



Richard Unit 1H
Doddridge County WV
Northing: 14242012.02
Easting: 1747841.28
As Drilled



WELL DETAILS Richard Unit 1H
 Created Level: 1331.0
 Easting: 1747841.28
 Northing: 14242012.02
 Longitude: 80° 37' 14.538 W
 Latitude: 39° 13' 9.508 N

PROJECT DETAILS: Doddridge County WV
 Geologic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83 CONUS)
 Ellipsoid: Clarke 1866
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level

SITE DETAILS:
 Hughes Pacific/Balton/Carolee/Exam/ine/Gully/Hughes/Gul
 Carolee/Balton/McClain/Richard/Eastman/Hughes/Gul
 Site Centre Northing: 14242014.55
 Easting: 1747814.24
 Positional Uncertainty: 2.0
 Convergence: 0.24
 Local North: Grid

LEGEND

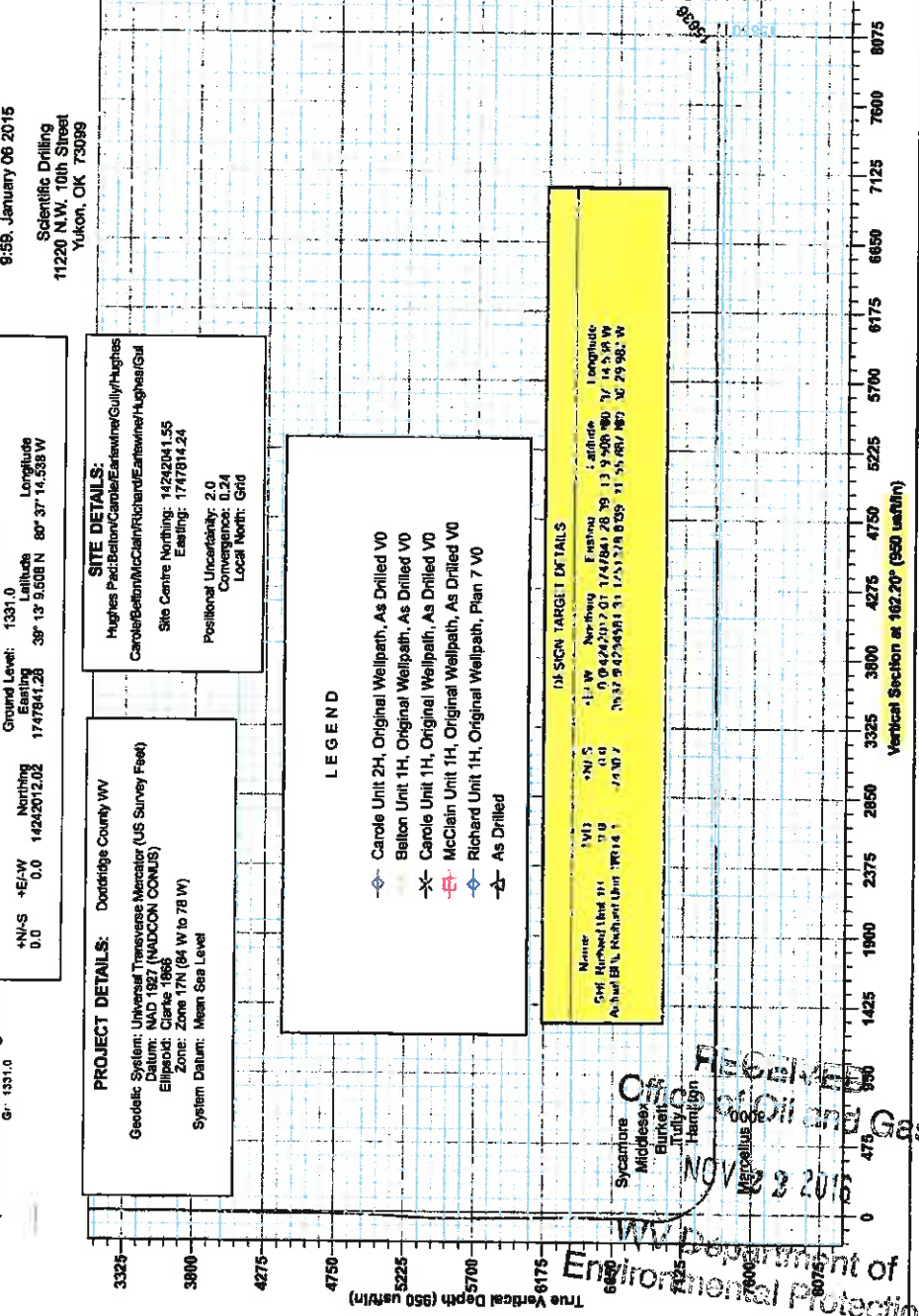
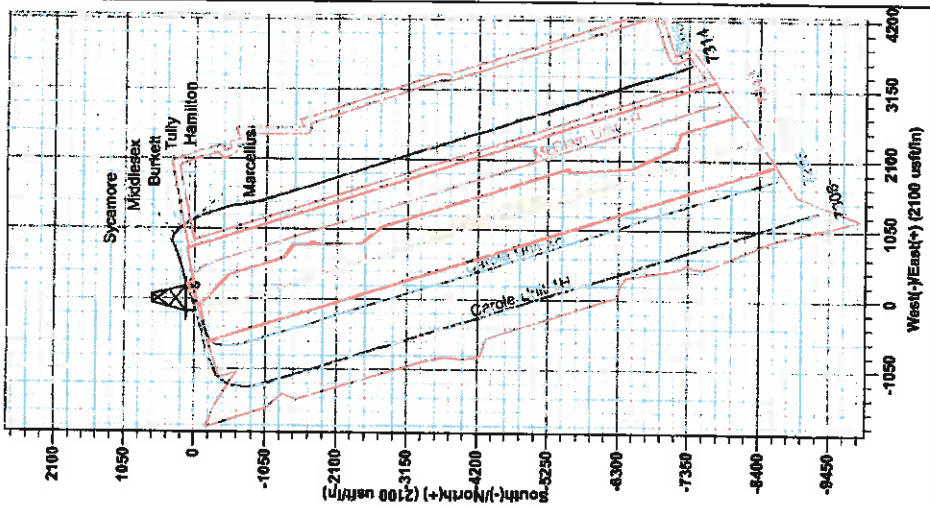
- Carolee Unit 2H, Original Wellpath, As Drilled V0
- Balton Unit 1H, Original Wellpath, As Drilled V0
- Carolee Unit 1H, Original Wellpath, As Drilled V0
- McClain Unit 1H, Original Wellpath, As Drilled V0
- Richard Unit 1H, Original Wellpath, Plan 7 V0
- As Drilled

