Antero Resources

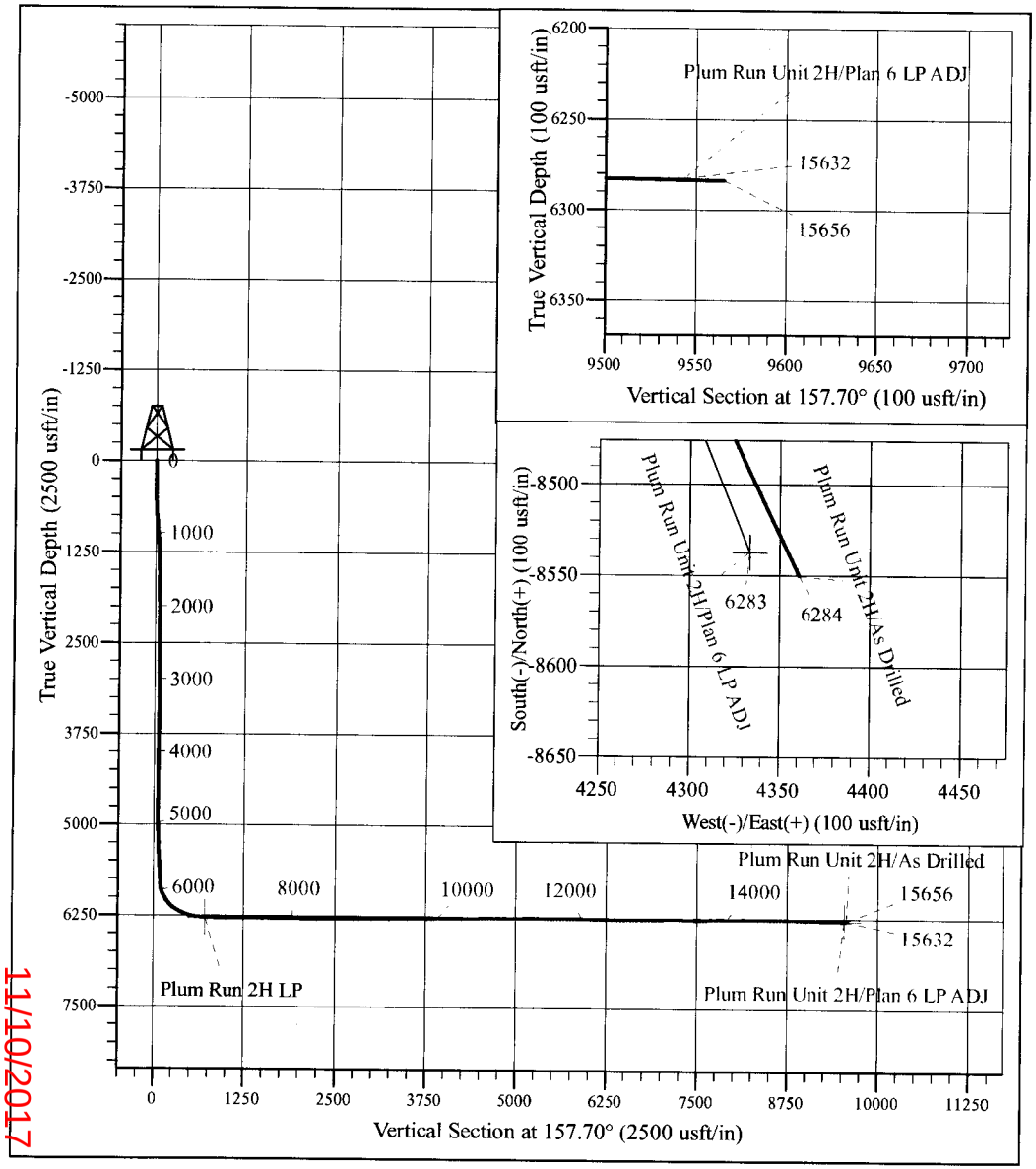
Hartley East Pad:Freeland/Plum Run/Woodworth
Plum Run Unit 2H
Plan 6 LP ADJ
Precision 522: GL 1021' + KB 18' @ 1039.0usft
Tyler County WV

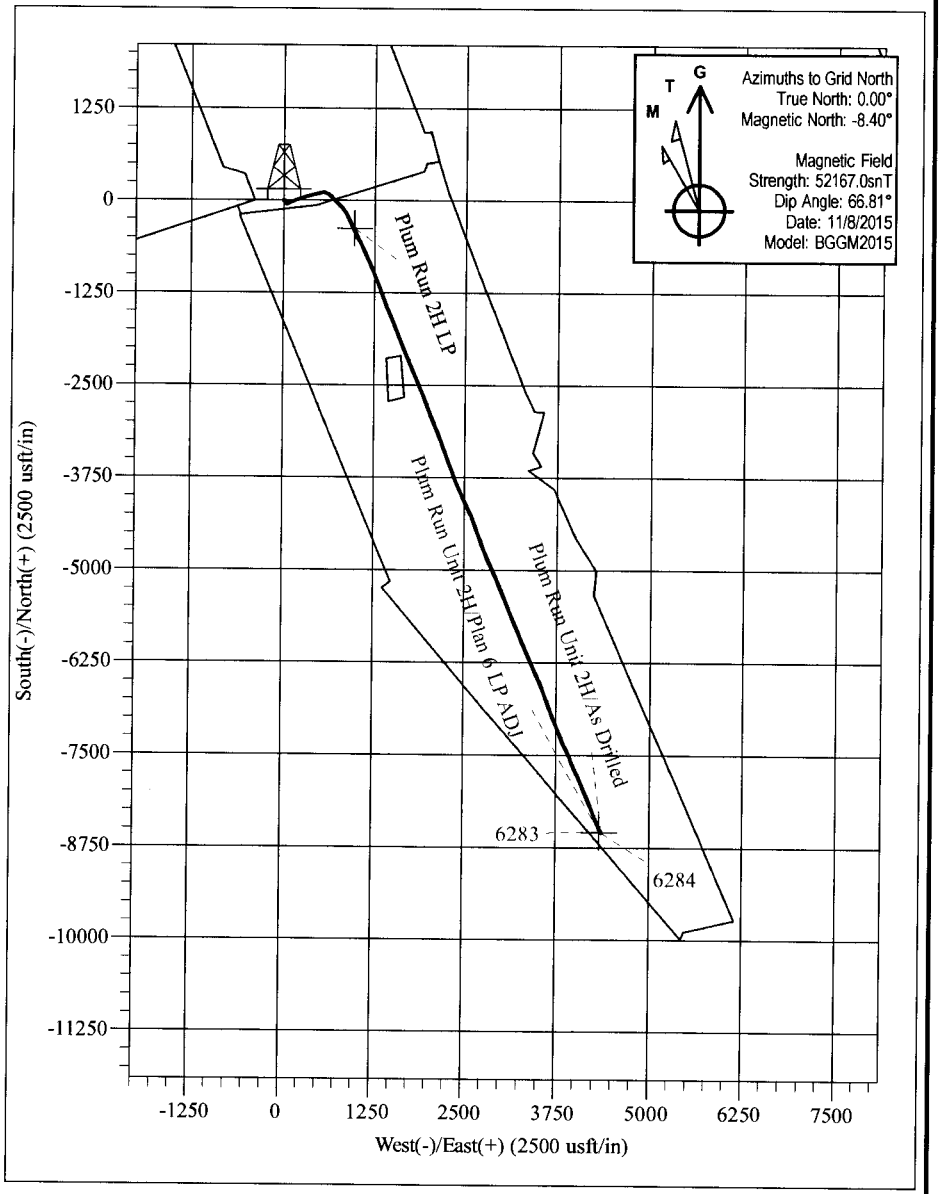
PROJECT DETAILS:
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level

