



Piceance Energy, LLC

Mesa County, CO

Piceance 28-05

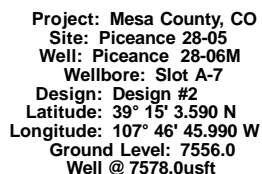
Piceance 28-06M

Slot A-7

Survey: Survey #1

Survey Report - Geographic

20 October, 2015



Archer



Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Central Zone

System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well Piceance 28-06M, True North
Vertical (TVD) Reference: Well @ 7578.0usft
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: Well @ 7578.0usft
Calculation Method: Minimum Curvature

WELL DETAILS: Piceance 28-06M

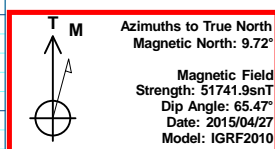
		Ground Level:		7556.0		
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1524407.76	2354569.16	39° 15' 3.950 N	107° 46' 45.990 W	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Piceance Federal 28-06M tot	7896.0	192.3	1350.6	1524566.09	2355924.17	39° 15' 5.490 N	107° 46' 28.820 W	Circle (Radius: 50.0)

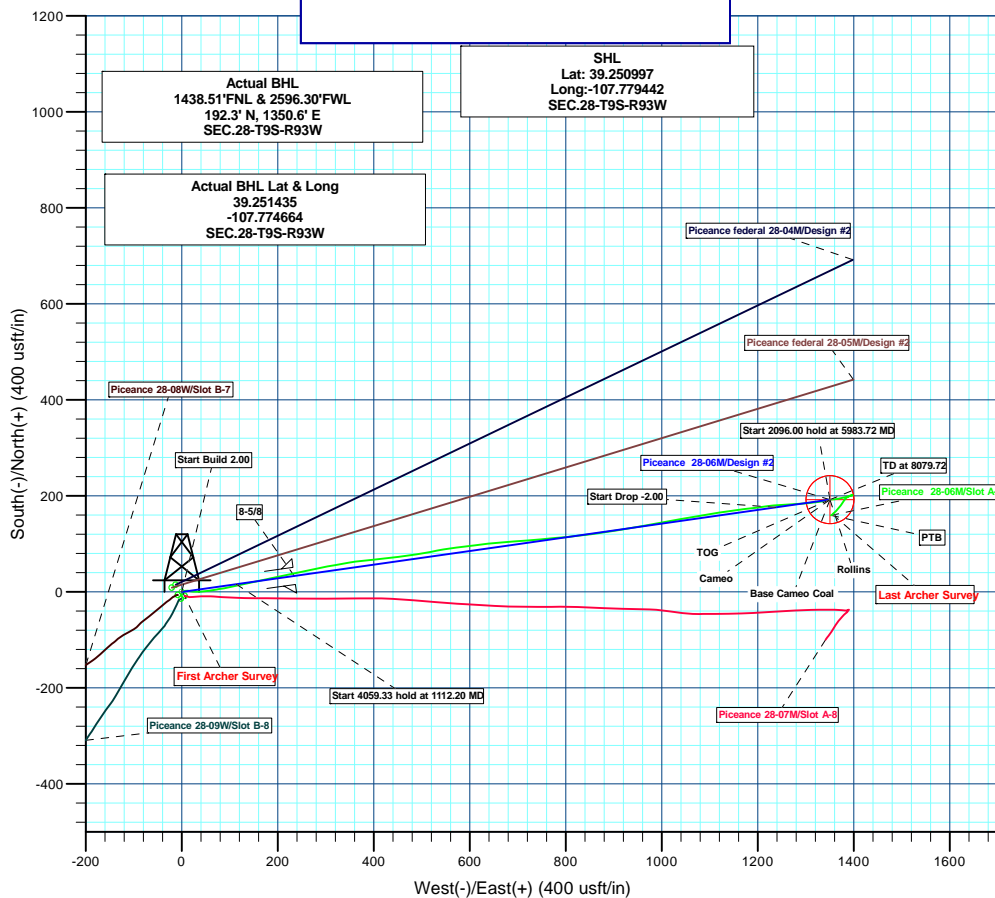
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	Start Build 2.00
1112.2	16.24	81.90	1101.4	16.1	113.2	2.00	81.90	114.4	Start 4059.33 hold at 1112.20 MD
5171.5	16.24	81.90	4998.6	176.2	1237.4	0.00	0.00	1249.9	Start Drop -2.00
5983.7	0.00	0.00	5800.0	192.3	1350.6	2.00	180.00	1364.2	Start 2096.00 hold at 5983.72 MD
8079.7	0.00	0.00	7896.0	192.3	1350.6	0.00	0.00	1364.2	TD at 8079.72



FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
2846.0	2929.4	G Sand
4696.0	4856.3	Williams Fork
5896.0	6079.7	TOG
6996.0	7179.7	Cameo
7654.0	7837.7	Base Cameo Coal
7696.0	7879.7	Rollins



Plan: Design #2 (Piceance 28-06M/Slot A-7)

Created By: Ricky Osburn **Date:** 10:36, October 21 2015



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Survey Report - Geographic

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 28-06M
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	MD Reference:	Well @ 7578.00usft
Well:	Piceance 28-06M	North Reference:	True
Wellbore:	Slot A-7	Survey Calculation Method:	Minimum Curvature
Design:	Slot A-7	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	Piceance 28-05			
Site Position:		Northing:	1,524,375.785 usft	Latitude: 39.250911
From:	Lat/Long	Easting:	2,354,593.535 usft	Longitude: -107.779353
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence: -1.44 °

Well	Piceance 28-06M					
Well Position	+N/-S	0.00 usft	Northing:	1,524,407.756 usft	Latitude:	39.250997
	+E/-W	0.00 usft	Easting:	2,354,569.158 usft	Longitude:	-107.779442
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,556.00 usft

Wellbore	Slot A-7				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/04/27	9.73	65.47	51,742

Design	Slot A-7			
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	80.57

Survey Program	Date	2015/08/14		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
139.00	8,046.00	Survey #1 (Slot A-7)	MWD	MWD - Standard



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Survey Report - Geographic

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 28-06M
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	MD Reference:	Well @ 7578.00usft
Well:	Piceance 28-06M	North Reference:	True
Wellbore:	Slot A-7	Survey Calculation Method:	Minimum Curvature
Design:	Slot A-7	Database:	EDMDBBW

