



Piceance Energy, LLC

Mesa County, CO

Piceance 29-07

Piceance Federal 29-06W

Wellbore #1

Plan: Design #1

Standard Planning Report

27 March, 2015

Archer



Project: Mesa County, CO
 Site: Piceance 29-07
 Well: Piceance Federal 29-06W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39° 15' 2.610 N
 Longitude: 107° 47' 30.500 W
 Ground Level: 7498.00
 Well @ 7520.00usft

Archer

PROJECT DETAILS: Mesa County, CO	
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 (N/E) Reference:	Well Piceance Federal 29-06W, True North
Vertical (TVD) Reference:	Well @ 7520.00usft
Section (VS) Reference:	Slot - (0.00N, 0.00E)
Measured Depth Reference:	Well @ 7520.00usft
Calculation Method:	Minimum Curvature

WELL DETAILS: Piceance Federal 29-06W					
+N/-S	+E/-W	Northing	Ground Level: Easting	7498.00 2351066.525	Latitude 39° 15' 2.610 N
0.00	0.00	1524396.719	Longitude	107° 47' 30.500 W	Slot

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude
Piceance Federal 29-06W tgt	7705.00	299.57	-2110.48	1524749.427	2348964.271	39° 15' 5.700 N
						107° 47' 57.330 W
						Shape Point

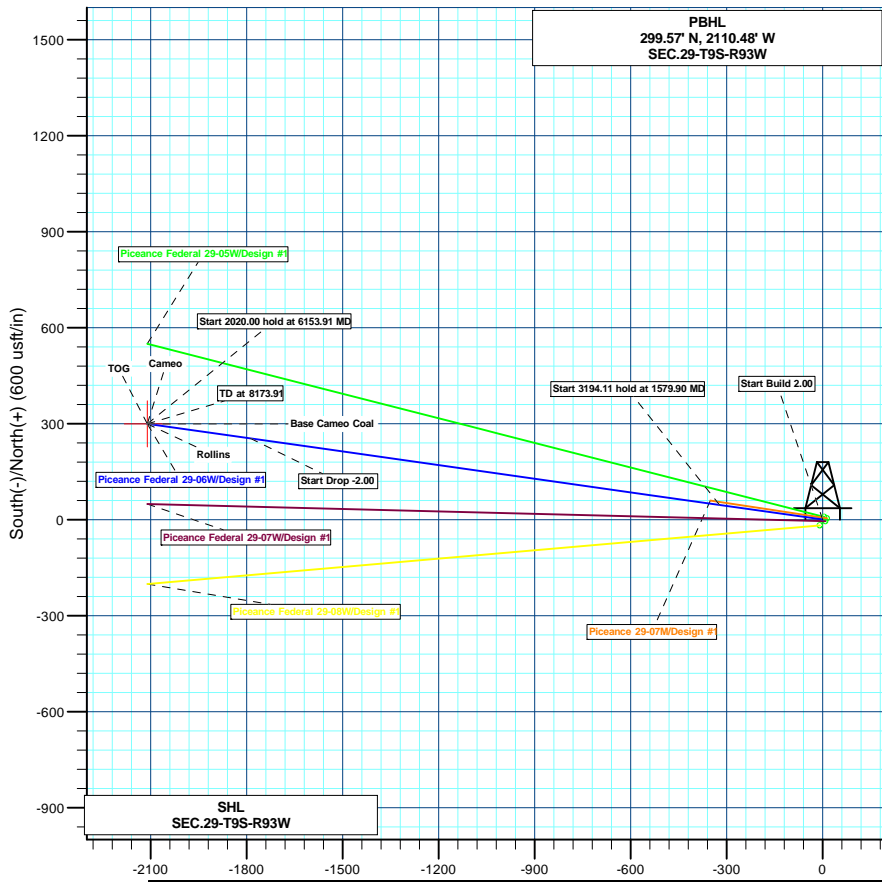
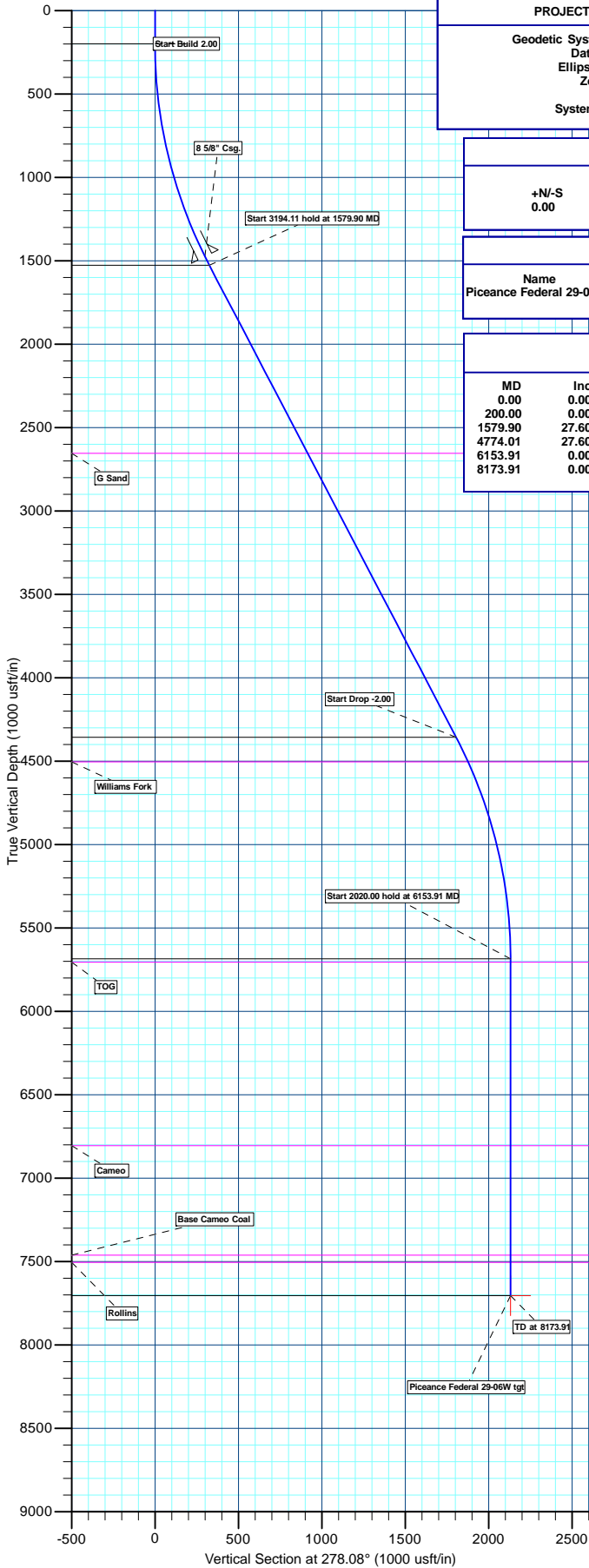
SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	Start 3194.11 hold at 1579.90 MD	
1579.90	27.60	278.08	1527.16	45.81	-322.72	2.00	278.08	325.96	Start 3194.11 hold at 1579.90 MD	
4774.01	27.60	278.08	4357.84	253.76	-1787.76	0.00	0.00	1805.68	Start Drop -2.00	
6153.91	0.00	0.00	5685.00	299.56	-2110.48	2.00	180.00	2131.64	Start 2020.00 hold at 6153.91 MD	
8173.91	0.00	0.00	7705.00	299.56	-2110.48	0.00	0.00	2131.64	TD at 8173.91	

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
2655.00	2852.55	G Sand
4505.00	4937.71	Williams Fork
5705.00	6173.91	TOG
6805.00	7273.91	Cameo
7463.00	7931.91	Base Cameo Coal
7505.00	7973.91	Rollins

T M

Azimuths to True North
 Magnetic North: 9.75°

Magnetic Field
 Strength: 51752.2snT
 Dip Angle: 65.47°
 Date: 03/16/2015
 Model: IGRF2010





Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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 29-07				
Site Position:		Northing:	1,524,470.306 usft	Latitude:	39° 15' 3.350 N
From:	Lat/Long	Easting:	2,351,118.741 usft	Longitude:	107° 47' 29.860 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.45 °

Well	Piceance Federal 29-06W					
Well Position	+N/-S	-74.88 usft	Northing:	1,524,396.719 usft	Latitude:	39° 15' 2.610 N
	+E/-W	-50.34 usft	Easting:	2,351,066.525 usft	Longitude:	107° 47' 30.500 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,498.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/03/16	9.75	65.47	51,752

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	278.08

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,579.90	27.60	278.08	1,527.16	45.81	-322.72	2.00	2.00	0.00	278.08	
4,774.01	27.60	278.08	4,357.84	253.76	-1,787.76	0.00	0.00	0.00	0.00	
6,153.91	0.00	0.00	5,685.00	299.56	-2,110.48	2.00	-2.00	0.00	180.00	
8,173.91	0.00	0.00	7,705.00	299.56	-2,110.48	0.00	0.00	0.00	0.00	Piceance Federal 29-