Scientific Drilling

WELL DETAILS: Plum Run Unit 2H SHL

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14294907.06	1642325.75	39° 21' 54.740 N	80° 59' 35.683 W





Plum Run Unit 2H
Approx. BHL
39° 20' 30.193 N 80° 58' 40.165 W

Shane Rhodes
13:43, November 18 2015

Scientific Drilling International
124 Vista Drive
Charleroi, PA 15022

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run Unit 2H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Antero NE

Project	Tyler County WV, Tyler Co West Virginia		
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	Hartley East Pad:Freeland/Plum Run/Woodworth				
Site Position:		**Northing:**	14,294,927.15 usft	**Latitude:**	39° 21' 54.939 N
From:	Map	**Easting:**	1,642,331.41 usft	**Longitude:**	80° 59' 35.611 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.00 °

Well	Plum Run Unit 2H, Marcellus					
Well Position	**+N/-S**	0.0 usft	**Northing:**	14,294,907.06 usft	**Latitude:**	39° 21' 54.740 N
	+E/-W	0.0 usft	**Easting:**	1,642,325.75 usft	**Longitude:**	80° 59' 35.683 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,039.0 usft	**Ground Level:**	1,021.0 usft

Wellbore	Original Wellpath			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	BGGM2015	11/8/2015	-8.40	66.81	52,167

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	157.70	

Survey Program **Date** 11/18/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
105.0	5,705.6	Survey #6 Final Gyro (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
5,841.0	15,656.0	Survey #7 MWD Surveys (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
105.0	0.36	225.30	105.0	-0.2	-0.2	0.1	0.34	0.34	0.00
First SDI Gyro @ 105									
130.0	0.15	237.43	130.0	-0.3	-0.3	0.2	0.86	-0.84	48.52
155.0	0.25	193.74	155.0	-0.4	-0.4	0.2	0.70	0.40	-174.76
180.0	0.27	223.83	180.0	-0.5	-0.4	0.3	0.55	0.08	120.36
205.0	0.32	185.58	205.0	-0.6	-0.5	0.4	0.80	0.20	-153.00
230.0	0.20	288.14	230.0	-0.6	-0.5	0.4	1.65	-0.48	410.24
255.0	0.31	184.33	255.0	-0.7	-0.6	0.4	1.63	0.44	-415.24

11/10/2017

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Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
280.0	0.35	202.19	280.0	-0.8	-0.6	0.5	0.44	0.16	71.44
305.0	0.29	210.19	305.0	-1.0	-0.6	0.6	0.30	-0.24	32.00
330.0	0.32	195.06	330.0	-1.1	-0.7	0.7	0.34	0.12	-60.52
355.0	0.20	181.24	355.0	-1.2	-0.7	0.8	0.54	-0.48	-55.28
380.0	0.21	180.12	380.0	-1.3	-0.7	0.9	0.04	0.04	-4.48
405.0	0.19	192.22	405.0	-1.4	-0.7	1.0	0.19	-0.08	48.40
430.0	0.26	164.62	430.0	-1.5	-0.7	1.1	0.51	0.28	-110.40
455.0	0.19	162.54	455.0	-1.6	-0.7	1.2	0.28	-0.28	-8.32
480.0	0.27	167.36	480.0	-1.7	-0.7	1.3	0.33	0.32	19.28
505.0	0.60	152.76	505.0	-1.8	-0.6	1.5	1.38	1.32	-58.40
530.0	0.94	142.72	530.0	-2.1	-0.4	1.8	1.46	1.36	-40.16
555.0	1.49	139.90	555.0	-2.5	-0.1	2.3	2.21	2.20	-11.28
580.0	2.09	137.95	580.0	-3.1	0.4	3.0	2.41	2.40	-7.80
605.0	2.69	135.28	605.0	-3.9	1.2	4.0	2.44	2.40	-10.68
630.0	3.20	134.48	629.9	-4.8	2.1	5.2	2.05	2.04	-3.20
655.0	3.79	133.58	654.9	-5.8	3.2	6.6	2.37	2.36	-3.60
680.0	4.44	135.05	679.8	-7.1	4.4	8.2	2.63	2.60	5.88
705.0	4.92	135.47	704.7	-8.5	5.9	10.1	1.92	1.92	1.68
730.0	5.16	135.05	729.6	-10.1	7.4	12.2	0.97	0.96	-1.68
755.0	5.24	135.06	754.5	-11.7	9.0	14.2	0.32	0.32	0.04
780.0	5.48	135.60	779.4	-13.4	10.7	16.4	0.98	0.96	2.16
805.0	5.88	133.32	804.3	-15.1	12.4	18.7	1.84	1.60	-9.12
830.0	5.90	134.55	829.2	-16.9	14.3	21.0	0.51	0.08	4.92
855.0	6.01	134.10	854.0	-18.7	16.1	23.4	0.48	0.44	-1.80
880.0	6.07	134.50	878.9	-20.5	18.0	25.8	0.29	0.24	1.60
905.0	6.10	134.03	903.7	-22.4	19.9	28.2	0.23	0.12	-1.88
930.0	6.16	133.59	928.6	-24.2	21.8	30.7	0.30	0.24	-1.76
955.0	5.79	133.90	953.5	-26.0	23.7	33.1	1.49	-1.48	1.24
980.0	5.61	132.99	978.3	-27.7	25.5	35.3	0.81	-0.72	-3.64
1,005.0	5.31	134.15	1,003.2	-29.4	27.3	37.5	1.28	-1.20	4.64
1,030.0	4.86	134.80	1,028.1	-30.9	28.8	39.5	1.81	-1.80	2.60
1,055.0	4.48	134.91	1,053.0	-32.3	30.3	41.4	1.52	-1.52	0.44
1,080.0	4.17	135.55	1,078.0	-33.7	31.6	43.2	1.25	-1.24	2.56
1,105.0	3.79	136.07	1,102.9	-34.9	32.8	44.8	1.53	-1.52	2.08
1,130.0	3.49	136.90	1,127.9	-36.1	33.9	46.2	1.22	-1.20	3.32
1,155.0	3.27	135.11	1,152.8	-37.1	34.9	47.6	0.98	-0.88	-7.16
1,180.0	2.88	137.14	1,177.8	-38.1	35.9	48.9	1.62	-1.56	8.12
1,205.0	2.57	137.10	1,202.8	-39.0	36.7	50.0	1.24	-1.24	-0.16
1,230.0	2.29	139.16	1,227.7	-39.8	37.4	51.0	1.17	-1.12	8.24
1,255.0	2.11	138.50	1,252.7	-40.5	38.0	51.9	0.73	-0.72	-2.64
1,280.0	1.95	137.52	1,277.7	-41.1	38.6	52.7	0.65	-0.64	-3.92
1,305.0	1.75	140.04	1,302.7	-41.7	39.1	53.5	0.86	-0.80	10.08

