



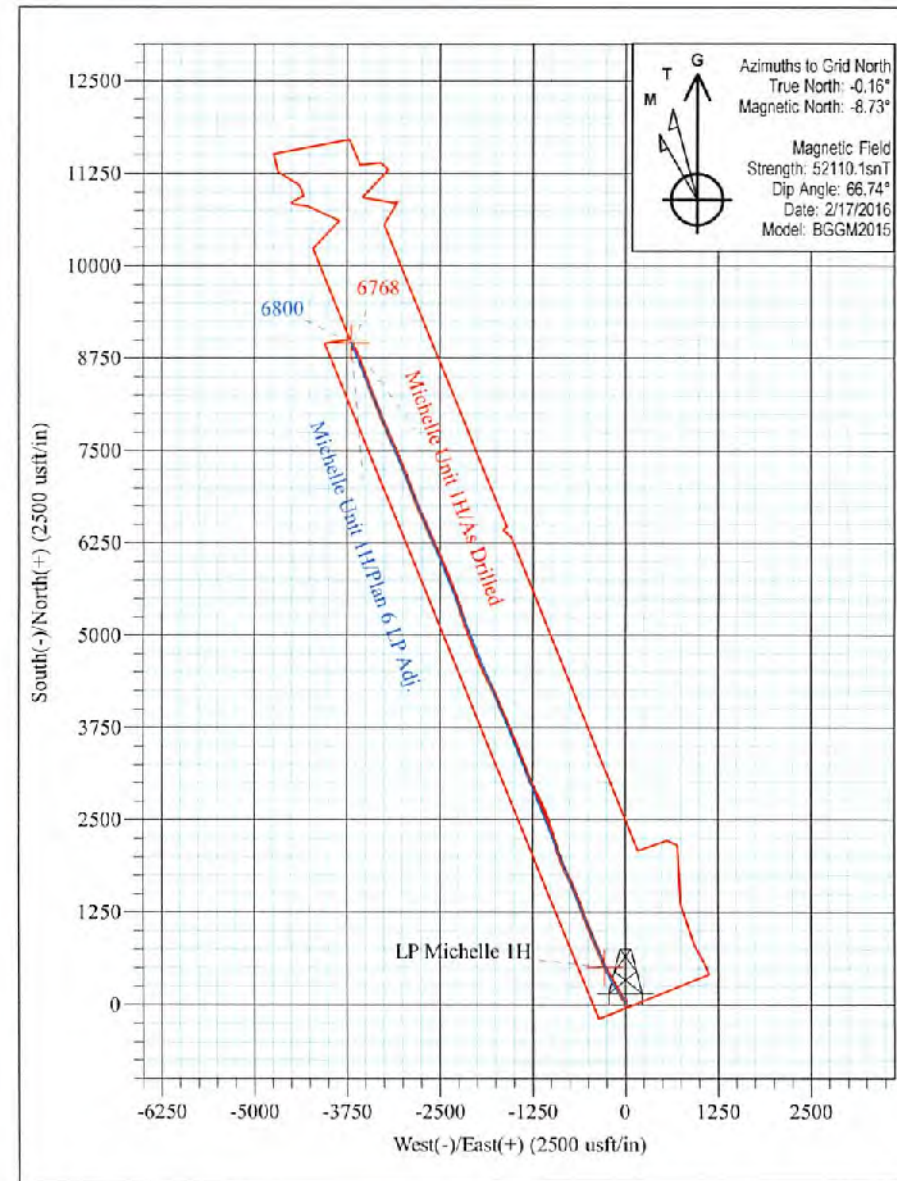
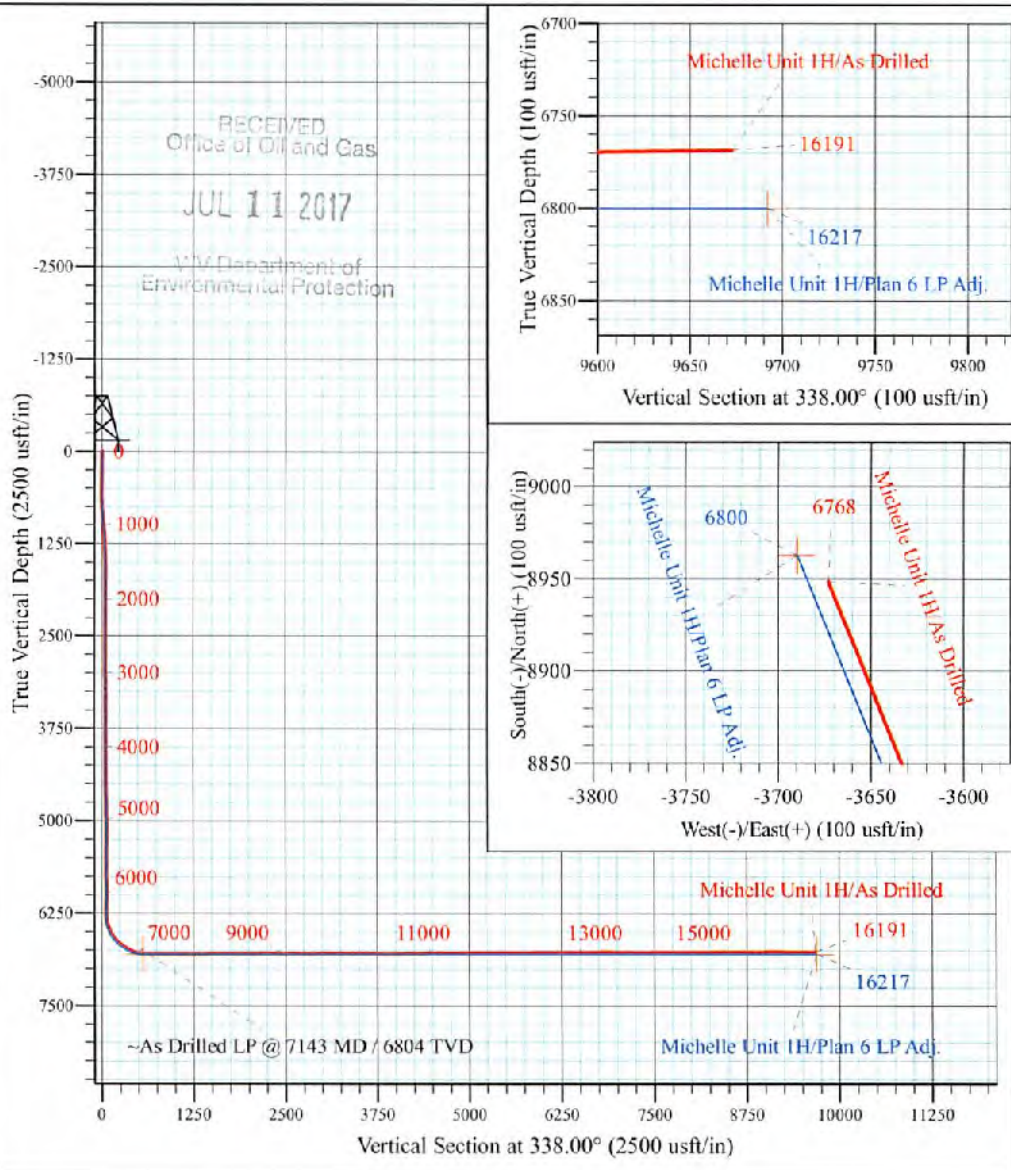
Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa
 Michelle Unit 1H
 Plan 6 LP Adj.
 PD 522: GL 1001' + KB 18' @ 1019.0usft
 Doddridge County WV

