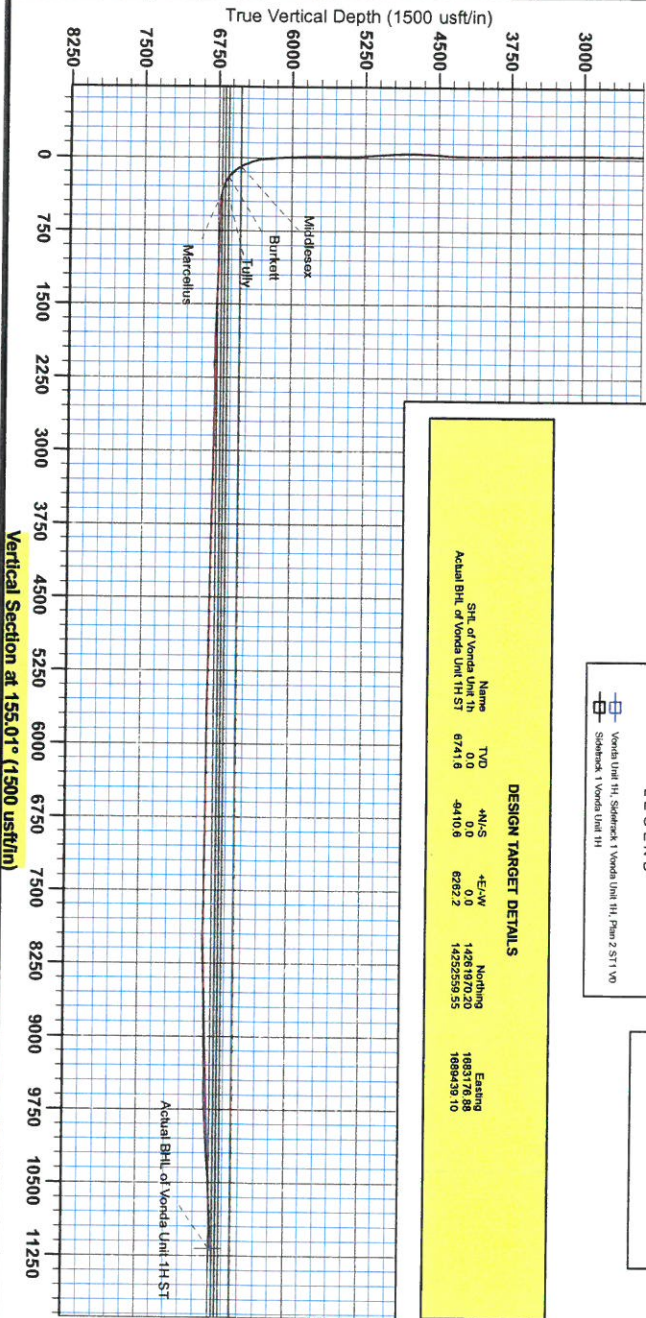




Antero Resources
 Vonda Unit 1H
 Doddridge County WV
 Northing: 14261970.20
 Easting: 1683176.88
 Sidetrack 1 Vonda Unit 1H



Vertical Section at 155.01° (1500 usft/in)

WELL DETAILS: Vonda Unit 1H

+N/-S	+E/-W	Northing	Ground Level	1164.0	Latitude	38° 16' 28.720" N	Longitude	80° 50' 56.052" W	SIT
0.0	0.0	14261970.20	Easting	1683176.88	38° 16' 28.720" N	80° 50' 56.052" W			

PROJECT DETAILS: Doddridge County, WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83 CONUS)
 Ellipsoid: GRS 1980
 Zone: Zone 17N (64 W to 78 W)
 System Datum: Mean Sea Level

REFERENCE INFORMATION

Coordinate (N/E) Reference: West Vonda Unit 1H Grid Point
 Mapped (N/E) Reference: Frontier 23 Vonda Unit 1H DL 1164.1 27 RRD @ 1160 East
 Mapped (N/E) Reference: Frontier 23 Vonda Unit 1H DL 1164.1 27 RRD @ 1160 East
 Contour Interval: 1000 Feet

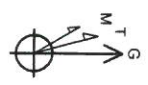
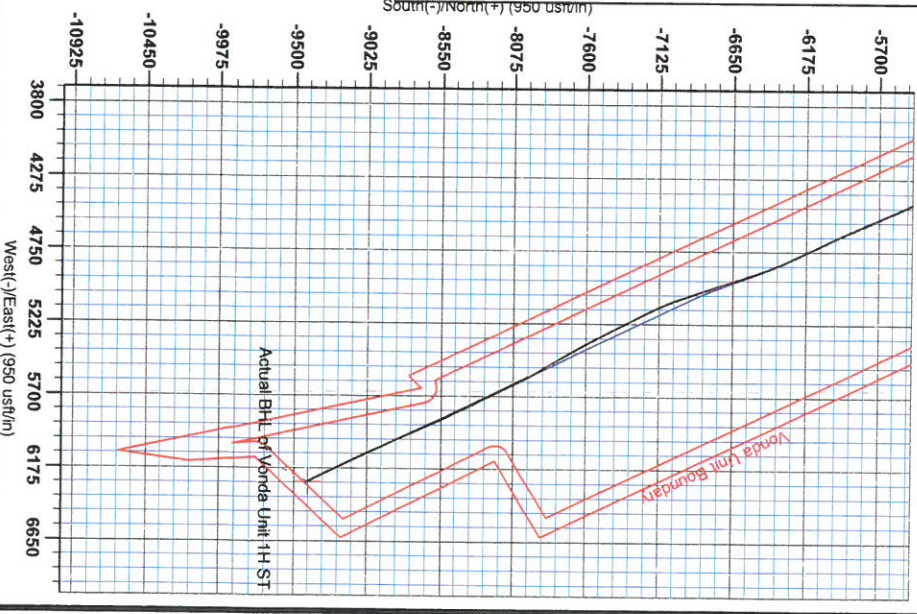
LEGEND

