

# RECEIVED

APR 22 2016

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV



**Antero**  
Hileman Unit 1H  
Doddridge County WV  
Northing: 14247201.15  
Easting: 1685675.80  
As Drilled

Frontier 22 CL 10537 \* KB 95 @ 1076.0out  
Gr: 1053.0

**REFERENCE INFORMATION**

Coordinate (AVG) Reference: West Hileman Unit 1H GSD North  
Easting (AVG) Reference: Zone 17N \* KB 29 @ 1076.0out  
Northing (AVG) Reference: Zone 17N \* KB 29 @ 1076.0out  
Measured Depth Reference: Frontier 22 CL 10537 \* KB 95 @ 1076.0out  
Calculation Method: Iteration Convergence

**PROJECT DETAILS:** Doddridge County WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: NAD 1983 (NAD83 CONUS)  
Elevation: Zone 17N (84 W to 78 W)  
System Datum: Mean Sea Level

Gene Lightfoot  
13.52, April 13 2015  
Scientific Drilling  
11220 NW 10th Street  
Yukon OK 73099



**WELL DETAILS:** Hileman Unit 1H

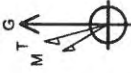
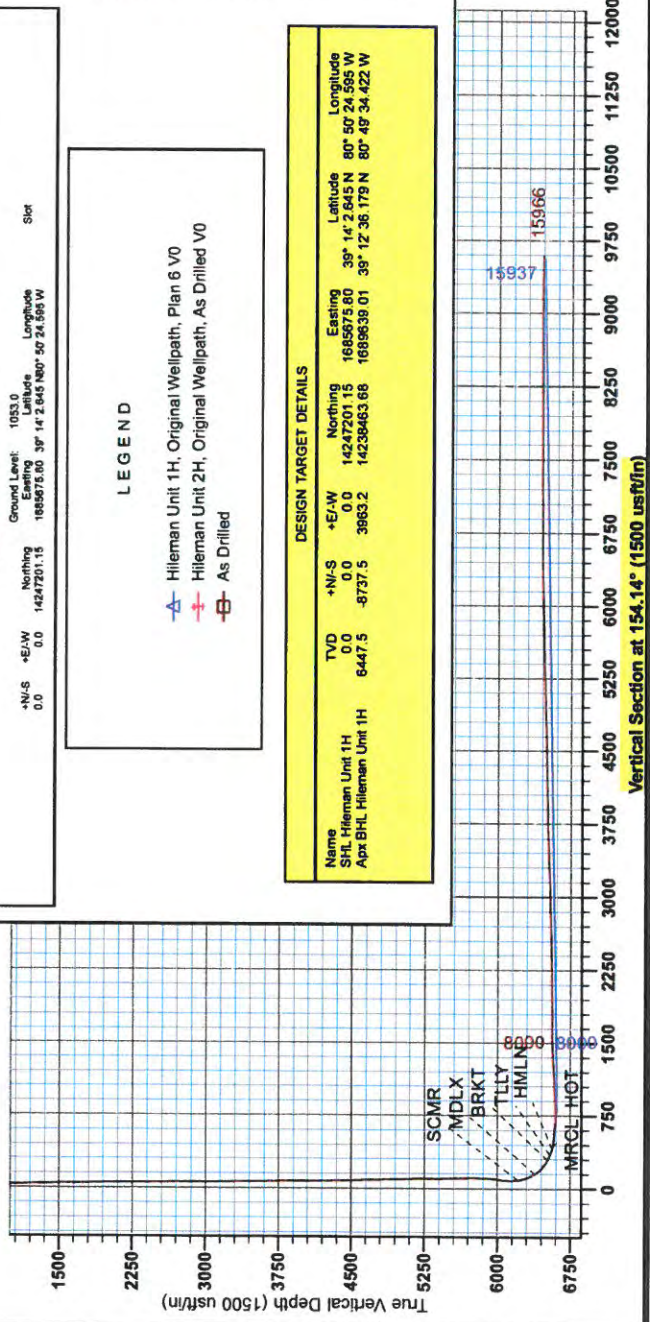
+N/-S	+E/-W	Northing	Longitude	Ground Level	Units	Sort
0.0	0.0	14247201.15	1685675.80	1053.0	Feet	
		14247201.15	1685675.80	14 2.645 160° 50 24.595 W		

**LEGEND**

- Hileman Unit 1H, Original Wellpath, Plan 6 V0
- Hileman Unit 2H, Original Wellpath, As Drilled V0
- As Drilled

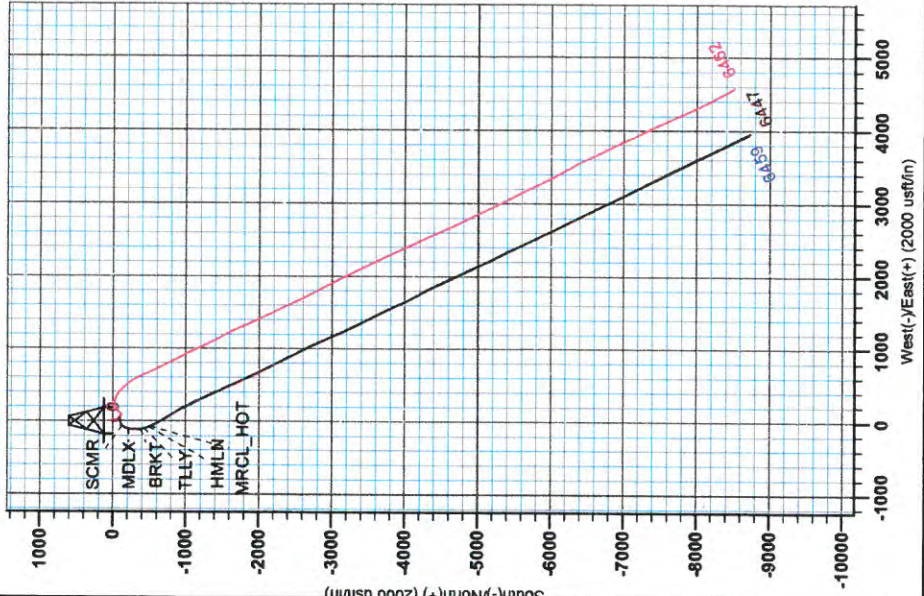
**DESIGN TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Longitude	Latitude
SPIL Hileman Unit 1H	0.0	0.0	0.0	14247201.15	1685675.80	39° 14' 2.645 N 80° 50' 24.595 W
ApX BHL Hileman Unit 1H	6447.5	-8737.5	3963.2	14238463.68	1685639.01	39° 12' 36.179 N 80° 49' 34.422 W