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned 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	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00										
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	2.00	278.08	299.98	0.25	-1.73	1.75	2.00	2.00	2.00	0.00
400.00	4.00	278.08	399.84	0.98	-6.91	6.98	2.00	2.00	2.00	0.00
500.00	6.00	278.08	499.45	2.21	-15.54	15.69	2.00	2.00	2.00	0.00
600.00	8.00	278.08	598.70	3.92	-27.60	27.88	2.00	2.00	2.00	0.00
700.00	10.00	278.08	697.47	6.12	-43.09	43.52	2.00	2.00	2.00	0.00
800.00	12.00	278.08	795.62	8.80	-61.98	62.60	2.00	2.00	2.00	0.00
900.00	14.00	278.08	893.06	11.96	-84.25	85.10	2.00	2.00	2.00	0.00
1,000.00	16.00	278.08	989.64	15.60	-109.88	110.98	2.00	2.00	2.00	0.00
1,100.00	18.00	278.08	1,085.27	19.70	-138.82	140.21	2.00	2.00	2.00	0.00
1,200.00	20.00	278.08	1,179.82	24.28	-171.05	172.77	2.00	2.00	2.00	0.00
1,300.00	22.00	278.08	1,273.17	29.32	-206.53	208.60	2.00	2.00	2.00	0.00
1,400.00	24.00	278.08	1,365.21	34.81	-245.22	247.67	2.00	2.00	2.00	0.00
1,500.00	26.00	278.08	1,455.84	40.74	-287.06	289.93	2.00	2.00	2.00	0.00
8 5/8" Csg.										
1,522.00	26.44	278.08	1,475.58	42.11	-296.68	299.65	2.00	2.00	2.00	0.00
Start 3194.11 hold at 1579.90 MD										
1,579.90	27.60	278.08	1,527.16	45.81	-322.72	325.96	2.00	2.00	2.00	0.00
1,600.00	27.60	278.08	1,544.97	47.12	-331.94	335.27	0.00	0.00	0.00	0.00
1,700.00	27.60	278.08	1,633.59	53.63	-377.81	381.59	0.00	0.00	0.00	0.00
1,800.00	27.60	278.08	1,722.21	60.14	-423.67	427.92	0.00	0.00	0.00	0.00
1,900.00	27.60	278.08	1,810.84	66.65	-469.54	474.25	0.00	0.00	0.00	0.00
2,000.00	27.60	278.08	1,899.46	73.16	-515.41	520.57	0.00	0.00	0.00	0.00
2,100.00	27.60	278.08	1,988.08	79.67	-561.27	566.90	0.00	0.00	0.00	0.00
2,200.00	27.60	278.08	2,076.70	86.18	-607.14	613.23	0.00	0.00	0.00	0.00
2,300.00	27.60	278.08	2,165.32	92.69	-653.01	659.55	0.00	0.00	0.00	0.00
2,400.00	27.60	278.08	2,253.95	99.20	-698.88	705.88	0.00	0.00	0.00	0.00
2,500.00	27.60	278.08	2,342.57	105.71	-744.74	752.21	0.00	0.00	0.00	0.00
2,600.00	27.60	278.08	2,431.19	112.22	-790.61	798.53	0.00	0.00	0.00	0.00
2,700.00	27.60	278.08	2,519.81	118.73	-836.48	844.86	0.00	0.00	0.00	0.00
2,800.00	27.60	278.08	2,608.43	125.24	-882.34	891.19	0.00	0.00	0.00	0.00
G Sand										
2,852.55	27.60	278.08	2,655.00	128.66	-906.44	915.53	0.00	0.00	0.00	0.00
2,900.00	27.60	278.08	2,697.06	131.75	-928.21	937.51	0.00	0.00	0.00	0.00
3,000.00	27.60	278.08	2,785.68	138.26	-974.08	983.84	0.00	0.00	0.00	0.00
3,100.00	27.60	278.08	2,874.30	144.77	-1,019.94	1,030.17	0.00	0.00	0.00	0.00
3,200.00	27.60	278.08	2,962.92	151.28	-1,065.81	1,076.49	0.00	0.00	0.00	0.00
3,300.00	27.60	278.08	3,051.54	157.79	-1,111.68	1,122.82	0.00	0.00	0.00	0.00
3,400.00	27.60	278.08	3,140.17	164.30	-1,157.54	1,169.15	0.00	0.00	0.00	0.00
3,500.00	27.60	278.08	3,228.79	170.81	-1,203.41	1,215.47	0.00	0.00	0.00	0.00
3,600.00	27.60	278.08	3,317.41	177.32	-1,249.28	1,261.80	0.00	0.00	0.00	0.00
3,700.00	27.60	278.08	3,406.03	183.83	-1,295.14	1,308.13	0.00	0.00	0.00	0.00
3,800.00	27.60	278.08	3,494.65	190.34	-1,341.01	1,354.45	0.00	0.00	0.00	0.00
3,900.00	27.60	278.08	3,583.27	196.85	-1,386.88	1,400.78	0.00	0.00	0.00	0.00
4,000.00	27.60	278.08	3,671.90	203.36	-1,432.74	1,447.11	0.00	0.00	0.00	0.00
4,100.00	27.60	278.08	3,760.52	209.87	-1,478.61	1,493.43	0.00	0.00	0.00	0.00
4,200.00	27.60	278.08	3,849.14	216.39	-1,524.48	1,539.76	0.00	0.00	0.00	0.00
4,300.00	27.60	278.08	3,937.76	222.90	-1,570.34	1,586.08	0.00	0.00	0.00	0.00
4,400.00	27.60	278.08	4,026.38	229.41	-1,616.21	1,632.41	0.00	0.00	0.00	0.00
4,500.00	27.60	278.08	4,115.01	235.92	-1,662.08	1,678.74	0.00	0.00	0.00	0.00
4,600.00	27.60	278.08	4,203.63	242.43	-1,707.95	1,725.06	0.00	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned 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)
4,700.00	27.60	278.08	4,292.25	248.94	-1,753.81	1,771.39	0.00	0.00	0.00
Start Drop -2.00									
4,774.01	27.60	278.08	4,357.84	253.76	-1,787.76	1,805.68	0.00	0.00	0.00
4,800.00	27.08	278.08	4,380.93	255.43	-1,799.58	1,817.61	2.00	-2.00	0.00
4,900.00	25.08	278.08	4,470.74	261.61	-1,843.10	1,861.57	2.00	-2.00	0.00
Williams Fork									
4,937.71	24.32	278.08	4,505.00	263.82	-1,858.70	1,877.33	2.00	-2.00	0.00
5,000.00	23.08	278.08	4,562.04	267.34	-1,883.49	1,902.37	2.00	-2.00	0.00
5,100.00	21.08	278.08	4,654.70	272.63	-1,920.70	1,939.95	2.00	-2.00	0.00
5,200.00	19.08	278.08	4,748.62	277.45	-1,954.69	1,974.28	2.00	-2.00	0.00
5,300.00	17.08	278.08	4,843.67	281.81	-1,985.41	2,005.31	2.00	-2.00	0.00
5,400.00	15.08	278.08	4,939.76	285.70	-2,012.83	2,033.00	2.00	-2.00	0.00
5,500.00	13.08	278.08	5,036.75	289.12	-2,036.91	2,057.33	2.00	-2.00	0.00
5,600.00	11.08	278.08	5,134.53	292.06	-2,057.63	2,078.25	2.00	-2.00	0.00
5,700.00	9.08	278.08	5,232.98	294.52	-2,074.95	2,095.75	2.00	-2.00	0.00
5,800.00	7.08	278.08	5,331.99	296.49	-2,088.86	2,109.80	2.00	-2.00	0.00
5,900.00	5.08	278.08	5,431.42	297.98	-2,099.35	2,120.39	2.00	-2.00	0.00
6,000.00	3.08	278.08	5,531.16	298.98	-2,106.39	2,127.50	2.00	-2.00	0.00
6,100.00	1.08	278.08	5,631.09	299.49	-2,109.98	2,131.13	2.00	-2.00	0.00
Start 2020.00 hold at 6153.91 MD									
6,153.91	0.00	0.00	5,685.00	299.56	-2,110.48	2,131.64	2.00	-2.00	0.00
TOG									
6,173.91	0.00	0.00	5,705.00	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,200.00	0.00	0.00	5,731.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,300.00	0.00	0.00	5,831.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,400.00	0.00	0.00	5,931.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,500.00	0.00	0.00	6,031.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,600.00	0.00	0.00	6,131.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,700.00	0.00	0.00	6,231.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,800.00	0.00	0.00	6,331.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
6,900.00	0.00	0.00	6,431.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,000.00	0.00	0.00	6,531.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,100.00	0.00	0.00	6,631.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,200.00	0.00	0.00	6,731.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
Cameo									
7,273.91	0.00	0.00	6,805.00	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,300.00	0.00	0.00	6,831.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,400.00	0.00	0.00	6,931.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,500.00	0.00	0.00	7,031.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,600.00	0.00	0.00	7,131.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,700.00	0.00	0.00	7,231.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,800.00	0.00	0.00	7,331.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
7,900.00	0.00	0.00	7,431.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
Base Cameo Coal									
7,931.91	0.00	0.00	7,463.00	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
Rollins									
7,973.91	0.00	0.00	7,505.00	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
8,000.00	0.00	0.00	7,531.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
8,100.00	0.00	0.00	7,631.09	299.56	-2,110.48	2,131.64	0.00	0.00	0.00
TD at 8173.91									
8,173.91	0.00	0.00	7,705.00	299.56	-2,110.48	2,131.64	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Piceance Federal 29-06' - hit/miss target - Shape	0.00	0.00	7,705.00	299.57	-2,110.48	1,524,749.427	2,348,964.271	39° 15' 5.570 N	107° 47' 57.330 W
- plan hits target center - Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,522.00	1,475.58	8 5/8" Csg.	8-5/8	12-1/4	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,852.55	2,655.00	G Sand		0.00		
4,937.71	4,505.00	Williams Fork		0.00		
6,173.91	5,705.00	TOG		0.00		
7,273.91	6,805.00	Cameo		0.00		
7,931.91	7,463.00	Base Cameo Coal		0.00		
7,973.91	7,505.00	Rollins		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
200.00	200.00	0.00	0.00	Start Build 2.00	
1,579.90	1,527.16	45.81	-322.72	Start 3194.11 hold at 1579.90 MD	
4,774.01	4,357.84	253.76	-1,787.76	Start Drop -2.00	
6,153.91	5,685.00	299.56	-2,110.48	Start 2020.00 hold at 6153.91 MD	
8,173.91	7,705.00	299.56	-2,110.48	TD at 8173.91	