- Vonda Unit 1H, Sidetrack 1 Vonda Unit 1H, Pass 2 ST 1 V0
- Sidetrack 1 Vonda Unit 1H

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
Sit. of Vonda Unit 1H	0.0	0.0	0.0	14261970.20	1683176.88
Actual BHL of Vonda Unit 1H ST	6741.6	-6410.6	6262.2	14232559.55	1688439.10

GENIE LIGHTFOOT
 13.33, July 30 2014
 Scientific Drilling International
 421 South Eagle Lane
 Oklahoma City, OK 73128



Azimuths to Grid North
 True North: -0.10°
 Magnetic North: -8.52°
 To convert Magnetic North to Grid, Subtract 8.52°
 To convert from North to Grid, Subtract 0.10°

Magnetic Field
 Strength: 25.4 A/m
 Dip Angle: 66.87°
 Date: 6/28/2014
 Model: BCGM2014

MORGANTOWN
 W.M. SURVEY LOG
 5102 80 NNJ



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MORGANTOWN, WV

Antero Resources

**Doddridge County WV
Nero Pad
Vonda Unit 1H**

Sidetrack 1 Vonda Unit 1H

Design: Sidetrack 1 Vonda Unit 1H

Standard Survey Report

30 July, 2014



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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Vonda Unit 1H
Project:	Doddridge County WV	TVD Reference:	Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
Site:	Nero Pad	MD Reference:	Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
Well:	Vonda Unit 1H	North Reference:	Grid
Wellbore:	Sidetrack 1 Vonda Unit 1H	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack 1 Vonda Unit 1H	Database:	Oklahoma District

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

Site	Nero Pad				
Site Position:	Northing:	14,261,930.17 usft	Latitude:	39° 16' 28.324 N	
From:	Map	Easting:	1,683,174.55 usft	Longitude:	80° 50' 56.082 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Vonda Unit 1H, Marcellus					
Well Position	+N-S	0.0 usft	Northing:	14,261,970.20 usft	Latitude:	39° 16' 28.720 N
	+E-W	0.0 usft	Easting:	1,683,176.88 usft	Longitude:	80° 50' 56.052 W
Position Uncertainty	2.0 usft	Wellhead Elevation:	1,186.0 usft	Ground Level:	1,164.0 usft	

Wellbore	Sidetrack 1 Vonda Unit 1H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	6/28/2014	-8.43	66.87	52,254

Design	Sidetrack 1 Vonda Unit 1H				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	14,623.0
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.0	0.0	0.0	155.01	

Survey Program	Date	7/30/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
50.0	970.0	Survey #2 Def Gyro to 970' (Original Wellp	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
1,000.0	2,814.0	Survey #4 Def Gyro to Int (Original Wellpa	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
2,900.0	5,568.7	Survey #6 Def Gyro to 5569 (Original Well	KPR-SS	SDC Keeper single shots	
5,700.0	14,623.0	Survey #7 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	
14,717.0	18,079.0	Survey #1 MWD (Sidetrack 1 Vonda Unit 1	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
50.0	0.17	317.71	50.0	0.1	0.0	-0.1	0.34	0.34	0.00
100.0	0.23	320.92	100.0	0.2	-0.2	-0.2	0.12	0.12	6.42
150.0	0.27	312.99	150.0	0.3	-0.3	-0.4	0.11	0.08	-15.86
200.0	0.31	322.60	200.0	0.5	-0.5	-0.7	0.13	0.08	19.22



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MORGANTOWN, WV

Survey Report



Company: Antero Resources
Project: Doddridge County WV
Site: Nero Pad
Well: Vonda Unit 1H
Wellbore: Sidetrack 1 Vonda Unit 1H
Design: Sidetrack 1 Vonda Unit 1H

Local Co-ordinate Reference: Well Vonda Unit 1H
TVD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
MD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

