



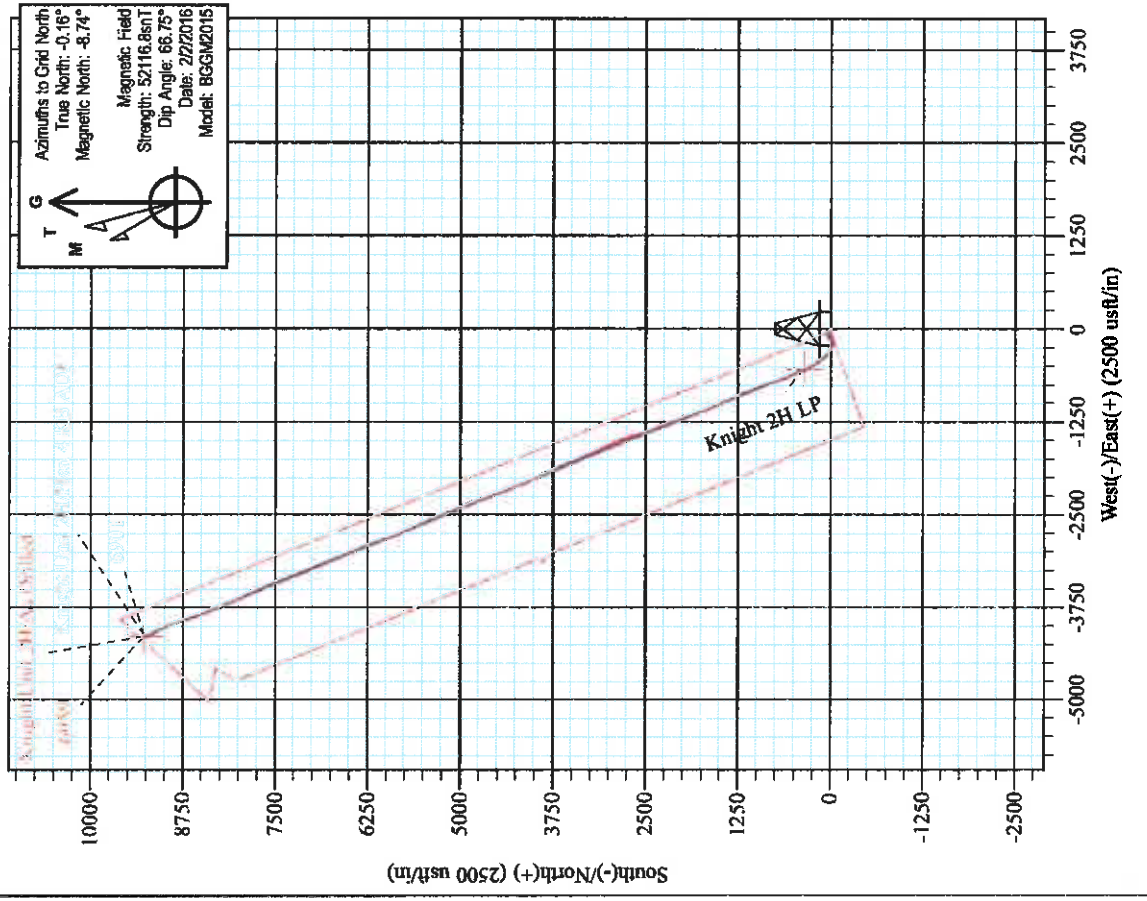
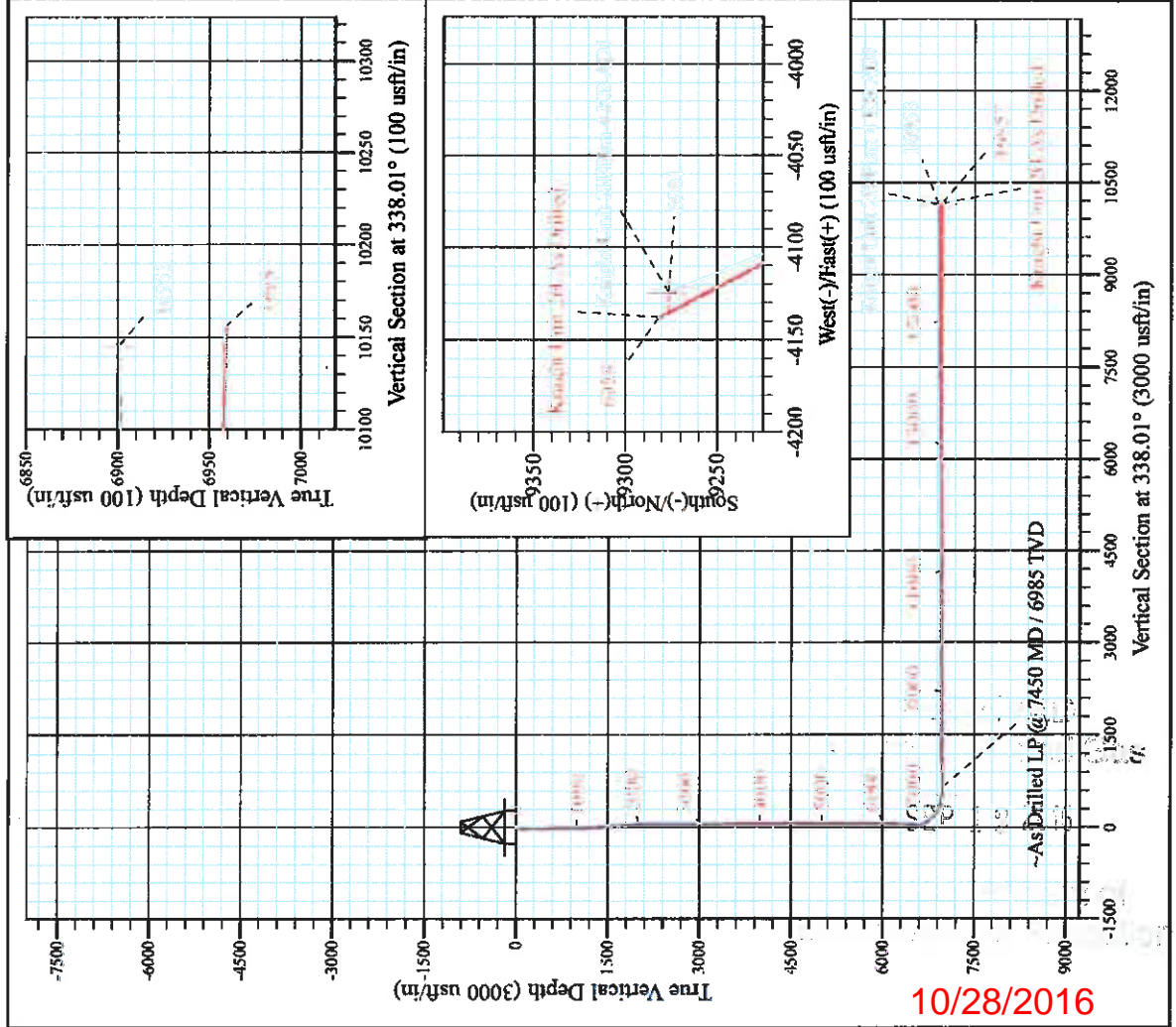
Hamilton Pad: Costlow/Gaskins/Hoskins/Knight
 Knight Unit 2H
 Plan 4 KB ADJ
 Precision 525: 1159' GL + 19' KB @ 1178.0usft
 Doddridge County WV

