



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 29-07**

**Piceance 29-03E**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**27 March, 2015**

# **Archer**



Project: Mesa County, CO  
Site: Piceance 29-07  
Well: Piceance 29-03E  
Wellbore: Wellbore #1  
Design: Design #1  
Latitude: 39° 15' 3.090 N  
Longitude: 107° 47' 30.030 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 29-03E, 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 29-03E

+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude	Slot
0.00	0.00	1524444.333	2351104.709	39° 15' 3.090 N	107° 47' 30.030 W	

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

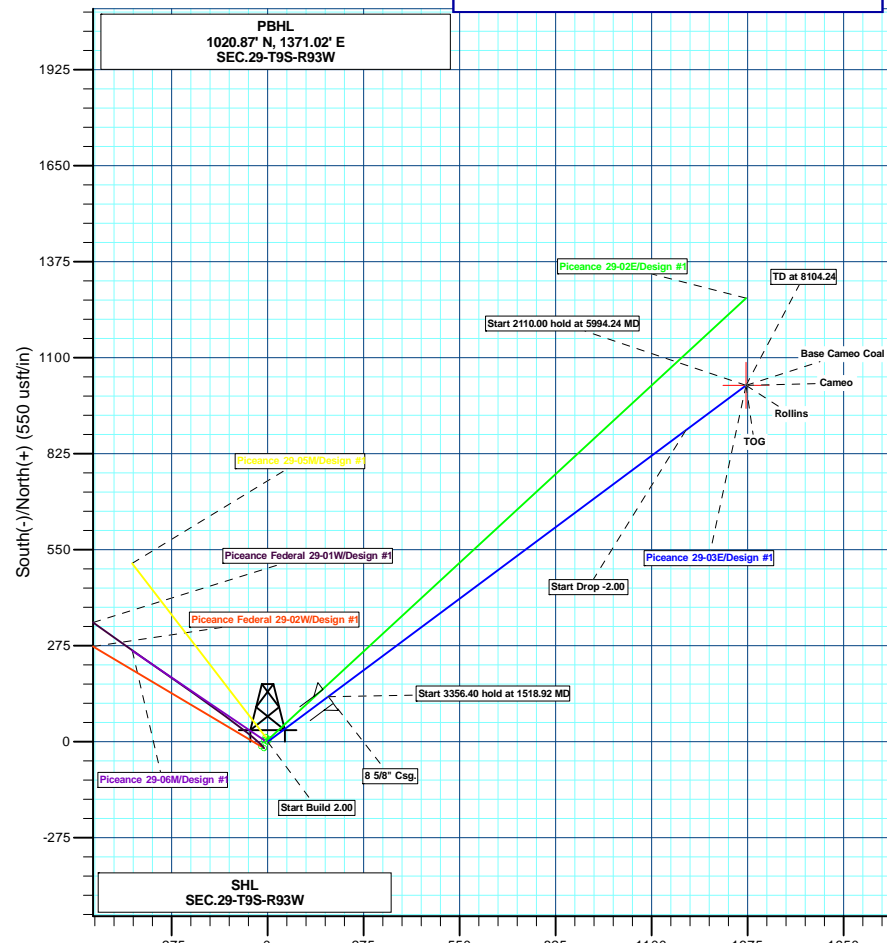
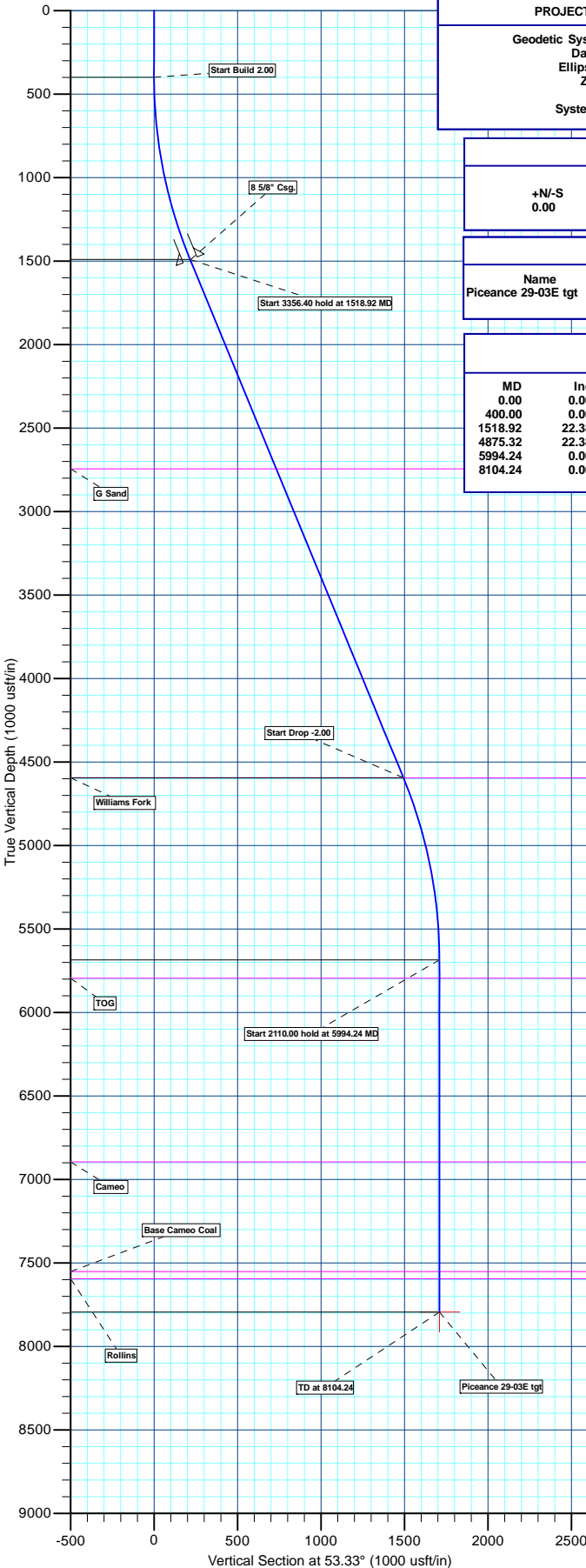
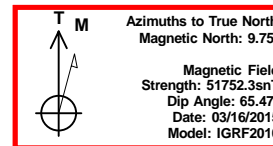
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Piceance 29-03E tgt	7795.00	1020.87	1371.02	1525430.296	2352501.047	39° 15' 13.180 N	107° 47' 12.600 W	

### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	
1518.92	22.38	53.33	1490.69	128.85	173.05	2.00	53.33	215.75	Start 3356.40 hold at 1518.92 MD
4875.32	22.38	53.33	4594.31	892.01	1197.98	0.00	0.00	1493.60	Start Drop -2.00
5994.24	0.00	0.00	5685.00	1020.86	1371.02	2.00	180.00	1709.35	Start 2110.00 hold at 5994.24 MD
8104.24	0.00	0.00	7795.00	1020.86	1371.02	0.00	0.00	1709.35	TD at 8104.24

### FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
2745.00	2875.39	G Sand
4595.00	4876.06	Williams Fork
5795.00	6104.24	TOG
6895.00	7204.24	Cameo
7553.00	7862.24	Base Cameo Coal
7595.00	7904.24	Rollins



Plan: Design #1 (Piceance 29-03E/Wellbore #1)

Created By: Ricky Osburn Date: 10:26, March 27 2015



<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Piceance 29-03E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site:</b>	Piceance 29-07	<b>North Reference:</b>	True
<b>Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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 29-03E					
Well Position	+N/-S	-26.32 usft	Northing:	1,524,444.333 usft	Latitude:	39° 15' 3.090 N
	+E/-W	-13.37 usft	Easting:	2,351,104.709 usft	Longitude:	107° 47' 30.030 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	53.33

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	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,518.92	22.38	53.33	1,490.69	128.85	173.05	2.00	2.00	0.00	53.33	
4,875.32	22.38	53.33	4,594.31	892.01	1,197.98	0.00	0.00	0.00	0.00	
5,994.24	0.00	0.00	5,685.00	1,020.86	1,371.02	2.00	-2.00	0.00	180.00	
8,104.24	0.00	0.00	7,795.00	1,020.86	1,371.02	0.00	0.00	0.00	0.00	Piceance 29-03E tgt



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 29-03E
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 29-03E	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
100.00	0.00	0.00	100.00	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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	2.00	53.33	499.98	1.04	1.40	1.75	2.00	2.00	0.00
600.00	4.00	53.33	599.84	4.17	5.60	6.98	2.00	2.00	0.00
700.00	6.00	53.33	699.45	9.37	12.59	15.69	2.00	2.00	0.00
800.00	8.00	53.33	798.70	16.65	22.36	27.88	2.00	2.00	0.00
900.00	10.00	53.33	897.47	25.99	34.91	43.52	2.00	2.00	0.00
1,000.00	12.00	53.33	995.62	37.39	50.21	62.60	2.00	2.00	0.00
1,100.00	14.00	53.33	1,093.06	50.82	68.25	85.10	2.00	2.00	0.00
1,200.00	16.00	53.33	1,189.64	66.28	89.01	110.98	2.00	2.00	0.00
1,300.00	18.00	53.33	1,285.27	83.74	112.46	140.21	2.00	2.00	0.00
1,400.00	20.00	53.33	1,379.82	103.18	138.57	172.77	2.00	2.00	0.00
1,500.00	22.00	53.33	1,473.17	124.58	167.31	208.60	2.00	2.00	0.00
Start 3356.40 hold at 1518.92 MD									
1,518.92	22.38	53.33	1,490.69	128.85	173.05	215.75	2.00	2.00	0.00
8 5/8" Csg.									
1,522.00	22.38	53.33	1,493.54	129.55	173.99	216.92	0.00	0.00	0.00
1,600.00	22.38	53.33	1,565.66	147.29	197.81	246.62	0.00	0.00	0.00
1,700.00	22.38	53.33	1,658.13	170.02	228.34	284.69	0.00	0.00	0.00
1,800.00	22.38	53.33	1,750.60	192.76	258.88	322.76	0.00	0.00	0.00
1,900.00	22.38	53.33	1,843.07	215.50	289.42	360.83	0.00	0.00	0.00
2,000.00	22.38	53.33	1,935.54	238.24	319.95	398.91	0.00	0.00	0.00
2,100.00	22.38	53.33	2,028.01	260.97	350.49	436.98	0.00	0.00	0.00
2,200.00	22.38	53.33	2,120.48	283.71	381.03	475.05	0.00	0.00	0.00
2,300.00	22.38	53.33	2,212.94	306.45	411.56	513.12	0.00	0.00	0.00
2,400.00	22.38	53.33	2,305.41	329.19	442.10	551.19	0.00	0.00	0.00
2,500.00	22.38	53.33	2,397.88	351.92	472.64	589.27	0.00	0.00	0.00
2,600.00	22.38	53.33	2,490.35	374.66	503.17	627.34	0.00	0.00	0.00
2,700.00	22.38	53.33	2,582.82	397.40	533.71	665.41	0.00	0.00	0.00
2,800.00	22.38	53.33	2,675.29	420.14	564.25	703.48	0.00	0.00	0.00
G Sand									
2,875.39	22.38	53.33	2,745.00	437.28	587.27	732.19	0.00	0.00	0.00
2,900.00	22.38	53.33	2,767.76	442.87	594.78	741.56	0.00	0.00	0.00
3,000.00	22.38	53.33	2,860.23	465.61	625.32	779.63	0.00	0.00	0.00
3,100.00	22.38	53.33	2,952.70	488.35	655.86	817.70	0.00	0.00	0.00
3,200.00	22.38	53.33	3,045.16	511.09	686.39	855.77	0.00	0.00	0.00
3,300.00	22.38	53.33	3,137.63	533.83	716.93	893.84	0.00	0.00	0.00
3,400.00	22.38	53.33	3,230.10	556.56	747.47	931.92	0.00	0.00	0.00
3,500.00	22.38	53.33	3,322.57	579.30	778.00	969.99	0.00	0.00	0.00
3,600.00	22.38	53.33	3,415.04	602.04	808.54	1,008.06	0.00	0.00	0.00
3,700.00	22.38	53.33	3,507.51	624.78	839.08	1,046.13	0.00	0.00	0.00
3,800.00	22.38	53.33	3,599.98	647.51	869.61	1,084.20	0.00	0.00	0.00
3,900.00	22.38	53.33	3,692.45	670.25	900.15	1,122.28	0.00	0.00	0.00
4,000.00	22.38	53.33	3,784.92	692.99	930.69	1,160.35	0.00	0.00	0.00
4,100.00	22.38	53.33	3,877.39	715.73	961.22	1,198.42	0.00	0.00	0.00
4,200.00	22.38	53.33	3,969.85	738.46	991.76	1,236.49	0.00	0.00	0.00
4,300.00	22.38	53.33	4,062.32	761.20	1,022.30	1,274.57	0.00	0.00	0.00
4,400.00	22.38	53.33	4,154.79	783.94	1,052.83	1,312.64	0.00	0.00	0.00
4,500.00	22.38	53.33	4,247.26	806.68	1,083.37	1,350.71	0.00	0.00	0.00
4,600.00	22.38	53.33	4,339.73	829.41	1,113.91	1,388.78	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 29-03E
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 29-03E	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	22.38	53.33	4,432.20	852.15	1,144.44	1,426.85	0.00	0.00	0.00	
4,800.00	22.38	53.33	4,524.67	874.89	1,174.98	1,464.93	0.00	0.00	0.00	
Start Drop -2.00										
4,875.32	22.38	53.33	4,594.31	892.01	1,197.98	1,493.60	0.00	0.00	0.00	
Williams Fork										
4,876.06	22.36	53.33	4,595.00	892.18	1,198.21	1,493.88	2.00	-2.00	0.00	
4,900.00	21.88	53.33	4,617.18	897.57	1,205.44	1,502.90	2.00	-2.00	0.00	
5,000.00	19.88	53.33	4,710.60	918.86	1,234.03	1,538.55	2.00	-2.00	0.00	
5,100.00	17.88	53.33	4,805.22	938.19	1,259.99	1,570.91	2.00	-2.00	0.00	
5,200.00	15.88	53.33	4,900.90	955.53	1,283.28	1,599.96	2.00	-2.00	0.00	
5,300.00	13.88	53.33	4,997.54	970.87	1,303.89	1,625.64	2.00	-2.00	0.00	
5,400.00	11.88	53.33	5,095.02	984.19	1,321.77	1,647.94	2.00	-2.00	0.00	
5,500.00	9.88	53.33	5,193.21	995.47	1,336.91	1,666.82	2.00	-2.00	0.00	
5,600.00	7.88	53.33	5,292.01	1,004.69	1,349.30	1,682.27	2.00	-2.00	0.00	
5,700.00	5.88	53.33	5,391.28	1,011.85	1,358.92	1,694.25	2.00	-2.00	0.00	
5,800.00	3.88	53.33	5,490.91	1,016.93	1,365.75	1,702.77	2.00	-2.00	0.00	
5,900.00	1.88	53.33	5,590.78	1,019.94	1,369.78	1,707.80	2.00	-2.00	0.00	
Start 2110.00 hold at 5994.24 MD										
5,994.24	0.00	0.00	5,685.00	1,020.86	1,371.02	1,709.35	2.00	-2.00	0.00	
6,000.00	0.00	0.00	5,690.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,790.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
TOG										
6,104.24	0.00	0.00	5,795.00	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,890.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,300.00	0.00	0.00	5,990.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,090.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,190.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,290.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,390.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,490.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,590.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,690.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,790.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,200.00	0.00	0.00	6,890.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
Cameo										
7,204.24	0.00	0.00	6,895.00	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,300.00	0.00	0.00	6,990.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,090.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,190.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,290.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,390.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,490.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
Base Cameo Coal										
7,862.24	0.00	0.00	7,553.00	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,590.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
Rollins										
7,904.24	0.00	0.00	7,595.00	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,690.76	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	
TD at 8104.24										
8,104.24	0.00	0.00	7,795.00	1,020.86	1,371.02	1,709.35	0.00	0.00	0.00	



