



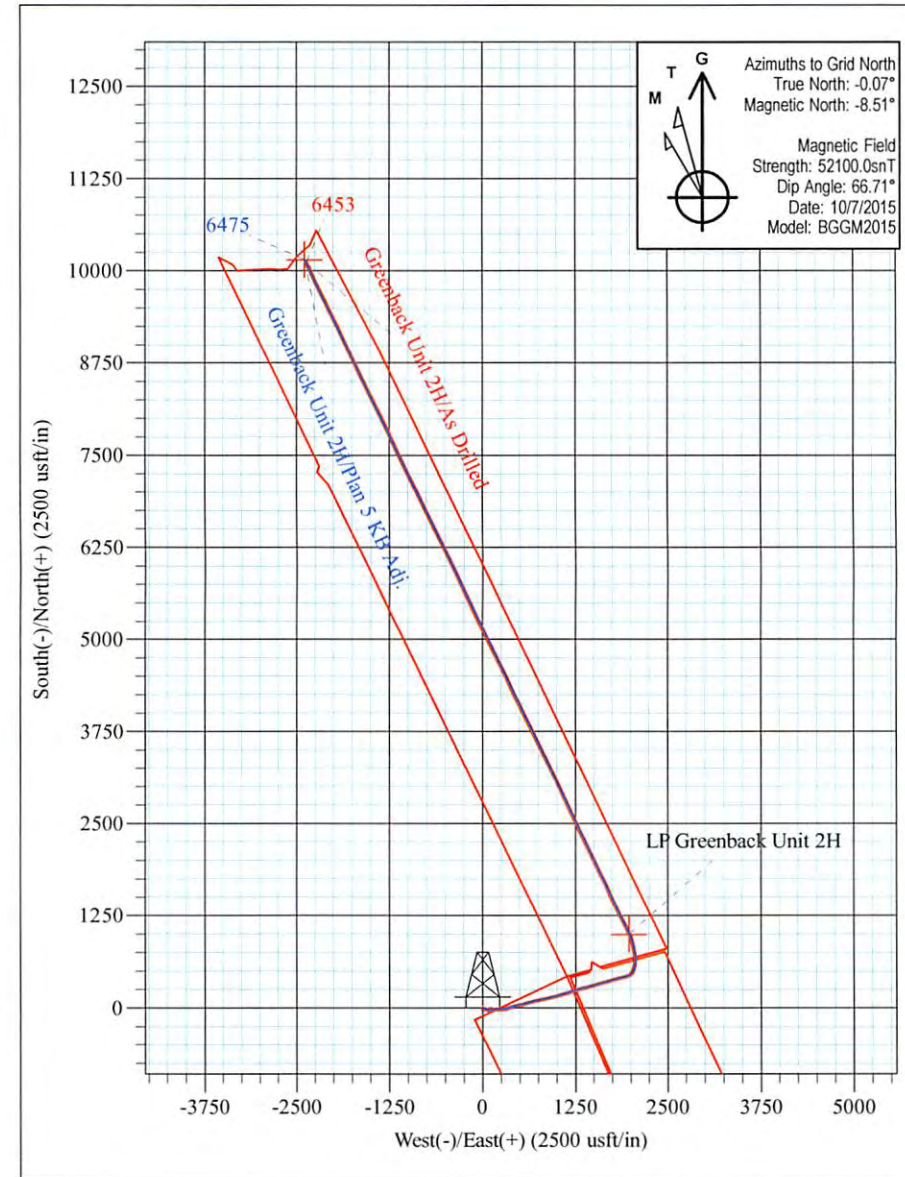
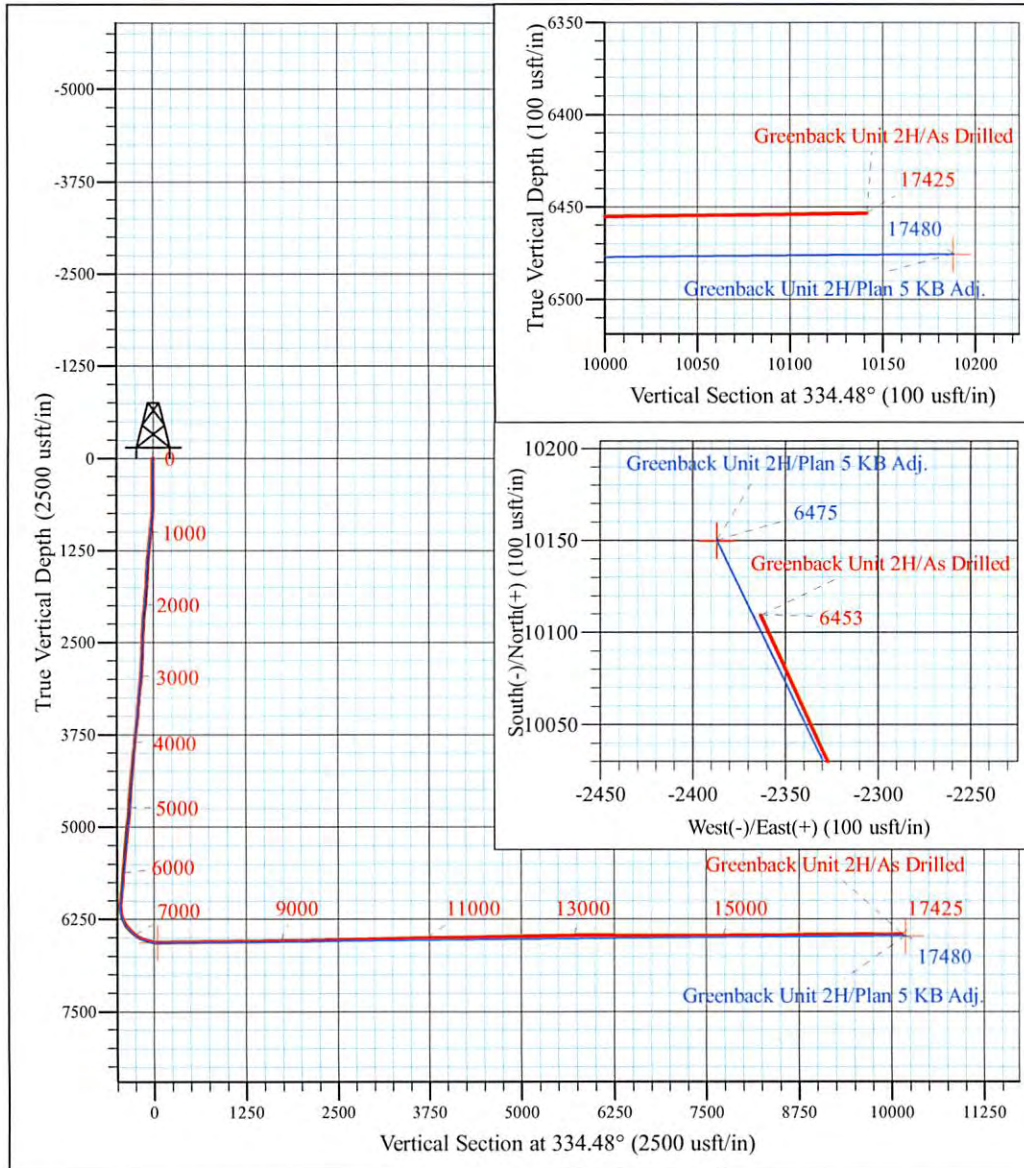
Mackay Pad - Caldwell/Greenback/McNabb
 Greenback Unit 2H
 Plan 5 KB Adj.
 Precision 523: GL 1099' + KB 19 @ 1118.0usft
 Ritchie County WV

