



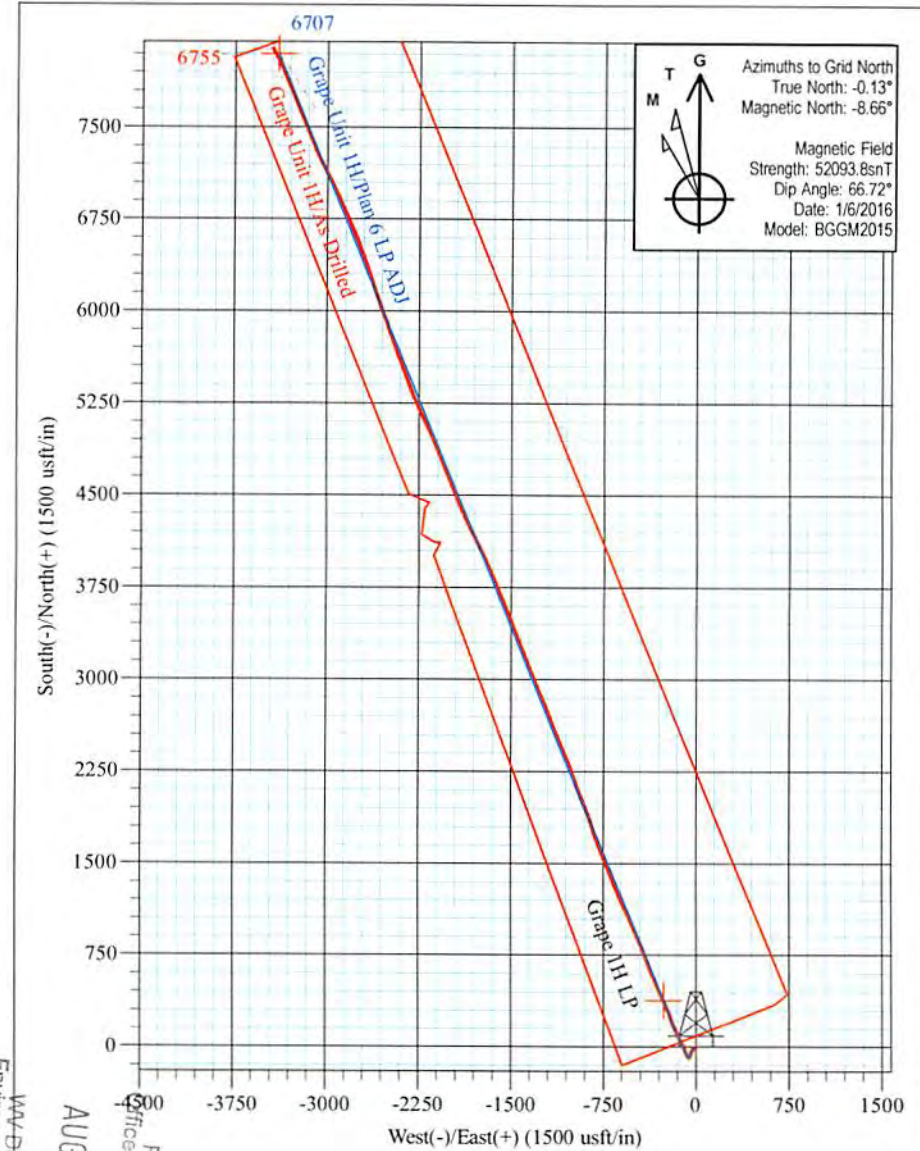
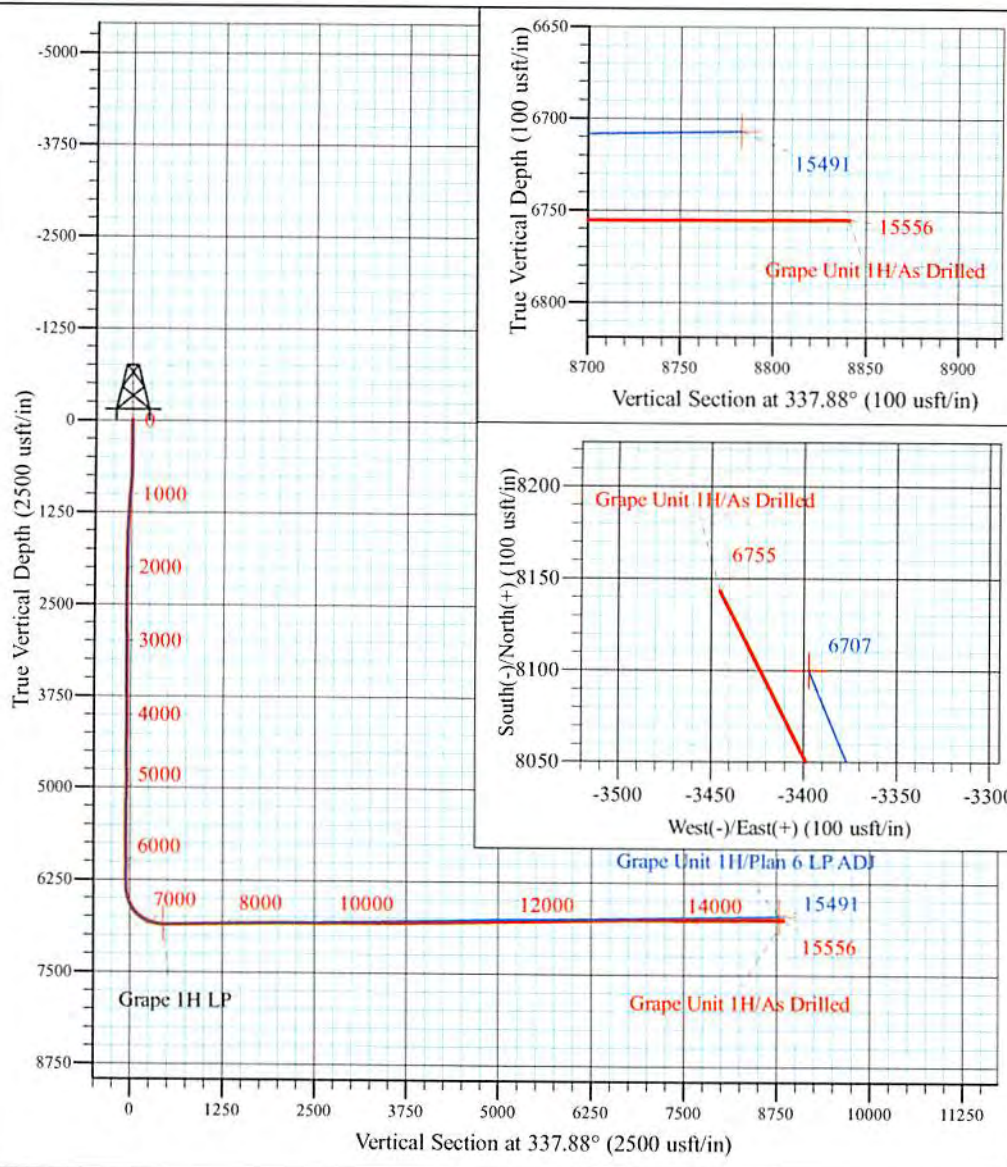
Cofor Pad: Outback Morton Nova Grape Rainer  
 Grape Unit 1H  
 Plan 6 LP ADJ  
 1189' GL + 25' KB @ 1214.0usft (Patterson 347)  
 Doddridge County WV