DE SIGN TARGET DETAILS

Name	UWI	UWI S	UWI W	Northing	Easting	Latitude	Longitude
Carolee Richard Unit 1H	0.0	0.0	0.0	14242012.02	1747841.28	39 13 9.508 N	80 37 14.538 W
Actual B/L Richard Unit 1H	17014.1	17490.7	17937.9	14242012.02	1747841.28	39 13 9.508 N	80 37 14.538 W

To convert Magnetic North to Grid, Subtract 8.24"
 To convert True North to Grid, Subtract 0.24"

Azimuths to Grid North
 True North: -0.24"
 Magnetic North: -8.82"
 Magnetic Field
 Strength: 52163.95nT
 Dip Angle: 66.77°
 Date: 10/3/2014
 Model: BGGM2014



Office of Oil and Gas
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 Environmental Protection Department of



Antero

Doddridge County WV

Hughes Pad:Belton/Carole/Earlewine/Gully/Hughes

Richard Unit 1H

Original Wellpath

Design: As Drilled

EOW Completion Report

06 January, 2015



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**WV Department of
Environmental Protection**



Company: Antero
Project: Doddridge County WV
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh-
Well: Richard Unit 1H
Wellbore: Original Wellpath
Design: As Drilled
Local Co-ordinate Reference: Well Richard Unit 1H
TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Project	Doddridge County WV, McClellan District		
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 Hughes Pad:Belton/Carole/Earlewine/Gully/Hughes
Site Position:
From: Map
Position Uncertainty: 2.0 usft
Northing: 14,242,041.55 usft
Easting: 1,747,814.24 usft
Slot Radius: 13-3/16"
Latitude: 39° 13' 9.801 N
Longitude: 80° 37' 14.880 W
Grid Convergence: 0.24 °

Well Richard Unit 1H, Marcellus
Well Position +N/-S 0.0 usft
Position Uncertainty +E/-W 0.0 usft 2.0 usft
Northing: 14,242,012.02 usft
Easting: 1,747,841.28 usft
Wellhead Elevation: 1,350.0 usft
Latitude: 39° 13' 9.508 N
Longitude: 80° 37' 14.538 W
Ground Level: 1,331.0 usft

Wellbore	Original Wellpath					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)	
	BGGM2014	10/3/2014	-8.58	66.77	52,164	

Design As Drilled
Audit Notes:
Version: 1.0
Vertical Section:
Phase: ACTUAL
Tie On Depth: 0.0
Depth From (TVD) (usft) 0.0
+N/-S (usft) 0.0
+E/-W (usft) 0.0
Direction (°) 162.20

Survey Program	Date 1/6/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
31.0	6,841.0	Survey #4 Final Gyro (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
6,891.0	15,636.0	Survey #5 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLog (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
31.0	0.12	273.33	31.0	0.0	0.0	0.0	0.39
56.0	0.24	273.33	56.0	0.0	-0.1	0.0	0.48
81.0	0.36	273.33	81.0	0.0	-0.2	-0.1	0.48
106.0	0.48	273.33	106.0	0.0	-0.4	-0.2	0.48
131.0	0.53	283.44	131.0	0.1	-0.6	-0.3	0.41
156.0	0.45	279.29	156.0	0.1	-0.9	-0.4	0.35
181.0	0.45	277.78	181.0	0.1	-1.2	-0.4	0.05
206.0	0.35	261.53	206.0	0.1	-1.2	-0.5	0.60
231.0	0.23	266.16	231.0	0.1	-1.3	-0.5	0.49
256.0	0.19	253.75	256.0	0.1	-1.4	-0.5	0.24

