



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 28-05**

**Piceance 28-01W**

**Slot A-3**

**Plan: Design #1**

## **Standard Planning Report**

**29 April, 2015**

# **Archer**



Project: Mesa County, CO  
Site: Piceance 28-05  
Well: Piceance 28-01W  
Wellbore: Slot A-3  
Design: Design #1  
Latitude: 39° 15' 4.050 N  
Longitude: 107° 46' 46.470 W  
Ground Level: 7556.00  
Well @ 7578.00usft

# 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 28-01W, True North  
Vertical (TVD) Reference: Well @ 7578.00usft  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: Well @ 7578.00usft  
Calculation Method: Minimum Curvature

### WELL DETAILS: Piceance 28-01W

+N/-S	+E/-W	North	Ground Level:	7556.00	Latitude	Longitude	Slot
0.00	0.00	1524455.228	Easting	2354532.580	39° 15' 4.050 N	107° 46' 46.470 W	

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

Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude	Shape
Piceance Federal 28-01W tgt	7896.00	1415.40	-328.00	1525878.415	2354240.194	39° 15' 18.040 N	107° 46' 50.640 W	Circle (Radius: 50.00)

### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
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	Start Build 2.00
1290.77	23.82	346.95	1256.78	237.64	-55.07	2.00	346.95	243.93	Start 2389.9 hold at 1290.8 MD
3680.72	23.82	346.95	3443.22	1177.76	-272.93	0.00	0.00	1208.97	Start Drop -2.00
4871.49	0.00	0.00	4600.00	1415.40	-328.00	2.00	180.00	1452.91	Start 3296.0 hold at 4871.5 MD
8167.49	0.00	0.00	7896.00	1415.40	-328.00	0.00	0.00	1452.91	TD at 8167.5



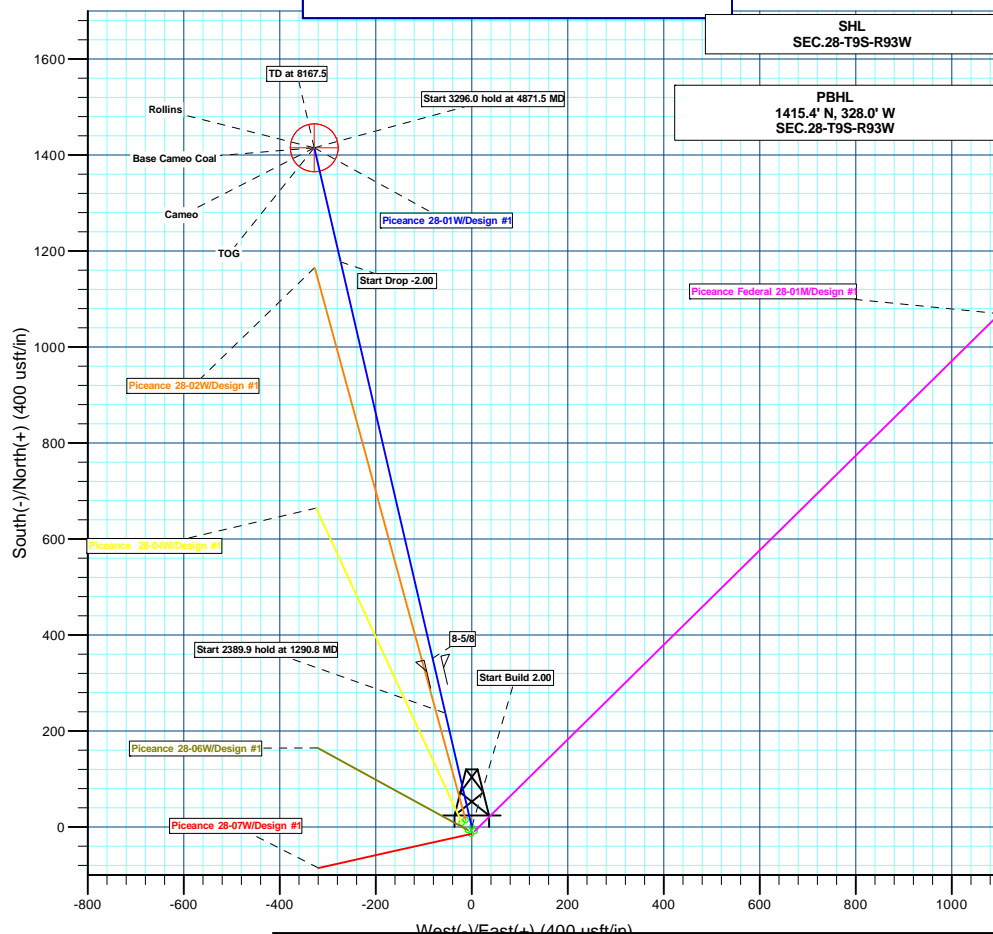
Azimuths to True North  
Magnetic North: 9.72°  
Magnetic Field  
Strength: 51741.9snT  
Dip Angle: 65.47°  
Date: 04/27/2015  
Model: IGRF2010

### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2846.00	3027.91	G Sand
4696.00	4967.49	Williams Fork
5196.00	5467.49	TOG
6996.00	7267.49	Cameo
7654.00	7925.49	Base Cameo Coal
7696.00	7967.49	Rollins

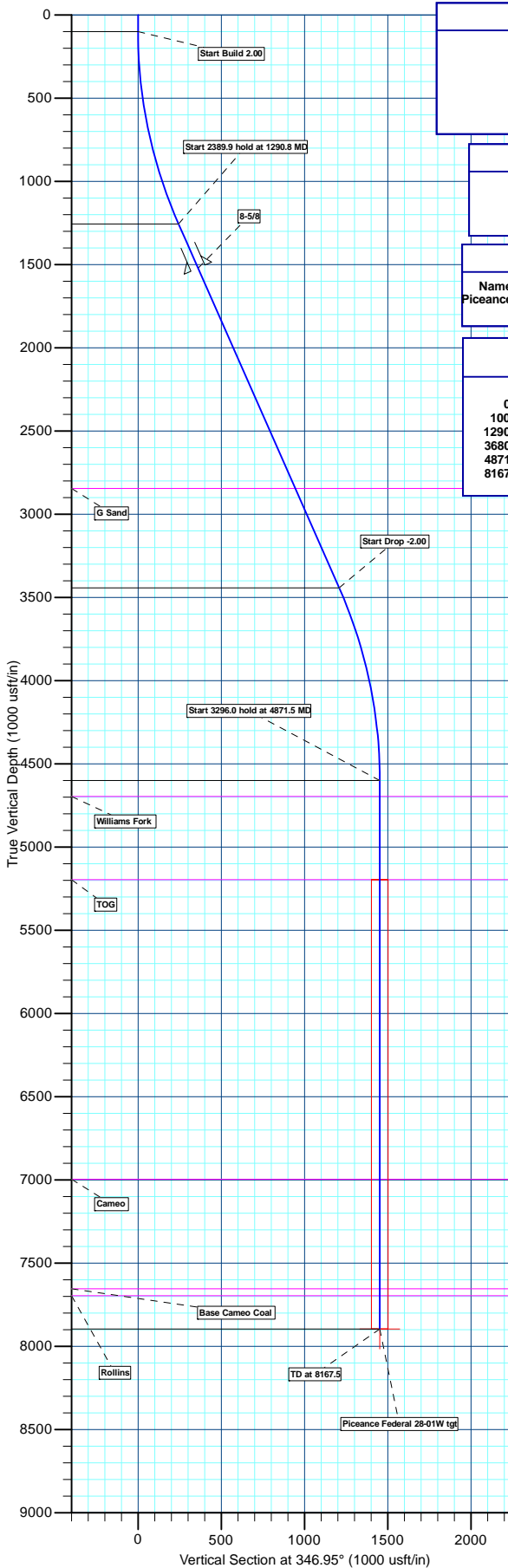
SHL  
SEC.28-T9S-R93W

PBHL  
1415.4' N, 328.0' W  
SEC.28-T9S-R93W



Plan: Design #1 (Piceance 28-01W/Slot A-3)

Created By: Ricky Osburn Date: 8:20, April 29 2015





Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-01W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7578.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	North Reference:	True
Well:	Piceance 28-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-3		
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 28-05				
Site Position:		Northing:	1,524,375.785 usft	Latitude:	39° 15' 3.280 N
From:	Lat/Long	Easting:	2,354,593.535 usft	Longitude:	107° 46' 45.670 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.44 °