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: **Grape Unit 1H SHL**

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14270973.62	1696923.17	39° 17' 57.479 N	80° 48' 0.935 W



WV Department of Environmental Protection  
 AUG 21 2017  
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**Grape Unit 1H**  
**Approx. BHL**  
 39° 19' 18.067 N 80° 48' 44.559 W

Shane Rhodes  
 10:33, January 13 2016  
 Scientific Drilling International  
 124 Vista Drive  
 Charleroi, PA 15022



Scientific Drilling International  
Survey Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Antero NE

<b>Project</b>	Doddridge County WV, McClellan District		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

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WV Department of Environmental Protection

<b>Site</b>	Cofor Pad: Outback Morton Nova Grape Rainer, Site Center: Outback Unit 1H				
<b>Site Position:</b>		<b>Northing:</b>	14,271,032.41 usft	<b>Latitude:</b>	39° 17' 58.061 N
<b>From:</b>	Map	<b>Easting:</b>	1,696,909.68 usft	<b>Longitude:</b>	80° 48' 1.105 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.13 °

<b>Well</b>	Grape Unit 1H, Marcellus					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	14,270,973.62 usft	<b>Latitude:</b>	39° 17' 57.479 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,696,923.17 usft	<b>Longitude:</b>	80° 48' 0.935 W
<b>Position Uncertainty</b>	2.0 usft		<b>Wellhead Elevation:</b>	1,214.0 usft	<b>Ground Level:</b>	1,189.0 usft

<b>Wellbore</b>	Original Wellpath				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2015	10/21/2015	-8.52	66.74	52,118
	BGGM2015	1/6/2016	-8.53	66.72	52,094

<b>Design</b>	As Drilled				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	337.88	

<b>Survey Program</b>	Date 1/14/2016				
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
110.6	6,096.0	Survey #6 Gyro to KOP (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
6,187.0	15,556.0	Survey #7 - SDI MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
110.6	0.37	136.47	110.6	-0.3	0.2	-0.3	0.33	0.33	0.00	
112.0	0.37	136.32	112.0	-0.3	0.3	-0.3	0.07	0.00	-10.71	
137.0	0.35	133.57	137.0	-0.4	0.4	-0.5	0.11	-0.08	-11.00	
162.0	0.44	143.99	162.0	-0.5	0.5	-0.6	0.46	0.36	41.68	
187.0	0.35	142.62	187.0	-0.6	0.6	-0.8	0.36	-0.36	-5.48	
212.0	0.38	140.44	212.0	-0.8	0.7	-1.0	0.13	0.12	-8.72	
237.0	0.32	148.89	237.0	-0.9	0.8	-1.1	0.32	-0.24	33.80	
262.0	0.33	133.91	262.0	-1.0	0.9	-1.3	0.34	0.04	-59.92	



Scientific Drilling International  
Survey Report

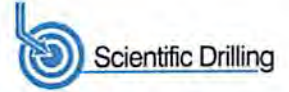


<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	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)
287.0	0.30	138.66	287.0	-1.1	0.9	-1.4	0.16	-0.12	19.00
312.0	0.30	135.23	312.0	-1.2	1.0	-1.5	0.07	0.00	-13.72
337.0	0.28	131.01	337.0	-1.3	1.1	-1.6	0.12	-0.08	-16.88
362.0	0.14	165.55	362.0	-1.4	1.2	-1.7	0.73	-0.56	138.16
387.0	0.09	185.42	387.0	-1.4	1.2	-1.7	0.25	-0.20	79.48
412.0	0.22	260.63	412.0	-1.4	1.1	-1.8	0.86	0.52	300.84
437.0	0.55	254.68	437.0	-1.5	1.0	-1.7	1.33	1.32	-23.80
462.0	1.30	246.84	462.0	-1.6	0.6	-1.7	3.04	3.00	-31.36
487.0	1.89	244.92	487.0	-1.9	0.0	-1.7	2.37	2.36	-7.68
512.0	2.18	246.09	512.0	-2.3	-0.8	-1.8	1.17	1.16	4.68
537.0	2.56	249.40	536.9	-2.7	-1.8	-1.8	1.61	1.52	13.24
562.0	3.13	252.72	561.9	-3.1	-3.0	-1.7	2.37	2.28	13.28
587.0	3.49	254.27	586.9	-3.5	-4.4	-1.6	1.48	1.44	6.20
612.0	3.60	252.98	611.8	-3.9	-5.8	-1.4	0.54	0.44	-5.16
637.0	4.04	246.49	636.8	-4.5	-7.4	-1.4	2.46	1.76	-25.96
662.0	4.80	238.23	661.7	-5.4	-9.1	-1.6	3.96	3.04	-33.04
687.0	5.37	232.82	686.6	-6.6	-10.9	-2.0	2.98	2.28	-21.64
712.0	5.66	231.54	711.5	-8.1	-12.8	-2.7	1.26	1.16	-5.12
737.0	6.15	224.61	736.3	-9.8	-14.7	-3.6	3.46	1.96	-27.72
762.0	6.31	223.34	761.2	-11.8	-16.6	-4.7	0.84	0.64	-5.08
787.0	6.43	222.70	786.0	-13.8	-18.5	-5.8	0.56	0.48	-2.56
812.0	6.62	219.66	810.9	-16.0	-20.4	-7.1	1.58	0.76	-12.16
837.0	6.72	218.10	835.7	-18.2	-22.2	-8.5	0.83	0.40	-6.24
862.0	6.85	217.28	860.5	-20.6	-24.0	-10.0	0.65	0.52	-3.28
887.0	6.88	216.54	885.4	-22.9	-25.8	-11.5	0.37	0.12	-2.96
912.0	7.03	216.31	910.2	-25.4	-27.6	-13.1	0.61	0.60	-0.92
937.0	7.01	213.26	935.0	-27.9	-29.3	-14.8	1.49	-0.08	-12.20
962.0	7.09	209.37	959.8	-30.5	-30.9	-16.6	1.94	0.32	-15.56
987.0	7.13	207.98	984.6	-33.2	-32.4	-18.6	0.71	0.16	-5.56
1,012.0	7.21	207.05	1,009.4	-36.0	-33.8	-20.6	0.56	0.32	-3.72
1,037.0	7.20	206.95	1,034.2	-38.8	-35.3	-22.6	0.06	-0.04	-0.40
1,062.0	7.11	204.89	1,059.0	-41.6	-36.6	-24.7	1.09	-0.36	-8.24
1,087.0	6.56	201.32	1,083.8	-44.3	-37.8	-26.8	2.78	-2.20	-14.28
1,112.0	6.35	201.33	1,108.7	-46.9	-38.8	-28.9	0.84	-0.84	0.04
1,137.0	6.12	199.75	1,133.5	-49.5	-39.8	-30.9	1.15	-0.92	-6.32
1,162.0	5.82	199.90	1,158.4	-51.9	-40.7	-32.8	1.20	-1.20	0.60
1,187.0	5.57	199.97	1,183.3	-54.3	-41.5	-34.6	1.00	-1.00	0.28
1,212.0	5.29	200.61	1,208.2	-56.5	-42.3	-36.4	1.15	-1.12	2.56
1,237.0	5.23	199.74	1,233.1	-58.6	-43.1	-38.1	0.40	-0.24	-3.48
1,262.0	4.99	199.43	1,258.0	-60.7	-43.9	-39.7	0.97	-0.96	-1.24
1,287.0	4.59	200.06	1,282.9	-62.7	-44.6	-41.3	1.61	-1.60	2.52
1,312.0	4.46	198.19	1,307.8	-64.5	-45.2	-42.8	0.79	-0.52	-7.48
1,337.0	4.05	200.46	1,332.7	-66.3	-45.8	-44.2	1.77	-1.64	9.08