Piceance Energy, LLC

Mesa County, CO

Piceance 29-07

Piceance Federal 29-06W

Wellbore #1

Design #1

Anticollision Report

27 March, 2015

Archer



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference	Design #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	2015/03/27		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,173.91	Design #1 (Wellbore #1)	MWD	MWD - Standard

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Piceance 29-07						
Piceance 29-07M - Wellbore #1 - Design #1	200.00	200.00	13.97	13.35	22.360	CC, ES
Piceance 29-07M - Wellbore #1 - Design #1	400.00	399.84	20.51	18.92	12.894	SF
Piceance Federal 29-05W - Wellbore #1 - Design #1	200.00	200.00	9.37	8.74	14.994	CC
Piceance Federal 29-05W - Wellbore #1 - Design #1	300.00	300.09	9.55	8.49	8.982	ES
Piceance Federal 29-05W - Wellbore #1 - Design #1	8,173.91	8,198.21	249.89	156.63	2.680	SF
Piceance Federal 29-07W - Wellbore #1 - Design #1	200.00	200.00	10.02	9.40	16.041	CC, ES
Piceance Federal 29-07W - Wellbore #1 - Design #1	8,173.91	8,175.04	250.95	157.81	2.694	SF
Piceance Federal 29-08W - Wellbore #1 - Design #1	354.62	354.42	19.50	18.20	14.941	CC
Piceance Federal 29-08W - Wellbore #1 - Design #1	400.00	399.68	19.65	18.15	13.074	ES
Piceance Federal 29-08W - Wellbore #1 - Design #1	8,173.91	8,165.31	500.90	408.27	5.407	SF

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	73.16	4.05	13.37	13.97					
100.00	100.00	100.00	100.00	0.09	0.09	73.16	4.05	13.37	13.97	13.80	0.18	79.694		
200.00	200.00	200.00	200.00	0.31	0.31	73.16	4.05	13.37	13.97	13.35	0.62	22.360	CC, ES	
300.00	299.98	299.98	299.98	0.53	0.54	157.78	4.05	13.37	15.57	14.48	1.10	14.220		
400.00	399.84	399.84	399.84	0.76	0.76	163.29	4.05	13.37	20.51	18.92	1.59	12.894	SF	
500.00	499.45	499.94	499.94	1.01	0.98	168.05	4.11	12.94	28.55	26.46	2.09	13.654		
600.00	598.70	600.69	600.62	1.30	1.19	170.78	4.65	9.46	37.12	34.54	2.58	14.394		
700.00	697.47	701.09	700.80	1.63	1.42	172.47	5.66	2.80	46.01	42.94	3.07	14.981		
800.00	795.62	800.38	799.82	2.02	1.66	173.91	6.76	-4.38	57.79	54.21	3.58	16.137		
900.00	893.06	899.20	898.37	2.46	1.90	175.10	7.85	-11.52	73.04	68.94	4.10	17.831		
1,000.00	989.64	997.42	996.33	2.97	2.14	176.02	8.94	-18.62	91.74	87.13	4.61	19.880		
1,100.00	1,085.27	1,094.93	1,093.58	3.54	2.39	176.73	10.01	-25.67	113.87	108.73	5.14	22.169		
1,200.00	1,179.82	1,191.60	1,189.99	4.19	2.63	177.27	11.08	-32.66	139.40	133.74	5.66	24.627		
1,300.00	1,273.17	1,287.33	1,285.46	4.90	2.88	177.69	12.14	-39.58	168.29	162.10	6.19	27.203		
1,400.00	1,365.21	1,381.98	1,379.86	5.70	3.12	178.02	13.18	-46.42	200.51	193.80	6.71	29.877		
1,500.00	1,455.84	1,475.46	1,473.09	6.56	3.36	178.27	14.22	-53.17	236.01	228.77	7.24	32.597		
1,600.00	1,544.97	1,567.66	1,565.04	7.51	3.60	178.48	15.23	-59.84	274.70	266.93	7.76	35.381		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Archer

Anticollision Report



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft	
Piceance 29-07 - Piceance 29-07M - Wellbore #1 - Design #1													Offset Well Error:	0.00 usft	
Survey Program: 0-MWD															
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
1,700.00	1,633.59	1,659.43	1,656.57	8.49	3.84	178.66	16.25	-66.47	314.41	306.13	8.28	37.983			
1,800.00	1,722.21	1,751.21	1,748.10	9.47	4.08	178.80	17.26	-73.11	354.13	345.33	8.80	40.235			
1,900.00	1,810.84	1,842.98	1,839.62	10.47	4.31	178.91	18.28	-79.74	393.85	384.51	9.33	42.195			
2,000.00	1,899.46	1,934.75	1,931.15	11.46	4.55	179.00	19.29	-86.37	433.56	423.69	9.87	43.914			
2,100.00	1,988.08	2,026.52	2,022.67	12.46	4.79	179.07	20.30	-93.01	473.28	462.86	10.42	45.429			
2,200.00	2,076.70	2,118.29	2,114.20	13.46	5.03	179.14	21.32	-99.64	513.00	502.03	10.97	46.773			
2,300.00	2,165.32	2,210.06	2,205.73	14.47	5.27	179.19	22.33	-106.27	552.72	541.20	11.52	47.971			
2,400.00	2,253.95	2,301.84	2,297.25	15.47	5.51	179.24	23.34	-112.91	592.44	580.36	12.08	49.044			
2,500.00	2,342.57	2,393.61	2,388.78	16.48	5.75	179.28	24.36	-119.54	632.16	619.52	12.64	50.011			
2,600.00	2,431.19	2,485.38	2,480.31	17.49	5.99	179.31	25.37	-126.17	671.89	658.68	13.20	50.885			
2,700.00	2,519.81	2,577.15	2,571.83	18.50	6.23	179.35	26.39	-132.81	711.61	697.84	13.77	51.679			
2,800.00	2,608.43	2,668.92	2,663.36	19.51	6.47	179.37	27.40	-139.44	751.33	736.99	14.34	52.402			
2,900.00	2,697.06	2,760.70	2,754.89	20.52	6.71	179.40	28.41	-146.07	791.05	776.14	14.91	53.064			
3,000.00	2,785.68	2,852.47	2,846.41	21.53	6.95	179.42	29.43	-152.71	830.77	815.29	15.48	53.672			
3,100.00	2,874.30	2,944.24	2,937.94	22.54	7.19	179.44	30.44	-159.34	870.49	854.44	16.05	54.232			
3,200.00	2,962.92	3,036.01	3,029.46	23.55	7.43	179.46	31.45	-165.97	910.22	893.59	16.63	54.748			
3,300.00	3,051.54	3,127.78	3,120.99	24.56	7.67	179.48	32.47	-172.61	949.94	932.74	17.20	55.227			
3,400.00	3,140.17	3,219.56	3,212.52	25.57	7.91	179.50	33.48	-179.24	989.66	971.88	17.78	55.671			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Archer

