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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Antero Resources

**Doddridge County WV
Koch/Gains/McCue/Mt Salem Revival/Milo
Gains - Koch Unit 1H
Original Wellpath**

Design: As Drilled

EOW Completion Report

25 November, 2014



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EOW Completion Report



Company: Antero Resources
Project: Doddridge County WV
Site: Koch/Gains/McCue/Mt Salem Revival/Milo
Well: Gains - Koch Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Gains - Koch Unit 1H
TVD Reference: P317 Koch 1H 1377 GL + 23 KB @ 1400.0usft
MD Reference: P317 Koch 1H 1377 GL + 23 KB @ 1400.0usft
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	Koch/Gains/McCue/Mt Salem Revival/Milo				
Site Position:		Northing:	14,280,147.06 usft	Latitude:	39° 19' 27.317 N
From:	Map	Easting:	1,727,993.07 usft	Longitude:	80° 41' 25.164 W
Position Uncertainty:	2.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.20 °

Well	Gains - Koch Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,280,147.06 usft	Latitude:	39° 19' 27.317 N
	+E/-W	0.0 usft	Easting:	1,727,993.07 usft	Longitude:	80° 41' 25.164 W
Position Uncertainty	2.0 usft		Wellhead Elevation:	1,400.0 usft	Ground Level:	1,377.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/9/2013	-8.52	66.89	52,383

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	161.65	

Survey Program	Date	11/10/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
112.0	6,736.9	Survey #3 Final Gyro (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
6,789.0	14,425.0	Survey #3 MWD (Original Wellpath)	MWD SDI	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	0.11	349.65	112.0	0.1	0.0	-0.1	0.10
	212.0	0.04	291.05	212.0	0.2	-0.1	-0.2	0.10
	312.0	0.04	319.25	312.0	0.3	-0.1	-0.3	0.02
	412.0	0.07	344.10	412.0	0.3	-0.2	-0.4	0.04
	512.0	0.17	167.58	512.0	0.3	-0.1	-0.3	0.24
	612.0	0.14	167.52	612.0	0.0	-0.1	0.0	0.03
	712.0	0.19	156.32	712.0	-0.3	0.0	0.3	0.06
	812.0	0.19	147.32	812.0	-0.6	0.2	0.6	0.03
	912.0	0.21	166.13	912.0	-0.9	0.3	0.9	0.07
	1,012.0	0.25	173.11	1,012.0	-1.3	0.4	1.3	0.05

