.69	1666585.25	14224623.37	39°10'19.663"N	80°54'27.596"W	2363.60	264.493	0.29	0.28	-0.14	
5963.00	30.530	267.710	5323.68	-561.05	-228.57	-2400.93	1666537.02	14224621.64	39°10'19.646"N	80°54'28.209"W	2411.79	264.562	0.84	-0.80	-0.50	
6059.00	29.650	267.890	5406.75	-574.87	-230.42	-2449.03	1666488.95	14224619.80	39°10'19.628"N	80°54'28.819"W	2459.84	264.625	0.92	-0.92	0.19	
6153.00	29.460	267.690	5488.52	-588.18	-232.21	-2495.36	1666442.63	14224618.01	39°10'19.611"N	80°54'29.408"W	2506.14	264.684	0.23	-0.20	-0.21	
6213.00	29.570	267.970	5540.73	-596.68	-233.33	-2524.90	1666413.11	14224616.89	39°10'19.600"N	80°54'29.783"W	2535.66	264.720	0.29	0.18	0.47	BH AT Curve <8-1/2">(6153')(6213'-19825')
6268.00	28.930	265.210	5588.72	-603.86	-234.92	-2551.72	1666386.30	14224615.30	39°10'19.585"N	80°54'30.123"W	2562.51	264.740	2.71	-1.16	-5.02	
6315.00	28.490	259.770	5629.95	-608.31	-237.86	-2574.08	1666363.94	14224612.36	39°10'19.556"N	80°54'30.407"W	2585.05	264.721	5.64	-0.94	-11.57	
6362.00	29.200	253.860	5671.12	-610.55	-243.04	-2596.13	1666341.90	14224607.18	39°10'19.505"N	80°54'30.687"W	2607.48	264.652	6.25	1.51	-12.57	
6409.00	29.760	246.660	5712.05	-610.20	-250.85	-2617.86	1666320.18	14224599.38	39°10'19.428"N	80°54'30.963"W	2629.85	264.526	7.63	1.19	-15.32	
6457.00	30.140	239.830	5753.65	-606.92	-261.63	-2639.22	1666298.83	14224588.60	39°10'19.322"N	80°54'31.235"W	2652.16	264.339	7.14	0.79	-14.23	
6504.00	30.650	233.300	5794.21	-600.94	-274.72	-2659.04	1666279.02	14224575.51	39°10'19.192"N	80°54'31.486"W	2673.19	264.101	7.11	1.09	-13.89	
6551.00	31.400	225.960	5834.50	-592.07	-290.40	-2677.45	1666260.62	14224559.84	39°10'19.038"N	80°54'31.720"W	2693.15	263.810	8.20	1.60	-15.62	
6598.00	32.130	218.600	5874.47	-580.15	-308.69	-2694.06	1666244.02	14224541.56	39°10'18.857"N	80°54'31.931"W	2711.68	263.464	8.38	1.55	-15.66	
6646.00	32.740	211.380	5915.00	-564.98	-329.75	-2708.78	1666229.30	14224520.51	39°10'18.649"N	80°54'32.119"W	2728.78	263.059	8.16	1.27	-15.04	
6693.00	33.070	204.930	5954.47	-547.60	-352.24	-2720.81	1666217.27	14224498.03	39°10'18.427"N	80°54'32.272"W	2743.52	262.623	7.49	0.70	-13.72	
6740.00	33.630	199.500	5993.74	-528.14	-376.14	-2730.56	1666207.53	14224474.14	39°10'18.191"N	80°54'32.396"W	2756.35	262.157	6.46	1.19	-11.55	