Anticollision Report



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	30.25	8.09	4.72	9.37					
100.00	100.00	100.00	100.00	0.09	0.09	30.25	8.09	4.72	9.37	9.19	0.18	53.442		
200.00	200.00	200.00	200.00	0.31	0.31	30.25	8.09	4.72	9.37	8.74	0.62	14.994 CC		
300.00	299.98	300.09	300.07	0.53	0.53	111.78	8.53	3.03	9.55	8.49	1.06	8.982 ES		
400.00	399.84	400.18	400.01	0.76	0.76	110.71	9.83	-2.05	10.09	8.58	1.52	6.649		
500.00	499.45	500.26	499.71	1.01	1.01	109.15	11.99	-10.51	11.01	8.98	2.02	5.445		
600.00	598.70	600.33	599.03	1.30	1.30	107.36	15.02	-22.33	12.29	9.70	2.59	4.743		
700.00	697.47	700.40	697.86	1.63	1.63	105.54	18.90	-37.51	13.96	10.71	3.25	4.295		
800.00	795.62	800.46	796.07	2.02	2.02	103.84	23.64	-56.02	16.00	11.99	4.01	3.989		
900.00	893.06	900.50	893.54	2.46	2.46	102.31	29.22	-77.84	18.42	13.53	4.89	3.766		
1,000.00	989.64	1,000.52	990.15	2.97	2.97	100.98	35.65	-102.93	21.22	15.32	5.90	3.597		
1,100.00	1,085.27	1,100.53	1,085.78	3.54	3.54	99.83	42.90	-131.27	24.40	17.35	7.05	3.463		
1,200.00	1,179.82	1,200.52	1,180.31	4.19	4.18	98.85	50.98	-162.83	27.94	19.61	8.33	3.354		
1,300.00	1,273.17	1,300.49	1,273.63	4.90	4.90	98.02	59.86	-197.55	31.84	22.08	9.76	3.263		
1,400.00	1,365.21	1,400.44	1,365.62	5.70	5.69	97.31	69.55	-235.39	36.11	24.77	11.34	3.184		
1,500.00	1,455.84	1,500.36	1,456.17	6.56	6.55	96.69	80.02	-276.31	40.72	27.65	13.07	3.115		
1,600.00	1,544.97	1,600.26	1,545.17	7.51	7.50	96.10	91.27	-320.26	45.67	30.72	14.96	3.053		
1,700.00	1,633.59	1,700.12	1,633.03	8.49	8.50	94.22	103.04	-366.24	50.75	33.80	16.95	2.994		
1,800.00	1,722.21	1,799.98	1,720.84	9.47	9.51	92.61	114.82	-412.29	55.88	36.92	18.96	2.948		
1,900.00	1,810.84	1,899.84	1,808.66	10.47	10.53	91.27	126.61	-458.34	61.04	40.08	20.96	2.912		
2,000.00	1,899.46	1,999.69	1,898.48	11.46	11.55	90.14	138.40	-504.39	66.23	43.26	22.97	2.883		
2,100.00	1,988.08	2,099.55	1,984.30	12.46	12.58	89.18	150.18	-550.43	71.44	46.46	24.98	2.860		
2,200.00	2,076.70	2,199.41	2,072.12	13.46	13.61	88.35	161.97	-596.48	76.67	49.68	26.99	2.841		
2,300.00	2,165.32	2,299.27	2,159.94	14.47	14.64	87.62	173.75	-642.53	81.92	52.92	29.00	2.825		
2,400.00	2,253.95	2,399.12	2,247.76	15.47	15.67	86.98	185.54	-688.58	87.17	56.16	31.01	2.811		
2,500.00	2,342.57	2,498.98	2,335.58	16.48	16.71	86.41	197.32	-734.63	92.44	59.42	33.01	2.800		
2,600.00	2,431.19	2,598.84	2,423.40	17.49	17.74	85.91	209.11	-780.68	97.71	62.69	35.02	2.790		
2,700.00	2,519.81	2,698.69	2,511.21	18.50	18.78	85.45	220.89	-826.72	102.99	65.96	37.03	2.781		
2,800.00	2,608.43	2,798.55	2,599.03	19.51	19.82	85.05	232.68	-872.77	108.27	69.24	39.03	2.774		
2,900.00	2,697.06	2,898.41	2,686.85	20.52	20.86	84.67	244.47	-918.82	113.57	72.52	41.04	2.767		
3,000.00	2,785.68	2,998.27	2,774.67	21.53	21.90	84.34	256.25	-964.87	118.86	75.81	43.05	2.761		
3,100.00	2,874.30	3,098.12	2,862.49	22.54	22.94	84.03	268.04	-1,010.92	124.16	79.11	45.05	2.756		
3,200.00	2,962.92	3,197.98	2,950.31	23.55	23.98	83.74	279.82	-1,056.96	129.46	82.41	47.06	2.751		
3,300.00	3,051.54	3,297.84	3,038.13	24.56	25.02	83.48	291.61	-1,103.01	134.77	85.71	49.06	2.747		
3,400.00	3,140.17	3,397.70	3,125.95	25.57	26.06	83.24	303.39	-1,149.06	140.07	89.01	51.06	2.743		
3,500.00	3,228.79	3,497.55	3,213.76	26.59	27.10	83.01	315.18	-1,195.11	145.38	92.32	53.07	2.740		
3,600.00	3,317.41	3,597.41	3,301.58	27.60	28.14	82.81	326.97	-1,241.16	150.70	95.63	55.07	2.736		
3,700.00	3,406.03	3,697.27	3,389.40	28.61	29.19	82.61	338.75	-1,287.21	156.01	98.94	57.07	2.731		
3,800.00	3,494.65	3,797.13	3,477.22	29.63	30.23	82.43	350.54	-1,333.25	161.33	102.25	59.08	2.734		
3,900.00	3,583.27	3,896.98	3,565.04	30.64	31.27	82.26	362.32	-1,379.30	166.64	105.56	61.08	2.728		
4,000.00	3,671.90	3,996.84	3,652.86	31.66	32.31	82.10	374.11	-1,425.35	171.96	108.88	63.08	2.726		
4,100.00	3,760.52	4,096.70	3,740.68	32.67	33.36	81.95	385.89	-1,471.40	177.28	112.20	65.08	2.724		
4,200.00	3,849.14	4,196.56	3,828.50	33.68	34.40	81.81	397.68	-1,517.45	182.60	115.52	67.08	2.722		
4,300.00	3,937.76	4,296.41	3,916.32	34.70	35.44	81.68	409.46	-1,563.50	187.92	118.84	69.09	2.720		
4,400.00	4,026.38	4,396.27	4,004.13	35.71	36.49	81.55	421.25	-1,609.54	193.25	122.16	71.09	2.718		
4,500.00	4,115.01	4,496.13	4,091.95	36.73	37.53	81.43	433.04	-1,655.59	198.57	125.48	73.09	2.717		
4,600.00	4,203.63	4,595.98	4,179.77	37.74	38.57	81.32	444.82	-1,701.64	203.89	128.80	75.09	2.715		
4,700.00	4,292.25	4,695.84	4,267.59	38.76	39.62	81.21	456.61	-1,747.69	209.22	132.13	77.09	2.714		
4,800.00	4,380.93	4,795.63	4,356.18	39.75	40.63	81.18	468.42	-1,793.84	214.50	135.45	79.05	2.713		
4,900.00	4,470.74	4,895.43	4,444.19	40.75	41.67	81.29	479.73	-1,839.99	219.44	138.78	80.67	2.720		
5,000.00	4,562.04	5,000.08	4,539.80	41.78	42.64	81.39	490.23	-1,887.07	224.04	141.89	82.15	2.727		
5,100.00	4,654.70	5,101.99	4,633.92	42.81	43.64	81.48	500.92	-1,935.16	228.27	144.76	83.51	2.734		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,200.00	4,748.62	5,203.95	4,729.41	42.56	43.57	81.57	508.77	-1,951.51	232.14	147.41	84.74	2.740		
5,300.00	4,843.67	5,305.95	4,826.16	43.11	44.14	81.64	516.78	-1,982.81	235.64	149.80	85.84	2.745		
5,400.00	4,939.76	5,408.00	4,924.04	43.59	44.64	81.70	523.94	-2,010.76	238.76	151.95	86.81	2.750		
5,500.00	5,036.75	5,510.08	5,022.91	44.01	45.08	81.76	530.23	-2,035.33	241.51	153.84	87.66	2.755		
5,600.00	5,134.53	5,612.20	5,122.67	44.37	45.46	81.81	535.64	-2,056.47	243.87	155.47	88.39	2.759		
5,700.00	5,232.98	5,714.34	5,223.16	44.68	45.78	81.85	540.16	-2,074.16	245.84	156.83	89.01	2.762		
5,800.00	5,331.99	5,816.51	5,324.26	44.93	46.04	81.88	543.80	-2,088.37	247.43	157.92	89.51	2.764		
5,900.00	5,431.42	5,918.69	5,425.84	45.13	46.24	81.90	546.54	-2,099.08	248.62	158.72	89.90	2.765		
6,000.00	5,531.16	6,020.89	5,527.77	45.27	46.40	81.92	548.39	-2,106.28	249.43	159.23	90.19	2.766		
6,100.00	5,631.09	6,123.10	5,629.90	45.37	46.50	81.92	549.32	-2,109.95	249.84	159.45	90.38	2.764		
6,200.00	5,731.09	6,224.29	5,731.09	45.43	46.56	0.00	549.46	-2,110.46	249.89	159.39	90.50	2.761		
6,300.00	5,831.09	6,324.29	5,831.09	45.49	46.62	0.00	549.46	-2,110.46	249.89	159.27	90.62	2.758		
6,400.00	5,931.09	6,424.29	5,931.09	45.55	46.68	0.00	549.46	-2,110.46	249.89	159.15	90.74	2.754		
6,500.00	6,031.09	6,524.29	6,031.09	45.61	46.74	0.00	549.46	-2,110.46	249.89	159.02	90.87	2.750		
6,600.00	6,131.09	6,624.29	6,131.09	45.68	46.80	0.00	549.46	-2,110.46	249.89	158.90	91.00	2.746		
6,700.00	6,231.09	6,724.29	6,231.09	45.74	46.87	0.00	549.46	-2,110.46	249.89	158.77	91.13	2.742		
6,800.00	6,331.09	6,824.29	6,331.09	45.81	46.93	0.00	549.46	-2,110.46	249.89	158.64	91.26	2.738		
6,900.00	6,431.09	6,924.29	6,431.09	45.87	46.99	0.00	549.46	-2,110.46	249.89	158.50	91.39	2.734		
7,000.00	6,531.09	7,024.29	6,531.09	45.94	47.06	0.00	549.46	-2,110.46	249.89	158.37	91.53	2.730		
7,100.00	6,631.09	7,124.29	6,631.09	46.01	47.13	0.00	549.46	-2,110.46	249.89	158.23	91.66	2.726		
7,200.00	6,731.09	7,224.29	6,731.09	46.08	47.20	0.00	549.46	-2,110.46	249.89	158.09	91.80	2.722		
7,300.00	6,831.09	7,324.29	6,831.09	46.15	47.26	0.00	549.46	-2,110.46	249.89	157.95	91.94	2.718		
7,400.00	6,931.09	7,424.29	6,931.09	46.22	47.33	0.00	549.46	-2,110.46	249.89	157.81	92.09	2.714		
7,500.00	7,031.09	7,524.29	7,031.09	46.29	47.41	0.00	549.46	-2,110.46	249.89	157.66	92.23	2.709		
7,600.00	7,131.09	7,624.29	7,131.09	46.37	47.48	0.00	549.46	-2,110.46	249.89	157.52	92.38	2.705		
7,700.00	7,231.09	7,724.29	7,231.09	46.44	47.55	0.00	549.46	-2,110.46	249.89	157.37	92.53	2.701		
7,800.00	7,331.09	7,824.29	7,331.09	46.52	47.62	0.00	549.46	-2,110.46	249.89	157.22	92.68	2.696		
7,900.00	7,431.09	7,924.29	7,431.09	46.59	47.70	0.00	549.46	-2,110.46	249.89	157.06	92.83	2.692		
8,000.00	7,531.09	8,024.29	7,531.09	46.67	47.77	0.00	549.46	-2,110.46	249.89	156.91	92.99	2.687		
8,100.00	7,631.09	8,124.29	7,631.09	46.75	47.85	0.00	549.46	-2,110.46	249.89	156.75	93.14	2.683		
8,173.91	7,705.00	8,198.21	7,705.00	46.81	47.91	0.00	549.46	-2,110.46	249.89	156.63	93.26	2.680 SF		