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: **Michelle Unit 1H SHL**

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14293363.66	1711349.02	39° 21' 38.506 N	80° 44' 56.571 W



Michelle Unit 1H
Approx. BHL
 39° 23' 7.083 N 80° 45' 43.049 W

Shane Rhodes
 9:27, March 09 2016
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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Project	Doddridge County WV, McClellan District		
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	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa				
Site Position:		Northing:	14,293,344.77 usft	Latitude:	39° 21' 38.319 N
From:	Map	Easting:	1,711,355.33 usft	Longitude:	80° 44' 56.491 W
Position Uncertainty:	2.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.16 °

Well	Michelle Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,293,363.66 usft	Latitude:	39° 21' 38.506 N
	+E/-W	0.0 usft	Easting:	1,711,349.02 usft	Longitude:	80° 44' 56.571 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,014.0 usft	Ground Level:	1,001.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	4/15/2015	-8.52	66.85	52,185
	BGGM2015	2/17/2016	-8.58	66.74	52,110

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	338.00	

Survey Program	Date	3/9/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	6,015.0	Survey #8 Def Gyro to KOP (Original Well)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
6,091.0	16,191.0	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	
105.0	0.72	301.08	105.0	0.3	-0.6	0.5	0.69	0.69	0.00	
First Gyro @ 105										
130.0	0.70	303.25	130.0	0.5	-0.8	0.8	0.13	-0.08	8.68	
155.0	0.54	307.03	155.0	0.7	-1.0	1.0	0.66	-0.64	15.12	
180.0	0.48	309.88	180.0	0.8	-1.2	1.2	0.26	-0.24	11.40	
205.0	0.21	317.99	205.0	0.9	-1.3	1.3	1.09	-1.08	32.44	
230.0	0.15	7.23	230.0	1.0	-1.4	1.4	0.64	-0.24	196.96	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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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)
255.0	0.06	355.56	255.0	1.0	-1.4	1.4	0.37	-0.36	-46.68
280.0	0.16	71.55	280.0	1.0	-1.3	1.5	0.63	0.40	303.96
305.0	0.10	90.80	305.0	1.0	-1.3	1.4	0.29	-0.24	77.00
330.0	0.06	301.90	330.0	1.1	-1.3	1.4	0.62	-0.16	-595.60
355.0	0.05	95.41	355.0	1.1	-1.3	1.5	0.43	-0.04	614.04
380.0	0.03	33.38	380.0	1.1	-1.2	1.5	0.18	-0.08	-248.12
405.0	0.04	358.22	405.0	1.1	-1.2	1.5	0.09	0.04	-140.64
430.0	0.05	302.64	430.0	1.1	-1.3	1.5	0.17	0.04	-222.32
455.0	0.05	29.78	455.0	1.1	-1.3	1.5	0.28	0.00	348.56
480.0	0.18	15.91	480.0	1.2	-1.2	1.5	0.53	0.52	-55.48
505.0	0.05	180.71	505.0	1.2	-1.2	1.6	0.91	-0.52	659.20
530.0	0.06	284.59	530.0	1.2	-1.2	1.6	0.35	0.04	415.52
555.0	0.15	38.24	555.0	1.2	-1.2	1.6	0.73	0.36	454.60
580.0	0.65	17.89	580.0	1.4	-1.2	1.7	2.05	2.00	-81.40
605.0	1.60	13.26	605.0	1.8	-1.0	2.1	3.81	3.80	-18.52
630.0	2.27	13.53	630.0	2.7	-0.9	2.8	2.68	2.68	1.08
655.0	2.82	15.01	654.9	3.7	-0.6	3.7	2.22	2.20	5.92
680.0	3.16	15.11	679.9	5.0	-0.2	4.7	1.44	1.44	0.40
705.0	3.90	16.00	704.9	6.5	0.2	5.9	2.89	2.88	3.56
730.0	4.08	14.31	729.8	8.2	0.6	7.3	0.86	0.72	-6.76
755.0	4.83	8.91	754.7	10.1	1.0	9.0	3.43	3.00	-21.60
780.0	5.30	5.80	779.6	12.3	1.3	10.9	2.18	1.88	-12.44
805.0	5.33	5.35	804.5	14.6	1.5	12.9	0.21	0.12	-1.80
830.0	5.43	6.28	829.4	16.9	1.8	15.0	0.53	0.40	3.72
855.0	5.81	8.31	854.3	19.3	2.1	17.1	1.72	1.52	8.12
880.0	5.92	9.04	879.2	21.8	2.5	19.3	0.53	0.44	2.92
905.0	5.97	9.28	904.0	24.4	2.9	21.5	0.22	0.20	0.88
930.0	5.99	9.64	926.9	27.0	3.3	23.8	0.18	0.08	1.52
955.0	6.04	8.99	953.8	29.6	3.7	26.0	0.34	0.20	-2.60
980.0	6.08	8.36	978.6	32.2	4.1	28.3	0.31	0.16	-2.52
1,005.0	6.17	7.99	1,003.5	34.8	4.5	30.6	0.39	0.36	-1.48
1,030.0	6.10	8.82	1,026.3	37.4	4.9	32.9	0.45	-0.28	3.32
1,055.0	5.68	9.30	1,053.2	40.0	5.3	35.1	1.69	-1.63	1.92
1,080.0	5.21	10.76	1,078.1	42.3	5.7	37.1	1.96	-1.88	5.84
1,105.0	4.75	11.84	1,103.0	44.4	6.1	38.9	1.87	-1.84	3.52
1,130.0	4.40	12.45	1,127.9	46.4	6.5	40.6	1.42	-1.40	3.24
1,155.0	4.19	10.57	1,152.8	48.2	6.9	42.1	1.01	-0.84	-7.52
1,180.0	3.75	11.41	1,177.8	49.9	7.2	43.6	1.78	-1.76	3.36
1,205.0	3.30	11.64	1,202.7	51.4	7.5	44.9	1.80	-1.80	0.92
1,230.0	2.98	12.61	1,227.7	52.8	7.8	46.0	1.30	-1.28	3.88
1,255.0	2.71	12.10	1,252.7	54.0	8.1	47.0	1.08	-1.08	-2.04
1,280.0	2.55	13.46	1,277.6	55.1	8.4	48.0	0.69	-0.64	5.52
1,305.0	2.38	12.86	1,302.6	56.2	8.6	48.8	0.69	-0.68	-2.48

