



# **Piceance Energy, LLC**

**Mesa County, CO**

**Bruton 30-10 Pad**

**Bruton 30-14E**

**Slot B-3**

**Plan: Design #3**

## **Standard Planning Report**

**24 June, 2015**



Project: Mesa County, CO  
Site: Bruton 30-10 Pad  
Well: Bruton 30-14E  
Wellbore: Slot B-3  
Design: Design #3  
Latitude: 39° 14' 52.800 N  
Longitude: 107° 48' 31.702 W  
Ground Level: 7643.00  
Well @ 7665.00usft

# 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 Bruton 30-14E, True North  
Vertical (TVD) Reference: Well @ 7665.00usft  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: Well @ 7665.00usft  
Calculation Method: Minimum Curvature

### WELL DETAILS: Bruton 30-14E

+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude	Slot
0.00	0.00	1523526.442	2346228.596	39° 14' 52.800 N	107° 48' 31.702 W	

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Bruton 30-14E tgt	7718.00	-750.66	952.00	1522751.828	2347161.216	39° 14' 45.380 N	107° 48' 19.600 W	Circle (Radius: 50.00)

### SECTION DETAILS

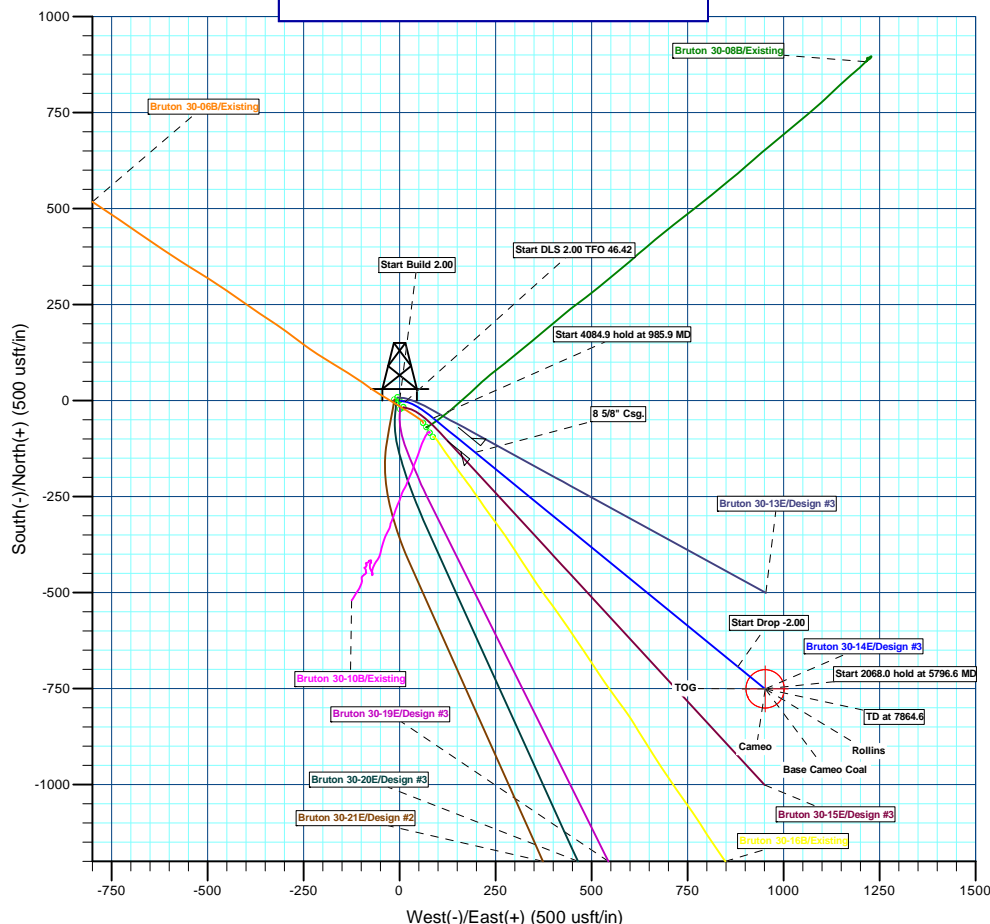
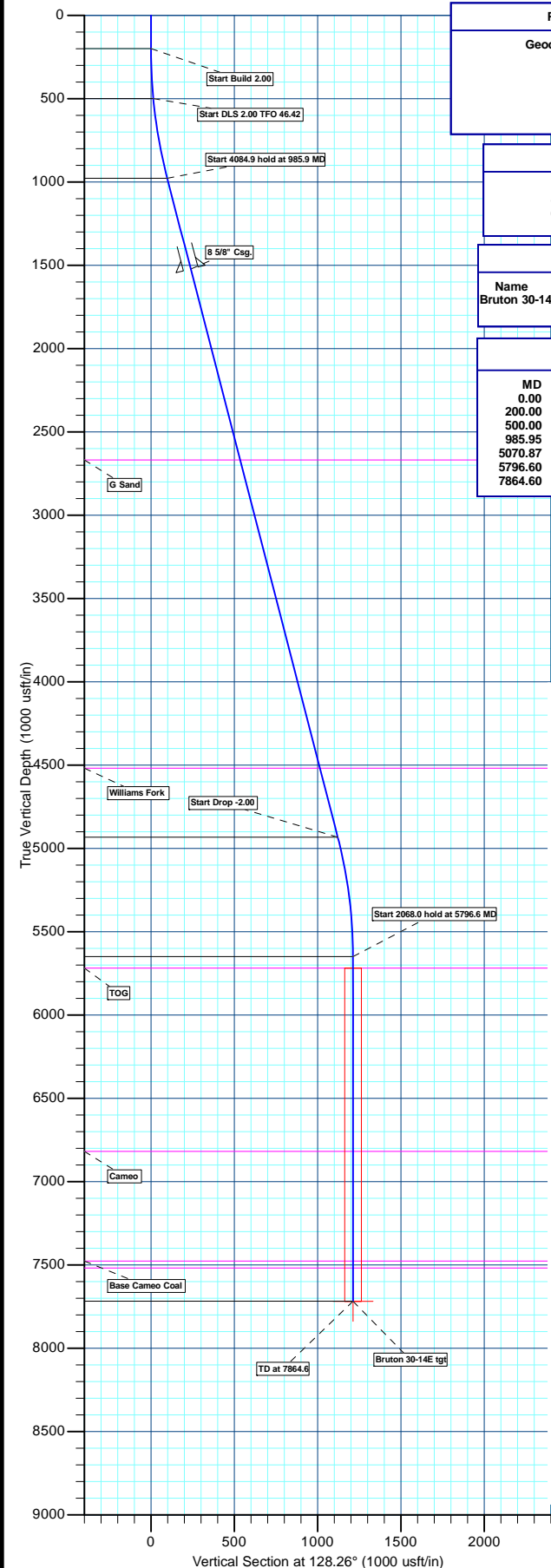
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSection	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	Start DLS 2.00 TFO 46.42
500.00	6.00	100.00	499.45	-2.73	15.46	2.00	100.00	13.82	Start 4084.9 hold at 985.9 MD
985.95	14.51	129.21	977.46	-45.73	87.83	2.00	46.42	97.28	Start Drop -2.00
5070.87	14.51	129.21	4932.01	-692.87	881.15	0.00	0.00	1120.93	Start 2068.0 hold at 5796.6 MD
5796.60	0.00	0.00	5650.00	-750.66	952.00	2.00	180.00	1212.36	TD at 7864.6
7864.60	0.00	0.00	7718.00	-750.66	952.00	0.00	0.00	1212.36	



Azimuths to True North  
Magnetic North: 9.72°  
Magnetic Field  
Strength: 51724.0snT  
Dip Angle: 65.46°  
Date: 06/09/2015  
Model: IGRF2010

### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2668.00	2732.22	G Sand
4518.00	4643.21	Williams Fork
5718.00	5864.60	TOG
6818.00	6964.60	Cameo
7476.00	7622.60	Base Cameo Coal
7518.00	7664.60	Rollins



Plan: Design #3 (Bruton 30-14E/Slot B-3)

Created By: Ricky Osburn Date: 14:16, July 09 2015



## Archer

### Planning Report

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-14E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Slot B-3		
<b>Design:</b>	Design #3		

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

Site		Bruton 30-10 Pad			
Site Position:		Northing:	1,523,574.98 usft	Latitude:	39° 14' 53.270 N
From:	Lat/Long	Easting:	2,346,190.61 usft	Longitude:	107° 48' 32.200 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.46 °

Well	Bruton 30-14E					
Well Position	+N/-S	-47.6 usft	Northing:	1,523,526.44 usft	Latitude:	39° 14' 52.800 N
	+E/-W	39.2 usft	Easting:	2,346,228.60 usft	Longitude:	107° 48' 31.702 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,643.0 usft

<b>Wellbore</b>	Slot B-3				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2015/06/09	9.72	65.46	51,724

<b>Design</b>	Design #3			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	128.26

<b>Plan Sections</b>										
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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	6.00	100.00	499.5	-2.7	15.5	2.00	2.00	0.00	100.00	
985.9	14.51	129.21	977.5	-45.7	87.8	2.00	1.75	6.01	46.42	
5,070.9	14.51	129.21	4,932.0	-692.9	881.2	0.00	0.00	0.00	0.00	
5,796.6	0.00	0.00	5,650.0	-750.7	952.0	2.00	-2.00	0.00	180.00	
7,864.6	0.00	0.00	7,718.0	-750.7	952.0	0.00	0.00	0.00	0.00	Bruton 30-14E tgt