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)
250.0	0.28	315.03	250.0	0.7	-0.6	-0.9	0.10	-0.06	-15.14
300.0	0.14	322.48	300.0	0.9	-0.8	-1.1	0.28	-0.28	14.90
350.0	0.24	317.63	350.0	1.0	-0.9	-1.3	0.20	0.20	-9.70
400.0	0.24	322.05	400.0	1.1	-1.0	-1.5	0.04	0.00	8.84
450.0	0.10	350.89	450.0	1.3	-1.1	-1.6	0.32	-0.28	57.68
500.0	0.18	321.90	500.0	1.4	-1.1	-1.7	0.21	0.16	-57.98
550.0	0.19	312.00	550.0	1.5	-1.3	-1.9	0.07	0.02	-19.80
600.0	0.17	339.65	600.0	1.6	-1.3	-2.0	0.18	-0.04	55.30
650.0	0.20	341.11	650.0	1.8	-1.4	-2.2	0.06	0.06	2.92
700.0	0.19	329.85	700.0	1.9	-1.5	-2.4	0.08	-0.02	-22.52
750.0	0.11	267.47	750.0	2.0	-1.6	-2.5	0.34	-0.16	-124.76
800.0	0.06	3.73	800.0	2.0	-1.6	-2.5	0.26	-0.10	192.52
850.0	0.10	8.95	850.0	2.1	-1.6	-2.6	0.08	0.08	10.44
900.0	0.33	323.96	900.0	2.2	-1.7	-2.7	0.54	0.46	-89.98
950.0	0.13	326.50	950.0	2.4	-1.8	-2.9	0.40	-0.40	5.08
970.0	0.25	320.00	970.0	2.5	-1.8	-3.0	0.61	0.60	-32.50
1,000.0	0.20	16.26	1,000.0	2.6	-1.9	-3.1	0.72	-0.17	187.53
1,050.0	2.21	31.13	1,050.0	3.5	-1.3	-3.7	4.03	4.02	29.74
1,100.0	3.65	32.81	1,099.9	5.6	0.0	-5.1	2.88	2.88	3.36
1,150.0	4.44	32.80	1,149.8	8.6	1.9	-7.0	1.58	1.58	-0.02
1,200.0	4.60	31.34	1,199.6	11.9	4.0	-9.1	0.39	0.32	-2.92
1,250.0	4.28	23.70	1,249.5	15.4	5.8	-11.5	1.34	-0.64	-15.28
1,300.0	4.42	21.91	1,299.3	18.9	7.3	-14.0	0.39	0.28	-3.58
1,350.0	4.78	22.18	1,349.2	22.6	8.8	-16.7	0.72	0.72	0.54
1,400.0	5.36	26.54	1,399.0	26.6	10.6	-19.6	1.39	1.16	8.72
1,450.0	5.80	29.54	1,448.7	30.9	12.9	-22.5	1.06	0.88	6.00
1,500.0	5.51	30.23	1,498.5	35.2	15.4	-25.4	0.60	-0.58	1.38
1,550.0	2.68	42.51	1,548.4	38.1	17.4	-27.2	5.89	-5.66	24.56
1,600.0	2.01	47.00	1,598.3	39.5	18.8	-27.9	1.39	-1.34	8.98
1,650.0	1.82	47.19	1,648.3	40.7	20.0	-28.4	0.38	-0.38	0.38
1,700.0	1.65	47.60	1,698.3	41.7	21.1	-28.9	0.34	-0.34	0.82
1,750.0	1.46	54.85	1,748.3	42.6	22.2	-29.2	0.55	-0.38	14.50
1,800.0	1.45	52.28	1,798.2	43.3	23.2	-29.5	0.13	-0.02	-5.14
1,850.0	1.34	54.22	1,848.2	44.0	24.2	-29.7	0.24	-0.22	3.88
1,900.0	1.25	54.48	1,898.2	44.7	25.1	-29.9	0.18	-0.18	0.52
1,950.0	1.24	51.49	1,948.2	45.4	26.0	-30.1	0.13	-0.02	-5.98
2,000.0	1.16	61.82	1,998.2	45.9	26.8	-30.3	0.46	-0.16	20.66
2,050.0	0.91	66.19	2,048.2	46.3	27.7	-30.3	0.52	-0.50	8.74
2,100.0	0.81	63.78	2,098.2	46.7	28.3	-30.3	0.21	-0.20	-4.82
2,150.0	0.53	59.23	2,148.2	46.9	28.8	-30.3	0.57	-0.56	-9.10
2,200.0	0.77	62.46	2,198.2	47.2	29.3	-30.4	0.49	0.48	6.46
2,250.0	0.40	61.15	2,248.2	47.4	29.8	-30.4	0.74	-0.74	-2.62



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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Survey Report



Company: Antero Resources
Project: Doddridge County WV
Site: Nero Pad
Well: Vonda Unit 1H
Wellbore: Sidetrack 1 Vonda Unit 1H
Design: Sidetrack 1 Vonda Unit 1H

Local Co-ordinate Reference: Well Vonda Unit 1H
TVD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
MD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