PROJECT DETAILS:
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level



WELL DETAILS: **Greenback Unit 2H SHL**

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14248722.26	1669525.02	39° 14' 17.917 N	80° 53' 49.907 W



Greenback Unit 2H
Approx. BHL
 39° 15' 57.903 N 80° 54' 19.817 W

Shane Rhodes
 16:52, October 29 2015
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022



Antero Resources

Ritchie County WV

Mackay Pad - Caldwell/Greenback/McNabb

Greenback Unit 2H

Original Wellpath

Design: As Drilled

Standard Survey Report

29 October, 2015



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05/26/2017



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Project	Ritchie County WV, Ritchie County WV, WV North		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Mackay Pad - Caldwell/Greenback/McNabb				
Site Position:	Northing:	14,248,714.78 usft	Latitude:	39° 14' 17.843 N	
From:	Map	Easting:	1,669,496.15 usft	Longitude:	80° 53' 50.274 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well	Greenback Unit 2H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,248,722.26 usft	Latitude:	39° 14' 17.917 N
	+E/-W	0.0 usft	Easting:	1,669,525.02 usft	Longitude:	80° 53' 49.907 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,112.0 usft	Ground Level:	1,099.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	5/19/2015	-8.40	66.76	52,129
	BGGM2015	10/7/2015	-8.44	66.71	52,100

Design	As Drilled				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	334.48	

Survey Program	Date	10/29/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
106.0	5,945.5	Survey #6 Final KOP Gyro (Original Wellp	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
5,977.0	17,425.0	Survey #7 SDI MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
106.0	0.36	133.16	106.0	-0.2	0.2	-0.3	0.34	0.34	0.00	
131.0	0.35	129.79	131.0	-0.3	0.4	-0.5	0.09	-0.04	-13.48	
156.0	0.28	138.74	156.0	-0.4	0.5	-0.6	0.34	-0.28	35.80	
181.0	0.31	157.35	181.0	-0.5	0.5	-0.7	0.40	0.12	74.44	
206.0	0.31	123.12	206.0	-0.6	0.6	-0.8	0.73	0.00	-136.92	
231.0	0.29	139.04	231.0	-0.7	0.7	-1.0	0.34	-0.08	63.68	
256.0	0.24	150.51	256.0	-0.8	0.8	-1.1	0.29	-0.20	45.88	
281.0	0.34	145.91	281.0	-0.9	0.8	-1.2	0.41	0.40	-18.40	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
306.0	0.33	154.56	306.0	-1.0	0.9	-1.3	0.21	-0.04	34.60	
331.0	0.31	160.43	331.0	-1.2	1.0	-1.5	0.15	-0.08	23.48	
356.0	0.30	190.95	356.0	-1.3	1.0	-1.6	0.64	-0.04	122.08	
381.0	0.26	202.63	381.0	-1.4	0.9	-1.7	0.28	-0.16	46.72	
406.0	0.23	205.38	406.0	-1.5	0.9	-1.8	0.13	-0.12	11.00	
431.0	0.27	213.29	431.0	-1.6	0.8	-1.8	0.21	0.16	31.64	
456.0	0.43	242.64	456.0	-1.7	0.7	-1.9	0.94	0.64	117.40	
481.0	0.55	231.84	481.0	-1.8	0.6	-1.9	0.60	0.48	-43.20	
506.0	0.57	228.40	506.0	-2.0	0.4	-1.9	0.16	0.08	-13.76	
531.0	0.50	231.58	531.0	-2.1	0.2	-2.0	0.30	-0.28	12.72	
556.0	0.48	230.44	556.0	-2.3	0.0	-2.0	0.09	-0.08	-4.56	
581.0	0.28	157.23	581.0	-2.4	0.0	-2.1	1.92	-0.80	-292.84	
606.0	1.03	99.36	606.0	-2.5	0.2	-2.3	3.65	3.00	-231.48	
631.0	1.82	95.42	631.0	-2.6	0.8	-2.7	3.18	3.16	-15.76	
656.0	2.53	93.32	656.0	-2.6	1.8	-3.1	2.86	2.84	-8.40	
681.0	3.25	95.39	680.9	-2.7	3.0	-3.8	2.91	2.88	8.28	
706.0	4.24	99.98	705.9	-2.9	4.6	-4.7	4.13	3.96	18.36	
731.0	5.05	102.03	730.8	-3.3	6.6	-5.9	3.31	3.24	8.20	
756.0	5.66	102.31	755.7	-3.8	8.9	-7.3	2.44	2.44	1.12	
781.0	6.17	102.33	780.6	-4.4	11.4	-8.9	2.04	2.04	0.08	
806.0	6.62	102.39	805.4	-5.0	14.1	-10.6	1.80	1.80	0.24	
831.0	6.86	102.98	830.2	-5.6	17.0	-12.4	1.00	0.96	2.36	
856.0	7.04	103.80	855.0	-6.3	20.0	-14.3	0.82	0.72	3.28	
881.0	7.28	105.04	879.8	-7.1	23.0	-16.3	1.14	0.96	4.96	
906.0	7.62	107.33	904.6	-8.0	26.1	-18.5	1.81	1.36	9.16	
931.0	8.06	109.15	929.4	-9.1	29.3	-20.8	2.02	1.76	7.28	
956.0	8.59	110.15	954.1	-10.3	32.7	-23.4	2.20	2.12	4.00	
981.0	8.97	110.54	978.8	-11.6	36.3	-26.1	1.54	1.52	1.56	
1,006.0	9.21	110.12	1,003.5	-13.0	40.0	-29.0	1.00	0.96	-1.68	
1,031.0	9.41	109.42	1,028.2	-14.4	43.8	-31.8	0.92	0.80	-2.80	
1,056.0	9.68	107.89	1,052.9	-15.7	47.7	-34.7	1.48	1.08	-6.12	
1,081.0	9.88	107.50	1,077.5	-17.0	51.8	-37.6	0.84	0.80	-1.56	
1,106.0	9.90	107.13	1,102.1	-18.2	55.9	-40.5	0.27	0.08	-1.48	
1,131.0	9.97	105.90	1,126.7	-19.5	60.0	-43.4	0.89	0.28	-4.92	
1,156.0	10.00	104.78	1,151.4	-20.6	64.2	-46.3	0.79	0.12	-4.48	
1,181.0	9.92	103.73	1,176.0	-21.7	68.4	-49.0	0.79	-0.32	-4.20	
1,206.0	9.85	102.46	1,200.6	-22.7	72.6	-51.7	0.92	-0.28	-5.08	
1,231.0	9.70	100.94	1,225.3	-23.5	76.7	-54.3	1.19	-0.60	-6.08	
1,256.0	9.58	99.41	1,249.9	-24.3	80.8	-56.7	1.13	-0.48	-6.12	
1,281.0	9.53	98.08	1,274.6	-24.9	85.0	-59.1	0.91	-0.20	-5.32	
1,306.0	9.49	96.52	1,299.2	-25.4	89.0	-61.3	1.04	-0.16	-6.24	
1,331.0	9.56	93.62	1,323.9	-25.8	93.2	-63.4	1.94	0.28	-11.60	
1,356.0	9.68	90.97	1,348.5	-25.9	97.3	-65.4	1.84	0.48	-10.60	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,381.0	9.76	89.66	1,373.2	-26.0	101.6	-67.2	0.94	0.32	-5.24
1,406.0	9.79	88.33	1,397.8	-25.9	105.8	-69.0	0.91	0.12	-5.32
1,431.0	9.83	86.77	1,422.4	-25.7	110.1	-70.6	1.08	0.16	-6.24
1,456.0	9.95	84.51	1,447.1	-25.4	114.3	-72.2	1.63	0.48	-9.04
1,481.0	10.18	82.03	1,471.7	-24.9	118.7	-73.6	1.96	0.92	-9.92
1,506.0	10.32	80.41	1,496.3	-24.2	123.1	-74.9	1.28	0.56	-6.48
1,531.0	10.39	79.50	1,520.9	-23.4	127.5	-76.1	0.71	0.28	-3.64
1,556.0	10.46	78.79	1,545.5	-22.6	131.9	-77.2	0.59	0.28	-2.84
1,581.0	10.61	78.57	1,570.0	-21.7	136.4	-78.3	0.62	0.60	-0.88
1,606.0	10.95	78.45	1,594.6	-20.7	141.0	-79.5	1.36	1.36	-0.48
1,631.0	11.16	78.30	1,619.1	-19.8	145.7	-80.6	0.85	0.84	-0.60
1,656.0	11.27	78.39	1,643.6	-18.8	150.5	-81.8	0.45	0.44	0.36
1,681.0	11.66	78.91	1,668.2	-17.8	155.3	-83.0	1.61	1.56	2.08
1,706.0	12.05	79.50	1,692.6	-16.8	160.4	-84.3	1.63	1.56	2.36
1,731.0	12.38	79.98	1,717.1	-15.9	165.6	-85.7	1.38	1.32	1.92
1,756.0	12.62	81.27	1,741.5	-15.0	170.9	-87.2	1.47	0.96	5.16
1,781.0	12.62	83.56	1,765.9	-14.3	176.3	-88.9	2.00	0.00	9.16
1,806.0	12.27	86.06	1,790.3	-13.8	181.7	-90.7	2.57	-1.40	10.00
1,831.0	12.16	87.09	1,814.7	-13.5	187.0	-92.7	0.98	-0.44	4.12
1,856.0	12.07	88.19	1,839.1	-13.3	192.2	-94.8	0.99	-0.36	4.40
1,881.0	12.02	89.40	1,863.6	-13.2	197.4	-96.9	1.03	-0.20	4.84
1,906.0	11.86	90.93	1,888.1	-13.2	202.6	-99.2	1.42	-0.64	6.12
1,931.0	11.58	91.87	1,912.5	-13.3	207.7	-101.5	1.36	-1.12	3.76
1,956.0	11.20	91.87	1,937.0	-13.5	212.6	-103.8	1.52	-1.52	0.00
1,981.0	10.90	91.45	1,961.6	-13.6	217.4	-105.9	1.24	-1.20	-1.68
2,006.0	10.61	91.39	1,986.1	-13.7	222.1	-108.1	1.16	-1.16	-0.24
2,031.0	10.78	90.78	2,010.7	-13.8	226.7	-110.1	0.82	0.68	-2.44
2,056.0	10.78	90.85	2,035.3	-13.9	231.4	-112.2	0.05	0.00	0.28
2,081.0	10.82	90.80	2,059.8	-13.9	236.1	-114.3	0.16	0.16	-0.20
2,106.0	10.84	90.76	2,084.4	-14.0	240.8	-116.4	0.09	0.08	-0.16
2,131.0	10.87	90.94	2,108.9	-14.1	245.5	-118.5	0.18	0.12	0.72
2,156.0	10.80	90.75	2,133.5	-14.1	250.2	-120.5	0.31	-0.28	-0.76
2,181.0	10.74	90.08	2,158.0	-14.2	254.8	-122.6	0.56	-0.24	-2.68
2,206.0	10.65	89.27	2,182.6	-14.2	259.5	-124.6	0.70	-0.36	-3.24
2,231.0	10.45	88.45	2,207.2	-14.1	264.1	-126.5	1.00	-0.80	-3.28
2,256.0	10.37	87.32	2,231.8	-13.9	268.6	-128.2	0.88	-0.32	-4.52
2,281.0	10.42	85.29	2,256.4	-13.6	273.1	-129.9	1.48	0.20	-8.12
2,306.0	10.50	84.26	2,280.9	-13.2	277.6	-131.5	0.81	0.32	-4.12
2,331.0	10.65	83.04	2,305.5	-12.7	282.2	-133.0	1.08	0.60	-4.88
2,356.0	10.78	81.58	2,330.1	-12.1	286.8	-134.4	1.20	0.52	-5.84
2,381.0	10.88	79.36	2,354.6	-11.3	291.4	-135.7	1.72	0.40	-8.88
2,406.0	10.92	78.36	2,379.2	-10.4	296.0	-136.9	0.77	0.16	-4.00
2,431.0	10.95	78.11	2,403.7	-9.4	300.7	-138.0	0.22	0.12	-1.00