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Project: Doddridge County WV
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh
Well: Richard Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Richard Unit 1H
TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
281.0	0.15	251.62	281.0	0.1	-1.5	-0.5	0.16
306.0	0.13	298.03	306.0	0.1	-1.6	-0.6	0.45
331.0	0.16	251.25	331.0	0.1	-1.6	-0.6	0.47
356.0	0.14	232.28	356.0	0.1	-1.7	-0.6	0.21
381.0	0.16	233.59	381.0	0.0	-1.7	-0.5	0.08
406.0	0.12	231.56	406.0	0.0	-1.8	-0.5	0.16
431.0	0.12	190.30	431.0	-0.1	-1.8	-0.5	0.34
456.0	0.14	184.59	456.0	-0.1	-1.8	-0.4	0.10
481.0	0.12	151.48	481.0	-0.2	-1.8	-0.4	0.31
506.0	0.12	181.59	506.0	-0.2	-1.8	-0.3	0.25
531.0	0.20	148.28	531.0	-0.3	-1.8	-0.3	0.48
556.0	0.15	123.09	556.0	-0.3	-1.7	-0.2	0.36
581.0	0.10	138.32	581.0	-0.4	-1.7	-0.2	0.24
606.0	0.18	129.34	606.0	-0.4	-1.6	-0.1	0.33
631.0	0.25	141.28	631.0	-0.5	-1.6	0.0	0.33
656.0	0.22	140.62	656.0	-0.6	-1.5	0.1	0.12
681.0	0.16	134.04	681.0	-0.6	-1.4	0.2	0.25
706.0	0.22	137.55	706.0	-0.7	-1.4	0.2	0.24
731.0	0.29	143.96	731.0	-0.8	-1.3	0.3	0.30
756.0	0.32	146.68	756.0	-0.9	-1.2	0.5	0.13
781.0	0.28	139.93	781.0	-1.0	-1.2	0.6	0.21
806.0	0.28	155.57	806.0	-1.1	-1.1	0.7	0.30
831.0	0.11	162.52	831.0	-1.2	-1.1	0.8	0.69
856.0	0.13	169.02	856.0	-1.2	-1.1	0.8	0.10
881.0	0.07	212.36	881.0	-1.3	-1.1	0.9	0.37
906.0	0.02	225.50	906.0	-1.3	-1.1	0.9	0.20
931.0	0.04	194.24	931.0	-1.3	-1.1	0.9	0.10
956.0	0.08	27.53	956.0	-1.3	-1.1	0.9	0.48
981.0	0.14	121.64	981.0	-1.3	-1.0	0.9	0.66
1,006.0	0.08	141.95	1,006.0	-1.3	-1.0	0.9	0.28
1,031.0	0.08	123.64	1,031.0	-1.3	-1.0	1.0	0.10
1,056.0	0.09	158.01	1,056.0	-1.4	-0.9	1.0	0.20
1,081.0	0.15	185.46	1,081.0	-1.4	-0.9	1.1	0.33
1,106.0	0.12	245.62	1,106.0	-1.5	-1.0	1.1	0.55
1,131.0	0.13	169.70	1,131.0	-1.5	-1.0	1.1	0.62
1,156.0	0.15	191.39	1,156.0	-1.6	-1.0	1.2	0.22
1,181.0	0.15	202.98	1,181.0	-1.6	-1.0	1.2	0.12
1,206.0	0.14	214.48	1,206.0	-1.7	-1.0	1.2	0.12
1,231.0	0.43	166.29	1,231.0	-1.8	-1.0	1.2	1.41
1,256.0	0.07	170.51	1,256.0	-1.9	-1.0	1.5	1.44
1,281.0	0.14	271.28	1,281.0	-1.9	-1.0	1.5	0.67
1,306.0	0.07	277.72	1,306.0	-1.9	-1.1	1.5	0.28
1,331.0	0.07	322.86	1,331.0	-1.9	-1.1	1.5	0.21
1,356.0	0.06	172.71	1,356.0	-1.9	-1.1	1.5	0.50

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 WV Department of
 Environmental Protection



EOW Completion Report



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 1H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well: Richard Unit 1H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Survey

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (*/100usft)
1,381.0	0.13	248.08	1,381.0	-1.9	-1.1	1.5	0.51
1,406.0	0.07	221.40	1,406.0	-1.9	-1.2	1.5	0.30
1,431.0	0.12	177.26	1,431.0	-2.0	-1.2	1.5	0.34
1,456.0	0.09	197.29	1,456.0	-2.0	-1.2	1.6	0.19
1,481.0	0.13	219.91	1,481.0	-2.1	-1.2	1.6	0.23
1,506.0	0.17	233.93	1,506.0	-2.1	-1.3	1.6	0.22
1,531.0	0.14	214.57	1,531.0	-2.1	-1.3	1.6	0.24
1,556.0	0.09	262.88	1,556.0	-2.2	-1.3	1.7	0.42
1,581.0	0.14	241.06	1,581.0	-2.2	-1.4	1.7	0.26
1,606.0	0.18	258.16	1,606.0	-2.2	-1.5	1.7	0.25
1,631.0	0.08	240.02	1,631.0	-2.2	-1.5	1.7	0.43
1,656.0	0.11	275.79	1,656.0	-2.2	-1.6	1.7	0.26
1,681.0	0.02	27.33	1,681.0	-2.2	-1.6	1.6	0.48
1,706.0	0.06	315.12	1,706.0	-2.2	-1.6	1.8	0.23
1,731.0	0.10	207.73	1,731.0	-2.2	-1.6	1.6	0.52
1,756.0	0.11	265.82	1,756.0	-2.3	-1.6	1.8	0.41
1,781.0	0.16	226.34	1,781.0	-2.3	-1.7	1.7	0.41
1,806.0	0.11	260.46	1,806.0	-2.3	-1.7	1.7	0.37
1,831.0	0.09	254.80	1,831.0	-2.3	-1.8	1.7	0.09
1,856.0	0.09	255.40	1,856.0	-2.3	-1.8	1.7	0.00
1,881.0	0.07	290.97	1,881.0	-2.3	-1.8	1.6	0.21
1,906.0	0.06	296.74	1,906.0	-2.3	-1.9	1.6	0.05
1,931.0	0.05	43.95	1,931.0	-2.3	-1.9	1.6	0.35
1,956.0	0.09	42.99	1,956.0	-2.3	-1.9	1.6	0.16
1,981.0	0.07	31.21	1,981.0	-2.2	-1.8	1.6	0.10
2,006.0	0.07	289.12	2,006.0	-2.2	-1.8	1.6	0.44
2,031.0	0.04	262.41	2,031.0	-2.2	-1.9	1.6	0.15
2,056.0	0.10	305.19	2,056.0	-2.2	-1.9	1.5	0.30
2,081.0	0.14	318.95	2,081.0	-2.2	-1.9	1.5	0.20
2,106.0	0.04	320.83	2,106.0	-2.2	-2.0	1.5	0.40
2,131.0	0.21	321.69	2,131.0	-2.1	-2.0	1.4	0.68
2,156.0	0.07	322.72	2,156.0	-2.1	-2.0	1.3	0.56
2,181.0	0.17	313.61	2,181.0	-2.0	-2.1	1.3	0.41
2,206.0	0.12	323.65	2,206.0	-2.0	-2.1	1.2	0.22
2,231.0	0.20	5.09	2,231.0	-1.9	-2.1	1.2	0.54
2,256.0	0.06	7.21	2,256.0	-1.9	-2.1	1.1	0.56
2,281.0	0.14	345.46	2,281.0	-1.8	-2.1	1.1	0.35
2,306.0	0.27	310.48	2,306.0	-1.7	-2.2	1.0	0.70
2,331.0	0.03	348.25	2,331.0	-1.7	-2.2	0.9	0.99
2,356.0	0.09	333.30	2,356.0	-1.7	-2.2	0.9	0.25
2,381.0	0.15	330.96	2,381.0	-1.6	-2.2	0.8	0.24
2,406.0	0.09	48.11	2,406.0	-1.6	-2.2	0.8	0.83
2,431.0	0.11	256.56	2,431.0	-1.6	-2.3	0.8	0.78
2,456.0	0.03	187.62	2,456.0	-1.6	-2.3	0.8	0.41
2,481.0	0.05	14.62	2,481.0	-1.6	-2.3	0.8	0.32