To convert Magnetic North to Grid, Subtract 8.54°  
To convert True North to Grid, Subtract 0.10°

Magnetic Field  
Strength: 52140.3nT  
Dip Angle: 86.77°  
Date: 3/23/2015  
Model: BCGM2014





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## **Antero**

**Doddridge County WV**

**Fritz Pad: Hayden/Washington/Sheep/Hileman**

**Hileman Unit 1H**

**Original Wellpath**

**Design: As Drilled**

# **EOW Completion Report**

**13 April, 2015**





**Company:** Antero  
**Project:** Doddridge County WV  
**Site:** Fritz Pad: Hayden/Washington/Sheep/Hileman  
**Well:** Hileman Unit 1H  
**Wellbore:** Original Wellpath  
**Design:** As Drilled

**Local Co-ordinate Reference:** Well Hileman Unit 1H  
**TVD Reference:** Frontier 22: GL 1053' + KB 25' @ 1078.0usft  
**MD Reference:** Frontier 22: GL 1053' + KB 25' @ 1078.0usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Oklahoma District

<b>Project</b>	Doddridge County WV, McClellan District		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Fee	<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)		

**Site** Fritz Pad: Hayden/Washington/Sheep/Hileman

**Site Position:** Northing: 14,247,222.50 usft Latitude: 39° 14' 2.856 N  
**From:** Map Easting: 1,685,696.44 usft Longitude: 80° 50' 24.332 W  
**Position Uncertainty:** 2.0 usft Slot Radius: 13-3/16" Grid Convergence: 0.10 °

**Well** Hileman Unit 1H, Marcellus

**Well Position** +N/-S 0.0 usft Northing: 14,247,201.15 usft Latitude: 39° 14' 2.645 N  
 +E/-W 0.0 usft Easting: 1,685,675.80 usft Longitude: 80° 50' 24.595 W  
**Position Uncertainty** 2.0 usft Wellhead Elevation: 1,078.0 usft Ground Level: 1,053.0 usft

**Wellbore** Original Wellpath

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	3/23/2015	-8.44	66.77	52,140

**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	154.14

**Survey Program** Date 4/13/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
112.0	5,612.0	Survey #6 Gyro to KOP (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
5,710.0	15,966.0	Survey #7 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1

**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
112.0	0.23	166.80	112.0	-0.2	0.1	0.2	0.21
137.0	0.30	169.05	137.0	-0.3	0.1	0.3	0.28
162.0	0.25	182.84	162.0	-0.5	0.1	0.4	0.33
187.0	0.27	181.67	187.0	-0.6	0.1	0.5	0.08
212.0	0.27	180.41	212.0	-0.7	0.1	0.6	0.02
237.0	0.28	154.53	237.0	-0.8	0.1	0.8	0.49
262.0	0.25	156.42	262.0	-0.9	0.2	0.9	0.12
287.0	0.42	154.02	287.0	-1.0	0.2	1.0	0.68
312.0	0.36	155.18	312.0	-1.2	0.3	1.2	0.24
337.0	0.26	157.87	337.0	-1.3	0.3	1.3	0.40

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**Database:** Oklahoma District