11/10/2017

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Well:	Plum Run 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)
1,330.0	1.59	141.99	1,327.7	-42.3	39.6	54.2	0.68	-0.64	7.80
1,355.0	1.50	142.09	1,352.7	-42.8	40.0	54.8	0.36	-0.36	0.40
1,380.0	1.43	143.07	1,377.7	-43.4	40.4	55.4	0.30	-0.28	3.92
1,405.0	1.31	142.39	1,402.7	-43.8	40.8	56.0	0.48	-0.48	-2.72
1,430.0	0.93	140.44	1,427.7	-44.2	41.1	56.5	1.53	-1.52	-7.80
1,455.0	0.90	147.63	1,452.6	-44.5	41.3	56.9	0.47	-0.12	28.76
1,480.0	0.79	146.69	1,477.6	-44.8	41.5	57.2	0.44	-0.44	-3.76
1,505.0	0.61	149.19	1,502.6	-45.1	41.7	57.5	0.73	-0.72	10.00
1,530.0	0.63	140.63	1,527.6	-45.3	41.8	57.8	0.38	0.08	-34.24
1,555.0	0.58	141.53	1,552.6	-45.5	42.0	58.1	0.20	-0.20	3.60
1,580.0	0.65	143.30	1,577.6	-45.7	42.1	58.3	0.29	0.28	7.08
1,605.0	0.68	142.66	1,602.6	-46.0	42.3	58.6	0.12	0.12	-2.56
1,630.0	0.61	145.77	1,627.6	-46.2	42.5	58.9	0.31	-0.28	12.44
1,655.0	0.65	133.42	1,652.6	-46.4	42.7	59.1	0.56	0.16	-49.40
1,680.0	0.67	142.84	1,677.6	-46.6	42.9	59.4	0.44	0.08	37.68
1,705.0	0.67	146.19	1,702.6	-46.9	43.0	59.7	0.16	0.00	13.40
1,730.0	0.61	139.52	1,727.6	-47.1	43.2	59.9	0.38	-0.24	-26.68
1,755.0	0.65	140.76	1,752.6	-47.3	43.4	60.2	0.17	0.16	4.96
1,780.0	0.59	142.50	1,777.6	-47.5	43.5	60.5	0.25	-0.24	6.96
1,805.0	0.58	141.90	1,802.6	-47.7	43.7	60.7	0.05	-0.04	-2.40
1,830.0	0.52	143.46	1,827.6	-47.9	43.8	60.9	0.25	-0.24	6.24
1,855.0	0.41	139.51	1,852.6	-48.1	44.0	61.1	0.46	-0.44	-15.80
1,880.0	0.40	129.31	1,877.6	-48.2	44.1	61.3	0.29	-0.04	-40.80
1,905.0	0.37	140.54	1,902.6	-48.3	44.2	61.5	0.32	-0.12	44.92
1,930.0	0.38	135.55	1,927.6	-48.4	44.3	61.6	0.14	0.04	-19.96
1,955.0	0.45	134.22	1,952.6	-48.5	44.4	61.8	0.28	0.28	-5.32
1,980.0	0.48	141.34	1,977.6	-48.7	44.6	62.0	0.26	0.12	28.48
2,005.0	0.33	139.34	2,002.6	-48.8	44.7	62.1	0.60	-0.60	-8.00
2,030.0	0.24	139.61	2,027.6	-48.9	44.8	62.3	0.36	-0.36	1.08
2,055.0	0.19	140.43	2,052.6	-49.0	44.8	62.3	0.20	-0.20	3.28
2,080.0	0.22	130.48	2,077.6	-49.1	44.9	62.4	0.19	0.12	-39.80
2,105.0	0.15	145.73	2,102.6	-49.1	44.9	62.5	0.34	-0.28	61.00
2,130.0	0.16	134.06	2,127.6	-49.2	45.0	62.6	0.13	0.04	-46.68
2,155.0	0.11	137.02	2,152.6	-49.2	45.0	62.6	0.20	-0.20	11.84
2,180.0	0.14	148.84	2,177.6	-49.3	45.1	62.7	0.16	0.12	47.28
2,205.0	0.09	129.04	2,202.6	-49.3	45.1	62.7	0.25	-0.20	-79.20
2,230.0	0.18	166.08	2,227.6	-49.3	45.1	62.8	0.48	0.36	148.16
2,255.0	0.17	130.45	2,252.6	-49.4	45.2	62.9	0.43	-0.04	-142.52
2,280.0	0.20	99.71	2,277.6	-49.4	45.2	62.9	0.41	0.12	-122.96
2,305.0	0.30	134.28	2,302.6	-49.5	45.3	63.0	0.71	0.40	138.28
2,330.0	0.16	145.22	2,327.6	-49.6	45.4	63.1	0.58	-0.56	43.76
2,355.0	0.18	138.11	2,352.6	-49.6	45.4	63.2	0.12	0.08	-28.44
2,380.0	0.10	120.28	2,377.6	-49.7	45.5	63.2	0.36	-0.32	-71.32