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



W.F.I. DETAILS: Knight Unit 2H SHL

+N/-S	+E/-W	Northing	Latitude	Longitude
0.0	0.0	14295894.82	39° 22' 3.492 N	80° 44' 37.637 W



Knight Unit 2H
 Approx. **BHL**
 39° 23' 35.378 N 80° 45' 30.026 W

Shane Rhodes
 9-28, February 23 2016
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022



Antero Resources

Doddridge County WV

Hamilton Pad: Costlow/Gaskins/Hoskins/Knight

Knight Unit 2H

Original Wellpath

Design: As Drilled

Standard Survey Report

24 February, 2016



www.scientificdrilling.com

10/28/2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddndge County WV	TVD Reference:	Precision 525. 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad. Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525. 1159' GL + 19' KB @ 1178.0usft
Well:	Knight Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Project:	Doddndge 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:	Hamilton Pad. Costlow/Gaskins/Hoskins/Knight, Site Center: Hoskins 2H				
Site Position:	Northing:	14,295,911.01 usft	Latitude:	39° 22' 3.652 N	
From:	Map	Easting:	1,712,840.20 usft	Longitude:	80° 44' 37.487 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.16 °

Well:	Knight Unit 2H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,295,894.82 usft	Latitude:	39° 22' 3.492 N
	+E/-W	0.0 usft	Easting:	1,712,828.47 usft	Longitude:	80° 44' 37.637 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,178.0 usft	Ground Level:	1,159.0 usft

Wellbore:	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	9/18/2014	-8.52	66.90	52,259
	BGGM2015	2/2/2016	-8.58	66.75	52,117

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		338.01

Survey Program	Date 2/24/2016				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
108.0	6,089.9	Survey #11 Final Gyro (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
6,124.0	16,957.0	Survey #13 Lateral MWD (Original Wellpa	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	
108.0	0.69	240.36	108.0	-0.3	-0.6	-0.1	0.64	0.64	0.00	
First Gyro @ 108										
133.0	0.58	230.02	133.0	-0.5	-0.8	-0.1	0.63	-0.44	-41.36	
158.0	0.56	229.55	158.0	-0.6	-1.0	-0.2	0.08	-0.08	-1.88	
183.0	0.48	231.51	183.0	-0.8	-1.2	-0.3	0.33	-0.32	7.84	
208.0	0.37	227.88	208.0	-0.9	-1.3	-0.3	0.45	-0.44	-14.52	
233.0	0.39	228.83	233.0	-1.0	-1.4	-0.4	0.08	0.08	3.80	



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad. Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight 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)	
258.0	0.36	245.49	258.0	-1.1	-1.6	-0.4	0.45	-0.12	66.64	
283.0	0.32	245.87	283.0	-1.2	-1.7	-0.4	0.16	-0.16	1.52	
308.0	0.30	253.06	308.0	-1.2	-1.8	-0.4	0.17	-0.08	28.76	
333.0	0.22	279.59	333.0	-1.2	-1.9	-0.4	0.57	-0.32	106.12	
358.0	0.22	292.82	358.0	-1.2	-2.0	-0.3	0.20	0.00	52.92	
383.0	0.20	299.19	383.0	-1.2	-2.1	-0.3	0.12	-0.08	25.48	
408.0	0.15	302.57	408.0	-1.1	-2.2	-0.2	0.20	-0.20	13.52	
433.0	0.16	299.04	433.0	-1.1	-2.2	-0.2	0.06	0.04	-14.12	
458.0	0.04	288.32	458.0	-1.1	-2.3	-0.1	0.48	-0.48	-42.88	
483.0	0.09	240.10	483.0	-1.1	-2.3	-0.1	0.28	0.20	-192.88	
508.0	0.16	244.04	508.0	-1.1	-2.3	-0.1	0.28	0.28	15.76	
533.0	0.20	258.60	533.0	-1.1	-2.4	-0.1	0.24	0.16	58.24	
558.0	0.26	257.97	558.0	-1.1	-2.5	-0.1	0.24	0.24	-2.52	
583.0	0.21	274.85	583.0	-1.1	-2.6	-0.1	0.34	-0.20	67.52	
608.0	0.27	274.94	608.0	-1.1	-2.7	0.0	0.24	0.24	0.36	
633.0	0.27	281.08	633.0	-1.1	-2.8	0.0	0.12	0.00	24.56	
658.0	0.24	280.29	658.0	-1.1	-2.9	0.1	0.12	-0.12	-3.16	
683.0	0.21	288.65	683.0	-1.1	-3.0	0.1	0.18	-0.12	33.44	
708.0	0.16	278.12	708.0	-1.1	-3.1	0.2	0.24	-0.20	-42.12	
733.0	0.15	290.30	733.0	-1.0	-3.2	0.2	0.14	-0.04	48.72	
758.0	0.14	300.67	758.0	-1.0	-3.2	0.3	0.11	-0.04	41.48	
783.0	0.16	263.82	783.0	-1.0	-3.3	0.3	0.39	0.08	-147.40	
808.0	0.30	316.86	808.0	-1.0	-3.4	0.4	0.96	0.56	212.16	
833.0	0.22	250.88	833.0	-0.9	-3.5	0.4	1.16	-0.32	-263.92	
858.0	0.26	267.05	858.0	-0.9	-3.6	0.5	0.31	0.16	64.68	
883.0	0.32	271.08	883.0	-0.9	-3.7	0.5	0.25	0.24	16.12	
908.0	0.26	283.94	908.0	-0.9	-3.8	0.6	0.35	-0.24	51.44	
933.0	0.22	288.46	933.0	-0.9	-3.9	0.6	0.18	-0.16	18.08	
958.0	0.24	293.12	958.0	-0.9	-4.0	0.7	0.11	0.08	18.64	
983.0	0.16	283.90	983.0	-0.8	-4.1	0.8	0.34	-0.32	-36.88	
1,008.0	0.18	272.87	1,008.0	-0.8	-4.2	0.8	0.15	0.08	-44.12	
1,033.0	0.16	268.02	1,033.0	-0.8	-4.2	0.8	0.10	-0.08	-19.40	
1,058.0	0.24	250.38	1,058.0	-0.8	-4.3	0.8	0.40	0.32	-70.56	
1,083.0	0.41	277.20	1,083.0	-0.9	-4.5	0.9	0.90	0.68	107.28	
1,108.0	0.81	288.58	1,108.0	-0.8	-4.7	1.0	1.66	1.60	45.52	
1,133.0	1.21	296.70	1,133.0	-0.6	-5.1	1.4	1.70	1.60	32.48	
1,158.0	1.92	303.46	1,158.0	-0.3	-5.7	1.9	2.93	2.84	27.04	
1,183.0	2.82	306.52	1,182.9	0.3	-6.6	2.8	3.63	3.60	12.24	
1,208.0	3.39	307.30	1,207.9	1.2	-7.6	3.9	2.29	2.28	3.12	
1,233.0	3.83	308.18	1,232.9	2.1	-8.9	5.3	1.77	1.76	3.52	
1,258.0	4.20	309.29	1,257.8	3.2	-10.2	6.8	1.51	1.48	4.44	
1,283.0	4.32	310.66	1,282.7	4.4	-11.7	8.5	0.63	0.48	5.48	
1,308.0	4.43	311.26	1,307.7	5.7	-13.1	10.2	0.48	0.44	2.40	