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## Planning Report

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-14E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Slot B-3		
<b>Design:</b>	Design #3		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Start Build 2.00</b>									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	2.00	100.00	300.0	-0.3	1.7	1.5	2.00	2.00	0.00
400.0	4.00	100.00	399.8	-1.2	6.9	6.1	2.00	2.00	0.00
<b>Start DLS 2.00 TFO 46.42</b>									
500.0	6.00	100.00	499.5	-2.7	15.5	13.8	2.00	2.00	0.00
600.0	7.52	111.14	598.8	-6.0	26.7	24.7	2.00	1.52	11.14
700.0	9.22	118.38	697.7	-12.2	39.9	38.8	2.00	1.70	7.24
800.0	11.03	123.32	796.1	-21.2	54.9	56.3	2.00	1.80	4.95
900.0	12.89	126.88	894.0	-33.2	71.8	76.9	2.00	1.86	3.55
<b>Start 4084.9 hold at 985.9 MD</b>									
985.9	14.51	129.21	977.5	-45.7	87.8	97.3	2.00	1.89	2.71
1,000.0	14.51	129.21	991.1	-48.0	90.6	100.8	0.00	0.00	0.00
1,100.0	14.51	129.21	1,087.9	-63.8	110.0	125.9	0.00	0.00	0.00
1,200.0	14.51	129.21	1,184.7	-79.6	129.4	150.9	0.00	0.00	0.00
1,300.0	14.51	129.21	1,281.5	-95.5	148.8	176.0	0.00	0.00	0.00
1,400.0	14.51	129.21	1,378.3	-111.3	168.2	201.0	0.00	0.00	0.00
1,500.0	14.51	129.21	1,475.1	-127.2	187.7	226.1	0.00	0.00	0.00
<b>8 5/8" Csg.</b>									
1,548.4	14.51	129.21	1,522.0	-134.8	197.1	238.2	0.00	0.00	0.00
1,600.0	14.51	129.21	1,571.9	-143.0	207.1	251.2	0.00	0.00	0.00
1,700.0	14.51	129.21	1,668.7	-158.9	226.5	276.2	0.00	0.00	0.00
1,800.0	14.51	129.21	1,765.5	-174.7	245.9	301.3	0.00	0.00	0.00
1,900.0	14.51	129.21	1,862.3	-190.5	265.3	326.3	0.00	0.00	0.00
2,000.0	14.51	129.21	1,959.1	-206.4	284.8	351.4	0.00	0.00	0.00
2,100.0	14.51	129.21	2,056.0	-222.2	304.2	376.5	0.00	0.00	0.00
2,200.0	14.51	129.21	2,152.8	-238.1	323.6	401.5	0.00	0.00	0.00
2,300.0	14.51	129.21	2,249.6	-253.9	343.0	426.6	0.00	0.00	0.00
2,400.0	14.51	129.21	2,346.4	-269.7	362.4	451.6	0.00	0.00	0.00
2,500.0	14.51	129.21	2,443.2	-285.6	381.9	476.7	0.00	0.00	0.00
2,600.0	14.51	129.21	2,540.0	-301.4	401.3	501.8	0.00	0.00	0.00
2,700.0	14.51	129.21	2,636.8	-317.3	420.7	526.8	0.00	0.00	0.00
<b>G Sand</b>									
2,732.2	14.51	129.21	2,668.0	-322.4	427.0	534.9	0.00	0.00	0.00
2,800.0	14.51	129.21	2,733.6	-333.1	440.1	551.9	0.00	0.00	0.00
2,900.0	14.51	129.21	2,830.4	-349.0	459.6	576.9	0.00	0.00	0.00
3,000.0	14.51	129.21	2,927.2	-364.8	479.0	602.0	0.00	0.00	0.00
3,100.0	14.51	129.21	3,024.0	-380.6	498.4	627.0	0.00	0.00	0.00
3,200.0	14.51	129.21	3,120.8	-396.5	517.8	652.1	0.00	0.00	0.00
3,300.0	14.51	129.21	3,217.7	-412.3	537.2	677.2	0.00	0.00	0.00
3,400.0	14.51	129.21	3,314.5	-428.2	556.7	702.2	0.00	0.00	0.00
3,500.0	14.51	129.21	3,411.3	-444.0	576.1	727.3	0.00	0.00	0.00
3,600.0	14.51	129.21	3,508.1	-459.9	595.5	752.3	0.00	0.00	0.00
3,700.0	14.51	129.21	3,604.9	-475.7	614.9	777.4	0.00	0.00	0.00
3,800.0	14.51	129.21	3,701.7	-491.5	634.3	802.5	0.00	0.00	0.00
3,900.0	14.51	129.21	3,798.5	-507.4	653.8	827.5	0.00	0.00	0.00
4,000.0	14.51	129.21	3,895.3	-523.2	673.2	852.6	0.00	0.00	0.00
4,100.0	14.51	129.21	3,992.1	-539.1	692.6	877.6	0.00	0.00	0.00
4,200.0	14.51	129.21	4,088.9	-554.9	712.0	902.7	0.00	0.00	0.00
4,300.0	14.51	129.21	4,185.7	-570.7	731.4	927.8	0.00	0.00	0.00
4,400.0	14.51	129.21	4,282.5	-586.6	750.9	952.8	0.00	0.00	0.00
4,500.0	14.51	129.21	4,379.4	-602.4	770.3	977.9	0.00	0.00	0.00



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## Planning Report

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Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7665.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7665.0usft
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-14E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-3		
Design:	Design #3		

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)
4,600.0	14.51	129.21	4,476.2	-618.3	789.7	1,002.9	0.00	0.00	0.00
Williams Fork									
4,643.2	14.51	129.21	4,518.0	-625.1	798.1	1,013.8	0.00	0.00	0.00
4,700.0	14.51	129.21	4,573.0	-634.1	809.1	1,028.0	0.00	0.00	0.00
4,800.0	14.51	129.21	4,669.8	-650.0	828.5	1,053.1	0.00	0.00	0.00
4,900.0	14.51	129.21	4,766.6	-665.8	848.0	1,078.1	0.00	0.00	0.00
5,000.0	14.51	129.21	4,863.4	-681.6	867.4	1,103.2	0.00	0.00	0.00
Start Drop -2.00									
5,070.9	14.51	129.21	4,932.0	-692.9	881.2	1,120.9	0.00	0.00	0.00
5,100.0	13.93	129.21	4,960.2	-697.4	886.7	1,128.1	2.00	-2.00	0.00
5,200.0	11.93	129.21	5,057.7	-711.5	904.0	1,150.5	2.00	-2.00	0.00
5,300.0	9.93	129.21	5,155.9	-723.5	918.7	1,169.4	2.00	-2.00	0.00
5,400.0	7.93	129.21	5,254.7	-733.3	930.8	1,185.0	2.00	-2.00	0.00
5,500.0	5.93	129.21	5,353.9	-741.0	940.1	1,197.0	2.00	-2.00	0.00
5,600.0	3.93	129.21	5,453.6	-746.4	946.8	1,205.6	2.00	-2.00	0.00
5,700.0	1.93	129.21	5,553.4	-749.6	950.7	1,210.7	2.00	-2.00	0.00
Start 2068.0 hold at 5796.6 MD									
5,796.6	0.00	0.00	5,650.0	-750.7	952.0	1,212.4	2.00	-2.00	0.00
5,800.0	0.00	0.00	5,653.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
TOG									
5,864.6	0.00	0.00	5,718.0	-750.7	952.0	1,212.4	0.00	0.00	0.00
5,900.0	0.00	0.00	5,753.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,853.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,100.0	0.00	0.00	5,953.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,200.0	0.00	0.00	6,053.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,300.0	0.00	0.00	6,153.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,400.0	0.00	0.00	6,253.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,500.0	0.00	0.00	6,353.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,600.0	0.00	0.00	6,453.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,700.0	0.00	0.00	6,553.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,653.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,753.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
Cameo									
6,964.6	0.00	0.00	6,818.0	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,853.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,100.0	0.00	0.00	6,953.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,200.0	0.00	0.00	7,053.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,300.0	0.00	0.00	7,153.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,400.0	0.00	0.00	7,253.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,500.0	0.00	0.00	7,353.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,600.0	0.00	0.00	7,453.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
Base Cameo Coal									
7,622.6	0.00	0.00	7,476.0	-750.7	952.0	1,212.4	0.00	0.00	0.00
Rollins									
7,664.6	0.00	0.00	7,518.0	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,700.0	0.00	0.00	7,553.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
7,800.0	0.00	0.00	7,653.4	-750.7	952.0	1,212.4	0.00	0.00	0.00
TD at 7864.6									
7,864.6	0.00	0.00	7,718.0	-750.7	952.0	1,212.4	0.00	0.00	0.00



# Archer

## Planning Report

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-14E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Slot B-3		
<b>Design:</b>	Design #3		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Bruton 30-14E tgt	0.00	0.00	7,718.0	-750.7	952.0	1,522,751.83	2,347,161.22	39° 14' 45.380 N	107° 48' 19.600 W
- plan hits target center									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,548.4	1,522.0	8 5/8" Csg.	8-5/8	12-1/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,732.2	2,668.0	G Sand		0.00	
4,643.2	4,518.0	Williams Fork		0.00	
5,864.6	5,718.0	TOG		0.00	
6,964.6	6,818.0	Cameo		0.00	
7,622.6	7,476.0	Base Cameo Coal		0.00	
7,664.6	7,518.0	Rollins		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
200.0	200.0	0.0	0.0	Start Build 2.00	
500.0	499.5	-2.7	15.5	Start DLS 2.00 TFO 46.42	
985.9	977.5	-45.7	87.8	Start 4084.9 hold at 985.9 MD	
5,070.9	4,932.0	-692.9	881.2	Start Drop -2.00	
5,796.6	5,650.0	-750.7	952.0	Start 2068.0 hold at 5796.6 MD	
7,864.6	7,718.0	-750.7	952.0	TD at 7864.6	