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)
2,300.0	0.49	69.98	2,298.2	47.6	30.2	-30.4	0.23	0.18	17.66
2,350.0	0.53	67.07	2,348.2	47.8	30.6	-30.4	0.10	0.08	-5.82
2,400.0	0.27	78.26	2,398.2	47.9	30.9	-30.3	0.54	-0.52	22.38
2,450.0	0.35	68.53	2,448.2	48.0	31.2	-30.3	0.19	0.16	-19.46
2,500.0	0.23	34.84	2,498.2	48.1	31.3	-30.3	0.41	-0.24	-67.38
2,550.0	0.11	212.17	2,548.2	48.1	31.4	-30.4	0.68	-0.24	354.66
2,600.0	0.28	52.07	2,598.2	48.2	31.5	-30.4	0.77	0.34	-320.20
2,650.0	0.20	341.18	2,648.2	48.3	31.5	-30.5	0.57	-0.16	-141.78
2,700.0	0.29	307.01	2,698.2	48.5	31.4	-30.7	0.34	0.18	-68.34
2,750.0	0.44	309.08	2,748.2	48.7	31.1	-31.0	0.30	0.30	4.14
2,800.0	0.59	307.18	2,798.2	49.0	30.8	-31.4	0.30	0.30	-3.80
2,814.0	0.62	315.00	2,812.2	49.1	30.7	-31.5	0.63	0.21	55.86
2,900.0	0.59	3.56	2,898.2	49.8	30.4	-32.3	0.58	-0.03	56.47
3,000.0	3.68	66.05	2,998.1	51.6	33.3	-32.7	3.45	3.09	62.49
3,100.0	6.58	64.28	3,097.7	55.4	41.4	-32.7	2.90	2.90	-1.77
3,200.0	8.40	61.47	3,196.8	61.4	53.0	-33.3	1.86	1.82	-2.81
3,300.0	10.06	64.30	3,295.5	68.7	67.3	-33.8	1.72	1.66	2.83
3,400.0	8.76	69.34	3,394.2	75.2	82.3	-33.4	1.54	-1.30	5.04
3,500.0	11.77	66.95	3,492.6	81.8	98.8	-32.4	3.04	3.01	-2.39
3,600.0	16.18	65.44	3,589.6	91.6	120.9	-32.0	4.42	4.41	-1.51
3,700.0	21.24	69.49	3,684.3	103.8	150.5	-30.5	5.22	5.06	4.05
3,800.0	25.79	71.14	3,775.9	117.2	188.1	-26.7	4.60	4.55	1.65
3,900.0	24.52	68.24	3,866.5	131.9	228.0	-23.2	1.77	-1.27	-2.90
4,000.0	23.81	65.02	3,957.7	148.1	265.5	-22.1	1.50	-0.71	-3.22
4,100.0	26.32	63.24	4,048.3	166.6	303.6	-22.7	2.62	2.51	-1.78
4,200.0	30.93	65.51	4,136.0	187.3	346.9	-23.2	4.74	4.61	2.27
4,300.0	32.26	65.17	4,221.2	209.1	394.5	-22.9	1.34	1.33	-0.34
4,400.0	29.25	62.04	4,307.1	231.8	440.3	-24.1	3.41	-3.01	-3.13
4,500.0	27.17	58.78	4,395.3	255.1	481.4	-27.8	2.59	-2.08	-3.26
4,600.0	28.14	57.06	4,483.8	279.7	520.7	-33.6	1.26	0.97	-1.72
4,700.0	28.12	58.31	4,572.0	304.9	560.5	-39.6	0.59	-0.02	1.25
4,800.0	27.14	61.01	4,660.6	328.4	600.6	-43.9	1.59	-0.98	2.70
4,900.0	25.85	64.78	4,750.1	348.7	640.2	-45.6	2.12	-1.29	3.77
5,000.0	24.59	67.23	4,840.6	366.1	679.1	-44.9	1.64	-1.26	2.45
5,100.0	24.47	68.21	4,931.6	381.8	717.6	-42.9	0.42	-0.12	0.98
5,200.0	28.07	75.26	5,021.2	395.5	759.6	-37.6	4.76	3.60	7.05
5,300.0	28.97	76.12	5,109.1	407.3	805.8	-28.7	0.99	0.90	0.86
5,400.0	28.11	72.59	5,197.0	420.1	851.8	-21.0	1.89	-0.86	-3.53
5,500.0	26.09	69.32	5,286.0	435.0	894.9	-16.2	2.51	-2.02	-3.27
5,568.7	24.47	68.12	5,348.1	445.6	922.2	-14.3	2.47	-2.36	-1.75
5,700.0	24.53	65.16	5,467.6	467.2	972.2	-12.7	0.94	0.05	-2.25
5,747.0	24.02	63.80	5,510.4	475.5	989.6	-12.9	1.61	-1.09	-2.89



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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Survey Report



Company: Antero Resources
Project: Doddridge County WV
Site: Nero Pad
Well: Vonda Unit 1H
Wellbore: Sidetrack 1 Vonda Unit 1H
Design: Sidetrack 1 Vonda Unit 1H

Local Co-ordinate Reference: Well Vonda Unit 1H
TVD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
MD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

