



Piceance Energy, LLC

Mesa County, CO

N Vega 28-11

Piceance 28-11W

Wellbore #1

Survey: Survey #1

Standard Survey Report

25 March, 2015

Archer



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 28-11W
Project:	Mesa County, CO	TVD Reference:	WELL @ 7602.00usft (Original Well Elev)
Site:	N Vega 28-11	MD Reference:	WELL @ 7602.00usft (Original Well Elev)
Well:	Piceance 28-11W	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

Project	Mesa County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		N Vega 28-11			
Site Position:		Northing:	1,523,092.764 usft	Latitude:	39° 14' 50.676 N
From:	Lat/Long	Easting:	2,354,890.736 usft	Longitude:	107° 46' 41.484 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.44 °

Well		Piceance 28-11W				
Well Position	+N/-S	0.00 usft	Northing:	1,523,239.422 usft	Latitude:	39° 14' 52.133 N
	+E/-W	0.00 usft	Easting:	2,354,922.280 usft	Longitude:	107° 46' 41.130 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	7,580.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2014/11/05	9.79	65.48	51,788

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	277.74	

Survey Program	Date	2015/03/25			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.00	7,988.00	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
first Archer Survey									
200.00	1.10	286.00	199.99	0.53	-1.85	1.90	0.55	0.55	0.00
292.00	1.32	274.51	291.97	0.86	-3.75	3.83	0.35	0.24	-12.49
385.00	1.32	276.26	384.94	1.06	-5.88	5.97	0.04	0.00	1.88
477.00	1.45	283.65	476.92	1.45	-8.07	8.19	0.24	0.14	8.03
570.00	3.08	287.60	569.84	2.48	-11.59	11.82	1.76	1.75	4.25
662.00	5.36	284.61	661.58	4.31	-18.11	18.52	2.49	2.48	-3.25
754.00	7.47	282.15	753.00	6.65	-28.11	28.75	2.31	2.29	-2.67
846.00	8.04	282.33	844.16	9.29	-40.25	41.13	0.62	0.62	0.20
941.00	8.79	283.30	938.14	12.38	-53.80	54.98	0.80	0.79	1.02
1,036.00	9.76	277.76	1,031.90	15.13	-68.84	70.25	1.39	1.02	-5.83
1,131.00	9.98	277.41	1,125.49	17.28	-84.98	86.54	0.24	0.23	-0.37



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Well:	Piceance 28-11W	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)	
1,226.00	10.85	274.95	1,218.93	19.12	-102.06	103.70	1.03	0.92	-2.59	
1,321.00	11.25	272.31	1,312.16	20.26	-120.22	121.86	0.68	0.42	-2.78	
1,416.00	11.73	270.73	1,405.26	20.76	-139.14	140.67	0.60	0.51	-1.66	
1,492.00	12.44	271.52	1,479.58	21.07	-155.05	156.47	0.96	0.93	1.04	
1,605.00	12.52	270.11	1,589.91	21.42	-179.46	180.71	0.28	0.07	-1.25	
1,700.00	10.90	272.22	1,682.93	21.79	-198.74	199.86	1.76	-1.71	2.22	
1,795.00	11.21	279.78	1,776.17	23.70	-216.81	218.03	1.56	0.33	7.96	
1,890.00	10.63	278.81	1,869.45	26.61	-234.57	236.02	0.64	-0.61	-1.02	
1,985.00	10.24	286.64	1,962.88	30.37	-251.32	253.12	1.55	-0.41	8.24	
2,080.00	9.49	284.53	2,056.48	34.76	-266.99	269.24	0.88	-0.79	-2.22	
2,175.00	9.10	283.30	2,150.23	38.45	-281.89	284.50	0.46	-0.41	-1.29	
2,270.00	8.96	282.94	2,244.05	41.83	-296.41	299.34	0.16	-0.15	-0.38	
2,364.00	7.82	283.30	2,337.04	44.95	-309.76	313.00	1.21	-1.21	0.38	
2,459.00	8.75	283.91	2,431.05	48.17	-323.07	326.61	0.98	0.98	0.64	
2,554.00	10.02	285.76	2,524.78	52.15	-338.04	341.98	1.37	1.34	1.95	
2,649.00	9.76	284.88	2,618.37	56.46	-353.77	358.15	0.32	-0.27	-0.93	
2,744.00	9.23	284.70	2,712.06	60.46	-368.92	373.71	0.56	-0.56	-0.19	
2,839.00	8.66	283.56	2,805.91	64.08	-383.25	388.38	0.63	-0.60	-1.20	
2,934.00	10.02	281.36	2,899.65	67.38	-398.30	403.75	1.48	1.43	-2.32	
3,029.00	9.62	282.33	2,993.26	70.70	-414.16	419.91	0.46	-0.42	1.02	
3,124.00	9.71	281.36	3,086.91	73.98	-429.77	435.82	0.20	0.09	-1.02	
3,219.00	8.83	279.08	3,180.67	76.71	-444.82	451.10	1.00	-0.93	-2.40	
3,314.00	8.53	279.78	3,274.58	79.05	-458.97	465.43	0.33	-0.32	0.74	
3,409.00	7.78	276.53	3,368.62	80.98	-472.30	478.90	0.93	-0.79	-3.42	
3,504.00	9.32	284.09	3,462.56	83.58	-486.15	492.98	2.00	1.62	7.96	
3,599.00	8.78	281.10	3,556.38	86.85	-500.73	507.86	0.75	-0.57	-3.15	
3,693.00	8.31	279.78	3,649.34	89.39	-514.46	521.81	0.54	-0.50	-1.40	
3,789.00	7.91	278.90	3,744.37	91.59	-527.82	535.35	0.44	-0.42	-0.92	
3,883.00	9.49	280.57	3,837.29	94.01	-541.83	549.56	1.70	1.68	1.78	
3,978.00	9.05	284.44	3,931.05	97.31	-556.77	564.80	0.80	-0.46	4.07	
4,073.00	9.05	280.83	4,024.87	100.58	-571.34	579.68	0.60	0.00	-3.80	
4,168.00	8.88	281.36	4,118.71	103.43	-585.87	594.46	0.20	-0.18	0.56	
4,263.00	8.66	279.78	4,212.60	106.09	-600.11	608.93	0.34	-0.23	-1.66	
4,358.00	8.31	276.97	4,306.56	108.13	-613.97	622.94	0.57	-0.37	-2.96	
4,453.00	8.35	278.55	4,400.56	109.99	-627.60	636.70	0.24	0.04	1.66	
4,548.00	8.57	277.76	4,494.52	111.97	-641.44	650.67	0.26	0.23	-0.83	
4,643.00	7.47	273.63	4,588.59	113.32	-654.62	663.91	1.31	-1.16	-4.35	
4,738.00	6.77	279.78	4,682.86	114.66	-666.30	675.67	1.09	-0.74	6.47	
4,833.00	5.93	277.41	4,777.28	116.25	-676.68	686.17	0.93	-0.88	-2.49	
4,928.00	5.10	267.39	4,871.84	116.69	-685.77	695.23	1.34	-0.87	-10.55	
5,023.00	5.05	261.94	4,966.47	115.91	-694.12	703.41	0.51	-0.05	-5.74	
5,118.00	4.17	265.19	5,061.16	115.03	-701.71	710.81	0.97	-0.93	3.42	
5,213.00	4.48	260.62	5,155.89	114.14	-708.81	717.72	0.49	0.33	-4.81	
5,308.00	2.37	262.38	5,250.71	113.27	-714.42	723.16	2.22	-2.22	1.85	
5,403.00	1.19	292.00	5,345.67	113.38	-717.28	726.01	1.54	-1.24	31.18	
5,498.00	1.19	259.04	5,440.65	113.56	-719.16	727.90	0.71	0.00	-34.69	
5,593.00	1.85	331.99	5,535.62	114.73	-720.85	729.73	1.98	0.69	76.79	
5,687.00	1.89	349.83	5,629.57	117.60	-721.84	731.10	0.62	0.04	18.98	
5,783.00	1.67	348.42	5,725.53	120.52	-722.40	732.05	0.23	-0.23	-1.47	
5,878.00	0.79	332.78	5,820.50	122.46	-722.97	732.88	0.98	-0.93	-16.46	
5,973.00	1.05	343.06	5,915.49	123.88	-723.53	733.62	0.32	0.27	10.82	
6,068.00	1.19	297.53	6,010.47	125.17	-724.66	734.91	0.92	0.15	-47.93	
6,163.00	0.40	7.06	6,105.47	125.95	-725.49	735.84	1.17	-0.83	73.19	
6,258.00	0.97	304.92	6,200.46	126.74	-726.11	736.56	0.90	0.60	-65.41	