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	1,524,407.756	2,354,569.158	39.250997	-107.779442
First Archer Survey									
139.00	1.27	75.29	138.99	0.39	1.49	1,524,408.110	2,354,570.657	39.250998	-107.779436
200.00	1.41	67.82	199.97	0.85	2.84	1,524,408.531	2,354,572.017	39.250999	-107.779432
292.00	3.43	67.02	291.89	2.35	6.42	1,524,409.943	2,354,575.635	39.251004	-107.779419
385.00	5.36	99.28	384.62	2.73	13.27	1,524,410.156	2,354,582.493	39.251005	-107.779395
477.00	5.76	104.73	476.19	0.87	21.98	1,524,408.072	2,354,591.149	39.251000	-107.779364
569.00	7.12	83.72	567.62	0.32	32.11	1,524,407.267	2,354,601.266	39.250998	-107.779328
661.00	7.65	84.16	658.85	1.56	43.87	1,524,408.219	2,354,613.053	39.251001	-107.779287
753.00	8.04	84.60	749.99	2.79	56.37	1,524,409.133	2,354,625.577	39.251005	-107.779243
846.00	9.89	81.44	841.85	4.59	70.74	1,524,410.573	2,354,639.992	39.251010	-107.779192
938.00	13.01	78.27	932.01	7.88	88.70	1,524,413.404	2,354,658.025	39.251019	-107.779128
1,030.00	13.32	78.63	1,021.59	12.07	109.23	1,524,417.082	2,354,678.653	39.251030	-107.779056
1,125.00	13.62	77.75	1,113.98	16.60	130.89	1,524,421.068	2,354,700.419	39.251043	-107.778979
1,220.00	14.24	77.66	1,206.19	21.47	153.23	1,524,425.376	2,354,722.880	39.251056	-107.778901
1,315.00	15.82	78.19	1,297.93	26.62	177.32	1,524,429.918	2,354,747.092	39.251070	-107.778815
1,410.00	17.18	77.75	1,389.02	32.25	203.71	1,524,434.882	2,354,773.612	39.251086	-107.778722
1,505.00	17.93	78.10	1,479.60	38.24	231.73	1,524,440.169	2,354,801.774	39.251102	-107.778623
1,599.00	18.15	78.45	1,568.97	44.15	260.23	1,524,445.367	2,354,830.416	39.251118	-107.778523
1,694.00	18.33	77.48	1,659.20	50.35	289.31	1,524,450.837	2,354,859.642	39.251135	-107.778420
1,789.00	17.97	80.74	1,749.48	55.95	318.36	1,524,455.703	2,354,888.821	39.251151	-107.778317
1,884.00	17.97	79.68	1,839.84	60.93	347.24	1,524,459.960	2,354,917.819	39.251164	-107.778215
1,979.00	17.49	84.34	1,930.33	64.97	375.87	1,524,463.274	2,354,946.536	39.251176	-107.778114
2,074.00	16.66	84.16	2,021.15	67.76	403.62	1,524,465.370	2,354,974.351	39.251183	-107.778016
2,169.00	16.66	83.81	2,112.16	70.62	430.71	1,524,467.544	2,355,001.500	39.251191	-107.777921
2,264.00	15.42	82.23	2,203.46	73.79	456.76	1,524,470.065	2,355,027.625	39.251200	-107.777829
2,358.00	15.07	81.26	2,294.15	77.34	481.22	1,524,472.997	2,355,052.166	39.251210	-107.777742
2,453.00	16.39	80.21	2,385.59	81.49	506.64	1,524,476.514	2,355,077.678	39.251221	-107.777653
2,548.00	15.42	78.54	2,476.95	86.28	532.22	1,524,480.659	2,355,103.377	39.251234	-107.777562
2,643.00	17.45	82.49	2,568.07	90.65	558.73	1,524,484.364	2,355,129.982	39.251246	-107.777469
2,738.00	16.44	83.28	2,658.94	94.09	586.20	1,524,487.109	2,355,157.533	39.251255	-107.777372
2,832.00	15.42	81.61	2,749.33	97.47	611.77	1,524,489.846	2,355,183.184	39.251265	-107.777281
2,927.00	16.83	85.04	2,840.60	100.50	637.97	1,524,492.220	2,355,209.450	39.251273	-107.777189
3,022.00	15.95	84.60	2,931.74	102.92	664.67	1,524,493.967	2,355,236.199	39.251280	-107.777095
3,117.00	17.84	85.57	3,022.63	105.27	692.17	1,524,495.629	2,355,263.755	39.251286	-107.776997
3,212.00	17.67	85.57	3,113.11	107.51	721.06	1,524,497.141	2,355,292.686	39.251292	-107.776895
3,307.00	16.61	85.31	3,203.89	109.73	748.97	1,524,498.664	2,355,320.641	39.251298	-107.776797
3,402.00	15.82	84.87	3,295.11	112.00	775.40	1,524,500.269	2,355,347.120	39.251305	-107.776704
3,497.00	15.47	83.37	3,386.59	114.62	800.88	1,524,502.249	2,355,372.661	39.251312	-107.776614
3,592.00	15.38	83.20	3,478.16	117.58	825.97	1,524,504.573	2,355,397.821	39.251320	-107.776525
3,686.00	15.21	83.20	3,568.83	120.51	850.60	1,524,506.890	2,355,422.509	39.251328	-107.776438
3,781.00	14.63	83.99	3,660.63	123.24	874.90	1,524,509.011	2,355,446.876	39.251336	-107.776352
3,876.00	15.42	80.03	3,752.39	126.69	899.27	1,524,511.842	2,355,471.326	39.251345	-107.776266
3,971.00	14.63	80.03	3,844.14	130.95	923.53	1,524,515.496	2,355,495.681	39.251357	-107.776180
4,066.00	16.52	79.24	3,935.64	135.55	948.62	1,524,519.464	2,355,520.876	39.251369	-107.776092
4,161.00	16.66	80.21	4,026.69	140.39	975.31	1,524,523.630	2,355,547.678	39.251383	-107.775998
4,256.00	16.35	79.07	4,117.78	145.24	1,001.85	1,524,527.814	2,355,574.340	39.251396	-107.775904
4,350.00	15.38	80.56	4,208.19	149.79	1,027.14	1,524,531.731	2,355,599.734	39.251408	-107.775815
4,445.00	17.45	80.74	4,299.32	154.15	1,053.63	1,524,535.424	2,355,626.324	39.251420	-107.775721
4,540.00	16.70	79.59	4,390.13	158.91	1,081.11	1,524,539.491	2,355,653.918	39.251433	-107.775624
4,635.00	16.30	81.26	4,481.22	163.40	1,107.72	1,524,543.315	2,355,680.625	39.251446	-107.775530
4,730.00	15.34	81.44	4,572.62	167.30	1,133.32	1,524,546.567	2,355,706.318	39.251456	-107.775440
4,825.00	16.57	82.93	4,663.96	170.83	1,159.19	1,524,549.455	2,355,732.269	39.251466	-107.775348
4,920.00	15.91	82.93	4,755.17	174.10	1,185.56	1,524,552.062	2,355,758.708	39.251475	-107.775255
5,015.00	14.19	81.61	4,846.90	177.41	1,210.00	1,524,554.750	2,355,783.227	39.251484	-107.775169



Archer

Survey Report - Geographic

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 28-06M
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	MD Reference:	Well @ 7578.00usft
Well:	Piceance 28-06M	North Reference:	True
Wellbore:	Slot A-7	Survey Calculation Method:	Minimum Curvature
Design:	Slot A-7	Database:	EDMDBBW

