



Antero Resources
 Snodgrass Unit 2H
 Ritchie County WV
 Northing: 14227817.50
 Easting: 1660210.10
 As Drilled

WELL DETAILS: Snodgrass Unit 2H

+N/S	+E/W	Northing	Easting	Ground Level	1015.0	Longitude	80° 55' 48.54" W	Spot
0.0	0.0	14227817.50	1660210.10					

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting
Actual BH Snodgrass Unit 2H	6363.0	-7441.6	1931.9	14220375.92	1662142.04
SH Snodgrass Unit 2H	0.0	0.0	0.0	14227817.50	1660210.10

REFERENCE INFORMATION

Coordinate (N/E) Reference: WVA Snodgrass Unit 2H, Grid North
 Section (US) Reference: S84 - (20N, 07E)
 Metering Method: American Customary
 Canadian Method: International System

PROJECT DETAILS: Ritchie County WV

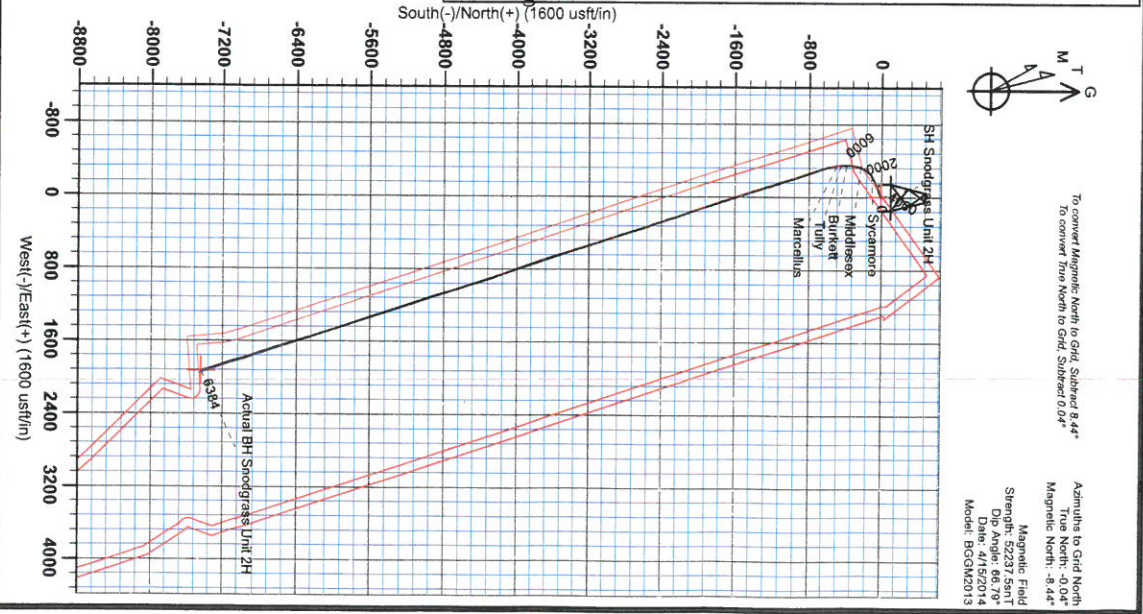
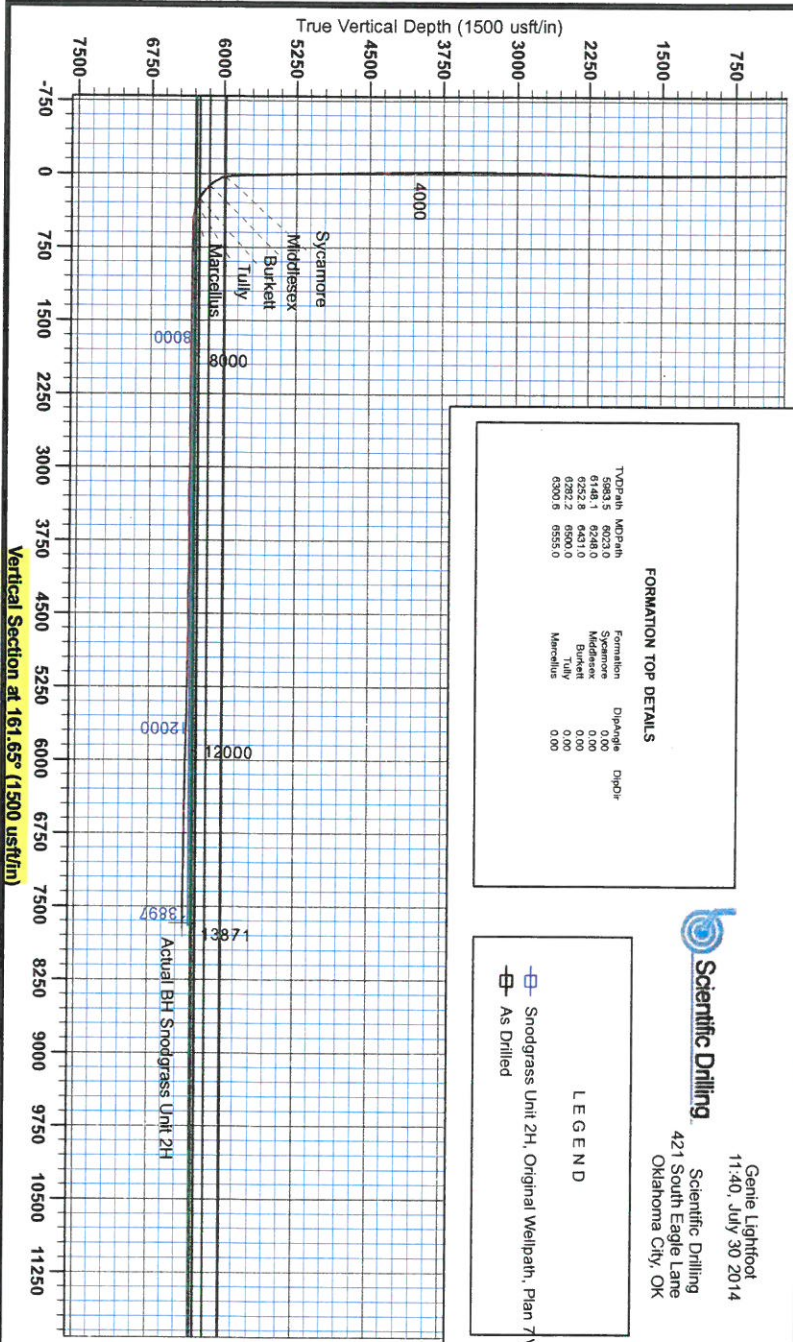
Geoid System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83 CONUS)
 Ellipsoid: Clarke 1886
 Zone: Zone 17N (64° W to 78° W)
 System Datum: Mean Sea Level