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)
5,844.0	23.27	67.09	5,599.3	491.7	1,025.0	-12.6	1.56	-0.77	3.39
5,939.0	23.95	63.43	5,686.3	507.6	1,059.5	-12.5	1.70	0.72	-3.85
6,034.0	23.42	64.27	5,773.3	524.4	1,093.8	-13.3	0.66	-0.56	0.88
6,130.0	22.03	70.55	5,861.9	538.7	1,128.0	-11.8	2.91	-1.45	6.54
6,227.0	22.11	72.14	5,951.8	550.4	1,162.5	-7.7	0.62	0.08	1.64
6,323.0	24.73	70.54	6,039.9	562.6	1,198.6	-3.6	2.81	2.73	-1.67
6,388.0	25.14	71.18	6,098.8	571.6	1,224.5	-0.8	0.76	0.63	0.98
6,420.0	25.84	73.34	6,127.7	575.8	1,237.6	1.0	3.64	2.19	6.75
6,451.0	25.56	74.03	6,155.6	579.6	1,250.5	3.0	1.32	-0.90	2.23
6,482.0	25.31	74.30	6,183.6	583.2	1,263.3	5.1	0.89	-0.81	0.87
6,514.0	24.70	74.35	6,212.6	586.8	1,276.4	7.3	1.91	-1.91	0.16
6,546.0	25.96	73.43	6,241.6	590.6	1,289.5	9.4	4.13	3.94	-2.88
6,578.0	28.29	74.39	6,270.0	594.7	1,303.5	11.7	7.41	7.28	3.00
6,610.0	29.50	74.80	6,298.0	598.8	1,318.4	14.2	3.83	3.78	1.28
6,642.0	30.17	80.77	6,325.8	602.1	1,334.0	17.8	9.51	2.09	18.66
6,674.0	30.25	89.16	6,353.5	603.6	1,350.0	23.3	13.19	0.25	26.22
6,707.0	30.66	96.61	6,381.9	602.7	1,366.7	31.1	11.50	1.24	22.58
6,739.0	31.57	101.19	6,409.3	600.1	1,383.0	40.3	7.92	2.84	14.31
6,771.0	32.95	106.27	6,436.4	596.1	1,399.6	51.0	9.50	4.31	15.88
6,803.0	34.19	111.34	6,463.1	590.4	1,416.3	63.2	9.58	3.88	15.84
6,835.0	35.84	112.16	6,489.3	583.6	1,433.3	76.6	5.36	5.16	2.56
6,867.0	38.71	112.32	6,514.7	576.2	1,451.3	90.8	8.97	8.97	0.50
6,875.0	39.33	112.66	6,521.0	574.3	1,455.9	94.5	8.21	7.76	4.22
Middlesex									
6,899.0	41.20	113.62	6,539.3	568.2	1,470.2	106.1	8.21	7.79	4.01
6,931.0	44.66	115.46	6,562.7	559.1	1,490.0	122.7	11.50	10.81	5.75
6,963.0	47.73	117.55	6,584.8	548.8	1,510.7	140.7	10.69	9.59	6.53
6,995.0	50.24	120.21	6,605.8	537.2	1,531.8	160.2	10.04	7.84	8.31
7,027.0	53.54	123.11	6,625.6	523.9	1,553.2	181.3	12.54	10.31	9.06
7,053.0	56.53	124.16	6,640.5	512.1	1,570.9	199.5	11.96	11.50	4.03
Burkett									
7,059.0	57.22	124.39	6,643.8	509.3	1,575.1	203.8	11.96	11.52	3.86
7,091.0	60.58	125.94	6,660.3	493.5	1,597.5	227.6	11.29	10.50	4.84
7,123.0	64.23	128.61	6,675.1	476.3	1,620.0	252.7	13.59	11.41	8.34
7,125.0	64.47	128.70	6,676.0	475.2	1,621.5	254.3	12.61	11.98	4.37
Tully									
7,155.0	68.07	129.97	6,688.1	457.8	1,642.7	279.0	12.61	12.00	4.24
7,219.0	76.41	133.12	6,707.6	417.4	1,688.2	334.9	13.85	13.03	4.92
7,233.0	77.13	134.60	6,710.8	408.0	1,698.1	347.6	11.48	5.15	10.54
Marcellus									
7,251.0	78.07	136.48	6,714.6	395.4	1,710.4	364.2	11.48	5.22	10.47
7,283.0	78.82	140.36	6,721.0	372.0	1,731.2	394.2	12.11	2.34	12.13



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GEOLOGICAL SURVEY
MORGANTOWN, WV

Survey Report



Company: Antero Resources
Project: Doddridge County WV
Site: Nero Pad
Well: Vonda Unit 1H
Wellbore: Sidetrack 1 Vonda Unit 1H
Design: Sidetrack 1 Vonda Unit 1H

Local Co-ordinate Reference: Well Vonda Unit 1H
TVD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
MD Reference: Frontier 23 Vonda Unit 1H GL 1164 + 22' RKB @ 1186.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