# **Piceance Energy, LLC**

**Mesa County, CO  
Bruton 30-10 Pad  
Bruton 30-14E**

**Slot B-3  
Design #3**

## **Anticollision Report**

**24 June, 2015**



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Reference	Design #3		
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	2015/06/24		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	7,864.6	Design #3 (Slot B-3)	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						
Bruton 30-10 Pad						
Bruton 30-06B - Existing - Existing	681.9	664.5	22.2	19.1	7.130	CC, ES
Bruton 30-06B - Existing - Existing	700.0	681.5	22.9	19.7	7.110	SF
Bruton 30-08B - Existing - Existing	914.2	885.9	48.1	44.0	11.600	CC, ES
Bruton 30-08B - Existing - Existing	1,000.0	967.7	54.1	49.3	11.355	SF
Bruton 30-10B - Existing - Existing	942.0	911.4	74.0	69.6	16.781	CC, ES
Bruton 30-10B - Existing - Existing	1,100.0	1,066.1	80.7	75.2	14.785	SF
Bruton 30-13E - Slot B-4 - Design #3	200.0	200.0	9.2	8.6	14.732	CC, ES
Bruton 30-13E - Slot B-4 - Design #3	7,864.6	7,835.6	249.9	200.0	5.004	SF
Bruton 30-15E - Slot B-2 - Design #3	200.0	200.0	20.1	19.4	32.121	CC
Bruton 30-15E - Slot B-2 - Design #3	400.0	399.0	20.5	19.0	13.532	ES
Bruton 30-15E - Slot B-2 - Design #3	1,100.0	1,093.5	28.6	22.6	4.791	SF
Bruton 30-16B - Existing - Existing	389.8	365.1	127.7	126.3	89.756	CC
Bruton 30-16B - Existing - Existing	400.0	374.7	127.7	126.2	86.942	ES
Bruton 30-16B - Existing - Existing	5,100.0	4,987.5	731.2	693.2	19.274	SF
Bruton 30-19E - Slot A-2 - Design #3	200.0	200.0	22.3	21.7	35.660	CC, ES
Bruton 30-19E - Slot A-2 - Design #3	1,300.0	1,276.2	159.6	151.1	18.904	SF
Bruton 30-20E - Slot A-3 - Design #3	200.0	200.0	9.9	9.3	15.858	CC, ES
Bruton 30-20E - Slot A-3 - Design #3	300.0	299.7	12.3	11.2	11.539	SF
Bruton 30-21E - Slot A-4 - Design #2	146.2	146.2	13.6	13.2	35.868	CC
Bruton 30-21E - Slot A-4 - Design #2	200.0	199.9	13.8	13.2	22.319	ES
Bruton 30-21E - Slot A-4 - Design #2	300.0	299.3	18.3	17.2	16.545	SF

Offset Design      Bruton 30-10 Pad - Bruton 30-06B - Existing - Existing													Offset Site Error:	0.0 usft
Survey Program:		98-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	18.0	0.0	0.0	133.48	-58.4	61.6	86.8					
100.0	100.0	82.3	100.3	0.1	0.1	133.31	-58.1	61.7	84.7	84.6	0.18	467.157		
200.0	200.0	184.2	202.2	0.3	0.3	132.61	-56.4	61.3	83.4	82.7	0.62	134.919		
300.0	300.0	286.3	304.2	0.5	0.5	32.69	-53.0	58.9	77.9	76.8	1.10	70.769		
400.0	399.8	387.9	405.5	0.7	0.8	35.70	-48.4	53.3	66.4	64.8	1.60	41.474		
500.0	499.5	487.4	504.5	1.0	1.1	44.21	-43.2	45.2	50.5	48.4	2.10	24.088		
600.0	598.8	585.7	602.1	1.3	1.3	54.05	-36.5	35.3	31.9	29.2	2.62	12.153		

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





# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-06B - Existing - Existing													Offset Site Error:	0.0 usft
Survey Program: 98-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		
681.9	679.8	664.5	680.1	1.5	1.6	93.37	-30.0	26.0	22.2	19.1	3.12	7.130 CC, ES		
700.0	697.7	681.5	696.9	1.6	1.7	105.63	-28.5	23.8	22.9	19.7	3.23	7.110 SF		
800.0	796.1	774.7	788.7	1.9	2.0	146.12	-20.5	10.0	45.5	41.8	3.72	12.249		
900.0	894.0	865.5	877.8	2.4	2.4	157.25	-11.5	-5.5	81.9	77.7	4.20	19.485		
1,000.0	991.1	953.4	963.6	2.8	2.7	161.77	-1.5	-21.3	124.2	119.5	4.69	26.504		
1,100.0	1,087.9	1,037.7	1,045.6	3.3	3.1	165.59	9.0	-38.3	170.5	165.4	5.12	33.295		
1,200.0	1,184.7	1,120.4	1,125.3	3.8	3.6	167.80	20.3	-56.6	219.4	213.8	5.57	39.405		
1,300.0	1,281.5	1,203.3	1,205.0	4.3	4.0	169.36	32.7	-76.0	269.9	263.9	6.02	44.845		
1,400.0	1,378.3	1,286.7	1,284.9	4.9	4.5	170.60	46.2	-95.9	321.4	314.9	6.47	49.645		
1,500.0	1,475.1	1,368.7	1,363.2	5.4	5.0	171.53	60.0	-115.8	373.7	366.7	6.93	53.933		
1,600.0	1,571.9	1,451.3	1,441.9	5.9	5.4	172.18	73.9	-136.6	426.7	419.3	7.39	57.751		
1,700.0	1,668.7	1,534.4	1,521.0	6.5	5.9	172.57	87.3	-158.2	480.0	472.2	7.85	61.150		
1,800.0	1,765.5	1,619.0	1,601.5	7.0	6.4	172.79	100.4	-180.8	533.5	525.2	8.32	64.160		
1,900.0	1,862.3	1,704.3	1,682.7	7.5	6.9	173.08	114.3	-202.9	586.9	578.1	8.78	66.810		
2,000.0	1,959.1	1,787.1	1,761.5	8.1	7.4	173.36	128.2	-224.2	640.4	631.1	9.26	69.173		
2,100.0	2,056.0	1,865.7	1,836.2	8.6	7.9	173.67	142.3	-244.3	694.3	684.6	9.73	71.373		
2,200.0	2,152.8	1,945.2	1,911.4	9.1	8.4	174.01	157.5	-264.7	748.9	738.7	10.20	73.389		
2,300.0	2,249.6	2,024.9	1,986.8	9.7	8.9	174.29	172.8	-285.6	803.9	793.2	10.68	75.240		
2,400.0	2,346.4	2,106.4	2,063.9	10.2	9.5	174.53	188.5	-307.3	859.3	848.1	11.17	76.941		
2,500.0	2,443.2	2,190.8	2,143.5	10.7	10.0	174.68	204.1	-330.2	914.7	903.0	11.65	78.495		
2,600.0	2,540.0	2,276.2	2,224.3	11.3	10.5	174.81	219.6	-353.3	969.9	957.7	12.13	79.926		



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-08B - Existing - Existing													Offset Site Error:	0.0 usft
Survey Program: 128-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	18.0	0.0	0.0	134.69	-69.3	70.1	100.2					
100.0	100.0	82.1	100.1	0.1	0.1	134.71	-69.4	70.0	98.6	98.4	0.18	547.699		
165.7	165.7	147.7	165.7	0.2	0.2	134.75	-69.4	70.0	98.5	98.1	0.42	235.089		
200.0	200.0	181.8	199.8	0.3	0.3	134.73	-69.4	70.0	98.5	98.0	0.56	174.466		
300.0	300.0	281.7	299.7	0.5	0.5	35.14	-69.3	70.4	97.4	96.4	1.01	96.698		
400.0	399.8	381.0	399.0	0.7	0.7	36.33	-69.0	71.7	93.8	92.4	1.48	63.538		
500.0	499.5	481.0	498.9	1.0	0.9	37.06	-66.6	75.1	87.4	85.4	1.97	44.338		
600.0	598.8	579.2	596.7	1.3	1.1	24.39	-62.3	82.2	79.0	76.5	2.50	31.628		
700.0	697.7	678.3	695.1	1.6	1.4	11.56	-55.9	92.3	68.3	65.3	3.04	22.471		
800.0	796.1	776.3	791.9	1.9	1.7	-6.33	-46.6	104.7	56.1	52.5	3.57	15.699		
900.0	894.0	872.4	886.1	2.4	2.1	-34.25	-34.9	119.4	48.3	44.2	4.07	11.867		
914.2	907.8	885.9	899.3	2.4	2.1	-38.94	-33.1	121.7	48.1	44.0	4.15	11.600 CC, ES		
1,000.0	991.1	967.7	978.9	2.8	2.5	-66.98	-21.4	136.1	54.1	49.3	4.76	11.355 SF		
1,100.0	1,087.9	1,062.4	1,071.2	3.3	2.8	-87.96	-8.2	153.1	72.3	66.7	5.65	12.793		
1,200.0	1,184.7	1,155.7	1,161.6	3.8	3.3	-100.14	7.1	170.3	98.6	92.1	6.52	15.121		
1,300.0	1,281.5	1,249.0	1,251.8	4.3	3.7	-107.29	23.4	187.5	128.5	121.2	7.36	17.461		
1,400.0	1,378.3	1,342.3	1,341.7	4.9	4.2	-111.53	40.5	205.6	160.5	152.3	8.19	19.610		
1,500.0	1,475.1	1,437.4	1,433.3	5.4	4.7	-114.17	57.7	224.8	193.1	184.1	9.01	21.427		
1,600.0	1,571.9	1,533.4	1,525.7	5.9	5.1	-115.78	74.1	245.0	225.1	215.3	9.84	22.889		
1,700.0	1,668.7	1,628.9	1,617.7	6.5	5.6	-117.00	90.1	265.0	257.0	246.3	10.65	24.134		
1,800.0	1,765.5	1,724.0	1,709.4	7.0	6.1	-118.01	105.6	284.5	288.5	277.0	11.47	25.154		
1,900.0	1,862.3	1,814.7	1,796.7	7.5	6.5	-118.64	120.8	304.0	320.5	308.2	12.30	26.059		
2,000.0	1,959.1	1,903.0	1,881.3	8.1	7.0	-119.08	137.2	323.5	354.4	341.2	13.15	26.956		
2,100.0	2,056.0	1,995.1	1,969.1	8.6	7.6	-119.31	155.0	344.8	389.2	375.2	14.01	27.781		
2,200.0	2,152.8	2,091.2	2,060.7	9.1	8.1	-119.51	173.4	367.2	423.9	409.0	14.87	28.498		
2,300.0	2,249.6	2,185.6	2,151.0	9.7	8.6	-119.77	191.2	388.3	458.1	442.4	15.72	29.135		
2,400.0	2,346.4	2,277.7	2,238.9	10.2	9.1	-119.94	208.8	409.4	492.7	476.2	16.58	29.722		
2,500.0	2,443.2	2,374.6	2,331.5	10.7	9.7	-120.12	227.1	431.3	527.0	509.5	17.46	30.189		
2,600.0	2,540.0	2,469.9	2,422.5	11.3	10.2	-120.21	244.8	453.4	561.1	542.8	18.33	30.613		
2,700.0	2,636.8	2,568.9	2,517.2	11.8	10.7	-120.31	262.4	476.2	594.5	575.2	19.23	30.920		
2,800.0	2,733.6	2,658.8	2,603.2	12.3	11.3	-120.35	278.3	497.3	627.8	607.7	20.09	31.248		
2,900.0	2,830.4	2,746.0	2,686.3	12.9	11.8	-120.39	294.8	517.8	662.2	641.3	20.95	31.613		
3,000.0	2,927.2	2,843.1	2,779.0	13.4	12.3	-120.44	313.0	540.5	696.5	674.7	21.84	31.893		
3,100.0	3,024.0	2,927.6	2,859.5	14.0	12.8	-120.50	329.5	560.0	731.6	708.9	22.67	32.265		
3,200.0	3,120.8	3,031.0	2,958.1	14.5	13.4	-120.58	349.4	583.8	766.3	742.7	23.59	32.489		
3,300.0	3,217.7	3,122.6	3,045.6	15.0	13.9	-120.66	366.9	604.6	800.9	776.4	24.44	32.763		
3,400.0	3,314.5	3,223.6	3,142.3	15.6	14.5	-120.81	385.8	626.6	834.9	809.6	25.33	32.959		
3,500.0	3,411.3	3,315.2	3,230.1	16.1	15.0	-120.93	402.8	646.6	868.8	842.6	26.19	33.177		
3,600.0	3,508.1	3,405.0	3,316.0	16.6	15.5	-121.02	419.8	666.4	903.2	876.2	27.04	33.396		
3,700.0	3,604.9	3,512.2	3,418.6	17.2	16.1	-121.10	439.3	690.5	936.9	908.9	27.97	33.494		
3,800.0	3,701.7	3,607.2	3,509.7	17.7	16.6	-121.17	456.1	711.7	970.0	941.1	28.84	33.631		