Archer
Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference				Offset		Semi Major Axis			Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	120.31	-5.06	8.65	10.02					
100.00	100.00	100.00	100.00	0.09	0.09	120.31	-5.06	8.65	10.02	9.85	0.18	57.171		
200.00	200.00	200.00	200.00	0.31	0.31	120.31	-5.06	8.65	10.02	9.40	0.62	16.041	CC, ES	
300.00	299.98	299.98	299.98	0.53	0.54	-161.00	-5.06	8.65	11.66	10.56	1.10	10.631		
400.00	399.84	400.35	400.33	0.76	0.75	-164.61	-5.01	6.90	15.06	13.48	1.58	9.545		
500.00	499.45	500.83	500.67	1.01	0.97	-165.66	-4.88	1.62	18.60	16.54	2.06	9.009		
600.00	598.70	601.44	600.88	1.30	1.22	-165.36	-4.66	-7.19	22.25	19.68	2.57	8.660		
700.00	697.47	702.15	700.83	1.63	1.50	-164.27	-4.34	-19.52	26.01	22.91	3.09	8.405		
800.00	795.62	802.98	800.40	2.02	1.83	-162.71	-3.94	-35.37	29.88	26.24	3.65	8.193		
900.00	893.06	903.91	899.45	2.46	2.21	-160.85	-3.45	-54.75	33.90	29.66	4.24	7.994		
1,000.00	989.64	1,004.95	997.86	2.97	2.65	-158.80	-2.87	-77.62	38.07	33.18	4.89	7.785		
1,100.00	1,085.27	1,106.09	1,095.50	3.54	3.16	-156.65	-2.20	-103.97	42.41	36.80	5.61	7.556		
1,200.00	1,179.82	1,207.33	1,192.24	4.19	3.73	-154.44	-1.45	-133.79	46.96	40.52	6.43	7.301		
1,300.00	1,273.17	1,308.67	1,287.95	4.90	4.39	-152.22	-0.61	-167.03	51.71	44.34	7.37	7.021		
1,400.00	1,365.21	1,410.09	1,382.52	5.70	5.11	-150.01	0.32	-203.68	56.69	48.26	8.43	6.725		
1,500.00	1,455.84	1,511.60	1,475.81	6.56	5.92	-147.83	1.34	-243.68	61.91	52.26	9.65	6.418		
1,600.00	1,544.97	1,613.21	1,567.70	7.51	6.80	-145.67	2.44	-287.00	67.32	56.29	11.03	6.104		
1,700.00	1,633.59	1,714.87	1,658.05	8.49	7.77	-142.47	3.62	-333.58	71.10	58.39	12.71	5.595		
1,800.00	1,722.21	1,814.72	1,745.99	9.47	8.76	-138.69	4.81	-380.85	73.89	59.26	14.63	5.050		
1,900.00	1,810.84	1,914.56	1,833.93	10.47	9.77	-135.20	6.01	-428.13	76.97	60.31	16.67	4.619		
2,000.00	1,899.46	2,014.41	1,921.86	11.46	10.78	-131.99	7.21	-475.40	80.32	61.55	18.78	4.278		
2,100.00	1,988.08	2,114.25	2,009.80	12.46	11.80	-129.04	8.41	-522.67	83.90	62.96	20.94	4.007		
2,200.00	2,076.70	2,214.10	2,097.74	13.46	12.82	-126.34	9.61	-569.94	87.69	64.55	23.14	3.790		
2,300.00	2,165.32	2,313.95	2,185.68	14.47	13.84	-123.87	10.81	-617.21	91.65	66.30	25.36	3.615		
2,400.00	2,253.95	2,413.79	2,273.62	15.47	14.87	-121.61	12.00	-664.49	95.77	68.19	27.58	3.472		
2,500.00	2,342.57	2,513.64	2,361.56	16.48	15.89	-119.53	13.20	-711.76	100.03	70.22	29.82	3.355		
2,600.00	2,431.19	2,613.49	2,449.50	17.49	16.92	-117.63	14.40	-759.03	104.41	72.36	32.04	3.258		
2,700.00	2,519.81	2,713.33	2,537.44	18.50	17.96	-115.88	15.60	-806.30	108.89	74.62	34.27	3.178		
2,800.00	2,608.43	2,813.18	2,625.38	19.51	18.99	-114.27	16.80	-853.57	113.47	76.98	36.49	3.110		
2,900.00	2,697.06	2,913.03	2,713.31	20.52	20.02	-112.79	18.00	-900.85	118.12	79.43	38.69	3.053		
3,000.00	2,785.68	3,012.87	2,801.25	21.53	21.05	-111.42	19.19	-948.12	122.86	81.96	40.89	3.004		
3,100.00	2,874.30	3,112.72	2,889.19	22.54	22.09	-110.16	20.39	-995.39	127.65	84.57	43.08	2.963		
3,200.00	2,962.92	3,212.57	2,977.13	23.55	23.12	-108.98	21.59	-1,042.66	132.50	87.24	45.26	2.927		
3,300.00	3,051.54	3,312.41	3,065.07	24.56	24.16	-107.89	22.79	-1,089.93	137.41	89.97	47.44	2.897		
3,400.00	3,140.17	3,412.26	3,153.01	25.57	25.20	-106.87	23.99	-1,137.21	142.36	92.76	49.60	2.870		
3,500.00	3,228.79	3,512.11	3,240.95	26.59	26.23	-105.93	25.18	-1,184.48	147.36	95.60	51.75	2.847		
3,600.00	3,317.41	3,611.95	3,328.89	27.60	27.27	-105.04	26.38	-1,231.75	152.39	98.49	53.90	2.827		
3,700.00	3,406.03	3,711.80	3,416.83	28.61	28.31	-104.21	27.58	-1,279.02	157.45	101.41	56.04	2.810		
3,800.00	3,494.65	3,811.65	3,504.76	29.63	29.35	-103.44	28.78	-1,326.30	162.55	104.37	58.17	2.794		
3,900.00	3,583.27	3,911.49	3,592.70	30.64	30.38	-102.71	29.98	-1,373.57	167.67	107.37	60.30	2.781		
4,000.00	3,671.90	4,011.34	3,680.64	31.66	31.42	-102.02	31.18	-1,420.84	172.82	110.40	62.42	2.769		
4,100.00	3,760.52	4,111.19	3,768.58	32.67	32.46	-101.37	32.37	-1,468.11	177.99	113.46	64.53	2.758		
4,200.00	3,849.14	4,211.03	3,856.52	33.68	33.50	-100.76	33.57	-1,515.38	183.19	116.55	66.64	2.749		
4,300.00	3,937.76	4,310.88	3,944.46	34.70	34.54	-100.19	34.77	-1,562.66	188.40	119.66	68.74	2.741		
4,400.00	4,026.38	4,410.73	4,032.40	35.71	35.58	-99.64	35.97	-1,609.93	193.63	122.79	70.84	2.733		
4,500.00	4,115.01	4,510.57	4,120.34	36.73	36.62	-99.13	37.17	-1,657.20	198.88	125.94	72.94	2.727		
4,600.00	4,203.63	4,610.42	4,208.28	37.74	37.65	-98.64	38.37	-1,704.47	204.14	129.12	75.03	2.721		
4,700.00	4,292.25	4,710.27	4,296.21	38.76	38.69	-98.17	39.56	-1,751.74	209.42	132.31	77.11	2.716		
4,800.00	4,380.93	4,809.95	4,384.34	39.75	39.65	-97.91	40.74	-1,798.32	214.72	135.64	79.08	2.715		
4,900.00	4,470.74	4,909.56	4,473.86	40.55	40.44	-97.93	41.85	-1,841.98	219.78	139.11	80.67	2.724		
5,000.00	4,562.04	5,009.20	4,564.87	41.28	41.17	-97.95	42.88	-1,882.51	224.48	142.35	82.13	2.733		
5,100.00	4,654.70	5,108.85	4,657.25	41.95	41.84	-97.97	43.83	-1,919.86	228.82	145.34	83.47	2.741		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Archer