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad. Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight Unit 2H	North Reference:	Grd
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)
1,333.0	4.52	311.35	1,332.6	6.9	-14.6	11.9	0.36	0.36	0.36
1,358.0	4.73	313.76	1,357.5	8.3	-16.1	13.7	1.14	0.84	9.64
1,383.0	5.17	322.11	1,382.4	9.9	-17.5	15.7	3.37	1.76	33.40
1,408.0	5.35	324.40	1,407.3	11.7	-18.9	18.0	1.11	0.72	9.16
1,433.0	5.57	327.28	1,432.2	13.7	-20.2	20.3	1.41	0.88	11.52
1,458.0	5.74	327.90	1,457.1	15.8	-21.5	22.7	0.72	0.68	2.48
1,483.0	5.82	326.75	1,481.9	17.9	-22.9	25.2	0.66	0.32	-4.60
1,508.0	5.94	326.89	1,506.8	20.1	-24.3	27.7	0.48	0.48	0.56
1,533.0	6.05	326.58	1,531.7	22.2	-25.7	30.3	0.46	0.44	-1.24
1,558.0	5.62	327.28	1,556.5	24.4	-27.1	32.7	1.74	-1.72	2.80
1,583.0	5.15	329.36	1,581.4	26.4	-28.3	35.1	2.04	-1.88	8.32
1,608.0	4.65	331.75	1,606.3	28.2	-29.4	37.2	2.16	-2.00	9.56
1,633.0	4.51	331.50	1,631.3	30.0	-30.3	39.2	0.57	-0.56	-1.00
1,658.0	4.49	331.90	1,656.2	31.7	-31.3	41.1	0.15	-0.08	1.60
1,683.0	4.45	330.73	1,681.1	33.4	-32.2	43.0	0.40	-0.16	-4.68
1,708.0	4.28	332.16	1,706.0	35.1	-33.1	44.9	0.81	-0.68	5.72
1,733.0	3.74	332.82	1,731.0	36.6	-33.9	46.7	2.17	-2.16	2.64
1,758.0	3.72	334.01	1,755.9	38.1	-34.6	48.3	0.32	-0.08	4.76
1,783.0	3.56	334.54	1,780.9	39.5	-35.3	49.9	0.65	-0.64	2.12
1,808.0	3.28	335.68	1,805.8	40.9	-36.0	51.4	1.15	-1.12	4.56
1,833.0	3.03	337.60	1,830.8	42.1	-36.5	52.7	1.09	-1.00	7.68
1,858.0	2.73	338.18	1,855.8	43.3	-37.0	54.0	1.21	-1.20	2.32
1,883.0	2.37	337.72	1,880.7	44.3	-37.4	55.1	1.44	-1.44	-1.84
1,908.0	2.17	336.85	1,905.7	45.2	-37.8	56.1	0.81	-0.80	-3.48
1,933.0	2.03	334.38	1,930.7	46.1	-38.2	57.0	0.67	-0.56	-9.88
1,958.0	1.90	332.21	1,955.7	46.8	-38.5	57.9	0.60	-0.52	-8.68
1,983.0	1.85	331.63	1,980.7	47.6	-38.9	58.7	0.21	-0.20	-2.32
2,008.0	1.78	323.25	2,005.7	48.2	-39.4	59.5	1.10	-0.28	-33.52
2,033.0	1.78	334.94	2,030.6	48.9	-39.8	60.2	1.45	0.00	46.76
2,058.0	1.55	333.49	2,055.6	49.5	-40.1	60.9	0.94	-0.92	-5.80
2,083.0	1.46	335.62	2,080.6	50.1	-40.3	61.6	0.42	-0.36	8.52
2,108.0	1.30	337.11	2,105.6	50.7	-40.6	62.2	0.66	-0.64	5.96
2,133.0	1.21	334.22	2,130.6	51.2	-40.8	62.8	0.44	-0.36	-11.56
2,158.0	1.06	337.11	2,155.6	51.6	-41.0	63.2	0.64	-0.60	11.56
2,183.0	0.94	337.84	2,180.6	52.0	-41.2	63.7	0.48	-0.48	2.92
2,208.0	0.87	336.65	2,205.6	52.4	-41.3	64.1	0.29	-0.28	-4.76
2,233.0	0.70	343.62	2,230.6	52.7	-41.5	64.4	0.78	-0.68	27.88
2,258.0	0.83	342.80	2,255.6	53.1	-41.6	64.8	0.52	0.52	-3.28
2,283.0	0.64	344.02	2,280.6	53.4	-41.6	65.1	0.76	-0.76	4.88
2,308.0	0.42	357.34	2,305.6	53.6	-41.7	65.3	1.00	-0.88	53.28
2,333.0	0.39	358.20	2,330.6	53.8	-41.7	65.5	0.12	-0.12	3.44
2,358.0	0.35	341.52	2,355.6	53.9	-41.7	65.6	0.46	-0.16	-66.72
2,383.0	0.48	340.41	2,380.6	54.1	-41.8	65.8	0.52	0.52	-4.44
2,408.0	0.54	341.50	2,405.6	54.3	-41.9	66.0	0.24	0.24	4.36