11/10/2017

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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)
2,405.0	0.31	159.71	2,402.6	-49.7	45.5	63.3	0.97	0.84	157.72
2,430.0	0.11	198.22	2,427.6	-49.8	45.5	63.4	0.94	-0.80	154.04
2,455.0	0.10	163.50	2,452.6	-49.9	45.5	63.4	0.25	-0.04	-138.88
2,480.0	0.13	129.40	2,477.6	-49.9	45.6	63.5	0.29	0.12	-136.40
2,505.0	0.14	177.74	2,502.6	-50.0	45.6	63.5	0.44	0.04	193.36
2,530.0	0.10	149.23	2,527.6	-50.0	45.6	63.6	0.28	-0.16	-114.04
2,555.0	0.15	160.17	2,552.6	-50.1	45.6	63.6	0.22	0.20	43.76
2,580.0	0.10	151.67	2,577.6	-50.1	45.6	63.7	0.21	-0.20	-34.00
2,605.0	0.20	138.11	2,602.6	-50.2	45.7	63.7	0.42	0.40	-54.24
2,630.0	0.19	174.94	2,627.6	-50.2	45.7	63.8	0.49	-0.04	147.32
2,655.0	0.13	181.59	2,652.6	-50.3	45.7	63.9	0.25	-0.24	26.60
2,680.0	0.16	196.64	2,677.6	-50.4	45.7	63.9	0.19	0.12	60.20
2,705.0	0.14	174.73	2,702.6	-50.4	45.7	64.0	0.24	-0.08	-87.64
2,730.0	0.16	216.54	2,727.6	-50.5	45.7	64.0	0.43	0.08	167.24
2,755.0	0.13	190.62	2,752.6	-50.5	45.7	64.1	0.29	-0.12	-103.68
2,780.0	0.13	179.02	2,777.6	-50.6	45.7	64.1	0.11	0.00	-46.40
2,805.0	0.13	180.45	2,802.6	-50.7	45.7	64.2	0.01	0.00	5.72
2,830.0	0.14	170.04	2,827.6	-50.7	45.7	64.2	0.11	0.04	-41.64
2,855.0	0.18	165.29	2,852.6	-50.8	45.7	64.3	0.17	0.16	-19.00
2,880.0	0.17	162.88	2,877.6	-50.9	45.7	64.4	0.05	-0.04	-9.64
2,905.0	0.15	185.39	2,902.6	-50.9	45.7	64.5	0.26	-0.08	90.04
2,930.0	0.13	187.82	2,927.6	-51.0	45.7	64.5	0.08	-0.08	9.72
2,955.0	0.12	196.12	2,952.6	-51.0	45.7	64.6	0.08	-0.04	33.20
2,980.0	0.11	105.78	2,977.6	-51.1	45.7	64.6	0.65	-0.04	-361.36
3,005.0	0.16	181.21	3,002.6	-51.1	45.7	64.6	0.68	0.20	301.72
3,030.0	0.16	173.28	3,027.6	-51.2	45.7	64.7	0.09	0.00	-31.72
3,055.0	0.09	181.60	3,052.6	-51.2	45.7	64.8	0.29	-0.28	33.28
3,080.0	0.08	164.17	3,077.6	-51.3	45.7	64.8	0.11	-0.04	-69.72
3,105.0	0.08	137.86	3,102.6	-51.3	45.7	64.8	0.15	0.00	-105.24
3,130.0	0.09	113.64	3,127.6	-51.3	45.8	64.9	0.15	0.04	-96.88
3,155.0	0.08	110.17	3,152.6	-51.3	45.8	64.9	0.04	-0.04	-13.88
3,180.0	0.12	143.36	3,177.6	-51.4	45.8	64.9	0.28	0.16	132.76
3,205.0	0.10	145.59	3,202.6	-51.4	45.9	65.0	0.08	-0.08	8.92
3,230.0	0.14	172.20	3,227.6	-51.5	45.9	65.0	0.27	0.16	106.44
3,255.0	0.13	151.34	3,252.6	-51.5	45.9	65.1	0.20	-0.04	-83.44
3,280.0	0.10	146.77	3,277.6	-51.5	45.9	65.1	0.13	-0.12	-18.28
3,305.0	0.13	124.08	3,302.6	-51.6	46.0	65.2	0.22	0.12	-90.76
3,330.0	0.09	123.85	3,327.6	-51.6	46.0	65.2	0.16	-0.16	-0.92
3,355.0	0.11	148.54	3,352.6	-51.6	46.0	65.2	0.19	0.08	98.76
3,380.0	0.10	153.75	3,377.6	-51.7	46.1	65.3	0.06	-0.04	20.84
3,405.0	0.13	148.22	3,402.6	-51.7	46.1	65.3	0.13	0.12	-22.12
3,430.0	0.13	135.62	3,427.6	-51.8	46.1	65.4	0.11	0.00	-50.40