FORMATION TOP DETAILS

TVD@BH	MD@BH	Formation	Dip@angle	Dip@dir
5963.5	6023.0	Sycamore	0.00	
6166.1	6288.0	Middlesex	0.00	
6282.2	6500.0	Burkett	0.00	
6300.6	6555.0	Tully	0.00	
		Marcellus	0.00	

LEGEND

- Snodgrass Unit 2H, Original Wellpath, Plan 7
- ⊖ As Drilled



Magnetic Field
 Strength: 5237.5nT
 Declination: 415.0714
 Date: 04/15/2014
 Model: BCGM2013

To convert Magnetic North to Grid North:
 True North - 0.04°
 Magnetic North - 8.44°

To convert True North to Grid North:
 Grid North - 8.44°

Geographic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83 CONUS)
 Ellipsoid: Clarke 1886
 Zone: Zone 17N (64° W to 78° W)
 System Datum: Mean Sea Level

Scientific Drilling
 421 South Eagle Lane
 Oklahoma City, OK
 11:40, July 30 2014
 Genie Lightfoot

WV TOWN SURVEY
 GEOLIGIOW

5102 80 NNJ

RECEIVED



RECEIVED

JUN 08 2015

WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Antero Resources

**Ritchie County WV
Pullman/Viller/Campbell
Snodgrass Unit 2H**

Original Wellpath

Design: As Drilled

Standard Survey Report

30 July, 2014



JUN 08 2015



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Snodgrass Unit 2H
Project:	Ritchie County WV	TVD Reference:	Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
Site:	Pullman/Viller/Campbell	MD Reference:	Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
Well:	Snodgrass Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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

Site	Pullman/Viller/Campbell				
Site Position:		Northing:	14,227,833.30 usft	Latitude:	39° 10' 51.458 N
From:	Map	Easting:	1,660,197.85 usft	Longitude:	80° 55' 48.700 W
Position Uncertainty:	2.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.04 °

Well	Snodgrass Unit 2H					
Well Position	+N/-S	0.0 usft	Northing:	14,227,817.50 usft	Latitude:	39° 10' 51.302 N
	+E/-W	0.0 usft	Easting:	1,660,210.10 usft	Longitude:	80° 55' 48.544 W
Position Uncertainty	2.0 usft		Wellhead Elevation:	1,028.0 usft	Ground Level:	1,015.0 usft

Wellbore	Original Wellpath				
-----------------	-------------------	--	--	--	--

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	4/15/2014	-8.40	66.79	52,238

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	161.65

Survey Program	Date 7/30/2014				
-----------------------	----------------	--	--	--	--

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
106.0	5,551.0	Survey #4 Def Gyro to KOP (Original Well)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
5,551.0	13,871.0	Survey #5 MWD (Original Wellpath)	MWD SDI	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	0.22	226.90	106.0	-0.1	-0.1	0.1	0.21	0.21	0.00
206.0	0.24	201.23	206.0	-0.5	-0.4	0.3	0.10	0.02	-25.67
306.0	0.26	204.38	306.0	-0.9	-0.5	0.7	0.02	0.02	3.15
406.0	0.40	200.83	406.0	-1.4	-0.8	1.1	0.14	0.14	-3.55
506.0	0.37	197.48	506.0	-2.0	-1.0	1.6	0.04	-0.03	-3.35
606.0	0.37	205.71	606.0	-2.6	-1.2	2.1	0.05	0.00	8.23
706.0	0.35	203.71	706.0	-3.2	-1.5	2.6	0.02	-0.02	-2.00
806.0	0.35	184.04	806.0	-3.8	-1.6	3.1	0.12	0.00	-19.67
906.0	0.26	197.20	906.0	-4.3	-1.7	3.6	0.11	-0.09	13.16