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EOW Completion Report



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 1H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well: Richard Unit 1H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
2,506.0	0.12	12.96	2,506.0	-1.6	-2.3	0.8	0.28
2,531.0	0.37	54.25	2,531.0	-1.5	-2.2	0.7	1.16
2,556.0	1.16	55.89	2,556.0	-1.3	-1.9	0.6	3.16
2,581.0	2.48	63.70	2,581.0	-0.9	-1.2	0.5	5.36
2,606.0	3.17	56.92	2,605.9	-0.3	-0.2	0.2	3.06
2,631.0	3.71	55.88	2,630.9	0.5	1.1	-0.2	2.17
2,656.0	4.23	53.12	2,655.8	1.5	2.5	-0.7	2.22
2,681.0	5.24	48.93	2,680.8	2.8	4.1	-1.5	4.27
2,706.0	5.08	48.68	2,705.7	4.3	5.8	-2.4	0.65
2,731.0	5.57	51.50	2,730.5	5.8	7.6	-3.2	2.22
2,756.0	6.09	54.95	2,755.4	7.3	9.6	-4.0	2.51
2,781.0	6.30	59.28	2,780.3	8.8	11.9	-4.7	2.05
2,806.0	6.56	63.85	2,805.1	10.1	14.3	-5.3	2.30
2,831.0	6.55	63.73	2,829.9	11.4	16.9	-5.7	0.07
2,856.0	6.58	63.87	2,854.8	12.6	19.4	-6.1	0.14
2,881.0	6.53	62.92	2,879.6	13.9	22.0	-6.5	0.48
2,906.0	6.43	61.97	2,904.5	15.2	24.5	-7.0	0.59
2,931.0	6.38	61.56	2,929.3	16.6	27.0	-7.5	0.27
2,956.0	6.36	61.26	2,954.1	17.9	29.4	-8.0	0.16
2,981.0	6.19	61.13	2,979.0	19.2	31.8	-8.6	0.68
3,006.0	5.99	61.50	3,003.9	20.5	34.1	-9.1	0.82
3,031.0	5.51	63.35	3,028.7	21.6	36.3	-9.5	2.06
3,056.0	4.40	67.90	3,053.6	22.5	38.3	-9.7	4.71
3,081.0	3.47	74.05	3,078.6	23.1	39.9	-9.8	4.08
3,106.0	2.92	83.10	3,103.5	23.4	41.3	-9.6	2.98
3,131.0	2.30	97.55	3,128.5	23.4	42.4	-9.3	3.60
3,156.0	1.81	118.35	3,153.5	23.1	43.2	-8.8	3.54
3,181.0	1.77	119.86	3,178.5	22.8	43.9	-8.2	0.25
3,206.0	1.73	121.28	3,203.5	22.4	44.6	-7.7	0.24
3,231.0	1.16	127.06	3,228.5	22.0	45.1	-7.2	2.35
3,256.0	0.46	182.66	3,253.5	21.8	45.3	-6.9	3.91
3,281.0	0.97	260.56	3,278.5	21.6	45.1	-6.8	3.93
3,306.0	1.55	263.69	3,303.5	21.6	44.5	-6.9	2.34
3,331.0	1.59	263.22	3,328.4	21.5	43.9	-7.0	0.17
3,356.0	1.61	263.70	3,353.4	21.4	43.2	-7.2	0.10
3,381.0	1.68	259.68	3,378.4	21.3	42.5	-7.3	0.54
3,406.0	1.67	259.60	3,403.4	21.2	41.7	-7.4	0.04
3,431.0	1.65	256.46	3,428.4	21.0	41.0	-7.5	0.37
3,456.0	1.52	254.69	3,453.4	20.8	40.4	-7.5	0.56
3,481.0	1.49	252.07	3,478.4	20.7	39.7	-7.5	0.30
3,506.0	1.46	253.27	3,503.4	20.5	39.1	-7.5	0.17
3,531.0	1.35	251.43	3,528.4	20.3	38.5	-7.5	0.48
3,556.0	1.47	251.49	3,553.4	20.1	38.0	-7.5	0.48
3,581.0	1.39	253.17	3,578.4	19.9	37.4	-7.5	0.36