Anticollision Report



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft		
Survey Program: 0-MWD													Piceance 29-07 - Piceance Federal 29-07W - Wellbore #1 - Design #1		Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
5,200.00	4,748.62	5,208.53	4,750.89	42.56	42.45	-97.99	44.69	-1,953.98	232.77	148.09	84.68	2.749				
5,300.00	4,843.67	5,308.22	4,845.69	43.11	42.99	-98.00	45.47	-1,984.84	236.35	150.58	85.77	2.756				
5,400.00	4,939.76	5,407.94	4,941.51	43.59	43.47	-98.02	46.17	-2,012.37	239.54	152.81	86.73	2.762				
5,500.00	5,036.75	5,507.66	5,038.25	44.01	43.89	-98.03	46.78	-2,036.57	242.34	154.77	87.58	2.767				
5,600.00	5,134.53	5,607.40	5,135.79	44.37	44.25	-98.04	47.31	-2,057.38	244.75	156.45	88.30	2.772				
5,700.00	5,232.98	5,707.16	5,234.01	44.68	44.56	-98.05	47.75	-2,074.79	246.77	157.86	88.91	2.776				
5,800.00	5,331.99	5,806.92	5,332.78	44.93	44.81	-98.06	48.11	-2,088.77	248.39	158.98	89.40	2.778				
5,900.00	5,431.42	5,906.69	5,431.98	45.13	45.00	-98.07	48.37	-2,099.31	249.61	159.81	89.80	2.780				
6,000.00	5,531.16	6,006.46	5,531.50	45.27	45.15	-98.07	48.55	-2,106.39	250.43	160.34	90.08	2.780				
6,100.00	5,631.09	6,106.24	5,631.21	45.37	45.25	-98.07	48.64	-2,110.00	250.85	160.57	90.28	2.779				
6,200.00	5,731.09	6,206.12	5,731.09	45.43	45.31	-180.00	48.66	-2,110.50	250.91	160.51	90.39	2.776				
6,300.00	5,831.09	6,306.12	5,831.09	45.49	45.37	-180.00	48.66	-2,110.50	250.91	160.39	90.51	2.772				
6,400.00	5,931.09	6,406.12	5,931.09	45.55	45.43	-180.00	48.66	-2,110.50	250.91	160.27	90.64	2.768				
6,500.00	6,031.09	6,506.12	6,031.09	45.61	45.49	-180.00	48.66	-2,110.50	250.91	160.14	90.76	2.764				
6,600.00	6,131.09	6,606.12	6,131.09	45.68	45.55	-180.00	48.66	-2,110.50	250.91	160.02	90.89	2.761				
6,700.00	6,231.09	6,706.12	6,231.09	45.74	45.62	-180.00	48.66	-2,110.50	250.91	159.89	91.02	2.757				
6,800.00	6,331.09	6,806.12	6,331.09	45.81	45.68	-180.00	48.66	-2,110.50	250.91	159.76	91.15	2.753				
6,900.00	6,431.09	6,906.12	6,431.09	45.87	45.75	-180.00	48.66	-2,110.50	250.91	159.63	91.28	2.749				
7,000.00	6,531.09	7,006.12	6,531.09	45.94	45.82	-180.00	48.66	-2,110.50	250.91	159.49	91.41	2.745				
7,100.00	6,631.09	7,106.12	6,631.09	46.01	45.88	-180.00	48.66	-2,110.50	250.91	159.35	91.55	2.741				
7,200.00	6,731.09	7,206.12	6,731.09	46.08	45.95	-180.00	48.66	-2,110.50	250.91	159.21	91.69	2.736				
7,300.00	6,831.09	7,306.12	6,831.09	46.15	46.02	-180.00	48.66	-2,110.50	250.91	159.07	91.83	2.732				
7,400.00	6,931.09	7,406.12	6,931.09	46.22	46.09	-180.00	48.66	-2,110.50	250.91	158.93	91.97	2.728				
7,500.00	7,031.09	7,506.12	7,031.09	46.29	46.17	-180.00	48.66	-2,110.50	250.91	158.79	92.12	2.724				
7,600.00	7,131.09	7,606.12	7,131.09	46.37	46.24	-180.00	48.66	-2,110.50	250.91	158.64	92.27	2.719				
7,700.00	7,231.09	7,706.12	7,231.09	46.44	46.31	-180.00	48.66	-2,110.50	250.91	158.49	92.41	2.715				
7,800.00	7,331.09	7,806.12	7,331.09	46.52	46.39	-180.00	48.66	-2,110.50	250.91	158.34	92.57	2.711				
7,900.00	7,431.09	7,906.12	7,431.09	46.59	46.46	-180.00	48.66	-2,110.50	250.91	158.19	92.72	2.706				
8,000.00	7,531.09	8,006.12	7,531.09	46.67	46.54	-180.00	48.66	-2,110.50	250.91	158.03	92.87	2.702				
8,100.00	7,631.09	8,106.12	7,631.09	46.75	46.62	-180.00	48.66	-2,110.50	250.91	157.88	93.03	2.697				
8,147.49	7,678.57	8,153.61	7,678.57	46.78	46.66	-180.00	48.66	-2,110.50	250.91	157.80	93.10	2.695				
8,173.91	7,705.00	8,175.04	7,700.00	46.81	46.67	-180.00	48.66	-2,110.50	250.95	157.81	93.14	2.694 SF				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Archer
Anticollision Report