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight 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)	Buidl Rate (°/100usft)	Turn Rate (°/100usft)
2,433.0	0.59	338.81	2,430.6	54.5	-41.9	66.3	0.23	0.20	-10.76
2,458.0	0.44	340.14	2,455.6	54.7	-42.0	66.5	0.80	-0.60	5.32
2,483.0	0.43	335.93	2,480.6	54.9	-42.1	66.7	0.13	-0.04	-16.84
2,508.0	0.33	345.29	2,505.6	55.1	-42.1	68.8	0.47	-0.40	37.44
2,533.0	0.23	0.61	2,530.6	55.2	-42.2	67.0	0.50	-0.40	61.28
2,558.0	0.23	327.28	2,555.6	55.3	-42.2	67.1	0.53	0.00	-133.32
2,583.0	0.32	322.45	2,580.6	55.4	-42.3	67.2	0.37	0.36	-19.32
2,608.0	0.35	297.36	2,605.6	55.5	-42.4	67.3	0.59	0.12	-100.36
2,633.0	0.42	307.53	2,630.6	55.6	-42.5	67.4	0.39	0.28	40.68
2,658.0	0.37	320.66	2,655.6	55.7	-42.6	67.6	0.41	-0.20	52.52
2,683.0	0.22	307.05	2,680.6	55.8	-42.7	67.7	0.66	-0.60	-54.44
2,708.0	0.24	287.05	2,705.6	55.8	-42.8	67.8	0.33	0.08	-80.00
2,733.0	0.35	277.34	2,730.6	55.8	-42.9	67.9	0.48	0.44	-38.84
2,758.0	0.43	279.71	2,755.6	55.9	-43.1	67.9	0.33	0.32	9.48
2,783.0	0.45	291.31	2,780.6	55.9	-43.3	68.1	0.36	0.08	46.40
2,808.0	0.42	300.88	2,805.6	56.0	-43.5	68.2	0.31	-0.12	38.28
2,833.0	0.30	297.01	2,830.6	56.1	-43.6	68.3	0.49	-0.48	-15.48
2,858.0	0.27	279.51	2,855.6	56.1	-43.7	68.4	0.37	-0.12	-70.00
2,883.0	0.29	265.34	2,880.6	56.1	-43.8	68.5	0.29	0.08	-56.68
2,908.0	0.46	268.88	2,905.6	56.1	-44.0	68.5	0.69	0.68	14.16
2,933.0	0.50	271.99	2,930.6	56.1	-44.2	68.6	0.19	0.16	12.44
2,958.0	0.52	280.22	2,955.6	56.1	-44.4	68.7	0.30	0.08	32.92
2,983.0	0.42	292.03	2,980.6	56.2	-44.6	68.8	0.55	-0.40	47.24
3,008.0	0.30	282.53	3,005.6	56.2	-44.8	68.9	0.53	-0.48	-38.00
3,033.0	0.33	266.95	3,030.6	56.3	-44.9	69.0	0.36	0.12	-62.32
3,058.0	0.41	262.20	3,055.6	56.2	-45.1	69.0	0.34	0.32	-19.00
3,083.0	0.51	270.69	3,080.6	56.2	-45.3	69.1	0.48	0.40	33.96
3,108.0	0.53	285.25	3,105.6	56.3	-45.5	69.2	0.53	0.08	58.24
3,133.0	0.43	291.63	3,130.6	56.3	-45.7	69.3	0.45	-0.40	25.52
3,158.0	0.40	274.77	3,155.6	56.4	-45.9	69.4	0.50	-0.12	-67.44
3,183.0	0.36	272.41	3,180.6	56.4	-46.0	69.5	0.17	-0.16	-9.44
3,208.0	0.41	263.24	3,205.6	56.4	-46.2	69.6	0.32	0.20	-36.68
3,233.0	0.51	266.74	3,230.6	56.4	-46.4	69.6	0.42	0.40	14.00
3,258.0	0.54	279.18	3,255.6	56.4	-46.6	69.7	0.47	0.12	49.76
3,283.0	0.49	282.59	3,280.6	56.4	-46.8	69.8	0.23	-0.20	13.64
3,308.0	0.42	293.99	3,305.6	56.5	-47.0	70.0	0.46	-0.28	45.60
3,333.0	0.37	279.63	3,330.6	56.5	-47.2	70.1	0.44	-0.20	-57.44
3,358.0	0.37	265.86	3,355.6	56.5	-47.4	70.1	0.35	0.00	-55.08
3,383.0	0.52	272.11	3,380.6	56.5	-47.6	70.2	0.63	0.60	25.00
3,408.0	0.54	275.21	3,405.6	56.5	-47.8	70.3	0.14	0.08	12.40
3,433.0	0.58	283.70	3,430.6	56.6	-48.0	70.4	0.37	0.16	33.96
3,458.0	0.53	291.38	3,455.6	56.7	-48.3	70.6	0.36	-0.20	30.72
3,483.0	0.46	292.19	3,480.6	56.7	-48.5	70.7	0.28	-0.28	3.24



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad: Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight 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)
3,508.0	0.38	290.22	3,505.6	56.8	-48.6	70.9	0.33	-0.32	-7.88
3,533.0	0.42	293.48	3,530.6	56.9	-48.8	71.0	0.18	0.16	13.04
3,558.0	0.38	285.39	3,555.6	56.9	-49.0	71.1	0.28	-0.16	-32.36
3,583.0	0.41	272.28	3,580.6	56.9	-49.1	71.2	0.38	0.12	-52.44
3,608.0	0.45	278.50	3,605.6	57.0	-49.3	71.3	0.25	0.16	24.88
3,633.0	0.46	277.21	3,630.6	57.0	-49.5	71.4	0.06	0.04	-5.16
3,658.0	0.51	276.46	3,655.6	57.0	-49.7	71.5	0.20	0.20	5.00
3,683.0	0.55	283.34	3,680.6	57.1	-49.9	71.6	0.24	0.16	19.52
3,708.0	0.54	283.97	3,705.6	57.1	-50.2	71.6	0.05	-0.04	2.52
3,733.0	0.59	289.07	3,730.6	57.2	-50.4	71.9	0.28	0.20	20.40
3,758.0	0.52	293.10	3,755.6	57.3	-50.6	72.1	0.32	-0.28	16.12
3,783.0	0.47	294.42	3,780.5	57.4	-50.8	72.2	0.21	-0.20	5.28
3,808.0	0.49	296.54	3,805.5	57.5	-51.0	72.4	0.11	0.08	8.48
3,833.0	0.45	294.91	3,830.5	57.5	-51.2	72.5	0.17	-0.16	-6.52
3,858.0	0.40	296.31	3,855.5	57.6	-51.4	72.7	0.20	-0.20	5.60
3,883.0	0.41	291.34	3,880.5	57.7	-51.5	72.8	0.15	0.04	-19.88
3,908.0	0.33	290.98	3,905.5	57.8	-51.7	72.9	0.32	-0.32	-1.44
3,933.0	0.37	299.03	3,930.5	57.8	-51.8	73.0	0.25	0.16	32.20
3,958.0	0.32	284.64	3,955.5	57.9	-52.0	73.1	0.40	-0.20	-57.56
3,983.0	0.34	293.16	3,980.5	57.9	-52.1	73.2	0.21	0.08	34.08
4,008.0	0.32	282.19	4,005.5	58.0	-52.2	73.3	0.26	-0.08	-43.88
4,033.0	0.39	284.87	4,030.5	58.0	-52.4	73.4	0.29	0.28	10.72
4,058.0	0.36	277.61	4,055.5	58.0	-52.5	73.5	0.22	-0.12	-29.04
4,083.0	0.37	271.75	4,080.5	58.0	-52.7	73.6	0.15	0.04	-23.44
4,108.0	0.35	279.13	4,105.5	58.1	-52.9	73.6	0.20	-0.08	29.52
4,133.0	0.30	264.02	4,130.5	58.1	-53.0	73.7	0.40	-0.20	-60.44
4,158.0	0.30	251.90	4,155.5	58.0	-53.1	73.7	0.25	0.00	-48.48
4,183.0	0.17	237.62	4,180.5	58.0	-53.2	73.7	0.57	-0.52	-57.12
4,208.0	0.28	247.63	4,205.5	58.0	-53.3	73.7	0.47	0.44	40.04
4,233.0	0.28	235.59	4,230.5	57.9	-53.4	73.7	0.23	0.00	-48.16
4,258.0	0.24	255.91	4,255.5	57.9	-53.5	73.7	0.40	-0.16	81.28
4,283.0	0.27	243.32	4,280.5	57.8	-53.6	73.7	0.25	0.12	-50.36
4,308.0	0.17	210.50	4,305.5	57.8	-53.7	73.7	0.63	-0.40	-131.28
4,333.0	0.22	239.57	4,330.5	57.7	-53.7	73.6	0.44	0.20	116.28
4,358.0	0.24	250.18	4,355.5	57.7	-53.8	73.6	0.19	0.08	42.44
4,383.0	0.32	249.14	4,380.5	57.6	-54.0	73.6	0.32	0.32	-4.16
4,408.0	0.29	248.41	4,405.5	57.6	-54.1	73.6	0.12	-0.12	-2.92
4,433.0	0.31	251.98	4,430.5	57.5	-54.2	73.6	0.11	0.08	14.28
4,458.0	0.27	268.21	4,455.5	57.5	-54.3	73.7	0.36	-0.16	64.92
4,483.0	0.19	262.50	4,480.5	57.5	-54.4	73.7	0.33	-0.32	-22.84
4,508.0	0.21	280.06	4,505.5	57.5	-54.5	73.7	0.26	0.08	70.24
4,533.0	0.21	257.92	4,530.5	57.5	-54.6	73.8	0.32	0.00	-88.56
4,558.0	0.25	271.26	4,555.5	57.5	-54.7	73.8	0.27	0.16	53.36