**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
362.0	0.35	152.28	362.0	-1.4	0.4	1.5	0.38
387.0	0.38	149.27	387.0	-1.6	0.5	1.6	0.14
412.0	0.40	146.41	412.0	-1.7	0.6	1.8	0.11
437.0	0.36	153.14	437.0	-1.9	0.7	2.0	0.24
462.0	0.42	152.71	462.0	-2.0	0.7	2.1	0.24
487.0	0.63	161.36	487.0	-2.2	0.8	2.4	0.90
512.0	1.17	180.00	512.0	-2.6	0.9	2.7	2.43
537.0	2.15	184.54	537.0	-3.3	0.8	3.4	3.95
562.0	2.82	188.83	562.0	-4.4	0.7	4.3	2.78
587.0	3.65	192.10	586.9	-5.8	0.4	5.4	3.40
612.0	4.01	194.50	611.9	-7.4	0.0	6.7	1.58
637.0	4.59	194.70	636.8	-9.2	-0.4	8.1	2.32
662.0	4.76	194.00	661.7	-11.2	-0.9	9.7	0.72
687.0	4.96	192.75	686.6	-13.3	-1.4	11.3	0.91
712.0	4.99	192.59	711.5	-15.4	-1.9	13.0	0.13
737.0	5.07	192.51	736.4	-17.5	-2.4	14.7	0.32
762.0	5.12	192.40	761.3	-19.7	-2.9	16.5	0.20
787.0	5.12	192.79	786.2	-21.9	-3.3	18.2	0.14
812.0	5.06	191.06	811.1	-24.0	-3.8	20.0	0.66
837.0	4.90	188.80	836.0	-26.2	-4.2	21.7	1.01
862.0	4.54	187.70	860.9	-28.2	-4.5	23.4	1.48
887.0	4.22	186.82	885.9	-30.1	-4.7	25.0	1.31
912.0	3.94	187.41	910.8	-31.9	-4.9	26.5	1.13
937.0	3.74	185.43	935.8	-33.5	-5.1	27.9	0.96
962.0	3.38	185.12	960.7	-35.1	-5.3	29.3	1.44
987.0	3.18	185.22	985.7	-36.5	-5.4	30.5	0.80
1,012.0	3.04	184.53	1,010.6	-37.8	-5.5	31.7	0.58
1,037.0	2.79	183.73	1,035.6	-39.1	-5.6	32.8	1.01
1,062.0	2.53	181.65	1,060.6	-40.3	-5.7	33.8	1.11
1,087.0	2.36	180.54	1,085.5	-41.3	-5.7	34.7	0.71
1,112.0	2.11	182.83	1,110.5	-42.3	-5.7	35.6	1.06
1,137.0	2.01	179.07	1,135.5	-43.2	-5.7	36.4	0.67
1,162.0	1.82	176.47	1,160.5	-44.0	-5.7	37.2	0.84
1,187.0	1.62	176.63	1,185.5	-44.8	-5.6	37.9	0.80
1,212.0	1.51	174.95	1,210.5	-45.5	-5.6	38.5	0.48
1,237.0	1.37	176.16	1,235.5	-46.1	-5.5	39.1	0.57
1,262.0	1.28	172.47	1,260.5	-46.7	-5.5	39.6	0.50
1,287.0	1.23	171.88	1,285.5	-47.2	-5.4	40.1	0.21
1,312.0	1.25	168.05	1,310.5	-47.8	-5.3	40.7	0.34
1,337.0	1.17	164.92	1,335.4	-48.3	-5.2	41.2	0.41
1,362.0	1.04	165.88	1,360.4	-48.7	-5.1	41.6	0.53
1,387.0	1.02	164.37	1,385.4	-49.2	-5.0	42.1	0.13
1,412.0	0.99	159.09	1,410.4	-49.6	-4.8	42.5	0.39
1,437.0	0.88	155.55	1,435.4	-50.0	-4.7	42.9	0.50

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**Survey**

MD (usft)	Inc (")	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,462.0	0.86	152.48	1,460.4	-50.3	-4.5	43.3	0.20
1,487.0	0.95	152.15	1,485.4	-50.7	-4.3	43.7	0.36
1,512.0	0.92	151.19	1,510.4	-51.0	-4.1	44.1	0.14
1,537.0	0.89	148.54	1,535.4	-51.4	-3.9	44.5	0.21
1,562.0	0.93	150.14	1,560.4	-51.7	-3.7	44.9	0.19
1,587.0	0.91	149.84	1,585.4	-52.0	-3.5	45.3	0.08
1,612.0	0.86	149.51	1,610.4	-52.4	-3.3	45.7	0.20
1,637.0	0.91	146.96	1,635.4	-52.7	-3.1	46.1	0.25
1,662.0	0.97	143.70	1,660.4	-53.0	-2.9	46.5	0.32
1,687.0	0.90	141.55	1,685.4	-53.4	-2.6	46.9	0.31
1,712.0	0.86	143.54	1,710.4	-53.7	-2.4	47.2	0.20
1,737.0	0.96	142.44	1,735.4	-54.0	-2.2	47.6	0.41
1,762.0	0.94	141.21	1,760.4	-54.3	-1.9	48.0	0.11
1,787.0	0.93	143.40	1,785.4	-54.6	-1.7	48.4	0.15
1,812.0	1.03	141.22	1,810.4	-55.0	-1.4	48.9	0.43
1,837.0	0.97	137.71	1,835.4	-55.3	-1.1	49.3	0.34
1,862.0	0.84	137.45	1,860.4	-55.6	-0.9	49.7	0.52
1,887.0	0.83	125.16	1,885.4	-55.8	-0.6	50.0	0.72
1,912.0	0.78	123.18	1,910.4	-56.0	-0.3	50.3	0.23
1,937.0	0.80	122.35	1,935.4	-56.2	0.0	50.6	0.09
1,962.0	0.73	121.66	1,960.4	-56.4	0.3	50.9	0.28
1,987.0	0.69	124.72	1,985.4	-56.6	0.5	51.1	0.22
2,012.0	0.61	121.70	2,010.4	-56.7	0.8	51.4	0.35
2,037.0	0.70	119.68	2,035.4	-56.9	1.0	51.6	0.37
2,062.0	0.61	126.31	2,060.4	-57.0	1.3	51.9	0.47
2,087.0	0.70	117.21	2,085.4	-57.2	1.5	52.1	0.55
2,112.0	0.57	121.31	2,110.4	-57.3	1.8	52.3	0.55
2,137.0	0.62	119.20	2,135.4	-57.4	2.0	52.5	0.22
2,162.0	0.69	125.24	2,160.4	-57.6	2.2	52.8	0.39
2,187.0	0.51	119.86	2,185.4	-57.7	2.4	53.0	0.75
2,212.0	0.62	123.78	2,210.4	-57.9	2.6	53.2	0.47
2,237.0	0.53	123.27	2,235.3	-58.0	2.9	53.4	0.36
2,262.0	0.64	120.62	2,260.3	-58.1	3.1	53.7	0.45
2,287.0	0.66	120.22	2,285.3	-58.3	3.3	53.9	0.08
2,312.0	0.70	122.69	2,310.3	-58.4	3.6	54.1	0.20
2,337.0	0.52	124.31	2,335.3	-58.6	3.8	54.4	0.72
2,362.0	0.53	121.88	2,360.3	-58.7	4.0	54.6	0.10
2,387.0	0.57	123.46	2,385.3	-58.8	4.2	54.8	0.17
2,412.0	0.63	117.58	2,410.3	-59.0	4.4	55.0	0.34
2,437.0	0.67	120.47	2,435.3	-59.1	4.7	55.2	0.21
2,462.0	0.64	122.69	2,460.3	-59.3	4.9	55.5	0.16
2,487.0	0.69	120.49	2,485.3	-59.4	5.1	55.7	0.22
2,512.0	0.64	111.86	2,510.3	-59.5	5.4	55.9	0.45
2,537.0	0.57	116.23	2,535.3	-59.6	5.6	56.1	0.34
2,562.0	0.51	133.75	2,560.3	-59.8	5.8	56.3	0.70