Scientific Drilling International  
Survey Report



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<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Antero NE

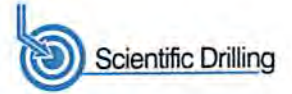
Survey

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)
1,362.0	3.80	199.29	1,357.7	-67.9	-46.4	-45.4	1.05	-1.00	-4.68
1,387.0	3.55	196.56	1,382.6	-69.4	-46.9	-46.7	1.22	-1.00	-10.92
1,412.0	3.37	196.27	1,407.6	-70.9	-47.3	-47.8	0.72	-0.72	-1.16
1,437.0	3.04	198.09	1,432.5	-72.2	-47.7	-48.9	1.38	-1.32	7.28
1,462.0	2.99	196.34	1,457.5	-73.5	-48.1	-49.9	0.42	-0.20	-7.00
1,487.0	2.83	195.93	1,482.5	-74.7	-48.5	-50.9	0.65	-0.64	-1.64
1,512.0	2.67	196.33	1,507.4	-75.8	-48.8	-51.9	0.64	-0.64	1.60
1,537.0	2.27	198.57	1,532.4	-76.9	-49.1	-52.7	1.65	-1.60	8.96
1,562.0	2.09	197.64	1,557.4	-77.8	-49.4	-53.4	0.73	-0.72	-3.72
1,587.0	2.14	196.72	1,582.4	-78.7	-49.7	-54.2	0.24	0.20	-3.68
1,612.0	2.01	201.60	1,607.4	-79.5	-50.0	-54.8	0.88	-0.52	19.52
1,637.0	1.92	198.58	1,632.3	-80.3	-50.3	-55.5	0.55	-0.36	-12.08
1,662.0	1.80	201.12	1,657.3	-81.1	-50.6	-56.1	0.58	-0.48	10.16
1,687.0	1.57	197.20	1,682.3	-81.8	-50.8	-56.6	1.03	-0.92	-15.68
1,712.0	1.41	196.83	1,707.3	-82.4	-51.0	-57.1	0.64	-0.64	-1.48
1,737.0	1.20	195.79	1,732.3	-82.9	-51.2	-57.6	0.85	-0.84	-4.16
1,762.0	1.22	194.10	1,757.3	-83.5	-51.3	-58.0	0.16	0.08	-6.76
1,787.0	1.05	192.82	1,782.3	-83.9	-51.4	-58.4	0.69	-0.68	-5.12
1,812.0	0.94	191.77	1,807.3	-84.4	-51.5	-58.8	0.45	-0.44	-4.20
1,837.0	0.88	186.20	1,832.3	-84.7	-51.6	-59.1	0.43	-0.24	-22.28
1,862.0	0.88	178.55	1,857.3	-85.1	-51.6	-59.4	0.47	0.00	-30.60
1,887.0	0.67	183.37	1,882.3	-85.5	-51.6	-59.8	0.88	-0.84	19.28
1,912.0	0.73	174.23	1,907.3	-85.8	-51.6	-60.0	0.51	0.24	-36.56
1,937.0	0.59	177.25	1,932.3	-86.1	-51.6	-60.3	0.58	-0.56	12.08
1,962.0	0.51	179.61	1,957.3	-86.3	-51.6	-60.5	0.33	-0.32	9.44
1,987.0	0.24	175.91	1,982.3	-86.5	-51.5	-60.7	1.08	-1.08	-14.80
2,012.0	0.12	204.22	2,007.3	-86.5	-51.6	-60.8	0.58	-0.48	113.24
2,037.0	0.13	195.90	2,032.3	-86.6	-51.6	-60.8	0.08	0.04	-33.28
2,062.0	0.05	231.28	2,057.3	-86.6	-51.6	-60.8	0.38	-0.32	141.52
2,087.0	0.06	294.66	2,082.3	-86.6	-51.6	-60.8	0.23	0.04	253.52
2,112.0	0.06	320.18	2,107.3	-86.6	-51.6	-60.8	0.11	0.00	102.08
2,137.0	0.11	188.00	2,132.3	-86.6	-51.6	-60.8	0.63	0.20	-528.72
2,162.0	0.17	143.59	2,157.3	-86.7	-51.6	-60.9	0.48	0.24	-177.64
2,187.0	0.01	44.75	2,182.3	-86.7	-51.6	-60.9	0.69	-0.64	-395.36
2,212.0	0.08	166.96	2,207.3	-86.7	-51.6	-60.9	0.34	0.28	488.84
2,237.0	0.12	157.77	2,232.3	-86.8	-51.6	-61.0	0.17	0.16	-36.76
2,262.0	0.14	173.71	2,257.3	-86.8	-51.6	-61.0	0.16	0.08	63.76
2,287.0	0.07	168.89	2,282.3	-86.9	-51.6	-61.1	0.28	-0.28	-19.28
2,312.0	0.15	190.41	2,307.3	-86.9	-51.6	-61.1	0.35	0.32	86.08
2,337.0	0.08	222.39	2,332.3	-87.0	-51.6	-61.1	0.37	-0.28	127.92
2,362.0	0.09	178.51	2,357.3	-87.0	-51.6	-61.2	0.26	0.04	-175.52
2,387.0	0.11	133.92	2,382.3	-87.0	-51.6	-61.2	0.31	0.08	-178.36
2,412.0	0.18	148.74	2,407.3	-87.1	-51.5	-61.3	0.32	0.28	59.28

