



**Hileman Unit 2H**  
**Doddridge County WV**  
**Northing: 14247208.27**  
**Easting: 1685682.68**  
**As Drilled**

**WELL DETAILS** Hileman Unit 2H

+N/-S	+E/-W	Ground Level: 1053.0	Well Name: Hileman Unit 2H
0.0	0.0	14247208.27	1685682.68
		14247208.27	1685682.68
		89° 14' 2.715" N	80° 50' 24.507" W

**PROJECT DETAILS:** Doddridge County WV

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

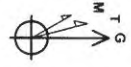
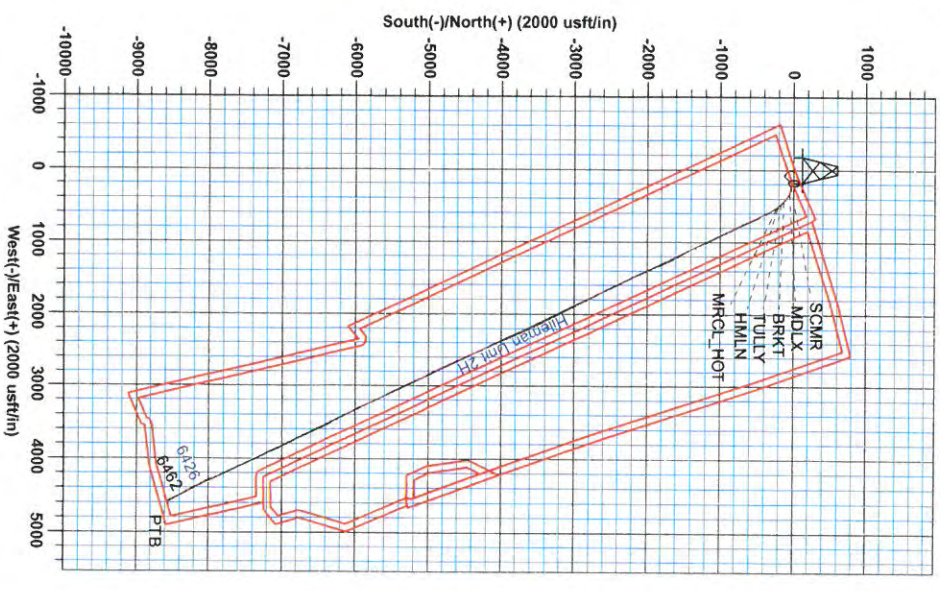
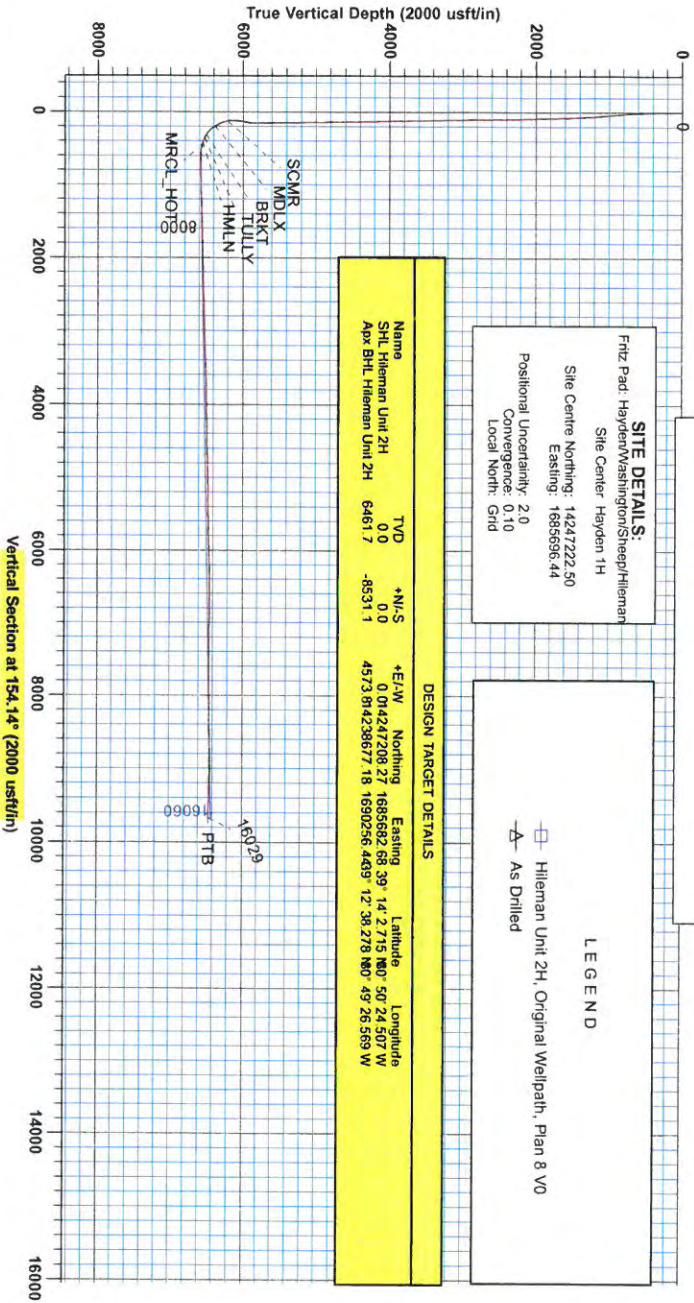
**SITE DETAILS:**  
 Fritz Pad: Hayden/Washington/Sheep/Hileman  
 Site Center: Hayden 1H  
 Site Centre Northing: 14247222.50  
 Easting: 1685696.44  
 Positional Uncertainty: 2.0  
 Convergence: 0.10  
 Local North: Grid