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 29-03E
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 29-03E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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 29-03E tgt	0.00	0.00	7,795.00	1,020.87	1,371.02	1,525,430.296	2,352,501.047	39° 15' 13.180 N	107° 47' 12.600 W
- plan hits target center									
- Point									

Casing Points				
Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
(usft)	(usft)	Name	(")	(")
1,522.00	1,493.54	8 5/8" Csg.	8-5/8	12-1/4

Formations					
Measured Depth	Vertical Depth			Dip	Dip Direction
(usft)	(usft)	Name	Lithology	(°)	(°)
2,875.39	2,745.00	G Sand		0.00	
4,876.06	4,595.00	Williams Fork		0.00	
6,104.24	5,795.00	TOG		0.00	
7,204.24	6,895.00	Cameo		0.00	
7,862.24	7,553.00	Base Cameo Coal		0.00	
7,904.24	7,595.00	Rollins		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	Comment
400.00	400.00	0.00	0.00	Start Build 2.00
1,518.92	1,490.69	128.85	173.05	Start 3356.40 hold at 1518.92 MD
4,875.32	4,594.31	892.01	1,197.98	Start Drop -2.00
5,994.24	5,685.00	1,020.86	1,371.02	Start 2110.00 hold at 5994.24 MD
8,104.24	7,795.00	1,020.86	1,371.02	TD at 8104.24



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 29-07**

**Piceance 29-03E**

**Wellbore #1**

**Design #1**

## **Anticollision Report**

**27 March, 2015**

# **Archer**



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance 29-03E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Reference Site:</b>	Piceance 29-07	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

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

<b>Survey Tool Program</b>	<b>Date</b>	2015/03/27		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	8,104.24	Design #1 (Wellbore #1)	MWD	MWD - Standard

Summary						
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 29-02E - Wellbore #1 - Design #1	300.00	300.00	9.00	7.92	8.376	CC, ES
Piceance 29-02E - Wellbore #1 - Design #1	8,104.24	8,155.94	249.89	186.18	3.922	SF
Piceance 29-05M - Wellbore #1 - Design #1	300.00	300.00	13.97	12.90	13.006	CC, ES
Piceance 29-05M - Wellbore #1 - Design #1	400.00	399.50	15.64	14.11	10.279	SF
Piceance 29-06M - Wellbore #1 - Design #1	400.00	400.00	10.27	8.75	6.739	CC, ES
Piceance 29-06M - Wellbore #1 - Design #1	500.00	499.98	11.25	9.27	5.696	SF
Piceance Federal 29-01W - Wellbore #1 - Design #1	433.73	434.06	19.40	17.72	11.555	CC, ES
Piceance Federal 29-01W - Wellbore #1 - Design #1	500.00	500.00	20.94	18.94	10.480	SF
Piceance Federal 29-02W - Wellbore #1 - Design #1	100.00	100.00	22.37	22.19	127.584	CC, ES
Piceance Federal 29-02W - Wellbore #1 - Design #1	400.00	396.22	38.16	36.54	23.572	SF