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525 1159' GL + 19' KB @ 1178.0usft
Well:	Knight 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)
4,583.0	0.22	271.30	4,580.5	57.5	-54.8	73.8	0.12	-0.12	0.16
4,608.0	0.20	276.09	4,605.5	57.5	-54.9	73.9	0.11	-0.08	19.16
4,633.0	0.22	270.14	4,630.5	57.5	-55.0	73.9	0.12	0.08	-23.80
4,658.0	0.21	270.37	4,655.5	57.5	-55.1	73.9	0.04	-0.04	0.92
4,683.0	0.22	264.60	4,680.5	57.5	-55.2	74.0	0.10	0.04	-23.08
4,708.0	0.19	260.16	4,705.5	57.5	-55.3	74.0	0.14	-0.12	-17.76
4,733.0	0.14	238.21	4,730.5	57.5	-55.3	74.0	0.32	-0.20	-87.80
4,758.0	0.15	226.85	4,755.5	57.4	-55.4	74.0	0.12	0.04	-45.44
4,783.0	0.17	248.51	4,780.5	57.4	-55.4	74.0	0.25	0.08	86.64
4,808.0	0.16	272.33	4,805.5	57.4	-55.5	74.0	0.28	-0.04	95.28
4,833.0	0.14	212.08	4,830.5	57.3	-55.6	74.0	0.61	-0.08	-241.00
4,858.0	0.20	238.29	4,855.5	57.3	-55.6	74.0	0.39	0.24	104.84
4,883.0	0.26	237.21	4,880.5	57.2	-55.7	73.9	0.24	0.24	-4.32
4,908.0	0.16	238.60	4,905.5	57.2	-55.8	73.9	0.40	-0.40	5.56
4,933.0	0.21	246.71	4,930.5	57.2	-55.8	73.9	0.23	0.20	32.44
4,958.0	0.20	236.76	4,955.5	57.1	-55.9	73.9	0.15	-0.04	-39.80
4,983.0	0.17	226.43	4,980.5	57.1	-56.0	73.9	0.18	-0.12	-41.32
5,008.0	0.25	224.36	5,005.5	57.0	-56.1	73.8	0.32	0.32	-8.28
5,033.0	0.27	236.93	5,030.5	56.9	-56.1	73.8	0.24	0.08	50.28
5,058.0	0.25	227.08	5,055.5	56.9	-56.2	73.8	0.20	-0.08	-39.40
5,083.0	0.19	255.62	5,080.5	56.8	-56.3	73.8	0.49	-0.24	114.16
5,108.0	0.20	261.28	5,105.5	56.8	-56.4	73.8	0.09	0.04	22.64
5,133.0	0.19	268.70	5,130.5	56.8	-56.5	73.8	0.11	-0.04	29.68
5,158.0	0.09	287.69	5,155.5	56.8	-56.5	73.8	0.44	-0.40	75.96
5,183.0	0.14	305.80	5,180.5	56.8	-56.6	73.9	0.24	0.20	72.44
5,208.0	0.03	80.26	5,205.5	56.8	-56.6	73.9	0.65	-0.44	537.84
5,233.0	0.09	235.88	5,230.5	56.8	-56.6	73.9	0.47	0.24	622.48
5,258.0	0.10	227.41	5,255.5	56.8	-56.6	73.9	0.07	0.04	-33.88
5,283.0	0.08	169.61	5,280.5	56.8	-56.7	73.9	0.34	-0.16	-231.20
5,308.0	0.09	240.51	5,305.5	56.8	-56.7	73.8	0.36	0.12	283.60
5,333.0	0.13	221.50	5,330.5	56.7	-56.7	73.8	0.21	0.16	-76.04
5,358.0	0.21	245.13	5,355.5	56.7	-56.8	73.8	0.42	0.32	94.52
5,383.0	0.12	247.83	5,380.5	56.7	-56.8	73.8	0.36	-0.36	10.80
5,408.0	0.19	270.58	5,405.5	56.6	-56.9	73.8	0.37	0.28	91.00
5,433.0	0.20	283.14	5,430.5	56.7	-57.0	73.9	0.18	0.04	50.24
5,458.0	0.21	299.86	5,455.5	56.7	-57.1	73.9	0.24	0.04	66.88
5,483.0	0.18	294.29	5,480.5	56.7	-57.1	74.0	0.14	-0.12	-22.28
5,508.0	0.08	327.14	5,505.5	56.8	-57.2	74.0	0.48	-0.40	131.40
5,533.0	0.08	236.58	5,530.5	56.8	-57.2	74.1	0.45	0.00	-362.24
5,558.0	0.07	329.43	5,555.5	56.8	-57.2	74.1	0.44	-0.04	371.40
5,583.0	0.01	44.78	5,580.5	56.8	-57.2	74.1	0.27	-0.24	301.40
5,608.0	0.11	311.62	5,605.5	56.8	-57.3	74.1	0.44	0.40	-372.64
5,633.0	0.19	286.33	5,630.5	56.8	-57.3	74.2	0.41	0.32	-101.16
5,658.0	0.07	248.30	5,655.5	56.8	-57.4	74.2	0.57	-0.48	-152.12