**LEGEND**

- Hileman Unit 2H, Original Wellpath, Plan 8 V0
- ▲ As Drilled

**DESIGN TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Hileman Unit 2H	0.0	0.0	0.0	0 014247208 27	1685682 68 39	14° 2' 7.15" N	80° 50' 24.507" W
App BHL Hileman Unit 2H	6461.7	-8531.1	4573.814239617	18 1690256 4489	12 38 278 N	80° 49' 26.569" W	



Azimuths to Grid North  
 True North: -4.10°  
 Magnetic North: -7.80°  
 To convert Magnetic North to Grid, Subtract 7.80°  
 To convert True North to Grid, Subtract 0.10°

Magnetic Field  
 Strength: 52206.88mT  
 Dip Angle: 66.70°  
 Date: 1/17/2015  
 Model: HDGM

Genie Lightfoot  
 Scientific Drilling  
 11220 NW 10th Street  
 Yukon, OK 73099  
 405-787-3663

Frontier 22 GL 1053 \* K9 25 @ 1078 Oush  
 Gr: 1053.0



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MAY 11 2016

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

## **Antero**

**Doddridge County WV**

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

**Hileman Unit 2H**

**Original Wellpath**

**Design: As Drilled**

## **EOW Completion Report**

**09 April, 2015**







**Company:** Antero  
**Project:** Doddridge County WV  
**Site:** Fritz Pad: Hayden/Washington/Sheep/Hileman  
**Well:** Hileman Unit 2H  
**Wellbore:** Original Wellpath  
**Design:** As Drilled

**Local Co-ordinate Reference:** Well Hileman Unit 2H  
**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 2H, Marcellus

**Well Position** **+N/-S** 0.0 usft **Northing:** 14,247,208.27 usft **Latitude:** 39° 14' 2.715 N  
**+E/-W** 0.0 usft **Easting:** 1,685,682.68 usft **Longitude:** 80° 50' 24.507 W  
**Position Uncertainty** 2.0 usft **Wellhead Elevation:** 1,078.0 usft **Ground Level:** 1,053.0 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>
	HDGM	1/7/2015	-7.70	66.70	52,207

**Design** As Drilled

**Audit Notes:**

**Version:** 1.0 **Phase:** ACTUAL **Tie On Depth:** 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	154.14

<b>Survey Program</b>	<b>Date</b> 4/9/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
112.0	5,759.0	Survey #6 Final Gyro (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
5,799.0	16,029.0	Survey #7 SDI MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1

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	0.22	74.68	112.0	0.1	0.2	0.0	0.20
137.0	0.27	73.86	137.0	0.1	0.3	0.1	0.20
162.0	0.29	57.06	162.0	0.1	0.4	0.1	0.34
187.0	0.30	69.61	187.0	0.2	0.5	0.1	0.26
212.0	0.36	78.32	212.0	0.2	0.7	0.1	0.31
237.0	0.35	79.96	237.0	0.3	0.8	0.1	0.06
262.0	0.30	89.24	262.0	0.3	1.0	0.2	0.29
287.0	0.30	79.48	287.0	0.3	1.1	0.2	0.20
312.0	0.32	91.75	312.0	0.3	1.2	0.3	0.28
337.0	0.29	112.78	337.0	0.3	1.4	0.3	0.46



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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
362.0	0.29	119.53	362.0	0.2	1.5	0.4	0.14
387.0	0.37	127.19	387.0	0.1	1.6	0.6	0.36
412.0	0.84	151.92	412.0	-0.1	1.7	0.8	2.11
437.0	1.16	157.07	437.0	-0.5	1.9	1.3	1.33
462.0	1.86	162.02	462.0	-1.1	2.1	1.9	2.85
487.0	2.67	163.17	487.0	-2.0	2.4	2.9	3.24
512.0	2.83	165.87	511.9	-3.2	2.8	4.1	0.82
537.0	3.13	169.56	536.9	-4.5	3.0	5.3	1.42
562.0	3.11	170.40	561.9	-5.8	3.3	6.6	0.20
587.0	3.30	170.94	586.8	-7.2	3.5	8.0	0.77
612.0	3.90	170.31	611.8	-8.7	3.8	9.5	2.41
637.0	4.21	169.31	636.7	-10.5	4.1	11.2	1.27
662.0	4.54	170.07	661.6	-12.3	4.4	13.0	1.34
687.0	5.30	170.20	686.5	-14.5	4.8	15.1	3.04
712.0	5.96	169.18	711.4	-16.9	5.2	17.5	2.67
737.0	5.96	168.60	736.3	-19.4	5.7	20.0	0.24
762.0	6.12	168.95	761.2	-22.0	6.2	22.5	0.66
787.0	6.09	169.25	786.0	-24.6	6.7	25.1	0.18
812.0	5.98	168.68	810.9	-27.2	7.2	27.6	0.50
837.0	5.86	168.90	835.7	-29.7	7.7	30.1	0.49
862.0	5.56	168.25	860.6	-32.2	8.2	32.5	1.23
887.0	5.42	168.23	885.5	-34.5	8.7	34.8	0.56
912.0	5.28	167.35	910.4	-36.8	9.2	37.1	0.65
937.0	5.19	167.14	935.3	-39.0	9.7	39.3	0.37
962.0	5.02	167.09	960.2	-41.2	10.2	41.5	0.68
987.0	4.83	167.73	985.1	-43.3	10.7	43.6	0.79
1,012.0	4.66	166.80	1,010.0	-45.3	11.1	45.6	0.75
1,037.0	4.69	166.80	1,034.9	-47.3	11.6	47.6	0.12
1,062.0	4.52	166.22	1,059.8	-49.2	12.1	49.5	0.71
1,087.0	4.38	165.83	1,084.8	-51.1	12.5	51.4	0.57
1,112.0	4.14	165.26	1,109.7	-52.9	13.0	53.3	0.97
1,137.0	4.00	165.09	1,134.6	-54.6	13.5	55.0	0.56
1,162.0	3.76	164.63	1,159.6	-56.2	13.9	56.7	0.97
1,187.0	3.59	163.52	1,184.5	-57.8	14.3	58.2	0.74
1,212.0	3.51	164.00	1,209.5	-59.3	14.8	59.8	0.34
1,237.0	3.31	164.00	1,234.4	-60.7	15.2	61.2	0.80
1,262.0	3.11	163.03	1,259.4	-62.0	15.6	62.6	0.83
1,287.0	3.04	161.98	1,284.4	-63.3	16.0	63.9	0.36
1,312.0	2.88	162.05	1,309.3	-64.5	16.4	65.2	0.64
1,337.0	2.87	160.97	1,334.3	-65.7	16.8	66.5	0.22
1,362.0	2.73	159.16	1,359.3	-66.9	17.2	67.7	0.66
1,387.0	2.59	158.10	1,384.2	-68.0	17.6	68.8	0.59
1,412.0	2.54	157.80	1,409.2	-69.0	18.0	70.0	0.21
1,437.0	2.63	157.21	1,434.2	-70.0	18.5	71.1	0.38