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2,587.0	0.58	125.30	2,585.3	-59.9	6.0	56.5	0.43
2,612.0	0.63	134.05	2,610.3	-60.1	6.2	56.8	0.42
2,637.0	0.69	130.76	2,635.3	-60.3	6.4	57.1	0.28
2,662.0	0.69	130.02	2,660.3	-60.5	6.7	57.3	0.04
2,687.0	0.73	129.96	2,685.3	-60.7	6.9	57.6	0.16
2,712.0	0.72	134.76	2,710.3	-60.9	7.1	57.9	0.25
2,737.0	0.74	129.56	2,735.3	-61.1	7.4	58.2	0.28
2,762.0	0.68	135.63	2,760.3	-61.3	7.6	58.5	0.38
2,787.0	0.67	128.71	2,785.3	-61.5	7.8	58.8	0.33
2,812.0	0.62	136.22	2,810.3	-61.7	8.0	59.0	0.39
2,837.0	0.62	128.22	2,835.3	-61.9	8.2	59.3	0.35
2,862.0	0.62	128.70	2,860.3	-62.0	8.4	59.5	0.02
2,887.0	0.62	129.42	2,885.3	-62.2	8.7	59.8	0.03
2,912.0	0.67	122.31	2,910.3	-62.4	8.9	60.0	0.38
2,937.0	0.65	126.63	2,935.3	-62.5	9.1	60.3	0.21
2,962.0	0.67	130.41	2,960.3	-62.7	9.3	60.5	0.19
2,987.0	0.71	136.40	2,985.3	-62.9	9.6	60.8	0.33
3,012.0	0.67	130.29	3,010.3	-63.1	9.8	61.1	0.33
3,037.0	0.66	126.04	3,035.3	-63.3	10.0	61.3	0.20
3,062.0	0.65	127.17	3,060.3	-63.5	10.2	61.6	0.07
3,087.0	0.70	127.22	3,085.3	-63.7	10.5	61.9	0.20
3,112.0	0.70	121.28	3,110.3	-63.8	10.7	62.1	0.29
3,137.0	0.73	122.95	3,135.3	-64.0	11.0	62.4	0.15
3,162.0	0.73	125.39	3,160.3	-64.2	11.2	62.7	0.12
3,187.0	0.76	121.14	3,185.3	-64.4	11.5	62.9	0.25
3,212.0	0.76	123.92	3,210.3	-64.5	11.8	63.2	0.15
3,237.0	0.78	121.88	3,235.3	-64.7	12.1	63.5	0.14
3,262.0	0.80	124.11	3,260.3	-64.9	12.4	63.8	0.15
3,287.0	0.81	127.55	3,285.3	-65.1	12.7	64.1	0.20
3,312.0	0.83	124.04	3,310.3	-65.3	12.9	64.4	0.22
3,337.0	0.91	129.78	3,335.3	-65.6	13.2	64.8	0.47
3,362.0	0.96	124.04	3,360.3	-65.8	13.6	65.1	0.42
3,387.0	0.97	125.09	3,385.3	-66.0	13.9	65.5	0.08
3,412.0	0.96	122.88	3,410.3	-66.3	14.3	65.9	0.15
3,437.0	0.93	125.65	3,435.3	-66.5	14.6	66.2	0.22
3,462.0	0.95	121.90	3,460.3	-66.7	15.0	66.6	0.26
3,487.0	0.92	123.89	3,485.3	-67.0	15.3	66.9	0.18
3,512.0	0.87	126.31	3,510.2	-67.2	15.6	67.3	0.25
3,537.0	0.89	121.72	3,535.2	-67.4	15.9	67.6	0.29
3,562.0	0.88	118.22	3,560.2	-67.6	16.3	67.9	0.22
3,587.0	0.91	120.02	3,585.2	-67.8	16.6	68.2	0.16
3,612.0	0.85	119.62	3,610.2	-68.0	16.9	68.5	0.24
3,637.0	0.82	116.11	3,635.2	-68.1	17.3	68.8	0.24
3,662.0	0.77	118.16	3,660.2	-68.3	17.6	69.1	0.23