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# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
6878.00	35.280	193.540	6032.50	-506.48	-401.61	-2738.09	1666200.00	14224448.67	39°10'17.939"N	80°54'32.492"W	2767.38	261.656	7.98	3.51	-12.68	
6835.00	37.740	189.120	6071.09	-481.80	-429.60	-2743.66	1666194.43	14224420.70	39°10'17.662"N	80°54'32.563"W	2777.09	261.101	7.50	5.12	-9.21	
6882.00	40.870	184.710	6107.46	-455.00	-459.14	-2747.21	1666190.89	14224391.17	39°10'17.371"N	80°54'32.608"W	2785.31	260.512	8.92	6.66	-9.38	
6929.00	44.520	182.450	6142.00	-425.55	-490.94	-2749.17	1666188.92	14224359.38	39°10'17.056"N	80°54'32.634"W	2792.67	259.875	8.42	7.77	-4.81	
6958.00†	47.462	181.637	6162.15	-406.07	-511.79	-2749.91	1666188.18	14224338.55	39°10'16.850"N	80°54'32.643"W	2797.13	259.457	10.34	10.14	-2.80	Middlesex: 6958' MD
6976.00	49.290	181.170	6174.10	-393.45	-525.24	-2750.24	1666187.85	14224325.10	39°10'16.717"N	80°54'32.648"W	2799.95	259.188	10.34	10.16	-2.59	
7024.00	53.940	179.660	6203.90	-357.95	-562.85	-2750.50	1666187.60	14224287.50	39°10'16.346"N	80°54'32.651"W	2807.50	258.435	10.00	9.69	-3.15	
7071.00	59.230	176.630	6229.78	-320.45	-602.04	-2749.20	1666188.90	14224248.33	39°10'15.958"N	80°54'32.635"W	2814.35	257.648	12.47	11.26	-6.45	
7118.00	63.840	174.330	6252.17	-280.43	-643.21	-2745.93	1666192.17	14224207.18	39°10'15.551"N	80°54'32.594"W	2820.25	256.817	10.71	9.81	-4.89	
7162.00†	68.951	172.490	6269.79	-241.05	-683.24	-2741.29	1666196.80	14224167.16	39°10'15.155"N	80°54'32.536"W	2825.15	256.005	12.23	11.62	-4.18	Burkett: 7162' MD
7165.00	69.300	172.370	6270.86	-238.30	-686.02	-2740.92	1666197.17	14224164.38	39°10'15.128"N	80°54'32.531"W	2825.47	255.948	12.23	11.64	-4.02	
7212.00	73.660	171.030	6285.78	-194.51	-730.11	-2734.48	1666203.61	14224120.31	39°10'14.692"N	80°54'32.450"W	2830.27	255.051	9.66	9.28	-2.85	
7259.00	77.340	168.740	6297.55	-149.55	-774.89	-2726.48	1666211.60	14224075.54	39°10'14.249"N	80°54'32.349"W	2834.46	254.134	9.14	7.83	-4.87	
7285.00†	78.617	167.973	6302.97	-124.32	-799.60	-2721.35	1666216.73	14224050.65	39°10'14.003"N	80°54'32.284"W	2836.45	253.622	5.70	4.91	-2.95	Tully: 7285' MD