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1,112.0	0.21	167.52	1,112.0	-1.7	0.4	1.7	0.05
1,212.0	0.24	167.28	1,212.0	-2.1	0.5	2.1	0.03
1,312.0	0.24	176.80	1,312.0	-2.5	0.6	2.5	0.04
1,412.0	0.26	174.22	1,412.0	-2.9	0.6	3.0	0.02
1,512.0	0.34	173.25	1,512.0	-3.4	0.7	3.5	0.08
1,612.0	0.36	176.26	1,612.0	-4.0	0.7	4.1	0.03
1,712.0	0.43	170.57	1,712.0	-4.7	0.8	4.7	0.08
1,812.0	0.43	173.83	1,812.0	-5.5	0.9	5.5	0.02
1,912.0	0.44	166.78	1,912.0	-6.2	1.0	6.2	0.05
2,012.0	0.43	169.25	2,012.0	-7.0	1.2	7.0	0.02
2,112.0	0.40	173.99	2,112.0	-7.7	1.3	7.7	0.05
2,212.0	0.46	170.15	2,212.0	-8.4	1.4	8.4	0.07
2,312.0	0.46	174.89	2,312.0	-9.2	1.5	9.2	0.04
2,412.0	0.47	168.74	2,412.0	-10.0	1.6	10.0	0.05
2,512.0	0.50	168.25	2,512.0	-10.8	1.8	10.9	0.03
2,612.0	0.47	185.84	2,612.0	-11.7	1.8	11.7	0.15
2,712.0	0.44	209.50	2,712.0	-12.4	1.6	12.3	0.19
2,812.0	0.49	217.98	2,812.0	-13.1	1.2	12.8	0.08
2,912.0	0.48	230.76	2,912.0	-13.7	0.6	13.2	0.11
3,012.0	0.44	231.71	3,011.9	-14.2	-0.1	13.5	0.04
3,112.0	0.43	229.76	3,111.9	-14.7	-0.6	13.7	0.02
3,212.0	0.42	226.10	3,211.9	-15.2	-1.2	14.0	0.03
3,312.0	0.46	226.94	3,311.9	-15.7	-1.8	14.4	0.04
3,412.0	0.41	208.49	3,411.9	-16.3	-2.2	14.8	0.15
3,512.0	0.29	208.92	3,511.9	-16.8	-2.5	15.2	0.12
3,612.0	0.39	214.02	3,611.9	-17.3	-2.8	15.6	0.10
3,712.0	2.39	255.56	3,711.9	-18.1	-5.0	15.6	2.11
3,812.0	4.79	221.45	3,811.7	-21.8	-9.8	17.6	3.11
3,912.0	7.30	235.51	3,911.1	-28.5	-17.8	21.5	2.90
4,012.0	11.21	247.30	4,009.8	-35.9	-32.0	24.0	4.33
4,112.0	14.42	246.75	4,107.3	-44.5	-52.4	25.8	3.21
4,212.0	17.15	245.69	4,203.6	-55.5	-77.3	28.4	2.75
4,312.0	18.96	252.06	4,298.6	-66.6	-106.2	29.8	2.68
4,412.0	21.44	251.00	4,392.5	-77.6	-139.0	29.9	2.51
4,512.0	23.22	246.88	4,485.0	-91.2	-174.4	31.7	2.37
4,612.0	23.91	242.57	4,576.6	-108.3	-210.5	36.5	1.86
4,712.0	24.42	249.56	4,667.9	-124.9	-247.9	40.5	2.90
4,812.0	23.39	249.69	4,759.3	-139.0	-285.9	41.9	1.03
4,912.0	25.49	247.07	4,850.4	-154.3	-324.3	44.3	2.36
5,012.0	24.69	251.04	4,940.9	-169.4	-363.9	46.3	1.86
5,112.0	23.66	250.80	5,032.2	-182.8	-402.6	46.8	1.03
5,212.0	24.29	251.76	5,123.5	-195.9	-441.0	47.0	0.74
5,312.0	25.32	248.76	5,214.3	-210.0	-480.5	48.1	1.63
5,412.0	24.12	246.29	5,305.1	-226.0	-519.2	51.1	1.58