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Survey Report



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<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	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)
2,437.0	0.12	273.41	2,432.3	-87.1	-51.5	-61.3	1.07	-0.24	498.68
2,462.0	0.07	299.82	2,457.3	-87.1	-51.6	-61.3	0.26	-0.20	105.64
2,487.0	0.07	354.62	2,482.3	-87.1	-51.6	-61.2	0.26	0.00	219.20
2,512.0	0.03	221.63	2,507.3	-87.1	-51.6	-61.2	0.37	-0.16	-531.96
2,537.0	0.07	201.12	2,532.3	-87.1	-51.6	-61.2	0.17	0.16	-82.04
2,562.0	0.05	296.67	2,557.3	-87.1	-51.6	-61.2	0.36	-0.08	382.20
2,587.0	0.09	240.83	2,582.3	-87.1	-51.7	-61.2	0.30	0.16	-223.36
2,612.0	0.06	236.41	2,607.3	-87.1	-51.7	-61.2	0.12	-0.12	-17.68
2,637.0	0.11	232.04	2,632.3	-87.1	-51.7	-61.2	0.20	0.20	-17.48
2,662.0	0.13	222.94	2,657.3	-87.2	-51.8	-61.3	0.11	0.08	-36.40
2,687.0	0.11	260.29	2,682.3	-87.2	-51.8	-61.3	0.32	-0.08	149.40
2,712.0	0.13	275.73	2,707.3	-87.2	-51.8	-61.3	0.15	0.08	61.76
2,737.0	0.14	278.37	2,732.3	-87.2	-51.9	-61.2	0.05	0.04	10.56
2,762.0	0.20	271.95	2,757.3	-87.2	-52.0	-61.2	0.25	0.24	-25.68
2,787.0	0.18	266.42	2,782.3	-87.2	-52.1	-61.2	0.11	-0.08	-22.12
2,812.0	0.20	311.68	2,807.3	-87.2	-52.1	-61.1	0.59	0.08	181.04
2,837.0	0.20	285.88	2,832.3	-87.1	-52.2	-61.0	0.36	0.00	-103.20
2,862.0	0.19	284.63	2,857.3	-87.1	-52.3	-61.0	0.04	-0.04	-5.00
2,887.0	0.25	276.19	2,882.3	-87.1	-52.4	-60.9	0.27	0.24	-33.76
2,912.0	0.27	312.91	2,907.3	-87.0	-52.5	-60.9	0.66	0.08	146.88
2,937.0	0.20	303.76	2,932.3	-87.0	-52.6	-60.8	0.32	-0.28	-36.60
2,962.0	0.22	321.25	2,957.3	-86.9	-52.6	-60.7	0.27	0.08	69.96
2,987.0	0.20	289.05	2,982.3	-86.9	-52.7	-60.6	0.47	-0.08	-128.80
3,012.0	0.21	314.69	3,007.3	-86.8	-52.8	-60.5	0.37	0.04	102.56
3,037.0	0.18	316.54	3,032.3	-86.7	-52.8	-60.5	0.12	-0.12	7.40
3,062.0	0.15	304.96	3,057.3	-86.7	-52.9	-60.4	0.18	-0.12	-46.32
3,087.0	0.14	283.63	3,082.3	-86.7	-52.9	-60.4	0.22	-0.04	-85.32
3,112.0	0.16	290.24	3,107.3	-86.7	-53.0	-60.3	0.11	0.08	26.44
3,137.0	0.22	307.97	3,132.3	-86.6	-53.1	-60.3	0.33	0.24	70.92
3,162.0	0.20	296.26	3,157.3	-86.6	-53.2	-60.2	0.19	-0.08	-46.64
3,187.0	0.25	274.88	3,182.3	-86.5	-53.2	-60.1	0.39	0.20	-85.52
3,212.0	0.24	314.40	3,207.3	-86.5	-53.3	-60.0	0.66	-0.04	158.08
3,237.0	0.24	307.74	3,232.3	-86.4	-53.4	-60.0	0.11	0.00	-26.64
3,262.0	0.21	304.86	3,257.3	-86.4	-53.5	-59.9	0.13	-0.12	-11.52
3,287.0	0.27	325.78	3,282.3	-86.3	-53.6	-59.8	0.42	0.24	83.68
3,312.0	0.23	317.41	3,307.3	-86.2	-53.6	-59.7	0.22	-0.16	-33.48
3,337.0	0.23	315.65	3,332.3	-86.1	-53.7	-59.6	0.03	0.00	-7.04
3,362.0	0.24	319.58	3,357.3	-86.1	-53.8	-59.5	0.08	0.04	15.72
3,387.0	0.22	309.07	3,382.3	-86.0	-53.8	-59.4	0.19	-0.08	-42.04
3,412.0	0.20	328.93	3,407.3	-85.9	-53.9	-59.3	0.30	-0.08	79.44
3,437.0	0.14	313.66	3,432.3	-85.9	-53.9	-59.2	0.30	-0.24	-61.08
3,462.0	0.17	315.61	3,457.3	-85.8	-54.0	-59.2	0.12	0.12	7.80
3,487.0	0.15	321.45	3,482.3	-85.8	-54.0	-59.1	0.10	-0.08	23.36
3,512.0	0.15	303.31	3,507.3	-85.7	-54.1	-59.0	0.19	0.00	-72.56