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-10B - Existing - Existing													Offset Site Error:	0.0 usft
Survey Program: 130-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	18.0	0.0	0.0	136.88	-83.9	78.6	116.4					
100.0	100.0	82.7	100.7	0.1	0.1	136.72	-83.5	78.6	114.7	114.5	0.18	627.763		
200.0	200.0	183.4	201.4	0.3	0.3	136.19	-82.1	78.7	113.7	113.2	0.58	197.710		
300.0	300.0	283.7	301.7	0.5	0.5	36.75	-81.1	77.8	110.9	109.9	1.03	107.851		
400.0	399.8	382.1	400.0	0.7	0.7	39.50	-81.7	75.8	106.0	104.5	1.49	71.327		
500.0	499.5	480.9	498.8	1.0	0.9	44.83	-84.0	73.0	99.6	97.7	1.96	50.854		
600.0	598.8	578.5	596.3	1.3	1.1	41.23	-87.9	69.8	92.6	90.1	2.46	37.595		
700.0	697.7	676.1	693.6	1.6	1.3	43.07	-93.1	67.1	85.5	82.5	2.98	28.690		
800.0	796.1	773.7	791.0	1.9	1.6	49.79	-99.3	64.3	78.8	75.2	3.53	22.298		
900.0	894.0	870.7	887.7	2.4	1.8	61.51	-106.5	60.5	74.5	70.4	4.14	18.009		
942.0	934.8	911.4	928.2	2.5	1.9	67.60	-109.8	59.0	74.0	69.6	4.41	16.781	CC, ES	
1,000.0	991.1	968.0	984.6	2.8	2.1	76.63	-114.5	57.1	74.8	70.0	4.79	15.610		
1,100.0	1,087.9	1,066.1	1,082.4	3.3	2.3	93.10	-122.3	54.7	80.7	75.2	5.46	14.785	SF	
1,200.0	1,184.7	1,163.8	1,179.9	3.8	2.5	106.89	-128.8	52.6	91.3	85.2	6.08	15.013		
1,300.0	1,281.5	1,260.5	1,276.3	4.3	2.7	117.46	-135.1	50.4	106.2	99.5	6.66	15.950		
1,400.0	1,378.3	1,357.7	1,373.3	4.9	3.0	125.26	-141.7	47.8	124.3	117.1	7.20	17.257		
1,500.0	1,475.1	1,455.3	1,470.6	5.4	3.2	131.12	-148.2	45.6	143.6	135.9	7.72	18.600		
1,600.0	1,571.9	1,552.3	1,567.4	5.9	3.4	135.73	-154.0	43.4	164.1	155.9	8.22	19.958		
1,700.0	1,668.7	1,649.1	1,664.0	6.5	3.6	139.39	-159.7	41.1	185.5	176.7	8.72	21.265		
1,800.0	1,765.5	1,746.8	1,761.5	7.0	3.9	142.16	-165.9	38.7	207.5	198.2	9.23	22.473		
1,900.0	1,862.3	1,844.8	1,859.3	7.5	4.1	144.47	-171.9	36.7	229.4	219.6	9.74	23.550		
2,000.0	1,959.1	1,941.6	1,955.9	8.1	4.3	146.38	-177.7	35.0	251.5	241.2	10.25	24.544		
2,100.0	2,056.0	2,038.1	2,052.2	8.6	4.5	148.10	-183.0	33.0	274.1	263.3	10.74	25.508		
2,200.0	2,152.8	2,134.6	2,148.5	9.1	4.8	149.56	-188.2	30.8	297.1	285.8	11.25	26.411		
2,300.0	2,249.6	2,231.6	2,245.4	9.7	5.0	150.78	-193.5	28.4	320.3	308.6	11.76	27.250		
2,400.0	2,346.4	2,329.1	2,342.7	10.2	5.2	151.85	-198.9	26.2	343.7	331.4	12.27	28.021		
2,500.0	2,443.2	2,426.2	2,439.6	10.7	5.5	152.78	-204.3	24.0	367.0	354.2	12.78	28.728		
2,600.0	2,540.0	2,523.5	2,536.8	11.3	5.7	153.63	-209.5	21.9	390.4	377.1	13.28	29.391		
2,700.0	2,636.8	2,621.3	2,634.4	11.8	5.9	154.39	-214.7	19.8	413.8	400.0	13.80	29.993		
2,800.0	2,733.6	2,715.3	2,728.2	12.3	6.1	155.04	-219.8	17.7	437.4	423.1	14.30	30.579		
2,900.0	2,830.4	2,808.8	2,821.6	12.9	6.3	155.58	-224.8	14.8	461.8	447.0	14.82	31.169		
3,000.0	2,927.2	2,907.2	2,919.7	13.4	6.6	156.00	-230.8	11.2	486.6	471.3	15.35	31.693		
3,100.0	3,024.0	3,006.6	3,018.9	14.0	6.8	156.29	-237.8	7.9	510.9	495.0	15.91	32.114		
3,200.0	3,120.8	3,107.5	3,119.3	14.5	7.1	156.51	-245.5	4.9	534.7	518.2	16.47	32.456		
3,300.0	3,217.7	3,203.2	3,214.8	15.0	7.3	156.75	-252.4	2.5	558.1	541.1	17.01	32.802		
3,400.0	3,314.5	3,301.5	3,312.8	15.6	7.6	157.05	-258.8	0.2	581.7	564.1	17.55	33.145		
3,500.0	3,411.3	3,395.3	3,406.5	16.1	7.8	157.36	-264.4	-2.1	605.4	587.3	18.07	33.502		
3,600.0	3,508.1	3,491.5	3,502.5	16.6	8.0	157.64	-270.1	-4.7	629.5	610.9	18.60	33.846		
3,700.0	3,604.9	3,592.2	3,602.9	17.2	8.2	157.86	-276.8	-7.5	653.4	634.3	19.15	34.119		
3,800.0	3,701.7	3,688.5	3,698.9	17.7	8.5	157.97	-284.1	-10.2	677.1	657.4	19.71	34.353		
3,900.0	3,798.5	3,789.7	3,799.7	18.3	8.8	158.04	-292.4	-13.0	700.5	680.3	20.29	34.526		
4,000.0	3,895.3	3,886.3	3,896.0	18.8	9.0	158.15	-299.8	-15.2	723.8	702.9	20.84	34.721		
4,100.0	3,992.1	3,980.4	3,989.9	19.3	9.2	158.30	-306.3	-17.4	747.2	725.8	21.38	34.946		
4,200.0	4,088.9	4,074.1	4,083.2	19.9	9.5	158.36	-313.6	-20.4	771.2	749.2	21.94	35.151		
4,300.0	4,185.7	4,180.2	4,188.9	20.4	9.7	158.41	-322.3	-23.4	794.7	772.1	22.53	35.275		
4,400.0	4,282.5	4,277.6	4,286.1	21.0	10.0	158.58	-328.7	-25.0	817.6	794.5	23.06	35.451		
4,500.0	4,379.4	4,368.0	4,376.3	21.5	10.2	158.79	-333.8	-26.7	841.0	817.5	23.57	35.680		
4,600.0	4,476.2	4,460.1	4,468.3	22.0	10.4	158.99	-338.7	-28.9	865.1	841.0	24.09	35.919		
4,700.0	4,573.0	4,551.0	4,559.0	22.6	10.6	159.16	-343.6	-31.9	889.9	865.3	24.60	36.173		
4,800.0	4,669.8	4,656.1	4,663.9	23.1	10.9	159.31	-349.9	-35.2	914.4	889.3	25.16	36.349		
4,900.0	4,766.6	4,756.1	4,763.6	23.7	11.1	159.41	-356.6	-38.1	938.5	912.8	25.71	36.501		
5,000.0	4,863.4	4,857.6	4,864.7	24.2	11.4	159.45	-364.5	-40.8	962.0	935.7	26.28	36.600		