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1,462.0	2.59	157.93	1,459.2	-71.1	18.9	72.2	0.21
1,487.0	2.44	158.25	1,484.1	-72.1	19.3	73.3	0.60
1,512.0	2.32	156.34	1,509.1	-73.1	19.7	74.3	0.58
1,537.0	2.26	157.34	1,534.1	-74.0	20.1	75.3	0.29
1,562.0	2.13	158.15	1,559.1	-74.9	20.5	76.3	0.53
1,587.0	2.17	159.04	1,584.1	-75.7	20.8	77.2	0.21
1,612.0	2.10	158.74	1,609.0	-76.6	21.1	78.2	0.28
1,637.0	2.04	157.26	1,634.0	-77.5	21.5	79.1	0.32
1,662.0	1.81	158.52	1,659.0	-78.2	21.8	79.9	0.94
1,687.0	1.81	157.83	1,684.0	-79.0	22.1	80.7	0.09
1,712.0	1.86	156.64	1,709.0	-79.7	22.4	81.5	0.25
1,737.0	1.84	154.94	1,734.0	-80.4	22.7	82.3	0.23
1,762.0	1.68	154.17	1,759.0	-81.1	23.1	83.1	0.65
1,787.0	1.73	152.69	1,784.0	-81.8	23.4	83.8	0.27
1,812.0	1.70	150.80	1,808.9	-82.5	23.7	84.6	0.26
1,837.0	1.76	152.09	1,833.9	-83.1	24.1	85.3	0.29
1,862.0	1.64	149.40	1,858.9	-83.8	24.5	86.1	0.58
1,887.0	1.47	144.49	1,883.9	-84.3	24.8	86.7	0.86
1,912.0	1.41	141.20	1,908.9	-84.8	25.2	87.3	0.41
1,937.0	1.44	141.00	1,933.9	-85.3	25.6	87.9	0.12
1,962.0	1.43	139.13	1,958.9	-85.8	26.0	88.6	0.19
1,987.0	1.35	140.88	1,983.9	-86.3	26.4	89.1	0.36
2,012.0	1.33	137.94	2,008.9	-86.7	26.8	89.7	0.29
2,037.0	1.32	142.09	2,033.9	-87.2	27.1	90.3	0.39
2,062.0	1.30	140.45	2,058.9	-87.6	27.5	90.8	0.17
2,087.0	1.34	142.40	2,083.9	-88.0	27.9	91.4	0.24
2,112.0	1.28	138.61	2,108.8	-88.5	28.2	91.9	0.42
2,137.0	1.18	137.90	2,133.8	-88.9	28.6	92.5	0.40
2,162.0	1.18	138.38	2,158.8	-89.3	28.9	93.0	0.04
2,187.0	1.04	138.62	2,183.8	-89.6	29.2	93.4	0.56
2,212.0	1.21	141.80	2,208.8	-90.0	29.6	93.9	0.72
2,237.0	1.12	133.72	2,233.8	-90.4	29.9	94.4	0.75
2,262.0	1.10	137.63	2,258.8	-90.7	30.2	94.8	0.31
2,287.0	1.24	140.73	2,283.8	-91.1	30.6	95.3	0.61
2,312.0	1.10	136.10	2,308.8	-91.5	30.9	95.8	0.68
2,337.0	1.19	143.99	2,333.8	-91.9	31.2	96.3	0.73
2,362.0	1.30	139.33	2,358.8	-92.3	31.6	96.8	0.60
2,387.0	1.18	141.58	2,383.8	-92.7	31.9	97.4	0.52
2,412.0	1.21	139.49	2,408.8	-93.1	32.2	97.9	0.21
2,437.0	1.26	140.16	2,433.8	-93.5	32.6	98.4	0.21
2,462.0	1.22	136.06	2,458.8	-93.9	33.0	98.9	0.39
2,487.0	1.30	137.85	2,483.8	-94.3	33.3	99.4	0.36
2,512.0	1.22	138.30	2,508.8	-94.8	33.7	100.0	0.32
2,537.0	1.12	134.27	2,533.8	-95.1	34.0	100.5	0.52
2,562.0	1.16	132.32	2,558.7	-95.5	34.4	100.9	0.22