<b>Offset Design</b>	Piceance 29-07 - Piceance 29-02E - Wellbore #1 - Design #1												<b>Offset Site Error:</b>	0.00 usft
<b>Survey Program:</b>	0-MWD												<b>Offset Well Error:</b>	0.00 usft
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>		<b>Distance</b>		<b>Minimum Separation</b>		<b>Separation Factor</b>	<b>Warning</b>					
<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Reference (usft)</b>	<b>Offset (usft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Between Centres (usft)</b>	<b>Between Ellipses (usft)</b>	<b>Minimum Separation (usft)</b>	<b>Separation Factor</b>		
0.00	0.00	0.00	0.00	0.00	0.00	25.92	8.09	3.93	9.00					
100.00	100.00	100.00	100.00	0.09	0.09	25.92	8.09	3.93	9.00	8.82	0.18	51.330		
200.00	200.00	200.00	200.00	0.31	0.31	25.92	8.09	3.93	9.00	8.37	0.62	14.402		
300.00	300.00	300.00	300.00	0.54	0.54	25.92	8.09	3.93	9.00	7.92	1.07	8.376 CC, ES		
400.00	400.00	399.67	399.65	0.76	0.76	29.32	9.27	5.21	10.64	9.12	1.52	6.999		
500.00	499.98	499.20	499.03	0.98	0.99	-20.33	12.79	9.02	14.03	12.06	1.98	7.096		
600.00	599.84	598.60	598.06	1.21	1.23	-19.26	18.64	15.35	17.55	15.09	2.45	7.154		
700.00	699.45	697.88	696.61	1.45	1.50	-19.50	26.81	24.20	21.14	18.20	2.94	7.181		
800.00	798.70	797.04	794.55	1.71	1.81	-20.48	37.28	35.53	24.82	21.37	3.45	7.187		
900.00	897.47	896.08	891.79	2.02	2.17	-21.91	50.02	49.32	28.59	24.60	3.99	7.172		
1,000.00	995.62	994.99	988.19	2.38	2.58	-23.61	65.01	65.56	32.46	27.91	4.55	7.132		
1,100.00	1,093.06	1,093.78	1,083.66	2.78	3.05	-25.48	82.23	84.20	36.46	31.30	5.16	7.063		
1,200.00	1,189.64	1,192.44	1,178.08	3.25	3.58	-27.44	101.65	105.23	40.59	34.76	5.83	6.960		
1,300.00	1,285.27	1,290.98	1,271.34	3.78	4.17	-29.45	123.23	128.59	44.88	38.30	6.58	6.822		
1,400.00	1,379.82	1,389.40	1,363.34	4.38	4.82	-31.47	146.95	154.27	49.33	41.92	7.41	6.655		
1,500.00	1,473.17	1,487.70	1,453.96	5.04	5.54	-33.49	172.76	182.22	53.96	45.60	8.36	6.454		
1,600.00	1,565.66	1,587.29	1,544.90	5.76	6.30	-35.47	200.31	212.04	58.70	49.29	9.41	6.239		

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





# Archer

## Anticollision Report

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<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance 29-03E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Reference Site:</b>	Piceance 29-07	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	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		
1,700.00	1,658.13	1,687.15	1,636.07	6.49	7.09	-37.19	227.97	241.99	63.48	52.97	10.52	6.036		
1,800.00	1,750.60	1,787.02	1,727.24	7.23	7.88	-38.66	255.62	271.93	68.32	56.65	11.67	5.853		
1,900.00	1,843.07	1,886.89	1,818.42	7.97	8.67	-39.93	283.28	301.87	73.19	60.33	12.86	5.690		
2,000.00	1,935.54	1,986.76	1,909.59	8.72	9.47	-41.05	310.93	331.82	78.10	64.02	14.08	5.546		
2,100.00	2,028.01	2,086.63	2,000.76	9.47	10.28	-42.03	338.59	361.76	83.03	67.71	15.32	5.419		
2,200.00	2,120.48	2,186.50	2,091.93	10.23	11.08	-42.90	366.25	391.70	87.98	71.40	16.58	5.306		
2,300.00	2,212.94	2,286.37	2,183.10	10.99	11.89	-43.68	393.90	421.65	92.95	75.10	17.85	5.206		
2,400.00	2,305.41	2,386.24	2,274.28	11.75	12.70	-44.39	421.56	451.59	97.94	78.80	19.14	5.117		
2,500.00	2,397.88	2,486.11	2,365.45	12.51	13.51	-45.02	449.22	481.53	102.94	82.50	20.44	5.037		
2,600.00	2,490.35	2,585.97	2,456.62	13.27	14.32	-45.59	476.87	511.48	107.95	86.21	21.74	4.966		
2,700.00	2,582.82	2,685.84	2,547.79	14.04	15.13	-46.11	504.53	541.42	112.97	89.92	23.05	4.902		
2,800.00	2,675.29	2,785.71	2,638.96	14.80	15.94	-46.59	532.18	571.36	118.00	93.64	24.36	4.843		
2,900.00	2,767.76	2,885.58	2,730.14	15.57	16.76	-47.03	559.84	601.31	123.04	97.36	25.68	4.790		
3,000.00	2,860.23	2,985.45	2,821.31	16.34	17.57	-47.44	587.50	631.25	128.08	101.07	27.01	4.742		
3,100.00	2,952.70	3,085.32	2,912.48	17.10	18.39	-47.81	615.15	661.19	133.13	104.80	28.34	4.698		
3,200.00	3,045.17	3,185.19	3,003.65	17.87	19.20	-48.16	642.81	691.13	138.19	108.52	29.67	4.657		
3,300.00	3,137.63	3,285.06	3,094.82	18.64	20.02	-48.48	670.46	721.08	143.25	112.24	31.01	4.620		
3,400.00	3,230.10	3,384.92	3,185.99	19.41	20.83	-48.78	698.12	751.02	148.31	115.97	32.34	4.586		
3,500.00	3,322.57	3,484.79	3,277.17	20.18	21.65	-49.06	725.78	780.96	153.38	119.70	33.68	4.554		
3,600.00	3,415.04	3,584.66	3,368.34	20.95	22.46	-49.32	753.43	810.91	158.45	123.43	35.02	4.524		
3,700.00	3,507.51	3,684.53	3,459.51	21.71	23.28	-49.57	781.09	840.85	163.53	127.16	36.37	4.497		
3,800.00	3,599.98	3,784.40	3,550.68	22.48	24.09	-49.80	808.75	870.79	168.60	130.89	37.71	4.471		
3,900.00	3,692.45	3,884.27	3,641.85	23.25	24.91	-50.02	836.40	900.74	173.68	134.63	39.06	4.447		
4,000.00	3,784.92	3,984.14	3,733.03	24.02	25.73	-50.22	864.06	930.68	178.77	138.36	40.40	4.425		
4,100.00	3,877.39	4,084.01	3,824.20	24.79	26.54	-50.42	891.71	960.62	183.85	142.10	41.75	4.403		
4,200.00	3,969.85	4,183.87	3,915.37	25.56	27.36	-50.60	919.37	990.57	188.94	145.84	43.10	4.384		
4,300.00	4,062.32	4,283.74	4,006.54	26.33	28.18	-50.78	947.03	1,020.51	194.03	149.57	44.45	4.365		
4,400.00	4,154.79	4,383.61	4,097.71	27.11	29.00	-50.94	974.68	1,050.45	199.12	153.31	45.80	4.347		
4,500.00	4,247.26	4,483.48	4,188.89	27.88	29.81	-51.10	1,002.34	1,080.40	204.21	157.05	47.15	4.331		
4,600.00	4,339.73	4,583.35	4,280.06	28.65	30.63	-51.25	1,030.00	1,110.34	209.30	160.79	48.51	4.315		
4,700.00	4,432.20	4,683.22	4,371.23	29.42	31.45	-51.39	1,057.65	1,140.28	214.39	164.53	49.86	4.300		
4,800.00	4,524.67	4,783.09	4,462.40	30.19	32.26	-51.52	1,085.31	1,170.23	219.49	168.27	51.21	4.286		
4,900.00	4,617.18	4,885.33	4,555.88	30.94	33.06	-51.71	1,113.41	1,200.66	224.43	171.87	52.56	4.270		
5,000.00	4,710.60	4,991.02	4,653.75	31.52	33.71	-52.01	1,140.45	1,229.93	228.81	175.11	53.70	4.261		
5,100.00	4,805.22	5,096.81	4,753.13	32.05	34.30	-52.28	1,165.05	1,256.56	232.79	178.06	54.73	4.254		
5,200.00	4,900.90	5,202.70	4,853.88	32.54	34.84	-52.51	1,187.16	1,280.50	236.37	180.71	55.66	4.247		
5,300.00	4,997.54	5,308.67	4,955.84	32.97	35.32	-52.71	1,206.74	1,301.70	239.54	183.06	56.48	4.241		
5,400.00	5,095.02	5,414.73	5,058.88	33.35	35.75	-52.88	1,223.77	1,320.13	242.29	185.09	57.20	4.236		
5,500.00	5,193.21	5,520.85	5,162.84	33.69	36.11	-53.02	1,238.20	1,335.76	244.63	186.80	57.82	4.231		
5,600.00	5,292.01	5,627.03	5,267.57	33.97	36.43	-53.14	1,250.01	1,348.55	246.54	188.20	58.34	4.226		
5,700.00	5,391.28	5,733.25	5,372.92	34.21	36.69	-53.22	1,259.19	1,358.49	248.02	189.27	58.75	4.222		
5,800.00	5,490.91	5,839.50	5,478.74	34.39	36.89	-53.28	1,265.51	1,365.55	249.08	190.02	59.06	4.218		
5,900.00	5,590.78	5,945.78	5,584.86	34.53	37.03	-53.32	1,269.57	1,369.73	249.70	190.44	59.26	4.214		
6,000.00	5,690.76	6,051.71	5,690.76	34.62	37.13	0.00	1,270.76	1,371.01	249.89	190.52	59.38	4.209		
6,100.00	5,790.76	6,151.71	5,790.76	34.69	37.20	0.00	1,270.76	1,371.01	249.89	190.34	59.55	4.196		
6,200.00	5,890.76	6,251.71	5,890.76	34.77	37.27	0.00	1,270.76	1,371.01	249.89	190.16	59.73	4.183		
6,300.00	5,990.76	6,351.71	5,990.76	34.85	37.35	0.00	1,270.76	1,371.01	249.89	189.97	59.92	4.170		
6,400.00	6,090.76	6,451.71	6,090.76	34.93	37.42	0.00	1,270.76	1,371.01	249.89	189.79	60.11	4.157		
6,500.00	6,190.76	6,551.71	6,190.76	35.01	37.50	0.00	1,270.76	1,371.01	249.89	189.60	60.30	4.144		
6,600.00	6,290.76	6,651.71	6,290.76	35.10	37.57	0.00	1,270.76	1,371.01	249.89	189.40	60.49	4.131		
6,700.00	6,390.76	6,751.71	6,390.76	35.18	37.65	0.00	1,270.76	1,371.01	249.89	189.21	60.69	4.118		
6,800.00	6,490.76	6,851.71	6,490.76	35.27	37.73	0.00	1,270.76	1,371.01	249.89	189.01	60.89	4.104		