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
3,455.0	0.07	117.23	3,452.6	-51.8	46.2	65.4	0.27	-0.24	-73.56
3,480.0	0.09	148.37	3,477.6	-51.8	46.2	65.5	0.19	0.08	124.56
3,505.0	0.09	215.40	3,502.6	-51.9	46.2	65.5	0.40	0.00	268.12
3,530.0	0.06	72.39	3,527.6	-51.9	46.2	65.5	0.57	-0.12	-572.04
3,555.0	0.01	59.32	3,552.6	-51.9	46.2	65.5	0.20	-0.20	-52.28
3,580.0	0.05	355.03	3,577.6	-51.8	46.2	65.5	0.19	0.16	-257.16
3,605.0	0.05	44.38	3,602.6	-51.8	46.2	65.5	0.17	0.00	197.40
3,630.0	0.07	44.50	3,627.6	-51.8	46.2	65.5	0.08	0.08	0.48
3,655.0	0.11	41.99	3,652.6	-51.8	46.2	65.5	0.16	0.16	-10.04
3,680.0	0.13	8.70	3,677.6	-51.7	46.3	65.4	0.29	0.08	-133.16
3,705.0	0.13	24.03	3,702.6	-51.7	46.3	65.4	0.14	0.00	61.32
3,730.0	0.18	32.12	3,727.6	-51.6	46.3	65.3	0.22	0.20	32.36
3,755.0	0.16	31.62	3,752.6	-51.6	46.3	65.3	0.08	-0.08	-2.00
3,780.0	0.11	0.66	3,777.6	-51.5	46.4	65.2	0.35	-0.20	-123.84
3,805.0	0.18	26.69	3,802.6	-51.4	46.4	65.2	0.38	0.28	104.12
3,830.0	0.17	24.82	3,827.6	-51.4	46.4	65.1	0.05	-0.04	-7.48
3,855.0	0.08	25.49	3,852.6	-51.3	46.4	65.1	0.36	-0.36	2.68
3,880.0	0.14	29.62	3,877.6	-51.3	46.5	65.1	0.24	0.24	16.52
3,905.0	0.16	17.87	3,902.6	-51.2	46.5	65.0	0.15	0.08	-47.00
3,930.0	0.11	31.88	3,927.6	-51.2	46.5	65.0	0.24	-0.20	56.04
3,955.0	0.14	23.57	3,952.6	-51.1	46.5	65.0	0.14	0.12	-33.24
3,980.0	0.11	21.56	3,977.6	-51.1	46.6	64.9	0.12	-0.12	-8.04
4,005.0	0.12	23.88	4,002.6	-51.0	46.6	64.9	0.04	0.04	9.28
4,030.0	0.20	13.58	4,027.6	-51.0	46.6	64.8	0.34	0.32	-41.20
4,055.0	0.17	11.31	4,052.6	-50.9	46.6	64.8	0.12	-0.12	-9.08
4,080.0	0.23	14.42	4,077.6	-50.8	46.6	64.7	0.24	0.24	12.44
4,105.0	0.22	27.41	4,102.6	-50.7	46.7	64.6	0.21	-0.04	51.96
4,130.0	0.16	28.93	4,127.6	-50.6	46.7	64.6	0.24	-0.24	6.08
4,155.0	0.17	20.85	4,152.6	-50.6	46.7	64.5	0.10	0.04	-32.32
4,180.0	0.16	16.08	4,177.6	-50.5	46.8	64.5	0.07	-0.04	-19.08
4,205.0	0.18	12.59	4,202.6	-50.4	46.8	64.4	0.09	0.08	-13.96
4,230.0	0.11	33.07	4,227.6	-50.4	46.8	64.4	0.34	-0.28	81.92
4,255.0	0.24	31.12	4,252.6	-50.3	46.8	64.3	0.52	0.52	-7.80
4,280.0	0.89	60.06	4,277.6	-50.2	47.0	64.3	2.76	2.60	115.76
4,305.0	1.44	61.12	4,302.6	-49.9	47.5	64.2	2.20	2.20	4.24
4,330.0	1.97	62.89	4,327.6	-49.6	48.1	64.1	2.13	2.12	7.08
4,355.0	2.68	65.49	4,352.6	-49.1	49.1	64.1	2.87	2.84	10.40
4,380.0	3.52	63.56	4,377.5	-48.5	50.3	64.0	3.39	3.36	-7.72
4,405.0	4.49	61.24	4,402.5	-47.7	51.8	63.8	3.93	3.88	-9.28
4,430.0	4.90	60.67	4,427.4	-46.7	53.6	63.6	1.65	1.64	-2.28
4,455.0	5.00	60.08	4,452.3	-45.7	55.5	63.3	0.45	0.40	-2.36
4,480.0	5.16	60.17	4,477.2	-44.6	57.4	63.0	0.64	0.64	0.36
4,505.0	6.01	59.80	4,502.1	-43.4	59.5	62.7	3.40	3.40	-1.48

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
4,530.0	6.69	60.47	4,526.9	-42.0	61.9	62.3	2.74	2.72	2.68
4,555.0	7.55	61.63	4,551.7	-40.5	64.6	62.0	3.49	3.44	4.64
4,580.0	8.30	62.72	4,576.5	-38.9	67.7	61.6	3.06	3.00	4.36
4,605.0	9.23	64.65	4,601.2	-37.2	71.1	61.4	3.90	3.72	7.72
4,630.0	10.01	65.50	4,625.9	-35.4	74.9	61.2	3.17	3.12	3.40
4,655.0	10.71	66.46	4,650.4	-33.6	79.0	61.1	2.88	2.80	3.84
4,680.0	11.26	67.31	4,675.0	-31.7	83.4	61.0	2.29	2.20	3.40
4,705.0	11.88	68.49	4,699.5	-29.8	88.0	61.0	2.65	2.48	4.72
4,730.0	12.84	69.18	4,723.9	-27.9	93.0	61.1	3.89	3.84	2.76
4,755.0	13.52	68.77	4,748.2	-25.9	98.3	61.2	2.75	2.72	-1.64
4,780.0	13.74	68.39	4,772.5	-23.7	103.8	61.3	0.95	0.88	-1.52
4,805.0	14.17	68.46	4,796.8	-21.5	109.4	61.4	1.72	1.72	0.28
4,830.0	14.33	68.84	4,821.0	-19.3	115.1	61.5	0.74	0.64	1.52
4,855.0	14.97	68.53	4,845.2	-17.0	121.0	61.6	2.58	2.56	-1.24
4,880.0	15.61	68.83	4,869.3	-14.6	127.2	61.7	2.58	2.56	1.20
4,905.0	16.61	68.68	4,893.3	-12.0	133.6	61.9	4.00	4.00	-0.60
4,930.0	17.41	68.68	4,917.3	-9.4	140.5	62.0	3.20	3.20	0.00
4,955.0	18.52	68.72	4,941.0	-6.6	147.6	62.1	4.44	4.44	0.16
4,980.0	19.76	68.86	4,964.7	-3.6	155.3	62.3	4.96	4.96	0.56
5,005.0	20.62	69.40	4,988.1	-0.5	163.3	62.5	3.52	3.44	2.16
5,030.0	21.40	70.11	5,011.5	2.6	171.7	62.8	3.28	3.12	2.84
5,055.0	22.47	70.68	5,034.6	5.7	180.5	63.3	4.36	4.28	2.28
5,080.0	22.95	71.64	5,057.7	8.8	189.7	63.8	2.43	1.92	3.84
5,105.0	23.34	72.04	5,080.7	11.9	199.0	64.5	1.68	1.56	1.60
5,130.0	23.35	72.54	5,103.6	14.9	208.5	65.3	0.79	0.04	2.00
5,155.0	23.25	72.32	5,126.6	17.9	217.9	66.2	0.53	-0.40	-0.88
5,180.0	23.27	72.21	5,149.6	20.9	227.3	66.9	0.19	0.08	-0.44
5,205.0	23.71	72.13	5,172.5	23.9	236.8	67.7	1.76	1.76	-0.32
5,230.0	24.26	72.25	5,195.3	27.0	246.4	68.5	2.21	2.20	0.48
5,255.0	24.85	72.19	5,218.1	30.2	256.3	69.3	2.36	2.36	-0.24
5,280.0	25.17	72.15	5,240.7	33.4	266.4	70.2	1.28	1.28	-0.16
5,305.0	25.26	72.18	5,263.4	36.7	276.5	71.0	0.36	0.36	0.12
5,330.0	24.72	72.21	5,286.0	39.9	286.6	71.8	2.16	-2.16	0.12
5,355.0	24.97	72.29	5,308.7	43.1	296.6	72.6	1.01	1.00	0.32
5,380.0	25.07	72.54	5,331.4	46.3	306.7	73.5	0.58	0.40	1.00
5,405.0	25.05	73.21	5,354.0	49.4	316.8	74.5	1.14	-0.08	2.68
5,430.0	24.84	73.98	5,376.7	52.4	326.9	75.5	1.55	-0.84	3.08
5,455.0	23.83	74.39	5,399.5	55.2	336.8	76.7	4.10	-4.04	1.64
5,480.0	23.12	74.52	5,422.4	57.9	346.4	77.9	2.85	-2.84	0.52
5,505.0	22.53	74.68	5,445.4	60.5	355.8	79.0	2.37	-2.36	0.64
5,530.0	21.63	74.78	5,468.6	62.9	364.8	80.2	3.60	-3.60	0.40
5,555.0	20.70	75.41	5,491.9	65.3	373.6	81.4	3.83	-3.72	2.52