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



# Archer

## Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-14E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.0usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Bruton 30-14E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-3	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design		Bruton 30-10 Pad - Bruton 30-10B - Existing - Existing										Offset Site Error:	0.0 usft
Survey Program:		130-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)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.0	4,960.2	4,954.8	4,961.6	24.7	11.6	159.52	-372.1	-43.5	985.4	958.6	26.85	36.696	



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-13E - Slot B-4 - Design #3													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	-29.49	8.0	-4.5	9.2					
100.0	100.0	100.0	100.0	0.1	0.1	-29.49	8.0	-4.5	9.2	9.0	0.18	52.506		
200.0	200.0	200.0	200.0	0.3	0.3	-29.49	8.0	-4.5	9.2	8.6	0.62	14.732 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	-136.91	8.0	-4.5	10.4	9.3	1.08	9.622		
400.0	399.8	400.2	400.2	0.7	0.8	-146.79	7.9	-2.8	13.3	11.7	1.55	8.541		
500.0	499.5	500.6	500.4	1.0	1.0	-152.11	7.4	2.5	16.5	14.5	2.04	8.101		
600.0	598.8	601.1	600.5	1.3	1.2	-162.01	6.6	11.2	20.1	17.5	2.54	7.910		
700.0	697.7	701.7	700.5	1.6	1.5	-164.09	4.4	22.9	23.9	20.8	3.05	7.815		
800.0	796.1	802.5	800.2	1.9	1.8	-164.03	-0.4	37.1	27.7	24.1	3.60	7.701		
900.0	894.0	903.5	899.4	2.4	2.1	-162.69	-7.7	53.6	31.7	27.5	4.19	7.564		
1,000.0	991.1	1,004.4	998.0	2.8	2.6	-160.28	-17.6	72.6	35.9	31.1	4.84	7.423		
1,100.0	1,087.9	1,104.2	1,095.4	3.3	3.0	-156.32	-28.4	92.2	40.3	34.8	5.51	7.323		
1,200.0	1,184.7	1,204.1	1,192.7	3.8	3.4	-153.16	-39.1	111.8	44.9	38.7	6.23	7.207		
1,300.0	1,281.5	1,304.0	1,290.0	4.3	3.9	-150.58	-49.9	131.4	49.6	42.6	6.99	7.091		
1,400.0	1,378.3	1,403.8	1,387.4	4.9	4.4	-148.45	-60.6	151.0	54.3	46.5	7.78	6.981		
1,500.0	1,475.1	1,503.7	1,484.7	5.4	4.9	-146.66	-71.4	170.6	59.1	50.5	8.60	6.881		
1,600.0	1,571.9	1,603.6	1,582.0	5.9	5.3	-145.15	-82.1	190.2	64.0	54.6	9.43	6.791		
1,700.0	1,668.7	1,703.4	1,679.4	6.5	5.8	-143.85	-92.8	209.8	68.9	58.6	10.27	6.710		
1,800.0	1,765.5	1,803.3	1,776.7	7.0	6.3	-142.72	-103.6	229.4	73.8	62.7	11.12	6.638		
1,900.0	1,862.3	1,903.2	1,874.0	7.5	6.8	-141.74	-114.3	249.0	78.8	66.8	11.99	6.574		
2,000.0	1,959.1	2,003.0	1,971.4	8.1	7.2	-140.87	-125.1	268.6	83.8	70.9	12.86	6.517		
2,100.0	2,056.0	2,102.9	2,068.7	8.6	7.7	-140.10	-135.8	288.3	88.8	75.1	13.73	6.466		
2,200.0	2,152.8	2,202.8	2,166.0	9.1	8.2	-139.41	-146.6	307.9	93.8	79.2	14.61	6.421		
2,300.0	2,249.6	2,302.6	2,263.4	9.7	8.7	-138.79	-157.3	327.5	98.8	83.3	15.49	6.379		
2,400.0	2,346.4	2,402.5	2,360.7	10.2	9.2	-138.23	-168.0	347.1	103.8	87.5	16.37	6.342		
2,500.0	2,443.2	2,502.4	2,458.0	10.7	9.7	-137.72	-178.8	366.7	108.9	91.6	17.26	6.308		
2,600.0	2,540.0	2,602.3	2,555.4	11.3	10.2	-137.26	-189.5	386.3	113.9	95.8	18.15	6.277		
2,700.0	2,636.8	2,702.1	2,652.7	11.8	10.6	-136.84	-200.3	405.9	119.0	100.0	19.04	6.249		
2,800.0	2,733.6	2,802.0	2,750.0	12.3	11.1	-136.45	-211.0	425.5	124.1	104.1	19.94	6.223		
2,900.0	2,830.4	2,901.9	2,847.4	12.9	11.6	-136.09	-221.8	445.1	129.1	108.3	20.83	6.199		
3,000.0	2,927.2	3,001.7	2,944.7	13.4	12.1	-135.76	-232.5	464.7	134.2	112.5	21.73	6.177		
3,100.0	3,024.0	3,101.6	3,042.0	14.0	12.6	-135.45	-243.2	484.3	139.3	116.7	22.62	6.156		
3,200.0	3,120.8	3,201.5	3,139.4	14.5	13.1	-135.17	-254.0	503.9	144.4	120.8	23.52	6.137		
3,300.0	3,217.7	3,301.3	3,236.7	15.0	13.6	-134.90	-264.7	523.5	149.4	125.0	24.42	6.120		
3,400.0	3,314.5	3,401.2	3,334.0	15.6	14.1	-134.65	-275.5	543.2	154.5	129.2	25.32	6.103		
3,500.0	3,411.3	3,501.1	3,431.4	16.1	14.5	-134.42	-286.2	562.8	159.6	133.4	26.22	6.088		
3,600.0	3,508.1	3,600.9	3,528.7	16.6	15.0	-134.20	-297.0	582.4	164.7	137.6	27.12	6.074		
3,700.0	3,604.9	3,700.8	3,626.0	17.2	15.5	-134.00	-307.7	602.0	169.8	141.8	28.02	6.060		
3,800.0	3,701.7	3,800.7	3,723.4	17.7	16.0	-133.81	-318.5	621.6	174.9	146.0	28.92	6.048		
3,900.0	3,798.5	3,900.5	3,820.7	18.3	16.5	-133.62	-329.2	641.2	180.0	150.2	29.82	6.036		
4,000.0	3,895.3	4,000.4	3,918.0	18.8	17.0	-133.45	-339.9	660.8	185.1	154.4	30.73	6.024		
4,100.0	3,992.1	4,100.3	4,015.4	19.3	17.5	-133.29	-350.7	680.4	190.2	158.6	31.63	6.014		
4,200.0	4,088.9	4,200.1	4,112.7	19.9	18.0	-133.13	-361.4	700.0	195.3	162.8	32.53	6.004		
4,300.0	4,185.7	4,300.0	4,210.0	20.4	18.4	-132.99	-372.2	719.6	200.4	167.0	33.43	5.994		
4,400.0	4,282.5	4,399.9	4,307.4	21.0	18.9	-132.85	-382.9	739.2	205.5	171.2	34.34	5.985		
4,500.0	4,379.4	4,499.8	4,404.7	21.5	19.4	-132.72	-393.7	758.8	210.6	175.4	35.24	5.977		
4,600.0	4,476.2	4,599.6	4,502.0	22.0	19.9	-132.59	-404.4	778.5	215.7	179.6	36.14	5.969		
4,700.0	4,573.0	4,699.5	4,599.4	22.6	20.4	-132.47	-415.1	798.1	220.8	183.8	37.05	5.961		
4,800.0	4,669.8	4,799.4	4,696.7	23.1	20.9	-132.35	-425.9	817.7	225.9	188.0	37.95	5.953		
4,900.0	4,766.6	4,899.2	4,794.0	23.7	21.4	-132.24	-436.6	837.3	231.1	192.2	38.86	5.946		
5,000.0	4,863.4	4,999.1	4,891.4	24.2	21.9	-132.14	-447.4	856.9	236.2	196.4	39.76	5.940		
5,100.0	4,960.2	5,099.0	4,988.7	24.7	22.3	-132.03	-458.1	876.5	241.2	200.5	40.66	5.931		