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-154.59	-18.21	-8.65	20.16					
100.00	100.00	100.00	100.00	0.09	0.09	-154.59	-18.21	-8.65	20.16	19.99	0.18	115.002		
200.00	200.00	200.00	200.00	0.31	0.31	-154.59	-18.21	-8.65	20.16	19.54	0.62	32.267		
300.00	299.98	299.98	299.98	0.53	0.54	-77.52	-18.21	-8.65	19.71	18.64	1.07	18.465		
354.62	354.54	354.42	354.42	0.65	0.65	-83.10	-18.26	-9.17	19.50	18.20	1.31	14.941	CC	
400.00	399.84	399.68	399.66	0.76	0.75	-87.87	-18.36	-10.38	19.65	18.15	1.50	13.074	ES	
500.00	499.45	499.48	499.32	1.01	0.97	-97.91	-18.81	-15.57	21.02	19.04	1.98	10.642		
600.00	598.70	599.39	598.84	1.30	1.21	-106.16	-19.57	-24.22	23.73	21.21	2.51	9.435		
700.00	697.47	699.38	698.08	1.63	1.49	-112.15	-20.62	-36.34	27.58	24.46	3.13	8.819		
800.00	795.62	799.45	796.92	2.02	1.81	-116.12	-21.98	-51.92	32.41	28.59	3.82	8.486		
900.00	893.06	899.59	895.22	2.46	2.19	-118.57	-23.63	-70.93	38.06	33.47	4.60	8.281		
1,000.00	989.64	999.79	992.85	2.97	2.62	-119.94	-25.59	-93.38	44.48	39.01	5.47	8.126		
1,100.00	1,085.27	1,100.04	1,089.68	3.54	3.12	-120.57	-27.84	-119.22	51.61	45.15	6.46	7.985		
1,200.00	1,179.82	1,200.34	1,185.60	4.19	3.69	-120.69	-30.38	-148.44	59.44	51.86	7.58	7.843		
1,300.00	1,273.17	1,300.68	1,280.46	4.90	4.33	-120.47	-33.22	-181.00	67.94	59.11	8.83	7.697		
1,400.00	1,365.21	1,401.05	1,374.14	5.70	5.04	-120.03	-36.34	-216.86	77.11	66.89	10.22	7.546		
1,500.00	1,455.84	1,501.44	1,466.53	6.56	5.83	-119.44	-39.75	-255.98	86.94	75.18	11.76	7.393		
1,600.00	1,544.97	1,601.85	1,557.50	7.51	6.70	-118.75	-43.43	-298.30	97.40	83.95	13.46	7.238		
1,700.00	1,633.59	1,702.31	1,646.97	8.49	7.64	-117.05	-47.39	-343.80	107.43	92.08	15.35	7.000		
1,800.00	1,722.21	1,801.77	1,734.71	9.47	8.62	-114.77	-51.46	-390.47	117.10	99.75	17.35	6.749		
1,900.00	1,810.84	1,901.20	1,822.42	10.47	9.62	-112.84	-55.52	-432.13	126.92	107.55	19.37	6.551		
2,000.00	1,899.46	2,000.63	1,910.13	11.46	10.61	-111.19	-59.58	-483.79	136.87	115.47	21.41	6.394		
2,100.00	1,988.08	2,100.06	1,997.84	12.46	11.62	-109.76	-63.65	-530.45	146.92	123.47	23.44	6.267		
2,200.00	2,076.70	2,199.49	2,085.55	13.46	12.62	-108.52	-67.71	-577.11	157.04	131.56	25.49	6.162		
2,300.00	2,165.32	2,298.93	2,173.26	14.47	13.64	-107.42	-71.77	-623.77	167.23	139.70	27.53	6.075		
2,400.00	2,253.95	2,398.36	2,260.97	15.47	14.65	-106.46	-75.84	-670.43	177.47	147.90	29.57	6.002		
2,500.00	2,342.57	2,497.79	2,348.68	16.48	15.66	-105.60	-79.90	-717.09	187.76	156.14	31.61	5.939		
2,600.00	2,431.19	2,597.22	2,436.39	17.49	16.68	-104.82	-83.96	-763.75	198.08	164.42	33.66	5.885		
2,700.00	2,519.81	2,696.66	2,524.10	18.50	17.70	-104.13	-88.03	-810.41	208.44	172.74	35.70	5.839		
2,800.00	2,608.43	2,796.09	2,611.81	19.51	18.71	-103.50	-92.09	-857.07	218.82	181.08	37.74	5.798		
2,900.00	2,697.06	2,895.52	2,699.52	20.52	19.73	-102.93	-96.15	-903.73	229.23	189.45	39.78	5.763		
3,000.00	2,785.68	2,994.95	2,787.23	21.53	20.75	-102.41	-100.21	-950.39	239.65	197.84	41.82	5.731		
3,100.00	2,874.30	3,094.38	2,874.94	22.54	21.78	-101.93	-104.28	-997.05	250.10	206.24	43.85	5.703		
3,200.00	2,962.92	3,193.82	2,962.65	23.55	22.80	-101.49	-108.34	-1,043.71	260.56	214.67	45.89	5.678		
3,300.00	3,051.54	3,293.25	3,050.36	24.56	23.82	-101.08	-112.40	-1,090.37	271.04	223.11	47.93	5.655		
3,400.00	3,140.17	3,392.68	3,138.07	25.57	24.84	-100.70	-116.47	-1,137.03	281.53	231.56	49.96	5.635		
3,500.00	3,228.79	3,492.11	3,225.78	26.59	25.86	-100.35	-120.53	-1,183.69	292.02	240.03	52.00	5.616		
3,600.00	3,317.41	3,591.54	3,313.49	27.60	26.89	-100.03	-124.59	-1,230.35	302.53	248.50	54.03	5.599		
3,700.00	3,406.03	3,690.98	3,401.20	28.61	27.91	-99.73	-128.66	-1,277.01	313.05	256.99	56.07	5.584		
3,800.00	3,494.65	3,790.41	3,488.91	29.63	28.93	-99.44	-132.72	-1,323.67	323.58	265.48	58.10	5.569		
3,900.00	3,583.27	3,889.84	3,576.62	30.64	29.96	-99.18	-136.78	-1,370.33	334.11	273.98	60.13	5.556		
4,000.00	3,671.90	3,989.27	3,664.33	31.66	30.98	-98.93	-140.84	-1,416.99	344.65	282.49	62.16	5.544		
4,100.00	3,760.52	4,088.70	3,752.04	32.67	32.01	-98.69	-144.91	-1,463.65	355.20	291.00	64.19	5.533		
4,200.00	3,849.14	4,188.14	3,839.75	33.68	33.03	-98.47	-148.97	-1,510.31	365.75	299.53	66.23	5.523		
4,300.00	3,937.76	4,287.57	3,927.46	34.70	34.06	-98.26	-153.03	-1,556.97	376.31	308.05	68.26	5.513		
4,400.00	4,026.38	4,387.00	4,015.17	35.71	35.08	-98.07	-157.10	-1,603.63	386.87	316.58	70.29	5.504		
4,500.00	4,115.01	4,486.43	4,102.89	36.73	36.11	-97.88	-161.16	-1,650.29	397.44	325.12	72.32	5.496		
4,600.00	4,203.63	4,585.87	4,190.60	37.74	37.13	-97.70	-165.22	-1,696.95	408.01	333.66	74.35	5.488		
4,700.00	4,292.25	4,685.30	4,278.31	38.76	38.16	-97.53	-169.29	-1,743.61	418.58	342.21	76.37	5.481		
4,800.00	4,380.87	4,784.73	4,366.02	39.77	39.15	-97.44	-173.35	-1,790.26	429.13	350.78	78.35	5.477		
4,900.00	4,470.74	4,885.74	4,456.58	40.78	40.17	-97.33	-177.42	-1,837.33	439.65	359.18	80.32	5.471		
5,000.00	4,562.04	4,986.49	4,548.34	41.79	41.18	-97.22	-181.50	-1,884.80	449.75	367.58	82.27	5.465		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Archer
Anticollision Report



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	4,654.70	5,087.36	4,641.62	41.95	41.39	-97.69	-184.17	-1,914.50	457.02	374.21	82.81	5.519		
5,200.00	4,748.62	5,188.34	4,736.29	42.56	42.01	-97.76	-187.21	-1,949.48	464.85	380.81	84.04	5.531		
5,300.00	4,843.67	5,289.42	4,832.24	43.11	42.57	-97.82	-189.97	-1,981.15	471.94	386.79	85.15	5.542		
5,400.00	4,939.76	5,390.59	4,929.34	43.59	43.06	-97.87	-192.43	-2,009.45	478.26	392.13	86.13	5.553		
5,500.00	5,036.75	5,491.85	5,027.46	44.01	43.50	-97.92	-194.60	-2,034.33	483.82	396.82	86.99	5.561		
5,600.00	5,134.53	5,593.18	5,126.48	44.37	43.87	-97.97	-196.47	-2,055.76	488.60	400.86	87.73	5.569		
5,700.00	5,232.98	5,694.58	5,226.25	44.68	44.19	-98.00	-198.03	-2,073.69	492.60	404.24	88.36	5.575		
5,800.00	5,331.99	5,796.02	5,326.66	44.93	44.44	-98.03	-199.28	-2,088.11	495.81	406.94	88.87	5.579		
5,900.00	5,431.42	5,897.51	5,427.55	45.13	44.65	-98.05	-200.23	-2,098.97	498.23	408.96	89.27	5.581		
6,000.00	5,531.16	5,999.03	5,528.80	45.27	44.80	-98.07	-200.87	-2,106.28	499.85	410.29	89.57	5.581		
6,100.00	5,631.09	6,100.56	5,630.26	45.37	44.90	-98.07	-201.19	-2,110.00	500.68	410.92	89.77	5.578		
6,200.00	5,731.09	6,201.39	5,731.09	45.43	44.96	-180.00	-201.24	-2,110.52	500.80	410.92	89.88	5.572		
6,300.00	5,831.09	6,301.39	5,831.09	45.49	45.02	-180.00	-201.24	-2,110.52	500.80	410.79	90.00	5.564		
6,400.00	5,931.09	6,401.39	5,931.09	45.55	45.08	-180.00	-201.24	-2,110.52	500.80	410.67	90.13	5.557		
6,500.00	6,031.09	6,501.39	6,031.09	45.61	45.14	-180.00	-201.24	-2,110.52	500.80	410.55	90.25	5.549		
6,600.00	6,131.09	6,601.39	6,131.09	45.68	45.20	-180.00	-201.24	-2,110.52	500.80	410.42	90.38	5.541		
6,700.00	6,231.09	6,701.39	6,231.09	45.74	45.27	-180.00	-201.24	-2,110.52	500.80	410.29	90.51	5.533		
6,800.00	6,331.09	6,801.39	6,331.09	45.81	45.33	-180.00	-201.24	-2,110.52	500.80	410.16	90.64	5.525		
6,900.00	6,431.09	6,901.39	6,431.09	45.87	45.40	-180.00	-201.24	-2,110.52	500.80	410.03	90.77	5.517		
7,000.00	6,531.09	7,001.39	6,531.09	45.94	45.47	-180.00	-201.24	-2,110.52	500.80	409.89	90.91	5.509		
7,100.00	6,631.09	7,101.39	6,631.09	46.01	45.53	-180.00	-201.24	-2,110.52	500.80	409.75	91.04	5.501		
7,200.00	6,731.09	7,201.39	6,731.09	46.08	45.60	-180.00	-201.24	-2,110.52	500.80	409.62	91.18	5.492		
7,300.00	6,831.09	7,301.39	6,831.09	46.15	45.67	-180.00	-201.24	-2,110.52	500.80	409.47	91.32	5.484		
7,400.00	6,931.09	7,401.39	6,931.09	46.22	45.74	-180.00	-201.24	-2,110.52	500.80	409.33	91.47	5.475		
7,500.00	7,031.09	7,501.39	7,031.09	46.29	45.82	-180.00	-201.24	-2,110.52	500.80	409.19	91.61	5.467		
7,600.00	7,131.09	7,601.39	7,131.09	46.37	45.89	-180.00	-201.24	-2,110.52	500.80	409.04	91.76	5.458		
7,700.00	7,231.09	7,701.39	7,231.09	46.44	45.96	-180.00	-201.24	-2,110.52	500.80	408.89	91.91	5.449		
7,800.00	7,331.09	7,801.39	7,331.09	46.52	46.04	-180.00	-201.24	-2,110.52	500.80	408.74	92.06	5.440		
7,900.00	7,431.09	7,901.39	7,431.09	46.59	46.11	-180.00	-201.24	-2,110.52	500.80	408.59	92.21	5.431		
8,000.00	7,531.09	8,001.39	7,531.09	46.67	46.19	-180.00	-201.24	-2,110.52	500.80	408.43	92.37	5.422		
8,100.00	7,631.09	8,101.39	7,631.09	46.75	46.27	-180.00	-201.24	-2,110.52	500.80	408.27	92.52	5.413		
8,145.42	7,676.51	8,146.81	7,676.51	46.78	46.30	-180.00	-201.24	-2,110.52	500.80	408.20	92.60	5.408		
8,173.91	7,705.00	8,165.31	7,695.00	46.81	46.32	-180.00	-201.24	-2,110.52	500.90	408.27	92.63	5.407 SF		