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,456.0	10.92	77.54	2,428.3	-8.4	305.3	-139.1	0.45	-0.12	-2.28
2,481.0	11.18	76.55	2,452.8	-7.3	310.0	-140.2	1.29	1.04	-3.96
2,506.0	11.13	75.41	2,477.3	-6.2	314.7	-141.1	0.90	-0.20	-4.56
2,531.0	11.28	75.33	2,501.9	-4.9	319.4	-142.0	0.60	0.60	-0.32
2,556.0	11.21	75.51	2,526.4	-3.7	324.1	-143.0	0.31	-0.28	0.72
2,581.0	11.12	74.45	2,550.9	-2.4	328.8	-143.9	0.90	-0.36	-4.24
2,606.0	11.00	73.12	2,575.5	-1.1	333.4	-144.6	1.13	-0.48	-5.32
2,631.0	10.60	71.98	2,600.0	0.3	337.8	-145.3	1.81	-1.60	-4.56
2,656.0	10.34	70.15	2,624.6	1.8	342.1	-145.8	1.69	-1.04	-7.32
2,681.0	10.45	69.58	2,649.2	3.3	346.4	-146.2	0.60	0.44	-2.28
2,706.0	10.62	69.93	2,673.8	4.9	350.7	-146.6	0.73	0.68	1.40
2,731.0	11.61	70.11	2,698.3	6.5	355.2	-147.1	3.96	3.96	0.72
2,756.0	12.51	70.91	2,722.7	8.3	360.1	-147.7	3.66	3.60	3.20
2,781.0	13.34	72.46	2,747.1	10.0	365.4	-148.4	3.60	3.32	6.20
2,806.0	14.06	73.94	2,771.4	11.8	371.1	-149.3	3.20	2.88	5.92
2,831.0	15.11	74.98	2,795.6	13.4	377.2	-150.4	4.33	4.20	4.16
2,856.0	15.76	76.26	2,819.7	15.1	383.6	-151.6	2.94	2.60	5.12
2,881.0	16.77	76.78	2,843.7	16.7	390.4	-153.1	4.08	4.04	2.08
2,906.0	17.54	76.94	2,867.6	18.4	397.6	-154.7	3.09	3.08	0.64
2,931.0	18.64	76.80	2,891.3	20.2	405.2	-156.4	4.40	4.40	-0.56
2,956.0	19.45	76.76	2,915.0	22.0	413.1	-158.1	3.24	3.24	-0.16
2,981.0	20.68	76.89	2,938.5	24.0	421.4	-159.9	4.92	4.92	0.52
3,006.0	21.55	76.93	2,961.8	26.0	430.2	-161.9	3.48	3.48	0.16
3,031.0	22.39	76.99	2,985.0	28.1	439.3	-163.9	3.36	3.36	0.24
3,056.0	23.22	77.20	3,008.0	30.3	448.8	-166.0	3.34	3.32	0.84
3,081.0	24.20	77.50	3,030.9	32.5	458.6	-168.2	3.95	3.92	1.20
3,106.0	25.16	77.51	3,053.6	34.8	468.8	-170.6	3.84	3.84	0.04
3,131.0	26.12	77.27	3,076.1	37.1	479.3	-173.0	3.86	3.84	-0.96
3,156.0	26.88	77.11	3,098.5	39.6	490.2	-175.5	3.05	3.04	-0.64
3,181.0	27.18	76.97	3,120.8	42.1	501.3	-177.9	1.23	1.20	-0.56
3,206.0	27.54	76.87	3,143.0	44.7	512.5	-180.4	1.45	1.44	-0.40
3,231.0	27.60	76.53	3,165.2	47.4	523.7	-182.9	0.67	0.24	-1.36
3,256.0	27.40	75.59	3,187.3	50.2	534.9	-185.2	1.91	-0.80	-3.76
3,281.0	27.21	74.71	3,209.5	53.1	546.0	-187.3	1.78	-0.76	-3.52
3,306.0	27.27	74.39	3,231.8	56.2	557.1	-189.3	0.63	0.24	-1.28
3,331.0	27.56	74.22	3,254.0	59.3	568.1	-191.3	1.20	1.16	-0.68
3,356.0	27.71	73.89	3,276.1	62.5	579.3	-193.2	0.86	0.60	-1.32
3,381.0	27.70	73.56	3,298.2	65.7	590.4	-195.1	0.61	-0.04	-1.32
3,406.0	27.70	73.41	3,320.4	69.0	601.6	-196.9	0.28	0.00	-0.60
3,431.0	27.67	73.32	3,342.5	72.4	612.7	-198.7	0.21	-0.12	-0.36
3,456.0	27.77	73.32	3,364.6	75.7	623.8	-200.5	0.40	0.40	0.00
3,481.0	27.53	73.56	3,386.8	79.0	635.0	-202.3	1.06	-0.96	0.96
3,506.0	27.20	73.96	3,409.0	82.2	646.0	-204.1	1.51	-1.32	1.60
3,531.0	26.52	74.29	3,431.3	85.3	656.9	-206.0	2.78	-2.72	1.32