WV Department of Environmental Protection



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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Survey

WV Department of
Environmental Protection

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)
1,330.0	2.18	13.06	1,327.6	57.1	8.8	49.7	0.90	-0.80	0.80
1,355.0	1.86	13.82	1,352.6	58.0	9.0	50.4	1.28	-1.23	3.04
1,380.0	1.83	13.58	1,377.6	58.7	9.2	51.0	0.92	-0.92	-0.96
1,405.0	1.45	9.53	1,402.6	59.4	9.3	51.6	0.84	-0.72	-16.20
1,430.0	1.23	5.46	1,427.6	60.0	9.4	52.1	0.96	-0.88	-16.28
1,455.0	1.02	5.28	1,452.5	60.4	9.5	52.5	0.84	-0.84	-0.72
1,480.0	0.97	2.10	1,477.5	60.9	9.5	52.9	0.30	-0.20	-12.72
1,505.0	0.78	4.90	1,502.5	81.3	9.5	53.2	0.78	-0.76	11.20
1,530.0	0.79	3.31	1,527.5	81.6	9.5	53.5	0.10	0.04	-6.36
1,555.0	0.82	10.61	1,552.5	81.9	9.6	53.8	0.77	-0.88	29.20
1,580.0	0.60	8.95	1,577.5	82.2	9.6	54.0	0.11	-0.08	-6.64
1,605.0	0.43	18.41	1,602.5	82.4	9.7	54.2	0.76	-0.88	37.84
1,630.0	0.32	29.29	1,627.5	82.5	9.7	54.3	0.52	-0.44	43.52
1,655.0	0.29	62.43	1,652.5	82.6	9.8	54.4	0.71	-0.12	132.58
1,680.0	0.31	68.62	1,677.5	82.7	9.9	54.4	0.15	0.08	24.78
1,705.0	0.36	69.07	1,702.5	82.7	10.1	54.4	0.20	0.20	1.80
1,730.0	0.28	58.96	1,727.5	82.8	10.2	54.4	0.39	-0.32	-40.44
1,755.0	0.33	65.75	1,752.5	82.9	10.3	54.4	0.25	0.20	27.18
1,780.0	0.30	64.75	1,777.5	82.9	10.5	54.4	0.12	-0.12	-4.00
1,805.0	0.31	69.59	1,802.5	83.0	10.6	54.4	0.11	0.04	19.38
1,830.0	0.28	66.99	1,827.5	83.0	10.7	54.4	0.13	-0.12	-10.40
1,855.0	0.27	83.60	1,852.5	83.0	10.8	54.4	0.32	-0.04	66.44
1,880.0	0.23	64.94	1,877.5	83.1	10.9	54.4	0.36	-0.16	-74.64
1,905.0	0.16	70.34	1,902.5	83.1	11.0	54.4	0.29	-0.28	21.60
1,930.0	0.15	58.75	1,927.5	83.1	11.1	54.4	0.13	-0.04	-46.36
1,955.0	0.12	98.29	1,952.5	83.1	11.1	54.4	0.38	-0.12	158.16
1,980.0	0.11	81.29	1,977.5	83.1	11.2	54.4	0.14	-0.04	-68.00
2,005.0	0.06	213.23	2,002.5	83.1	11.2	54.4	0.63	-0.20	527.76
2,030.0	0.07	161.34	2,027.5	83.1	11.2	54.3	0.23	0.04	-207.56
2,055.0	0.12	179.30	2,052.5	83.1	11.2	54.3	0.23	0.20	71.84
2,080.0	0.09	166.17	2,077.5	83.0	11.2	54.2	0.15	-0.12	-52.52
2,105.0	0.10	213.12	2,102.5	83.0	11.2	54.2	0.30	0.04	187.80
2,130.0	0.17	104.38	2,127.5	83.0	11.2	54.2	0.89	0.28	-434.96
2,155.0	0.09	107.65	2,152.5	82.9	11.3	54.1	0.32	-0.32	13.08
2,180.0	0.11	149.04	2,177.5	82.9	11.3	54.1	0.29	0.08	165.56
2,205.0	0.11	99.87	2,202.5	82.9	11.3	54.1	0.37	0.00	-196.68
2,230.0	0.09	89.00	2,227.5	82.9	11.4	54.1	0.11	-0.06	-43.48
2,255.0	0.10	171.82	2,252.5	82.9	11.4	54.0	0.50	0.04	331.28
2,280.0	0.05	350.20	2,277.5	82.9	11.4	54.0	0.60	-0.20	713.52
2,305.0	0.06	17.11	2,302.5	82.9	11.4	54.0	0.11	0.04	107.64
2,330.0	0.05	202.05	2,327.5	82.9	11.4	54.0	0.44	-0.04	-700.24
2,355.0	0.13	224.70	2,352.5	82.9	11.4	54.0	0.34	0.32	90.60