JUN 08 2015



Scientific Drilling International
Survey Report

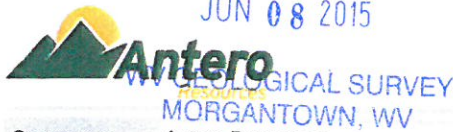


Company:	Antero Resources	Local Co-ordinate Reference:	Well Snodgrass Unit 2H
Project:	Ritchie County WV	TVD Reference:	Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
Site:	Pullman/Viller/Campbell	MD Reference:	Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
Well:	Snodgrass Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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)
1,006.0	0.53	214.88	1,006.0	-4.9	-2.0	4.0	0.29	0.27	17.68
1,106.0	1.77	209.37	1,106.0	-6.6	-3.1	5.3	1.24	1.24	-5.51
1,206.0	3.37	236.09	1,205.9	-9.6	-6.3	7.2	1.96	1.60	26.72
1,306.0	5.37	245.08	1,305.6	-13.2	-12.9	8.5	2.11	2.00	8.99
1,406.0	6.12	243.94	1,405.1	-17.5	-22.0	9.7	0.76	0.75	-1.14
1,506.0	6.30	246.38	1,504.5	-22.1	-31.8	11.0	0.32	0.18	2.44
1,606.0	6.38	253.75	1,603.9	-25.8	-42.1	11.3	0.82	0.08	7.37
1,706.0	6.59	255.34	1,703.2	-28.8	-53.0	10.7	0.28	0.21	1.59
1,806.0	7.49	254.78	1,802.5	-32.0	-64.9	10.0	0.90	0.90	-0.56
1,906.0	7.64	254.78	1,901.6	-35.5	-77.6	9.2	0.15	0.15	0.00
2,006.0	6.81	254.95	2,000.8	-38.7	-89.7	8.5	0.83	-0.83	0.17
2,106.0	5.91	270.65	2,100.2	-40.2	-100.6	6.5	1.95	-0.90	15.70
2,206.0	3.95	298.74	2,199.8	-38.5	-108.8	2.3	3.05	-1.96	28.09
2,306.0	3.50	301.58	2,299.6	-35.3	-114.4	-2.5	0.49	-0.45	2.84
2,406.0	2.78	304.67	2,399.5	-32.3	-119.0	-6.8	0.74	-0.72	3.09
2,506.0	2.60	305.58	2,499.4	-29.6	-122.8	-10.6	0.18	-0.18	0.91
2,606.0	2.04	302.79	2,599.3	-27.3	-126.2	-13.8	0.57	-0.56	-2.79
2,706.0	1.57	298.82	2,699.2	-25.7	-128.9	-16.2	0.49	-0.47	-3.97
2,806.0	1.28	297.42	2,799.2	-24.5	-131.0	-18.0	0.29	-0.29	-1.40
2,906.0	0.95	289.73	2,899.2	-23.7	-132.8	-19.3	0.36	-0.33	-7.69
3,006.0	0.89	287.16	2,999.2	-23.2	-134.3	-20.3	0.07	-0.06	-2.57
3,106.0	0.69	280.53	3,099.2	-22.9	-135.7	-21.0	0.22	-0.20	-6.63
3,206.0	0.39	270.21	3,199.2	-22.7	-136.6	-21.4	0.31	-0.30	-10.32
3,306.0	0.31	268.18	3,299.2	-22.8	-137.2	-21.6	0.08	-0.08	-2.03
3,406.0	0.44	256.59	3,399.2	-22.8	-137.9	-21.7	0.15	0.13	-11.59
3,506.0	0.20	221.89	3,499.2	-23.1	-138.4	-21.7	0.30	-0.24	-34.70
3,606.0	0.41	253.38	3,599.1	-23.3	-138.8	-21.6	0.26	0.21	31.49
3,706.0	0.13	199.66	3,699.1	-23.5	-139.2	-21.5	0.35	-0.28	-53.72
3,806.0	0.16	180.26	3,799.1	-23.8	-139.2	-21.3	0.06	0.03	-19.40
3,906.0	0.25	164.08	3,899.1	-24.1	-139.2	-20.9	0.11	0.09	-16.18
4,006.0	0.57	120.05	3,999.1	-24.6	-138.7	-20.3	0.43	0.32	-44.03
4,106.0	0.34	124.36	4,099.1	-25.0	-138.0	-19.7	0.23	-0.23	4.31
4,206.0	0.54	131.01	4,199.1	-25.5	-137.4	-19.1	0.21	0.20	6.65
4,306.0	0.94	132.87	4,299.1	-26.3	-136.4	-18.0	0.40	0.40	1.86
4,406.0	0.94	133.91	4,399.1	-27.5	-135.3	-16.5	0.02	0.00	1.04
4,506.0	1.07	130.09	4,499.1	-28.6	-134.0	-15.0	0.15	0.13	-3.82
4,606.0	1.17	141.50	4,599.1	-30.0	-132.6	-13.2	0.24	0.10	11.41
4,706.0	1.37	148.55	4,699.1	-31.8	-131.3	-11.1	0.25	0.20	7.05
4,806.0	1.36	147.77	4,799.0	-33.9	-130.1	-8.8	0.02	-0.01	-0.78
4,906.0	1.36	144.40	4,899.0	-35.8	-128.8	-6.5	0.08	0.00	-3.37
5,006.0	1.24	140.55	4,999.0	-37.6	-127.4	-4.4	0.15	-0.12	-3.85
5,106.0	1.34	142.52	5,098.9	-39.4	-126.0	-2.3	0.11	0.10	1.97
5,206.0	1.29	142.65	5,198.9	-41.2	-124.6	-0.1	0.05	-0.05	0.13