Well	Piceance 28-01W					
Well Position	+N/-S	77.89 usft	Northing:	1,524,455.228 usft	Latitude:	39° 15' 4.050 N
	+E/-W	-62.93 usft	Easting:	2,354,532.580 usft	Longitude:	107° 46' 46.470 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,556.00 usft

Wellbore	Slot A-3				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/04/27	9.73	65.47	51,742

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	346.95

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	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,290.77	23.82	346.95	1,256.78	237.64	-55.07	2.00	2.00	0.00	346.95	
3,680.72	23.82	346.95	3,443.22	1,177.76	-272.93	0.00	0.00	0.00	0.00	
4,871.49	0.00	0.00	4,600.00	1,415.40	-328.00	2.00	-2.00	0.00	180.00	
8,167.49	0.00	0.00	7,896.00	1,415.40	-328.00	0.00	0.00	0.00	0.00	Piceance Federal 28-01



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-01W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7578.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	North Reference:	True
Well:	Piceance 28-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-3		
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
Start Build 2.00									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	346.95	199.98	1.70	-0.39	1.75	2.00	2.00	0.00
300.00	4.00	346.95	299.84	6.80	-1.58	6.98	2.00	2.00	0.00
400.00	6.00	346.95	399.45	15.29	-3.54	15.69	2.00	2.00	0.00
500.00	8.00	346.95	498.70	27.16	-6.29	27.88	2.00	2.00	0.00
600.00	10.00	346.95	597.47	42.40	-9.83	43.52	2.00	2.00	0.00
700.00	12.00	346.95	695.62	60.99	-14.13	62.60	2.00	2.00	0.00
800.00	14.00	346.95	793.06	82.90	-19.21	85.10	2.00	2.00	0.00
900.00	16.00	346.95	889.64	108.11	-25.05	110.98	2.00	2.00	0.00
1,000.00	18.00	346.95	985.27	136.59	-31.65	140.21	2.00	2.00	0.00
1,100.00	20.00	346.95	1,079.82	168.31	-39.00	172.77	2.00	2.00	0.00
1,200.00	22.00	346.95	1,173.17	203.22	-47.09	208.60	2.00	2.00	0.00
Start 2389.9 hold at 1290.8 MD									
1,290.77	23.82	346.95	1,256.78	237.64	-55.07	243.93	2.00	2.00	0.00
1,300.00	23.82	346.95	1,265.22	241.27	-55.91	247.66	0.00	0.00	0.00
1,400.00	23.82	346.95	1,356.71	280.60	-65.03	288.04	0.00	0.00	0.00
1,500.00	23.82	346.95	1,448.19	319.94	-74.14	328.42	0.00	0.00	0.00
8-5/8									
1,580.68	23.82	346.95	1,522.00	351.68	-81.50	361.00	0.00	0.00	0.00
1,600.00	23.82	346.95	1,539.68	359.28	-83.26	368.80	0.00	0.00	0.00
1,700.00	23.82	346.95	1,631.16	398.61	-92.37	409.18	0.00	0.00	0.00
1,800.00	23.82	346.95	1,722.65	437.95	-101.49	449.56	0.00	0.00	0.00
1,900.00	23.82	346.95	1,814.13	477.29	-110.61	489.94	0.00	0.00	0.00
2,000.00	23.82	346.95	1,905.62	516.62	-119.72	530.31	0.00	0.00	0.00
2,100.00	23.82	346.95	1,997.10	555.96	-128.84	570.69	0.00	0.00	0.00
2,200.00	23.82	346.95	2,088.59	595.30	-137.95	611.07	0.00	0.00	0.00
2,300.00	23.82	346.95	2,180.07	634.63	-147.07	651.45	0.00	0.00	0.00
2,400.00	23.82	346.95	2,271.56	673.97	-156.18	691.83	0.00	0.00	0.00
2,500.00	23.82	346.95	2,363.04	713.31	-165.30	732.21	0.00	0.00	0.00
2,600.00	23.82	346.95	2,454.53	752.64	-174.42	772.59	0.00	0.00	0.00
2,700.00	23.82	346.95	2,546.01	791.98	-183.53	812.97	0.00	0.00	0.00
2,800.00	23.82	346.95	2,637.50	831.32	-192.65	853.35	0.00	0.00	0.00
2,900.00	23.82	346.95	2,728.98	870.65	-201.76	893.73	0.00	0.00	0.00
3,000.00	23.82	346.95	2,820.47	909.99	-210.88	934.11	0.00	0.00	0.00
G Sand									
3,027.91	23.82	346.95	2,846.00	920.97	-213.42	945.38	0.00	0.00	0.00
3,100.00	23.82	346.95	2,911.95	949.33	-219.99	974.48	0.00	0.00	0.00
3,200.00	23.82	346.95	3,003.44	988.66	-229.11	1,014.86	0.00	0.00	0.00
3,300.00	23.82	346.95	3,094.92	1,028.00	-238.23	1,055.24	0.00	0.00	0.00
3,400.00	23.82	346.95	3,186.41	1,067.34	-247.34	1,095.62	0.00	0.00	0.00
3,500.00	23.82	346.95	3,277.89	1,106.67	-256.46	1,136.00	0.00	0.00	0.00
3,600.00	23.82	346.95	3,369.38	1,146.01	-265.57	1,176.38	0.00	0.00	0.00
Start Drop -2.00									
3,680.72	23.82	346.95	3,443.22	1,177.76	-272.93	1,208.97	0.00	0.00	0.00
3,700.00	23.43	346.95	3,460.89	1,185.29	-274.68	1,216.70	2.00	-2.00	0.00
3,800.00	21.43	346.95	3,553.32	1,222.46	-283.29	1,254.85	2.00	-2.00	0.00
3,900.00	19.43	346.95	3,647.02	1,256.46	-291.17	1,289.76	2.00	-2.00	0.00
4,000.00	17.43	346.95	3,741.89	1,287.26	-298.31	1,321.37	2.00	-2.00	0.00
4,100.00	15.43	346.95	3,837.80	1,314.81	-304.69	1,349.65	2.00	-2.00	0.00
4,200.00	13.43	346.95	3,934.64	1,339.08	-310.32	1,374.57	2.00	-2.00	0.00
4,300.00	11.43	346.95	4,032.29	1,360.05	-315.18	1,396.09	2.00	-2.00	0.00
4,400.00	9.43	346.95	4,130.64	1,377.69	-319.26	1,414.20	2.00	-2.00	0.00



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Project:	Mesa County, CO	MD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	North Reference:	True
Well:	Piceance 28-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-3		
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)
4,500.00	7.43	346.95	4,229.55	1,391.97	-322.57	1,428.85	2.00	-2.00	0.00
4,600.00	5.43	346.95	4,328.92	1,402.88	-325.10	1,440.05	2.00	-2.00	0.00
4,700.00	3.43	346.95	4,428.61	1,410.40	-326.84	1,447.78	2.00	-2.00	0.00
4,800.00	1.43	346.95	4,528.52	1,414.53	-327.80	1,452.02	2.00	-2.00	0.00
Start 3296.0 hold at 4871.5 MD									
4,871.49	0.00	0.00	4,600.00	1,415.40	-328.00	1,452.91	2.00	-2.00	0.00
4,900.00	0.00	0.00	4,628.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
Williams Fork									
4,967.49	0.00	0.00	4,696.00	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,000.00	0.00	0.00	4,728.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,100.00	0.00	0.00	4,828.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,200.00	0.00	0.00	4,928.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,300.00	0.00	0.00	5,028.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,400.00	0.00	0.00	5,128.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
TOG									
5,467.49	0.00	0.00	5,196.00	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,500.00	0.00	0.00	5,228.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,600.00	0.00	0.00	5,328.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,700.00	0.00	0.00	5,428.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,800.00	0.00	0.00	5,528.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
5,900.00	0.00	0.00	5,628.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,000.00	0.00	0.00	5,728.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,100.00	0.00	0.00	5,828.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,200.00	0.00	0.00	5,928.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,300.00	0.00	0.00	6,028.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,400.00	0.00	0.00	6,128.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,500.00	0.00	0.00	6,228.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,600.00	0.00	0.00	6,328.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,700.00	0.00	0.00	6,428.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,800.00	0.00	0.00	6,528.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
6,900.00	0.00	0.00	6,628.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,000.00	0.00	0.00	6,728.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,100.00	0.00	0.00	6,828.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,200.00	0.00	0.00	6,928.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
Cameo									
7,267.49	0.00	0.00	6,996.00	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,300.00	0.00	0.00	7,028.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,400.00	0.00	0.00	7,128.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,500.00	0.00	0.00	7,228.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,600.00	0.00	0.00	7,328.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,700.00	0.00	0.00	7,428.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,800.00	0.00	0.00	7,528.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
7,900.00	0.00	0.00	7,628.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
Base Cameo Coal									
7,925.49	0.00	0.00	7,654.00	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
Rollins									
7,967.49	0.00	0.00	7,696.00	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
8,000.00	0.00	0.00	7,728.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
8,100.00	0.00	0.00	7,828.51	1,415.40	-328.00	1,452.91	0.00	0.00	0.00
TD at 8167.5									
8,167.49	0.00	0.00	7,896.00	1,415.40	-328.00	1,452.91	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-01W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7578.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	North Reference:	True
Well:	Piceance 28-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-3		
Design:	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Piceance Federal 28-01' - plan hits target center - Circle (radius 50.00)	0.00	0.00	7,896.00	1,415.40	-328.00	1,525,878.415	2,354,240.194	39° 15' 18.040 N	107° 46' 50.640 W