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Survey										WV Department of Environmental Protection
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2,380.0	0.17	139.69	2,377.5	62.8	11.4	54.0	0.82	0.16	-340.04	
2,405.0	0.26	245.52	2,402.5	62.6	11.3	53.9	1.39	0.36	423.32	
2,430.0	0.18	212.13	2,427.5	62.7	11.3	53.9	0.59	-0.32	-133.56	
2,455.0	0.19	213.43	2,452.5	62.6	11.2	53.9	0.04	0.04	5.20	
2,480.0	0.24	233.64	2,477.5	62.6	11.2	53.8	0.36	0.20	80.84	
2,505.0	0.20	232.23	2,502.5	62.5	11.1	53.8	0.16	-0.16	-5.64	
2,530.0	0.15	229.37	2,527.5	62.5	11.0	53.8	0.20	-0.20	-11.44	
2,555.0	0.18	221.64	2,552.5	62.4	11.0	53.7	0.15	0.12	-30.92	
2,580.0	0.17	230.85	2,577.5	62.4	10.9	53.7	0.12	-0.04	36.84	
2,605.0	0.24	256.55	2,602.5	62.3	10.8	53.7	0.46	0.26	102.80	
2,630.0	0.31	266.09	2,627.5	62.3	10.7	53.7	0.33	0.26	36.16	
2,655.0	0.31	273.02	2,652.5	62.3	10.6	53.8	0.15	0.00	27.72	
2,680.0	0.41	281.22	2,677.5	62.3	10.4	53.9	0.45	0.40	32.80	
2,705.0	0.46	274.84	2,702.5	62.3	10.2	54.0	0.28	0.20	-25.52	
2,730.0	0.40	274.75	2,727.5	62.4	10.1	54.1	0.24	-0.24	-0.36	
2,755.0	0.54	270.14	2,752.5	62.4	9.8	54.1	0.58	0.56	-18.44	
2,780.0	0.71	272.62	2,777.5	62.4	9.6	54.2	0.69	0.68	9.92	
2,805.0	0.73	274.41	2,802.5	62.4	9.3	54.4	0.12	0.08	7.16	
2,830.0	0.84	267.65	2,827.5	62.4	8.9	54.5	0.57	0.44	-27.04	
2,855.0	0.85	265.99	2,852.5	62.4	8.6	54.5	0.11	0.04	-6.64	
2,880.0	0.90	263.69	2,877.5	62.3	8.2	54.7	0.24	0.20	-9.20	
2,905.0	0.85	258.34	2,902.5	62.3	7.8	54.8	0.38	-0.20	-21.40	
2,930.0	0.82	261.12	2,927.5	62.2	7.4	54.9	0.20	-0.12	11.12	
2,955.0	0.82	266.02	2,952.5	62.2	7.1	55.0	0.28	0.00	19.60	
2,980.0	0.82	261.06	2,977.5	62.1	6.7	55.1	0.28	0.00	-19.84	
3,005.0	0.84	265.59	3,002.5	62.1	6.4	55.2	0.27	0.08	18.12	
3,030.0	0.78	262.63	3,027.5	62.1	6.0	55.3	0.29	-0.24	-11.84	
3,055.0	0.81	260.12	3,052.5	62.0	5.7	55.4	0.18	0.12	-10.04	
3,080.0	0.80	265.23	3,077.5	62.0	5.3	55.5	0.29	-0.04	20.44	
3,105.0	0.71	282.06	3,102.5	61.9	5.0	55.5	0.40	-0.36	-12.68	
3,130.0	0.71	259.50	3,127.5	61.9	4.7	55.6	0.13	0.00	-10.24	
3,155.0	0.71	264.37	3,152.5	61.8	4.4	55.7	0.24	0.00	19.48	
3,180.0	0.70	264.65	3,177.5	61.8	4.1	55.8	0.04	-0.04	1.12	
3,205.0	0.63	262.41	3,202.5	61.8	3.8	55.9	0.30	-0.28	-8.96	
3,230.0	0.76	274.59	3,227.5	61.8	3.5	56.0	0.78	0.52	48.72	
3,255.0	0.76	271.38	3,252.5	61.8	3.2	56.1	0.17	0.00	-12.84	
3,280.0	0.77	270.22	3,277.5	61.8	2.8	56.2	0.07	0.04	-4.64	
3,305.0	0.78	267.66	3,302.5	61.8	2.5	56.4	0.14	0.04	-10.24	
3,330.0	0.78	269.74	3,327.5	61.8	2.1	56.5	0.11	0.00	8.32	
3,355.0	0.78	266.93	3,352.5	61.8	1.8	56.6	0.15	0.00	-11.24	
3,380.0	0.76	269.10	3,377.5	61.8	1.5	56.7	0.14	-0.08	8.68	
3,405.0	0.78	271.51	3,402.5	61.8	1.1	56.8	0.15	0.08	9.64	
3,430.0	0.79	269.72	3,427.5	61.8	0.8	57.0	0.11	0.04	-7.16	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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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)
3,455.0	0.76	270.52	3,452.5	61.8	0.5	57.1	0.13	-0.12	3.20
3,460.0	0.68	267.04	3,477.5	61.8	0.1	57.2	0.36	-0.32	-13.92
3,505.0	0.67	270.12	3,502.5	61.7	-0.2	57.3	0.15	-0.04	12.32
3,530.0	0.75	266.65	3,527.5	61.7	-0.5	57.4	0.36	0.32	-13.88
3,555.0	0.72	269.52	3,552.5	61.7	-0.8	57.5	0.19	-0.12	11.48
3,580.0	0.70	266.63	3,577.4	61.7	-1.1	57.6	0.16	-0.08	-11.56
3,605.0	0.75	264.45	3,602.4	61.7	-1.4	57.7	0.23	0.20	-8.72
3,630.0	0.68	264.72	3,627.4	61.7	-1.7	57.8	0.28	-0.28	1.08
3,655.0	0.69	266.46	3,652.4	61.6	-2.0	57.9	0.09	0.04	6.96
3,680.0	0.71	269.51	3,677.4	61.6	-2.3	58.0	0.17	0.08	12.20
3,705.0	0.74	268.81	3,702.4	61.6	-2.6	58.1	0.13	0.12	-2.80
3,730.0	0.70	268.03	3,727.4	61.6	-3.0	58.2	0.16	-0.16	-3.12
3,755.0	0.70	261.50	3,752.4	61.6	-3.3	58.3	0.32	0.00	-26.12
3,780.0	0.67	265.00	3,777.4	61.6	-3.6	58.4	0.21	-0.12	14.00
3,805.0	0.68	265.92	3,802.4	61.5	-3.8	58.5	0.06	-0.04	3.68
3,830.0	0.68	263.08	3,827.4	61.5	-4.1	58.6	0.13	0.00	-11.36
3,855.0	0.67	268.13	3,852.4	61.5	-4.4	58.7	0.24	0.04	20.20
3,880.0	0.64	266.36	3,877.4	61.5	-4.7	58.8	0.14	-0.12	-7.08
3,905.0	0.64	269.44	3,902.4	61.5	-5.0	58.8	0.14	0.00	12.32
3,930.0	0.68	274.37	3,927.4	61.5	-5.3	59.0	0.28	0.16	19.72
3,955.0	0.70	280.71	3,952.4	61.5	-5.6	59.1	0.32	0.08	25.36
3,980.0	0.70	274.71	3,977.4	61.5	-5.9	59.3	0.29	0.00	-24.00
4,005.0	0.74	272.57	4,002.4	61.6	-6.2	59.4	0.19	0.16	-8.56
4,030.0	0.75	274.44	4,027.4	61.6	-6.5	59.5	0.11	0.04	7.48
4,055.0	0.66	267.58	4,052.4	61.6	-6.8	59.7	0.49	-0.38	-27.44
4,080.0	0.59	264.27	4,077.4	61.6	-7.1	59.7	0.31	-0.28	-13.24
4,105.0	0.57	271.39	4,102.4	61.6	-7.3	59.8	0.30	-0.08	28.48
4,130.0	0.65	274.34	4,127.4	61.6	-7.6	59.9	0.34	0.32	11.80
4,155.0	0.59	268.17	4,152.4	61.6	-7.9	60.1	0.36	-0.24	-24.68
4,180.0	0.58	265.80	4,177.4	61.6	-8.1	60.1	0.10	-0.04	-9.48
4,205.0	0.59	284.82	4,202.4	61.6	-8.4	60.2	0.77	0.04	76.08
4,230.0	0.67	276.66	4,227.4	61.6	-8.6	60.4	0.48	0.32	-32.64
4,255.0	0.77	277.49	4,252.4	61.7	-9.0	60.5	0.40	0.40	3.32
4,280.0	0.65	273.75	4,277.4	61.7	-9.3	60.7	0.51	-0.48	-14.96
4,305.0	0.69	272.13	4,302.4	61.7	-9.6	60.8	0.18	0.16	-6.48
4,330.0	0.73	269.49	4,327.4	61.7	-9.9	60.9	0.21	0.16	-10.56
4,355.0	0.62	268.80	4,352.4	61.7	-10.2	61.0	0.44	-0.44	-2.76
4,380.0	0.58	273.53	4,377.4	61.7	-10.4	61.1	0.25	-0.16	18.92
4,405.0	0.50	276.36	4,402.4	61.8	-10.7	61.3	0.34	-0.32	11.32
4,430.0	0.51	278.14	4,427.4	61.8	-10.9	61.4	0.07	0.04	7.12
4,455.0	0.49	289.02	4,452.4	61.8	-11.1	61.5	0.39	-0.08	43.52
4,480.0	0.51	291.19	4,477.4	61.9	-11.3	61.6	0.11	0.08	8.68