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,109.00	15.03	85.48	4,937.87	180.05	1,233.55	1,524,556.800	2,355,806.835	39.251491	-107.775086
5,204.00	14.59	85.83	5,029.71	181.89	1,257.76	1,524,558.033	2,355,831.087	39.251496	-107.775000
5,299.00	13.27	86.98	5,121.91	183.33	1,280.58	1,524,558.904	2,355,853.939	39.251500	-107.774920
5,394.00	12.08	86.45	5,214.60	184.52	1,301.40	1,524,559.572	2,355,874.773	39.251504	-107.774846
5,489.00	12.00	80.12	5,307.51	186.83	1,321.05	1,524,561.388	2,355,894.476	39.251510	-107.774777
5,584.00	11.21	79.86	5,400.57	190.15	1,339.87	1,524,564.235	2,355,913.373	39.251519	-107.774710
5,679.00	9.23	81.61	5,494.06	192.89	1,356.50	1,524,566.555	2,355,930.066	39.251527	-107.774651
5,773.00	6.64	82.14	5,587.15	194.74	1,369.34	1,524,568.076	2,355,942.952	39.251532	-107.774606
5,868.00	3.60	73.18	5,681.76	196.35	1,377.64	1,524,569.482	2,355,951.288	39.251536	-107.774577
5,963.00	2.68	71.42	5,776.62	197.92	1,382.60	1,524,570.927	2,355,956.286	39.251540	-107.774559
6,057.00	2.20	74.93	5,870.53	199.09	1,386.42	1,524,572.000	2,355,960.139	39.251544	-107.774546
6,152.00	1.98	79.59	5,965.47	199.86	1,389.80	1,524,572.686	2,355,963.532	39.251546	-107.774534
6,247.00	1.63	71.77	6,060.42	200.58	1,392.70	1,524,573.332	2,355,966.447	39.251548	-107.774524
6,342.00	1.41	76.25	6,155.39	201.28	1,395.11	1,524,573.972	2,355,968.882	39.251550	-107.774515
6,437.00	1.41	79.94	6,250.36	201.76	1,397.40	1,524,574.397	2,355,971.180	39.251551	-107.774507
6,532.00	0.88	249.31	6,345.35	201.71	1,397.87	1,524,574.331	2,355,971.647	39.251551	-107.774505
6,626.00	2.24	252.30	6,439.31	200.90	1,395.44	1,524,573.579	2,355,969.202	39.251549	-107.774514
6,721.00	1.36	253.09	6,534.27	200.00	1,392.60	1,524,572.758	2,355,966.333	39.251546	-107.774524
6,816.00	1.10	255.29	6,629.25	199.44	1,390.64	1,524,572.248	2,355,964.359	39.251545	-107.774531
6,911.00	1.19	241.40	6,724.23	198.74	1,388.89	1,524,571.588	2,355,962.594	39.251543	-107.774537
7,006.00	1.49	242.72	6,819.20	197.70	1,386.92	1,524,570.600	2,355,960.604	39.251540	-107.774544
7,101.00	1.67	227.69	6,914.16	196.20	1,384.80	1,524,569.155	2,355,958.446	39.251536	-107.774551
7,196.00	2.15	221.45	7,009.11	193.94	1,382.60	1,524,566.944	2,355,956.186	39.251530	-107.774559
7,291.00	2.68	216.00	7,104.03	190.80	1,380.11	1,524,563.875	2,355,953.623	39.251521	-107.774568
7,386.00	2.90	214.15	7,198.91	187.02	1,377.46	1,524,560.157	2,355,950.875	39.251511	-107.774577
7,480.00	3.16	211.52	7,292.78	182.84	1,374.77	1,524,556.049	2,355,948.082	39.251499	-107.774587
7,575.00	3.34	215.47	7,387.63	178.36	1,371.79	1,524,551.639	2,355,944.995	39.251487	-107.774597
7,670.00	3.21	222.50	7,482.48	174.14	1,368.39	1,524,547.511	2,355,941.488	39.251475	-107.774609
7,765.00	3.38	222.94	7,577.32	170.13	1,364.69	1,524,543.594	2,355,937.683	39.251464	-107.774623
7,860.00	3.12	225.58	7,672.17	166.27	1,360.93	1,524,539.830	2,355,933.834	39.251454	-107.774636
7,955.00	3.16	231.47	7,767.02	162.83	1,357.04	1,524,536.488	2,355,929.854	39.251444	-107.774650
Last Archer Survey									
7,986.00	3.25	231.12	7,797.97	161.75	1,355.69	1,524,535.439	2,355,928.474	39.251441	-107.774654
PTB - Piceance Federal 28-06M tgt									
8,046.00	3.25	231.12	7,857.88	159.61	1,353.04	1,524,533.371	2,355,925.774	39.251435	-107.774664

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
139.00	138.99	0.39	1.49	First Archer Survey
7,986.00	7,797.97	161.75	1,355.69	Last Archer Survey
8,046.00	7,857.88	159.61	1,353.04	PTB

Checked By: _____	Approved By: _____	Date: _____
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