7307.00	79.700	167.330	6307.10	-102.85	-820.91	-2716.73	1666221.35	14224029.55	39°10'13.795"N	80°54'32.226"W	2838.05	253.187	5.70	4.92	-2.92	
7354.00	80.570	164.370	6315.16	-56.71	-865.80	-2705.41	1666232.67	14223984.67	39°10'13.351"N	80°54'32.083"W	2840.57	252.254	6.47	1.85	-6.30	
7401.00	80.630	161.850	6322.84	-10.38	-910.16	-2691.94	1666246.13	14223940.33	39°10'12.912"N	80°54'31.912"W	2841.64	251.319	5.29	0.13	-5.36	
7404.00†	80.640	161.731	6323.32	-7.42	-912.98	-2691.01	1666247.06	14223937.52	39°10'12.884"N	80°54'31.901"W	2841.67	251.260	3.94	0.33	-3.98	Marcellus POE: 7404' MD
7448.00	80.790	159.980	6330.42	36.00	-954.00	-2676.77	1666261.29	14223896.51	39°10'12.479"N	80°54'31.720"W	2841.69	250.384	3.94	0.34	-3.98	
7496.00	82.160	159.470	6337.54	83.46	-998.52	-2660.32	1666277.74	14223852.00	39°10'12.038"N	80°54'31.512"W	2841.54	249.427	3.04	2.85	-1.06	
7543.00	84.850	159.870	6342.86	130.14	-1042.31	-2644.10	1666293.95	14223808.24	39°10'11.806"N	80°54'31.307"W	2842.13	248.486	5.79	5.72	0.85	
7591.00	87.470	161.120	6346.07	178.02	-1087.45	-2628.11	1666309.93	14223763.11	39°10'11.159"N	80°54'31.104"W	2844.21	247.521	6.05	5.46	2.60	
7638.00	89.510	160.000	6347.31	225.00	-1131.75	-2612.48	1666325.56	14223718.83	39°10'10.721"N	80°54'30.906"W	2847.09	246.577	4.95	4.34	-2.38	
7685.00	90.250	158.180	6347.41	271.97	-1175.65	-2595.70	1666342.33	14223674.95	39°10'10.287"N	80°54'30.694"W	2849.53	245.633	4.18	1.57	-3.87	
7780.00	89.600	153.140	6347.53	366.51	-1262.18	-2556.56	1666381.46	14223588.45	39°10'09.431"N	80°54'30.198"W	2851.16	243.724	5.35	-0.68	-5.31	
7874.00	89.260	152.970	6348.47	459.58	-1345.97	-2513.97	1666424.03	14223504.89	39°10'08.603"N	80°54'29.658"W	2851.61	241.836	0.40	-0.36	-0.18	
7968.00	88.460	151.640	6350.34	552.45	-1429.18	-2470.29	1666467.69	14223421.52	39°10'07.780"N	80°54'29.105"W	2853.93	239.949	1.65	-0.85	-1.41	
8063.00	87.510	154.290	6353.68	646.42	-1513.74	-2427.14	1666510.82	14223336.99	39°10'06.944"N	80°54'28.558"W	2860.50	238.049	2.96	-1.00	2.79	
8158.00	89.170	160.350	6356.43	741.13	-1601.32	-2390.55	1666547.40	14223249.45	39°10'06.078"N	80°54'28.094"W	2877.31	236.184	6.61	1.75	6.38	
8252.00	88.890	164.100	6358.02	835.08	-1690.80	-2361.86	1666576.08	14223160.01	39°10'05.193"N	80°54'27.731"W	2904.68	234.402	4.00	-0.30	3.99	