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)
7,315.0	82.32	143.46	6,726.3	347.1	1,750.6	425.0	14.52	10.94	9.69
7,347.0	85.80	145.89	6,729.6	321.2	1,769.0	456.3	13.24	10.88	7.59
7,405.0	88.49	152.96	6,732.5	271.3	1,798.5	513.9	13.03	4.64	12.19
7,465.0	89.25	155.23	6,733.7	217.4	1,824.7	573.8	3.99	1.27	3.78
7,561.0	90.04	156.20	6,734.3	129.9	1,864.2	669.8	1.30	0.82	1.01
7,657.0	88.81	158.48	6,735.2	41.3	1,901.1	765.7	2.70	-1.28	2.38
7,752.0	89.08	157.78	6,737.0	-46.9	1,936.5	860.6	0.79	0.28	-0.74
7,848.0	88.90	157.78	6,738.7	-135.7	1,972.8	956.5	0.19	-0.19	0.00
7,944.0	89.52	158.75	6,740.0	-224.9	2,008.4	1,052.3	1.20	0.65	1.01
8,039.0	88.11	159.27	6,742.0	-313.6	2,042.4	1,147.0	1.58	-1.48	0.55
8,135.0	87.93	159.89	6,745.3	-403.5	2,075.9	1,242.7	0.67	-0.19	0.65
8,232.0	87.41	158.66	6,749.2	-494.1	2,110.2	1,339.3	1.38	-0.54	-1.27
8,328.0	88.64	155.23	6,752.5	-582.4	2,147.7	1,435.2	3.79	1.28	-3.57
8,424.0	88.64	155.41	6,754.8	-669.6	2,187.8	1,531.2	0.19	0.00	0.19
8,521.0	88.11	154.97	6,757.6	-757.6	2,228.5	1,628.1	0.71	-0.55	-0.45
8,617.0	87.23	154.61	6,761.5	-844.4	2,269.3	1,724.0	0.99	-0.92	-0.38
8,713.0	88.99	154.61	6,764.6	-931.1	2,310.5	1,820.0	1.83	1.83	0.00
8,808.0	89.34	153.47	6,766.0	-1,016.5	2,352.1	1,915.0	1.26	0.37	-1.20
8,905.0	88.90	151.01	6,767.5	-1,102.3	2,397.2	2,011.8	2.58	-0.45	-2.54
9,001.0	88.20	152.86	6,769.9	-1,187.0	2,442.4	2,107.7	2.06	-0.73	1.93
9,097.0	92.68	157.34	6,769.2	-1,274.0	2,482.8	2,203.6	6.60	4.67	4.67
9,194.0	90.57	158.57	6,766.4	-1,363.9	2,519.2	2,300.4	2.52	-2.18	1.27
9,290.0	89.43	157.43	6,766.4	-1,452.9	2,555.1	2,396.3	1.68	-1.19	-1.19
9,386.0	88.55	155.67	6,768.1	-1,540.9	2,593.3	2,492.2	2.05	-0.92	-1.83
9,483.0	89.78	155.85	6,769.6	-1,629.4	2,633.1	2,589.2	1.28	1.27	0.19
9,579.0	88.90	155.23	6,770.7	-1,716.7	2,672.9	2,685.2	1.12	-0.92	-0.65
9,675.0	88.46	155.23	6,772.9	-1,803.9	2,713.1	2,781.2	0.46	-0.46	0.00
9,771.0	89.52	155.05	6,774.6	-1,891.0	2,753.5	2,877.2	1.12	1.10	-0.19
9,867.0	88.81	154.88	6,776.0	-1,977.9	2,794.1	2,973.2	0.76	-0.74	-0.18
9,964.0	89.87	156.90	6,777.1	-2,066.5	2,833.7	3,070.1	2.35	1.09	2.08
10,060.0	89.16	155.67	6,777.9	-2,154.4	2,872.3	3,166.1	1.48	-0.74	-1.28
10,156.0	89.43	155.67	6,779.1	-2,241.8	2,911.9	3,262.1	0.28	0.28	0.00
10,253.0	89.60	155.58	6,779.9	-2,330.2	2,951.9	3,359.1	0.20	0.18	-0.09
10,349.0	88.46	154.88	6,781.5	-2,417.3	2,992.1	3,455.1	1.39	-1.19	-0.73
10,446.0	89.25	153.30	6,783.5	-2,504.6	3,034.5	3,552.0	1.82	0.81	-1.63
10,542.0	88.72	152.68	6,785.2	-2,590.1	3,078.1	3,647.9	0.85	-0.55	-0.65
10,639.0	88.37	152.33	6,787.6	-2,676.1	3,122.8	3,744.8	0.51	-0.36	-0.36
10,735.0	89.34	153.91	6,789.5	-2,761.7	3,166.2	3,840.7	1.93	1.01	1.65
10,831.0	88.99	153.30	6,790.9	-2,847.7	3,208.9	3,936.7	0.73	-0.36	-0.64
10,928.0	88.81	152.95	6,792.8	-2,934.2	3,252.7	4,033.6	0.41	-0.19	-0.36
11,024.0	88.55	155.49	6,795.0	-3,020.6	3,294.5	4,129.6	2.66	-0.27	2.65
11,121.0	89.43	156.11	6,796.7	-3,109.1	3,334.2	4,226.6	1.11	0.91	0.64