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**MD Reference:** Frontier 22: GL 1053' + KB 25' @ 1078.0usft  
**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)
3,687.0	0.80	115.36	3,685.2	-68.4	17.9	69.4	0.19
3,712.0	0.74	116.71	3,710.2	-68.6	18.2	69.7	0.25
3,737.0	0.73	130.55	3,735.2	-68.8	18.4	69.9	0.71
3,762.0	0.81	132.31	3,760.2	-69.0	18.7	70.2	0.33
3,787.0	0.86	130.53	3,785.2	-69.2	19.0	70.6	0.23
3,812.0	0.97	123.72	3,810.2	-69.5	19.3	70.9	0.62
3,837.0	0.94	122.50	3,835.2	-69.7	19.6	71.3	0.14
3,862.0	0.91	120.16	3,860.2	-69.9	20.0	71.6	0.19
3,887.0	0.91	117.51	3,885.2	-70.1	20.3	72.0	0.17
3,912.0	0.78	118.50	3,910.2	-70.3	20.7	72.2	0.52
3,937.0	0.62	117.69	3,935.2	-70.4	20.9	72.5	0.64
3,962.0	0.55	114.42	3,960.2	-70.5	21.2	72.7	0.31
3,987.0	0.53	131.11	3,985.2	-70.7	21.3	72.9	0.63
4,012.0	0.57	128.70	4,010.2	-70.8	21.5	73.1	0.18
4,037.0	0.55	113.61	4,035.2	-70.9	21.7	73.3	0.59
4,062.0	0.73	103.92	4,060.2	-71.0	22.0	73.5	0.84
4,087.0	0.67	124.63	4,085.2	-71.1	22.3	73.7	1.03
4,112.0	0.73	129.20	4,110.2	-71.3	22.5	74.0	0.33
4,137.0	0.78	134.30	4,135.2	-71.5	22.8	74.3	0.33
4,162.0	0.80	130.95	4,160.2	-71.8	23.0	74.6	0.20
4,187.0	0.92	130.34	4,185.2	-72.0	23.3	75.0	0.48
4,212.0	1.00	130.22	4,210.2	-72.3	23.6	75.4	0.32
4,237.0	0.95	130.19	4,235.2	-72.6	24.0	75.8	0.20
4,262.0	1.08	128.09	4,260.2	-72.9	24.3	76.2	0.54
4,287.0	1.18	124.41	4,285.2	-73.1	24.7	76.6	0.49
4,312.0	1.24	131.23	4,310.2	-73.5	25.1	77.1	0.62
4,337.0	1.31	133.49	4,335.2	-73.8	25.5	77.6	0.34
4,362.0	1.30	130.67	4,360.2	-74.2	25.9	78.1	0.26
4,387.0	1.29	132.52	4,385.1	-74.6	26.4	78.6	0.17
4,412.0	1.32	133.01	4,410.1	-75.0	26.8	79.2	0.13
4,437.0	1.38	131.58	4,435.1	-75.4	27.2	79.7	0.28
4,462.0	1.35	134.58	4,460.1	-75.8	27.7	80.3	0.31
4,487.0	1.31	135.70	4,485.1	-76.2	28.1	80.8	0.19
4,512.0	1.31	138.86	4,510.1	-76.6	28.5	81.4	0.29
4,537.0	1.34	138.49	4,535.1	-77.1	28.8	81.9	0.12
4,562.0	1.34	136.60	4,560.1	-77.5	29.2	82.5	0.18
4,587.0	1.46	140.72	4,585.1	-77.9	29.6	83.1	0.63
4,612.0	1.53	136.50	4,610.1	-78.4	30.1	83.7	0.52
4,637.0	1.58	136.72	4,635.1	-78.9	30.5	84.3	0.20
4,662.0	1.57	137.73	4,660.1	-79.4	31.0	85.0	0.12
4,687.0	1.60	139.60	4,685.1	-79.9	31.5	85.7	0.24
4,712.0	1.55	140.51	4,710.0	-80.5	31.9	86.3	0.22
4,737.0	1.65	135.59	4,735.0	-81.0	32.4	87.0	0.68
4,762.0	1.68	137.55	4,760.0	-81.5	32.9	87.7	0.26



**Company:** Antero  
**Project:** Doddridge County WV  
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**Wellbore:** Original Wellpath  
**Design:** As Drilled