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2,587.0	1.17	132.88	2,583.7	-95.8	34.8	101.4	0.06
2,612.0	1.13	130.86	2,608.7	-96.1	35.2	101.9	0.23
2,637.0	1.17	133.35	2,633.7	-96.5	35.5	102.3	0.26
2,662.0	1.05	129.81	2,658.7	-96.8	35.9	102.8	0.55
2,687.0	1.22	135.13	2,683.7	-97.1	36.3	103.2	0.80
2,712.0	1.11	132.38	2,708.7	-97.5	36.6	103.7	0.49
2,737.0	1.18	125.99	2,733.7	-97.8	37.0	104.2	0.58
2,762.0	1.08	130.80	2,758.7	-98.1	37.4	104.6	0.55
2,787.0	1.13	131.03	2,783.7	-98.4	37.8	105.0	0.20
2,812.0	1.15	128.33	2,808.7	-98.7	38.1	105.5	0.23
2,837.0	1.00	127.87	2,833.7	-99.0	38.5	105.9	0.60
2,862.0	0.98	126.41	2,858.7	-99.3	38.9	106.3	0.13
2,887.0	0.97	122.36	2,883.7	-99.5	39.2	106.7	0.28
2,912.0	0.98	122.62	2,908.7	-99.8	39.6	107.0	0.04
2,937.0	1.04	123.87	2,933.7	-100.0	39.9	107.4	0.26
2,962.0	1.04	123.20	2,958.7	-100.3	40.3	107.8	0.05
2,987.0	0.97	122.31	2,983.7	-100.5	40.7	108.2	0.29
3,012.0	1.00	120.17	3,008.7	-100.7	41.0	108.5	0.19
3,037.0	0.92	122.36	3,033.7	-100.9	41.4	108.9	0.35
3,062.0	1.02	117.84	3,058.7	-101.1	41.8	109.2	0.50
3,087.0	1.05	118.41	3,083.7	-101.4	42.2	109.6	0.13
3,112.0	0.96	116.72	3,108.7	-101.6	42.6	110.0	0.38
3,137.0	1.00	120.38	3,133.6	-101.8	42.9	110.3	0.30
3,162.0	1.07	118.31	3,158.6	-102.0	43.3	110.7	0.32
3,187.0	1.01	118.97	3,183.6	-102.2	43.7	111.0	0.24
3,212.0	1.01	115.22	3,208.6	-102.4	44.1	111.4	0.26
3,237.0	1.09	117.26	3,233.6	-102.6	44.5	111.8	0.35
3,262.0	1.05	118.01	3,258.6	-102.8	44.9	112.1	0.17
3,287.0	1.05	117.79	3,283.6	-103.0	45.3	112.5	0.02
3,312.0	1.02	116.54	3,308.6	-103.2	45.7	112.9	0.15
3,337.0	1.08	117.22	3,333.6	-103.5	46.2	113.2	0.25
3,362.0	1.06	117.13	3,358.6	-103.7	46.6	113.6	0.08
3,387.0	1.13	118.75	3,383.6	-103.9	47.0	114.0	0.31
3,412.0	1.11	118.65	3,408.6	-104.1	47.4	114.4	0.08
3,437.0	1.12	120.16	3,433.6	-104.4	47.8	114.8	0.12
3,462.0	1.01	120.01	3,458.6	-104.6	48.2	115.2	0.44
3,487.0	1.09	119.25	3,483.6	-104.8	48.6	115.5	0.32
3,512.0	1.08	121.92	3,508.6	-105.1	49.1	115.9	0.21
3,537.0	0.99	120.57	3,533.6	-105.3	49.4	116.3	0.37
3,562.0	1.05	121.79	3,558.6	-105.5	49.8	116.7	0.26
3,587.0	1.07	120.84	3,583.6	-105.8	50.2	117.1	0.11
3,612.0	1.05	122.31	3,608.6	-106.0	50.6	117.5	0.14
3,637.0	1.08	123.60	3,633.6	-106.3	51.0	117.9	0.15
3,662.0	1.06	122.64	3,658.6	-106.5	51.4	118.3	0.11