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
5,580.0	20.72	75.57	5,515.3	67.5	382.1	82.6	0.24	0.08	0.64
5,605.0	20.95	75.87	5,538.7	69.7	390.7	83.8	1.01	0.92	1.20
5,630.0	21.54	77.38	5,562.0	71.8	399.5	85.2	3.22	2.36	6.04
5,655.0	21.97	77.74	5,585.2	73.8	408.6	86.8	1.80	1.72	1.44
5,680.0	22.31	78.51	5,608.3	75.7	417.8	88.5	1.79	1.36	3.08
5,705.0	22.71	77.55	5,631.4	77.7	427.2	90.2	2.17	1.60	-3.84
Last SDI Gyro @ 5705									
5,705.6	22.72	77.53	5,632.0	77.7	427.4	90.2	2.22	1.75	-3.51
5,841.0	24.15	70.33	5,756.2	92.7	479.0	96.0	2.36	1.06	-5.32
First SDI MWD @ 5841									
5,872.0	24.80	71.99	5,784.4	96.9	491.2	96.8	3.05	2.10	5.35
5,902.0	25.02	71.06	5,811.7	100.9	503.2	97.6	1.50	0.73	-3.10
5,933.0	25.21	74.31	5,839.7	104.8	515.7	98.8	4.49	0.61	10.48
5,964.0	26.39	84.33	5,867.6	107.2	528.9	101.5	14.56	3.81	32.32
5,995.0	28.47	92.86	5,895.2	107.6	543.2	106.6	14.33	6.71	27.52
6,026.0	31.33	102.29	5,922.1	105.5	558.5	114.3	17.73	9.23	30.42
6,057.0	33.58	107.87	5,948.2	101.1	574.5	124.4	12.08	7.26	18.00
6,088.0	34.94	112.77	5,973.8	95.1	590.8	136.2	9.92	4.39	15.81
6,118.0	35.69	119.61	5,998.3	87.4	606.4	149.2	13.41	2.50	22.80
6,149.0	37.75	125.65	6,023.2	77.4	622.0	164.4	13.41	6.65	19.48
6,180.0	39.89	129.78	6,047.3	65.5	637.3	181.2	10.83	6.90	13.32
6,211.0	41.93	131.50	6,070.8	52.3	652.7	199.3	7.52	6.58	5.55
6,242.0	44.41	133.02	6,093.4	38.0	668.4	218.5	8.67	8.00	4.90
6,273.0	48.63	134.65	6,114.7	22.4	684.6	239.0	14.14	13.61	5.26
6,301.0	53.27	135.00	6,132.3	7.1	700.0	259.1	16.61	16.58	1.27
Middlesex @ 6301									
6,304.0	53.77	135.04	6,134.1	5.4	701.7	261.3	16.61	16.58	1.18
6,335.0	58.37	135.19	6,151.4	-12.8	719.9	285.0	14.84	14.84	0.48
6,366.0	60.89	135.47	6,167.1	-31.8	738.7	309.8	8.17	8.13	0.90
6,396.0	62.69	134.75	6,181.3	-50.6	757.3	334.2	6.36	6.00	-2.40
6,427.0	64.49	134.63	6,195.1	-70.1	777.1	359.7	5.82	5.81	-0.39
6,458.0	66.31	138.54	6,208.0	-90.6	796.4	386.0	12.88	5.87	12.61
6,489.0	68.27	141.48	6,219.9	-112.5	814.8	413.2	10.79	6.32	9.48
6,492.0	68.40	141.77	6,221.1	-114.7	816.5	415.9	9.97	4.28	9.69
Burket @ 6492									
6,520.0	69.62	144.46	6,231.1	-135.6	832.2	441.2	9.97	4.36	9.60
6,528.0	70.11	145.09	6,233.8	-141.7	836.6	448.5	9.60	6.16	7.84
Tully @ 6528									
6,551.0	71.54	146.87	6,241.4	-159.7	848.7	469.8	9.60	6.21	7.75
6,553.0	71.70	147.08	6,242.0	-161.3	849.7	471.7	12.75	8.16	10.33
Marcellus @ 6553									
6,581.0	74.01	149.93	6,250.3	-184.1	863.7	498.1	12.75	8.24	10.19
6,612.0	77.30	152.36	6,258.0	-210.4	878.2	527.9	13.05	10.61	7.84
6,643.0	80.34	153.62	6,264.0	-237.5	892.0	558.2	10.59	9.81	4.06