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EOW Completion Report



Company: Antero
Project: Doddridge County WV
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Well: Richard Unit 1H
Wellbore: Original Wellpath
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (%/100usft)
3,606.0	1.30	257.47	3,603.4	19.7	36.8	-7.6	0.54
3,631.0	0.86	279.81	3,628.3	19.7	36.3	-7.7	2.40
3,656.0	0.88	278.65	3,653.3	19.8	36.0	-7.8	0.11
3,681.0	0.85	280.11	3,678.3	19.8	35.6	-8.0	0.15
3,706.0	0.69	286.78	3,703.3	19.9	35.3	-8.2	0.73
3,731.0	0.86	278.00	3,728.3	20.0	34.9	-8.4	0.83
3,756.0	1.00	276.25	3,753.3	20.0	34.5	-8.5	0.57
3,781.0	0.71	280.57	3,778.3	20.1	34.2	-8.7	1.19
3,806.0	0.37	293.68	3,803.3	20.1	33.9	-8.8	1.44
3,831.0	0.25	311.95	3,828.3	20.2	33.8	-8.9	0.62
3,856.0	0.23	315.63	3,853.3	20.3	33.7	-9.0	0.10
3,881.0	0.32	314.61	3,878.3	20.4	33.7	-9.1	0.36
3,906.0	0.35	341.61	3,903.3	20.5	33.6	-9.2	0.64
3,931.0	0.38	326.90	3,928.3	20.6	33.5	-9.4	0.39
3,956.0	0.47	327.30	3,953.3	20.8	33.4	-9.6	0.36
3,981.0	0.57	328.31	3,978.3	21.0	33.3	-9.8	0.40
4,006.0	0.66	332.75	4,003.3	21.2	33.2	-10.1	0.41
4,031.0	0.67	327.61	4,028.3	21.5	33.0	-10.4	0.24
4,056.0	0.68	329.64	4,053.3	21.7	32.9	-10.6	0.10
4,081.0	0.65	326.46	4,078.3	22.0	32.7	-10.9	0.19
4,106.0	0.69	326.66	4,103.3	22.2	32.5	-11.2	0.16
4,131.0	0.69	332.43	4,128.3	22.5	32.4	-11.5	0.28
4,156.0	0.70	329.91	4,153.3	22.7	32.2	-11.8	0.13
4,181.0	0.68	329.25	4,178.3	23.0	32.1	-12.1	0.09
4,206.0	0.70	328.47	4,203.3	23.3	31.9	-12.4	0.09
4,231.0	0.65	327.97	4,228.3	23.5	31.8	-12.7	0.20
4,256.0	0.57	330.78	4,253.3	23.7	31.6	-12.9	0.34
4,281.0	0.50	322.74	4,278.3	23.9	31.5	-13.1	0.41
4,306.0	0.55	325.34	4,303.3	24.1	31.4	-13.4	0.22
4,331.0	0.45	320.49	4,328.3	24.3	31.3	-13.6	0.43
4,356.0	0.48	316.42	4,353.3	24.4	31.1	-13.8	0.18
4,381.0	0.56	297.99	4,378.3	24.6	30.9	-13.9	0.74
4,406.0	0.42	307.54	4,403.3	24.7	30.8	-14.1	0.65
4,431.0	0.43	319.60	4,428.3	24.8	30.6	-14.3	0.36
4,456.0	0.47	307.50	4,453.3	24.9	30.5	-14.4	0.41
4,481.0	0.48	303.61	4,478.3	25.1	30.3	-14.6	0.14
4,506.0	0.49	310.91	4,503.3	25.2	30.2	-14.8	0.25
4,531.0	0.49	307.42	4,528.3	25.3	30.0	-15.1	0.12
4,556.0	0.53	299.98	4,553.3	25.5	29.8	-15.3	0.31
4,581.0	0.51	307.06	4,578.3	25.6	29.6	-15.5	0.48
4,606.0	0.56	295.87	4,603.3	25.7	29.4	-15.5	0.48
4,631.0	0.50	312.43	4,628.3	25.8	29.2	-15.2	0.66
4,656.0	0.56	304.03	4,653.3	26.0	29.0	-15.8	0.39
4,681.0	0.52	309.37	4,678.3	26.1	28.9	-16.0	0.26

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EOW Completion Report



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 1H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well: Richard Unit 1H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Survey