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Survey Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	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)
3,537.0	0.13	303.51	3,532.3	-85.7	-54.1	-59.0	0.08	-0.08	0.80
3,562.0	0.10	298.81	3,557.3	-85.7	-54.2	-59.0	0.13	-0.12	-18.80
3,587.0	0.15	311.10	3,582.3	-85.6	-54.2	-58.9	0.23	0.20	49.16
3,612.0	0.17	295.12	3,607.3	-85.6	-54.3	-58.9	0.19	0.08	-63.92
3,637.0	0.15	269.23	3,632.3	-85.6	-54.4	-58.8	0.30	-0.08	-103.56
3,662.0	0.11	251.92	3,657.3	-85.6	-54.4	-58.8	0.22	-0.16	-69.24
3,687.0	0.17	235.58	3,682.3	-85.6	-54.5	-58.8	0.29	0.24	-65.36
3,712.0	0.17	247.05	3,707.3	-85.7	-54.5	-58.8	0.14	0.00	45.88
3,737.0	0.16	244.43	3,732.3	-85.7	-54.6	-58.8	0.05	-0.04	-10.48
3,762.0	0.13	239.60	3,757.3	-85.7	-54.6	-58.8	0.13	-0.12	-19.32
3,787.0	0.18	251.49	3,782.3	-85.7	-54.7	-58.8	0.24	0.20	47.56
3,812.0	0.22	239.68	3,807.3	-85.8	-54.8	-58.8	0.23	0.16	-47.24
3,837.0	0.16	239.90	3,832.3	-85.8	-54.9	-58.8	0.24	-0.24	0.88
3,862.0	0.22	244.21	3,857.3	-85.9	-54.9	-58.9	0.25	0.24	17.24
3,887.0	0.18	252.04	3,882.3	-85.9	-55.0	-58.9	0.19	-0.16	31.32
3,912.0	0.18	257.74	3,907.3	-85.9	-55.1	-58.8	0.07	0.00	22.80
3,937.0	0.17	247.87	3,932.3	-85.9	-55.2	-58.8	0.13	-0.04	-39.48
3,962.0	0.19	256.30	3,957.3	-86.0	-55.2	-58.8	0.13	0.08	33.72
3,987.0	0.21	259.57	3,982.3	-86.0	-55.3	-58.8	0.09	0.08	13.08
4,012.0	0.21	261.95	4,007.3	-86.0	-55.4	-58.8	0.03	0.00	9.52
4,037.0	0.16	273.53	4,032.3	-86.0	-55.5	-58.8	0.25	-0.20	46.32
4,062.0	0.15	266.70	4,057.3	-86.0	-55.6	-58.7	0.08	-0.04	-27.32
4,087.0	0.15	268.03	4,082.3	-86.0	-55.6	-58.7	0.01	0.00	5.32
4,112.0	0.14	269.52	4,107.3	-86.0	-55.7	-58.7	0.04	-0.04	5.96
4,137.0	0.20	287.17	4,132.3	-86.0	-55.8	-58.7	0.32	0.24	70.60
4,162.0	0.09	245.24	4,157.3	-86.0	-55.8	-58.6	0.58	-0.44	-167.72
4,187.0	0.10	281.48	4,182.3	-86.0	-55.9	-58.6	0.24	0.04	144.96
4,212.0	0.12	284.26	4,207.3	-86.0	-55.9	-58.6	0.08	0.08	11.12
4,237.0	0.13	281.81	4,232.3	-86.0	-56.0	-58.6	0.05	0.04	-9.80
4,262.0	0.09	251.36	4,257.3	-86.0	-56.0	-58.5	0.28	-0.16	-121.80
4,287.0	0.13	281.84	4,282.3	-86.0	-56.1	-58.5	0.28	0.16	121.92
4,312.0	0.10	279.84	4,307.3	-85.9	-56.1	-58.5	0.12	-0.12	-8.00
4,337.0	0.14	234.86	4,332.3	-86.0	-56.1	-58.5	0.40	0.16	-179.92
4,362.0	0.08	253.40	4,357.3	-86.0	-56.2	-58.5	0.28	-0.24	74.16
4,387.0	0.07	271.73	4,382.3	-86.0	-56.2	-58.5	0.10	-0.04	73.32
4,412.0	0.19	199.87	4,407.3	-86.0	-56.2	-58.5	0.72	0.48	-287.44
4,437.0	0.16	214.17	4,432.3	-86.1	-56.3	-58.6	0.21	-0.12	57.20
4,462.0	0.17	208.36	4,457.3	-86.2	-56.3	-58.6	0.08	0.04	-23.24
4,487.0	0.14	206.44	4,482.3	-86.2	-56.4	-58.7	0.12	-0.12	-7.68
4,512.0	0.18	201.70	4,507.3	-86.3	-56.4	-58.7	0.17	0.16	118.96
4,537.0	0.14	209.61	4,532.3	-86.3	-56.4	-58.7	0.18	-0.16	31.64
4,562.0	0.17	198.82	4,557.3	-86.4	-56.4	-58.8	0.17	0.12	-43.16
4,587.0	0.29	190.45	4,582.3	-86.5	-56.5	-58.9	0.50	0.48	-33.48

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Scientific Drilling International  
Survey Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WW	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Antero NE

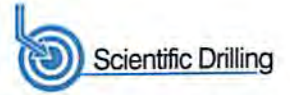
Survey

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)
4,612.0	0.10	214.61	4,607.3	-86.6	-56.5	-58.9	0.81	-0.76	96.64
4,637.0	0.06	226.37	4,632.3	-86.6	-56.5	-59.0	0.17	-0.16	47.04
4,662.0	0.23	188.36	4,657.3	-86.7	-56.5	-59.0	0.75	0.68	-152.04
4,687.0	0.19	200.68	4,682.3	-86.8	-56.5	-59.1	0.24	-0.16	49.28
4,712.0	0.15	194.06	4,707.3	-86.8	-56.6	-59.1	0.18	-0.16	-26.48
4,737.0	0.20	198.48	4,732.3	-86.9	-56.6	-59.2	0.21	0.20	17.68
4,762.0	0.19	196.09	4,757.3	-87.0	-56.6	-59.3	0.05	-0.04	-9.56
4,787.0	0.16	193.75	4,782.3	-87.1	-56.6	-59.3	0.12	-0.12	-9.36
4,812.0	0.11	202.83	4,807.3	-87.1	-56.7	-59.4	0.22	-0.20	36.32
4,837.0	0.19	191.24	4,832.3	-87.2	-56.7	-59.4	0.34	0.32	-46.36
4,862.0	0.25	193.87	4,857.3	-87.3	-56.7	-59.5	0.24	0.24	10.52
4,887.0	0.25	183.60	4,882.3	-87.4	-56.7	-59.6	0.18	0.00	-41.08
4,912.0	0.06	151.11	4,907.3	-87.4	-56.7	-59.7	0.81	-0.76	-129.96
4,937.0	0.25	180.94	4,932.3	-87.5	-56.7	-59.7	0.80	0.76	119.32
4,962.0	0.15	168.36	4,957.3	-87.6	-56.7	-59.8	0.43	-0.40	-50.32
4,987.0	0.10	157.29	4,982.3	-87.6	-56.7	-59.9	0.22	-0.20	-44.28
5,012.0	0.21	167.22	5,007.3	-87.7	-56.7	-59.9	0.45	0.44	39.72
5,037.0	0.29	181.22	5,032.3	-87.8	-56.7	-60.0	0.40	0.32	56.00
5,062.0	0.14	159.55	5,057.3	-87.9	-56.6	-60.1	0.67	-0.60	-86.68
5,087.0	0.31	170.21	5,082.3	-88.0	-56.6	-60.2	0.70	0.68	42.64
5,112.0	0.24	172.36	5,107.3	-88.1	-56.6	-60.3	0.28	-0.28	8.60
5,137.0	0.21	181.37	5,132.3	-88.2	-56.6	-60.4	0.19	-0.12	36.04
5,162.0	0.24	173.02	5,157.3	-88.3	-56.6	-60.5	0.18	0.12	-33.40
5,187.0	0.22	160.56	5,182.3	-88.4	-56.6	-60.6	0.21	-0.08	-49.84
5,212.0	0.29	177.77	5,207.3	-88.5	-56.5	-60.7	0.41	0.28	68.84
5,237.0	0.25	174.95	5,232.3	-88.6	-56.5	-60.8	0.17	-0.16	-11.28
5,262.0	0.07	110.15	5,257.3	-88.7	-56.5	-60.9	0.92	-0.72	-259.20
5,287.0	0.10	112.54	5,282.3	-88.7	-56.5	-60.9	0.12	0.12	9.56
5,312.0	0.17	161.97	5,307.3	-88.8	-56.5	-61.0	0.52	0.28	197.72
5,337.0	0.19	175.75	5,332.3	-88.8	-56.4	-61.0	0.19	0.08	55.12
5,362.0	0.17	185.57	5,357.3	-88.9	-56.4	-61.1	0.15	-0.08	39.28
5,387.0	0.20	184.14	5,382.3	-89.0	-56.4	-61.2	0.12	0.12	-5.72
5,412.0	0.14	177.19	5,407.3	-89.1	-56.5	-61.3	0.25	-0.24	-27.80
5,437.0	0.09	197.41	5,432.3	-89.1	-56.5	-61.3	0.25	-0.20	80.88
5,462.0	0.12	221.14	5,457.3	-89.2	-56.5	-61.3	0.21	0.12	94.92
5,487.0	0.12	220.25	5,482.3	-89.2	-56.5	-61.4	0.01	0.00	-3.56
5,512.0	0.20	223.37	5,507.3	-89.2	-56.6	-61.4	0.32	0.32	12.48
5,537.0	0.24	226.83	5,532.3	-89.3	-56.6	-61.4	0.17	0.16	13.84
5,562.0	0.25	234.99	5,557.3	-89.4	-56.7	-61.5	0.15	0.04	32.64
5,587.0	0.13	204.36	5,582.3	-89.4	-56.8	-61.5	0.61	-0.48	-122.52
5,612.0	0.24	206.07	5,607.3	-89.5	-56.8	-61.5	0.44	0.44	6.84
5,637.0	0.35	204.04	5,632.3	-89.6	-56.9	-61.6	0.44	0.44	-8.12
5,662.0	0.33	196.78	5,657.3	-89.8	-56.9	-61.7	0.19	-0.08	-29.04