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11,217.0	88.55	155.49	6,798.4	-3,196.6	3,373.6	4,322.5	1.12	-0.92	-0.65
11,312.0	89.60	157.60	6,800.0	-3,283.7	3,411.4	4,417.5	2.48	1.11	2.22
11,408.0	89.25	156.72	6,800.9	-3,372.2	3,448.6	4,513.4	0.99	-0.36	-0.92
11,504.0	88.72	154.44	6,802.6	-3,459.6	3,488.3	4,609.4	2.44	-0.55	-2.38
11,601.0	89.96	155.67	6,803.7	-3,547.5	3,529.2	4,706.4	1.80	1.28	1.27
11,679.0	89.60	154.88	6,804.0	-3,618.4	3,561.8	4,784.4	1.11	-0.46	-1.01
11,794.0	89.87	154.88	6,804.6	-3,722.5	3,610.7	4,899.4	0.23	0.23	0.00
11,890.0	89.52	154.70	6,805.1	-3,809.4	3,651.6	4,995.4	0.41	-0.36	-0.19
11,986.0	89.25	154.26	6,806.1	-3,896.0	3,692.9	5,091.4	0.54	-0.28	-0.46
12,083.0	89.08	154.70	6,807.5	-3,983.5	3,734.7	5,188.4	0.49	-0.18	0.45
12,179.0	88.20	154.35	6,809.8	-4,070.2	3,776.0	5,284.3	0.99	-0.92	-0.36
12,276.0	89.52	155.23	6,811.7	-4,157.9	3,817.3	5,381.3	1.64	1.36	0.91
12,372.0	88.90	155.93	6,813.0	-4,245.3	3,857.0	5,477.3	0.97	-0.65	0.73
12,469.0	88.99	156.46	6,814.8	-4,334.0	3,896.1	5,574.2	0.55	0.09	0.55
12,565.0	89.16	155.41	6,816.4	-4,421.7	3,935.3	5,670.2	1.11	0.18	-1.09
12,662.0	89.78	154.88	6,817.3	-4,509.7	3,976.0	5,767.2	0.84	0.64	-0.55
12,758.0	89.34	155.49	6,818.0	-4,596.8	4,016.3	5,863.2	0.78	-0.46	0.64
12,855.0	88.37	155.05	6,820.0	-4,684.9	4,056.9	5,960.2	1.10	-1.00	-0.45
12,951.0	90.48	154.97	6,820.9	-4,771.9	4,097.4	6,056.2	2.20	2.20	-0.08
13,047.0	89.69	154.44	6,820.8	-4,858.7	4,138.5	6,152.2	0.99	-0.82	-0.55
13,144.0	90.22	154.09	6,820.9	-4,946.1	4,180.6	6,249.2	0.65	0.55	-0.36
13,240.0	90.40	154.70	6,820.3	-5,032.7	4,222.1	6,345.2	0.66	0.19	0.64
13,336.0	90.40	155.05	6,819.7	-5,119.6	4,262.8	6,441.2	0.36	0.00	0.36
13,432.0	88.99	153.82	6,820.2	-5,206.2	4,304.2	6,537.1	1.95	-1.47	-1.28
13,528.0	89.69	153.38	6,821.3	-5,292.1	4,346.9	6,633.1	0.86	0.73	-0.46
13,624.0	90.40	153.91	6,821.2	-5,378.2	4,389.5	6,729.1	0.92	0.74	0.55
13,715.0	89.69	153.38	6,821.1	-5,459.7	4,429.9	6,820.1	0.97	-0.78	-0.58
13,806.0	89.16	156.72	6,822.0	-5,542.2	4,468.3	6,911.0	3.72	-0.58	3.67
13,897.0	88.90	155.93	6,823.6	-5,625.5	4,504.9	7,002.0	0.91	-0.29	-0.87
13,988.0	88.29	156.20	6,825.8	-5,708.7	4,541.8	7,093.0	0.73	-0.67	0.30
14,078.0	90.22	156.81	6,827.0	-5,791.2	4,577.6	7,182.9	2.25	2.14	0.68
14,169.0	89.78	156.46	6,827.0	-5,874.7	4,613.7	7,273.9	0.62	-0.48	-0.38
14,260.0	89.16	155.23	6,827.8	-5,957.8	4,651.0	7,364.9	1.51	-0.68	-1.35
14,351.0	90.57	154.61	6,828.0	-6,040.2	4,689.5	7,455.9	1.69	1.55	-0.68
14,442.0	90.13	154.18	6,827.5	-6,122.2	4,728.9	7,546.8	0.68	-0.48	-0.47
14,532.0	89.25	153.91	6,828.0	-6,203.2	4,768.2	7,636.8	1.02	-0.98	-0.30
14,623.0	89.78	155.76	6,828.7	-6,285.5	4,806.9	7,727.8	2.11	0.58	2.03
14,717.0	86.44	156.64	6,831.8	-6,371.5	4,844.8	7,821.7	3.67	-3.55	0.94
14,814.0	89.43	160.42	6,835.3	-6,461.7	4,880.3	7,918.5	4.97	3.08	3.90
14,910.0	92.33	161.82	6,833.9	-6,552.5	4,911.4	8,013.9	3.35	3.02	1.46
15,006.0	92.24	161.29	6,830.0	-6,643.5	4,941.7	8,109.2	0.56	-0.09	-0.55
15,103.0	91.89	160.77	6,826.5	-6,735.1	4,973.2	8,205.6	0.65	-0.36	-0.54