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525 1159' GL + 19' KB @ 1178.0usft
Well:	Knight Unit 2H	North Reference:	Grd
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)
5,683.0	0.15	281.71	5,680.5	56.8	-57.4	74.2	0.40	0.32	133.64
5,708.0	0.13	252.48	5,705.5	56.8	-57.5	74.2	0.29	-0.08	-116.92
5,733.0	0.16	239.75	5,730.5	56.8	-57.5	74.2	0.18	0.12	-50.92
5,758.0	0.16	243.28	5,755.5	56.8	-57.6	74.2	0.04	0.00	14.12
5,783.0	0.15	269.01	5,780.5	56.8	-57.7	74.2	0.28	-0.04	102.92
5,808.0	0.13	211.60	5,805.5	56.7	-57.7	74.2	0.54	-0.08	-229.64
5,833.0	0.02	222.49	5,830.5	56.7	-57.7	74.2	0.44	-0.44	43.56
5,858.0	0.25	247.13	5,855.5	56.7	-57.8	74.2	0.93	0.92	98.56
5,883.0	0.12	138.06	5,880.5	56.6	-57.8	74.2	1.24	-0.52	-436.28
5,908.0	0.27	129.90	5,905.5	56.6	-57.7	74.1	0.61	0.60	-32.64
5,933.0	0.17	196.96	5,930.5	56.5	-57.7	74.0	1.03	-0.40	268.24
5,958.0	0.12	180.72	5,955.5	56.4	-57.7	74.0	0.26	-0.20	-64.96
5,983.0	0.03	261.93	5,980.5	56.4	-57.7	73.9	0.48	-0.36	324.84
6,008.0	0.02	47.95	6,005.5	56.4	-57.7	73.9	0.19	-0.04	584.08
6,033.0	0.12	217.01	6,030.5	56.4	-57.7	73.9	0.56	0.40	676.24
6,058.0	0.15	166.40	6,055.5	56.4	-57.7	73.9	0.47	0.12	-202.44
6,083.0	0.38	221.48	6,080.5	56.3	-57.8	73.8	1.28	0.92	220.32
6,089.0	0.43	227.92	6,086.5	56.2	-57.8	73.8	1.14	0.86	107.35
Last Gyro @ 6089									
6,089.9	0.44	228.80	6,087.5	56.2	-57.8	73.8	1.14	0.90	92.52
6,124.0	0.12	206.77	6,121.5	56.1	-57.9	73.7	0.97	-0.94	-64.70
First SDI MWD @ 6124									
6,168.0	0.26	221.09	6,165.5	56.0	-58.0	73.6	0.33	0.32	32.55
6,213.0	0.24	153.91	6,210.5	55.8	-58.1	73.5	0.62	-0.04	-149.29
6,258.0	2.57	229.19	6,255.5	55.1	-58.8	73.1	5.80	5.18	167.29
6,303.0	8.98	229.48	6,300.3	52.1	-62.2	71.6	14.24	14.24	0.64
6,348.0	14.28	232.00	6,344.3	46.4	-69.3	69.0	11.83	11.78	5.60
6,392.0	18.08	233.09	6,386.6	39.0	-79.0	65.7	8.66	8.64	2.48
6,437.0	22.19	231.93	6,428.8	29.6	-91.3	61.6	9.18	9.13	-2.58
6,482.0	25.90	231.03	6,469.9	18.1	-105.6	58.4	8.28	8.24	-2.00
6,527.0	27.25	234.31	6,510.1	5.9	-121.6	51.0	4.43	3.00	7.29
6,572.0	29.83	247.07	6,549.7	-4.4	-140.3	48.4	14.68	5.73	28.36
6,573.0	29.88	247.33	6,550.6	-4.6	-140.8	48.4	13.87	4.60	26.28
SCMR @ 6573									
6,616.0	32.31	257.89	6,587.4	-11.2	-161.9	50.3	13.87	5.66	24.55
6,661.0	33.85	268.34	6,625.2	-14.1	-186.2	56.7	13.11	3.42	23.22
6,706.0	34.85	277.61	6,662.3	-12.7	-211.5	67.4	11.82	2.22	20.60
6,751.0	36.65	288.42	6,698.9	-6.8	-237.0	82.5	14.58	4.00	24.02
6,787.0	38.92	295.47	6,727.4	1.5	-257.4	97.8	13.55	6.31	19.58
MDLX @ 6787									
6,796.0	39.55	297.12	6,734.3	4.0	-262.5	102.0	13.55	7.00	18.34
6,840.0	42.91	305.39	6,767.4	19.1	-287.3	125.3	14.54	7.64	18.80
6,885.0	45.44	310.42	6,799.7	38.4	-312.0	152.4	9.60	5.62	11.18
6,930.0	49.45	314.65	6,830.2	60.8	-336.3	182.3	11.28	8.91	9.40



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad. Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight 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)
6,975.0	53.67	317.73	6,858.1	86.2	-360.7	215.0	10.80	9.38	6.84
6,982.0	54.20	318.10	6,862.3	90.4	-364.5	220.3	8.66	7.56	5.22
BRKT @ 6982									
7,020.0	57.09	320.00	6,883.7	114.1	-385.1	250.0	8.66	7.61	5.01
7,033.0	58.53	320.68	6,890.6	122.6	-392.1	260.5	11.92	11.08	5.21
TLLY @ 7033									
7,065.0	62.09	322.26	6,906.5	144.3	-409.4	287.1	11.92	11.12	4.95
7,109.0	68.52	324.31	6,924.8	176.4	-433.3	325.8	15.21	14.61	4.66
7,154.0	72.54	327.42	6,939.8	211.5	-457.0	367.2	11.06	8.93	6.91
7,169.0	73.45	328.02	6,944.2	223.6	-464.7	381.4	7.17	6.08	3.97
MRCL_HOT @ 7169									
7,199.0	75.28	329.19	6,952.3	248.3	-479.8	409.9	7.17	6.09	3.92
7,244.0	77.95	331.32	6,962.7	286.3	-501.5	453.2	7.51	5.93	4.73
7,289.0	81.32	333.00	6,970.8	325.4	-522.1	497.2	8.34	7.49	3.73
7,334.0	83.42	334.60	6,976.8	365.4	-541.8	541.7	5.85	4.67	3.56
7,378.0	85.15	335.93	6,981.2	405.2	-560.1	585.5	4.95	3.93	3.02
7,412.0	85.89	336.04	6,983.8	436.2	-573.9	619.3	2.20	2.18	0.32
7,450.0	89.61	338.46	6,985.3	471.2	-588.6	657.3	11.68	9.79	6.37
~As Drilled LP @ 7450 MD / 6985 TVD									
7,540.0	92.00	340.07	6,984.1	555.3	-620.5	747.2	3.20	2.66	1.79
7,629.0	92.17	341.05	6,980.8	639.2	-650.1	836.1	1.12	0.19	1.10
7,719.0	89.18	338.04	6,979.8	723.5	-681.5	926.0	4.71	-3.32	-3.34
7,809.0	90.61	341.34	6,979.9	807.9	-712.7	1,016.0	4.00	1.59	3.67
7,898.0	91.32	343.93	6,978.4	892.8	-739.3	1,104.7	3.02	0.80	2.91
7,988.0	89.24	337.82	6,978.0	977.8	-768.8	1,194.5	7.17	-2.31	-6.79
8,078.0	89.74	335.36	6,978.8	1,060.4	-804.5	1,284.5	2.79	0.56	-2.73
8,167.0	90.93	337.50	6,978.3	1,141.9	-840.1	1,373.4	2.75	1.34	2.40
8,257.0	90.90	336.13	6,976.8	1,224.7	-875.5	1,463.4	1.52	-0.03	-1.52
8,347.0	90.69	336.53	6,975.6	1,307.1	-911.7	1,553.4	0.50	-0.23	0.44
8,436.0	90.55	338.42	6,974.6	1,389.3	-945.8	1,642.3	2.13	-0.16	2.12
8,526.0	90.72	335.24	6,973.6	1,472.0	-981.2	1,732.3	3.54	0.19	-3.53
8,615.0	90.34	336.88	6,972.8	1,553.3	-1,017.3	1,821.2	1.89	-0.43	1.84
8,705.0	90.24	338.60	6,972.4	1,636.6	-1,051.4	1,911.2	1.91	-0.11	1.91
8,795.0	91.14	338.27	6,971.3	1,720.3	-1,084.4	2,001.2	1.07	1.00	-0.37
8,884.0	89.25	337.41	6,971.0	1,802.7	-1,118.0	2,090.2	2.33	-2.12	-0.97
8,974.0	89.69	339.85	6,971.8	1,886.5	-1,150.8	2,180.2	2.75	0.49	2.71
9,063.0	91.10	341.24	6,971.2	1,970.5	-1,180.4	2,269.1	2.22	1.58	1.56
9,153.0	90.36	339.96	6,970.0	2,055.3	-1,210.3	2,359.0	1.64	-0.82	-1.42
9,243.0	91.40	340.97	6,968.7	2,140.1	-1,240.4	2,448.9	1.61	1.16	1.12
9,332.0	88.89	337.32	6,968.4	2,223.3	-1,272.1	2,537.9	4.98	-2.82	-4.10
9,422.0	90.16	338.43	6,969.2	2,306.7	-1,306.0	2,627.9	1.87	1.41	1.23
9,512.0	90.63	340.48	6,968.6	2,390.9	-1,337.6	2,717.8	2.34	0.52	2.28
9,601.0	89.79	339.97	6,968.2	2,474.7	-1,367.7	2,806.8	1.10	-0.94	-0.57
9,691.0	89.68	344.21	6,968.6	2,560.3	-1,395.4	2,896.5	4.71	-0.12	4.71