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,556.0	26.02	74.59	3,453.7	88.3	667.5	-207.9	2.07	-2.00	1.20	
3,581.0	25.86	74.97	3,476.2	91.1	678.1	-209.9	0.92	-0.64	1.52	
3,606.0	25.87	75.29	3,498.7	93.9	688.6	-211.9	0.56	0.04	1.28	
3,631.0	25.96	75.58	3,521.2	96.7	699.2	-214.0	0.62	0.36	1.16	
3,656.0	26.12	75.86	3,543.6	99.4	709.8	-216.1	0.81	0.64	1.12	
3,681.0	26.23	76.60	3,566.1	102.0	720.5	-218.4	1.38	0.44	2.96	
3,706.0	26.16	77.46	3,588.5	104.5	731.3	-220.8	1.54	-0.28	3.44	
3,731.0	26.21	78.08	3,610.9	106.8	742.1	-223.3	1.11	0.20	2.48	
3,756.0	26.24	78.82	3,633.4	109.0	752.9	-226.0	1.31	0.12	2.96	
3,781.0	26.21	79.34	3,655.8	111.1	763.7	-228.7	0.93	-0.12	2.08	
3,806.0	26.30	79.47	3,678.2	113.2	774.6	-231.6	0.43	0.36	0.52	
3,831.0	26.31	79.56	3,700.6	115.2	785.5	-234.5	0.16	0.04	0.36	
3,856.0	26.24	79.60	3,723.0	117.2	796.4	-237.4	0.29	-0.28	0.16	
3,881.0	26.33	79.45	3,745.5	119.2	807.3	-240.2	0.45	0.36	-0.60	
3,906.0	26.33	79.07	3,767.9	121.3	818.2	-243.1	0.67	0.00	-1.52	
3,931.0	26.07	78.58	3,790.3	123.4	829.0	-245.8	1.35	-1.04	-1.96	
3,956.0	26.26	78.24	3,812.7	125.6	839.8	-248.4	0.97	0.76	-1.36	
3,981.0	26.64	77.81	3,835.1	127.9	850.7	-251.1	1.70	1.52	-1.72	
4,006.0	26.82	77.13	3,857.5	130.4	861.7	-253.6	1.42	0.72	-2.72	
4,031.0	26.61	76.66	3,879.8	132.9	872.6	-256.0	1.19	-0.84	-1.88	
4,056.0	26.44	76.05	3,902.1	135.6	883.5	-258.3	1.28	-0.68	-2.44	
4,081.0	26.65	75.67	3,924.5	138.3	894.3	-260.5	1.08	0.84	-1.52	
4,106.0	26.15	75.63	3,946.9	141.0	905.1	-262.7	2.00	-2.00	-0.16	
4,131.0	25.82	75.65	3,969.4	143.8	915.7	-264.8	1.32	-1.32	0.08	
4,156.0	25.97	75.54	3,991.9	146.5	926.3	-266.9	0.63	0.60	-0.44	
4,181.0	26.25	75.37	4,014.3	149.2	936.9	-269.0	1.16	1.12	-0.68	
4,206.0	26.69	75.38	4,036.7	152.0	947.7	-271.1	1.76	1.76	0.04	
4,231.0	27.30	75.38	4,059.0	154.9	958.7	-273.2	2.44	2.44	0.00	
4,256.0	28.69	75.28	4,081.0	157.9	970.0	-275.4	5.56	5.56	-0.40	
4,281.0	29.29	74.68	4,102.9	161.0	981.7	-277.6	2.67	2.40	-2.40	
4,306.0	28.93	73.64	4,124.8	164.3	993.4	-279.7	2.48	-1.44	-4.16	
4,331.0	27.99	72.96	4,146.7	167.8	1,004.8	-281.5	3.98	-3.76	-2.72	
4,356.0	28.67	72.75	4,168.7	171.3	1,016.2	-283.2	2.75	2.72	-0.84	
4,381.0	29.12	73.15	4,190.6	174.8	1,027.7	-285.0	1.96	1.80	1.60	
4,406.0	28.83	73.96	4,212.5	178.2	1,039.3	-286.9	1.95	-1.16	3.24	
4,431.0	26.87	74.26	4,234.6	181.4	1,050.6	-288.9	7.86	-7.84	1.20	
4,456.0	28.19	74.31	4,256.8	184.6	1,061.7	-290.8	5.28	5.28	0.20	
4,481.0	29.01	74.31	4,278.7	187.8	1,073.2	-292.9	3.28	3.28	0.00	
4,506.0	28.31	74.14	4,300.7	191.1	1,084.8	-294.9	2.82	-2.80	-0.68	
4,531.0	29.74	73.97	4,322.5	194.4	1,096.4	-296.9	5.73	5.72	-0.68	
4,556.0	28.52	74.00	4,344.4	197.7	1,108.1	-298.9	4.88	-4.88	0.12	
4,581.0	29.40	74.19	4,366.2	201.1	1,119.8	-301.0	3.54	3.52	0.76	
4,606.0	26.59	74.63	4,388.3	204.2	1,131.1	-303.0	11.27	-11.24	1.76	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,631.0	28.31	74.90	4,410.5	207.2	1,142.2	-305.0	6.90	6.88	1.08
4,656.0	28.07	75.57	4,432.5	210.3	1,153.6	-307.3	1.59	-0.96	2.68
4,681.0	26.31	75.78	4,454.8	213.1	1,164.7	-309.5	7.05	-7.04	0.84
4,706.0	28.15	75.37	4,477.0	215.9	1,175.7	-311.7	7.40	7.36	-1.64
4,731.0	27.52	74.94	4,499.1	218.9	1,187.0	-313.8	2.64	-2.52	-1.72
4,756.0	25.70	74.65	4,521.4	221.9	1,197.8	-315.8	7.30	-7.28	-1.16
4,781.0	27.99	74.32	4,543.7	224.9	1,208.7	-317.8	9.18	9.16	-1.32
4,806.0	25.80	73.37	4,566.0	228.0	1,219.6	-319.6	8.93	-8.76	-3.80
4,831.0	23.91	72.42	4,588.7	231.1	1,229.6	-321.2	7.73	-7.56	-3.80
4,856.0	23.05	70.83	4,611.7	234.3	1,239.1	-322.4	4.27	-3.44	-6.36
4,881.0	25.01	70.28	4,634.5	237.6	1,248.7	-323.5	7.89	7.84	-2.20
4,906.0	27.55	70.30	4,656.9	241.4	1,259.1	-324.6	10.16	10.16	0.08
4,931.0	28.49	70.76	4,679.0	245.3	1,270.2	-325.9	3.86	3.76	1.84
4,956.0	26.91	71.37	4,701.1	249.1	1,281.1	-327.2	6.42	-6.32	2.44
4,981.0	27.34	71.93	4,723.4	252.6	1,292.0	-328.6	2.00	1.72	2.24
5,006.0	29.13	72.15	4,745.4	256.3	1,303.2	-330.2	7.17	7.16	0.88
5,031.0	29.09	72.66	4,767.2	260.0	1,314.8	-331.8	1.01	-0.16	2.04
5,056.0	28.12	73.14	4,789.2	263.5	1,326.2	-333.6	3.99	-5.88	1.92
5,081.0	26.77	74.16	4,811.4	266.7	1,337.3	-335.4	5.72	-5.40	4.08
5,106.0	26.61	74.56	4,833.7	269.8	1,348.1	-337.4	0.96	-0.64	1.60
5,131.0	26.52	75.16	4,856.1	272.7	1,358.9	-339.4	1.13	-0.36	2.40
5,156.0	26.23	75.94	4,878.5	275.5	1,369.7	-341.5	1.81	-1.16	3.12
5,181.0	25.30	76.16	4,901.0	278.1	1,380.2	-343.7	3.74	-3.72	0.88
5,206.0	25.92	76.35	4,923.5	280.6	1,390.7	-345.9	2.50	2.48	0.76
5,231.0	26.09	76.54	4,946.0	283.2	1,401.4	-348.2	0.76	0.68	0.76
5,256.0	26.20	76.51	4,968.4	285.8	1,412.1	-350.5	0.44	0.44	-0.12
5,281.0	27.86	76.67	4,990.7	288.4	1,423.1	-352.8	6.65	6.64	0.64
5,306.0	27.90	76.64	5,012.8	291.1	1,434.5	-355.3	0.17	0.16	-0.12
5,331.0	28.74	76.78	5,034.8	293.8	1,446.0	-357.8	3.37	3.36	0.56
5,356.0	29.67	76.50	5,056.6	296.7	1,457.9	-360.4	3.76	3.72	-1.12
5,381.0	27.97	76.30	5,078.5	299.5	1,469.6	-362.9	6.81	-6.80	-0.80
5,406.0	29.07	76.34	5,100.5	302.3	1,481.2	-365.3	4.40	4.40	0.16
5,431.0	30.72	76.56	5,122.2	305.2	1,493.3	-367.9	6.61	6.60	0.88
5,456.0	28.26	75.93	5,143.9	308.2	1,505.3	-370.4	9.92	-9.84	-2.52
5,481.0	30.21	75.37	5,165.7	311.2	1,517.1	-372.8	7.88	7.80	-2.24
5,506.0	29.39	74.84	5,187.4	314.4	1,529.1	-375.1	3.45	-3.28	-2.12
5,531.0	29.56	74.11	5,209.2	317.7	1,541.0	-377.2	1.59	0.68	-2.92
5,556.0	29.71	73.75	5,230.9	321.1	1,552.9	-379.2	0.93	0.60	-1.44
5,581.0	30.02	73.69	5,252.6	324.6	1,564.8	-381.2	1.25	1.24	-0.24
5,606.0	28.65	73.67	5,274.4	328.0	1,576.6	-383.2	5.48	-5.48	-0.08
5,631.0	29.16	73.43	5,296.3	331.4	1,588.1	-385.1	2.09	2.04	-0.96
5,656.0	29.58	72.90	5,318.1	335.0	1,599.9	-387.0	1.98	1.68	-2.12
5,681.0	28.05	72.55	5,340.0	338.6	1,611.4	-388.7	6.16	-6.12	-1.40