JUN 08 2015



Scientific Drilling International Survey Report



Company: Antero Resources
Project: Ritchie County WV
Site: Pullman/Viller/Campbell
Well: Snodgrass Unit 2H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Snodgrass Unit 2H
TVD Reference: Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
MD Reference: Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

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)
5,306.0	1.25	141.72	5,298.9	-43.0	-123.2	2.0	0.04	-0.04	-0.93
5,406.0	1.30	133.60	5,398.9	-44.6	-121.7	4.0	0.19	0.05	-8.12
5,506.0	1.66	142.22	5,498.8	-46.5	-120.0	6.4	0.42	0.36	8.62
5,551.0	1.83	142.71	5,543.8	-47.6	-119.2	7.7	0.38	0.38	1.09
5,607.0	1.51	143.78	5,599.8	-48.9	-118.2	9.2	0.57	-0.57	1.91
5,652.0	1.26	177.88	5,644.8	-49.9	-117.8	10.3	1.88	-0.56	75.78
5,697.0	6.26	236.55	5,689.7	-51.8	-119.9	11.4	12.68	11.11	130.38
5,742.0	11.72	245.92	5,734.1	-55.0	-126.1	12.5	12.52	12.13	20.82
5,787.0	17.10	246.44	5,777.7	-59.5	-136.3	13.5	11.96	11.96	1.16
5,832.0	21.77	245.61	5,820.1	-65.6	-150.0	15.0	10.40	10.38	-1.84
5,876.0	26.64	244.77	5,860.2	-73.2	-166.4	17.1	11.10	11.07	-1.91
5,921.0	30.95	243.56	5,899.7	-82.6	-185.9	19.9	9.66	9.58	-2.69
5,966.0	34.87	243.38	5,937.4	-93.5	-207.7	23.4	8.71	8.71	-0.40
6,011.0	36.64	239.06	5,973.9	-106.2	-230.8	28.2	6.85	3.93	-9.60
6,023.0	37.17	236.26	5,983.5	-110.1	-236.9	29.9	14.71	4.42	-23.37
Sycamore									
6,055.0	38.89	229.14	6,008.8	-122.0	-252.5	36.3	14.71	5.37	-22.24
6,100.0	41.49	221.68	6,043.2	-142.4	-273.1	49.2	12.15	5.78	-16.58
6,145.0	43.74	214.24	6,076.3	-166.4	-291.8	66.1	12.25	5.00	-16.53
6,190.0	45.32	207.85	6,108.4	-193.4	-308.0	86.6	10.56	3.51	-14.20
6,235.0	47.65	200.92	6,139.4	-223.1	-321.4	110.6	12.30	5.18	-15.40
6,248.0	48.54	199.34	6,148.1	-232.2	-324.8	118.2	11.37	6.86	-12.19
Middlesex									
6,279.0	50.75	195.73	6,168.1	-254.7	-331.9	137.3	11.37	7.12	-11.63
6,324.0	53.68	189.97	6,195.7	-289.4	-339.7	167.7	12.03	6.51	-12.80
6,369.0	57.30	185.85	6,221.2	-326.1	-344.8	201.0	11.03	8.04	-9.16
6,414.0	60.31	182.48	6,244.5	-364.5	-347.6	236.5	9.26	6.69	-7.49
6,431.0	61.71	181.01	6,252.8	-379.3	-348.0	250.5	11.18	8.22	-8.67
Burkett									
6,459.0	64.04	178.66	6,265.5	-404.3	-348.0	274.2	11.18	8.33	-8.38
6,500.0	68.02	175.78	6,282.2	-441.7	-346.1	310.2	11.63	9.71	-7.02
Tully									
6,504.0	68.41	175.51	6,283.7	-445.4	-345.9	313.8	11.63	9.77	-6.79
6,548.0	72.31	172.67	6,298.5	-486.6	-341.6	354.3	10.75	8.86	-6.45
6,555.0	72.95	172.33	6,300.6	-493.2	-340.7	360.9	10.33	9.20	-4.91
Marcellus									
6,593.0	76.46	170.50	6,310.6	-529.4	-335.2	397.0	10.33	9.23	-4.81
6,638.0	81.48	167.49	6,319.2	-572.8	-326.8	440.8	12.94	11.16	-6.69
6,683.0	86.44	165.37	6,323.9	-616.3	-316.3	485.3	11.98	11.02	-4.71
6,728.0	91.24	162.44	6,324.8	-659.5	-303.8	530.3	12.50	10.67	-6.51
6,796.0	90.92	161.76	6,323.6	-724.2	-282.9	598.3	1.11	-0.47	-1.00
6,886.0	88.46	162.03	6,324.0	-809.7	-255.0	688.3	2.75	-2.73	0.30
6,975.0	88.55	161.50	6,326.4	-894.2	-227.1	777.2	0.60	0.10	-0.60
7,065.0	89.60	162.12	6,327.8	-979.7	-199.0	867.2	1.35	1.17	0.69