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



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-13E - Slot B-4 - Design #3													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)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,200.0	5,057.7	5,197.7	5,084.9	25.1	22.8	-131.54	-468.7	895.8	244.5	203.0	41.57	5.882		
5,300.0	5,155.9	5,293.4	5,178.8	25.4	23.1	-130.95	-477.8	912.4	246.9	204.5	42.36	5.828		
5,400.0	5,254.7	5,389.2	5,273.2	25.7	23.4	-130.41	-485.4	926.3	248.7	205.6	43.04	5.777		
5,500.0	5,353.9	5,485.0	5,368.2	25.9	23.7	-129.93	-491.5	937.4	249.9	206.3	43.63	5.727		
5,600.0	5,453.6	5,580.9	5,463.6	26.1	23.9	-129.49	-496.1	945.8	250.5	206.4	44.13	5.678		
5,700.0	5,553.4	5,676.8	5,559.3	26.2	24.0	-129.09	-499.1	951.3	250.6	206.1	44.53	5.628		
5,800.0	5,653.4	5,772.8	5,655.2	26.3	24.1	0.47	-500.6	954.0	250.1	205.2	44.84	5.577		
5,862.4	5,715.8	5,833.3	5,715.8	26.4	24.2	0.54	-500.8	954.4	249.9	204.9	45.00	5.553		
5,900.0	5,753.4	5,871.0	5,753.4	26.4	24.2	0.54	-500.8	954.4	249.9	204.8	45.08	5.543		
6,000.0	5,853.4	5,971.0	5,853.4	26.5	24.3	0.54	-500.8	954.4	249.9	204.6	45.30	5.516		
6,100.0	5,953.4	6,071.0	5,953.4	26.6	24.4	0.54	-500.8	954.4	249.9	204.4	45.52	5.489		
6,200.0	6,053.4	6,171.0	6,053.4	26.7	24.6	0.54	-500.8	954.4	249.9	204.2	45.75	5.462		
6,300.0	6,153.4	6,271.0	6,153.4	26.8	24.7	0.54	-500.8	954.4	249.9	203.9	45.98	5.435		
6,400.0	6,253.4	6,371.0	6,253.4	26.9	24.8	0.54	-500.8	954.4	249.9	203.7	46.21	5.408		
6,500.0	6,353.4	6,471.0	6,353.4	27.0	24.9	0.54	-500.8	954.4	249.9	203.5	46.45	5.380		
6,600.0	6,453.4	6,571.0	6,453.4	27.1	25.0	0.54	-500.8	954.4	249.9	203.2	46.69	5.353		
6,700.0	6,553.4	6,671.0	6,553.4	27.2	25.1	0.54	-500.8	954.4	249.9	203.0	46.93	5.325		
6,800.0	6,653.4	6,771.0	6,653.4	27.3	25.2	0.54	-500.8	954.4	249.9	202.7	47.18	5.297		
6,900.0	6,753.4	6,871.0	6,753.4	27.4	25.3	0.54	-500.8	954.4	249.9	202.5	47.43	5.269		
7,000.0	6,853.4	6,971.0	6,853.4	27.5	25.5	0.54	-500.8	954.4	249.9	202.2	47.68	5.242		
7,100.0	6,953.4	7,071.0	6,953.4	27.6	25.6	0.54	-500.8	954.4	249.9	202.0	47.93	5.214		
7,200.0	7,053.4	7,171.0	7,053.4	27.7	25.7	0.54	-500.8	954.4	249.9	201.7	48.19	5.186		
7,300.0	7,153.4	7,271.0	7,153.4	27.9	25.8	0.54	-500.8	954.4	249.9	201.5	48.45	5.158		
7,400.0	7,253.4	7,371.0	7,253.4	28.0	25.9	0.54	-500.8	954.4	249.9	201.2	48.71	5.130		
7,500.0	7,353.4	7,471.0	7,353.4	28.1	26.1	0.54	-500.8	954.4	249.9	200.9	48.98	5.103		
7,600.0	7,453.4	7,571.0	7,453.4	28.2	26.2	0.54	-500.8	954.4	249.9	200.7	49.24	5.075		
7,700.0	7,553.4	7,671.0	7,553.4	28.3	26.3	0.54	-500.8	954.4	249.9	200.4	49.51	5.047		
7,800.0	7,653.4	7,771.0	7,653.4	28.4	26.5	0.54	-500.8	954.4	249.9	200.1	49.79	5.019		
7,864.6	7,718.0	7,835.6	7,718.0	28.5	26.5	0.54	-500.8	954.4	249.9	200.0	49.94	5.004 SF		



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-15E - Slot B-2 - Design #3													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	0.0	0.0	0.0	148.53	-17.1	10.5	20.1					
100.0	100.0	100.0	100.0	0.1	0.1	148.53	-17.1	10.5	20.1	19.9	0.18	114.481		
200.0	200.0	200.0	200.0	0.3	0.3	148.53	-17.1	10.5	20.1	19.4	0.62	32.121 CC		
300.0	300.0	299.5	299.5	0.5	0.5	48.84	-17.6	12.1	20.2	19.1	1.06	19.002		
400.0	399.8	399.0	398.8	0.7	0.7	49.77	-18.9	17.2	20.5	19.0	1.51	13.532 ES		
500.0	499.5	498.5	497.9	1.0	1.0	51.24	-21.1	25.5	21.0	19.0	2.00	10.487		
600.0	598.8	597.7	596.5	1.3	1.3	42.24	-25.3	36.3	21.7	19.1	2.54	8.521		
700.0	697.7	697.0	694.7	1.6	1.6	37.97	-32.5	48.6	22.3	19.2	3.11	7.190		
800.0	796.1	796.2	792.4	1.9	1.9	36.71	-42.7	62.5	23.1	19.4	3.72	6.210		
900.0	894.0	895.3	889.5	2.4	2.3	37.47	-56.0	77.9	24.0	19.6	4.40	5.458		
1,000.0	991.1	994.5	985.8	2.8	2.8	39.87	-72.2	94.8	25.2	20.0	5.17	4.874		
1,100.0	1,087.9	1,093.5	1,081.2	3.3	3.3	42.84	-91.4	113.1	28.6	22.6	5.97	4.791 SF		
1,200.0	1,184.7	1,193.4	1,176.9	3.8	3.9	44.03	-112.4	132.4	33.8	27.0	6.80	4.975		
1,300.0	1,281.5	1,293.2	1,272.6	4.3	4.4	44.91	-133.4	151.7	39.0	31.4	7.64	5.107		
1,400.0	1,378.3	1,393.1	1,368.3	4.9	5.0	45.58	-154.3	171.0	44.2	35.7	8.50	5.205		
1,500.0	1,475.1	1,493.0	1,464.0	5.4	5.6	46.11	-175.3	190.3	49.4	40.1	9.37	5.280		
1,600.0	1,571.9	1,592.8	1,559.7	5.9	6.2	46.54	-196.2	209.6	54.7	44.4	10.24	5.338		
1,700.0	1,668.7	1,692.7	1,655.5	6.5	6.8	46.89	-217.2	229.0	59.9	48.8	11.12	5.384		
1,800.0	1,765.5	1,792.6	1,751.2	7.0	7.4	47.19	-238.2	248.3	65.1	53.1	12.01	5.421		
1,900.0	1,862.3	1,892.4	1,846.9	7.5	8.0	47.44	-259.1	267.6	70.3	57.4	12.90	5.452		
2,000.0	1,959.1	1,992.3	1,942.6	8.1	8.6	47.66	-280.1	286.9	75.6	61.8	13.79	5.478		
2,100.0	2,056.0	2,092.1	2,038.3	8.6	9.1	47.85	-301.0	306.2	80.8	66.1	14.69	5.500		
2,200.0	2,152.8	2,192.0	2,134.0	9.1	9.7	48.02	-322.0	325.5	86.0	70.4	15.59	5.519		
2,300.0	2,249.6	2,291.9	2,229.7	9.7	10.3	48.16	-343.0	344.8	91.3	74.8	16.49	5.535		
2,400.0	2,346.4	2,391.7	2,325.4	10.2	10.9	48.30	-363.9	364.1	96.5	79.1	17.39	5.550		
2,500.0	2,443.2	2,491.6	2,421.1	10.7	11.5	48.41	-384.9	383.4	101.7	83.4	18.29	5.562		
2,600.0	2,540.0	2,591.5	2,516.9	11.3	12.1	48.52	-405.8	402.7	106.9	87.8	19.19	5.573		
2,700.0	2,636.8	2,691.3	2,612.6	11.8	12.7	48.62	-426.8	422.0	112.2	92.1	20.09	5.583		
2,800.0	2,733.6	2,791.2	2,708.3	12.3	13.3	48.71	-447.8	441.3	117.4	96.4	21.00	5.592		
2,900.0	2,830.4	2,891.0	2,804.0	12.9	13.9	48.79	-468.7	460.6	122.6	100.7	21.90	5.599		
3,000.0	2,927.2	2,990.9	2,899.7	13.4	14.5	48.86	-489.7	479.9	127.9	105.1	22.81	5.607		
3,100.0	3,024.0	3,090.8	2,995.4	14.0	15.1	48.93	-510.6	499.2	133.1	109.4	23.71	5.613		
3,200.0	3,120.8	3,190.6	3,091.1	14.5	15.7	48.99	-531.6	518.5	138.3	113.7	24.62	5.619		
3,300.0	3,217.7	3,290.5	3,186.8	15.0	16.4	49.05	-552.6	537.8	143.6	118.1	25.53	5.624		
3,400.0	3,314.5	3,390.4	3,282.5	15.6	17.0	49.10	-573.5	557.1	148.8	122.4	26.44	5.629		
3,500.0	3,411.3	3,490.2	3,378.3	16.1	17.6	49.15	-594.5	576.4	154.0	126.7	27.34	5.634		
3,600.0	3,508.1	3,590.1	3,474.0	16.6	18.2	49.20	-615.4	595.7	159.3	131.0	28.25	5.638		
3,700.0	3,604.9	3,690.0	3,569.7	17.2	18.8	49.24	-636.4	615.0	164.5	135.4	29.16	5.642		
3,800.0	3,701.7	3,789.8	3,665.4	17.7	19.4	49.29	-657.4	634.3	169.7	139.7	30.07	5.646		
3,900.0	3,798.5	3,889.7	3,761.1	18.3	20.0	49.33	-678.3	653.6	175.0	144.0	30.98	5.649		
4,000.0	3,895.3	3,989.5	3,856.8	18.8	20.6	49.36	-699.3	673.0	180.2	148.3	31.88	5.652		
4,100.0	3,992.1	4,089.4	3,952.5	19.3	21.2	49.40	-720.2	692.3	185.4	152.7	32.79	5.655		
4,200.0	4,088.9	4,189.3	4,048.2	19.9	21.8	49.43	-741.2	711.6	190.7	157.0	33.70	5.658		
4,300.0	4,185.7	4,289.1	4,143.9	20.4	22.4	49.46	-762.2	730.9	195.9	161.3	34.61	5.660		
4,400.0	4,282.5	4,389.0	4,239.7	21.0	23.0	49.49	-783.1	750.2	201.2	165.6	35.52	5.663		
4,500.0	4,379.4	4,488.9	4,335.4	21.5	23.6	49.52	-804.1	769.5	206.4	170.0	36.43	5.665		
4,600.0	4,476.2	4,588.7	4,431.1	22.0	24.2	49.54	-825.0	788.8	211.6	174.3	37.34	5.667		
4,700.0	4,573.0	4,688.6	4,526.8	22.6	24.8	49.57	-846.0	808.1	216.9	178.6	38.25	5.669		
4,800.0	4,669.8	4,788.4	4,622.5	23.1	25.4	49.59	-867.0	827.4	222.1	182.9	39.16	5.671		
4,900.0	4,766.6	4,888.3	4,718.2	23.7	26.0	49.62	-887.9	846.7	227.3	187.3	40.07	5.673		
5,000.0	4,863.4	4,988.2	4,813.9	24.2	26.6	49.64	-908.9	866.0	232.6	191.6	40.98	5.675		
5,100.0	4,960.2	5,093.3	4,915.0	24.7	27.1	49.85	-930.0	885.5	237.0	195.1	41.92	5.653		