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,580.68	1,522.00	8-5/8	8-5/8	12-1/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,027.91	2,846.00	G Sand		0.00	
4,967.49	4,696.00	Williams Fork		0.00	
5,467.49	5,196.00	TOG		0.00	
7,267.49	6,996.00	Cameo		0.00	
7,925.49	7,654.00	Base Cameo Coal		0.00	
7,967.49	7,696.00	Rollins		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.00	0.00	Start Build 2.00
1,290.77	1,256.78	237.64	-55.07	Start 2389.9 hold at 1290.8 MD
3,680.72	3,443.22	1,177.76	-272.93	Start Drop -2.00
4,871.49	4,600.00	1,415.40	-328.00	Start 3296.0 hold at 4871.5 MD
8,167.49	7,896.00	1,415.40	-328.00	TD at 8167.5



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 28-05**

**Piceance Federal 28-01W**

**Slot A-3**

**Design #1**

## **Anticollision Report**

**28 April, 2015**

# **Archer**



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Reference	Design #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	2015/04/28		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	8,167.5	Design #1 (Slot A-3)	MWD	MWD - Standard	

Summary						
Site Name	Reference	Offset	Distance		Separation	Warning
	Measured	Measured	Between	Between		
	Depth	Depth	Centres	Ellipses		
Offset Well - Wellbore - Design						
Piceance 28-05						
Piceance Federal 28-01M - Slot A-4 - Design #1	100.0	100.0	10.3	10.1	58.478	CC, ES
Piceance Federal 28-01M - Slot A-4 - Design #1	300.0	299.9	16.3	15.1	13.887	SF
Piceance Federal 28-02W - Slot A-2 - Design #1	606.3	604.7	10.1	7.3	3.634	CC
Piceance Federal 28-02W - Slot A-2 - Design #1	700.0	698.4	10.7	7.2	3.104	ES
Piceance Federal 28-02W - Slot A-2 - Design #1	800.0	798.4	12.5	8.3	2.973	SF
Piceance Federal 28-04W - Slot B-2 - Design #1	100.0	100.0	22.4	22.2	127.696	CC
Piceance Federal 28-04W - Slot B-2 - Design #1	200.0	199.4	22.6	22.0	35.179	ES
Piceance Federal 28-04W - Slot B-2 - Design #1	900.0	896.1	37.5	32.3	7.185	SF
Piceance Federal 28-06W - Slot B-3 - Design #1	100.0	100.0	9.9	9.8	56.675	CC, ES
Piceance Federal 28-06W - Slot B-3 - Design #1	300.0	299.8	14.3	13.2	12.316	SF
Piceance Federal 28-07W - Slot B-4 - Design #1	100.0	100.0	14.3	14.1	81.288	CC, ES
Piceance Federal 28-07W - Slot B-4 - Design #1	400.0	399.5	29.5	27.8	17.067	SF

Offset Design		Piceance 28-05 - Piceance Federal 28-01M - Slot A-4 - Design #1										Offset Site Error:		0.0 usf
Survey Program:		0-MWD										Offset Well Error:		0.0 usf
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		
0.0	0.0	0.0	0.0	0.0	0.0	142.13	-8.1	6.3	10.3					
100.0	100.0	100.0	100.0	0.1	0.1	142.13	-8.1	6.3	10.3	10.1	0.18	58.478	CC, ES	
200.0	200.0	200.0	200.0	0.3	0.3	150.25	-6.9	7.5	11.7	11.0	0.67	17.431		
300.0	299.8	299.9	299.7	0.6	0.6	140.89	-3.2	11.3	16.3	15.1	1.17	13.887	SF	
400.0	399.5	399.3	398.8	0.8	0.8	133.41	2.9	17.4	24.4	22.7	1.69	14.407		
500.0	498.7	498.3	497.0	1.1	1.1	128.64	11.3	26.0	36.0	33.7	2.26	15.949		
600.0	597.5	596.6	594.1	1.4	1.4	125.65	22.0	36.9	51.1	48.2	2.88	17.699		
700.0	695.6	694.1	689.8	1.8	1.8	123.69	35.0	50.0	69.5	65.9	3.58	19.376		
800.0	793.1	790.6	783.9	2.3	2.2	122.30	50.0	65.3	91.1	86.8	4.36	20.885		
900.0	889.6	886.0	876.2	2.8	2.7	121.26	67.1	82.6	116.0	110.8	5.22	22.203		
1,000.0	985.3	980.1	966.3	3.3	3.2	120.42	86.0	101.9	144.0	137.8	6.17	23.343		
1,100.0	1,079.8	1,072.9	1,054.3	3.9	3.8	119.69	106.7	122.9	175.0	167.8	7.20	24.325		
1,200.0	1,173.2	1,164.3	1,140.0	4.6	4.4	119.04	129.1	145.5	209.0	200.7	8.30	25.180		
1,300.0	1,265.2	1,254.1	1,223.2	5.3	5.0	118.48	152.9	169.7	245.9	236.4	9.49	25.904		
1,400.0	1,356.7	1,342.7	1,304.1	6.1	5.7	118.25	178.1	195.3	284.7	273.9	10.75	26.491		
1,500.0	1,448.2	1,430.2	1,382.9	6.9	6.5	117.62	204.8	222.4	324.7	312.7	12.04	26.964		

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





<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-01M - Slot A-4 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 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		
1,600.0	1,539.7	1,516.3	1,459.3	7.6	7.2	116.72	232.7	250.7	366.1	352.7	13.37	27.372		
1,700.0	1,631.2	1,603.2	1,535.2	8.4	8.1	115.66	262.3	280.7	408.7	393.9	14.75	27.707		
1,800.0	1,722.6	1,693.2	1,613.7	9.2	8.9	114.70	293.3	312.2	451.6	435.5	16.16	27.949		
1,900.0	1,814.1	1,783.3	1,692.1	10.0	9.8	113.90	324.4	343.8	494.7	477.1	17.57	28.151		
2,000.0	1,905.6	1,873.3	1,770.6	10.8	10.7	113.23	355.4	375.3	537.8	518.8	18.99	28.322		
2,100.0	1,997.1	1,963.4	1,849.0	11.5	11.5	112.66	386.4	406.8	581.0	560.6	20.41	28.468		
2,200.0	2,088.6	2,053.5	1,927.5	12.3	12.4	112.17	417.5	438.3	624.2	602.4	21.83	28.595		
2,300.0	2,180.1	2,143.5	2,005.9	13.1	13.3	111.74	448.5	469.8	667.5	644.2	23.25	28.706		
2,400.0	2,271.6	2,233.6	2,084.3	13.9	14.2	111.37	479.6	501.3	710.7	686.1	24.68	28.804		
2,500.0	2,363.0	2,323.6	2,162.8	14.7	15.1	111.04	510.6	532.8	754.0	727.9	26.10	28.891		
2,600.0	2,454.5	2,413.7	2,241.2	15.5	15.9	110.74	541.7	564.4	797.4	769.8	27.53	28.968		
2,700.0	2,546.0	2,503.8	2,319.7	16.3	16.8	110.47	572.7	595.9	840.7	811.8	28.95	29.038		
2,800.0	2,637.5	2,593.8	2,398.1	17.1	17.7	110.23	603.8	627.4	884.0	853.7	30.38	29.102		
2,900.0	2,729.0	2,683.9	2,476.6	17.8	18.6	110.02	634.8	658.9	927.4	895.6	31.80	29.159		
3,000.0	2,820.5	2,773.9	2,555.0	18.6	19.5	109.82	665.9	690.4	970.8	937.5	33.23	29.212		