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,706.0	27.38	72.44	5,362.1	342.1	1,622.5	-390.3	2.69	-2.68	-0.44
5,731.0	27.41	72.53	5,384.3	345.5	1,633.4	-391.9	0.20	0.12	0.36
5,756.0	27.04	72.93	5,406.5	348.9	1,644.4	-393.6	1.65	-1.48	1.60
5,781.0	26.90	73.54	5,428.8	352.2	1,655.2	-395.3	1.24	-0.56	2.44
5,806.0	26.89	74.46	5,451.1	355.3	1,666.1	-397.1	1.67	-0.04	3.68
5,831.0	26.68	75.14	5,473.4	358.3	1,677.0	-399.2	1.49	-0.84	2.72
5,856.0	26.85	75.63	5,495.7	361.1	1,687.9	-401.3	1.11	0.68	1.96
5,881.0	26.87	75.93	5,518.0	363.9	1,698.8	-403.5	0.55	0.08	1.20
5,906.0	26.37	75.74	5,540.4	366.6	1,709.7	-405.7	2.03	-2.00	-0.76
5,931.0	26.09	75.48	5,562.8	369.4	1,720.4	-407.8	1.21	-1.12	-1.04
5,945.5	26.41	75.34	5,575.8	371.0	1,726.6	-409.1	2.25	2.21	-0.97
5,977.0	25.68	74.18	5,604.1	374.6	1,739.9	-411.5	2.82	-2.32	-3.68
6,007.0	25.54	74.94	5,631.2	378.1	1,752.4	-413.8	1.19	-0.47	2.53
6,037.0	25.14	74.26	5,658.3	381.5	1,764.8	-416.1	1.65	-1.33	-2.27
6,067.0	24.82	73.64	5,685.5	385.0	1,777.0	-418.1	1.38	-1.07	-2.07
6,096.0	24.53	72.81	5,711.8	388.5	1,788.6	-420.0	1.56	-1.00	-2.86
6,126.0	24.42	72.64	5,739.1	392.2	1,800.4	-421.8	0.44	-0.37	-0.57
6,156.0	25.35	73.81	5,766.4	395.8	1,812.5	-423.7	3.51	3.10	3.90
6,186.0	26.78	77.23	5,793.3	399.1	1,825.3	-426.2	6.91	4.77	11.40
6,216.0	27.25	77.76	5,820.0	402.0	1,838.6	-429.3	1.76	1.57	1.77
6,246.0	26.89	77.44	5,846.8	405.0	1,851.9	-432.4	1.29	-1.20	-1.07
6,276.0	26.56	76.64	5,873.5	408.0	1,865.1	-435.3	1.63	-1.10	-2.67
6,306.0	26.10	75.39	5,900.4	411.2	1,878.0	-438.0	2.40	-1.53	-4.17
6,336.0	25.56	74.58	5,927.4	414.6	1,890.6	-440.4	2.15	-1.80	-2.70
6,366.0	26.35	74.14	5,954.4	418.1	1,903.2	-442.6	2.71	2.63	-1.47
6,396.0	26.83	74.18	5,981.2	421.8	1,916.2	-444.9	1.60	1.60	0.13
6,426.0	27.66	74.89	6,007.9	425.5	1,929.4	-447.3	2.97	2.77	2.37
6,455.0	28.21	75.68	6,033.5	428.9	1,942.5	-449.8	2.29	1.90	2.72
6,485.0	27.79	74.83	6,060.0	432.5	1,956.2	-452.5	1.93	-1.40	-2.83
6,515.0	27.13	68.64	6,086.6	436.8	1,969.3	-454.2	9.76	-2.20	-20.63
6,545.0	27.56	60.85	6,113.3	442.7	1,981.7	-454.3	12.01	1.43	-25.97
6,575.0	28.10	52.70	6,139.8	450.4	1,993.4	-452.4	12.80	1.80	-27.17
6,605.0	28.47	44.92	6,166.3	459.7	2,004.1	-448.6	12.34	1.23	-25.93
6,634.0	29.06	37.65	6,191.7	470.2	2,013.3	-443.1	12.23	2.03	-25.07
6,664.0	30.03	30.95	6,217.8	482.4	2,021.6	-435.6	11.47	3.23	-22.33
6,671.0	30.32	29.70	6,223.9	485.4	2,023.4	-433.6	9.85	4.10	-17.81
Sycamore @ 6671 MD									
6,694.0	31.34	25.76	6,243.6	495.9	2,028.8	-426.6	9.85	4.45	-17.14
6,724.0	33.22	22.45	6,269.0	510.5	2,035.4	-416.2	8.60	6.27	-11.03
6,754.0	34.97	18.15	6,293.8	526.3	2,041.2	-404.5	9.93	5.83	-14.33
6,784.0	38.01	14.45	6,317.9	543.4	2,046.2	-391.2	12.51	10.13	-12.33
6,814.0	40.84	11.17	6,341.1	561.9	2,050.4	-376.2	11.71	9.43	-10.93
6,844.0	43.18	8.48	6,363.4	581.7	2,053.8	-359.9	9.84	7.80	-8.97
6,874.0	44.53	6.51	6,385.0	602.3	2,056.5	-342.4	6.40	4.50	-6.57