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)
6,352.00	1.19	12.50	6,294.45	128.15	-726.55	737.19	1.29	0.23	71.89
6,447.00	0.70	315.64	6,389.44	129.53	-726.74	737.57	1.05	-0.52	-59.85
6,542.00	1.45	323.99	6,484.42	130.91	-727.85	738.85	0.80	0.79	8.79
6,637.00	1.63	18.74	6,579.39	133.17	-728.13	739.43	1.50	0.19	57.63
6,732.00	0.57	47.48	6,674.37	134.77	-727.34	738.87	1.22	-1.12	30.25
6,827.00	0.75	341.22	6,769.37	135.67	-727.20	738.84	0.78	0.19	-69.75
6,922.00	0.26	287.34	6,864.36	136.33	-727.60	739.33	0.67	-0.52	-56.72
7,017.00	1.01	229.42	6,959.36	135.85	-728.44	740.10	0.95	0.79	-60.97
7,111.00	1.80	208.50	7,053.33	134.01	-729.78	741.18	0.99	0.84	-22.26
7,206.00	1.89	234.60	7,148.28	131.79	-731.77	742.85	0.88	0.09	27.47
7,301.00	3.16	221.86	7,243.19	128.93	-734.79	745.46	1.45	1.34	-13.41
7,396.00	3.30	227.66	7,338.04	125.14	-738.56	748.68	0.37	0.15	6.11
7,491.00	3.69	242.69	7,432.86	121.90	-743.30	752.94	1.04	0.41	15.82
7,586.00	3.30	235.92	7,527.68	118.96	-748.28	757.48	0.60	-0.41	-7.13
7,681.00	3.91	231.88	7,622.50	115.43	-753.09	761.78	0.70	0.64	-4.25
7,775.00	3.69	236.10	7,716.29	111.77	-758.12	766.27	0.38	-0.23	4.49
7,870.00	3.21	235.22	7,811.12	108.54	-762.85	770.51	0.51	-0.51	-0.93
Piceance 28-11W tgt									
7,932.87	3.77	237.93	7,873.87	106.44	-766.04	773.40	0.93	0.90	4.32
Last Archer Survey									
7,938.00	3.82	238.12	7,878.99	106.26	-766.33	773.66	0.93	0.90	3.63
PTB									
7,988.00	3.82	238.12	7,928.88	104.50	-769.16	776.23	0.00	0.00	0.00

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	199.99	0.53	-1.85	first Archer Survey
7,938.00	7,878.99	106.26	-766.33	Last Archer Survey
7,988.00	7,928.88	104.50	-769.16	PTB

Checked By: _____ Approved By: _____ Date: _____