# Archer

## Anticollision Report

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<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 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		
0.0	0.0	0.0	0.0	0.0	0.0	-39.67	15.2	-12.6	19.7					
100.0	100.0	100.0	100.0	0.1	0.1	-39.67	15.2	-12.6	19.7	19.5	0.18	112.457		
200.0	200.0	200.0	200.0	0.3	0.3	-29.10	15.2	-12.6	18.2	17.5	0.67	27.041		
300.0	299.8	299.4	299.4	0.6	0.5	-35.74	16.8	-13.0	15.2	14.1	1.16	13.124		
400.0	399.5	399.0	398.8	0.8	0.8	-45.81	21.8	-14.4	12.7	11.1	1.64	7.747		
500.0	498.7	498.7	498.1	1.1	1.0	-60.62	30.2	-16.7	10.8	8.7	2.14	5.071		
600.0	597.5	598.5	597.2	1.4	1.3	-79.88	41.9	-19.9	10.1	7.3	2.73	3.693		
606.3	603.7	604.7	603.4	1.5	1.3	-81.16	42.7	-20.1	10.1	7.3	2.77	3.634 CC		
700.0	695.6	698.4	695.9	1.8	1.6	-99.60	56.9	-24.0	10.7	7.2	3.44	3.104 ES		
800.0	793.1	798.4	794.1	2.3	2.0	-115.32	75.2	-29.0	12.5	8.3	4.20	2.973 SF		
900.0	889.6	898.6	891.7	2.8	2.4	-126.16	96.9	-34.9	15.1	10.1	4.95	3.044		
1,000.0	985.3	998.9	988.6	3.3	2.9	-133.34	121.9	-41.8	18.1	12.4	5.71	3.174		
1,100.0	1,079.8	1,099.3	1,084.6	3.9	3.4	-138.10	150.2	-49.5	21.5	15.0	6.50	3.303		
1,200.0	1,173.2	1,199.8	1,179.6	4.6	4.1	-141.30	181.8	-58.1	25.0	17.7	7.33	3.410		
1,300.0	1,265.2	1,300.3	1,273.5	5.3	4.7	-143.52	216.5	-67.6	28.7	20.5	8.21	3.493		
1,400.0	1,356.7	1,400.2	1,366.4	6.1	5.4	-145.45	252.0	-77.4	32.6	23.5	9.06	3.597		
1,500.0	1,448.2	1,500.2	1,459.2	6.9	6.1	-146.96	287.6	-87.1	36.6	26.7	9.92	3.687		
1,600.0	1,539.7	1,600.1	1,552.1	7.6	6.8	-148.18	323.1	-96.8	40.6	29.8	10.77	3.765		
1,700.0	1,631.2	1,700.0	1,645.0	8.4	7.5	-149.17	358.7	-106.5	44.6	32.9	11.63	3.832		
1,800.0	1,722.6	1,799.9	1,737.8	9.2	8.3	-150.01	394.2	-116.3	48.6	36.1	12.48	3.891		
1,900.0	1,814.1	1,899.8	1,830.7	10.0	9.0	-150.71	429.8	-126.0	52.6	39.3	13.34	3.942		
2,000.0	1,905.6	1,999.7	1,923.6	10.8	9.7	-151.32	465.4	-135.7	56.6	42.4	14.20	3.988		
2,100.0	1,997.1	2,099.7	2,016.4	11.5	10.4	-151.84	500.9	-145.4	60.7	45.6	15.06	4.028		
2,200.0	2,088.6	2,199.6	2,109.3	12.3	11.1	-152.30	536.5	-155.2	64.7	48.8	15.92	4.064		
2,300.0	2,180.1	2,299.5	2,202.2	13.1	11.8	-152.70	572.0	-164.9	68.7	52.0	16.78	4.097		
2,400.0	2,271.6	2,399.4	2,295.0	13.9	12.6	-153.06	607.6	-174.6	72.8	55.1	17.64	4.126		
2,500.0	2,363.0	2,499.3	2,387.9	14.7	13.3	-153.39	643.1	-184.3	76.8	58.3	18.50	4.153		
2,600.0	2,454.5	2,599.2	2,480.8	15.5	14.0	-153.68	678.7	-194.1	80.9	61.5	19.37	4.177		
2,700.0	2,546.0	2,699.2	2,573.6	16.3	14.7	-153.94	714.3	-203.8	84.9	64.7	20.23	4.199		
2,800.0	2,637.5	2,799.1	2,666.5	17.1	15.5	-154.18	749.8	-213.5	89.0	67.9	21.09	4.219		
2,900.0	2,729.0	2,899.0	2,759.4	17.8	16.2	-154.39	785.4	-223.2	93.1	71.1	21.96	4.237		
3,000.0	2,820.5	2,998.9	2,852.3	18.6	16.9	-154.59	820.9	-233.0	97.1	74.3	22.83	4.254		
3,100.0	2,912.0	3,098.8	2,945.1	19.4	17.6	-154.78	856.5	-242.7	101.2	77.5	23.69	4.270		
3,200.0	3,003.4	3,198.8	3,038.0	20.2	18.4	-154.95	892.0	-252.4	105.2	80.7	24.56	4.285		
3,300.0	3,094.9	3,298.7	3,130.9	21.0	19.1	-155.10	927.6	-262.1	109.3	83.9	25.42	4.299		
3,400.0	3,186.4	3,398.6	3,223.7	21.8	19.8	-155.25	963.2	-271.9	113.3	87.1	26.29	4.311		
3,500.0	3,277.9	3,495.7	3,314.3	22.6	20.4	-155.60	996.8	-281.1	118.4	91.3	27.03	4.378		
3,600.0	3,369.4	3,591.7	3,405.0	23.4	20.9	-156.56	1,027.2	-289.4	126.3	98.8	27.48	4.596		
3,700.0	3,460.9	3,687.0	3,496.1	24.1	21.4	-157.96	1,054.5	-296.8	137.3	109.5	27.73	4.950		
3,800.0	3,553.3	3,781.9	3,587.6	24.7	21.8	-159.40	1,078.7	-303.5	149.2	121.3	27.88	5.350		
3,900.0	3,647.0	3,876.4	3,679.5	25.3	22.2	-160.64	1,099.9	-309.3	160.9	132.9	28.04	5.739		
4,000.0	3,741.9	3,970.6	3,771.7	25.8	22.5	-161.73	1,118.1	-314.3	172.5	144.3	28.18	6.120		
4,100.0	3,837.8	4,064.4	3,864.2	26.3	22.8	-162.70	1,133.3	-318.4	183.9	155.6	28.31	6.495		
4,200.0	3,934.6	4,157.9	3,956.8	26.7	23.1	-163.57	1,145.6	-321.8	195.1	166.7	28.41	6.867		
4,300.0	4,032.3	4,251.0	4,049.5	27.1	23.3	-164.36	1,154.9	-324.3	206.1	177.6	28.47	7.237		
4,400.0	4,130.6	4,343.9	4,142.1	27.4	23.4	-165.09	1,161.3	-326.1	216.8	188.3	28.50	7.608		
4,500.0	4,229.6	4,436.4	4,234.5	27.7	23.5	-165.76	1,164.8	-327.0	227.3	198.8	28.48	7.981		
4,600.0	4,328.9	4,530.8	4,328.9	27.9	23.6	-166.38	1,165.5	-327.2	237.4	209.0	28.42	8.353		
4,700.0	4,428.6	4,630.5	4,428.6	28.1	23.7	-166.84	1,165.5	-327.2	244.9	216.5	28.38	8.629		
4,800.0	4,528.5	4,730.4	4,528.5	28.2	23.8	-167.08	1,165.5	-327.2	249.0	220.7	28.37	8.778		
4,900.0	4,628.5	4,830.4	4,628.5	28.3	23.9	179.82	1,165.5	-327.2	249.9	221.4	28.45	8.784		
5,000.0	4,728.5	4,930.4	4,728.5	28.3	24.0	179.82	1,165.5	-327.2	249.9	221.2	28.74	8.694		