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,875.0	44.63	6.41	6,385.7	603.0	2,056.6	-341.8	11.99	9.82	-9.80
Middlesex @ 6875 MD									
6,904.0	47.51	3.71	6,405.9	623.8	2,058.4	-323.8	11.99	9.94	-9.32
6,934.0	50.85	0.22	6,425.5	646.5	2,059.2	-303.7	14.19	11.13	-11.63
6,964.0	53.83	357.65	6,443.8	670.2	2,058.7	-282.1	12.03	9.93	-8.57
6,993.0	56.35	355.50	6,460.4	694.0	2,057.3	-260.1	10.60	8.69	-7.41
7,023.0	59.19	354.25	6,476.4	719.3	2,055.0	-236.3	10.10	9.47	-4.17
7,053.0	62.08	352.44	6,491.1	745.2	2,052.0	-211.5	10.97	9.63	-6.03
7,058.0	62.66	352.09	6,493.4	749.6	2,051.4	-207.3	13.18	11.65	-6.96
Burkett @ 7058 MD									
7,082.0	65.47	350.47	6,503.9	770.9	2,048.1	-186.7	13.18	11.70	-6.76
7,112.0	67.79	348.66	6,515.8	798.0	2,043.1	-160.1	9.51	7.73	-6.03
7,137.0	69.16	348.02	6,525.0	820.8	2,038.4	-137.5	5.97	5.47	-2.57
Tully @ 7137 MD									
7,142.0	69.43	347.89	6,526.8	825.4	2,037.4	-132.9	5.97	5.47	-2.54
7,172.0	72.29	346.56	6,536.6	853.0	2,031.2	-105.3	10.41	9.53	-4.43
7,202.0	75.33	344.57	6,545.0	880.9	2,024.0	-77.0	11.97	10.13	-6.63
7,216.0	76.65	344.03	6,548.4	894.0	2,020.3	-63.6	10.10	9.40	-3.82
MRCL_HOT @ 7216 MD									
7,232.0	78.15	343.43	6,551.8	909.0	2,015.9	-48.2	10.10	9.40	-3.78
7,261.0	81.35	341.67	6,557.0	936.2	2,007.4	-20.0	12.55	11.03	-6.07
7,291.0	85.66	338.20	6,560.4	964.2	1,997.1	9.7	18.40	14.37	-11.57
7,321.0	88.96	335.55	6,561.8	991.7	1,985.4	39.6	14.10	11.00	-8.83
7,340.0	89.73	334.99	6,562.0	1,009.0	1,977.4	58.6	5.01	4.05	-2.95
7,438.0	90.34	333.99	6,562.0	1,097.4	1,935.2	156.6	1.20	0.62	-1.02
7,528.0	90.55	334.22	6,561.3	1,178.4	1,895.9	246.6	0.35	0.23	0.26
7,617.0	91.06	332.87	6,560.0	1,258.1	1,856.3	335.6	1.62	0.57	-1.52
7,707.0	90.91	333.24	6,558.5	1,338.3	1,815.5	425.5	0.44	-0.17	0.41
7,797.0	89.89	333.99	6,557.8	1,418.9	1,775.5	515.5	1.41	-1.13	0.83
7,886.0	91.17	337.27	6,557.0	1,499.9	1,738.8	604.5	3.96	1.44	3.69
7,976.0	91.41	337.37	6,555.0	1,583.0	1,704.1	694.4	0.29	0.27	0.11
8,065.0	89.46	334.71	6,554.3	1,664.3	1,668.0	783.3	3.71	-2.19	-2.99
8,155.0	90.97	334.24	6,554.0	1,745.5	1,629.2	873.3	1.76	1.68	-0.52
8,245.0	91.20	333.47	6,552.3	1,826.3	1,589.5	963.3	0.89	0.26	-0.86
8,334.0	89.73	332.86	6,551.6	1,905.7	1,549.4	1,052.2	1.79	-1.65	-0.69
8,424.0	90.23	334.66	6,551.6	1,986.4	1,509.6	1,142.2	2.08	0.56	2.00
8,513.0	90.07	334.05	6,551.4	2,066.6	1,471.0	1,231.2	0.71	-0.18	-0.69
8,603.0	91.78	334.40	6,549.9	2,147.7	1,431.9	1,321.2	1.94	1.90	0.39
8,692.0	90.47	334.65	6,548.2	2,228.0	1,393.6	1,410.2	1.50	-1.47	0.28
8,782.0	90.67	334.59	6,547.3	2,309.3	1,355.1	1,500.2	0.23	0.22	-0.07
8,871.0	91.18	334.07	6,545.8	2,389.5	1,316.5	1,589.2	0.82	0.57	-0.58
8,961.0	91.18	333.03	6,544.0	2,470.1	1,276.4	1,679.2	1.16	0.00	-1.16
9,050.0	91.38	335.58	6,542.0	2,550.2	1,237.9	1,768.1	2.87	0.22	2.87
9,140.0	91.32	335.27	6,539.9	2,632.1	1,200.5	1,858.1	0.35	-0.07	-0.34