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Scientific Drilling International  
Survey Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	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)	
5,687.0	0.23	220.20	5,682.3	-89.9	-57.0	-61.8	0.60	-0.40	93.68	
5,712.0	0.22	201.32	5,707.3	-90.0	-57.0	-61.9	0.30	-0.04	-75.52	
5,737.0	0.32	206.53	5,732.3	-90.1	-57.1	-62.0	0.41	0.40	20.84	
5,762.0	0.14	220.86	5,757.3	-90.2	-57.1	-62.0	0.75	-0.72	57.32	
5,787.0	0.19	203.47	5,782.3	-90.2	-57.1	-62.1	0.28	0.20	-69.56	
5,812.0	0.04	213.39	5,807.3	-90.3	-57.2	-62.1	0.60	-0.60	39.68	
5,837.0	0.10	201.59	5,832.3	-90.3	-57.2	-62.1	0.25	0.24	-47.20	
5,862.0	0.27	191.98	5,857.3	-90.4	-57.2	-62.2	0.69	0.68	-38.44	
5,887.0	0.06	150.91	5,882.3	-90.4	-57.2	-62.2	0.91	-0.84	-164.28	
5,912.0	0.23	224.67	5,907.3	-90.5	-57.2	-62.3	0.88	0.68	295.04	
5,937.0	0.22	220.96	5,932.3	-90.6	-57.3	-62.3	0.07	-0.04	-14.84	
5,962.0	0.14	214.84	5,957.3	-90.6	-57.4	-62.3	0.33	-0.32	-24.48	
5,987.0	0.06	211.55	5,982.3	-90.7	-57.4	-62.4	0.32	-0.32	-13.16	
6,012.0	0.22	220.57	6,007.3	-90.7	-57.4	-62.4	0.64	0.64	36.08	
6,037.0	0.10	195.49	6,032.3	-90.8	-57.5	-62.4	0.54	-0.48	-100.32	
6,062.0	0.13	175.88	6,057.3	-90.8	-57.5	-62.5	0.20	0.12	-78.44	
6,087.0	0.13	248.92	6,082.3	-90.8	-57.5	-62.5	0.62	0.00	292.16	
6,096.0	0.18	244.99	6,091.3	-90.9	-57.5	-62.5	0.57	0.56	-43.67	
<b>Last Gyro @ 6096</b>										
6,187.0	0.07	50.23	6,182.3	-90.9	-57.6	-62.5	0.27	-0.12	181.58	
<b>First SDI MWD @ 6187</b>										
6,218.0	0.32	260.78	6,213.3	-90.9	-57.7	-62.5	1.23	0.81	-482.10	
6,281.0	0.10	303.48	6,276.3	-90.9	-57.9	-62.4	0.41	-0.35	67.78	
6,375.0	1.95	324.02	6,370.2	-89.5	-58.9	-60.8	1.98	1.97	21.85	
6,406.0	6.67	321.65	6,401.1	-87.7	-60.3	-58.5	15.23	15.23	-7.65	
6,438.0	10.91	327.69	6,432.8	-83.7	-63.1	-53.8	13.54	13.25	18.88	
6,469.0	13.53	329.94	6,463.1	-78.1	-66.5	-47.3	8.59	8.45	7.26	
6,501.0	17.08	332.33	6,493.9	-70.7	-70.5	-38.9	11.27	11.09	7.47	
6,532.0	20.00	332.12	6,523.3	-61.9	-75.1	-29.1	9.42	9.42	-0.68	
6,563.0	22.39	334.15	6,552.2	-51.9	-80.2	-17.9	8.06	7.71	6.55	
6,595.0	25.32	337.11	6,581.5	-40.1	-85.5	-5.0	9.89	9.16	9.25	
6,626.0	28.45	339.13	6,609.1	-27.1	-90.7	9.0	10.52	10.10	6.52	
6,638.0	29.72	338.81	6,619.6	-21.7	-92.8	14.9	10.64	10.56	-2.69	
<b>Middlesex @ 6638</b>										
6,658.0	31.83	338.32	6,636.8	-12.2	-96.5	25.1	10.64	10.57	-2.43	
6,689.0	35.89	335.77	6,662.5	3.7	-103.3	42.3	13.87	13.10	-8.23	
6,720.0	40.03	333.99	6,687.0	21.0	-111.4	61.4	13.81	13.35	-5.74	
6,752.0	43.77	332.78	6,710.8	40.1	-121.0	82.7	11.96	11.69	-3.78	
6,783.0	48.06	332.64	6,732.3	59.9	-131.2	104.9	13.84	13.84	-0.45	
6,808.0	51.38	333.28	6,748.5	76.8	-139.9	123.9	13.43	13.29	2.58	
<b>Burket @ 6808</b>										
6,814.0	52.18	333.43	6,752.2	81.1	-142.0	128.6	13.43	13.30	2.43	
6,845.0	56.19	335.12	6,770.3	103.7	-152.9	153.6	13.67	12.94	5.45	
6,858.0	58.10	335.37	6,777.4	113.6	-157.4	164.5	14.77	14.68	1.38	
<b>Tully @ 6858</b>										





Scientific Drilling International  
Survey Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Antero NE