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
6,674.0	82.89	154.74	6,268.5	-265.1	905.4	588.8	8.97	8.23	3.61
6,705.0	83.43	155.12	6,272.2	-293.0	918.4	619.6	2.12	1.74	1.23
6,736.0	83.16	155.37	6,275.8	-320.9	931.3	650.3	1.18	-0.87	0.81
6,767.0	84.08	155.32	6,279.2	-348.9	944.2	681.1	2.97	2.97	-0.16
6,794.0	87.55	154.32	6,281.2	-373.3	955.6	708.0	13.37	12.85	-3.70
6,824.0	89.97	154.91	6,281.9	-400.4	968.5	737.9	8.30	8.07	1.97
6,855.0	90.30	155.74	6,281.8	-428.6	981.4	768.9	2.88	1.06	2.68
6,886.0	90.27	155.49	6,281.6	-456.8	994.2	799.9	0.81	-0.10	-0.81
6,948.0	88.29	153.21	6,282.4	-512.7	1,021.0	861.8	4.87	-3.19	-3.68
7,040.0	89.56	152.39	6,284.1	-594.5	1,063.1	953.4	1.64	1.38	-0.89
7,133.0	89.60	153.84	6,284.8	-677.4	1,105.1	1,046.1	1.56	0.04	1.56
7,225.0	89.56	154.86	6,285.5	-760.4	1,145.0	1,138.0	1.11	-0.04	1.11
7,318.0	90.10	156.50	6,285.8	-845.1	1,183.3	1,230.9	1.86	0.58	1.76
7,410.0	90.27	158.56	6,285.5	-930.1	1,218.4	1,322.9	2.25	0.18	2.24
7,503.0	89.63	157.53	6,285.6	-1,016.4	1,253.2	1,415.9	1.30	-0.69	-1.11
7,595.0	89.56	157.54	6,286.2	-1,101.4	1,288.3	1,507.9	0.08	-0.08	0.01
7,688.0	90.17	159.48	6,286.4	-1,187.9	1,322.4	1,600.9	2.19	0.66	2.09
7,780.0	90.70	158.34	6,285.7	-1,273.8	1,355.5	1,692.9	1.37	0.58	-1.24
7,873.0	90.64	158.99	6,284.6	-1,360.4	1,389.3	1,785.8	0.70	-0.06	0.70
7,966.0	89.16	156.99	6,284.8	-1,446.6	1,424.2	1,878.8	2.68	-1.59	-2.15
8,058.0	88.65	157.76	6,286.6	-1,531.5	1,459.6	1,970.8	1.00	-0.55	0.84
8,151.0	89.53	158.43	6,288.0	-1,617.8	1,494.3	2,063.8	1.19	0.95	0.72
8,243.0	89.76	158.39	6,288.6	-1,703.3	1,528.1	2,155.8	0.25	0.25	-0.04
8,336.0	89.86	157.64	6,288.9	-1,789.6	1,562.9	2,248.8	0.81	0.11	-0.81
8,429.0	89.43	157.98	6,289.5	-1,875.7	1,598.1	2,341.8	0.59	-0.46	0.37
8,521.0	90.27	158.54	6,289.7	-1,961.1	1,632.1	2,433.8	1.10	0.91	0.61
8,614.0	90.20	156.59	6,289.4	-2,047.1	1,667.6	2,526.8	2.10	-0.08	-2.10
8,706.0	90.94	156.03	6,288.4	-2,131.3	1,704.6	2,618.7	1.01	0.80	-0.61
8,799.0	89.63	156.42	6,288.0	-2,216.4	1,742.1	2,711.7	1.47	-1.41	0.42
8,892.0	90.30	156.37	6,288.0	-2,301.6	1,779.3	2,804.7	0.72	0.72	-0.05
8,984.0	90.53	157.84	6,287.4	-2,386.4	1,815.1	2,896.7	1.62	0.25	1.60
9,077.0	89.93	157.48	6,287.0	-2,472.4	1,850.5	2,989.7	0.75	-0.65	-0.39
9,169.0	89.59	156.75	6,287.4	-2,557.2	1,886.2	3,081.7	0.88	-0.37	-0.79
9,262.0	91.64	156.29	6,286.4	-2,642.5	1,923.3	3,174.6	2.26	2.20	-0.49
9,355.0	91.00	158.94	6,284.2	-2,728.4	1,958.7	3,267.6	2.93	-0.69	2.85
9,447.0	90.53	158.94	6,283.0	-2,814.3	1,991.7	3,359.6	0.51	-0.51	0.00
9,540.0	90.90	159.57	6,281.8	-2,901.2	2,024.7	3,452.5	0.79	0.40	0.68
9,633.0	90.03	158.63	6,281.1	-2,988.1	2,057.9	3,545.5	1.38	-0.94	-1.01
9,725.0	90.47	157.36	6,280.7	-3,073.4	2,092.3	3,637.5	1.46	0.48	-1.38
9,818.0	89.66	156.25	6,280.6	-3,158.9	2,129.0	3,730.5	1.48	-0.87	-1.19
9,910.0	90.10	158.62	6,280.8	-3,243.8	2,164.3	3,822.5	2.62	0.48	2.58
10,003.0	90.87	159.89	6,280.0	-3,330.8	2,197.2	3,915.4	1.60	0.83	1.37