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



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## Anticollision Report

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<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-02W - Slot A-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)			
5,100.0	4,828.5	5,030.4	4,828.5	28.4	24.1	179.82	1,165.5	-327.2	249.9	220.9	29.04	8.605		
5,200.0	4,928.5	5,130.4	4,928.5	28.5	24.2	179.82	1,165.5	-327.2	249.9	220.6	29.34	8.517		
5,300.0	5,028.5	5,230.4	5,028.5	28.6	24.2	179.82	1,165.5	-327.2	249.9	220.2	29.64	8.430		
5,400.0	5,128.5	5,330.4	5,128.5	28.6	24.3	179.82	1,165.5	-327.2	249.9	219.9	29.95	8.343		
5,500.0	5,228.5	5,430.4	5,228.5	28.7	24.4	179.82	1,165.5	-327.2	249.9	219.6	30.26	8.257		
5,600.0	5,328.5	5,530.4	5,328.5	28.8	24.5	179.82	1,165.5	-327.2	249.9	219.3	30.58	8.172		
5,700.0	5,428.5	5,630.4	5,428.5	28.9	24.6	179.82	1,165.5	-327.2	249.9	219.0	30.90	8.088		
5,800.0	5,528.5	5,730.4	5,528.5	29.0	24.7	179.82	1,165.5	-327.2	249.9	218.7	31.22	8.004		
5,900.0	5,628.5	5,830.4	5,628.5	29.1	24.8	179.82	1,165.5	-327.2	249.9	218.4	31.54	7.922		
6,000.0	5,728.5	5,930.4	5,728.5	29.2	24.9	179.82	1,165.5	-327.2	249.9	218.0	31.87	7.841		
6,100.0	5,828.5	6,030.4	5,828.5	29.2	25.0	179.82	1,165.5	-327.2	249.9	217.7	32.20	7.760		
6,200.0	5,928.5	6,130.4	5,928.5	29.3	25.2	179.82	1,165.5	-327.2	249.9	217.4	32.54	7.680		
6,300.0	6,028.5	6,230.4	6,028.5	29.4	25.3	179.82	1,165.5	-327.2	249.9	217.0	32.87	7.602		
6,400.0	6,128.5	6,330.4	6,128.5	29.5	25.4	179.82	1,165.5	-327.2	249.9	216.7	33.21	7.524		
6,500.0	6,228.5	6,430.4	6,228.5	29.6	25.5	179.82	1,165.5	-327.2	249.9	216.3	33.55	7.448		
6,600.0	6,328.5	6,530.4	6,328.5	29.7	25.6	179.82	1,165.5	-327.2	249.9	216.0	33.90	7.372		
6,700.0	6,428.5	6,630.4	6,428.5	29.8	25.7	179.82	1,165.5	-327.2	249.9	215.7	34.24	7.298		
6,800.0	6,528.5	6,730.4	6,528.5	29.9	25.8	179.82	1,165.5	-327.2	249.9	215.3	34.59	7.224		
6,900.0	6,628.5	6,830.4	6,628.5	30.0	25.9	179.82	1,165.5	-327.2	249.9	215.0	34.94	7.151		
7,000.0	6,728.5	6,930.4	6,728.5	30.1	26.1	179.82	1,165.5	-327.2	249.9	214.6	35.30	7.080		
7,100.0	6,828.5	7,030.4	6,828.5	30.2	26.2	179.82	1,165.5	-327.2	249.9	214.2	35.65	7.009		
7,200.0	6,928.5	7,130.4	6,928.5	30.3	26.3	179.82	1,165.5	-327.2	249.9	213.9	36.01	6.940		
7,300.0	7,028.5	7,230.4	7,028.5	30.4	26.4	179.82	1,165.5	-327.2	249.9	213.5	36.37	6.871		
7,400.0	7,128.5	7,330.4	7,128.5	30.5	26.6	179.82	1,165.5	-327.2	249.9	213.2	36.73	6.803		
7,500.0	7,228.5	7,430.4	7,228.5	30.6	26.7	179.82	1,165.5	-327.2	249.9	212.8	37.09	6.737		
7,600.0	7,328.5	7,530.4	7,328.5	30.8	26.8	179.82	1,165.5	-327.2	249.9	212.4	37.46	6.671		
7,700.0	7,428.5	7,630.4	7,428.5	30.9	26.9	179.82	1,165.5	-327.2	249.9	212.1	37.83	6.606		
7,800.0	7,528.5	7,730.4	7,528.5	31.0	27.1	179.82	1,165.5	-327.2	249.9	211.7	38.20	6.542		
7,900.0	7,628.5	7,830.4	7,628.5	31.1	27.2	179.82	1,165.5	-327.2	249.9	211.3	38.57	6.479		
8,000.0	7,728.5	7,930.4	7,728.5	31.2	27.3	179.82	1,165.5	-327.2	249.9	211.0	38.94	6.418		
8,100.0	7,828.5	8,030.4	7,828.5	31.3	27.5	179.82	1,165.5	-327.2	249.9	210.6	39.31	6.356		
8,142.0	7,870.5	8,072.4	7,870.5	31.4	27.5	179.82	1,165.5	-327.2	249.9	210.4	39.47	6.331		
8,167.5	7,896.0	8,089.9	7,888.0	31.4	27.5	179.82	1,165.5	-327.2	250.0	210.5	39.55	6.321		