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# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
8347.00	89.540	167.240	6359.33	929.76	-1782.82	-2338.35	1666599.58	14223068.02	39°10'04.283"N	80°54'27.434"W	2940.47	232.677	3.38	0.68	3.31	
8441.00	90.950	166.530	6358.92	1023.27	-1874.37	-2317.02	1666620.90	14222976.51	39°10'03.378"N	80°54'27.164"W	2980.24	231.029	1.68	1.50	-0.76	
8536.00	90.400	162.070	6357.80	1118.10	-1965.79	-2291.33	1666646.59	14222885.12	39°10'02.474"N	80°54'26.839"W	3019.03	229.373	4.73	-0.58	-4.69	
8630.00	89.260	159.620	6358.08	1212.09	-2054.58	-2260.49	1666677.41	14222796.37	39°10'01.596"N	80°54'26.449"W	3054.68	227.732	2.87	-1.21	-2.61	
8725.00	90.520	158.120	6358.27	1307.01	-2143.19	-2226.24	1666711.65	14222707.80	39°10'00.720"N	80°54'26.015"W	3090.21	226.089	2.06	1.33	-1.58	
8819.00	89.720	156.500	6358.07	1400.80	-2229.91	-2189.98	1666747.89	14222621.11	39°09'59.863"N	80°54'25.556"W	3125.46	224.482	1.92	-0.85	-1.72	
8914.00	88.980	155.120	6359.15	1495.38	-2316.56	-2151.06	1666786.80	14222534.50	39°09'59.006"N	80°54'25.063"W	3161.25	222.878	1.65	-0.78	-1.45	
9008.00	89.290	156.270	6360.56	1588.95	-2402.22	-2112.37	1666825.47	14222448.87	39°09'58.159"N	80°54'24.573"W	3198.87	221.327	1.27	0.33	1.22	
9102.00	89.320	158.330	6361.71	1682.73	-2488.92	-2076.10	1666861.72	14222362.20	39°09'57.302"N	80°54'24.114"W	3241.13	219.833	2.19	0.03	2.19	
9197.00	89.230	160.360	6362.91	1777.67	-2577.81	-2042.60	1666895.22	14222273.35	39°09'56.423"N	80°54'23.689"W	3288.96	218.393	2.14	-0.09	2.14	
9291.00	89.380	161.390	6364.05	1871.67	-2666.61	-2011.80	1666926.00	14222184.59	39°09'55.545"N	80°54'23.300"W	3340.38	217.032	1.11	0.16	1.10	
9386.00	88.800	162.470	6365.56	1966.64	-2756.91	-1982.34	1666955.45	14222094.32	39°09'54.652"N	80°54'22.927"W	3395.62	215.718	1.29	-0.61	1.14	
9481.00	88.770	163.660	6367.57	2061.56	-2847.77	-1954.67	1666983.10	14222003.50	39°09'53.754"N	80°54'22.577"W	3454.06	214.465	1.25	-0.03	1.25	
9576.00	90.180	167.110	6368.44	2156.28	-2939.68	-1930.71	1667007.06	14221911.63	39°09'52.845"N	80°54'22.274"W	3517.01	213.296	3.92	1.48	3.63	
9671.00	89.600	165.960	6368.62	2250.85	-3032.06	-1908.59	1667029.17	14221819.28	39°09'51.932"N	80°54'21.994"W	3582.75	212.189	1.36	-0.61	-1.21	
9766.00	89.260	166.020	6369.57	2345.50	-3124.23	-1885.59	1667052.16	14221727.15	39°09'51.020"N	80°54'21.703"W	3649.15	211.113	0.36	-0.36	0.06	
9860.00	89.380	164.180	6370.68	2439.26	-3215.06	-1861.42	1667076.32	14221636.36	39°09'50.122"N	80°54'21.398"W	3715.04	210.070	1.96	0.13	-1.96	
9955.00	89.170	162.360	6371.89	2534.18	-3306.03	-1834.08	1667103.65	14221545.42	39°09'49.223"N	80°54'21.052"W	3780.70	209.020	1.93	-0.22	-1.92	
10050.00	89.780	161.790	6372.76	2629.17	-3396.41	-1804.84	1667132.87	14221455.08	39°09'48.329"N	80°54'20.682"W	3846.18	207.986	0.88	0.64	-0.60	
10145.00	89.850	161.140	6373.06	2724.16	-3486.48	-1774.64	1667163.06	14221365.04	39°09'47.439"N	80°54'20.299"W	3912.15	206.976	0.69	0.07	-0.68	
10239.00	89.850	159.270	6373.31	2818.15	-3574.92	-1742.81	1667194.88	14221276.63	39°09'46.564"N	80°54'19.896"W	3977.12	205.990	1.99	0.00	-1.99	
10334.00	89.910	160.220	6373.51	2913.12	-3664.05	-1709.92	1667227.76	14221187.55	39°09'45.683"N	80°54'19.480"W	4043.40	205.017	1.00	0.06	1.00	
10428.00	90.460	161.290	6373.21	3007.11	-3752.79	-1678.94	1667258.73	14221098.84	39°09'44.806"N	80°54'19.088"W	4111.24	204.103	1.28	0.59	1.14	
10523.00	90.580	161.690	6372.34	3102.11	-3842.88	-1648.78	1667288.87	14221008.79	39°09'43.915"N	80°54'18.706"W	4181.65	203.222	0.44	0.13	0.42	
10617.00	89.850	160.220	6371.99	3196.10	-3931.73	-1618.11	1667319.53	14220919.98	39°09'43.036"N	80°54'18.318"W	4251.68	202.370	1.75	-0.78	-1.56	
10712.00	89.690	161.320	6372.37	3291.10	-4021.42	-1586.82	1667350.81	14220830.32	39°09'42.149"N	80°54'17.922"W	4323.18	201.534	1.17	-0.17	1.16	
10806.00	90.580	163.060	6372.15	3385.08	-4110.91	-1558.07	1667379.54	14220740.86	39°09'41.265"N	80°54'17.558"W	4396.27	200.757	2.08	0.95	1.85	
10901.00	89.720	162.800	6371.90	3480.03	-4201.73	-1530.19	1667407.42	14220650.08	39°09'40.367"N	80°54'17.205"W	4471.69	200.011	0.95	-0.91	-0.27	
10995.00	90.680	164.520	6371.57	3573.93	-4291.93	-1503.74	1667433.85	14220559.92	39°09'39.475"N	80°54'16.871"W	4547.73	199.309	2.10	1.02	1.83	
11090.00	90.620	160.660	6370.50	3668.88	-4382.55	-1475.33	1667462.26	14220469.33	39°09'38.579"N	80°54'16.511"W	4624.21	198.605	4.06	-0.06	-4.06	