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight 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)
9,780.0	90.22	346.05	6,968.7	2,646.3	-1,418.2	2,984.8	2.15	0.61	2.07
9,825.0	89.88	345.72	6,968.7	2,690.0	-1,429.2	3,029.4	1.05	-0.76	-0.73
9,870.0	89.75	343.76	6,968.8	2,733.4	-1,441.0	3,074.1	4.37	-0.29	-4.36
9,915.0	90.22	341.89	6,968.8	2,776.4	-1,454.3	3,118.9	4.28	1.04	-4.16
9,960.0	90.12	339.95	6,968.7	2,818.9	-1,469.0	3,163.9	4.32	-0.22	-4.31
10,005.0	90.08	338.59	6,968.6	2,861.0	-1,484.9	3,208.9	3.02	-0.09	-3.02
10,049.0	90.05	336.78	6,968.6	2,901.7	-1,501.6	3,252.9	4.11	-0.07	-4.11
10,094.0	89.98	334.97	6,968.6	2,942.7	-1,520.0	3,297.8	4.03	-0.16	-4.02
10,139.0	90.15	334.33	6,968.5	2,983.4	-1,539.3	3,342.7	1.47	0.38	-1.42
10,184.0	90.45	333.45	6,968.3	3,023.8	-1,559.1	3,387.6	2.07	0.67	-1.98
10,229.0	90.55	332.59	6,967.9	3,063.9	-1,579.5	3,432.5	1.92	0.22	-1.91
10,274.0	90.08	332.73	6,967.6	3,103.9	-1,600.2	3,477.3	1.09	-1.04	0.31
10,318.0	89.58	334.26	6,967.8	3,143.3	-1,619.8	3,521.1	3.66	-1.14	3.48
10,363.0	89.44	335.97	6,968.2	3,184.1	-1,638.8	3,566.1	3.81	-0.31	3.80
10,408.0	90.25	337.07	6,968.3	3,225.3	-1,656.7	3,611.0	3.04	1.80	2.44
10,453.0	91.09	338.45	6,967.8	3,267.0	-1,673.7	3,656.0	3.59	1.87	3.07
10,498.0	90.62	337.19	6,967.1	3,308.7	-1,690.7	3,701.0	2.99	-1.04	-2.80
10,542.0	89.95	335.07	6,966.9	3,348.9	-1,708.5	3,745.0	5.05	-1.52	-4.82
10,587.0	89.17	334.34	6,967.2	3,389.6	-1,727.7	3,789.9	2.37	-1.73	-1.62
10,632.0	90.18	336.02	6,967.5	3,430.4	-1,746.6	3,834.9	4.36	2.24	3.73
10,677.0	91.12	338.63	6,967.0	3,471.9	-1,764.0	3,879.9	6.16	2.09	5.80
10,722.0	91.02	337.58	6,966.1	3,513.7	-1,780.7	3,924.8	2.34	-0.22	-2.33
10,767.0	90.58	336.50	6,965.5	3,555.1	-1,798.3	3,969.8	2.59	-0.98	-2.40
10,811.0	89.74	335.96	6,965.4	3,595.4	-1,816.0	4,013.8	2.27	-1.91	-1.23
10,856.0	90.11	335.42	6,965.4	3,636.4	-1,834.6	4,058.8	1.45	0.82	-1.20
10,946.0	87.99	333.44	6,966.9	3,717.6	-1,873.4	4,148.6	3.22	-2.36	-2.20
11,035.0	88.26	332.92	6,969.8	3,796.9	-1,913.5	4,237.2	0.66	0.30	-0.58
11,080.0	90.28	335.01	6,970.4	3,837.4	-1,933.3	4,282.1	6.46	4.49	4.64
11,125.0	91.56	337.77	6,969.7	3,878.6	-1,951.3	4,327.1	6.76	2.84	6.13
11,170.0	91.73	337.87	6,968.4	3,920.2	-1,968.3	4,372.0	0.44	0.38	0.22
11,215.0	91.19	337.25	6,967.2	3,961.8	-1,985.4	4,417.0	1.83	-1.20	-1.38
11,259.0	90.55	334.90	6,966.6	4,002.0	-2,003.3	4,461.0	5.53	-1.45	-5.34
11,304.0	89.51	334.63	6,966.5	4,042.7	-2,022.5	4,505.9	2.39	-2.31	-0.60
11,349.0	90.12	336.53	6,966.7	4,083.7	-2,041.1	4,550.9	4.43	1.36	4.22
11,394.0	90.79	338.24	6,966.3	4,125.2	-2,058.4	4,595.9	4.08	1.49	3.80
11,439.0	91.12	338.46	6,965.6	4,167.1	-2,075.0	4,640.9	0.88	0.73	0.49
11,483.0	91.02	338.95	6,964.8	4,208.1	-2,091.0	4,684.9	1.14	-0.23	1.11
11,573.0	89.95	337.93	6,964.0	4,291.7	-2,124.0	4,774.9	1.64	-1.19	-1.13
11,663.0	90.52	339.30	6,963.6	4,375.5	-2,156.8	4,864.8	1.65	0.63	1.52
11,752.0	89.65	338.03	6,963.5	4,458.4	-2,189.2	4,953.8	1.73	-0.98	-1.43
11,842.0	90.08	339.44	6,963.7	4,542.3	-2,221.9	5,043.8	1.64	0.48	1.57
11,932.0	90.72	339.64	6,963.1	4,626.6	-2,253.3	5,133.8	0.75	0.71	0.22
12,021.0	90.82	338.57	6,961.9	4,709.8	-2,285.1	5,222.8	1.21	0.11	-1.20