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 29-03E
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 29-03E	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	
6,900.00	6,590.76	6,951.71	6,590.76	35.35	37.81	0.00	1,270.76	1,371.01	249.89	188.81	61.09	4.091	
7,000.00	6,690.76	7,051.71	6,690.76	35.44	37.89	0.00	1,270.76	1,371.01	249.89	188.60	61.29	4.077	
7,100.00	6,790.76	7,151.71	6,790.76	35.53	37.97	0.00	1,270.76	1,371.01	249.89	188.39	61.50	4.063	
7,200.00	6,890.76	7,251.71	6,890.76	35.62	38.06	0.00	1,270.76	1,371.01	249.89	188.19	61.71	4.050	
7,300.00	6,990.76	7,351.71	6,990.76	35.71	38.14	0.00	1,270.76	1,371.01	249.89	187.97	61.92	4.036	
7,400.00	7,090.76	7,451.71	7,090.76	35.80	38.23	0.00	1,270.76	1,371.01	249.89	187.76	62.13	4.022	
7,500.00	7,190.76	7,551.71	7,190.76	35.90	38.31	0.00	1,270.76	1,371.01	249.89	187.54	62.35	4.008	
7,600.00	7,290.76	7,651.71	7,290.76	35.99	38.40	0.00	1,270.76	1,371.01	249.89	187.32	62.57	3.994	
7,700.00	7,390.76	7,751.71	7,390.76	36.09	38.49	0.00	1,270.76	1,371.01	249.89	187.10	62.79	3.980	
7,800.00	7,490.76	7,851.71	7,490.76	36.19	38.58	0.00	1,270.76	1,371.01	249.89	186.88	63.02	3.966	
7,900.00	7,590.76	7,951.71	7,590.76	36.29	38.67	0.00	1,270.76	1,371.01	249.89	186.65	63.24	3.951	
8,000.00	7,690.76	8,051.71	7,690.76	36.38	38.77	0.00	1,270.76	1,371.01	249.89	186.42	63.47	3.937	
8,100.00	7,790.76	8,151.71	7,790.76	36.49	38.86	0.00	1,270.76	1,371.01	249.89	186.19	63.70	3.923	
8,104.24	7,795.00	8,155.94	7,795.00	36.49	38.86	0.00	1,270.76	1,371.01	249.89	186.18	63.71	3.922 SF	