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**Survey**

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4,787.0	1.68	139.47	4,785.0	-82.1	33.3	88.4	0.23
4,812.0	1.69	140.94	4,810.0	-82.6	33.8	89.1	0.18
4,837.0	1.61	143.29	4,835.0	-83.2	34.3	89.8	0.42
4,862.0	1.57	138.53	4,860.0	-83.7	34.7	90.5	0.55
4,887.0	1.49	139.94	4,885.0	-84.2	35.1	91.1	0.35
4,912.0	1.49	141.95	4,910.0	-84.7	35.5	91.8	0.21
4,937.0	1.44	140.98	4,935.0	-85.2	35.9	92.4	0.22
4,962.0	1.44	138.59	4,959.9	-85.7	36.3	93.0	0.24
4,987.0	1.36	136.72	4,984.9	-86.2	36.8	93.6	0.37
5,012.0	1.33	136.93	5,009.9	-86.6	37.2	94.1	0.12
5,037.0	1.41	128.83	5,034.9	-87.0	37.6	94.7	0.84
5,062.0	1.37	123.36	5,059.9	-87.4	38.1	95.2	0.55
5,087.0	1.37	123.49	5,084.9	-87.7	38.6	95.7	0.01
5,112.0	1.39	118.98	5,109.9	-88.0	39.1	96.2	0.44
5,137.0	1.36	119.78	5,134.9	-88.3	39.6	96.7	0.14
5,162.0	1.34	120.38	5,159.9	-88.6	40.1	97.2	0.10
5,187.0	1.42	120.46	5,184.9	-88.9	40.6	97.7	0.32
5,212.0	1.44	119.35	5,209.9	-89.2	41.2	98.2	0.14
5,237.0	1.31	124.07	5,234.9	-89.5	41.7	98.8	0.69
5,262.0	1.22	120.65	5,259.9	-89.8	42.2	99.2	0.47
5,287.0	1.22	121.06	5,284.9	-90.1	42.6	99.7	0.03
5,312.0	1.15	118.73	5,309.9	-90.4	43.1	100.1	0.34
5,337.0	1.12	115.81	5,334.8	-90.6	43.5	100.5	0.26
5,362.0	1.19	119.76	5,359.8	-90.8	44.0	100.9	0.42
5,387.0	1.28	112.68	5,384.8	-91.1	44.4	101.3	0.71
5,412.0	1.31	109.17	5,409.8	-91.3	45.0	101.7	0.34
5,437.0	1.33	110.21	5,434.8	-91.5	45.5	102.1	0.12
5,462.0	1.32	111.72	5,459.8	-91.7	46.0	102.6	0.15
5,487.0	1.36	107.99	5,484.8	-91.9	46.6	103.0	0.38
5,512.0	1.39	112.18	5,509.8	-92.1	47.2	103.4	0.42
5,537.0	1.44	115.68	5,534.8	-92.3	47.7	103.9	0.40
5,562.0	1.46	116.70	5,559.8	-92.6	48.3	104.4	0.13
5,587.0	1.36	117.16	5,584.8	-92.9	48.8	104.9	0.40
5,612.0	1.37	116.58	5,609.8	-93.1	49.4	105.3	0.07
5,710.0	1.45	121.31	5,707.7	-94.3	51.5	107.3	0.14
5,774.0	1.17	155.07	5,771.7	-95.3	52.4	108.7	1.26
5,806.0	2.44	252.11	5,803.7	-95.8	51.9	108.9	8.85
5,838.0	5.89	260.50	5,835.6	-96.3	49.7	108.3	10.92
5,870.0	8.57	262.23	5,867.4	-96.9	45.7	107.1	8.40
5,903.0	11.68	264.57	5,899.9	-97.6	39.9	105.2	9.50
5,935.0	14.62	263.85	5,931.0	-98.3	32.7	102.7	9.20
5,967.0	15.83	263.48	5,961.9	-99.2	24.3	99.9	3.79
5,999.0	17.37	266.15	5,992.6	-100.0	15.2	96.7	5.37
6,031.0	20.05	271.26	6,022.9	-100.2	5.0	92.4	9.81



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**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
6,063.0	21.48	268.03	6,052.8	-100.3	-6.4	87.5	5.72
6,095.0	20.91	257.11	6,082.6	-101.8	-17.8	83.8	12.45
6,127.0	20.58	246.43	6,112.6	-105.3	-28.5	82.3	11.85
6,158.0	21.65	240.36	6,141.5	-110.3	-38.5	82.5	7.85
6,190.0	23.67	235.06	6,171.0	-116.9	-48.9	83.9	8.97
6,221.0	25.68	228.42	6,199.2	-124.9	-59.0	86.7	11.04
6,237.0	26.33	226.89	6,213.6	-129.7	-64.2	88.7	5.85
<b>SCMR</b>							
6,253.0	27.00	225.43	6,227.9	-134.6	-69.4	90.9	5.85
6,285.0	28.13	217.94	6,256.2	-145.7	-79.2	96.6	11.38
6,317.0	28.71	209.56	6,284.4	-158.3	-87.6	104.3	12.59
6,349.0	29.55	202.75	6,312.4	-172.3	-94.5	113.8	10.68
6,381.0	32.03	196.61	6,339.9	-187.7	-100.0	125.3	12.50
6,413.0	35.23	192.99	6,366.5	-204.9	-104.5	138.8	11.80
6,437.0	38.06	190.73	6,385.8	-218.9	-107.4	150.1	13.06
<b>MDLX</b>							
6,444.0	38.89	190.12	6,391.2	-223.2	-108.2	153.6	13.06
6,477.0	43.07	187.28	6,416.1	-244.5	-111.4	171.4	13.86
6,509.0	47.27	184.76	6,438.7	-267.1	-113.8	190.7	14.26
6,541.0	51.57	182.86	6,459.5	-291.3	-115.4	211.8	14.17
6,572.0	56.71	181.49	6,477.7	-316.4	-116.3	234.0	16.96
6,604.0	60.33	178.41	6,494.4	-343.7	-116.3	258.6	13.97
6,636.0	61.51	173.67	6,509.9	-371.6	-114.4	284.5	13.46
6,647.0	61.74	171.82	6,515.2	-381.2	-113.1	293.7	14.97
<b>BRKT</b>							
6,667.0	62.23	168.47	6,524.6	-398.6	-110.1	310.7	14.97
6,699.0	64.81	164.70	6,538.8	-426.4	-103.5	338.6	13.27
6,706.0	65.49	164.09	6,541.8	-432.6	-101.7	344.9	12.58
<b>TLLY</b>							
6,730.0	67.85	162.03	6,551.3	-453.6	-95.3	366.6	12.58
6,762.0	73.76	159.26	6,561.8	-482.1	-85.3	396.7	20.20
6,773.0	75.54	158.65	6,564.7	-492.0	-81.5	407.2	17.06
<b>HMLN</b>							
6,794.0	78.95	157.52	6,569.3	-511.0	-73.8	427.7	17.06
6,796.0	79.09	157.34	6,569.7	-512.8	-73.1	429.6	11.27
<b>MRCL_HOT</b>							
6,857.0	83.50	152.00	6,579.0	-567.3	-47.3	489.9	11.27
6,882.0	83.75	150.94	6,581.7	-589.1	-35.4	514.7	4.33
6,978.0	84.58	151.43	6,591.5	-672.8	10.6	610.1	1.00
7,074.0	87.59	149.45	6,598.0	-756.1	57.8	705.6	3.75
7,171.0	91.61	149.55	6,598.7	-839.7	107.1	802.3	4.15
7,266.0	91.41	148.20	6,596.2	-921.0	156.2	896.8	1.44
7,362.0	94.47	150.57	6,591.3	-1,003.5	205.0	992.4	4.03
7,459.0	94.03	154.27	6,584.1	-1,089.2	249.7	1,089.0	3.83
7,555.0	93.56	153.93	6,577.8	-1,175.3	291.6	1,184.8	0.60