JUN 08 2015



Scientific Drilling International Survey Report



Company: Antero Resources
Project: Ritchie County WV
Site: Pullman/Viller/Campbell
Well: Snodgrass Unit 2H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Snodgrass Unit 2H
TVD Reference: Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
MD Reference: Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

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)
7,155.0	89.60	161.85	6,328.4	-1,065.3	-171.2	957.2	0.30	0.00	-0.30
7,244.0	90.40	161.59	6,328.4	-1,149.8	-143.3	1,046.2	0.95	0.90	-0.29
7,334.0	89.87	162.73	6,328.2	-1,235.5	-115.7	1,136.2	1.40	-0.59	1.27
7,424.0	89.78	162.20	6,328.5	-1,321.3	-88.6	1,226.2	0.60	-0.10	-0.59
7,514.0	89.60	161.68	6,329.0	-1,406.8	-60.7	1,316.2	0.61	-0.20	-0.58
7,603.0	89.34	161.68	6,329.8	-1,491.3	-32.7	1,405.2	0.29	-0.29	0.00
7,693.0	89.60	160.80	6,330.7	-1,576.5	-3.8	1,495.2	1.02	0.29	-0.98
7,783.0	89.43	160.18	6,331.4	-1,661.4	26.3	1,585.2	0.71	-0.19	-0.69
7,872.0	89.69	161.41	6,332.1	-1,745.4	55.6	1,674.1	1.41	0.29	1.38
7,962.0	89.60	161.15	6,332.7	-1,830.6	84.4	1,764.1	0.31	-0.10	-0.29
8,052.0	89.78	161.41	6,333.1	-1,915.9	113.3	1,854.1	0.35	0.20	0.29
8,141.0	90.13	161.32	6,333.2	-2,000.2	141.8	1,943.1	0.41	0.39	-0.10
8,231.0	89.16	160.89	6,333.8	-2,085.4	170.9	2,033.1	1.18	-1.08	-0.48
8,325.0	89.43	160.09	6,334.9	-2,174.0	202.3	2,127.1	0.90	0.29	-0.85
8,419.0	89.69	161.85	6,335.6	-2,262.8	232.9	2,221.1	1.89	0.28	1.87
8,512.0	89.87	161.24	6,336.0	-2,351.0	262.4	2,314.1	0.68	0.19	-0.66
8,606.0	90.31	161.32	6,335.9	-2,440.1	292.6	2,408.1	0.48	0.47	0.09
8,700.0	90.22	161.32	6,335.4	-2,529.1	322.7	2,502.1	0.10	-0.10	0.00