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Survey

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5,512.0	23.19	253.26	5,396.8	-239.9	-556.7	52.4	2.95
5,612.0	23.76	253.30	5,488.5	-251.4	-594.9	51.3	0.57
5,712.0	25.45	252.43	5,579.4	-263.6	-634.7	50.4	1.73
5,812.0	25.77	250.75	5,669.6	-277.3	-675.7	50.5	0.79
5,912.0	26.30	245.94	5,759.4	-293.5	-716.4	53.0	2.18
6,012.0	24.76	244.19	5,849.7	-311.6	-755.5	57.9	1.71
6,112.0	25.66	244.81	5,940.1	-330.0	-794.0	63.2	0.94
6,212.0	25.41	244.27	6,030.4	-348.5	-832.9	68.6	0.34
6,312.0	24.38	243.66	6,121.1	-367.0	-870.7	74.2	1.06
6,412.0	25.56	244.67	6,211.7	-385.4	-908.7	79.7	1.25
6,512.0	23.34	247.70	6,302.8	-402.1	-946.5	83.7	2.55
6,612.0	24.46	249.07	6,394.2	-417.0	-984.2	86.0	1.25
6,712.0	24.37	249.69	6,485.2	-431.6	-1,022.9	87.6	0.27
6,736.9	24.58	249.08	6,507.9	-435.2	-1,032.5	88.0	1.32
6,789.0	24.36	247.92	6,555.3	-443.1	-1,052.6	89.2	1.01
6,820.0	24.34	247.82	6,583.6	-447.9	-1,064.5	90.0	0.15
6,914.0	23.92	246.69	6,669.4	-462.8	-1,099.9	93.0	0.66
6,957.0	23.55	248.66	6,708.7	-469.4	-1,115.9	94.2	2.03
Sycamore							
6,977.0	23.39	249.59	6,727.1	-472.2	-1,123.3	94.5	2.03
7,009.0	23.21	246.95	6,756.5	-476.9	-1,135.1	95.3	3.31
7,040.0	23.30	240.19	6,784.9	-482.3	-1,146.0	97.0	8.61
7,072.0	24.97	232.63	6,814.2	-489.6	-1,156.9	100.5	10.97
7,104.0	27.52	228.94	6,842.9	-498.5	-1,167.8	105.5	9.46
7,135.0	30.78	225.42	6,869.9	-508.8	-1,178.9	111.8	11.88
7,167.0	34.03	222.61	6,896.9	-521.1	-1,190.8	119.8	11.19
7,198.0	37.37	219.97	6,922.1	-534.7	-1,202.7	128.9	11.86
7,226.0	40.37	217.49	6,943.9	-548.5	-1,213.7	138.5	12.06
Middlesex							
7,230.0	40.80	217.16	6,947.0	-550.5	-1,215.3	139.9	12.06
7,262.0	43.26	212.06	6,970.7	-568.2	-1,227.4	152.9	13.15
7,293.0	44.49	206.52	6,993.1	-586.9	-1,237.9	167.3	13.00
7,325.0	45.02	199.32	7,015.8	-607.6	-1,246.7	184.2	15.92
7,357.0	45.73	193.08	7,038.3	-629.5	-1,253.0	203.0	14.05
7,388.0	47.31	187.72	7,059.6	-651.6	-1,257.1	222.7	13.54
7,420.0	49.51	183.76	7,080.9	-675.4	-1,259.4	244.5	11.53
7,426.0	50.01	182.92	7,084.8	-680.0	-1,259.7	248.8	13.48
Burkett							
7,452.0	52.23	179.44	7,101.1	-700.2	-1,260.1	267.9	13.48
7,472.0	54.15	177.26	7,113.1	-716.2	-1,259.6	283.2	12.96
Tully							
7,483.0	55.22	176.11	7,119.4	-725.1	-1,259.1	291.9	12.96
7,515.0	57.86	173.13	7,137.1	-751.7	-1,256.6	317.9	11.33
7,547.0	60.67	171.98	7,153.4	-779.0	-1,253.0	344.9	9.31
7,578.0	63.14	170.31	7,168.0	-806.0	-1,248.8	371.9	9.28