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**Design:** As Drilled

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**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)
3,687.0	1.05	120.96	3,683.6	-106.8	51.8	118.7	0.13
3,712.0	1.08	122.87	3,708.6	-107.0	52.2	119.0	0.19
3,737.0	1.09	124.04	3,733.5	-107.3	52.6	119.5	0.10
3,762.0	1.13	121.90	3,758.5	-107.5	53.0	119.9	0.23
3,787.0	1.11	123.07	3,783.5	-107.8	53.4	120.3	0.12
3,812.0	1.12	121.94	3,808.5	-108.1	53.8	120.7	0.10
3,837.0	1.13	123.17	3,833.5	-108.3	54.2	121.1	0.10
3,862.0	1.19	122.56	3,858.5	-108.6	54.6	121.5	0.25
3,887.0	1.12	124.31	3,883.5	-108.9	55.1	122.0	0.31
3,912.0	1.16	120.61	3,908.5	-109.1	55.5	122.4	0.34
3,937.0	1.18	123.50	3,933.5	-109.4	55.9	122.8	0.25
3,962.0	1.19	123.03	3,958.5	-109.7	56.3	123.3	0.06
3,987.0	1.20	122.10	3,983.5	-110.0	56.8	123.7	0.09
4,012.0	1.19	125.13	4,008.5	-110.3	57.2	124.2	0.26
4,037.0	1.24	125.67	4,033.5	-110.6	57.6	124.6	0.21
4,062.0	1.31	126.04	4,058.5	-110.9	58.1	125.1	0.28
4,087.0	1.40	124.48	4,083.5	-111.2	58.6	125.6	0.39
4,112.0	1.44	126.64	4,108.5	-111.6	59.1	126.2	0.27
4,137.0	1.41	127.96	4,133.5	-112.0	59.6	126.7	0.18
4,162.0	1.38	124.80	4,158.4	-112.3	60.1	127.3	0.33
4,187.0	1.47	127.86	4,183.4	-112.7	60.6	127.8	0.47
4,212.0	1.52	125.46	4,208.4	-113.1	61.1	128.4	0.32
4,237.0	1.56	127.04	4,233.4	-113.5	61.6	129.0	0.23
4,262.0	1.62	126.82	4,258.4	-113.9	62.2	129.6	0.24
4,287.0	1.68	125.81	4,283.4	-114.3	62.8	130.3	0.27
4,312.0	1.67	127.43	4,308.4	-114.8	63.4	130.9	0.19
4,337.0	1.76	126.05	4,333.4	-115.2	64.0	131.6	0.40
4,362.0	1.79	127.09	4,358.4	-115.7	64.6	132.3	0.18
4,387.0	1.80	127.31	4,383.4	-116.1	65.2	133.0	0.05
4,412.0	2.01	126.47	4,408.3	-116.6	65.9	133.7	0.85
4,437.0	1.93	127.25	4,433.3	-117.2	66.6	134.5	0.34
4,462.0	1.95	128.14	4,458.3	-117.7	67.2	135.2	0.14
4,487.0	2.02	126.13	4,483.3	-118.2	67.9	136.0	0.39
4,512.0	1.94	127.18	4,508.3	-118.7	68.6	136.8	0.35
4,537.0	2.05	126.79	4,533.3	-119.2	69.3	137.5	0.44
4,562.0	1.97	129.14	4,558.3	-119.8	70.0	138.3	0.46
4,587.0	1.86	130.63	4,583.2	-120.3	70.6	139.1	0.48
4,612.0	1.71	133.74	4,608.2	-120.8	71.2	139.8	0.71
4,637.0	1.64	133.16	4,633.2	-121.3	71.7	140.5	0.29
4,662.0	1.59	133.71	4,658.2	-121.8	72.3	141.1	0.21
4,687.0	1.47	133.40	4,683.2	-122.3	72.7	141.8	0.48
4,712.0	1.27	133.27	4,708.2	-122.7	73.2	142.3	0.80
4,737.0	1.13	134.80	4,733.2	-123.1	73.6	142.8	0.57
4,762.0	0.96	136.47	4,758.2	-123.4	73.9	143.2	0.69



**Company:** Antero  
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**Site:** Fritz Pad: Hayden/Washington/Sheep/Hileman  
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**Design:** As Drilled

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**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
4,787.0	0.74	135.70	4,783.2	-123.7	74.1	143.6	0.88
4,812.0	0.63	133.86	4,808.2	-123.9	74.3	143.9	0.45
4,837.0	0.43	138.89	4,833.2	-124.0	74.5	144.1	0.82
4,862.0	0.53	135.37	4,858.2	-124.2	74.6	144.3	0.42
4,887.0	0.52	131.01	4,883.2	-124.3	74.8	144.5	0.16
4,912.0	0.53	131.20	4,908.2	-124.5	75.0	144.7	0.04
4,937.0	0.50	133.00	4,933.2	-124.6	75.1	144.9	0.14
4,962.0	0.50	124.82	4,958.2	-124.8	75.3	145.1	0.29
4,987.0	0.56	124.99	4,983.2	-124.9	75.5	145.3	0.24
5,012.0	0.54	115.79	5,008.2	-125.0	75.7	145.5	0.36
5,037.0	0.61	113.73	5,033.2	-125.1	75.9	145.7	0.29
5,062.0	0.67	105.24	5,058.2	-125.2	76.2	145.9	0.45
5,087.0	0.66	104.09	5,083.2	-125.3	76.5	146.1	0.07
5,112.0	0.64	97.55	5,108.2	-125.4	76.8	146.3	0.31
5,137.0	0.71	100.75	5,133.2	-125.4	77.1	146.5	0.32
5,162.0	0.63	98.92	5,158.2	-125.5	77.3	146.6	0.33
5,187.0	0.66	101.34	5,183.2	-125.5	77.6	146.8	0.16
5,212.0	0.74	95.72	5,208.2	-125.5	77.9	147.0	0.42
5,237.0	0.74	100.85	5,233.2	-125.6	78.2	147.1	0.26
5,262.0	0.72	97.62	5,258.2	-125.6	78.6	147.3	0.18
5,287.0	0.77	96.48	5,283.2	-125.7	78.9	147.5	0.21
5,312.0	0.73	97.60	5,308.1	-125.7	79.2	147.7	0.17
5,337.0	0.76	103.08	5,333.1	-125.8	79.5	147.9	0.31
5,362.0	0.74	91.31	5,358.1	-125.8	79.8	148.0	0.62
5,387.0	0.76	94.04	5,383.1	-125.8	80.2	148.2	0.16
5,412.0	0.79	94.29	5,408.1	-125.9	80.5	148.4	0.12
5,437.0	0.79	92.15	5,433.1	-125.9	80.9	148.5	0.12
5,462.0	0.76	106.16	5,458.1	-125.9	81.2	148.7	0.77
5,487.0	0.85	98.64	5,483.1	-126.0	81.5	148.9	0.55
5,512.0	0.83	96.47	5,508.1	-126.1	81.9	149.2	0.15
5,537.0	0.83	98.07	5,533.1	-126.1	82.2	149.3	0.09
5,562.0	0.73	108.30	5,558.1	-126.2	82.6	149.6	0.68
5,587.0	0.93	102.83	5,583.1	-126.3	82.9	149.8	0.86
5,612.0	0.84	106.81	5,608.1	-126.4	83.3	150.0	0.44
5,637.0	1.02	101.72	5,633.1	-126.5	83.7	150.3	0.79
5,662.0	0.93	110.66	5,658.1	-126.6	84.1	150.6	0.71
5,687.0	0.92	111.41	5,683.1	-126.7	84.5	150.9	0.06
5,712.0	1.02	107.42	5,708.1	-126.9	84.9	151.2	0.48
5,737.0	0.97	108.83	5,733.1	-127.0	85.3	151.5	0.22
5,759.0	1.07	107.72	5,755.1	-127.1	85.7	151.8	0.46
5,799.0	1.07	74.53	5,795.1	-127.1	86.4	152.1	1.53
5,831.0	3.94	52.40	5,827.1	-126.4	87.5	151.9	9.30
5,863.0	7.99	47.91	5,858.9	-124.2	90.1	151.1	12.73
5,895.0	11.96	43.70	5,890.4	-120.3	94.0	149.3	12.61