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<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance 29-03E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Reference Site:</b>	Piceance 29-07	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	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	-19.74	13.15	-4.72	13.97				
100.00	100.00	100.00	100.00	0.09	0.09	-19.74	13.15	-4.72	13.97	13.80	0.18	79.704	
200.00	200.00	200.00	200.00	0.31	0.31	-19.74	13.15	-4.72	13.97	13.35	0.62	22.363	
300.00	300.00	300.00	300.00	0.54	0.54	-19.74	13.15	-4.72	13.97	12.90	1.07	13.006 CC, ES	
400.00	400.00	399.50	399.48	0.76	0.76	-21.68	14.52	-5.77	15.64	14.11	1.52	10.279 SF	
500.00	499.98	498.73	498.57	0.98	0.99	-83.63	18.61	-8.92	20.43	18.46	1.97	10.361	
600.00	599.84	597.37	596.83	1.21	1.23	-95.83	25.37	-14.12	29.11	26.68	2.43	11.985	
700.00	699.45	695.61	694.39	1.45	1.50	-105.85	34.55	-21.19	42.43	39.51	2.92	14.547	
800.00	798.70	794.07	792.09	1.71	1.78	-113.88	44.22	-28.63	58.34	54.92	3.43	17.030	
900.00	897.47	892.04	889.30	2.02	2.08	-120.58	53.84	-36.04	76.65	72.68	3.97	19.288	
1,000.00	995.62	989.40	985.92	2.38	2.37	-126.21	63.41	-43.40	97.64	93.08	4.56	21.429	
1,100.00	1,093.06	1,086.04	1,081.81	2.78	2.67	-130.97	72.90	-50.70	121.51	116.34	5.17	23.524	
1,200.00	1,189.64	1,181.83	1,176.86	3.25	2.97	-134.99	82.31	-57.94	148.38	142.58	5.79	25.616	
1,300.00	1,285.27	1,276.66	1,270.96	3.78	3.26	-138.40	91.62	-65.11	178.32	171.89	6.43	27.718	
1,400.00	1,379.82	1,370.42	1,363.99	4.38	3.56	-141.30	100.83	-72.20	211.38	204.30	7.08	29.853	
1,500.00	1,473.17	1,462.98	1,455.84	5.04	3.85	-143.78	109.93	-79.19	247.55	239.82	7.73	32.013	
1,600.00	1,565.66	1,554.68	1,546.84	5.76	4.14	-146.17	118.93	-86.13	285.96	277.59	8.38	34.136	
1,700.00	1,658.13	1,646.36	1,637.81	6.49	4.43	-148.07	127.94	-93.06	324.78	315.76	9.02	36.012	
1,800.00	1,750.60	1,738.05	1,728.79	7.23	4.72	-149.57	136.94	-99.99	363.84	354.18	9.66	37.663	
1,900.00	1,843.07	1,829.73	1,819.76	7.97	5.01	-150.78	145.95	-106.92	403.06	392.76	10.30	39.119	
2,000.00	1,935.54	1,921.41	1,910.73	8.72	5.30	-151.78	154.96	-113.85	442.42	431.47	10.95	40.409	
2,100.00	2,028.01	2,013.09	2,001.71	9.47	5.59	-152.61	163.96	-120.78	481.87	470.27	11.60	41.558	
2,200.00	2,120.48	2,104.77	2,092.68	10.23	5.88	-153.32	172.97	-127.71	521.39	509.15	12.24	42.586	
2,300.00	2,212.94	2,196.45	2,183.66	10.99	6.17	-153.93	181.97	-134.64	560.97	548.08	12.89	43.509	
2,400.00	2,305.41	2,288.13	2,274.63	11.75	6.46	-154.46	190.98	-141.57	600.60	587.05	13.54	44.342	
2,500.00	2,397.88	2,379.81	2,365.60	12.51	6.75	-154.92	199.98	-148.50	640.26	626.07	14.20	45.097	
2,600.00	2,490.35	2,471.49	2,456.58	13.27	7.04	-155.33	208.99	-155.43	679.96	665.11	14.85	45.784	
2,700.00	2,582.82	2,563.17	2,547.55	14.04	7.34	-155.70	217.99	-162.36	719.68	704.18	15.51	46.411	
2,800.00	2,675.29	2,654.86	2,638.53	14.80	7.63	-156.02	227.00	-169.29	759.43	743.27	16.16	46.986	
2,900.00	2,767.76	2,746.54	2,729.50	15.57	7.92	-156.32	236.01	-176.22	799.19	782.37	16.82	47.514	
3,000.00	2,860.23	2,838.22	2,820.47	16.34	8.21	-156.58	245.01	-183.15	838.97	821.49	17.48	48.002	
3,100.00	2,952.70	2,929.90	2,911.45	17.10	8.51	-156.82	254.02	-190.08	878.76	860.63	18.14	48.453	
3,200.00	3,045.17	3,021.58	3,002.42	17.87	8.80	-157.05	263.02	-197.01	918.57	899.77	18.80	48.871	
3,300.00	3,137.63	3,113.26	3,093.40	18.64	9.09	-157.25	272.03	-203.94	958.39	938.93	19.46	49.259	
3,400.00	3,230.10	3,204.94	3,184.37	19.41	9.38	-157.44	281.03	-210.87	998.21	978.09	20.12	49.622	

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 29-03E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Reference Site:</b>	Piceance 29-07	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	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	-66.79	4.05	-9.44	10.27				
100.00	100.00	100.00	100.00	0.09	0.09	-66.79	4.05	-9.44	10.27	10.09	0.18	58.581	
200.00	200.00	200.00	200.00	0.31	0.31	-66.79	4.05	-9.44	10.27	9.65	0.62	16.436	
300.00	300.00	300.00	300.00	0.54	0.54	-66.79	4.05	-9.44	10.27	9.20	1.07	9.559	
400.00	400.00	400.00	400.00	0.76	0.76	-66.79	4.05	-9.44	10.27	8.75	1.52	6.739 CC, ES	
500.00	499.98	499.98	499.98	0.98	0.99	-127.82	4.05	-9.44	11.25	9.27	1.97	5.696 SF	
600.00	599.84	599.84	599.84	1.21	1.21	-143.72	4.05	-9.44	15.04	12.59	2.45	6.147	
700.00	699.45	699.45	699.45	1.45	1.44	-156.81	4.05	-9.44	22.66	19.72	2.94	7.710	
800.00	798.70	798.70	798.70	1.71	1.66	-164.81	4.05	-9.44	34.21	30.77	3.44	9.953	
900.00	897.47	896.61	896.59	2.02	1.87	-167.83	4.96	-10.79	50.31	46.38	3.93	12.803	
1,000.00	995.62	993.26	993.11	2.38	2.09	-167.50	7.71	-14.83	71.54	67.11	4.42	16.171	
1,100.00	1,093.06	1,088.32	1,087.84	2.78	2.31	-166.06	12.19	-21.43	97.79	92.86	4.93	19.841	
1,200.00	1,189.64	1,183.60	1,182.64	3.25	2.54	-164.97	17.49	-29.23	128.10	122.66	5.44	23.546	
1,300.00	1,285.27	1,277.81	1,276.39	3.78	2.77	-164.56	22.72	-36.93	161.62	155.66	5.96	27.127	
1,400.00	1,379.82	1,370.83	1,368.96	4.38	3.01	-164.50	27.89	-44.55	198.29	191.81	6.48	30.588	
1,500.00	1,473.17	1,462.57	1,460.24	5.04	3.25	-164.61	32.99	-52.05	238.07	231.06	7.01	33.948	
1,600.00	1,565.66	1,553.37	1,550.61	5.76	3.50	-164.94	38.04	-59.48	279.93	272.40	7.53	37.189	
1,700.00	1,658.13	1,644.15	1,640.94	6.49	3.74	-165.22	43.08	-66.91	321.85	313.79	8.06	39.951	
1,800.00	1,750.60	1,734.93	1,731.28	7.23	3.99	-165.44	48.13	-74.34	363.77	355.18	8.59	42.346	
1,900.00	1,843.07	1,825.71	1,821.61	7.97	4.24	-165.62	53.18	-81.77	405.70	396.56	9.13	44.413	
2,000.00	1,935.54	1,916.49	1,911.95	8.72	4.49	-165.76	58.22	-89.20	447.62	437.94	9.69	46.213	
2,100.00	2,028.01	2,007.27	2,002.28	9.47	4.74	-165.88	63.27	-96.63	489.55	479.31	10.24	47.790	
2,200.00	2,120.48	2,098.05	2,092.62	10.23	4.99	-165.97	68.31	-104.06	531.49	520.68	10.81	49.181	
2,300.00	2,212.94	2,188.83	2,182.95	10.99	5.25	-166.06	73.36	-111.49	573.42	562.05	11.37	50.415	
2,400.00	2,305.41	2,279.61	2,273.29	11.75	5.50	-166.13	78.40	-118.92	615.35	603.41	11.95	51.515	
2,500.00	2,397.88	2,370.40	2,363.62	12.51	5.76	-166.19	83.45	-126.34	657.29	644.77	12.52	52.502	
2,600.00	2,490.35	2,461.18	2,453.96	13.27	6.01	-166.25	88.50	-133.77	699.22	686.13	13.10	53.390	
2,700.00	2,582.82	2,551.96	2,544.29	14.04	6.27	-166.30	93.54	-141.20	741.16	727.48	13.68	54.194	
2,800.00	2,675.29	2,642.74	2,634.63	14.80	6.53	-166.34	98.59	-148.63	783.10	768.84	14.26	54.924	
2,900.00	2,767.76	2,733.52	2,724.96	15.57	6.78	-166.38	103.63	-156.06	825.03	810.19	14.84	55.590	
3,000.00	2,860.23	2,824.30	2,815.30	16.34	7.04	-166.42	108.68	-163.49	866.97	851.54	15.43	56.199	
3,100.00	2,952.70	2,915.08	2,905.63	17.10	7.30	-166.45	113.72	-170.92	908.91	892.89	16.01	56.759	
3,200.00	3,045.17	3,005.86	2,995.97	17.87	7.56	-166.48	118.77	-178.35	950.84	934.24	16.60	57.274	
3,300.00	3,137.63	3,096.64	3,086.30	18.64	7.82	-166.51	123.82	-185.77	992.78	975.59	17.19	57.750	