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# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
11185.00	91.570	162.010	6368.68	3763.85	-4472.54	-1444.93	1667492.64	14220379.38	39°09'37.689"N	80°54'16.127"W	4700.15	197.904	1.74	1.00	1.42	
11279.00	90.680	162.450	6366.83	3857.82	-4562.03	-1416.25	1667521.32	14220289.92	39°09'36.804"N	80°54'15.764"W	4776.81	197.247	1.06	-0.95	0.47	
11374.00	90.770	160.900	6365.63	3952.80	-4652.20	-1386.38	1667551.17	14220199.79	39°09'35.913"N	80°54'15.386"W	4854.39	196.594	1.63	0.09	-1.63	
11468.00	90.680	159.500	6364.44	4046.78	-4740.64	-1354.54	1667582.99	14220111.39	39°09'35.038"N	80°54'14.983"W	4930.36	195.946	1.49	-0.10	-1.49	
11563.00	90.460	159.060	6363.50	4141.73	-4829.49	-1320.93	1667616.59	14220022.57	39°09'34.160"N	80°54'14.557"W	5006.88	195.297	0.52	-0.23	-0.46	
11657.00	90.340	160.650	6362.84	4235.70	-4917.73	-1288.56	1667648.95	14219934.37	39°09'33.287"N	80°54'14.148"W	5083.75	194.683	1.70	-0.13	1.69	
11752.00	90.340	159.620	6362.28	4330.68	-5007.08	-1256.28	1667681.22	14219845.06	39°09'32.404"N	80°54'13.739"W	5162.27	194.085	1.08	0.00	-1.08	
11846.00	90.490	157.260	6361.60	4424.57	-5094.49	-1221.74	1667715.74	14219757.68	39°09'31.539"N	80°54'13.302"W	5238.94	193.486	2.52	0.16	-2.51	
11941.00	89.630	156.140	6361.50	4519.29	-5181.74	-1184.17	1667753.30	14219670.46	39°09'30.677"N	80°54'12.826"W	5315.33	192.873	1.49	-0.91	-1.18	
12036.00	89.940	158.630	6361.85	4614.08	-5269.43	-1147.64	1667789.82	14219582.81	39°09'29.810"N	80°54'12.363"W	5392.96	192.287	2.64	0.33	2.62	
12130.00	90.030	161.550	6361.88	4708.05	-5357.80	-1115.63	1667821.81	14219494.47	39°09'28.936"N	80°54'11.958"W	5472.72	191.762	3.11	0.10	3.11	
12225.00	90.370	163.680	6361.55	4803.01	-5448.46	-1087.25	1667850.18	14219403.85	39°09'28.040"N	80°54'11.599"W	5555.88	191.285	2.27	0.36	2.24	
12319.00	89.940	165.010	6361.29	4896.86	-5538.97	-1061.88	1667875.54	14219313.38	39°09'27.145"N	80°54'11.278"W	5639.84	190.853	1.49	-0.46	1.41	
12414.00	90.430	165.430	6360.99	4991.62	-5630.82	-1037.65	1667899.76	14219221.56	39°09'26.237"N	80°54'10.972"W	5725.63	190.441	0.68	0.52	0.44	
12508.00	90.830	163.390	6359.95	5085.45	-5721.35	-1012.39	1667925.01	14219131.07	39°09'25.341"N	80°54'10.652"W	5810.23	190.035	2.21	0.43	-2.17	
12603.00	90.860	161.010	6358.55	5180.41	-5811.79	-983.35	1667954.04	14219040.67	39°09'24.447"N	80°54'10.285"W	5894.39	189.603	2.51	0.03	-2.51	
12697.00	90.520	157.830	6357.42	5274.35	-5899.77	-950.32	1667987.06	14218952.72	39°09'23.577"N	80°54'09.867"W	5975.82	189.150	3.40	-0.36	-3.36	
12792.00	89.780	155.940	6357.17	5369.09	-5987.14	-913.02	1668024.34	14218865.39	39°09'22.713"N	80°54'09.395"W	6056.36	188.671	2.14	-0.78	-1.99	
12887.00	90.830	157.180	6356.66	5463.79	-6074.30	-875.24	1668062.11	14218778.26	39°09'21.851"N	80°54'08.916"W	6137.03	188.199	1.71	1.11	1.31	
12981.00	90.250	157.440	6355.78	5557.58	-6161.02	-838.98	1668098.35	14218691.58	39°09'20.994"N	80°54'08.457"W	6217.88	187.755	0.68	-0.62	0.28	
13076.00	90.120	156.460	6355.47	5652.32	-6248.43	-801.78	1668135.53	14218604.20	39°09'20.130"N	80°54'07.986"W	6299.66	187.312	1.04	-0.14	-1.03	
13170.00	89.970	155.880	6355.40	5745.97	-6334.42	-763.80	1668173.50	14218518.25	39°09'19.279"N	80°54'07.505"W	6380.30	186.876	0.64	-0.16	-0.62	
13265.00	89.660	159.740	6355.70	5840.80	-6422.36	-727.93	1668209.35	14218430.34	39°09'18.410"N	80°54'07.051"W	6463.49	186.466	4.08	-0.33	4.06	
13359.00	89.970	163.250	6356.01	5934.78	-6511.49	-698.10	1668239.17	14218341.25	39°09'17.528"N	80°54'06.674"W	6548.81	186.119	3.75	0.33	3.73	
13454.00	89.970	165.540	6356.06	6029.62	-6602.98	-672.55	1668264.71	14218249.79	39°09'16.624"N	80°54'06.350"W	6637.15	185.816	2.41	0.00	2.41	
13548.00	90.150	167.470	6355.96	6123.20	-6694.38	-650.61	1668286.64	14218158.43	39°09'15.720"N	80°54'06.073"W	6725.92	185.551	2.06	0.19	2.05	
13643.00	90.280	167.580	6355.60	6217.60	-6787.14	-630.09	1668307.15	14218065.71	39°09'14.803"N	80°54'05.814"W	6816.32	185.304	0.18	0.14	0.12	
13737.00	90.180	167.100	6355.23	6311.05	-6878.85	-609.49	1668327.75	14217974.03	39°09'13.896"N	80°54'05.554"W	6905.80	185.063	0.52	-0.11	-0.51	
13832.00	90.030	167.630	6355.05	6405.48	-6971.55	-588.71	1668348.52	14217881.37	39°09'12.980"N	80°54'05.291"W	6996.36	184.827	0.58	-0.16	0.56	
13926.00	90.710	172.230	6354.44	6498.34	-7064.08	-572.28	1668364.94	14217788.88	39°09'12.065"N	80°54'05.084"W	7087.22	184.632	4.95	0.72	4.89	