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**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,928.0	15.36	41.14	5,922.5	-114.6	99.2	146.4	10.46
5,959.0	18.93	41.48	5,952.1	-107.7	105.3	142.8	11.52
5,991.0	22.90	42.44	5,982.0	-99.2	112.9	138.5	12.45
6,023.0	25.58	43.06	6,011.1	-89.6	121.8	133.8	8.41
6,055.0	27.96	42.90	6,039.7	-79.0	131.7	128.6	7.44
6,087.0	29.54	47.59	6,067.8	-68.2	142.6	123.6	8.60
6,120.0	30.08	56.76	6,096.4	-58.2	155.5	120.2	13.90
6,152.0	30.34	62.59	6,124.1	-50.1	169.4	119.0	9.20
6,183.0	29.95	66.47	6,150.9	-43.4	183.5	119.1	6.41
6,216.0	29.90	74.15	6,179.5	-37.8	198.9	120.8	11.60
6,248.0	30.45	80.47	6,207.2	-34.3	214.6	124.5	10.07
6,252.0	30.45	81.32	6,210.6	-34.0	216.6	125.1	10.75
<b>SCMR</b>							
6,280.0	30.60	87.24	6,234.7	-32.6	230.7	130.0	10.75
6,312.0	32.21	94.08	6,262.1	-32.8	247.4	137.4	12.21
6,344.0	33.96	97.86	6,288.9	-34.6	264.8	146.6	8.45
6,376.0	34.95	101.27	6,315.3	-37.6	282.6	157.1	6.78
6,408.0	35.44	108.35	6,341.4	-42.4	300.4	169.1	12.84
6,440.0	36.93	114.12	6,367.2	-49.2	318.0	183.0	11.61
6,464.0	38.64	117.04	6,386.2	-55.6	331.2	194.5	10.33
<b>MDLX</b>							
6,472.0	39.23	117.97	6,392.4	-57.9	335.7	198.5	10.33
6,505.0	42.44	121.26	6,417.4	-68.6	354.4	216.3	11.71
6,537.0	45.66	124.61	6,440.4	-80.7	373.1	235.3	12.42
6,569.0	48.92	128.13	6,462.1	-94.6	392.0	256.1	13.00
6,600.0	52.50	131.33	6,481.7	-110.0	410.4	278.0	14.04
6,632.0	56.60	133.55	6,500.3	-127.6	429.7	302.2	14.00
6,643.0	58.19	134.08	6,506.2	-134.0	436.4	310.9	14.98
<b>BRKT</b>							
6,664.0	61.22	135.05	6,516.8	-146.7	449.3	328.0	14.98
6,696.0	65.54	136.87	6,531.2	-167.3	469.1	355.1	14.43
6,698.0	65.79	137.05	6,532.0	-168.6	470.4	356.9	15.09
<b>TULLY</b>							
6,728.0	69.61	139.68	6,543.4	-189.3	488.8	383.6	15.09
6,760.0	72.70	140.44	6,553.7	-212.6	508.3	413.0	9.91
6,769.0	73.15	141.12	6,556.3	-219.2	513.7	421.3	8.83
<b>HMLN</b>							
6,789.0	74.16	142.63	6,562.0	-234.3	525.5	440.1	8.83
<b>MRCL_HOT</b>							
6,792.0	74.31	142.86	6,562.8	-236.6	527.3	442.9	8.83
6,824.0	76.83	145.95	6,570.8	-261.8	545.3	473.5	12.22
6,857.0	80.14	149.12	6,577.3	-289.1	562.7	505.6	13.75
6,888.0	82.84	151.39	6,581.9	-315.7	577.9	536.2	11.33
6,949.0	88.79	154.40	6,586.4	-369.8	605.6	596.9	10.92
6,981.0	89.36	154.07	6,586.9	-398.7	619.5	628.9	2.06