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 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		
0.0	0.0	0.0	0.0	0.0	0.0	-66.00	9.1	-20.5	22.4					
100.0	100.0	100.0	100.0	0.1	0.1	-66.00	9.1	-20.5	22.4	22.2	0.18	127.696 CC		
200.0	200.0	199.4	199.4	0.3	0.3	-53.58	10.7	-21.2	22.6	22.0	0.64	35.179 ES		
300.0	299.8	298.8	298.7	0.6	0.6	-55.38	15.4	-23.4	23.4	22.3	1.12	20.828		
400.0	399.5	398.2	397.7	0.8	0.8	-58.12	23.2	-27.0	24.8	23.2	1.63	15.208		
500.0	498.7	497.6	496.3	1.1	1.1	-61.46	34.1	-32.0	26.8	24.6	2.18	12.266		
600.0	597.5	597.2	594.8	1.4	1.4	-65.67	47.8	-38.4	29.2	26.4	2.81	10.403		
700.0	695.6	697.1	693.4	1.8	1.8	-74.47	62.1	-45.0	30.9	27.4	3.53	8.772		
800.0	793.1	796.8	791.9	2.3	2.1	-88.13	76.2	-51.5	33.0	28.7	4.36	7.578		
900.0	889.6	896.1	890.0	2.8	2.5	-104.74	90.4	-58.1	37.5	32.3	5.22	7.185 SF		
1,000.0	985.3	995.1	987.7	3.3	2.8	-120.76	104.5	-64.6	46.1	40.1	5.96	7.728		
1,100.0	1,079.8	1,093.4	1,084.9	3.9	3.2	-133.62	118.5	-71.1	59.5	52.9	6.57	9.056		
1,200.0	1,173.2	1,191.1	1,181.3	4.6	3.5	-143.03	132.4	-77.5	77.5	70.4	7.10	10.921		
1,300.0	1,265.2	1,288.0	1,277.1	5.3	3.9	-149.78	146.2	-83.9	99.8	92.2	7.61	13.123		
1,400.0	1,356.7	1,384.6	1,372.4	6.1	4.2	-154.48	159.9	-90.3	124.3	116.2	8.09	15.356		
1,500.0	1,448.2	1,481.2	1,467.8	6.9	4.6	-157.64	173.7	-96.7	149.3	140.7	8.61	17.346		
1,600.0	1,539.7	1,577.7	1,563.1	7.6	4.9	-159.88	187.4	-103.0	174.6	165.4	9.14	19.104		
1,700.0	1,631.2	1,674.3	1,658.5	8.4	5.3	-161.56	201.2	-109.4	200.0	190.4	9.68	20.656		
1,800.0	1,722.6	1,770.8	1,753.8	9.2	5.6	-162.86	214.9	-115.8	225.7	215.4	10.24	22.029		
1,900.0	1,814.1	1,867.4	1,849.2	10.0	6.0	-163.90	228.7	-122.1	251.3	240.5	10.81	23.248		
2,000.0	1,905.6	1,963.9	1,944.6	10.8	6.4	-164.74	242.4	-128.5	277.1	265.7	11.39	24.336		
2,100.0	1,997.1	2,060.5	2,039.9	11.5	6.7	-165.44	256.2	-134.9	302.9	290.9	11.97	25.310		
2,200.0	2,088.6	2,157.0	2,135.3	12.3	7.1	-166.03	269.9	-141.2	328.7	316.2	12.55	26.187		
2,300.0	2,180.1	2,253.6	2,230.6	13.1	7.4	-166.54	283.7	-147.6	354.6	341.5	13.14	26.979		
2,400.0	2,271.6	2,350.1	2,326.0	13.9	7.8	-166.97	297.4	-154.0	380.5	366.7	13.74	27.698		
2,500.0	2,363.0	2,446.7	2,421.3	14.7	8.1	-167.35	311.2	-160.3	406.4	392.1	14.33	28.353		
2,600.0	2,454.5	2,543.2	2,516.7	15.5	8.5	-167.69	324.9	-166.7	432.3	417.4	14.93	28.951		
2,700.0	2,546.0	2,639.8	2,612.1	16.3	8.8	-167.98	338.6	-173.1	458.2	442.7	15.53	29.500		
2,800.0	2,637.5	2,736.3	2,707.4	17.1	9.2	-168.25	352.4	-179.4	484.2	468.0	16.14	30.006		
2,900.0	2,729.0	2,832.9	2,802.8	17.8	9.5	-168.48	366.1	-185.8	510.1	493.4	16.74	30.472		
3,000.0	2,820.5	2,929.5	2,898.1	18.6	9.9	-168.70	379.9	-192.2	536.1	518.7	17.35	30.904		
3,100.0	2,912.0	3,026.0	2,993.5	19.4	10.2	-168.89	393.6	-198.5	562.1	544.1	17.95	31.304		
3,200.0	3,003.4	3,122.6	3,088.9	20.2	10.6	-169.07	407.4	-204.9	588.0	569.5	18.56	31.677		
3,300.0	3,094.9	3,219.1	3,184.2	21.0	10.9	-169.24	421.1	-211.3	614.0	594.8	19.17	32.025		
3,400.0	3,186.4	3,315.7	3,279.6	21.8	11.3	-169.38	434.9	-217.6	640.0	620.2	19.78	32.349		
3,500.0	3,277.9	3,412.2	3,374.9	22.6	11.6	-169.52	448.6	-224.0	666.0	645.6	20.39	32.654		
3,600.0	3,369.4	3,508.8	3,470.3	23.4	12.0	-169.65	462.4	-230.4	691.9	670.9	21.01	32.939		
3,700.0	3,460.9	3,605.3	3,565.7	24.1	12.3	-169.79	476.1	-236.7	717.9	696.2	21.63	33.193		
3,800.0	3,553.3	3,702.5	3,661.6	24.7	12.7	-169.95	489.9	-243.1	741.6	719.3	22.25	33.334		
3,900.0	3,647.0	3,800.4	3,758.3	25.3	13.1	-170.05	503.9	-249.6	761.9	739.0	22.84	33.351		
4,000.0	3,741.9	3,898.9	3,855.6	25.8	13.4	-170.08	517.9	-256.1	778.8	755.4	23.42	33.258		
4,100.0	3,837.8	3,998.0	3,953.5	26.3	13.8	-170.07	532.0	-262.6	792.4	768.4	23.97	33.063		
4,200.0	3,934.6	4,097.5	4,051.7	26.7	14.1	-169.99	546.2	-269.2	802.5	778.1	24.49	32.777		
4,300.0	4,032.3	4,197.2	4,150.2	27.1	14.5	-169.87	560.4	-275.8	809.3	784.3	24.97	32.405		
4,400.0	4,130.6	4,297.1	4,248.9	27.4	14.9	-169.70	574.6	-282.4	812.6	787.1	25.43	31.951		
4,500.0	4,229.6	4,397.1	4,347.6	27.7	15.2	-169.46	588.8	-288.9	812.5	786.6	25.86	31.420		
4,600.0	4,328.9	4,496.9	4,446.2	27.9	15.6	-169.17	603.1	-295.5	808.9	782.7	26.25	30.812		
4,700.0	4,428.6	4,596.6	4,544.6	28.1	16.0	-168.82	617.2	-302.1	802.0	775.4	26.62	30.129		
4,800.0	4,528.5	4,695.9	4,642.7	28.2	16.3	-168.39	631.4	-308.6	791.7	764.7	26.95	29.370		
4,900.0	4,628.5	4,796.6	4,722.6	28.3	16.6	-178.93	642.0	-313.6	779.2	752.0	27.22	28.626		
5,000.0	4,728.5	4,896.3	4,801.6	28.3	16.8	-179.22	650.6	-317.5	768.4	740.8	27.58	27.857		
5,100.0	4,828.5	4,996.4	4,881.4	28.4	17.0	-179.44	657.1	-320.6	760.1	732.2	27.92	27.224		

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



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-04W - Slot B-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 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		
5,200.0	4,928.5	5,016.8	4,961.7	28.5	17.1	179.60	661.7	-322.7	754.5	726.2	28.24	26.718		
5,300.0	5,028.5	5,100.0	5,044.8	28.6	17.2	179.68	664.2	-323.9	751.4	722.8	28.54	26.329		
5,385.0	5,113.5	5,168.7	5,113.5	28.6	17.3	179.70	664.7	-324.1	750.7	721.9	28.77	26.093		
5,400.0	5,128.5	5,183.7	5,128.5	28.6	17.3	179.70	664.7	-324.1	750.7	721.9	28.82	26.051		
5,500.0	5,228.5	5,283.7	5,228.5	28.7	17.5	179.70	664.7	-324.1	750.7	721.6	29.15	25.754		
5,600.0	5,328.5	5,383.7	5,328.5	28.8	17.6	179.70	664.7	-324.1	750.7	721.2	29.49	25.458		
5,700.0	5,428.5	5,483.7	5,428.5	28.9	17.8	179.70	664.7	-324.1	750.7	720.9	29.83	25.167		
5,800.0	5,528.5	5,583.7	5,528.5	29.0	17.9	179.70	664.7	-324.1	750.7	720.5	30.17	24.880		
5,900.0	5,628.5	5,683.7	5,628.5	29.1	18.1	179.70	664.7	-324.1	750.7	720.2	30.52	24.597		
6,000.0	5,728.5	5,783.7	5,728.5	29.2	18.2	179.70	664.7	-324.1	750.7	719.8	30.87	24.319		
6,100.0	5,828.5	5,883.7	5,828.5	29.2	18.4	179.70	664.7	-324.1	750.7	719.5	31.22	24.045		
6,200.0	5,928.5	5,983.7	5,928.5	29.3	18.5	179.70	664.7	-324.1	750.7	719.1	31.58	23.775		
6,300.0	6,028.5	6,083.7	6,028.5	29.4	18.7	179.70	664.7	-324.1	750.7	718.8	31.93	23.510		
6,400.0	6,128.5	6,183.7	6,128.5	29.5	18.8	179.70	664.7	-324.1	750.7	718.4	32.29	23.248		
6,500.0	6,228.5	6,283.7	6,228.5	29.6	19.0	179.70	664.7	-324.1	750.7	718.1	32.65	22.991		
6,600.0	6,328.5	6,383.7	6,328.5	29.7	19.1	179.70	664.7	-324.1	750.7	717.7	33.01	22.738		
6,700.0	6,428.5	6,483.7	6,428.5	29.8	19.3	179.70	664.7	-324.1	750.7	717.3	33.38	22.490		
6,800.0	6,528.5	6,583.7	6,528.5	29.9	19.5	179.70	664.7	-324.1	750.7	717.0	33.75	22.245		
6,900.0	6,628.5	6,683.7	6,628.5	30.0	19.6	179.70	664.7	-324.1	750.7	716.6	34.12	22.004		
7,000.0	6,728.5	6,783.7	6,728.5	30.1	19.8	179.70	664.7	-324.1	750.7	716.2	34.49	21.767		
7,100.0	6,828.5	6,883.7	6,828.5	30.2	19.9	179.70	664.7	-324.1	750.7	715.8	34.86	21.535		
7,200.0	6,928.5	6,983.7	6,928.5	30.3	20.1	179.70	664.7	-324.1	750.7	715.5	35.23	21.306		
7,300.0	7,028.5	7,083.7	7,028.5	30.4	20.3	179.70	664.7	-324.1	750.7	715.1	35.61	21.081		
7,400.0	7,128.5	7,183.7	7,128.5	30.5	20.4	179.70	664.7	-324.1	750.7	714.7	35.99	20.859		
7,500.0	7,228.5	7,283.7	7,228.5	30.6	20.6	179.70	664.7	-324.1	750.7	714.3	36.37	20.642		
7,600.0	7,328.5	7,383.7	7,328.5	30.8	20.8	179.70	664.7	-324.1	750.7	714.0	36.75	20.428		
7,700.0	7,428.5	7,483.7	7,428.5	30.9	21.0	179.70	664.7	-324.1	750.7	713.6	37.13	20.217		
7,800.0	7,528.5	7,583.7	7,528.5	31.0	21.1	179.70	664.7	-324.1	750.7	713.2	37.52	20.010		
7,900.0	7,628.5	7,683.7	7,628.5	31.1	21.3	179.70	664.7	-324.1	750.7	712.8	37.90	19.807		
8,000.0	7,728.5	7,783.7	7,728.5	31.2	21.5	179.70	664.7	-324.1	750.7	712.4	38.29	19.607		
8,100.0	7,828.5	7,883.7	7,828.5	31.3	21.6	179.70	664.7	-324.1	750.7	712.0	38.68	19.410		
8,135.5	7,864.0	7,919.2	7,864.0	31.4	21.7	179.70	664.7	-324.1	750.7	711.9	38.81	19.341		
8,167.5	7,896.0	7,931.2	7,876.0	31.4	21.7	179.70	664.7	-324.1	751.0	712.1	38.90	19.307		