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# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
14020.00	90.370	173.560	6353.56	6590.35	-7157.35	-560.65	1668376.56	14217695.65	39°09'11.143"N	80°54'04.938"W	7179.27	184.479	1.46	-0.36	1.41	
14115.00	90.740	169.540	6352.64	6683.76	-7251.29	-546.70	1668390.51	14217601.74	39°09'10.215"N	80°54'04.762"W	7271.87	184.312	4.25	0.39	-4.23	
14209.00	91.110	161.640	6351.12	6777.38	-7342.25	-523.33	1668413.88	14217510.82	39°09'09.315"N	80°54'04.466"W	7360.88	184.077	8.41	0.39	-8.40	
14304.00	91.350	158.470	6349.08	6872.33	-7431.52	-490.93	1668446.26	14217421.59	39°09'08.433"N	80°54'04.056"W	7447.72	183.780	3.35	0.25	-3.34	
14398.00	91.320	156.050	6346.89	6966.09	-7518.18	-454.61	1668482.57	14217334.96	39°09'07.576"N	80°54'03.597"W	7531.92	183.460	2.57	-0.03	-2.57	
14493.00	91.350	154.690	6344.67	7060.58	-7604.52	-415.03	1668522.13	14217248.66	39°09'06.722"N	80°54'03.095"W	7615.83	183.124	1.43	0.03	-1.43	
14587.00	90.890	154.670	6342.84	7153.97	-7689.47	-374.84	1668562.31	14217163.74	39°09'05.882"N	80°54'02.586"W	7698.60	182.791	0.49	-0.49	-0.02	
14682.00	90.860	154.790	6341.39	7248.38	-7775.37	-334.29	1668602.84	14217077.88	39°09'05.032"N	80°54'02.073"W	7782.55	182.462	0.13	-0.03	0.13	
14776.00	91.020	153.200	6339.84	7341.64	-7859.84	-293.08	1668644.03	14216993.44	39°09'04.197"N	80°54'01.551"W	7865.30	182.135	1.70	0.17	-1.69	
14870.00	89.940	149.810	6339.06	7434.30	-7942.43	-248.24	1668688.85	14216910.88	39°09'03.380"N	80°54'00.983"W	7946.31	181.790	3.78	-1.15	-3.61	
14965.00	90.770	150.640	6338.47	7527.59	-8024.89	-201.07	1668736.01	14216828.46	39°09'02.565"N	80°54'00.385"W	8027.41	181.435	1.24	0.87	0.87	
15059.00	90.950	156.710	6337.06	7620.74	-8109.09	-159.41	1668777.65	14216744.29	39°09'01.732"N	80°53'59.858"W	8110.66	181.126	6.46	0.19	6.46	
15154.00	90.490	158.390	6335.86	7715.55	-8196.88	-123.13	1668813.91	14216656.53	39°09'00.864"N	80°53'59.398"W	8197.81	180.861	1.83	-0.48	1.77	
15248.00	90.340	159.420	6335.18	7809.48	-8284.58	-89.30	1668847.73	14216568.87	39°08'59.997"N	80°53'58.970"W	8285.06	180.618	1.11	-0.16	1.10	
15343.00	90.180	160.300	6334.75	7904.45	-8373.77	-56.59	1668880.42	14216479.72	39°08'59.115"N	80°53'58.556"W	8373.96	180.387	0.94	-0.17	0.93	
15437.00	90.150	162.340	6334.48	7998.44	-8462.81	-26.49	1668910.52	14216390.71	39°08'58.234"N	80°53'58.175"W	8462.85	180.179	2.17	-0.03	2.17	
15532.00	90.000	165.760	6334.35	8093.31	-8554.14	-0.38	1668936.61	14216299.42	39°08'57.331"N	80°53'57.845"W	8554.14	180.003	3.60	-0.16	3.60	
15626.00	90.280	166.940	6334.12	8186.91	-8645.48	21.80	1668958.78	14216208.11	39°08'56.428"N	80°53'57.565"W	8645.51	179.856	1.29	0.30	1.26	
15721.00	90.370	167.280	6333.59	8281.39	-8738.09	42.99	1668979.97	14216115.54	39°08'55.513"N	80°53'57.297"W	8738.19	179.718	0.37	0.09	0.36	
15815.00	90.220	167.500	6333.10	8374.82	-8829.82	63.51	1669000.48	14216023.85	39°08'54.606"N	80°53'57.038"W	8830.05	179.588	0.28	-0.16	0.23	
15910.00	90.280	166.930	6332.69	8469.28	-8922.46	84.53	1669021.49	14215931.24	39°08'53.690"N	80°53'56.773"W	8922.86	179.457	0.60	0.06	-0.60	
16004.00	90.310	165.110	6332.20	8562.93	-9013.67	107.24	1669044.19	14215840.07	39°08'52.788"N	80°53'56.486"W	9014.31	179.318	1.94	0.03	-1.94	
16099.00	90.370	162.010	6331.64	8657.83	-9104.78	134.12	1669071.06	14215749.00	39°08'51.887"N	80°53'56.146"W	9105.76	179.156	3.26	0.06	-3.26	
16193.00	89.970	160.480	6331.36	8751.83	-9193.78	164.35	1669101.27	14215660.03	39°08'51.007"N	80°53'55.763"W	9195.25	178.976	1.68	-0.43	-1.63	
16288.00	90.000	160.310	6331.39	8846.82	-9283.27	196.22	1669133.14	14215570.57	39°08'50.123"N	80°53'55.360"W	9285.35	178.789	0.18	0.03	-0.18	
16382.00	89.940	159.230	6331.43	8940.79	-9371.47	228.72	1669165.63	14215482.41	39°08'49.250"N	80°53'54.949"W	9374.27	178.602	1.15	-0.06	-1.15	
16477.00	89.910	157.630	6331.56	9035.69	-9459.82	263.65	1669200.54	14215394.10	39°08'48.377"N	80°53'54.507"W	9463.49	178.404	1.68	-0.03	-1.68	
16571.00	90.280	160.430	6331.40	9129.62	-9547.58	297.29	1669234.16	14215306.37	39°08'47.509"N	80°53'54.081"W	9552.21	178.217	3.00	0.39	2.98	
16666.00	90.060	161.500	6331.12	9224.61	-9637.39	328.27	1669265.13	14215216.60	39°08'46.621"N	80°53'53.689"W	9642.98	178.049	1.15	-0.23	1.13	
16760.00	90.090	160.410	6331.00	9318.61	-9726.24	358.94	1669295.79	14215127.79	39°08'45.742"N	80°53'53.301"W	9732.86	177.886	1.16	0.03	-1.16	