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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,077.0	92.38	155.55	6,585.4	-485.5	660.3	724.9	3.50
7,173.0	91.64	155.03	6,582.1	-572.7	700.4	820.8	0.94
7,268.0	89.50	153.49	6,581.1	-658.2	741.7	915.8	2.78
7,364.0	92.02	155.35	6,579.9	-744.8	783.1	1,011.8	3.26
7,459.0	91.98	153.67	6,576.5	-830.5	824.0	1,106.7	1.77
7,556.0	91.58	151.93	6,573.5	-916.7	868.3	1,203.6	1.84
7,652.0	91.58	150.53	6,570.9	-1,000.8	914.5	1,299.5	1.46
7,748.0	91.14	155.60	6,568.6	-1,086.4	957.9	1,395.4	5.30
7,844.0	91.95	154.28	6,566.0	-1,173.3	998.6	1,491.4	1.61
7,941.0	90.98	155.27	6,563.5	-1,261.0	1,039.9	1,588.3	1.43
8,037.0	90.77	153.45	6,562.1	-1,347.5	1,081.4	1,684.3	1.91
8,134.0	92.08	151.93	6,559.7	-1,433.7	1,125.9	1,781.2	2.07
8,230.0	92.18	149.26	6,556.1	-1,517.3	1,173.0	1,877.0	2.78
8,326.0	92.45	151.62	6,552.2	-1,600.7	1,220.4	1,972.7	2.47
8,422.0	92.05	156.37	6,548.4	-1,686.9	1,262.4	2,068.6	4.96
8,518.0	91.71	156.68	6,545.3	-1,774.9	1,300.6	2,164.5	0.48
8,614.0	90.37	155.92	6,543.5	-1,862.8	1,339.2	2,260.4	1.60
8,710.0	90.94	155.67	6,542.4	-1,950.3	1,378.6	2,356.3	0.65
8,806.0	90.97	154.40	6,540.8	-2,037.4	1,419.1	2,452.3	1.32
8,902.0	91.48	154.81	6,538.8	-2,124.1	1,460.2	2,548.3	0.68
8,998.0	91.54	153.84	6,536.3	-2,210.5	1,501.8	2,644.2	1.01
9,093.0	91.78	155.31	6,533.5	-2,296.3	1,542.6	2,739.2	1.57
9,188.0	92.05	154.56	6,530.3	-2,382.3	1,582.8	2,834.1	0.84
9,284.0	91.31	154.38	6,527.5	-2,468.9	1,624.2	2,930.1	0.79
9,380.0	91.68	154.37	6,525.0	-2,555.4	1,665.7	3,026.1	0.39
9,477.0	92.08	153.50	6,521.8	-2,642.5	1,708.3	3,123.0	0.99
9,573.0	91.51	153.00	6,518.8	-2,728.2	1,751.4	3,218.9	0.79
9,669.0	91.68	152.40	6,516.2	-2,813.5	1,795.5	3,314.9	0.65
9,765.0	92.02	152.39	6,513.1	-2,898.5	1,839.9	3,410.8	0.35
9,860.0	91.74	151.39	6,509.9	-2,982.3	1,884.7	3,505.7	1.09
9,957.0	90.84	152.40	6,507.8	-3,067.8	1,930.3	3,602.6	1.39
10,053.0	91.31	152.77	6,506.0	-3,153.0	1,974.5	3,698.5	0.62
10,150.0	91.88	154.42	6,503.3	-3,239.8	2,017.6	3,795.5	1.80
10,246.0	89.60	152.60	6,502.0	-3,325.7	2,060.5	3,891.4	3.04
10,343.0	91.37	153.85	6,501.2	-3,412.3	2,104.2	3,988.4	2.23
10,439.0	92.28	154.94	6,498.1	-3,498.9	2,145.6	4,084.4	1.48
10,535.0	92.58	153.93	6,494.1	-3,585.4	2,187.0	4,180.3	1.10
10,631.0	92.35	154.51	6,489.9	-3,671.7	2,228.7	4,276.2	0.65
10,726.0	89.80	154.72	6,488.2	-3,757.6	2,269.4	4,371.1	2.69
10,821.0	89.66	154.19	6,488.6	-3,843.3	2,310.4	4,466.1	0.58
10,917.0	90.60	155.74	6,488.4	-3,930.2	2,351.0	4,562.1	1.89
11,014.0	91.34	156.36	6,486.7	-4,018.9	2,390.4	4,659.1	1.00
11,109.0	91.98	156.04	6,484.0	-4,105.8	2,428.7	4,754.0	0.75
11,205.0	92.41	155.76	6,480.3	-4,193.3	2,467.9	4,849.8	0.53