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
10,096.0	90.80	159.76	6,278.6	-3,418.1	2,229.3	4,008.3	0.16	-0.08	-0.14
10,188.0	90.80	159.11	6,277.4	-3,504.2	2,261.6	4,100.3	0.71	0.00	-0.71
10,281.0	90.03	159.13	6,276.7	-3,591.1	2,294.7	4,193.3	0.83	-0.83	0.02
10,373.0	90.16	158.61	6,276.5	-3,676.9	2,327.9	4,285.2	0.58	0.14	-0.57
10,466.0	90.53	158.31	6,276.0	-3,763.4	2,362.0	4,378.2	0.51	0.40	-0.32
10,558.0	90.03	156.59	6,275.5	-3,848.4	2,397.3	4,470.2	1.95	-0.54	-1.87
10,651.0	90.57	155.46	6,275.0	-3,933.3	2,435.1	4,563.2	1.35	0.58	-1.22
10,743.0	90.00	153.76	6,274.6	-4,016.5	2,474.5	4,655.0	1.95	-0.62	-1.85
10,836.0	91.37	153.65	6,273.5	-4,099.8	2,515.7	4,747.8	1.48	1.47	-0.12
10,928.0	91.17	155.26	6,271.4	-4,182.8	2,555.4	4,839.6	1.76	-0.22	1.75
11,021.0	90.53	157.37	6,270.0	-4,268.0	2,592.8	4,932.6	2.37	-0.69	2.27
11,114.0	89.93	159.41	6,269.7	-4,354.4	2,627.0	5,025.6	2.29	-0.65	2.19
11,206.0	89.83	159.35	6,269.9	-4,440.5	2,659.4	5,117.5	0.13	-0.11	-0.07
11,299.0	90.43	159.93	6,269.6	-4,527.7	2,691.8	5,210.5	0.90	0.65	0.62
11,391.0	90.23	160.51	6,269.1	-4,614.3	2,722.9	5,302.4	0.67	-0.22	0.63
11,483.0	90.30	159.18	6,268.7	-4,700.6	2,754.6	5,394.3	1.45	0.08	-1.45
11,576.0	90.60	157.81	6,268.0	-4,787.2	2,788.7	5,487.3	1.51	0.32	-1.47
11,668.0	90.23	157.39	6,267.3	-4,872.2	2,823.7	5,579.3	0.61	-0.40	-0.46
11,761.0	89.79	156.41	6,267.3	-4,957.8	2,860.2	5,672.3	1.16	-0.47	-1.05
11,853.0	89.46	156.18	6,267.9	-5,042.0	2,897.2	5,764.3	0.44	-0.36	-0.25
11,946.0	88.22	157.20	6,269.8	-5,127.4	2,934.0	5,857.2	1.73	-1.33	1.10
12,038.0	88.12	157.37	6,272.7	-5,212.2	2,969.5	5,949.2	0.21	-0.11	0.18
12,131.0	88.75	156.95	6,275.2	-5,297.9	3,005.6	6,042.1	0.81	0.68	-0.45
12,224.0	89.59	157.73	6,276.6	-5,383.7	3,041.4	6,135.1	1.23	0.90	0.84
12,316.0	90.03	158.84	6,276.9	-5,469.2	3,075.5	6,227.1	1.30	0.48	1.21
12,409.0	90.84	160.21	6,276.2	-5,556.3	3,108.0	6,320.1	1.71	0.87	1.47
12,501.0	90.43	158.44	6,275.2	-5,642.3	3,140.5	6,412.0	1.97	-0.45	-1.92
12,594.0	89.49	156.54	6,275.2	-5,728.3	3,176.1	6,505.0	2.28	-1.01	-2.04
12,687.0	89.66	156.37	6,275.9	-5,813.5	3,213.2	6,598.0	0.26	0.18	-0.18
12,779.0	89.86	156.71	6,276.3	-5,897.9	3,249.8	6,690.0	0.43	0.22	0.37
12,872.0	90.77	158.71	6,275.8	-5,984.0	3,285.1	6,783.0	2.36	0.98	2.15
12,964.0	90.00	156.79	6,275.2	-6,069.1	3,320.0	6,875.0	2.25	-0.84	-2.09
13,057.0	89.96	156.58	6,275.2	-6,154.5	3,356.8	6,967.9	0.23	-0.04	-0.23
13,149.0	91.01	156.98	6,274.4	-6,239.0	3,393.0	7,059.9	1.22	1.14	0.43
13,242.0	90.03	155.49	6,273.6	-6,324.2	3,430.5	7,152.9	1.92	-1.05	-1.60
13,334.0	89.43	154.92	6,274.0	-6,407.7	3,469.1	7,244.8	0.90	-0.65	-0.62
13,427.0	88.55	155.52	6,275.7	-6,492.1	3,508.1	7,337.7	1.15	-0.95	0.65
13,520.0	89.33	157.49	6,277.4	-6,577.4	3,545.1	7,430.7	2.28	0.84	2.12
13,612.0	90.00	159.19	6,277.9	-6,662.9	3,579.1	7,522.6	1.99	0.73	1.85
13,705.0	91.88	160.88	6,276.4	-6,750.3	3,610.8	7,615.5	2.72	2.02	1.82
13,797.0	91.64	160.58	6,273.6	-6,837.1	3,641.2	7,707.4	0.42	-0.26	-0.33
13,890.0	91.11	158.65	6,271.3	-6,924.2	3,673.6	7,800.3	2.15	-0.57	-2.08
13,982.0	89.06	155.74	6,271.2	-7,009.0	3,709.2	7,892.3	3.87	-2.23	-3.16

11/10/2017

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Plum Run Unit 2H
Project:	Tyler County WV	**TVD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site:	Hartley East Pad:Freeland/Plum Run/Woodworth	**MD Reference:**	Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well:	Plum Run 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)
14,075.0	90.03	157.86	6,271.9	-7,094.5	3,745.8	7,985.3	2.51	1.04	2.28
14,168.0	91.11	160.15	6,271.0	-7,181.3	3,779.2	8,078.2	2.72	1.16	2.46
14,260.0	89.59	157.15	6,270.5	-7,267.0	3,812.7	8,170.2	3.66	-1.65	-3.26
14,352.0	89.29	155.84	6,271.4	-7,351.3	3,849.3	8,262.2	1.46	-0.33	-1.42
14,445.0	90.23	155.60	6,271.7	-7,436.1	3,887.6	8,355.1	1.04	1.01	-0.26
14,538.0	90.74	156.32	6,271.0	-7,521.0	3,925.5	8,448.1	0.95	0.55	0.77
14,630.0	90.67	158.52	6,269.8	-7,606.0	3,960.8	8,540.0	2.39	-0.08	2.39
14,723.0	87.68	154.26	6,271.2	-7,691.1	3,998.0	8,633.0	5.60	-3.22	-4.58
14,815.0	89.66	156.29	6,273.3	-7,774.7	4,036.5	8,724.9	3.08	2.15	2.21
14,908.0	88.96	156.80	6,274.4	-7,860.0	4,073.5	8,817.8	0.93	-0.75	0.55
15,000.0	89.22	158.01	6,275.9	-7,944.9	4,108.8	8,909.8	1.35	0.28	1.32
15,093.0	89.33	158.54	6,277.1	-8,031.3	4,143.3	9,002.8	0.58	0.12	0.57
15,185.0	88.65	157.86	6,278.7	-8,116.7	4,177.4	9,094.8	1.05	-0.74	-0.74
15,278.0	91.17	160.14	6,278.8	-8,203.5	4,210.7	9,187.8	3.65	2.71	2.45
15,370.0	89.02	158.39	6,278.7	-8,289.5	4,243.3	9,279.7	3.01	-2.34	-1.90
15,463.0	88.65	156.24	6,280.6	-8,375.3	4,279.2	9,372.7	2.35	-0.40	-2.31
15,556.0	89.09	154.97	6,282.4	-8,460.0	4,317.6	9,465.6	1.44	0.47	-1.37
15,590.0	89.12	154.27	6,282.9	-8,490.7	4,332.1	9,499.5	2.06	0.09	-2.06
Last SDI MWD @ 15590									
15,656.0	89.12	154.27	6,283.9	-8,550.2	4,360.8	9,565.4	0.00	0.00	0.00
Proojection To Bit @ 15656 MD / 6283 TVD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,301.0	6,132.3	Middlesex @ 6301		0.00	
6,492.0	6,221.1	Burket @ 6492		0.00	
6,528.0	6,233.8	Tully @ 6528		0.00	
6,553.0	6,242.0	Marcellus @ 6553		0.00	

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
105.0	105.0	-0.2	-0.2	First SDI Gyro @ 105
5,705.0	5,631.4	77.7	427.2	Last SDI Gyro @ 5705
5,841.0	5,756.2	92.7	479.0	First SDI MWD @ 5841
15,590.0	6,282.9	-8,490.7	4,332.1	Last SDI MWD @ 15590
15,656.0	6,283.9	-8,550.2	4,360.8	Proojection To Bit @ 15656 MD / 6283 TVD

Checked By: _____ Approved By: _____ Date: _____

11/10/2017