PROJECT:  
Office: 19850 Gas

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WV Department of  
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# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
16655.00	90.000	159.320	6330.92	9413.59	-9815.43	391.64	1669328.48	14215038.63	39°08'44.861"N	80°53'52.887"W	9823.24	177.715	1.15	-0.09	-1.15	
16949.00	89.970	158.630	6330.95	9507.52	-9903.17	425.37	1669362.19	14214950.92	39°08'43.993"N	80°53'52.460"W	9912.31	177.540	0.73	-0.03	-0.73	
17044.00	89.780	155.020	6331.16	9602.24	-9990.49	462.75	1669399.56	14214863.64	39°08'43.129"N	80°53'51.987"W	10001.21	177.348	3.81	-0.20	-3.80	
17139.00	90.060	154.290	6331.29	9696.64	-10076.35	503.41	1669440.21	14214777.82	39°08'42.280"N	80°53'51.472"W	10088.92	177.140	0.82	0.29	-0.77	
17233.00	90.000	156.150	6331.24	9790.17	-10161.81	542.54	1669479.32	14214692.39	39°08'41.435"N	80°53'50.977"W	10176.28	176.944	2.36	-0.06	2.36	
17327.00	89.600	158.430	6331.57	9883.97	-10248.63	578.56	1669515.32	14214605.60	39°08'40.577"N	80°53'50.521"W	10264.95	176.769	2.09	-0.43	2.04	
17422.00	89.170	161.420	6332.59	9978.93	-10337.85	611.16	1669547.91	14214516.43	39°08'39.695"N	80°53'50.108"W	10355.90	176.617	3.18	-0.45	3.15	
17517.00	89.970	164.570	6333.30	10073.87	-10428.68	638.94	1669575.68	14214425.63	39°08'38.796"N	80°53'49.757"W	10448.23	176.494	3.42	0.84	3.32	
17611.00	90.000	164.550	6333.32	10167.70	-10519.28	663.97	1669600.69	14214335.06	39°08'37.901"N	80°53'49.441"W	10540.22	176.388	0.04	0.03	-0.02	
17706.00	89.970	162.860	6333.35	10262.60	-10610.47	690.62	1669627.34	14214243.92	39°08'36.999"N	80°53'49.104"W	10632.92	176.276	1.78	-0.03	-1.78	
17800.00	89.910	161.480	6333.45	10356.58	-10699.95	719.40	1669656.11	14214154.47	39°08'36.114"N	80°53'48.740"W	10724.11	176.154	1.47	-0.06	-1.47	
17895.00	90.280	160.930	6333.29	10451.58	-10789.88	750.01	1669686.70	14214064.57	39°08'35.225"N	80°53'48.353"W	10815.92	176.024	0.70	0.39	-0.58	
17989.00	90.890	160.350	6332.33	10545.57	-10878.56	781.17	1669717.85	14213975.93	39°08'34.348"N	80°53'47.959"W	10906.57	175.893	0.90	0.65	-0.62	
18084.00	90.310	159.350	6331.34	10640.54	-10967.74	813.89	1669750.56	14213886.78	39°08'33.466"N	80°53'47.544"W	10997.90	175.756	1.22	-0.61	-1.05	
18178.00	90.400	160.050	6330.75	10734.51	-11055.90	846.50	1669783.16	14213798.66	39°08'32.595"N	80°53'47.132"W	11088.26	175.622	0.75	0.10	0.74	
18273.00	90.340	161.560	6330.14	10829.50	-11145.61	877.74	1669814.38	14213708.98	39°08'31.708"N	80°53'46.737"W	11180.12	175.497	1.59	-0.06	1.59	
18367.00	90.250	162.600	6329.66	10923.48	-11235.05	906.66	1669843.29	14213619.58	39°08'30.823"N	80°53'46.371"W	11271.57	175.386	1.11	-0.10	1.11	
18461.00	90.280	164.040	6329.22	11017.41	-11325.09	933.64	1669870.26	14213529.58	39°08'29.933"N	80°53'46.030"W	11363.51	175.287	1.53	0.03	1.53	
18556.00	90.400	163.940	6328.66	11112.29	-11416.41	959.84	1669896.45	14213438.30	39°08'29.030"N	80°53'45.699"W	11456.68	175.194	0.16	0.13	-0.11	
18650.00	90.400	164.500	6328.00	11206.15	-11506.86	985.40	1669922.00	14213347.88	39°08'28.136"N	80°53'45.376"W	11548.98	175.105	0.60	0.00	0.60	
18745.00	90.340	163.050	6327.39	11301.04	-11598.07	1011.94	1669948.53	14213256.70	39°08'27.234"N	80°53'45.040"W	11642.14	175.014	1.53	-0.06	-1.53	
18839.00	90.400	161.680	6326.78	11395.01	-11687.65	1040.42	1669977.00	14213167.16	39°08'26.348"N	80°53'44.680"W	11733.87	174.913	1.46	0.06	-1.46	
18934.00	90.220	159.650	6326.27	11490.01	-11777.29	1071.87	1670008.43	14213077.56	39°08'25.462"N	80°53'44.282"W	11825.96	174.800	2.15	-0.19	-2.14	
19028.00	90.710	161.040	6325.50	11583.99	-11865.81	1103.49	1670040.04	14212989.08	39°08'24.587"N	80°53'43.882"W	11917.01	174.687	1.57	0.52	1.48	
19122.00	90.400	163.060	6324.59	11677.97	-11955.22	1132.45	1670068.99	14212899.70	39°08'23.703"N	80°53'43.516"W	12008.74	174.589	2.17	-0.33	2.15	
19217.00	90.400	163.540	6323.93	11772.90	-12046.21	1159.75	1670096.28	14212808.75	39°08'22.803"N	80°53'43.171"W	12101.91	174.501	0.51	0.00	0.51	
19311.00	89.940	164.130	6323.65	11866.79	-12136.49	1185.92	1670122.44	14212718.50	39°08'21.910"N	80°53'42.840"W	12194.30	174.419	0.80	-0.49	0.63	
19406.00	89.970	164.450	6323.73	11961.64	-12227.95	1211.64	1670148.15	14212627.09	39°08'21.006"N	80°53'42.515"W	12287.83	174.341	0.34	0.03	0.34	
19500.00	89.940	163.790	6323.80	12055.51	-12318.36	1237.36	1670173.86	14212536.71	39°08'20.112"N	80°53'42.190"W	12380.35	174.264	0.70	-0.03	-0.70	
19595.00	90.000	163.410	6323.85	12150.42	-12409.49	1264.19	1670200.67	14212445.61	39°08'19.211"N	80°53'41.851"W	12473.72	174.183	0.40	0.06	-0.40	