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7,610.0	65.77	169.26	7,181.8	-834.4	-1,243.7	400.4	8.74
7,636.0	68.63	168.11	7,191.9	-857.9	-1,239.0	424.2	11.73
Marcellus							
7,642.0	69.29	167.85	7,194.1	-863.4	-1,237.8	429.8	11.73
7,673.0	73.51	166.89	7,203.9	-892.1	-1,231.4	459.0	13.93
7,705.0	76.24	166.18	7,212.3	-922.1	-1,224.2	489.8	8.80
7,737.0	76.77	165.39	7,219.8	-952.3	-1,216.6	520.8	2.92
7,768.0	79.93	163.55	7,226.0	-981.5	-1,208.4	551.2	11.73
7,800.0	83.01	163.46	7,230.8	-1,011.8	-1,199.5	582.8	9.63
7,860.0	90.00	162.39	7,234.4	-1,069.1	-1,181.9	642.6	11.79
7,888.0	90.22	162.14	7,234.4	-1,095.7	-1,173.4	670.6	1.19
7,983.0	90.84	160.73	7,233.5	-1,185.8	-1,143.1	765.6	1.62
8,073.0	89.34	160.73	7,233.3	-1,270.7	-1,113.4	855.6	1.67
8,164.0	89.25	159.85	7,234.5	-1,356.4	-1,082.7	946.6	0.97
8,255.0	90.22	160.91	7,234.9	-1,442.1	-1,052.2	1,037.5	1.58
8,347.0	91.10	161.08	7,233.8	-1,529.1	-1,022.2	1,129.5	0.97
8,437.0	90.30	160.32	7,232.7	-1,614.0	-992.5	1,219.5	1.23
8,528.0	89.25	161.00	7,233.1	-1,699.9	-962.3	1,310.5	1.37
8,619.0	90.13	161.26	7,233.6	-1,786.0	-932.9	1,401.5	1.01
8,710.0	89.78	160.38	7,233.7	-1,871.9	-903.0	1,492.5	1.04
8,801.0	90.04	159.41	7,233.8	-1,957.4	-871.7	1,583.4	1.10
8,892.0	90.13	160.56	7,233.7	-2,042.9	-840.6	1,674.4	1.27
8,984.0	90.84	164.42	7,232.9	-2,130.6	-812.9	1,766.3	4.27
9,074.0	91.45	167.06	7,231.1	-2,217.8	-790.7	1,856.1	3.01
9,167.0	91.54	164.16	7,228.7	-2,307.8	-767.6	1,948.8	3.12
9,263.0	90.75	161.61	7,226.7	-2,399.6	-739.4	2,044.8	2.78
9,358.0	90.92	161.10	7,225.4	-2,489.6	-709.0	2,139.8	0.57
9,452.0	91.10	160.50	7,223.7	-2,578.3	-678.1	2,233.7	0.67
9,547.0	91.80	160.56	7,221.3	-2,667.9	-646.5	2,328.7	0.74
9,642.0	91.10	162.05	7,218.9	-2,757.8	-616.0	2,423.7	1.73
9,737.0	90.20	163.11	7,217.8	-2,848.5	-587.6	2,518.6	1.46
9,832.0	90.04	161.26	7,217.6	-2,938.9	-558.5	2,613.6	1.95
9,927.0	90.04	160.91	7,217.5	-3,028.8	-527.7	2,708.6	0.37
10,021.0	90.04	160.03	7,217.5	-3,117.4	-496.3	2,802.6	0.94
10,116.0	89.96	158.54	7,217.5	-3,206.2	-462.7	2,897.5	1.57
10,211.0	89.60	159.50	7,217.8	-3,294.9	-428.7	2,992.4	1.08
10,306.0	90.84	163.46	7,217.5	-3,385.0	-398.5	3,087.4	4.37
10,400.0	89.43	161.52	7,217.3	-3,474.6	-370.2	3,181.4	2.55
10,495.0	90.22	161.79	7,217.5	-3,564.8	-340.3	3,276.4	0.88
10,590.0	90.92	161.70	7,216.6	-3,655.0	-310.6	3,371.4	0.74
10,685.0	89.43	161.00	7,216.3	-3,745.0	-280.2	3,466.4	1.73
10,780.0	89.34	158.10	7,217.3	-3,834.0	-247.0	3,561.3	3.05
10,875.0	90.31	159.77	7,217.6	-3,922.7	-212.9	3,656.2	2.03
10,969.0	89.16	162.23	7,218.1	-4,011.5	-182.3	3,750.2	2.89
11,064.0	89.34	162.84	7,219.3	-4,102.1	-153.8	3,845.1	0.67