8,794.0	90.40	160.80	6,334.9	-2,618.0	353.2	2,596.1	0.59	0.19	-0.55
8,888.0	90.04	162.56	6,334.6	-2,707.2	382.7	2,690.1	1.91	-0.38	1.87
8,981.0	90.40	162.91	6,334.2	-2,796.1	410.3	2,783.1	0.54	0.39	0.38
9,075.0	90.57	163.26	6,333.4	-2,886.0	437.7	2,877.0	0.41	0.18	0.37
9,169.0	88.11	161.06	6,334.5	-2,975.4	466.5	2,971.0	3.51	-2.62	-2.34
9,264.0	87.85	160.27	6,337.8	-3,065.0	497.9	3,065.9	0.87	-0.27	-0.83
9,357.0	87.85	162.47	6,341.3	-3,153.1	527.6	3,158.8	2.36	0.00	2.37
9,447.0	90.22	162.91	6,342.8	-3,239.0	554.3	3,248.8	2.68	2.63	0.49
9,537.0	90.84	163.43	6,342.0	-3,325.1	580.4	3,338.8	0.90	0.69	0.58
9,626.0	90.22	163.35	6,341.2	-3,410.4	605.8	3,427.7	0.70	-0.70	-0.09
9,716.0	90.13	163.61	6,340.9	-3,496.7	631.4	3,517.7	0.31	-0.10	0.29
9,806.0	90.22	161.85	6,340.6	-3,582.6	658.2	3,607.7	1.96	0.10	-1.96
9,895.0	90.66	162.47	6,339.9	-3,667.4	685.4	3,696.7	0.85	0.49	0.70
9,985.0	89.52	161.06	6,339.8	-3,752.8	713.6	3,786.7	2.01	-1.27	-1.57
10,075.0	89.78	161.06	6,340.4	-3,838.0	742.8	3,876.6	0.29	0.29	0.00
10,164.0	90.13	161.15	6,340.4	-3,922.2	771.6	3,965.6	0.41	0.39	0.10
10,254.0	89.08	159.04	6,341.0	-4,006.8	802.2	4,055.6	2.62	-1.17	-2.34
10,344.0	89.43	160.97	6,342.2	-4,091.3	833.0	4,145.6	2.18	0.39	2.14
10,434.0	88.29	159.22	6,344.0	-4,175.9	863.7	4,235.5	2.32	-1.27	-1.94
10,523.0	89.69	160.01	6,345.6	-4,259.4	894.6	4,324.4	1.81	1.57	0.89
10,613.0	90.84	162.38	6,345.2	-4,344.5	923.7	4,414.4	2.93	1.28	2.63
10,703.0	91.28	162.64	6,343.5	-4,430.4	950.7	4,504.4	0.57	0.49	0.29
10,793.0	90.13	162.82	6,342.4	-4,516.3	977.4	4,594.4	1.29	-1.28	0.20
10,882.0	88.81	162.38	6,343.2	-4,601.2	1,004.0	4,683.3	1.56	-1.48	-0.49
10,972.0	88.11	161.94	6,345.6	-4,686.9	1,031.6	4,773.3	0.92	-0.78	-0.49