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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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)
4,505.0	0.46	265.78	4,502.4	62.0	-11.5	61.8	0.27	-0.20	-21.64
4,530.0	0.45	292.28	4,527.4	62.0	-11.7	61.9	0.21	-0.04	26.00
4,555.0	0.47	292.18	4,552.4	62.1	-11.9	62.0	0.08	0.08	-0.40
4,580.0	0.47	279.29	4,577.4	62.2	-12.1	62.2	0.42	0.00	-51.56
4,605.0	0.47	279.15	4,602.4	62.2	-12.3	62.3	0.00	0.00	-0.56
4,630.0	0.39	279.25	4,627.4	62.2	-12.5	62.4	0.32	-0.32	0.40
4,655.0	0.44	270.32	4,652.4	62.2	-12.6	62.4	0.33	0.20	-35.72
4,680.0	0.40	275.10	4,677.4	62.3	-12.8	62.5	0.21	-0.16	19.12
4,705.0	0.38	268.16	4,702.4	62.3	-13.0	62.6	0.26	-0.08	-35.76
4,730.0	0.38	279.89	4,727.4	62.3	-13.2	62.7	0.36	0.00	54.92
4,755.0	0.32	284.11	4,752.4	62.3	-13.3	62.7	0.26	-0.24	16.88
4,780.0	0.40	293.05	4,777.4	62.4	-13.4	62.8	0.39	0.32	35.78
4,805.0	0.43	287.03	4,802.4	62.4	-13.6	63.0	0.21	0.12	-24.08
4,830.0	0.46	277.74	4,827.4	62.5	-13.8	63.1	0.31	0.12	-37.18
4,855.0	0.41	273.16	4,852.4	62.5	-14.0	63.2	0.24	-0.20	-18.32
4,880.0	0.33	272.57	4,877.4	62.5	-14.2	63.2	0.32	-0.32	-2.36
4,905.0	0.33	290.49	4,902.4	62.5	-14.3	63.3	0.41	0.00	71.68
4,930.0	0.34	284.95	4,927.4	62.6	-14.4	63.4	0.14	0.04	-22.16
4,955.0	0.43	280.96	4,952.4	62.6	-14.6	63.5	0.38	0.36	-15.96
4,980.0	0.45	274.01	4,977.4	62.6	-14.8	63.6	0.23	0.06	-27.80
5,005.0	0.40	268.51	5,002.4	62.6	-15.0	63.7	0.26	-0.20	-22.00
5,030.0	0.42	267.77	5,027.4	62.6	-15.2	63.7	0.08	0.06	-2.96
5,055.0	0.33	257.02	5,052.4	62.6	-15.3	63.8	0.46	-0.36	-43.00
5,080.0	0.35	266.97	5,077.4	62.6	-15.5	63.8	0.25	0.06	39.80
5,105.0	0.38	276.41	5,102.4	62.6	-15.6	63.9	0.27	0.12	37.76
5,130.0	0.34	265.01	5,127.4	62.6	-15.8	63.9	0.33	-0.16	-45.60
5,155.0	0.30	275.67	5,152.4	62.6	-15.9	64.0	0.29	-0.16	42.64
5,180.0	0.35	282.80	5,177.4	62.6	-16.1	64.1	0.26	0.20	28.52
5,205.0	0.30	267.69	5,202.4	62.6	-16.2	64.1	0.40	-0.20	-60.44
5,230.0	0.29	279.94	5,227.4	62.6	-16.3	64.2	0.25	-0.04	49.00
5,255.0	0.35	297.23	5,252.4	62.7	-16.5	64.3	0.45	0.24	69.16
5,280.0	0.31	297.44	5,277.4	62.7	-16.6	64.4	0.18	-0.16	0.84
5,305.0	0.37	294.76	5,302.4	62.8	-16.7	64.5	0.25	0.24	-10.72
5,330.0	0.28	301.62	5,327.4	62.9	-16.8	64.6	0.39	-0.36	27.44
5,355.0	0.40	297.71	5,352.4	62.9	-17.0	64.7	0.49	0.48	-15.64
5,380.0	0.43	306.66	5,377.4	63.0	-17.1	64.9	0.29	0.12	35.80
5,405.0	0.28	309.02	5,402.4	63.1	-17.2	65.0	0.60	-0.60	9.44
5,430.0	0.33	316.11	5,427.4	63.2	-17.3	65.1	0.25	0.20	28.36
5,455.0	0.34	316.88	5,452.4	63.3	-17.4	65.3	0.04	0.04	3.08
5,480.0	0.37	316.73	5,477.4	63.4	-17.5	65.4	0.12	0.12	-0.60
5,505.0	0.37	317.36	5,502.4	63.6	-17.7	65.5	0.02	0.00	2.52
5,530.0	0.24	329.40	5,527.4	63.7	-17.7	65.7	0.58	-0.52	48.16
5,555.0	0.25	331.24	5,552.4	63.8	-17.8	65.8	0.05	0.04	7.36



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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Survey WV Department of Environmental Protection