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11,159.0	88.64	165.39	7,221.0	-4,193.5	-127.8	3,940.0	2.78
11,254.0	88.81	164.69	7,223.1	-4,285.2	-103.3	4,034.8	0.76
11,349.0	89.69	163.28	7,224.3	-4,376.5	-77.0	4,129.7	1.75
11,443.0	90.66	164.42	7,224.0	-4,466.8	-50.9	4,223.7	1.59
11,538.0	90.17	162.51	7,223.4	-4,557.9	-23.9	4,318.6	2.08
11,633.0	91.01	163.02	7,222.4	-4,648.6	4.3	4,413.6	1.03
11,727.0	90.66	159.50	7,221.0	-4,737.6	34.5	4,507.6	3.76
11,822.0	88.81	157.31	7,221.4	-4,825.9	69.4	4,602.4	3.02
11,916.0	89.34	159.33	7,223.0	-4,913.3	104.2	4,696.2	2.22
12,011.0	90.22	160.29	7,223.3	-5,002.4	136.9	4,791.2	1.37
12,106.0	90.31	159.94	7,222.9	-5,091.8	169.3	4,886.1	0.38
12,201.0	91.28	164.07	7,221.6	-5,182.1	198.6	4,981.1	4.47
12,296.0	90.66	161.70	7,220.0	-5,272.9	226.5	5,076.1	2.58
12,391.0	91.19	160.38	7,218.4	-5,362.7	257.4	5,171.0	1.50
12,486.0	90.48	161.17	7,217.0	-5,452.4	288.7	5,266.0	1.12
12,581.0	90.13	159.68	7,216.5	-5,541.9	320.5	5,361.0	1.61
12,676.0	90.84	161.17	7,215.7	-5,631.4	352.3	5,456.0	1.74
12,770.0	90.22	161.79	7,214.9	-5,720.5	382.2	5,550.0	0.93
12,865.0	90.66	161.35	7,214.1	-5,810.6	412.2	5,645.0	0.65
12,960.0	90.84	160.73	7,212.9	-5,900.5	443.1	5,739.9	0.68
13,055.0	90.48	163.55	7,211.8	-5,990.9	472.2	5,834.9	2.99
13,150.0	90.40	162.23	7,211.1	-6,081.7	500.2	5,929.9	1.39
13,244.0	90.31	163.55	7,210.5	-6,171.5	527.8	6,023.9	1.41
13,339.0	90.84	163.81	7,209.5	-6,262.7	554.5	6,118.8	0.62
13,434.0	91.45	161.96	7,207.6	-6,353.5	582.5	6,213.8	2.05
13,529.0	90.66	162.05	7,205.9	-6,443.8	611.8	6,308.7	0.84
13,624.0	89.08	160.82	7,206.1	-6,533.8	642.1	6,403.7	2.11
13,719.0	88.64	161.96	7,208.0	-6,623.9	672.4	6,498.7	1.29
13,813.0	90.13	161.61	7,209.0	-6,713.1	701.7	6,592.7	1.63
13,908.0	91.19	164.42	7,207.9	-6,804.0	729.5	6,687.7	3.16
14,003.0	91.24	163.54	7,205.9	-6,895.3	755.7	6,782.6	0.93
14,098.0	90.40	161.17	7,204.5	-6,985.8	784.5	6,877.5	2.65
14,193.0	91.28	160.73	7,203.1	-7,075.6	815.5	6,972.5	1.04
14,288.0	89.69	159.50	7,202.3	-7,164.9	847.8	7,067.5	2.12
14,383.0	90.17	158.77	7,202.4	-7,254.8	875.2	7,162.4	1.13
14,478.0	90.50	160.00	7,202.1	-7,344.7	896.4	7,257.4	2.12



Company: Antero Resources
Project: Doddridge County WV
Site: Koch/Gains/McCue/Mt Salem Revival/Milo
Well: Gains - Koch Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Gains - Koch Unit 1H
TVD Reference: P317 Koch 1H 1377 GL + 23 KB @ 1400.0usft
MD Reference: P317 Koch 1H 1377 GL + 23 KB @ 1400.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,957.0	6,708.7	-469.4	-1,115.9	Sycamore
7,226.0	6,943.9	-548.5	-1,213.7	Middlesex
7,426.0	7,084.8	-680.0	-1,259.7	Burkett
7,472.0	7,113.1	-716.2	-1,259.6	Tully
7,636.0	7,191.9	-857.9	-1,239.0	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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 MORGANTOWN, WV