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 29-03E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Reference Site:</b>	Piceance 29-07	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	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	-152.60	-18.21	-9.44	20.51				
100.00	100.00	100.00	100.00	0.09	0.09	-152.60	-18.21	-9.44	20.51	20.34	0.18	116.998	
200.00	200.00	200.00	200.00	0.31	0.31	-152.60	-18.21	-9.44	20.51	19.89	0.62	32.827	
300.00	300.00	300.00	300.00	0.54	0.54	-152.60	-18.21	-9.44	20.51	19.44	1.07	19.092	
400.00	400.00	400.32	400.28	0.76	0.76	-145.49	-16.19	-11.13	19.65	18.13	1.53	12.874	
433.73	433.73	434.06	433.95	0.84	0.85	167.27	-14.61	-12.46	19.40	17.72	1.68	11.555 CC, ES	
500.00	499.98	500.00	499.64	0.98	1.01	-176.00	-10.26	-16.22	20.94	18.94	2.00	10.480 SF	
600.00	599.84	598.07	596.88	1.21	1.27	-153.43	-1.45	-25.26	31.51	28.99	2.51	12.534	
700.00	699.45	694.08	691.34	1.45	1.59	-142.16	9.75	-38.18	51.41	48.37	3.05	16.879	
800.00	798.70	787.30	782.14	1.71	1.98	-137.12	23.06	-54.54	78.93	75.33	3.60	21.943	
900.00	897.47	877.14	868.57	2.02	2.43	-134.65	38.11	-73.84	113.17	109.00	4.18	27.105	
1,000.00	995.62	963.12	950.14	2.38	2.94	-133.26	54.53	-95.51	153.62	148.83	4.78	32.114	
1,100.00	1,093.06	1,044.90	1,026.51	2.78	3.49	-132.35	71.95	-118.98	199.83	194.41	5.42	36.860	
1,200.00	1,189.64	1,122.24	1,097.52	3.25	4.08	-131.62	90.01	-143.71	251.41	245.33	6.09	41.304	
1,300.00	1,285.27	1,200.00	1,167.61	3.78	4.73	-130.98	109.69	-171.01	308.01	301.21	6.80	45.277	
1,400.00	1,379.82	1,263.14	1,223.48	4.38	5.33	-130.25	126.77	-194.95	369.09	361.58	7.52	49.105	
1,500.00	1,473.17	1,326.69	1,278.71	5.04	5.96	-129.49	144.94	-220.61	434.41	426.14	8.27	52.523	
1,600.00	1,565.66	1,394.59	1,336.79	5.76	6.68	-129.82	165.18	-249.37	502.66	493.56	9.10	55.233	
1,700.00	1,658.13	1,467.40	1,398.98	6.49	7.48	-130.31	186.96	-280.33	571.13	561.17	9.96	57.332	
1,800.00	1,750.60	1,540.20	1,461.17	7.23	8.27	-130.69	208.74	-311.29	639.62	628.78	10.84	59.027	
1,900.00	1,843.07	1,613.01	1,523.36	7.97	9.08	-131.01	230.52	-342.25	708.12	696.40	11.72	60.399	
2,000.00	1,935.54	1,685.81	1,585.55	8.72	9.88	-131.26	252.30	-373.21	776.63	764.01	12.62	61.516	
2,100.00	2,028.01	1,758.62	1,647.74	9.47	10.69	-131.48	274.08	-404.16	845.15	831.61	13.54	62.439	
2,200.00	2,120.48	1,831.42	1,709.93	10.23	11.50	-131.66	295.86	-435.12	913.67	899.22	14.45	63.217	
2,300.00	2,212.94	1,904.23	1,772.13	10.99	12.32	-131.81	317.65	-466.08	982.20	966.82	15.38	63.877	