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)	
5,580.0	0.26	330.86	5,577.4	63.9	-17.8	65.9	0.04	0.04	-1.52	
5,605.0	0.30	310.44	5,602.4	63.9	-17.9	66.0	0.43	0.16	-81.68	
5,630.0	0.23	301.76	5,627.4	64.0	-18.0	66.1	0.32	-0.28	-34.72	
5,655.0	0.04	354.88	5,652.4	64.1	-18.1	66.2	0.83	-0.76	212.48	
5,680.0	0.04	91.00	5,677.4	64.1	-18.1	66.2	0.24	0.00	384.48	
5,705.0	0.01	119.85	5,702.4	64.1	-18.0	66.2	0.13	-0.12	115.40	
5,730.0	0.09	109.04	5,727.4	64.1	-18.0	66.1	0.32	-0.32	-43.24	
5,755.0	0.02	60.37	5,752.4	64.0	-18.0	66.1	0.31	-0.28	-194.68	
5,780.0	0.10	109.80	5,777.4	64.0	-18.0	66.1	0.35	0.32	197.72	
5,805.0	0.21	98.50	5,802.4	64.0	-17.9	66.1	0.45	0.44	-45.20	
5,830.0	0.18	109.19	5,827.4	64.0	-17.8	66.0	0.19	-0.12	42.76	
5,855.0	0.07	105.79	5,852.4	64.0	-17.8	66.0	0.44	-0.44	-13.60	
5,880.0	0.07	178.59	5,877.4	64.0	-17.8	66.0	0.33	0.00	291.20	
5,905.0	0.12	160.67	5,902.4	63.9	-17.7	65.9	0.23	0.20	-71.68	
5,930.0	0.17	139.70	5,927.4	63.9	-17.7	65.9	0.29	0.20	-83.88	
5,955.0	0.17	156.75	5,952.4	63.8	-17.7	65.8	0.20	0.00	68.20	
5,980.0	0.25	148.49	5,977.4	63.7	-17.6	65.7	0.34	0.32	-33.04	
6,005.0	0.16	142.29	6,002.4	63.7	-17.6	65.6	0.37	-0.36	-24.80	
6,015.0	0.29	133.19	6,012.4	63.6	-17.6	65.6	1.34	1.30	-91.00	
Last Gyro @ 6015										
6,091.0	0.30	196.04	6,088.4	63.3	-17.5	65.2	0.40	0.01	82.70	
First SDI MWD @ 6091										
6,183.0	0.31	233.76	6,180.4	62.9	-17.7	65.0	0.21	0.01	41.01	
6,214.0	0.08	352.99	6,211.4	62.9	-17.8	65.0	1.15	-0.74	384.61	
6,245.0	0.07	150.00	6,242.4	62.9	-17.8	65.0	0.47	-0.03	506.48	
6,276.0	1.22	320.29	6,273.3	63.1	-18.0	65.3	4.16	3.71	549.32	
6,307.0	3.43	324.58	6,304.3	64.2	-18.8	66.5	7.15	7.13	13.84	
6,337.0	6.72	320.06	6,334.2	66.2	-20.4	69.1	11.04	10.97	-15.07	
6,368.0	9.98	323.47	6,364.9	69.8	-23.2	73.4	10.63	10.52	11.00	
6,374.0	10.69	323.80	6,370.8	70.7	-23.8	74.4	11.81	11.77	5.41	
SCMR @ 6374										
6,399.0	13.63	324.79	6,395.2	74.9	-26.9	79.5	11.81	11.78	3.98	
6,430.0	17.06	324.97	6,425.1	81.6	-31.6	87.5	11.07	11.06	0.58	
6,461.0	21.02	324.58	6,454.4	89.9	-37.4	97.4	12.78	12.77	-1.26	
6,492.0	24.27	327.63	6,483.0	99.8	-44.1	109.0	11.14	10.48	9.84	
6,523.0	27.05	331.54	6,510.9	111.4	-50.8	122.3	10.50	8.97	12.61	
6,553.0	30.22	333.44	6,537.3	124.1	-57.5	136.6	10.99	10.57	6.33	
6,564.0	31.55	333.64	6,546.7	129.2	-60.0	142.3	12.13	12.09	1.79	
MDLX @ 6564										
6,584.0	33.97	333.96	6,583.5	138.9	-64.8	153.1	12.13	12.10	1.61	
6,615.0	37.75	332.80	6,588.6	155.1	-72.9	171.1	12.39	12.19	-3.74	
6,646.0	41.67	330.56	6,612.5	172.6	-82.3	190.8	13.46	12.65	-7.23	
6,677.0	45.95	329.19	6,634.9	191.1	-93.1	212.1	14.14	13.81	-4.42	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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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)	
6,708.0	49.63	328.60	6,655.7	210.8	-104.9	234.7	11.95	11.87	-1.90	
6,738.0	52.37	327.97	6,674.6	230.6	-117.2	257.7	9.28	9.13	-2.10	
6,752.0	53.77	328.61	6,683.0	240.1	-123.1	268.7	10.64	9.99	4.58	
BRKT @ 6752										
6,789.0	55.47	329.36	6,692.8	252.0	-130.2	282.4	10.64	10.01	4.40	
6,800.0	58.53	330.86	6,709.7	274.5	-143.2	308.2	10.67	9.87	4.84	
6,801.0	58.61	330.87	6,710.2	275.3	-143.6	309.0	7.87	7.84	0.66	
TLLY @ 6801										
6,831.0	60.96	331.12	6,725.3	296.0	-156.2	334.8	7.67	7.84	0.64	
6,852.0	63.35	330.09	6,739.8	321.8	-169.6	361.9	8.25	7.71	-3.32	
6,892.0	66.13	329.43	6,752.6	345.3	-183.3	388.8	9.47	9.26	-2.20	
HMLN @ 6892										
6,893.0	66.22	329.41	6,753.0	346.1	-183.7	389.7	9.47	9.26	-2.14	
6,920.0	68.83	330.55	6,763.3	367.7	-196.2	414.4	10.42	9.67	4.21	
MRCL_HOT @ 6920										
6,923.0	69.12	330.67	6,764.4	370.1	-197.6	417.2	10.42	9.68	4.12	
6,954.0	71.40	330.41	6,774.9	395.5	-211.9	446.1	7.40	7.35	-0.84	
6,985.0	73.12	330.42	6,784.3	421.2	-226.5	475.4	5.55	5.55	0.03	
7,016.0	77.26	330.96	6,792.2	447.3	-241.2	505.1	13.53	13.42	1.81	
7,046.0	81.64	333.06	6,797.7	473.3	-255.0	534.4	16.05	14.53	6.93	
7,077.0	85.25	335.45	6,801.3	501.1	-268.4	565.1	13.94	11.65	7.71	
7,108.0	87.57	336.69	6,803.2	529.4	-280.9	596.0	8.48	7.48	4.00	
7,143.0	89.23	337.68	6,804.2	561.6	-294.5	631.0	5.52	4.74	2.83	
-As Drilled LP @ 7143 MD / 6804 TVD										
7,174.0	89.73	337.55	6,804.5	590.3	-306.3	662.0	1.67	1.61	-0.42	
7,205.0	89.46	336.76	6,804.7	618.8	-318.3	693.0	2.69	-0.87	-2.55	
7,236.0	89.39	336.85	6,805.0	647.3	-330.5	724.0	0.37	-0.23	0.29	
7,328.0	90.78	337.43	6,804.8	732.1	-366.3	816.0	1.64	1.51	0.63	
7,421.0	89.64	336.17	6,804.5	817.6	-402.9	909.0	1.83	-1.23	-1.35	
7,513.0	90.84	338.23	6,804.1	902.4	-438.6	1,001.0	2.59	1.30	2.24	
7,606.0	89.20	337.31	6,804.1	988.5	-473.7	1,094.0	2.02	-1.76	-0.99	
7,699.0	91.42	339.30	6,803.6	1,074.9	-508.1	1,186.9	3.21	2.39	2.14	
7,791.0	90.81	339.06	6,801.8	1,160.8	-540.8	1,278.9	0.71	-0.66	-0.26	
7,884.0	90.54	340.83	6,800.7	1,248.2	-572.7	1,371.8	1.93	-0.29	1.90	
7,976.0	91.57	340.80	6,799.0	1,335.1	-602.9	1,463.7	1.12	1.12	-0.03	
8,069.0	88.74	337.23	6,798.8	1,421.9	-636.2	1,556.7	4.60	-3.04	-3.84	
8,161.0	90.08	337.32	6,799.7	1,506.7	-671.8	1,648.7	1.46	1.46	0.10	
8,254.0	90.05	338.83	6,799.6	1,593.0	-706.5	1,741.7	1.62	-0.03	1.62	
8,346.0	89.92	335.22	6,799.6	1,677.7	-742.4	1,833.6	3.93	-0.14	-3.92	
8,439.0	90.96	334.93	6,798.9	1,762.0	-781.6	1,926.5	1.16	1.12	-0.31	
8,532.0	91.20	336.19	6,797.2	1,846.7	-820.1	2,019.4	1.38	0.26	1.35	
8,624.0	91.26	339.54	6,795.2	1,931.9	-854.7	2,111.4	3.64	0.07	3.64	
8,717.0	89.45	339.38	6,794.6	2,018.9	-887.3	2,204.3	1.95	-1.95	-0.17	