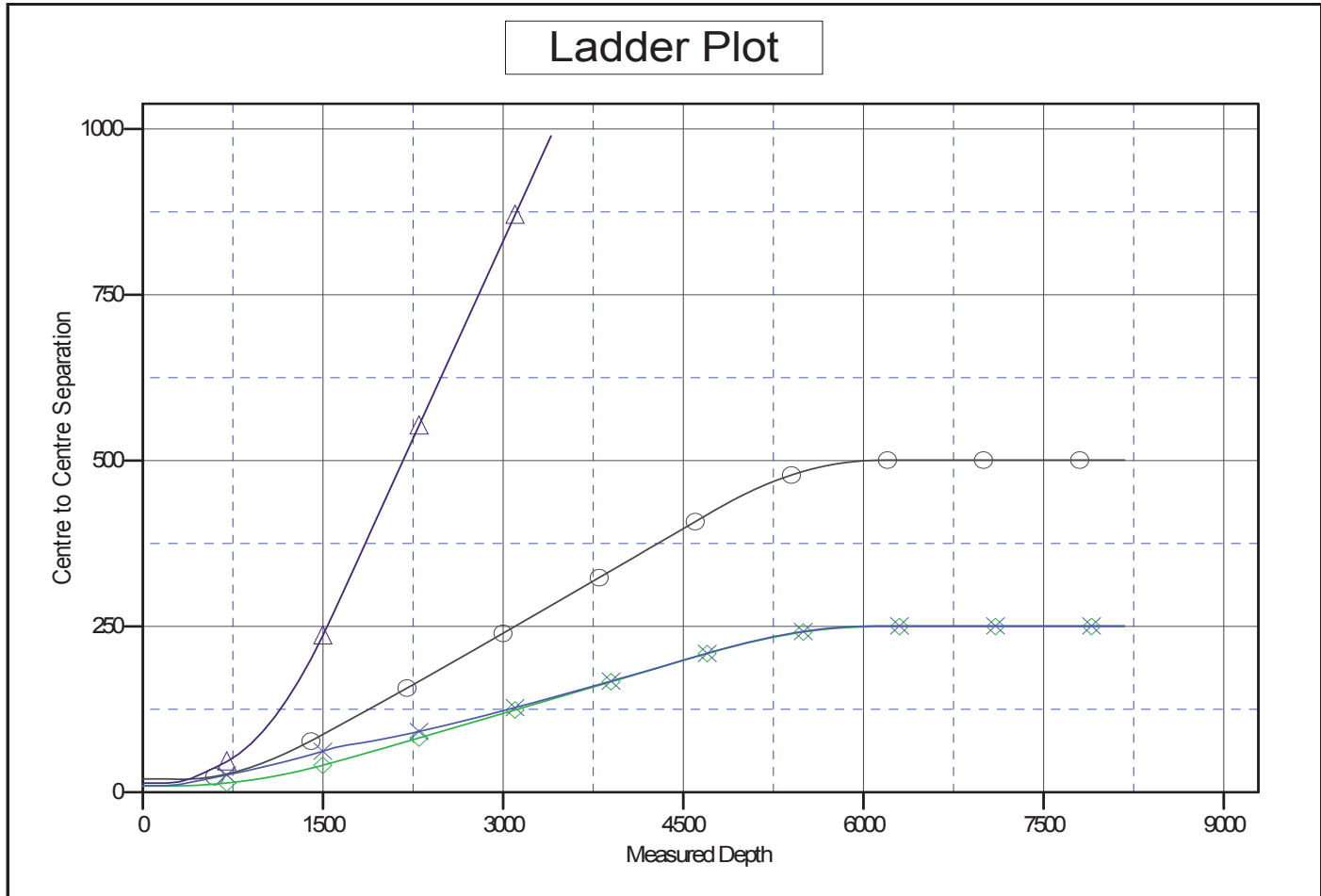
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7520.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 29-06W
 Coordinate System is US State Plane 1983, Colorado Central Zone
 Grid Convergence at Surface is: -1.45°



LEGEND

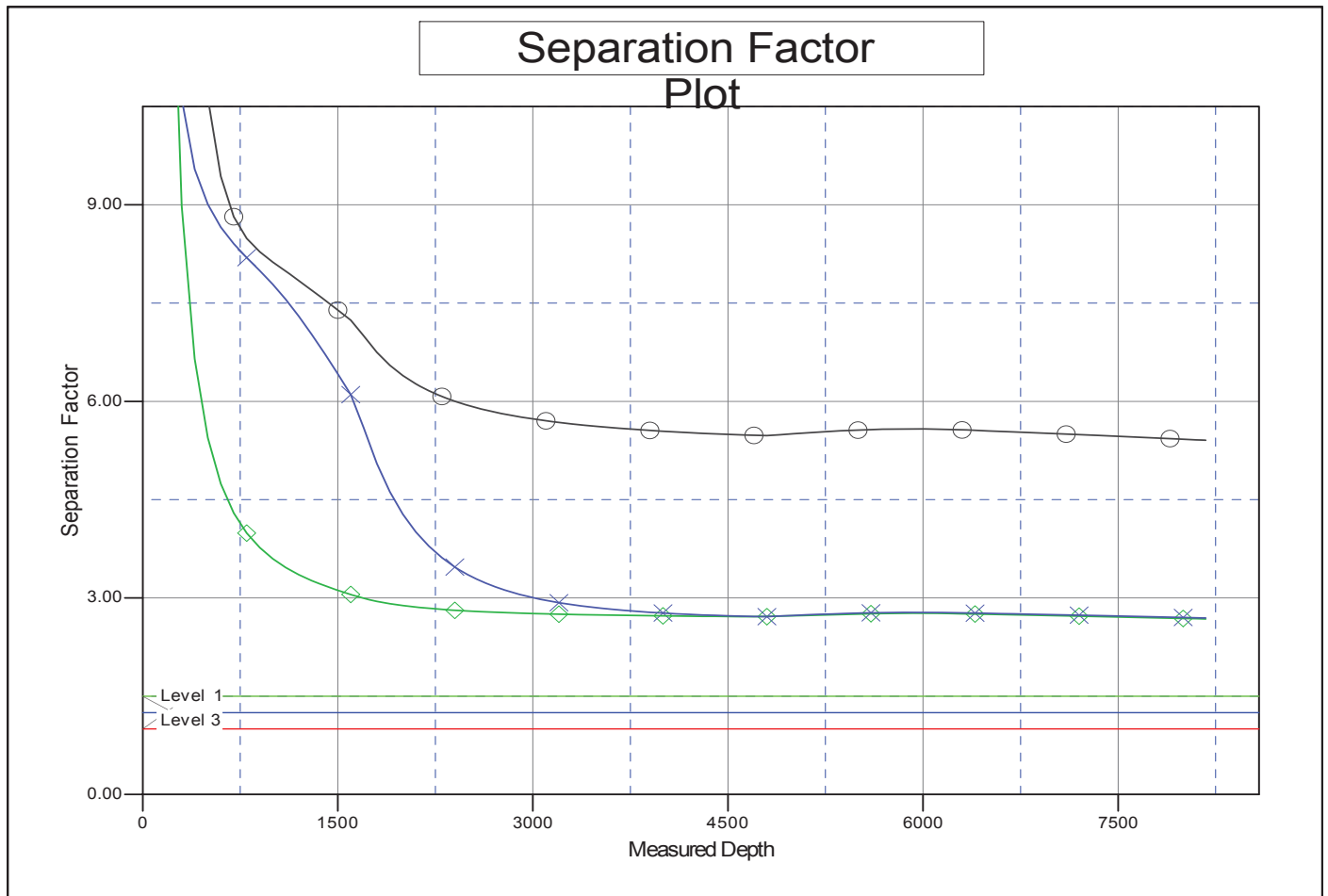
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- Piceance Federal 29-05W, Wellbore #1, Design #1 V0 ✕ Piceance Federal 29-07W, Wellbore #1, Design #1 V0



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-06W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-06W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7520.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 29-06W
 Coordinate System is US State Plane 1983, Colorado Central Zone
 Grid Convergence at Surface is: -1.45°



LEGEND

- Piceance Federal 29-08W, Wellbore #1, Design #1 V0 ▲
- Piceance 29-07M, Wellbore #1, Design #1 V0 ▲
- Piceance Federal 29-05W, Wellbore #1, Design #1 V0 ▲
- Piceance Federal 29-07W, Wellbore #1, Design #1 V0 ✕