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (*/100usft)
4,706.0	0.50	311.73	4,703.3	26.3	28.7	-16.2	0.12
4,731.0	0.61	306.00	4,728.3	26.4	28.5	-16.4	0.49
4,756.0	0.80	33.56	4,753.3	26.6	28.5	-16.6	3.94
4,781.0	1.59	49.39	4,778.3	27.0	28.8	-16.9	3.40
4,806.0	2.63	55.78	4,803.3	27.5	29.6	-17.2	4.26
4,831.0	3.56	54.65	4,828.2	28.3	30.7	-17.6	3.73
4,856.0	4.24	54.15	4,853.2	29.3	32.1	-18.1	2.72
4,881.0	5.06	55.05	4,878.1	30.5	33.7	-18.7	3.29
4,906.0	5.81	55.73	4,903.0	31.8	35.7	-19.4	3.01
4,931.0	6.70	56.73	4,927.8	33.3	37.9	-20.1	3.59
4,956.0	7.59	57.57	4,952.6	35.0	40.5	-21.0	3.58
4,981.0	8.30	57.79	4,977.4	36.9	43.5	-21.8	2.84
5,006.0	9.15	58.33	5,002.1	38.8	46.7	-22.7	3.42
5,031.0	9.89	58.32	5,026.8	41.0	50.2	-23.7	2.96
5,056.0	10.79	58.88	5,051.3	43.4	54.0	-24.8	3.62
5,081.0	11.40	59.66	5,075.9	45.8	58.2	-25.9	2.51
5,106.0	12.32	59.70	5,100.3	48.4	62.6	-27.0	3.66
5,131.0	12.54	59.62	5,124.8	51.2	67.3	-28.1	0.88
5,156.0	12.67	59.63	5,149.2	53.9	72.0	-29.3	0.52
5,181.0	13.40	59.53	5,173.5	56.8	76.8	-30.8	2.92
5,206.0	13.78	59.54	5,197.8	59.7	81.9	-31.9	1.52
5,231.0	14.42	59.28	5,222.1	62.8	87.1	-33.2	2.57
5,256.0	14.81	59.15	5,246.3	66.1	92.5	-34.6	1.57
5,281.0	15.66	59.21	5,270.4	69.4	98.2	-36.1	3.40
5,306.0	15.65	59.49	5,294.4	72.9	104.0	-37.6	0.30
5,331.0	16.87	59.64	5,318.4	76.4	110.0	-39.1	4.88
5,356.0	16.89	60.87	5,342.4	80.0	116.3	-40.6	1.43
5,381.0	17.64	62.37	5,366.2	83.6	122.9	-42.0	3.49
5,406.0	17.95	64.33	5,390.0	87.0	129.7	-43.2	2.70
5,431.0	18.64	66.09	5,413.8	90.3	136.8	-44.1	3.54
5,456.0	19.15	68.21	5,437.4	93.4	144.3	-44.8	3.42
5,481.0	19.51	69.62	5,461.0	96.4	152.0	-45.3	2.36
5,506.0	20.26	70.98	5,484.5	99.2	160.0	-45.6	3.52
5,531.0	20.90	71.55	5,507.9	102.1	168.3	-45.7	2.68
5,556.0	21.06	71.87	5,531.3	104.9	176.8	-45.8	0.79
5,581.0	21.61	72.01	5,554.6	107.7	185.5	-45.8	2.21
5,606.0	21.62	72.20	5,577.8	110.5	194.2	-45.9	0.28
5,631.0	22.17	72.29	5,601.0	113.4	203.1	-45.9	2.20
5,656.0	22.54	72.56	5,624.1	116.2	212.2	-45.8	1.54
5,681.0	22.02	73.36	5,647.3	119.0	221.0	-45.7	2.41
5,706.0	22.85	73.45	5,670.4	121.7	230.4	-45.5	3.32
5,731.0	23.40	73.45	5,693.4	124.5	239.8	-45.3	2.20
5,756.0	23.27	73.58	5,716.3	127.4	249.3	-45.0	0.56
5,781.0	24.04	73.89	5,739.2	130.2	258.9	-44.8	3.12

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Company: Antero
Project: Doddridge County WV
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh-
Well: Richard Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Richard Unit 1H
TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,806.0	24.64	73.61	5,762.0	133.0	268.8	-44.5	2.44
5,831.0	24.50	73.75	5,784.7	136.0	278.8	-44.2	0.61
5,856.0	25.20	73.58	5,807.4	138.9	288.9	-44.0	2.81
5,881.0	25.76	73.51	5,830.0	142.0	299.2	-43.7	2.24
5,906.0	25.83	74.11	5,852.5	145.0	309.6	-43.4	1.08
5,931.0	25.75	74.80	5,875.0	147.9	320.1	-43.0	1.24
5,956.0	26.31	75.45	5,897.5	150.7	330.7	-42.4	2.51
5,981.0	26.23	76.06	5,919.9	153.5	341.4	-41.7	1.13
6,006.0	27.15	76.49	5,942.2	156.1	352.3	-40.9	3.76
6,031.0	26.82	76.56	5,964.5	158.8	363.4	-40.1	1.33
6,056.0	27.40	76.73	5,986.8	161.4	374.5	-39.2	2.34
6,081.0	27.87	76.60	6,008.9	164.1	385.7	-38.3	1.90
6,106.0	27.83	76.07	6,031.0	166.8	397.1	-37.5	1.00
6,131.0	27.21	75.71	6,053.2	169.6	408.3	-36.7	2.57
6,156.0	26.50	74.87	6,075.5	172.5	419.2	-36.1	3.22
6,181.0	26.21	74.45	6,097.9	175.4	429.9	-35.6	1.38
6,206.0	26.37	73.75	6,120.3	178.5	440.6	-35.3	1.40
6,231.0	26.92	73.42	6,142.6	181.6	451.3	-35.0	2.28
6,256.0	27.66	73.20	6,164.9	184.9	462.3	-34.8	2.99
6,281.0	28.14	72.98	6,187.0	188.3	473.5	-34.6	1.96
6,306.0	28.63	73.10	6,208.9	191.8	484.9	-34.4	1.97
6,331.0	28.72	72.93	6,230.9	195.3	496.3	-34.2	0.49
6,356.0	28.33	72.63	6,252.8	198.8	507.7	-34.1	1.66
6,381.0	27.52	72.19	6,274.9	202.4	518.9	-34.1	3.34
6,406.0	26.52	71.08	6,297.2	206.0	529.7	-34.2	4.48
6,431.0	26.40	71.07	6,319.6	209.6	540.2	-34.4	0.48
6,456.0	26.82	71.01	6,341.9	213.2	550.8	-34.6	1.68
6,481.0	27.34	71.20	6,364.2	216.9	561.6	-34.8	2.11
6,506.0	27.76	71.66	6,386.4	220.6	572.5	-35.0	1.88
6,531.0	27.51	71.94	6,408.5	224.2	583.5	-35.1	1.13
6,556.0	27.54	72.49	6,430.7	227.7	594.6	-35.1	1.02
6,581.0	27.52	72.30	6,452.9	231.2	605.6	-35.0	0.36
6,606.0	27.30	71.91	6,475.0	234.8	616.5	-35.1	1.14
6,631.0	27.20	71.74	6,497.3	238.3	627.4	-35.1	0.51
6,656.0	27.28	71.83	6,519.5	241.9	638.3	-35.2	0.36
6,681.0	27.42	72.15	6,541.7	245.5	649.2	-35.3	0.81
6,706.0	27.54	71.68	6,563.9	249.0	660.2	-35.3	0.99
6,731.0	27.58	71.47	6,586.0	252.7	671.1	-35.4	0.42
6,756.0	27.45	71.04	6,608.2	256.4	682.1	-35.6	0.95
6,781.0	27.30	70.73	6,630.4	260.2	692.9	-35.9	0.83
6,806.0	27.19	70.38	6,652.6	264.0	703.7	-36.2	0.76
6,831.0	26.73	70.00	6,674.9	267.8	714.4	-36.6	1.96
6,841.0	26.64	69.86	6,683.9	269.4	718.6	-36.8	1.10
6,928.0	26.44	69.20	6,761.7	283.0	755.0	-38.6	0.41