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**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,651.0	92.62	155.32	6,572.6	-1,262.0	332.7	1,280.7	1.75
7,747.0	92.18	156.44	6,568.6	-1,349.5	371.9	1,376.6	1.25
7,843.0	91.95	156.26	6,565.1	-1,437.4	410.3	1,472.4	0.30
7,940.0	90.64	155.17	6,562.9	-1,525.8	450.2	1,569.4	1.76
8,036.0	90.34	155.75	6,562.1	-1,613.1	490.1	1,665.3	0.68
8,132.0	89.83	155.36	6,561.9	-1,700.5	529.8	1,761.3	0.67
8,228.0	91.65	158.03	6,560.7	-1,788.6	567.8	1,857.2	3.37
8,324.0	91.91	154.84	6,557.7	-1,876.6	606.2	1,953.0	3.33
8,420.0	89.97	152.88	6,556.1	-1,962.7	648.4	2,049.0	2.87
8,516.0	90.00	152.22	6,556.2	-2,047.9	692.7	2,145.0	0.69
8,612.0	89.90	151.83	6,556.3	-2,132.7	737.7	2,240.9	0.42
8,708.0	92.15	153.94	6,554.5	-2,218.1	781.5	2,336.9	3.21
8,804.0	91.75	152.80	6,551.3	-2,303.9	824.5	2,432.8	1.26
8,899.0	91.55	152.65	6,548.5	-2,388.3	868.0	2,527.7	0.26
8,996.0	91.61	152.14	6,545.9	-2,474.2	912.9	2,624.7	0.53
9,092.0	91.38	150.84	6,543.4	-2,558.6	958.7	2,720.5	1.37
9,188.0	91.34	153.65	6,541.1	-2,643.5	1,003.4	2,816.4	2.93
9,283.0	91.11	154.61	6,539.0	-2,728.9	1,044.9	2,911.4	1.04
9,379.0	91.85	156.16	6,536.6	-2,816.2	1,084.8	3,007.3	1.79
9,475.0	92.05	156.72	6,533.3	-2,904.1	1,123.2	3,103.2	0.62
9,571.0	92.05	155.76	6,529.9	-2,991.9	1,161.8	3,199.1	1.00
9,666.0	92.05	156.28	6,526.5	-3,078.7	1,200.4	3,294.0	0.55
9,762.0	92.32	156.30	6,522.8	-3,166.5	1,239.0	3,389.8	0.28
9,857.0	92.69	154.28	6,518.7	-3,252.7	1,278.7	3,484.7	2.16
9,953.0	91.08	153.42	6,515.5	-3,338.8	1,320.9	3,580.7	1.90
10,048.0	91.41	153.30	6,513.4	-3,423.7	1,363.5	3,675.6	0.37
10,143.0	91.65	153.17	6,510.9	-3,508.5	1,406.3	3,770.6	0.29
10,239.0	91.34	153.05	6,508.4	-3,594.1	1,449.7	3,866.5	0.35
10,335.0	91.07	152.99	6,506.4	-3,679.7	1,493.2	3,962.5	0.29
10,431.0	91.54	155.37	6,504.2	-3,766.0	1,535.0	4,058.5	2.53
10,528.0	91.27	155.34	6,501.8	-3,854.2	1,575.5	4,155.4	0.28
10,623.0	90.91	155.45	6,500.0	-3,940.5	1,615.0	4,250.4	0.40
10,717.0	91.35	154.30	6,498.1	-4,025.6	1,654.9	4,344.3	1.31
10,812.0	89.40	149.58	6,497.5	-4,109.4	1,699.6	4,439.2	5.38
10,907.0	92.25	150.04	6,496.2	-4,191.5	1,747.4	4,534.0	3.04
11,003.0	92.08	151.55	6,492.5	-4,275.3	1,794.2	4,629.7	1.58
11,099.0	91.75	153.11	6,489.3	-4,360.2	1,838.7	4,725.6	1.66
11,196.0	91.57	154.42	6,486.5	-4,447.2	1,881.6	4,822.6	1.36
11,291.0	91.92	154.71	6,483.6	-4,533.0	1,922.4	4,917.5	0.48
11,387.0	91.18	154.55	6,481.0	-4,619.7	1,963.5	5,013.5	0.79
11,483.0	90.98	153.07	6,479.2	-4,705.8	2,005.8	5,109.5	1.56
11,579.0	91.68	154.83	6,477.0	-4,792.0	2,048.0	5,205.4	1.97
11,674.0	92.45	155.37	6,473.6	-4,878.1	2,088.0	5,300.4	0.99
11,770.0	92.42	155.01	6,469.5	-4,965.2	2,128.2	5,396.2	0.38