Project ID: 19850  
 Date: FEB 18 2020  
 Department of Environmental Protection



# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

WELLPATH DATA (244 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
19690.00	90.090	163.060	6323.77	12245.36	-12500.45	1291.59	1670228.06	14212354.89	39°08'18.312"N	80°53'41.504"W	12567.00	174.101	0.38	0.03	-0.37	
19784.00	90.340	162.670	6323.42	12339.31	-12590.28	1319.28	1670255.75	14212264.89	39°08'17.424"N	80°53'41.154"W	12659.21	174.018	0.49	0.27	-0.41	
19825.00	89.970	162.020	6323.31	12380.30	-12629.35	1331.72	1670268.18	14212225.84	39°08'17.037"N	80°53'40.997"W	12699.37	173.981	1.82	-0.90	-1.59	
19850.00	89.970	162.020	6323.32	12405.30	-12653.13	1339.44	1670275.89	14212202.07	39°08'16.802"N	80°53'40.899"W	12723.83	173.957	0.00	0.00	0.00	Projected MD at TD: 19850'

HOLE & CASING SECTIONS - Ref Wellbore: Karen Unit 1H AWB Ref Wellpath: Karen Unit 1H AWP Proj: 19850'									
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	-0.05	-0.69
20in Conductor	30.00	110.00	80.00	30.00	110.00	0.00	0.00	-0.05	-0.69
17.5in Open Hole	110.00	476.00	366.00	110.00	475.98	-0.05	-0.69	-1.49	-3.32
13.375in Casing Surface	30.00	476.00	446.00	30.00	475.98	0.00	0.00	-1.49	-3.32
12.25in Open Hole	476.00	2792.00	2316.00	475.98	2627.48	-1.49	-3.32	-72.74	-744.09
9.625in Casing Intermediate	30.00	2792.00	2762.00	30.00	2627.48	0.00	0.00	-72.74	-744.09
8.75in Open Hole	2792.00	6244.00	3452.00	2627.48	5567.74	-72.74	-744.09	-234.07	-2540.09
8.5in Open Hole	6244.00	19850.00	13606.00	5567.74	6323.32	-234.07	-2540.09	-12653.13	1339.44
5.5in Casing Production	30.00	19850.00	19820.00	30.00	6323.32	0.00	0.00	-12653.13	1339.44

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 Office of Oil and Gas  
 FEB 18 2020  
 Environmental and  
 Energy Affairs Division



# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Karen Unit 1H - POE - Rev-2	6322.00	-836.03	-2679.40	1666258.67	14224014.43	39°10'13.645"N	80°54'31.752"W	point
Karen Unit 1H - BHL - Rev-2	6347.00	-12668.69	1370.94	1670307.38	14212186.52	39°08'16.648"N	80°53'40.499"W	point
Karen Unit 1H - LP - Rev-2	6347.00	-1011.94	-2619.18	1666318.86	14223838.59	39°10'11.905"N	80°54'30.990"W	point

WELLPATH COMPOSITION - Ref Wellbore: Karen Unit 1H AWB Ref Wellpath: Karen Unit 1H AWP Proj: 19850'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
30.00	470.00	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-1/2">(100'-455')	Karen Unit 1H AWB
470.00	2683.00	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12-1/4">(455')(495'-2668')	Karen Unit 1H AWB
2683.00	6153.00	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4">(2668')(2843'-6138')	Karen Unit 1H AWB
6153.00	19825.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8-1/2">(6153')(6213'-19825')	Karen Unit 1H AWB
19825.00	19850.00	Blind Drilling (std)	Projection to bit	Karen Unit 1H AWB

PROJ TO  
C:\Users\jw3\Documents

FILE # 61020

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Environmental Protection



# Actual Wellpath Report

Karen Unit 1H AWP Proj: 19850'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #05
Area	Ritchie County, WV	Well	Karen Unit 1H
Field	Ritchie	Wellbore	Karen Unit 1H AWB
Facility	Ireland North Pad		

## COMMENTS

Wellpath general comments  
API: 47-085-10215-0000  
BHI Job #: 109581868  
Rig: H&P 519  
Duration: 01/14/2019-01/18/2019  
Gyrodatta MS Gyro <17-1/2">(100'-455')  
WFT EM <12-1/4">(455')(495'-2668')  
WFT EM <8-3/4">(2668')(2843'-6138')  
BH AT Curve <8-1/2">(6153')(6213'-19825')  
Middlesex: 6958' MD  
Burkett: 7162' MD  
Tully: 7285' MD  
Marcellus POE: 7404' MD  
Projected MD at TD: 19850'

APPROVED  
BY: [Signature]  
DATE: FEB 17 2020  
W.D. [Signature]  
Chief, [Signature]