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11,301.0	90.37	155.17	6,478.0	-4,280.6	2,507.7	4,945.8	2.21
11,398.0	90.64	155.19	6,477.1	-4,368.7	2,548.5	5,042.8	0.28
11,494.0	90.77	155.56	6,476.0	-4,455.9	2,588.5	5,138.7	0.41
11,591.0	91.08	156.76	6,474.4	-4,544.6	2,627.7	5,235.7	1.28
11,687.0	90.37	155.86	6,473.2	-4,632.5	2,666.2	5,331.6	1.19
11,783.0	89.87	154.80	6,473.0	-4,719.8	2,706.3	5,427.6	1.22
11,873.0	90.50	153.40	6,472.7	-4,800.7	2,745.6	5,517.6	1.71
11,964.0	91.04	153.26	6,471.5	-4,882.0	2,786.4	5,608.5	0.61
12,054.0	91.48	153.12	6,469.5	-4,962.3	2,827.0	5,698.5	0.51
12,144.0	91.85	152.93	6,466.9	-5,042.5	2,867.8	5,788.4	0.46
12,235.0	91.48	154.02	6,464.2	-5,123.9	2,908.5	5,879.4	1.26
12,325.0	91.65	153.87	6,461.8	-5,204.7	2,948.0	5,969.4	0.25
12,416.0	92.76	154.77	6,458.3	-5,286.7	2,987.4	6,060.3	1.57
12,507.0	91.63	154.85	6,454.8	-5,369.0	3,026.1	6,151.2	1.24
12,598.0	91.01	153.44	6,452.7	-5,450.8	3,065.7	6,242.2	1.69
12,689.0	89.90	152.82	6,452.0	-5,532.0	3,106.9	6,333.2	1.40
12,780.0	90.10	152.67	6,452.0	-5,612.9	3,148.5	6,424.2	0.27
12,870.0	90.27	154.45	6,451.7	-5,693.5	3,188.6	6,514.1	1.99
12,967.0	89.43	155.11	6,451.9	-5,781.2	3,230.0	6,611.1	1.10
13,061.0	89.76	154.22	6,452.6	-5,866.2	3,270.2	6,705.1	1.01
13,157.0	90.94	154.90	6,452.0	-5,952.9	3,311.4	6,801.1	1.42
13,253.0	89.93	153.04	6,451.3	-6,039.1	3,353.5	6,897.1	2.20
13,348.0	88.12	150.24	6,452.9	-6,122.7	3,398.6	6,992.0	3.51
13,445.0	88.89	151.49	6,455.4	-6,207.4	3,445.9	7,088.8	1.51
13,540.0	90.34	151.50	6,456.1	-6,290.9	3,491.2	7,183.7	1.53
13,634.0	90.47	152.72	6,455.4	-6,374.0	3,535.2	7,277.6	1.31
13,730.0	90.71	154.64	6,454.4	-6,460.0	3,577.7	7,373.6	2.02
13,826.0	89.56	155.21	6,454.2	-6,547.0	3,618.4	7,469.6	1.34
13,922.0	89.76	154.89	6,454.7	-6,634.0	3,658.9	7,565.6	0.39
14,018.0	90.00	155.12	6,454.9	-6,721.0	3,699.5	7,661.6	0.35
14,113.0	89.93	153.90	6,455.0	-6,806.7	3,740.3	7,756.6	1.29
14,209.0	90.47	154.37	6,454.7	-6,893.1	3,782.2	7,852.6	0.75
14,306.0	90.87	153.89	6,453.5	-6,980.4	3,824.5	7,949.6	0.64
14,402.0	90.34	155.07	6,452.5	-7,067.0	3,865.9	8,045.6	1.35
14,498.0	90.81	155.73	6,451.6	-7,154.3	3,905.9	8,141.5	0.84
14,594.0	89.50	154.11	6,451.3	-7,241.3	3,946.6	8,237.5	2.17
14,690.0	89.77	154.13	6,451.9	-7,327.6	3,988.5	8,333.5	0.28
14,787.0	90.77	154.54	6,451.5	-7,415.1	4,030.5	8,430.5	1.11
14,883.0	91.31	154.87	6,449.7	-7,501.8	4,071.5	8,526.5	0.66
14,979.0	90.37	155.75	6,448.3	-7,589.0	4,111.6	8,622.5	1.34
15,075.0	90.44	155.91	6,447.6	-7,676.6	4,150.9	8,718.4	0.18
15,171.0	90.44	155.55	6,446.9	-7,764.1	4,190.3	8,814.4	0.37
15,268.0	89.76	155.86	6,446.7	-7,852.6	4,230.2	8,911.3	0.77
15,364.0	89.19	155.19	6,447.6	-7,939.9	4,270.0	9,007.3	0.92
15,460.0	89.53	154.91	6,448.7	-8,027.0	4,310.5	9,103.3	0.46

**Company:** Antero  
**Project:** Doddridge County WV  
**Site:** Fritz Pad: Hayden/Washington/Sheep/Hileman  
**Well:** Hileman Unit 2H  
**Wellbore:** Original Wellpath  
**Design:** As Drilled

**Local Co-ordinate Reference:** Well Hileman Unit 2H  
**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)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
15,556.0	88.89	153.10	6,450.0	-8,113.2	4,352.6	9,199.3	2.00
15,653.0	89.06	153.02	6,451.7	-8,199.7	4,396.5	9,296.2	0.19
15,748.0	89.40	152.73	6,453.0	-8,284.2	4,439.8	9,391.2	0.47
15,844.0	87.92	151.63	6,455.2	-8,369.1	4,484.6	9,487.1	1.92
15,941.0	88.05	151.40	6,458.7	-8,454.3	4,530.8	9,584.0	0.27
15,968.0	88.02	150.69	6,459.6	-8,477.9	4,543.9	9,610.9	2.63
16,029.0	88.02	150.69	6,461.7	-8,531.1	4,573.8	9,671.8	0.00

PTB

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,252.0	6,210.6	-34.0	216.6	SCMR
6,464.0	6,386.2	-55.6	331.2	MDLX
6,643.0	6,506.2	-134.0	436.4	BRKT
6,698.0	6,532.0	-168.6	470.4	TULLY
6,769.0	6,556.3	-219.2	513.7	HMLN
6,789.0	6,562.0	-234.3	525.5	MRCL_HOT
16,029.0	6,461.7	-8,531.1	4,573.8	PTB

Checked By: _____	Approved By: _____	Date: _____
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