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-06W - Slot B-3 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	-127.66	-6.1	-7.9	9.9					
100.0	100.0	100.0	100.0	0.1	0.1	-127.66	-6.1	-7.9	9.9	9.8	0.18	56.675 CC, ES		
200.0	200.0	200.0	200.0	0.3	0.3	-123.06	-6.1	-7.9	10.8	10.1	0.64	16.733		
300.0	299.8	299.8	299.8	0.6	0.5	-140.83	-6.1	-7.9	14.3	13.2	1.16	12.316 SF		
400.0	399.5	399.5	399.5	0.8	0.8	-155.39	-6.1	-7.9	21.8	20.1	1.71	12.765		
500.0	498.7	499.2	499.1	1.1	1.0	-161.39	-5.2	-9.4	32.6	30.3	2.23	14.583		
600.0	597.5	598.9	598.7	1.4	1.2	-161.60	-2.8	-13.9	45.4	42.6	2.75	16.487		
700.0	695.6	697.9	697.5	1.8	1.4	-160.37	1.0	-20.8	60.4	57.1	3.29	18.355		
800.0	793.1	796.3	795.5	2.3	1.7	-160.35	4.8	-27.7	78.6	74.8	3.85	20.413		
900.0	889.6	893.9	892.8	2.8	1.9	-160.95	8.5	-34.6	100.1	95.7	4.42	22.630		
1,000.0	985.3	990.8	989.4	3.3	2.2	-161.80	12.3	-41.4	124.8	119.8	5.00	24.959		
1,100.0	1,079.8	1,086.8	1,085.1	3.9	2.4	-162.71	16.0	-48.2	152.7	147.1	5.58	27.370		
1,200.0	1,173.2	1,181.8	1,179.7	4.6	2.7	-163.59	19.6	-54.9	183.9	177.7	6.16	29.843		
1,300.0	1,265.2	1,275.6	1,273.3	5.3	2.9	-164.43	23.3	-61.6	218.2	211.5	6.74	32.389		
1,400.0	1,356.7	1,368.9	1,366.3	6.1	3.2	-165.27	26.9	-68.1	254.0	246.7	7.28	34.898		
1,500.0	1,448.2	1,462.3	1,459.3	6.9	3.4	-165.89	30.5	-74.7	289.7	281.9	7.83	37.022		
1,600.0	1,539.7	1,555.6	1,552.4	7.6	3.7	-166.39	34.1	-81.3	325.5	317.1	8.38	38.832		
1,700.0	1,631.2	1,649.0	1,645.4	8.4	3.9	-166.78	37.7	-87.9	361.3	352.3	8.94	40.388		
1,800.0	1,722.6	1,742.3	1,738.5	9.2	4.2	-167.10	41.3	-94.5	397.1	387.6	9.51	41.736		
1,900.0	1,814.1	1,835.7	1,831.5	10.0	4.4	-167.37	44.9	-101.1	432.9	422.8	10.09	42.912		
2,000.0	1,905.6	1,929.0	1,924.6	10.8	4.7	-167.60	48.5	-107.7	468.7	458.0	10.67	43.946		
2,100.0	1,997.1	2,022.4	2,017.6	11.5	4.9	-167.79	52.1	-114.3	504.5	493.3	11.25	44.860		
2,200.0	2,088.6	2,115.7	2,110.7	12.3	5.2	-167.96	55.7	-120.9	540.4	528.5	11.83	45.674		
2,300.0	2,180.1	2,209.1	2,203.7	13.1	5.4	-168.11	59.3	-127.5	576.2	563.8	12.42	46.401		
2,400.0	2,271.6	2,302.4	2,296.8	13.9	5.7	-168.24	62.9	-134.1	612.0	599.0	13.01	47.056		
2,500.0	2,363.0	2,395.8	2,389.8	14.7	5.9	-168.36	66.5	-140.7	647.9	634.3	13.60	47.647		
2,600.0	2,454.5	2,489.1	2,482.9	15.5	6.2	-168.47	70.1	-147.2	683.7	669.5	14.19	48.183		
2,700.0	2,546.0	2,582.5	2,575.9	16.3	6.4	-168.56	73.7	-153.8	719.6	704.8	14.78	48.672		
2,800.0	2,637.5	2,675.8	2,669.0	17.1	6.7	-168.64	77.3	-160.4	755.4	740.0	15.38	49.119		
2,900.0	2,729.0	2,769.2	2,762.0	17.8	6.9	-168.72	80.9	-167.0	791.3	775.3	15.98	49.529		
3,000.0	2,820.5	2,862.5	2,855.1	18.6	7.2	-168.79	84.5	-173.6	827.1	810.5	16.57	49.906		
3,100.0	2,912.0	2,955.9	2,948.1	19.4	7.4	-168.86	88.1	-180.2	862.9	845.8	17.17	50.255		
3,200.0	3,003.4	3,049.2	3,041.1	20.2	7.7	-168.92	91.7	-186.8	898.8	881.0	17.77	50.578		
3,300.0	3,094.9	3,142.6	3,134.2	21.0	7.9	-168.97	95.3	-193.4	934.6	916.3	18.37	50.877		
3,400.0	3,186.4	3,235.9	3,227.2	21.8	8.2	-169.02	98.9	-200.0	970.5	951.5	18.97	51.156		