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,229.0	90.20	334.64	6,538.7	2,712.7	1,162.8	1,947.1	1.44	-1.26	-0.71
9,319.0	91.28	335.93	6,537.5	2,794.4	1,125.2	2,037.1	1.87	1.20	1.43
9,408.0	91.48	335.12	6,535.4	2,875.4	1,088.3	2,126.0	0.94	0.22	-0.91
9,497.0	90.61	334.23	6,533.7	2,955.8	1,050.2	2,215.0	1.40	-0.98	-1.00
9,587.0	90.47	334.02	6,532.9	3,036.8	1,011.0	2,305.0	0.28	-0.16	-0.23
9,677.0	91.15	336.29	6,531.6	3,118.5	973.1	2,395.0	2.63	0.76	2.52
9,766.0	91.48	337.27	6,529.6	3,200.2	938.1	2,483.9	1.16	0.37	1.10
9,856.0	90.64	334.04	6,527.9	3,282.2	901.0	2,573.8	3.71	-0.93	-3.59
9,945.0	90.48	334.11	6,527.0	3,362.3	862.1	2,662.8	0.20	-0.18	0.08
10,035.0	91.72	334.06	6,525.3	3,443.2	822.7	2,752.8	1.38	1.38	-0.06
10,124.0	92.02	333.94	6,522.4	3,523.1	783.8	2,841.7	0.36	0.34	-0.13
10,214.0	90.58	334.47	6,520.4	3,604.2	744.6	2,931.7	1.70	-1.60	0.59
10,303.0	90.68	333.77	6,519.4	3,684.2	705.8	3,020.7	0.79	0.11	-0.79
10,393.0	91.02	332.79	6,518.1	3,764.6	665.3	3,110.7	1.15	0.38	-1.09
10,482.0	90.95	332.50	6,516.5	3,843.6	624.4	3,199.6	0.34	-0.08	-0.33
10,572.0	91.96	333.95	6,514.2	3,924.0	583.9	3,289.6	1.96	1.12	1.61
10,661.0	91.39	334.59	6,511.6	4,004.1	545.3	3,378.5	0.96	-0.64	0.72
10,751.0	91.08	334.35	6,509.7	4,085.3	506.5	3,468.5	0.44	-0.34	-0.27
10,840.0	90.21	334.03	6,508.7	4,165.4	467.7	3,557.5	1.04	-0.98	-0.36
10,930.0	90.41	334.39	6,508.2	4,246.4	428.6	3,647.5	0.46	0.22	0.40
11,019.0	91.99	335.21	6,506.4	4,326.9	390.7	3,736.5	2.00	1.78	0.92
11,108.0	90.98	335.32	6,504.0	4,407.8	353.5	3,825.4	1.14	-1.13	0.12
11,198.0	90.34	334.31	6,503.0	4,489.2	315.2	3,915.4	1.33	-0.71	-1.12
11,287.0	90.44	334.10	6,502.4	4,569.3	276.4	4,004.4	0.26	0.11	-0.24
11,377.0	92.26	334.74	6,500.3	4,650.5	237.6	4,094.4	2.14	2.02	0.71
11,466.0	90.92	333.42	6,497.8	4,730.5	198.7	4,183.4	2.11	-1.51	-1.48
11,556.0	89.81	332.53	6,497.2	4,810.7	157.8	4,273.3	1.58	-1.23	-0.99
11,646.0	89.84	333.84	6,497.5	4,891.0	117.2	4,363.3	1.46	0.03	1.46
11,735.0	91.75	335.47	6,496.3	4,971.4	79.1	4,452.3	2.82	2.15	1.83
11,825.0	91.92	334.92	6,493.4	5,053.0	41.4	4,542.2	0.64	0.19	-0.61
11,914.0	92.23	335.02	6,490.2	5,133.6	3.7	4,631.2	0.37	0.35	0.11
12,004.0	90.48	334.52	6,488.0	5,215.0	-34.6	4,721.1	2.02	-1.94	-0.56
12,093.0	90.61	334.61	6,487.2	5,295.4	-72.8	4,810.1	0.18	0.15	0.10
12,183.0	90.68	334.14	6,486.2	5,376.5	-111.7	4,900.1	0.53	0.08	-0.52
12,272.0	90.74	333.86	6,485.1	5,456.5	-150.8	4,989.1	0.32	0.07	-0.31
12,362.0	90.84	333.17	6,483.8	5,537.1	-190.9	5,079.1	0.77	0.11	-0.77
12,452.0	91.52	336.02	6,482.0	5,618.3	-229.5	5,169.1	3.25	0.76	3.17
12,541.0	91.92	336.10	6,479.3	5,699.6	-265.6	5,258.0	0.46	0.45	0.09
12,631.0	90.85	335.61	6,477.1	5,781.7	-302.4	5,347.9	1.31	-1.19	-0.54
12,720.0	90.64	335.12	6,476.0	5,862.6	-339.5	5,436.9	0.60	-0.24	-0.55
12,809.0	90.48	334.38	6,475.1	5,943.1	-377.4	5,525.9	0.85	-0.18	-0.83
12,899.0	90.41	334.26	6,474.4	6,024.2	-416.4	5,615.9	0.15	-0.08	-0.13
12,989.0	91.18	334.31	6,473.2	6,105.3	-455.5	5,705.9	0.86	0.86	0.06