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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)
15,199.0	90.75	161.29	6,824.3	-6,825.9	5,004.4	8,301.0	1.31	-1.19	0.54
15,295.0	90.48	161.56	6,823.3	-6,916.9	5,035.0	8,396.4	0.40	-0.28	0.28
15,392.0	91.28	159.45	6,821.8	-7,008.3	5,067.4	8,493.0	2.33	0.82	-2.18
15,488.0	90.92	156.72	6,820.0	-7,097.4	5,103.2	8,588.8	2.87	-0.38	-2.84
15,585.0	90.92	153.30	6,818.4	-7,185.2	5,144.2	8,685.8	3.53	0.00	-3.53
15,680.0	90.22	153.21	6,817.5	-7,270.1	5,186.9	8,780.7	0.74	-0.74	-0.09
15,777.0	90.40	152.77	6,816.9	-7,356.5	5,231.0	8,877.7	0.49	0.19	-0.45
15,874.0	90.75	152.33	6,816.0	-7,442.6	5,275.7	8,974.6	0.58	0.36	-0.45
15,970.0	90.75	152.07	6,814.7	-7,527.5	5,320.4	9,070.4	0.27	0.00	-0.27
16,065.0	91.36	152.42	6,813.0	-7,611.5	5,364.7	9,165.3	0.74	0.64	0.37
16,162.0	91.45	150.40	6,810.6	-7,696.7	5,411.1	9,262.1	2.08	0.09	-2.08
16,258.0	89.69	149.61	6,809.6	-7,779.8	5,459.1	9,357.7	2.01	-1.83	-0.82
16,355.0	90.04	148.99	6,809.9	-7,863.2	5,508.6	9,454.2	0.73	0.36	-0.64
16,451.0	90.13	150.92	6,809.7	-7,946.3	5,556.7	9,549.9	2.01	0.09	2.01
16,547.0	90.40	153.65	6,809.3	-8,031.3	5,601.3	9,645.7	2.86	0.28	2.84
16,644.0	93.39	154.26	6,806.1	-8,118.4	5,643.9	9,742.7	3.15	3.08	0.63
16,741.0	93.91	153.65	6,799.9	-8,205.4	5,686.4	9,839.4	0.83	0.54	-0.63
16,837.0	91.71	152.24	6,795.2	-8,290.7	5,730.0	9,935.3	2.72	-2.29	-1.47
16,933.0	92.77	154.97	6,791.4	-8,376.7	5,772.6	10,031.1	3.05	1.10	2.84
17,030.0	95.76	154.97	6,784.2	-8,464.3	5,813.5	10,127.9	3.08	3.08	0.00
17,126.0	96.11	154.09	6,774.3	-8,550.5	5,854.6	10,223.3	0.98	0.36	-0.92
17,223.0	94.70	155.23	6,765.2	-8,637.8	5,895.9	10,319.9	1.87	-1.45	1.18
17,318.0	92.42	155.41	6,759.3	-8,723.9	5,935.5	10,414.7	2.41	-2.40	0.19
17,415.0	93.30	155.58	6,754.4	-8,812.1	5,975.7	10,511.6	0.92	0.91	0.18
17,511.0	92.51	155.32	6,749.6	-8,899.3	6,015.5	10,607.5	0.87	-0.82	-0.27
17,608.0	91.98	155.76	6,745.8	-8,987.5	6,055.7	10,704.4	0.71	-0.55	0.45
17,705.0	91.71	154.26	6,742.6	-9,075.4	6,096.6	10,801.3	1.57	-0.28	-1.55
17,801.0	91.45	153.65	6,740.0	-9,161.6	6,138.8	10,897.3	0.69	-0.27	-0.64
17,897.0	88.99	154.00	6,739.6	-9,247.7	6,181.1	10,993.3	2.59	-2.56	0.36
17,994.0	89.25	153.56	6,741.1	-9,334.8	6,223.9	11,090.2	0.53	0.27	-0.45
18,028.0	89.60	153.30	6,741.4	-9,365.2	6,239.2	11,124.2	1.28	1.03	-0.76
18,079.0	90.12	152.91	6,741.6	-9,410.6	6,262.2	11,175.2	1.27	1.02	-0.76

PBHL Vonda Unit 1H ST



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Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,875.0	6,521.0	Middlesex		0.00	
7,053.0	6,640.5	Burkett		0.00	
7,125.0	6,676.0	Tully		0.00	
7,233.0	6,710.8	Marcellus		0.00	

Checked By: _____ Approved By: _____ Date: _____

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