Company:	Antero Resources	Local Co-ordinate Reference:	Well Snodgrass Unit 2H
Project:	Ritchie County WV	TVD Reference:	Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
Site:	Pullman/Viller/Campbell	MD Reference:	Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
Well:	Snodgrass Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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)
11,062.0	91.10	163.79	6,346.2	-4,772.9	1,058.1	4,863.3	3.91	3.32	2.06
11,151.0	89.96	163.17	6,345.4	-4,858.2	1,083.4	4,952.2	1.46	-1.28	-0.70
11,241.0	88.81	162.99	6,346.4	-4,944.3	1,109.6	5,042.2	1.29	-1.28	-0.20
11,331.0	88.55	161.06	6,348.5	-5,029.9	1,137.4	5,132.2	2.16	-0.29	-2.14
11,421.0	88.72	160.62	6,350.6	-5,114.8	1,166.9	5,222.1	0.52	0.19	-0.49
11,511.0	89.08	161.15	6,352.3	-5,199.9	1,196.4	5,312.1	0.71	0.40	0.59
11,601.0	89.69	161.06	6,353.3	-5,285.0	1,225.5	5,402.1	0.69	0.68	-0.10
11,690.0	88.46	161.32	6,354.7	-5,369.2	1,254.2	5,491.1	1.41	-1.38	0.29
11,780.0	89.16	161.94	6,356.6	-5,454.6	1,282.6	5,581.0	1.04	0.78	0.69
11,870.0	88.72	161.41	6,358.3	-5,540.1	1,310.8	5,671.0	0.77	-0.49	-0.59
11,959.0	88.99	160.89	6,360.1	-5,624.3	1,339.6	5,760.0	0.66	0.30	-0.58
12,049.0	88.46	160.53	6,362.1	-5,709.2	1,369.3	5,850.0	0.71	-0.59	-0.40
12,139.0	88.64	159.65	6,364.3	-5,793.8	1,400.0	5,939.9	1.00	0.20	-0.98
12,228.0	89.16	161.68	6,366.0	-5,877.7	1,429.4	6,028.9	2.35	0.58	2.28
12,318.0	89.25	161.85	6,367.3	-5,963.2	1,457.6	6,118.9	0.21	0.10	0.19
12,408.0	89.69	162.29	6,368.1	-6,048.8	1,485.3	6,208.9	0.69	0.49	0.49
12,498.0	88.55	162.29	6,369.5	-6,134.6	1,512.7	6,298.8	1.27	-1.27	0.00
12,587.0	88.55	161.76	6,371.8	-6,219.2	1,540.1	6,387.8	0.60	0.00	-0.60
12,677.0	90.84	164.49	6,372.2	-6,305.3	1,566.2	6,477.8	3.96	2.54	3.03
12,767.0	89.60	163.61	6,371.9	-6,391.8	1,591.0	6,567.7	1.69	-1.38	-0.98
12,857.0	88.46	161.68	6,373.4	-6,477.7	1,617.8	6,657.7	2.49	-1.27	-2.14
12,946.0	89.52	162.64	6,375.0	-6,562.4	1,645.1	6,746.6	1.61	1.19	1.08
13,036.0	90.04	162.29	6,375.3	-6,648.2	1,672.2	6,836.6	0.70	0.58	-0.39
13,126.0	88.90	159.48	6,376.2	-6,733.3	1,701.7	6,926.6	3.37	-1.27	-3.12
13,215.0	90.13	161.15	6,376.9	-6,817.1	1,731.6	7,015.6	2.33	1.38	1.88
13,305.0	88.90	161.06	6,377.7	-6,902.2	1,760.8	7,105.6	1.37	-1.37	-0.10
13,394.0	89.16	162.03	6,379.2	-6,986.6	1,788.9	7,194.5	1.13	0.29	1.09
13,484.0	89.96	162.99	6,379.9	-7,072.4	1,816.0	7,284.5	1.39	0.89	1.07
13,574.0	88.55	161.06	6,381.0	-7,158.0	1,843.8	7,374.5	2.66	-1.57	-2.14
13,664.0	89.34	161.76	6,382.7	-7,243.3	1,872.4	7,464.5	1.17	0.88	0.78
13,753.0	90.57	164.14	6,382.8	-7,328.4	1,898.5	7,553.5	3.01	1.38	2.67
13,814.0	89.08	163.35	6,383.0	-7,387.0	1,915.6	7,614.4	2.76	-2.44	-1.30
13,871.0	89.08	163.35	6,383.9	-7,441.6	1,931.9	7,671.4	0.00	0.00	0.00

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,023.0	5,983.5	Sycamore		0.00	
6,248.0	6,148.1	Middlesex		0.00	
6,431.0	6,252.8	Burkett		0.00	
6,500.0	6,282.2	Tully		0.00	
6,555.0	6,300.6	Marcellus		0.00	



Company: Antero Resources
Project: Ritchie County WV
Site: Pullman/Viller/Campbell
Well: Snodgrass Unit 2H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Snodgrass Unit 2H
TVD Reference: Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
MD Reference: Snodgrass Unit 2H GL 1015 + 19 @ 1034.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------

RECEIVED
JUN 08 2015
WV GEOLOGICAL SURVEY
MORGANTOWN, WV