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,078.0	91.05	334.45	6,471.4	6,185.6	-494.0	5,794.9	0.21	-0.15	0.16	
13,168.0	90.91	333.40	6,469.9	6,266.4	-533.5	5,884.9	1.18	-0.16	-1.17	
13,257.0	90.31	335.11	6,468.9	6,346.5	-572.2	5,973.8	2.04	-0.67	1.92	
13,347.0	89.97	334.83	6,468.7	6,428.1	-610.3	6,063.8	0.49	-0.38	-0.31	
13,436.0	89.73	334.40	6,469.0	6,508.5	-648.4	6,152.8	0.55	-0.27	-0.48	
13,526.0	89.40	334.24	6,469.6	6,589.6	-687.4	6,242.8	0.41	-0.37	-0.18	
13,615.0	89.10	333.55	6,470.8	6,669.5	-726.6	6,331.8	0.85	-0.34	-0.78	
13,705.0	90.10	335.28	6,471.4	6,750.7	-765.4	6,421.8	2.22	1.11	1.92	
13,794.0	90.34	335.20	6,471.1	6,831.5	-802.7	6,510.8	0.28	0.27	-0.09	
13,883.0	90.30	334.94	6,470.6	6,912.2	-840.2	6,599.8	0.30	-0.04	-0.29	
13,973.0	90.37	334.17	6,470.1	6,993.5	-878.9	6,689.8	0.86	0.08	-0.86	
14,062.0	88.56	333.44	6,470.9	7,073.3	-918.2	6,778.8	2.19	-2.03	-0.82	
14,152.0	89.97	334.70	6,472.1	7,154.3	-957.5	6,868.8	2.10	1.57	1.40	
14,241.0	89.87	333.87	6,472.2	7,234.4	-996.1	6,957.8	0.94	-0.11	-0.93	
14,330.0	89.53	333.57	6,472.6	7,314.2	-1,035.5	7,046.8	0.51	-0.38	-0.34	
14,420.0	89.73	334.52	6,473.2	7,395.2	-1,074.9	7,136.8	1.08	0.22	1.06	
14,509.0	90.13	335.66	6,473.3	7,475.9	-1,112.4	7,225.8	1.36	0.45	1.28	
14,599.0	90.27	335.83	6,473.0	7,557.9	-1,149.4	7,315.7	0.24	0.16	0.19	
14,688.0	90.27	335.82	6,472.6	7,639.1	-1,185.8	7,404.7	0.01	0.00	-0.01	
14,778.0	90.50	335.68	6,472.0	7,721.2	-1,222.8	7,494.7	0.30	0.26	-0.16	
14,867.0	90.44	334.83	6,471.3	7,802.0	-1,260.0	7,583.7	0.96	-0.07	-0.96	
14,957.0	90.00	334.46	6,470.9	7,883.3	-1,298.6	7,673.7	0.64	-0.49	-0.41	
15,047.0	90.67	334.24	6,470.4	7,964.5	-1,337.5	7,763.7	0.78	0.74	-0.24	
15,136.0	90.37	333.65	6,469.6	8,044.4	-1,376.6	7,852.7	0.74	-0.34	-0.66	
15,226.0	90.27	333.94	6,469.1	8,125.2	-1,416.4	7,942.6	0.34	-0.11	0.32	
15,316.0	89.83	332.76	6,469.0	8,205.6	-1,456.7	8,032.6	1.40	-0.49	-1.31	
15,405.0	90.60	334.94	6,468.7	8,285.5	-1,496.0	8,121.6	2.60	0.87	2.45	
15,495.0	90.44	333.43	6,467.9	8,366.5	-1,535.2	8,211.6	1.69	-0.18	-1.68	
15,585.0	90.30	332.68	6,467.3	8,446.7	-1,575.9	8,301.6	0.85	-0.16	-0.83	
15,674.0	90.57	334.42	6,466.6	8,526.4	-1,615.6	8,390.6	1.98	0.30	1.96	
15,764.0	90.80	335.55	6,465.5	8,608.0	-1,653.6	8,480.5	1.28	0.26	1.26	
15,853.0	90.50	335.27	6,464.5	8,688.9	-1,690.7	8,569.5	0.46	-0.34	-0.31	
15,943.0	90.57	334.62	6,463.7	8,770.4	-1,728.8	8,659.5	0.73	0.08	-0.72	
16,032.0	90.47	334.66	6,462.9	8,850.8	-1,766.9	8,748.5	0.12	-0.11	0.04	
16,121.0	90.60	334.80	6,462.0	8,931.3	-1,804.9	8,837.5	0.21	0.15	0.16	
16,211.0	90.07	334.57	6,461.5	9,012.7	-1,843.4	8,927.5	0.64	-0.59	-0.26	
16,301.0	90.74	335.45	6,460.9	9,094.2	-1,881.4	9,017.5	1.23	0.74	0.98	
16,390.0	90.33	335.29	6,460.0	9,175.1	-1,918.5	9,106.5	0.49	-0.46	-0.18	
16,480.0	89.06	333.49	6,460.5	9,256.3	-1,957.4	9,196.5	2.45	-1.41	-2.00	
16,569.0	91.01	334.56	6,460.5	9,336.3	-1,996.4	9,285.5	2.50	2.19	1.20	
16,659.0	91.14	333.93	6,458.8	9,417.3	-2,035.5	9,375.5	0.71	0.14	-0.70	
16,748.0	91.98	334.71	6,456.4	9,497.5	-2,074.0	9,464.4	1.29	0.94	0.88	
16,838.0	90.74	333.94	6,454.2	9,578.6	-2,113.0	9,554.4	1.62	-1.38	-0.86	
16,927.0	90.23	333.65	6,453.5	9,658.5	-2,152.3	9,643.4	0.66	-0.57	-0.33	



Company:	Antero Resources	Local Co-ordinate Reference:	Well Greenback Unit 2H
Project:	Ritchie County WV	TVD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Site:	Mackay Pad - Caldwell/Greenback/McNabb	MD Reference:	Precision 523: GL 1099' + KB 19 @ 1118.0usft
Well:	Greenback Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,017.0	88.72	333.77	6,454.3	9,739.1	-2,192.1	9,733.4	1.68	-1.68	0.13
17,106.0	89.73	335.18	6,455.5	9,819.4	-2,230.5	9,822.4	1.95	1.13	1.58
17,196.0	90.10	335.27	6,455.6	9,901.2	-2,268.2	9,912.4	0.42	0.41	0.10
17,286.0	90.47	335.54	6,455.2	9,983.0	-2,305.7	10,002.3	0.51	0.41	0.30
17,362.0	90.87	335.64	6,454.3	10,052.2	-2,337.1	10,078.3	0.54	0.53	0.13
17,425.0	90.87	335.64	6,453.3	10,109.6	-2,363.1	10,141.3	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,671.0	6,223.9	Sycamore @ 6671 MD		0.00	
6,875.0	6,385.7	Middlesex @ 6875 MD		0.00	
7,058.0	6,493.4	Burkett @ 7058 MD		0.00	
7,137.0	6,525.0	Tully @ 7137 MD		0.00	
7,216.0	6,548.4	MRCL_HOT @ 7216 MD		0.00	

Checked By: _____ Approved By: _____ Date: _____