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 29-03E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7520.00usft
<b>Reference Site:</b>	Piceance 29-07	<b>MD Reference:</b>	Well @ 7520.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance 29-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	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	-126.02	-13.15	-18.09	22.37					
100.00	100.00	100.00	100.00	0.09	0.09	-126.02	-13.15	-18.09	22.37	22.19	0.18	127.584 CC, ES		
200.00	200.00	199.45	199.40	0.31	0.32	-120.21	-11.83	-20.32	23.52	22.89	0.62	37.633		
300.00	300.00	298.36	298.01	0.54	0.57	-106.34	-7.90	-26.94	28.15	27.05	1.10	25.631		
400.00	400.00	396.22	395.03	0.76	0.86	-92.20	-1.45	-37.81	38.16	36.54	1.62	23.572 SF		
500.00	499.98	492.38	489.63	0.98	1.22	-136.39	7.35	-52.63	55.38	53.26	2.11	26.187		
600.00	599.84	586.06	580.83	1.21	1.65	-132.12	18.25	-71.00	80.16	77.52	2.64	30.408		
700.00	699.45	676.63	667.91	1.45	2.14	-130.21	30.94	-92.38	111.71	108.54	3.17	35.238		
800.00	798.70	763.56	750.29	1.71	2.69	-129.33	45.09	-116.23	149.53	145.81	3.72	40.186		
900.00	897.47	846.44	827.58	2.02	3.29	-128.87	60.35	-141.94	193.24	188.95	4.29	45.031		
1,000.00	995.62	924.98	899.57	2.38	3.92	-128.54	76.38	-168.95	242.44	237.56	4.88	49.665		
1,100.00	1,093.06	1,000.00	967.06	2.78	4.58	-128.23	93.09	-197.10	296.77	291.28	5.50	53.977		
1,200.00	1,189.64	1,073.72	1,032.24	3.25	5.29	-127.91	110.67	-226.72	355.57	349.42	6.16	57.742		
1,300.00	1,285.27	1,152.72	1,101.89	3.78	6.07	-127.78	129.69	-258.77	416.59	409.75	6.84	60.865		
1,400.00	1,379.82	1,230.17	1,170.18	4.38	6.84	-127.73	148.34	-290.19	479.40	471.84	7.56	63.401		
1,500.00	1,473.17	1,305.97	1,237.02	5.04	7.60	-127.70	166.59	-320.95	544.00	535.68	8.32	65.413		
1,600.00	1,565.66	1,380.62	1,302.83	5.76	8.35	-128.69	184.57	-351.24	609.85	600.71	9.14	66.734		
1,700.00	1,658.13	1,455.24	1,368.62	6.49	9.10	-129.71	202.54	-381.51	675.86	665.88	9.98	67.696		
1,800.00	1,750.60	1,529.85	1,434.41	7.23	9.85	-130.55	220.50	-411.78	741.98	731.14	10.84	68.448		
1,900.00	1,843.07	1,604.47	1,500.20	7.97	10.60	-131.25	238.47	-442.06	808.17	796.46	11.71	69.044		
2,000.00	1,935.54	1,679.09	1,565.99	8.72	11.36	-131.85	256.44	-472.33	874.42	861.84	12.58	69.516		
2,100.00	2,028.01	1,753.70	1,631.78	9.47	12.11	-132.36	274.41	-502.60	940.71	927.25	13.46	69.902		

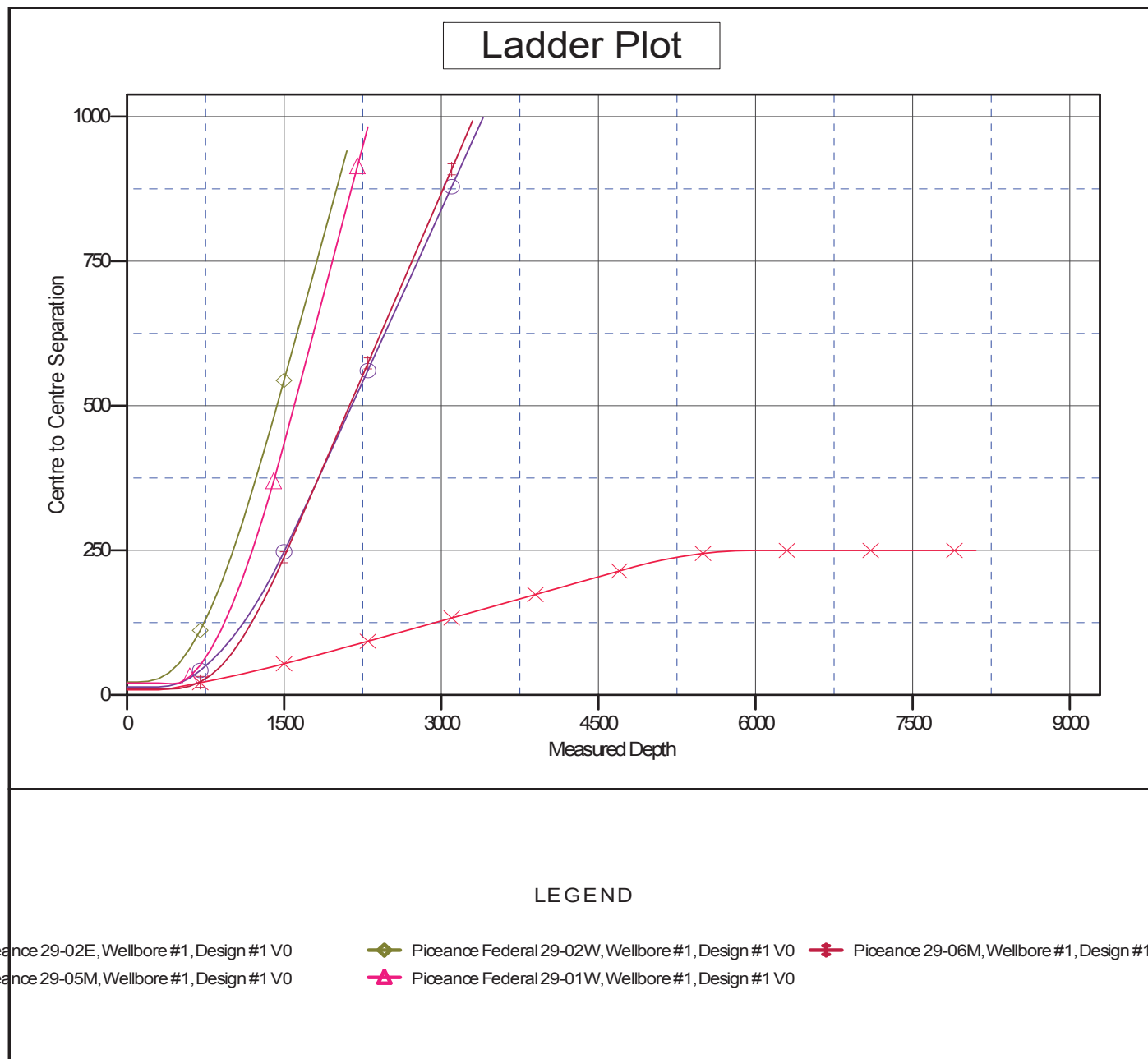
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 29-03E
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 29-03E	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 29-03E  
Coordinate System is US State Plane 1983, Colorado Central Zone  
Grid Convergence at Surface is: -1.45°





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Reference Depths are relative to Well @ 7520.00usft

Offset Depths are relative to Offset Datum

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