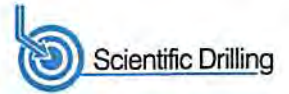
Survey

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)	
6,877.0	60.89	335.72	6,787.0	128.5	-164.2	180.9	14.77	14.69	1.84	
6,908.0	65.94	337.18	6,800.9	153.9	-175.3	208.6	16.83	16.29	4.71	
6,939.0	69.63	338.35	6,812.6	180.5	-186.1	237.3	12.41	11.90	3.77	
6,955.0	70.70	339.16	6,818.1	194.5	-191.6	252.3	8.22	6.70	5.06	
<b>Marcellus @ 6955</b>										
6,970.0	71.71	339.91	6,822.9	207.8	-196.6	266.5	8.22	6.72	5.00	
7,002.0	73.03	339.98	6,832.6	236.5	-207.0	297.0	4.13	4.13	0.22	
7,033.0	75.80	340.16	6,840.9	264.5	-217.2	326.8	8.95	8.94	0.58	
7,064.0	80.38	339.65	6,847.3	293.0	-227.6	357.2	14.86	14.77	-1.65	
7,154.0	89.43	336.13	6,855.3	376.0	-261.3	446.7	10.78	10.06	-3.91	
7,247.0	89.90	336.36	6,855.8	461.1	-298.8	539.7	0.56	0.51	0.25	
7,341.0	91.31	337.76	6,854.8	547.6	-335.4	633.6	2.11	1.50	1.49	
7,435.0	91.31	339.75	6,852.7	635.2	-369.5	727.6	2.12	0.00	2.12	
7,529.0	89.77	338.72	6,851.8	723.1	-402.8	821.6	1.97	-1.64	-1.10	
7,623.0	91.34	337.52	6,850.9	810.3	-437.8	915.5	2.10	1.67	-1.28	
7,716.0	90.57	336.62	6,849.4	896.0	-474.1	1,008.5	1.27	-0.83	-0.97	
7,810.0	90.84	336.43	6,848.2	982.2	-511.5	1,102.5	0.35	0.29	-0.20	
7,904.0	91.58	337.18	6,846.2	1,068.6	-548.5	1,196.5	1.12	0.79	0.80	
7,998.0	90.17	333.06	6,844.8	1,153.8	-588.0	1,290.3	4.63	-1.50	-4.38	
8,092.0	91.44	336.58	6,843.5	1,238.9	-628.0	1,384.1	3.98	1.35	3.74	
8,185.0	92.81	340.35	6,840.0	1,325.3	-662.1	1,477.1	4.31	1.47	4.05	
8,279.0	90.64	337.88	6,837.2	1,413.1	-695.6	1,571.0	3.50	-2.31	-2.63	
8,373.0	89.66	338.39	6,836.9	1,500.3	-730.6	1,665.0	1.18	-1.04	0.54	
8,467.0	90.07	336.82	6,837.1	1,587.2	-766.4	1,759.0	1.73	0.44	-1.67	
8,561.0	90.13	339.66	6,837.0	1,674.5	-801.3	1,853.0	3.02	0.06	3.02	
8,654.0	91.44	344.38	6,835.7	1,762.9	-830.0	1,945.7	5.27	1.41	5.08	
8,748.0	91.38	340.19	6,833.4	1,852.4	-858.6	2,039.4	4.46	-0.06	-4.46	
8,842.0	90.44	338.78	6,831.9	1,940.4	-891.5	2,133.3	1.80	-1.00	-1.50	
8,936.0	89.93	337.78	6,831.6	2,027.8	-926.3	2,227.3	1.19	-0.54	-1.06	
9,029.0	90.23	338.13	6,831.5	2,114.0	-961.2	2,320.3	0.50	0.32	0.38	
9,123.0	91.48	341.58	6,830.1	2,202.2	-993.6	2,414.2	3.90	1.33	3.67	
9,217.0	90.44	338.86	6,828.5	2,290.6	-1,025.4	2,508.1	3.10	-1.11	-2.89	
9,311.0	90.47	338.40	6,827.7	2,378.1	-1,059.6	2,602.1	0.49	0.03	-0.49	
9,404.0	90.57	337.75	6,826.9	2,464.4	-1,094.3	2,695.1	0.71	0.11	-0.70	
9,498.0	90.57	336.75	6,826.0	2,551.1	-1,130.7	2,789.1	1.06	0.00	-1.06	
9,592.0	90.97	339.15	6,824.7	2,638.2	-1,166.0	2,883.1	2.59	0.43	2.55	
9,686.0	91.28	340.94	6,822.9	2,726.5	-1,198.0	2,977.0	1.93	0.33	1.90	
9,780.0	89.20	336.54	6,822.5	2,814.1	-1,232.1	3,070.9	5.18	-2.21	-4.68	
9,874.0	88.83	336.06	6,824.1	2,900.2	-1,269.9	3,164.9	0.64	-0.39	-0.51	
9,969.0	90.54	337.96	6,824.6	2,987.6	-1,307.0	3,259.9	2.69	1.80	2.00	
10,063.0	91.24	338.72	6,823.1	3,075.0	-1,341.7	3,353.9	1.10	0.74	0.81	
10,157.0	89.70	339.04	6,822.4	3,162.7	-1,375.6	3,447.8	1.67	-1.64	0.34	
10,251.0	89.60	337.07	6,822.9	3,249.8	-1,410.7	3,541.8	2.10	-0.11	0.21	