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddndge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178 0usft
Site:	Hamilton Pad. Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178 0usft
Well:	Knight 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)
12,111.0	91.05	338.83	6,960.4	4,793.6	-2,317.7	5,312.7	0.39	0.26	0.29
12,201.0	89.95	338.77	6,959.6	4,877.5	-2,350.3	5,402.7	1.22	-1.22	-0.07
12,290.0	90.62	337.17	6,959.2	4,960.0	-2,383.7	5,491.7	1.95	0.75	-1.80
12,380.0	91.32	339.73	6,957.7	5,043.7	-2,416.7	5,581.7	2.95	0.78	2.84
12,470.0	90.82	339.39	6,956.0	5,128.0	-2,448.1	5,671.7	0.67	-0.56	-0.38
12,559.0	90.55	338.32	6,954.9	5,211.0	-2,480.3	5,760.6	1.24	-0.30	-1.20
12,649.0	88.78	337.83	6,955.4	5,294.5	-2,513.9	5,850.6	2.04	-1.97	-0.54
12,738.0	89.51	338.12	6,956.8	5,377.0	-2,547.2	5,939.6	0.88	0.82	0.33
12,828.0	90.42	337.76	6,956.8	5,460.4	-2,581.0	6,029.6	1.09	1.01	-0.40
12,918.0	90.55	336.76	6,956.1	5,543.4	-2,615.8	6,119.6	1.12	0.14	-1.11
13,007.0	90.86	336.23	6,955.0	5,625.0	-2,651.3	6,208.8	0.69	0.35	-0.60
13,097.0	90.18	335.91	6,954.2	5,707.3	-2,687.8	6,298.5	0.84	-0.76	-0.36
13,187.0	90.28	336.70	6,953.8	5,789.7	-2,724.0	6,388.5	0.88	0.11	0.88
13,276.0	89.95	337.09	6,953.6	5,871.6	-2,758.9	6,477.5	0.57	-0.37	0.44
13,366.0	89.15	338.03	6,954.3	5,954.7	-2,793.3	6,567.4	1.37	-0.89	1.04
13,456.0	90.05	343.12	6,955.0	6,039.6	-2,823.2	6,657.3	5.74	1.00	5.66
13,545.0	89.95	341.53	6,955.0	6,124.4	-2,850.2	6,746.1	1.79	-0.11	-1.79
13,635.0	89.05	337.40	6,955.7	6,208.6	-2,881.8	6,836.0	4.70	-1.00	-4.59
13,724.0	89.31	336.73	6,957.0	6,290.6	-2,916.4	6,925.0	0.81	0.29	-0.75
13,814.0	91.06	340.11	6,956.7	6,374.3	-2,949.5	7,015.0	4.23	1.94	3.76
13,904.0	91.69	338.20	6,954.6	6,458.4	-2,981.6	7,104.9	2.23	0.70	-2.12
13,993.0	90.38	336.71	6,953.0	6,540.5	-3,015.7	7,193.9	2.23	-1.47	-1.67
14,083.0	89.55	335.62	6,953.0	6,622.9	-3,052.0	7,283.9	1.52	-0.92	-1.21
14,172.0	91.39	339.79	6,952.3	6,705.2	-3,085.8	7,372.8	5.12	2.07	4.69
14,262.0	90.48	339.70	6,950.8	6,789.6	-3,116.9	7,462.8	1.02	-1.01	-0.10
14,351.0	89.48	339.10	6,950.8	6,872.9	-3,148.3	7,551.7	1.31	-1.12	-0.67
14,441.0	88.84	337.00	6,952.2	6,956.4	-3,181.9	7,641.7	2.44	-0.71	-2.33
14,531.0	89.28	338.47	6,953.6	7,039.6	-3,216.0	7,731.7	1.70	0.49	1.63
14,620.0	89.48	336.58	6,954.6	7,121.9	-3,250.0	7,820.7	2.14	0.22	-2.12
14,710.0	90.15	338.90	6,954.9	7,205.2	-3,284.1	7,910.7	2.68	0.74	2.58
14,799.0	91.13	341.37	6,953.9	7,288.9	-3,314.3	7,999.6	2.99	1.10	2.78
14,889.0	90.96	339.90	6,952.3	7,373.7	-3,344.2	8,089.5	1.64	-0.19	-1.63
14,978.0	90.12	336.61	6,951.4	7,456.4	-3,377.1	8,178.5	3.82	-0.94	-3.70
15,068.0	90.15	334.47	6,951.2	7,538.3	-3,414.4	8,268.4	2.38	0.03	-2.38
15,158.0	89.85	336.32	6,951.2	7,620.1	-3,451.9	8,358.3	2.08	-0.33	2.08
15,247.0	89.18	336.75	6,952.0	7,701.8	-3,487.3	8,447.3	0.89	-0.75	0.48
15,337.0	89.48	337.08	6,953.0	7,784.6	-3,522.6	8,537.2	0.50	0.33	0.37
15,427.0	88.74	335.14	6,954.4	7,866.8	-3,559.0	8,627.2	2.31	-0.82	-2.16
15,516.0	89.21	336.13	6,956.0	7,947.9	-3,595.7	8,716.1	1.23	0.53	1.11
15,606.0	89.55	336.14	6,957.0	8,030.2	-3,632.2	8,806.0	0.38	0.38	0.01
15,696.0	90.79	337.53	6,956.7	8,112.9	-3,667.6	8,896.0	2.07	1.38	1.54
15,785.0	89.88	337.07	6,956.2	8,195.0	-3,701.9	8,985.0	1.15	-1.02	-0.52
15,875.0	89.45	337.81	6,956.7	8,278.1	-3,736.4	9,075.0	0.95	-0.48	0.82



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525 1159' GL + 19' KB @ 1178 0usft
Well:	Knight 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)
15,965.0	90.76	339.22	6,956.5	8,361.9	-3,769.4	9,165.0	2.14	1.46	1.57
16,054.0	90.69	339.24	6,955.4	8,445.1	-3,801.0	9,254.0	0.08	-0.08	0.02
16,144.0	89.65	339.52	6,955.2	8,529.3	-3,832.6	9,343.9	1.20	-1.16	0.31
16,234.0	88.64	339.15	6,956.5	8,613.5	-3,864.4	9,433.9	1.20	-1.12	-0.41
16,323.0	90.99	343.14	6,956.8	8,697.7	-3,893.2	9,522.7	5.20	2.64	4.48
16,413.0	89.01	340.27	6,956.8	8,783.2	-3,921.4	9,612.5	3.87	-2.20	-3.19
16,502.0	89.95	338.73	6,957.6	8,866.5	-3,952.8	9,701.5	2.03	1.06	-1.73
16,592.0	90.29	337.95	6,957.4	8,950.1	-3,985.8	9,791.5	0.95	0.38	-0.87
16,682.0	90.15	337.45	6,957.1	9,033.4	-4,019.9	9,881.5	0.58	-0.16	-0.56
16,771.0	90.35	336.22	6,956.7	9,115.2	-4,054.9	9,970.4	1.40	0.22	-1.38
16,861.0	88.94	332.87	6,957.2	9,196.5	-4,093.6	10,060.3	4.04	-1.57	-3.72
16,895.0	89.08	332.59	6,957.8	9,226.7	-4,109.2	10,094.1	0.92	0.41	-0.82
Last SDI MWD @ 16895									
16,957.0	89.08	332.59	6,958.8	9,281.7	-4,137.7	10,155.8	0.00	0.00	0.00
Projection To Bit @ 16957 MD / 6958 TVD									

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
-As Drilled LP Knight 2H - actual wellpath hits target center - Point	0.00	0.00	6,985.3	471.2	-588.6	14,296,365.98	1,712,239.86	39° 22' 8.167 N	80° 44' 45.117 W

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,573.0	6,550.6	SCMR @ 6573			
6,787.0	6,727.4	MDLX @ 6787			
6,982.0	6,862.3	BRKT @ 6982			
7,033.0	6,890.6	TLLY @ 7033			
7,169.0	6,944.2	MRCL_HOT @ 7169			

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates (+N/-S (usft), +E/-W (usft))	Comment
108.0	108.0	-0.3, -0.8	First Gyro @ 108
6,089.0	6,086.5	56.2, -57.8	Last Gyro @ 6089
6,124.0	6,121.5	56.1, -57.9	First SDI MWD @ 6124
7,450.0	6,985.3	471.2, -588.6	-As Drilled LP @ 7450 MD / 6985 TVD
16,895.0	6,957.8	9,226.7, -4,109.2	Last SDI MWD @ 16895
16,957.0	6,958.8	9,281.7, -4,137.7	Projection To Bit @ 16957 MD / 6958 TVD



Company:	Antero Resources	Local Co-ordinate Reference:	Well Knight Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Site:	Hamilton Pad Costlow/Gaskins/Hoskins/Knight	MD Reference:	Precision 525: 1159' GL + 19' KB @ 1178.0usft
Well:	Knight Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Checked By: _____	Approved By: _____	Date: _____
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