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



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-01W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance Federal 28-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 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		
0.0	0.0	0.0	0.0	0.0	0.0	-173.66	-14.2	-1.6	14.3					
100.0	100.0	100.0	100.0	0.1	0.1	-173.66	-14.2	-1.6	14.3	14.1	0.18	81.288 CC, ES		
200.0	200.0	200.0	200.0	0.3	0.3	-162.69	-14.2	-1.6	15.9	15.2	0.68	23.355		
300.0	299.8	299.8	299.8	0.6	0.5	-166.93	-14.2	-1.6	21.0	19.8	1.20	17.399		
400.0	399.5	399.5	399.5	0.8	0.8	-170.73	-14.2	-1.6	29.5	27.8	1.73	17.067 SF		
500.0	498.7	498.7	498.7	1.1	1.0	-173.41	-14.2	-1.6	41.6	39.3	2.25	18.460		
600.0	597.5	597.5	597.5	1.4	1.2	-175.18	-14.2	-1.6	57.2	54.4	2.78	20.596		
700.0	695.6	695.6	695.6	1.8	1.4	-176.36	-14.2	-1.6	76.2	72.9	3.30	23.111		
800.0	793.1	792.9	792.9	2.3	1.6	-176.27	-14.5	-3.0	98.7	94.9	3.81	25.932		
900.0	889.6	889.1	889.0	2.8	1.8	-174.75	-15.5	-7.7	124.9	120.5	4.32	28.922		
1,000.0	985.3	984.3	983.9	3.3	2.0	-172.82	-17.1	-14.9	154.6	149.8	4.84	31.920		
1,100.0	1,079.8	1,078.6	1,077.8	3.9	2.3	-171.52	-18.8	-22.3	187.8	182.5	5.39	34.882		
1,200.0	1,173.2	1,171.6	1,170.6	4.6	2.5	-170.71	-20.4	-29.6	224.3	218.4	5.93	37.798		
1,300.0	1,265.2	1,263.4	1,262.1	5.3	2.7	-170.23	-22.0	-36.9	264.0	257.5	6.49	40.698		
1,400.0	1,356.7	1,354.6	1,353.0	6.1	2.9	-170.01	-23.6	-44.1	305.0	298.0	7.00	43.571		
1,500.0	1,448.2	1,445.9	1,443.9	6.9	3.2	-169.85	-25.2	-51.2	346.0	338.4	7.53	45.957		
1,600.0	1,539.7	1,537.1	1,534.8	7.6	3.4	-169.72	-26.8	-58.4	386.9	378.9	8.07	47.959		
1,700.0	1,631.2	1,628.3	1,625.8	8.4	3.6	-169.62	-28.4	-65.6	427.9	419.3	8.62	49.652		
1,800.0	1,722.6	1,719.5	1,716.7	9.2	3.9	-169.53	-30.0	-72.8	468.9	459.7	9.18	51.091		
1,900.0	1,814.1	1,810.7	1,807.6	10.0	4.1	-169.46	-31.6	-80.0	509.9	500.1	9.74	52.333		
2,000.0	1,905.6	1,901.9	1,898.5	10.8	4.3	-169.40	-33.2	-87.2	550.9	540.6	10.31	53.408		
2,100.0	1,997.1	1,993.1	1,989.4	11.5	4.6	-169.35	-34.8	-94.4	591.9	581.0	10.89	54.346		
2,200.0	2,088.6	2,084.3	2,080.3	12.3	4.8	-169.30	-36.4	-101.6	632.8	621.4	11.47	55.169		
2,300.0	2,180.1	2,175.6	2,171.2	13.1	5.1	-169.26	-38.0	-108.8	673.8	661.8	12.05	55.898		
2,400.0	2,271.6	2,266.8	2,262.2	13.9	5.3	-169.22	-39.7	-116.0	714.8	702.2	12.64	56.545		
2,500.0	2,363.0	2,358.0	2,353.1	14.7	5.5	-169.19	-41.3	-123.1	755.8	742.6	13.23	57.124		
2,600.0	2,454.5	2,449.2	2,444.0	15.5	5.8	-169.16	-42.9	-130.3	796.8	783.0	13.82	57.644		
2,700.0	2,546.0	2,540.4	2,534.9	16.3	6.0	-169.14	-44.5	-137.5	837.8	823.4	14.42	58.113		
2,800.0	2,637.5	2,631.6	2,625.8	17.1	6.3	-169.11	-46.1	-144.7	878.8	863.7	15.01	58.538		
2,900.0	2,729.0	2,722.8	2,716.7	17.8	6.5	-169.09	-47.7	-151.9	919.7	904.1	15.61	58.925		
3,000.0	2,820.5	2,814.1	2,807.7	18.6	6.8	-169.07	-49.3	-159.1	960.7	944.5	16.21	59.278		



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-01W
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.0usft
Reference Site:	Piceance 28-05	MD Reference:	Well @ 7578.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 28-01W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-3	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7578.0usft

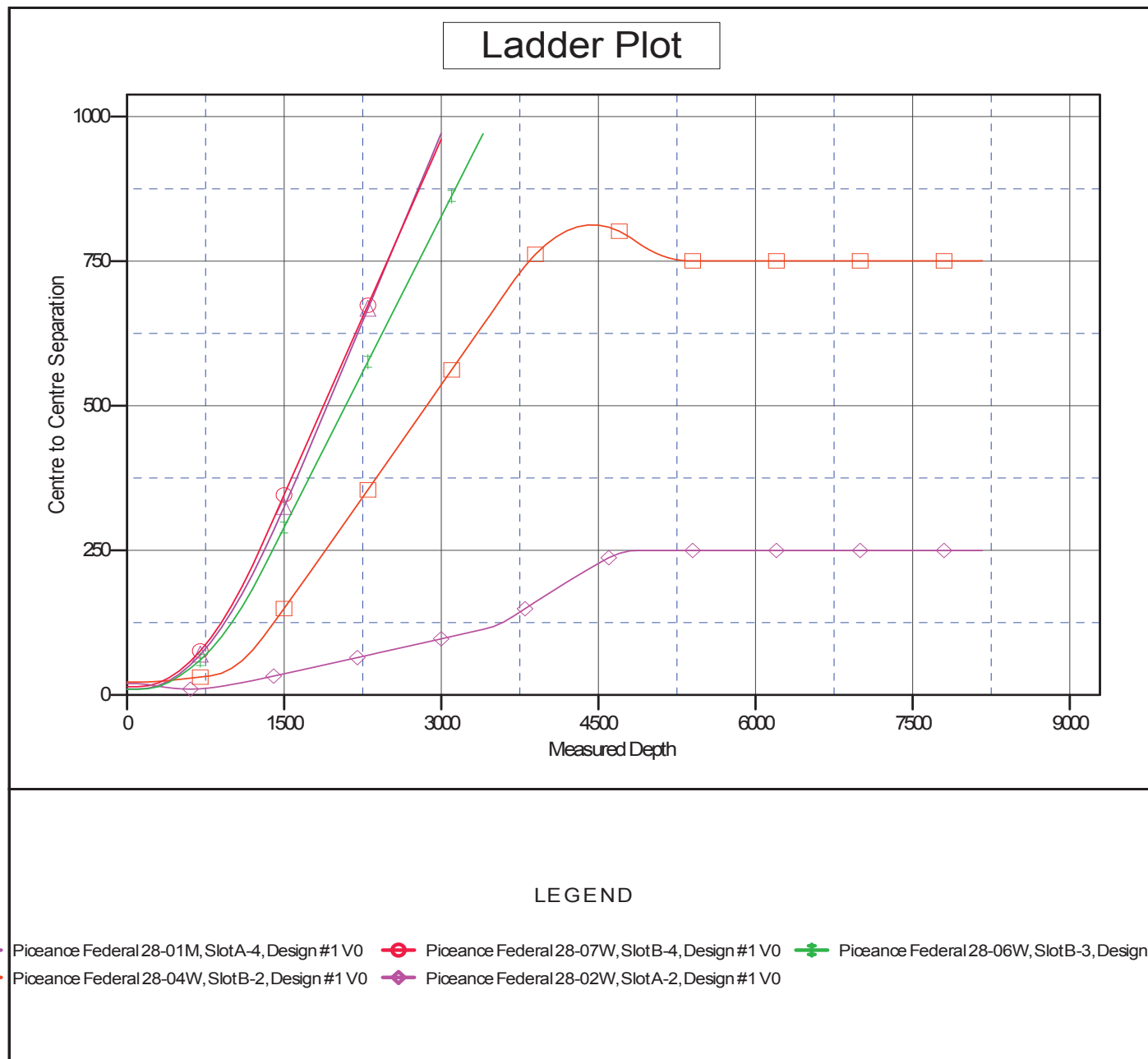
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 28-01W

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.44°







Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-01W
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.0usft
Reference Site:	Piceance 28-05	MD Reference:	Well @ 7578.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 28-01W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-3	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7578.0usft

Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 28-01W

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.44°