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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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)
8,809.0	90.42	341.39	6,794.7	2,105.6	-916.2	2,296.2	2.43	1.05	2.18
8,901.0	89.28	342.71	6,794.9	2,193.1	-946.6	2,388.0	1.90	-1.24	1.43
8,994.0	90.32	344.05	6,795.3	2,282.2	-973.2	2,480.6	1.82	1.12	1.44
9,086.0	90.43	343.49	6,794.7	2,370.6	-998.9	2,572.1	0.62	0.12	-0.61
9,179.0	89.45	340.94	6,794.8	2,459.1	-1,027.3	2,654.9	2.94	-1.05	-2.74
9,271.0	88.38	336.88	6,796.5	2,544.9	-1,060.4	2,756.8	4.56	-1.16	-4.41
9,364.0	90.40	336.92	6,797.5	2,630.4	-1,096.9	2,849.8	2.17	2.17	0.04
9,456.0	90.16	334.60	6,797.1	2,714.3	-1,134.6	2,941.7	2.54	-0.26	-2.52
9,548.0	90.40	335.83	6,796.6	2,798.7	-1,173.6	3,034.6	1.35	0.26	1.32
9,641.0	90.19	333.14	6,796.1	2,881.8	-1,213.2	3,126.4	2.93	-0.23	-2.92
9,734.0	91.07	333.74	6,795.1	2,964.9	-1,254.8	3,219.1	1.15	0.95	0.65
9,826.0	89.69	338.12	6,794.5	3,048.9	-1,292.3	3,311.0	4.99	-1.50	4.76
9,919.0	90.38	339.51	6,794.4	3,135.6	-1,325.9	3,404.0	1.66	0.72	1.49
10,012.0	89.89	338.15	6,794.2	3,222.4	-1,359.5	3,497.0	1.55	-0.51	-1.46
10,104.0	91.10	341.79	6,793.5	3,308.8	-1,391.0	3,588.9	4.17	1.32	3.96
10,197.0	88.34	338.28	6,793.9	3,396.2	-1,422.8	3,681.8	4.80	-2.97	-3.77
10,289.0	88.81	335.91	6,796.2	3,480.9	-1,458.6	3,773.8	2.63	0.51	-2.58
10,382.0	90.69	338.98	6,796.6	3,566.7	-1,494.2	3,866.8	3.87	2.02	3.30
10,474.0	90.02	340.18	6,796.0	3,653.0	-1,526.3	3,958.7	1.49	-0.73	1.30
10,567.0	91.20	338.07	6,795.0	3,739.8	-1,559.5	4,051.7	2.60	1.27	-2.27
10,660.0	90.73	336.08	6,793.5	3,825.5	-1,595.7	4,144.7	2.20	-0.51	-2.14
10,752.0	90.16	334.25	6,792.8	3,909.0	-1,634.3	4,236.6	2.08	-0.62	-1.99
10,845.0	91.07	337.29	6,791.8	3,993.8	-1,672.5	4,329.5	3.41	0.98	3.27
10,938.0	90.40	337.29	6,790.6	4,079.5	-1,708.4	4,422.5	0.72	-0.72	0.00
11,030.0	90.36	336.65	6,790.0	4,164.2	-1,744.4	4,514.4	0.70	-0.04	-0.70
11,123.0	90.43	334.98	6,789.3	4,249.0	-1,782.5	4,607.4	1.80	0.08	-1.80
11,216.0	90.09	333.61	6,788.9	4,332.8	-1,822.6	4,700.2	1.52	-0.37	-1.47
11,308.0	90.30	334.72	6,788.6	4,415.6	-1,862.9	4,792.0	1.23	0.23	1.21
11,400.0	90.33	334.69	6,788.1	4,498.8	-1,902.2	4,883.8	0.05	0.03	-0.03
11,493.0	90.16	337.63	6,787.7	4,583.9	-1,939.8	4,976.7	3.17	-0.18	3.16
11,586.0	90.16	338.62	6,787.4	4,670.2	-1,974.4	5,069.7	1.06	0.00	1.06
11,678.0	90.30	339.54	6,787.0	4,756.1	-2,007.3	5,161.7	1.01	0.15	1.00
11,771.0	89.76	337.48	6,787.0	4,842.6	-2,041.4	5,254.7	2.29	-0.58	-2.22
11,863.0	90.00	338.48	6,787.2	4,927.9	-2,075.8	5,346.7	1.12	0.26	1.09
11,956.0	91.37	340.06	6,786.1	5,014.9	-2,108.8	5,439.7	2.25	1.47	1.70
12,048.0	90.90	339.86	6,784.3	5,101.3	-2,140.3	5,531.6	0.56	-0.51	-0.22
12,141.0	91.14	339.37	6,782.6	5,188.5	-2,172.7	5,624.6	0.59	0.26	-0.53
12,233.0	90.83	341.74	6,781.0	5,275.2	-2,203.3	5,716.4	2.60	-0.34	2.58
12,326.0	89.22	340.86	6,781.0	5,363.3	-2,233.1	5,809.3	1.97	-1.73	-0.95
12,419.0	89.05	340.62	6,782.4	5,451.1	-2,263.8	5,902.2	0.32	-0.18	-0.26
12,511.0	90.33	340.09	6,782.9	5,537.7	-2,294.7	5,994.1	1.51	1.39	-0.58
12,603.0	89.99	339.13	6,782.6	5,623.9	-2,326.8	6,086.0	1.11	-0.37	-1.04
12,696.0	90.30	338.44	6,782.4	5,710.6	-2,360.4	6,179.0	0.81	0.33	-0.74