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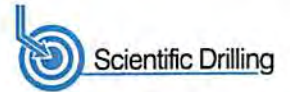
Scientific Drilling International  
Survey Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WW	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	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)
10,345.0	90.13	337.68	6,823.2	3,336.6	-1,446.8	3,635.8	0.86	0.56	0.65
10,439.0	90.40	336.86	6,822.7	3,423.9	-1,481.6	3,729.8	1.29	0.29	1.26
10,534.0	91.74	341.17	6,821.0	3,513.2	-1,514.1	3,824.7	2.81	1.41	2.43
10,628.0	90.67	334.86	6,819.0	3,600.3	-1,549.3	3,918.7	6.81	-1.14	-6.71
10,722.0	91.68	337.74	6,817.1	3,686.3	-1,587.0	4,012.6	3.25	1.07	3.06
10,816.0	90.67	335.53	6,815.1	3,772.6	-1,624.3	4,106.5	2.58	-1.07	-2.35
10,910.0	91.34	339.67	6,813.5	3,859.5	-1,660.1	4,200.5	4.46	0.71	4.40
11,004.0	91.04	334.30	6,811.5	3,945.9	-1,696.9	4,294.4	5.72	-0.32	-5.71
11,098.0	91.07	334.42	6,809.8	4,030.7	-1,737.5	4,388.3	0.13	0.03	0.13
11,192.0	90.64	333.59	6,808.4	4,115.1	-1,778.7	4,482.0	0.99	-0.46	-0.88
11,287.0	91.98	335.53	6,806.2	4,200.9	-1,819.5	4,576.8	2.48	1.41	2.04
11,381.0	91.98	333.93	6,803.0	4,285.8	-1,859.6	4,670.6	1.70	0.00	-1.70
11,475.0	91.11	337.72	6,800.4	4,371.6	-1,898.1	4,764.5	4.14	-0.93	4.03
11,569.0	90.67	336.97	6,799.0	4,458.3	-1,934.3	4,858.5	0.92	-0.47	-0.60
11,663.0	91.07	339.76	6,797.5	4,545.7	-1,968.9	4,952.5	3.00	0.43	2.97
11,757.0	91.78	339.94	6,795.2	4,633.9	-2,001.3	5,046.4	0.78	0.76	0.19
11,851.0	90.80	337.75	6,793.1	4,721.5	-2,035.2	5,140.3	2.55	-1.04	-2.33
11,945.0	90.60	336.17	6,791.9	4,808.0	-2,072.0	5,234.3	1.69	-0.21	-1.68
12,039.0	90.80	338.73	6,790.8	4,894.8	-2,108.0	5,328.3	2.73	0.21	2.72
12,133.0	91.85	336.99	6,788.6	4,981.8	-2,143.5	5,422.3	2.16	1.12	-1.85
12,227.0	89.30	331.20	6,787.7	5,066.3	-2,184.5	5,516.0	6.73	-2.71	-6.16
12,321.0	91.91	337.07	6,786.7	5,150.9	-2,225.5	5,609.8	6.83	2.78	6.24
12,416.0	90.64	335.10	6,784.6	5,237.7	-2,264.0	5,704.7	2.47	-1.34	-2.07
12,510.0	91.17	337.80	6,783.1	5,323.9	-2,301.5	5,798.6	2.93	0.56	2.87
12,604.0	92.38	341.15	6,780.2	5,411.8	-2,334.5	5,892.5	3.79	1.29	3.56
12,698.0	91.71	339.63	6,776.8	5,500.3	-2,366.0	5,986.4	1.77	-0.71	-1.62
12,792.0	91.84	339.78	6,773.9	5,588.4	-2,398.6	6,080.3	0.21	0.14	0.16
12,887.0	92.01	339.52	6,770.7	5,677.5	-2,431.6	6,175.2	0.33	0.18	-0.27
12,981.0	91.04	341.73	6,768.2	5,766.1	-2,462.8	6,269.1	2.57	-1.03	2.35
13,075.0	91.11	341.68	6,766.4	5,855.3	-2,492.3	6,362.8	0.09	0.07	-0.05
13,169.0	90.54	337.56	6,765.1	5,943.4	-2,525.0	6,456.8	4.42	-0.61	-4.38
13,263.0	91.31	341.25	6,763.6	6,031.4	-2,558.1	6,550.7	4.01	0.82	3.93
13,358.0	89.73	339.18	6,762.7	6,120.8	-2,590.2	6,645.6	2.74	-1.66	-2.18
13,452.0	90.74	343.19	6,762.3	6,209.7	-2,620.5	6,739.4	4.40	1.07	4.27
13,546.0	89.80	340.57	6,761.9	6,299.0	-2,649.8	6,833.2	2.96	-1.00	-2.79
13,640.0	90.70	342.06	6,761.5	6,388.1	-2,679.9	6,927.0	1.85	0.96	1.59
13,734.0	90.07	337.22	6,760.8	6,476.2	-2,712.6	7,020.9	5.19	-0.67	-5.15
13,828.0	91.34	341.49	6,759.7	6,564.1	-2,745.7	7,114.9	4.74	1.35	4.54
13,922.0	89.23	335.92	6,759.2	6,651.7	-2,779.8	7,208.8	6.34	-2.24	-5.93
14,016.0	88.39	335.41	6,761.2	6,737.3	-2,818.5	7,302.7	1.05	-0.89	-0.54
14,110.0	88.26	335.40	6,763.9	6,822.7	-2,857.7	7,396.6	0.14	-0.14	-0.01
14,204.0	89.83	338.56	6,765.5	6,908.6	-2,895.9	7,490.5	2.08	1.67	1.67
14,298.0	89.73	334.41	6,765.8	6,994.1	-2,934.9	7,584.4	2.29	-0.11	-0.11



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Grape Unit 1H
<b>Project:</b>	Doddridge County WV	<b>TVD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Site:</b>	Cofor Pad: Outback Morton Nova Grape Rainer	<b>MD Reference:</b>	1189' GL + 25' KB @ 1214.0usft (Patterson 347)
<b>Well:</b>	Grape Unit 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	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)
14,392.0	91.54	335.46	6,764.8	7,079.2	-2,974.7	7,678.3	2.23	1.93	1.12
14,486.0	89.90	330.98	6,763.6	7,163.1	-3,017.1	7,772.0	5.07	-1.74	-4.77
14,580.0	90.23	334.75	6,763.5	7,246.8	-3,059.9	7,865.6	4.03	0.35	4.01
14,674.0	92.35	339.94	6,761.4	7,333.4	-3,096.1	7,959.5	5.96	2.26	5.52
14,769.0	89.80	335.39	6,759.6	7,421.3	-3,132.2	8,054.5	5.49	-2.68	-4.79
14,863.0	90.54	338.45	6,759.3	7,507.7	-3,169.0	8,148.4	3.35	0.79	3.26
14,957.0	90.70	337.92	6,758.3	7,595.0	-3,204.0	8,242.4	0.59	0.17	-0.56
15,051.0	90.37	337.26	6,757.4	7,681.9	-3,239.8	8,336.4	0.78	-0.35	-0.70
15,145.0	89.83	337.76	6,757.3	7,768.7	-3,275.8	8,430.4	0.78	-0.57	0.53
15,239.0	90.67	337.64	6,756.9	7,855.7	-3,311.4	8,524.4	0.90	0.89	-0.13
15,333.0	90.50	336.38	6,755.9	7,942.2	-3,348.1	8,618.4	1.35	-0.18	-1.34
15,427.0	89.90	334.06	6,755.6	8,027.6	-3,387.5	8,712.3	2.55	-0.64	-2.47
15,496.0	90.27	333.32	6,755.5	8,089.4	-3,418.1	8,781.1	1.20	0.54	-1.07
<b>Last SDI MWD @ 15496</b>									
15,556.0	90.27	333.32	6,755.2	8,143.0	-3,445.1	8,840.9	0.00	0.00	0.00
<b>Projection To Bit @ 15556 MD / 6755 TVD</b>									

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,638.0	6,619.6	Middlesex @ 6638		0.00	
6,808.0	6,748.5	Burket @ 6808		0.00	
6,858.0	6,777.4	Tully @ 6858		0.00	
6,955.0	6,818.1	Marcellus @ 6955		0.00	

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,096.0	6,091.3	-90.9	-57.5	Last Gyro @ 6096
6,187.0	6,182.3	-90.9	-57.6	First SDI MWD @ 6187
15,496.0	6,755.5	8,089.4	-3,418.1	Last SDI MWD @ 15496
15,556.0	6,755.2	8,143.0	-3,445.1	Projection To Bit @ 15556 MD / 6755 TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

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