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EOW Completion Report



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 1H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh-	MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well: Richard Unit 1H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
6,958.0	26.97	68.52	6,788.5	287.8	767.6	-39.4	2.04
6,988.0	27.33	66.83	6,815.2	293.0	780.3	-40.5	2.84
7,018.0	27.23	62.40	6,841.9	298.9	792.7	-42.3	6.78
7,048.0	26.54	56.02	6,868.6	305.8	804.3	-45.3	9.88
7,078.0	26.26	53.04	6,895.5	313.6	815.2	-49.4	4.51
7,107.0	25.58	58.89	6,921.6	320.7	825.7	-52.9	9.12
7,137.0	25.31	68.72	6,948.7	326.3	837.2	-54.8	14.09
7,167.0	26.35	77.93	6,975.7	330.1	849.7	-54.5	13.80
7,189.0	27.61	84.93	6,995.3	331.5	859.5	-52.9	15.52
Sycamore							
7,197.0	28.15	87.32	7,002.4	331.8	863.3	-52.0	15.52
7,227.0	29.59	94.77	7,028.7	331.5	877.7	-47.3	12.91
7,257.0	31.33	101.11	7,054.5	329.4	892.8	-40.7	12.18
7,286.0	32.93	107.00	7,079.1	325.6	907.7	-32.6	12.12
7,316.0	34.29	113.08	7,104.1	319.9	923.3	-22.4	12.09
7,346.0	35.42	118.00	7,128.7	312.5	938.7	-10.6	10.10
7,376.0	35.62	122.62	7,153.1	303.7	953.8	2.4	8.97
7,382.0	35.86	123.51	7,158.0	301.8	956.7	5.1	9.59
Middlesex							
7,406.0	36.90	126.98	7,177.3	293.6	968.3	16.5	9.59
7,436.0	40.14	130.19	7,200.8	281.9	982.9	32.0	12.69
7,465.0	44.00	132.02	7,222.3	269.2	997.5	48.7	13.96
7,495.0	47.53	134.57	7,243.2	254.4	1,013.2	67.5	13.25
7,525.0	50.56	137.23	7,262.9	238.1	1,028.9	87.8	12.12
7,554.0	53.43	140.28	7,280.8	221.0	1,044.0	108.8	12.91
7,557.0	53.81	140.42	7,282.5	219.1	1,045.5	111.0	13.24
Burkett							
7,584.0	57.24	141.65	7,297.8	201.8	1,059.5	131.7	13.24
7,598.0	59.27	141.99	7,305.2	192.4	1,066.9	142.9	14.68
Tully							
7,614.0	61.60	142.37	7,313.1	181.4	1,075.4	156.0	14.68
7,643.0	65.93	142.89	7,325.9	160.8	1,091.2	180.5	15.02
7,673.0	70.00	144.11	7,337.1	138.4	1,107.7	206.8	14.08
7,703.0	73.79	145.82	7,346.5	115.1	1,124.1	234.1	13.75
7,733.0	80.09	148.10	7,353.2	90.6	1,140.0	262.2	22.27
7,738.0	80.88	148.24	7,354.1	86.4	1,142.6	267.0	16.10
Hamilton							
7,758.0	84.06	148.77	7,356.7	69.5	1,153.0	286.3	16.10
7,816.0	91.18	151.10	7,359.1	19.4	1,182.0	342.9	12.91
7,830.0	90.64	151.82	7,358.9	7.1	1,188.6	355.6	6.44
Marcellus							
7,856.0	89.63	153.16	7,358.8	-16.0	1,200.7	382.2	6.14
7,945.0	90.40	158.17	7,358.8	-97.0	1,237.3	470.6	5.70
8,035.0	88.93	159.53	7,359.3	-181.0	1,269.8	568.2	2.23
8,124.0	90.71	161.05	7,359.6	-264.8	1,299.8	649.4	2.63

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EOW Completion Report



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 1H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh-	MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well: Richard Unit 1H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Survey