WV Department of Environmental Protection



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deanc/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

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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)
12,789.0	90.43	340.08	6,781.8	5,797.6	-2,393.3	6,272.0	1.77	0.14	1.78
12,881.0	90.06	339.24	6,781.4	5,883.9	-2,425.3	6,364.0	1.00	-0.40	-0.91
12,974.0	89.86	335.77	6,781.5	5,969.8	-2,460.9	6,456.9	3.74	-0.22	-3.73
13,067.0	91.07	335.86	6,780.7	6,054.6	-2,499.0	6,549.9	1.30	1.30	0.10
13,159.0	90.94	335.06	6,779.1	6,136.3	-2,537.2	6,641.8	0.88	-0.14	-0.87
13,252.0	91.00	336.72	6,777.5	6,223.2	-2,575.2	6,734.7	1.79	0.06	1.78
13,344.0	89.69	338.04	6,777.0	6,308.1	-2,610.6	6,826.7	2.02	-1.42	1.43
13,429.0	90.19	337.57	6,777.1	6,396.8	-2,642.7	6,911.7	0.81	0.59	-0.55
13,522.0	90.08	336.43	6,776.8	6,472.4	-2,679.0	7,004.7	1.23	-0.12	-1.23
13,614.0	88.71	335.47	6,777.8	6,556.4	-2,716.5	7,096.6	1.82	-1.49	-1.04
13,707.0	89.15	336.87	6,779.5	6,641.4	-2,754.1	7,189.5	1.58	0.47	1.51
13,799.0	89.45	336.84	6,780.7	6,726.0	-2,790.2	7,281.5	0.33	0.33	-0.03
13,892.0	90.70	338.83	6,780.6	6,812.1	-2,825.3	7,374.5	2.53	1.34	2.14
13,984.0	89.92	340.16	6,780.1	6,898.3	-2,857.5	7,466.5	1.68	-0.85	1.45
14,077.0	90.12	339.74	6,780.0	6,985.7	-2,889.4	7,559.4	0.50	0.22	-0.45
14,169.0	91.56	340.49	6,778.7	7,072.2	-2,920.7	7,651.3	1.76	1.57	0.82
14,262.0	89.56	338.59	6,777.8	7,159.3	-2,953.2	7,744.3	2.97	-2.15	-2.04
14,355.0	90.20	338.83	6,778.0	7,246.0	-2,987.0	7,837.3	0.73	0.69	0.26
14,447.0	90.54	338.30	6,777.4	7,331.6	-3,020.6	7,929.3	0.68	0.37	-0.58
14,540.0	89.53	336.87	6,777.3	7,417.6	-3,056.1	8,022.3	1.88	-1.09	-1.54
14,632.0	90.34	337.10	6,777.4	7,502.2	-3,092.0	8,114.2	0.92	0.88	0.25
14,725.0	90.00	336.11	6,777.1	7,587.6	-3,129.0	8,207.2	1.13	-0.37	-1.06
14,817.0	89.97	335.60	6,777.2	7,671.5	-3,166.6	8,299.2	0.58	-0.03	-0.55
14,910.0	90.84	336.64	6,776.5	7,756.6	-3,204.2	8,392.1	1.46	0.94	1.12
15,002.0	91.45	336.95	6,774.7	7,841.1	-3,240.5	8,484.1	0.74	0.86	0.34
15,095.0	91.17	338.22	6,772.5	7,927.1	-3,275.9	8,577.0	1.40	-0.30	1.37
15,187.0	90.23	338.56	6,771.4	8,012.6	-3,309.8	8,669.0	1.09	-1.02	0.37
15,280.0	90.47	337.28	6,770.8	8,098.8	-3,344.8	8,762.0	1.40	0.26	-1.38
15,372.0	91.27	339.31	6,769.4	8,184.2	-3,378.8	8,854.0	2.37	0.87	2.21
15,465.0	91.13	338.81	6,767.5	8,271.1	-3,412.0	8,947.0	0.56	-0.15	-0.54
15,557.0	90.03	339.79	6,766.6	8,357.1	-3,444.5	9,038.9	1.60	-1.20	1.07
15,650.0	89.07	340.01	6,767.3	8,444.4	-3,476.5	9,131.9	1.06	-1.03	0.24
15,742.0	88.90	339.23	6,768.9	8,530.7	-3,508.5	9,223.8	0.87	-0.18	-0.85
15,835.0	89.51	338.48	6,770.2	8,617.4	-3,542.1	9,315.8	1.04	0.66	-0.81
15,927.0	90.78	339.45	6,770.0	8,703.3	-3,575.1	9,408.8	1.74	1.38	1.05
16,020.0	89.57	337.70	6,769.7	8,789.8	-3,609.1	9,501.8	2.29	-1.30	-1.88
16,112.0	90.65	338.37	6,769.5	8,875.2	-3,643.5	9,593.8	1.38	1.17	0.73
16,126.0	90.78	338.17	6,769.4	8,888.2	-3,648.7	9,607.8	1.70	0.93	-1.43
Last SDI MWD @ 16126									
16,191.0	90.78	338.17	6,768.5	8,948.5	-3,672.8	9,672.8	0.00	0.00	0.00
Projection To Bit @ 16191 MD / 6768 TVD									

WV Department of Environmental Protection



Company:	Antero Resources	Local Co-ordinate Reference:	Well Michelle Unit 1H
Project:	Doddridge County WV	TVD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Site:	Misery Pad: Anne/Arthur/Deano/Hardin/Michelle/Rexa	MD Reference:	PD 522: GL 1001' + KB 18' @ 1019.0usft
Well:	Michelle Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
~As Drilled LP_Michelle	0.00	0.00	6,804.2	561.6	-294.5	14,293,925.27	1,711,054.51	39° 21' 44.067 N	80° 45' 0.302 W
- actual wellpath hits target center									
- Point									

Formations							
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)		
6,374.0	6,370.8	SCMR @ 6374		0.00			
6,564.0	6,546.7	MDLX @ 6564		0.00			
6,752.0	6,683.0	BRKT @ 6752		0.00			
6,801.0	6,710.2	TLLY @ 6801		0.00			
6,892.0	6,752.6	HMLN @ 6892		0.00			
6,920.0	6,763.3	MRCL_HOT @ 6920		0.00			

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
105.0	105.0	0.3	-0.6	First Gyro @ 105	
6,015.0	6,012.4	63.6	-17.6	Last Gyro @ 6015	
6,091.0	6,088.4	63.3	-17.5	First SDI MWD @ 6091	
7,143.0	6,804.2	561.6	-294.5	~As Drilled LP @ 7143 MD / 6804 TVD	
16,126.0	6,769.4	8,888.2	-3,648.7	Last SDI MWD @ 16126	
16,191.0	6,768.5	8,948.5	-3,672.8	Projection To Bit @ 16191 MD / 6768 TVD	

Checked By: _____ Approved By: _____ Date: _____

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