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11,866.0	90.23	154.05	6,467.3	-5,051.8	2,169.5	5,492.2	2.49
11,963.0	90.20	154.31	6,466.9	-5,139.1	2,211.7	5,589.2	0.27
12,059.0	91.38	153.64	6,465.6	-5,225.4	2,253.8	5,685.2	1.41
12,155.0	91.54	153.55	6,463.1	-5,311.3	2,296.5	5,781.2	0.19
12,252.0	91.44	153.31	6,460.6	-5,398.1	2,339.9	5,878.1	0.27
12,348.0	92.72	154.98	6,457.1	-5,484.4	2,381.7	5,974.1	2.19
12,445.0	91.11	156.93	6,453.9	-5,572.9	2,421.2	6,070.9	2.61
12,540.0	90.64	156.10	6,452.4	-5,660.1	2,459.1	6,165.9	1.00
12,636.0	91.51	155.47	6,450.6	-5,747.6	2,498.4	6,261.8	1.12
12,732.0	91.21	155.66	6,448.3	-5,835.0	2,538.1	6,357.7	0.37
12,827.0	90.00	155.71	6,447.3	-5,921.5	2,577.3	6,452.7	1.27
12,922.0	89.70	155.42	6,447.6	-6,008.0	2,616.6	6,547.7	0.44
13,018.0	89.90	153.23	6,447.9	-6,094.5	2,658.2	6,643.7	2.29
13,115.0	89.70	153.10	6,448.3	-6,181.1	2,701.9	6,740.6	0.25
13,210.0	90.97	153.59	6,447.7	-6,266.0	2,744.6	6,835.6	1.43
13,305.0	90.37	154.21	6,446.6	-6,351.3	2,786.3	6,930.6	0.91
13,401.0	90.10	152.63	6,446.2	-6,437.1	2,829.3	7,026.6	1.67
13,497.0	90.23	150.70	6,445.9	-6,521.6	2,874.9	7,122.5	2.01
13,594.0	91.64	154.44	6,444.3	-6,607.7	2,919.5	7,219.4	4.12
13,690.0	91.04	154.20	6,442.1	-6,694.2	2,961.1	7,315.4	0.67
13,786.0	89.97	154.45	6,441.3	-6,780.7	3,002.7	7,411.4	1.14
13,882.0	89.97	154.79	6,441.3	-6,867.5	3,043.9	7,507.4	0.35
13,978.0	90.13	153.86	6,441.2	-6,954.0	3,085.5	7,603.4	0.98
14,074.0	90.10	154.40	6,441.0	-7,040.4	3,127.3	7,699.4	0.56
14,170.0	89.93	153.13	6,441.0	-7,126.5	3,169.8	7,795.4	1.33
14,267.0	90.20	152.91	6,440.9	-7,212.9	3,213.8	7,892.4	0.36
14,362.0	90.60	152.03	6,440.2	-7,297.1	3,257.7	7,987.3	1.02
14,458.0	89.26	153.45	6,440.4	-7,382.5	3,301.7	8,083.3	2.03
14,553.0	90.34	154.18	6,440.7	-7,467.7	3,343.6	8,178.3	1.37
14,650.0	90.74	152.42	6,439.8	-7,554.4	3,387.2	8,275.3	1.86
14,746.0	89.89	154.66	6,439.2	-7,640.3	3,429.9	8,371.3	2.50
14,842.0	90.13	154.46	6,439.2	-7,727.0	3,471.2	8,467.3	0.33
14,939.0	90.07	154.31	6,439.1	-7,814.5	3,513.1	8,564.3	0.17
15,035.0	90.23	154.15	6,438.8	-7,900.9	3,554.8	8,660.3	0.24
15,131.0	90.00	154.54	6,438.6	-7,987.5	3,596.4	8,756.3	0.47
15,227.0	90.00	154.39	6,438.6	-8,074.1	3,637.8	8,852.3	0.16
15,323.0	90.57	153.76	6,438.1	-8,160.4	3,679.8	8,948.3	0.88
15,418.0	88.22	153.99	6,439.1	-8,245.7	3,721.6	9,043.3	2.49
15,514.0	89.33	153.87	6,441.2	-8,331.9	3,763.8	9,139.2	1.16
15,610.0	89.36	153.59	6,442.3	-8,418.0	3,806.2	9,235.2	0.29
15,706.0	88.86	154.15	6,443.8	-8,504.2	3,848.5	9,331.2	0.78
15,802.0	88.96	153.77	6,445.6	-8,590.4	3,890.7	9,427.2	0.41
15,898.0	89.40	153.75	6,447.0	-8,676.5	3,933.1	9,523.2	0.46
15,906.0	89.60	153.71	6,447.0	-8,683.7	3,936.6	9,531.2	2.55
15,966.0	89.60	153.71	6,447.5	-8,737.5	3,963.2	9,591.2	0.00

**Company:** Antero  
**Project:** Doddridge County WV  
**Site:** Fritz Pad: Hayden/Washington/Sheep/Hileman  
**Well:** Hileman Unit 1H  
**Wellbore:** Original Wellpath  
**Design:** As Drilled

**Local Co-ordinate Reference:** Well Hileman Unit 1H  
**TVD Reference:** Frontier 22: GL 1053' + KB 25' @ 1078.0usft  
**MD Reference:** Frontier 22: GL 1053' + KB 25' @ 1078.0usft  
**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)
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**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,237.0	6,213.6	-129.7	-64.2	SCMR
6,437.0	6,385.8	-218.9	-107.4	MDLX
6,647.0	6,515.2	-381.2	-113.1	BRKT
6,706.0	6,541.8	-432.6	-101.7	TLLY
6,773.0	6,564.7	-492.0	-81.5	HMLN
6,796.0	6,569.7	-512.8	-73.1	MRCL_HOT

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

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MORGANTOWN, WV