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLog (?/100usft)
8,214.0	90.44	160.97	7,358.7	-349.9	1,329.1	739.4	0.31
8,303.0	89.63	161.81	7,358.6	-434.2	1,357.5	828.4	1.31
8,393.0	91.01	166.84	7,358.1	-520.8	1,381.8	918.3	5.80
8,483.0	90.10	168.61	7,357.3	-608.8	1,400.9	1,007.9	2.21
8,572.0	90.03	171.01	7,357.2	-696.3	1,416.7	1,096.1	2.70
8,662.0	91.11	171.32	7,356.3	-785.3	1,430.5	1,185.0	1.25
8,751.0	90.47	167.91	7,355.0	-872.8	1,446.5	1,273.2	3.90
8,845.0	89.87	164.27	7,354.8	-964.0	1,469.1	1,367.0	3.92
8,939.0	89.50	162.71	7,355.3	-1,054.1	1,495.8	1,460.9	1.71
9,033.0	89.66	162.94	7,356.0	-1,143.9	1,523.6	1,554.9	0.30
9,127.0	91.85	164.47	7,354.9	-1,234.2	1,550.0	1,648.9	2.67
9,220.0	90.87	163.16	7,352.8	-1,323.4	1,575.9	1,741.8	1.64
9,314.0	89.83	162.84	7,352.3	-1,413.3	1,603.4	1,835.8	1.16
9,409.0	90.10	162.01	7,352.3	-1,503.9	1,632.1	1,930.8	0.92
9,503.0	89.53	161.73	7,352.6	-1,593.2	1,661.3	2,024.8	0.68
9,597.0	89.97	160.78	7,353.0	-1,682.2	1,691.5	2,118.8	1.11
9,691.0	90.47	162.32	7,352.7	-1,771.4	1,721.3	2,212.8	1.72
9,785.0	90.37	162.25	7,352.0	-1,860.9	1,749.9	2,306.8	0.13
9,875.0	90.44	161.98	7,351.4	-1,946.6	1,777.5	2,396.8	0.31
9,964.0	90.20	162.17	7,350.9	-2,031.3	1,804.9	2,485.8	0.34
10,054.0	90.94	163.53	7,350.0	-2,117.3	1,831.4	2,575.8	1.72
10,143.0	90.30	161.90	7,349.0	-2,202.2	1,857.9	2,664.8	1.97
10,233.0	90.50	161.40	7,348.4	-2,287.7	1,886.2	2,754.8	0.60
10,323.0	89.70	161.21	7,348.2	-2,372.9	1,915.0	2,844.7	0.91
10,412.0	90.67	161.87	7,347.9	-2,457.3	1,943.2	2,933.7	1.32
10,502.0	90.13	161.86	7,347.3	-2,542.9	1,971.2	3,023.7	0.60
10,591.0	90.87	163.71	7,346.5	-2,627.9	1,997.6	3,112.7	2.24
10,681.0	90.10	163.13	7,345.8	-2,714.1	2,023.3	3,202.7	1.07
10,770.0	90.67	162.50	7,345.2	-2,799.1	2,049.6	3,291.7	0.95
10,860.0	90.77	161.16	7,344.0	-2,884.6	2,077.6	3,381.7	1.49
10,949.0	90.34	162.06	7,343.2	-2,969.1	2,105.7	3,470.7	1.12
11,039.0	90.37	162.20	7,342.6	-3,054.7	2,133.3	3,560.7	0.16
11,129.0	90.44	162.62	7,342.0	-3,140.5	2,160.5	3,650.7	0.47
11,218.0	89.87	161.61	7,341.7	-3,225.2	2,187.8	3,739.7	1.30
11,308.0	89.56	162.94	7,342.2	-3,311.0	2,215.2	3,829.7	1.52
11,397.0	90.17	161.98	7,342.4	-3,395.8	2,242.1	3,918.6	1.28
11,487.0	90.37	163.43	7,342.0	-3,481.7	2,268.8	4,008.6	1.63
11,576.0	91.11	162.43	7,340.8	-3,566.8	2,294.9	4,097.6	1.40
11,665.0	91.04	162.22	7,339.2	-3,651.6	2,322.0	4,186.6	0.25
11,755.0	90.60	162.15	7,337.9	-3,737.3	2,349.5	4,276.6	0.50
11,845.0	89.80	162.38	7,337.5	-3,823.0	2,376.9	4,366.6	0.92
11,934.0	91.34	161.56	7,336.7	-3,907.6	2,404.4	4,455.6	0.86
12,024.0	90.40	161.74	7,335.3	-3,993.0	2,432.8	4,545.6	1.06
12,113.0	90.13	162.46	7,334.9	-4,077.7	2,460.1	4,632.6	0.88
12,203.0	91.28	163.55	7,333.8	-4,163.8	2,486.4	4,724.6	1.76

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EOW Completion Report



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 2H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference: Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well: Richard Unit 2H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
14,448.0	90.37	161.85	7,331.6	-6,018.7	3,771.2	6,883.4	1.09
14,538.0	90.60	163.54	7,330.9	-6,104.6	3,797.9	6,973.4	1.90
14,627.0	89.06	162.71	7,331.1	-6,189.8	3,823.8	7,062.4	1.97
14,717.0	89.16	162.13	7,332.5	-6,275.5	3,850.9	7,152.4	0.65
14,806.0	89.87	161.07	7,333.3	-6,360.0	3,879.0	7,241.3	1.43
14,896.0	90.47	162.96	7,333.0	-6,445.6	3,906.8	7,331.3	2.20
14,985.0	90.61	161.47	7,332.2	-6,530.3	3,934.0	7,420.3	1.68
15,075.0	90.40	162.91	7,331.4	-6,616.0	3,961.5	7,510.3	1.62
15,165.0	88.92	162.42	7,331.9	-6,701.9	3,988.3	7,600.3	1.73
15,245.0	88.59	162.57	7,333.6	-6,778.2	4,012.4	7,680.3	0.45
15,309.0	88.59	162.57	7,335.2	-6,839.2	4,031.6	7,744.3	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,198.0	6,861.0	446.5	1,446.4	Sycamore
7,382.0	7,025.6	466.8	1,526.0	Middlesex
7,598.0	7,206.0	429.1	1,634.7	Tully
7,830.0	7,334.4	278.1	1,747.3	Marcelius

Checked By: _____ Approved By: _____ Date: _____

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