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



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-15E - Slot B-2 - Design #3													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)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,200.0	5,057.7	5,199.8	5,018.5	25.1	27.6	50.21	-948.7	902.7	240.4	197.7	42.71	5.629		
5,300.0	5,155.9	5,306.4	5,122.9	25.4	27.9	50.51	-964.6	917.3	243.3	199.9	43.39	5.607		
5,400.0	5,254.7	5,413.1	5,228.1	25.7	28.2	50.74	-977.6	929.3	245.7	201.7	43.98	5.587		
5,500.0	5,353.9	5,519.8	5,333.9	25.9	28.5	50.93	-987.7	938.6	247.5	203.1	44.46	5.568		
5,600.0	5,453.6	5,626.6	5,440.2	26.1	28.7	51.05	-994.9	945.2	248.9	204.0	44.83	5.551		
5,700.0	5,553.4	5,733.4	5,546.8	26.2	28.8	51.13	-999.2	949.2	249.6	204.5	45.11	5.534		
5,800.0	5,653.4	5,840.0	5,653.4	26.3	28.9	-179.64	-1,000.6	950.4	249.9	204.6	45.30	5.516		
5,900.0	5,753.4	5,940.0	5,753.4	26.4	29.0	-179.64	-1,000.6	950.4	249.9	204.4	45.51	5.491		
6,000.0	5,853.4	6,040.0	5,853.4	26.5	29.1	-179.64	-1,000.6	950.4	249.9	204.2	45.73	5.465		
6,100.0	5,953.4	6,140.0	5,953.4	26.6	29.2	-179.64	-1,000.6	950.4	249.9	204.0	45.94	5.439		
6,200.0	6,053.4	6,240.0	6,053.4	26.7	29.3	-179.64	-1,000.6	950.4	249.9	203.7	46.16	5.413		
6,300.0	6,153.4	6,340.0	6,153.4	26.8	29.4	-179.64	-1,000.6	950.4	249.9	203.5	46.39	5.387		
6,400.0	6,253.4	6,440.0	6,253.4	26.9	29.4	-179.64	-1,000.6	950.4	249.9	203.3	46.61	5.361		
6,500.0	6,353.4	6,540.0	6,353.4	27.0	29.5	-179.64	-1,000.6	950.4	249.9	203.1	46.84	5.335		
6,600.0	6,453.4	6,640.0	6,453.4	27.1	29.6	-179.64	-1,000.6	950.4	249.9	202.8	47.07	5.309		
6,700.0	6,553.4	6,740.0	6,553.4	27.2	29.7	-179.64	-1,000.6	950.4	249.9	202.6	47.31	5.282		
6,800.0	6,653.4	6,840.0	6,653.4	27.3	29.8	-179.64	-1,000.6	950.4	249.9	202.3	47.55	5.256		
6,900.0	6,753.4	6,940.0	6,753.4	27.4	29.9	-179.64	-1,000.6	950.4	249.9	202.1	47.79	5.229		
7,000.0	6,853.4	7,040.0	6,853.4	27.5	30.0	-179.64	-1,000.6	950.4	249.9	201.9	48.04	5.202		
7,100.0	6,953.4	7,140.0	6,953.4	27.6	30.1	-179.64	-1,000.6	950.4	249.9	201.6	48.28	5.176		
7,200.0	7,053.4	7,240.0	7,053.4	27.7	30.2	-179.64	-1,000.6	950.4	249.9	201.4	48.53	5.149		
7,300.0	7,153.4	7,340.0	7,153.4	27.9	30.3	-179.64	-1,000.6	950.4	249.9	201.1	48.79	5.122		
7,400.0	7,253.4	7,440.0	7,253.4	28.0	30.4	-179.64	-1,000.6	950.4	249.9	200.9	49.04	5.095		
7,500.0	7,353.4	7,540.0	7,353.4	28.1	30.5	-179.64	-1,000.6	950.4	249.9	200.6	49.30	5.069		
7,600.0	7,453.4	7,640.0	7,453.4	28.2	30.6	-179.64	-1,000.6	950.4	249.9	200.3	49.57	5.042		
7,700.0	7,553.4	7,740.0	7,553.4	28.3	30.7	-179.64	-1,000.6	950.4	249.9	200.1	49.83	5.015		
7,800.0	7,653.4	7,840.0	7,653.4	28.4	30.8	-179.64	-1,000.6	950.4	249.9	199.8	50.10	4.988		
7,834.7	7,688.1	7,874.7	7,688.1	28.5	30.9	-179.64	-1,000.6	950.4	249.9	199.7	50.19	4.979		
7,864.6	7,718.0	7,886.6	7,700.0	28.5	30.9	-179.64	-1,000.6	950.4	250.5	200.3	50.25	4.986		





# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-16B - Existing - Existing													Offset Site Error:	0.0 usft
Survey Program: 128-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	18.0	0.0	0.0	137.44	-94.8	87.1	130.0					
100.0	100.0	81.8	99.8	0.1	0.1	137.30	-94.7	87.3	128.8	128.6	0.18	710.845		
200.0	200.0	181.4	199.4	0.3	0.3	136.86	-94.2	88.2	129.1	128.5	0.57	227.364		
300.0	300.0	280.0	298.0	0.5	0.5	36.98	-94.2	89.3	128.4	127.4	1.01	127.341		
389.8	389.7	365.1	383.0	0.7	0.7	37.84	-95.7	91.7	127.7	126.3	1.42	89.756 CC		
400.0	399.8	374.7	392.6	0.7	0.7	37.99	-96.0	92.1	127.7	126.2	1.47	86.942 ES		
500.0	499.5	468.7	486.3	1.0	0.9	40.16	-101.5	97.2	128.9	127.0	1.95	66.211		
600.0	598.8	563.5	580.4	1.3	1.2	32.29	-111.0	103.6	131.4	129.0	2.45	53.604		
700.0	697.7	657.5	673.2	1.6	1.5	28.20	-123.6	112.0	135.0	132.0	2.97	45.386		
800.0	796.1	752.7	766.5	1.9	1.9	26.11	-139.1	122.8	139.2	135.7	3.53	39.470		
900.0	894.0	848.5	859.8	2.4	2.3	25.18	-156.8	135.3	143.1	139.0	4.11	34.813		
1,000.0	991.1	944.0	952.1	2.8	2.8	25.27	-177.0	149.5	147.1	142.4	4.72	31.153		
1,100.0	1,087.9	1,042.9	1,047.3	3.3	3.3	27.40	-198.7	165.3	151.3	146.0	5.34	28.363		
1,200.0	1,184.7	1,139.4	1,139.7	3.8	3.8	29.06	-220.8	181.9	157.2	151.2	5.98	26.278		
1,300.0	1,281.5	1,236.0	1,231.7	4.3	4.4	30.78	-245.0	198.8	165.4	158.7	6.67	24.804		
1,400.0	1,378.3	1,334.5	1,325.1	4.9	5.0	32.17	-270.3	216.8	174.6	167.2	7.39	23.624		
1,500.0	1,475.1	1,431.9	1,417.2	5.4	5.6	33.38	-296.3	235.0	184.9	176.8	8.14	22.729		
1,600.0	1,571.9	1,530.3	1,510.0	5.9	6.2	34.27	-322.9	254.2	196.0	187.1	8.90	22.024		
1,700.0	1,668.7	1,628.2	1,602.1	6.5	6.9	34.91	-349.7	273.9	207.7	198.0	9.67	21.479		
1,800.0	1,765.5	1,725.0	1,692.9	7.0	7.5	35.81	-377.4	292.3	220.3	209.8	10.46	21.058		
1,900.0	1,862.3	1,820.8	1,782.6	7.5	8.1	36.66	-406.0	310.7	234.2	222.9	11.27	20.771		
2,000.0	1,959.1	1,919.5	1,874.3	8.1	8.8	37.24	-436.3	330.6	249.3	237.2	12.09	20.617		
2,100.0	2,056.0	2,017.7	1,965.9	8.6	9.5	37.77	-465.8	350.2	263.8	250.9	12.91	20.435		
2,200.0	2,152.8	2,114.8	2,055.9	9.1	10.2	38.04	-495.9	370.7	279.4	265.7	13.72	20.370		
2,300.0	2,249.6	2,216.9	2,150.6	9.7	10.9	38.10	-526.9	393.1	294.6	280.1	14.52	20.291		
2,400.0	2,346.4	2,318.6	2,245.4	10.2	11.5	38.25	-556.7	414.7	308.6	293.3	15.32	20.143		
2,500.0	2,443.2	2,416.5	2,336.9	10.7	12.2	38.55	-585.3	434.6	322.3	306.2	16.14	19.970		
2,600.0	2,540.0	2,512.7	2,426.6	11.3	12.8	38.79	-614.0	454.4	336.7	319.8	16.96	19.851		
2,700.0	2,636.8	2,610.1	2,517.2	11.8	13.5	39.06	-643.8	474.3	351.8	334.0	17.80	19.764		
2,800.0	2,733.6	2,706.0	2,606.1	12.3	14.2	39.25	-673.4	494.3	367.4	348.8	18.63	19.722		
2,900.0	2,830.4	2,806.1	2,698.9	12.9	14.9	39.48	-704.9	515.0	383.5	364.0	19.48	19.687		
3,000.0	2,927.2	2,904.3	2,789.9	13.4	15.6	39.60	-735.3	535.7	399.2	378.9	20.31	19.658		
3,100.0	3,024.0	2,998.0	2,876.3	14.0	16.3	39.54	-764.6	556.7	415.5	394.4	21.10	19.691		
3,200.0	3,120.8	3,104.3	2,974.4	14.5	17.1	39.45	-797.9	580.8	432.0	410.0	21.94	19.688		
3,300.0	3,217.7	3,198.9	3,062.0	15.0	17.8	39.48	-827.1	601.4	447.6	424.9	22.74	19.687		
3,400.0	3,314.5	3,290.2	3,146.4	15.6	18.4	39.69	-856.6	620.0	464.6	441.0	23.56	19.718		
3,500.0	3,411.3	3,395.0	3,243.2	16.1	19.2	39.94	-890.8	641.1	481.8	457.4	24.45	19.705		
3,600.0	3,508.1	3,487.3	3,328.3	16.6	19.8	40.10	-920.8	660.1	498.9	473.6	25.28	19.735		
3,700.0	3,604.9	3,589.4	3,422.4	17.2	20.6	40.22	-954.1	681.6	516.3	490.2	26.15	19.746		
3,800.0	3,701.7	3,694.1	3,519.3	17.7	21.3	40.27	-987.1	704.0	532.7	505.7	27.00	19.728		
3,900.0	3,798.5	3,790.8	3,608.7	18.3	22.0	40.31	-1,017.4	724.8	548.8	521.0	27.83	19.724		
4,000.0	3,895.3	3,893.8	3,704.1	18.8	22.8	40.32	-1,049.3	747.1	564.6	536.0	28.67	19.694		
4,100.0	3,992.1	3,992.3	3,795.4	19.3	23.4	40.34	-1,079.4	768.3	580.0	550.5	29.49	19.669		
4,200.0	4,088.9	4,088.0	3,884.2	19.9	24.1	40.46	-1,109.5	788.0	596.0	565.7	30.33	19.653		
4,300.0	4,185.7	4,191.1	3,979.9	20.4	24.8	40.62	-1,141.4	808.6	611.5	580.3	31.21	19.594		
4,400.0	4,282.5	4,286.9	4,068.9	21.0	25.5	40.69	-1,171.0	828.6	627.1	595.0	32.05	19.567		
4,500.0	4,379.4	4,382.6	4,157.4	21.5	26.2	40.71	-1,201.0	849.2	643.2	610.4	32.87	19.567		
4,600.0	4,476.2	4,484.8	4,251.9	22.0	26.9	40.72	-1,232.9	871.3	659.3	625.6	33.72	19.552		
4,700.0	4,573.0	4,591.9	4,351.2	22.6	27.7	40.70	-1,265.4	894.5	674.6	640.0	34.58	19.510		
4,800.0	4,669.8	4,690.9	4,443.4	23.1	28.4	40.69	-1,294.6	915.9	688.8	653.4	35.40	19.459		
4,900.0	4,766.6	4,796.7	4,542.0	23.7	29.1	40.76	-1,326.2	937.8	703.2	667.0	36.27	19.388		
5,000.0	4,863.4	4,892.8	4,631.9	24.2	29.8	40.82	-1,353.9	957.6	716.7	679.6	37.10	19.317		

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



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-16B - Existing - Existing												Offset Site Error:	0.0 usft
Survey Program: 128-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	
5,100.0	4,960.2	4,987.5	4,720.2	24.7	30.4	40.98	-1,382.2	976.5	731.2	693.2	37.93	19.274 SF	
5,200.0	5,057.7	5,076.8	4,803.4	25.1	31.0	41.21	-1,409.5	994.2	748.2	709.6	38.63	19.368	
5,300.0	5,155.9	5,175.7	4,895.2	25.4	31.7	41.28	-1,440.6	1,014.1	768.9	729.7	39.26	19.584	
5,400.0	5,254.7	5,278.5	4,990.8	25.7	32.4	41.23	-1,472.2	1,034.4	791.4	751.6	39.80	19.882	
5,500.0	5,353.9	5,367.4	5,073.5	25.9	33.1	41.08	-1,499.5	1,052.6	816.5	776.3	40.20	20.309	
5,600.0	5,453.6	5,466.9	5,165.6	26.1	33.8	40.74	-1,530.4	1,073.7	844.8	804.3	40.51	20.856	
5,700.0	5,553.4	5,574.2	5,265.5	26.2	34.5	40.21	-1,562.6	1,096.5	874.7	834.0	40.70	21.490	
5,800.0	5,653.4	5,679.4	5,363.9	26.3	35.2	168.86	-1,592.9	1,117.9	905.9	865.1	40.81	22.199	
5,900.0	5,753.4	5,837.9	5,514.4	26.4	36.2	167.59	-1,633.4	1,146.2	934.9	894.0	40.84	22.891	
6,000.0	5,853.4	5,990.9	5,662.9	26.5	36.9	166.72	-1,663.7	1,167.5	957.2	916.2	40.98	23.359	
6,100.0	5,953.4	6,117.7	5,787.0	26.6	37.4	166.11	-1,684.0	1,182.8	975.7	934.6	41.14	23.719	
6,200.0	6,053.4	6,251.4	5,918.9	26.7	37.8	165.62	-1,701.8	1,195.9	991.1	949.8	41.34	23.973	



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-19E - Slot A-2 - Design #3													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	0.0	0.0	0.0	175.63	-22.2	1.7	22.3					
100.0	100.0	100.0	100.0	0.1	0.1	175.63	-22.2	1.7	22.3	22.1	0.18	127.096		
200.0	200.0	200.0	200.0	0.3	0.3	175.63	-22.2	1.7	22.3	21.7	0.62	35.660 CC, ES		
300.0	300.0	299.2	299.2	0.5	0.5	80.35	-23.9	1.5	23.6	22.6	1.04	22.731		
400.0	399.8	398.0	397.9	0.7	0.7	91.44	-29.0	1.1	28.5	27.0	1.47	19.373		
500.0	499.5	496.3	495.7	1.0	1.0	102.83	-37.5	0.4	38.1	36.1	1.96	19.413		
600.0	598.8	594.0	592.8	1.3	1.2	100.01	-49.2	-0.4	51.3	48.9	2.47	20.750		
700.0	697.7	692.1	689.6	1.6	1.6	97.17	-64.3	0.9	65.6	62.5	3.04	21.590		
800.0	796.1	790.0	785.8	1.9	1.9	94.43	-82.7	4.6	80.1	76.4	3.70	21.660		
900.0	894.0	888.0	881.1	2.4	2.4	91.87	-104.5	10.7	94.8	90.3	4.48	21.184		
1,000.0	991.1	985.8	975.3	2.8	2.9	89.82	-129.5	19.2	109.5	104.1	5.38	20.369		
1,100.0	1,087.9	1,083.4	1,068.0	3.3	3.4	88.85	-157.7	30.1	124.8	118.5	6.36	19.616		
1,200.0	1,184.7	1,180.3	1,158.9	3.8	4.1	86.48	-188.7	43.2	141.4	134.0	7.40	19.122		
1,300.0	1,281.5	1,276.2	1,247.3	4.3	4.8	83.22	-222.5	58.5	159.6	151.1	8.44	18.904 SF		
1,400.0	1,378.3	1,370.8	1,333.0	4.9	5.6	79.47	-258.7	75.7	179.8	170.3	9.48	18.971		
1,500.0	1,475.1	1,465.5	1,417.3	5.4	6.4	75.56	-297.4	94.9	202.3	191.9	10.49	19.297		
1,600.0	1,571.9	1,561.9	1,502.8	5.9	7.3	72.24	-337.3	114.7	226.0	214.5	11.47	19.692		
1,700.0	1,668.7	1,658.3	1,588.3	6.5	8.1	69.54	-377.2	134.6	250.2	237.7	12.44	20.107		
1,800.0	1,765.5	1,754.7	1,673.8	7.0	9.0	67.32	-417.0	154.4	274.8	261.4	13.39	20.518		
1,900.0	1,862.3	1,851.1	1,759.3	7.5	9.9	65.47	-456.9	174.3	299.8	285.4	14.33	20.913		
2,000.0	1,959.1	1,947.5	1,844.8	8.1	10.8	63.89	-496.8	194.1	325.0	309.7	15.27	21.286		
2,100.0	2,056.0	2,043.9	1,930.3	8.6	11.7	62.55	-536.6	214.0	350.4	334.2	16.20	21.636		
2,200.0	2,152.8	2,140.4	2,015.8	9.1	12.6	61.38	-576.5	233.8	376.0	358.9	17.12	21.963		
2,300.0	2,249.6	2,236.8	2,101.3	9.7	13.5	60.36	-616.4	253.7	401.7	383.7	18.04	22.267		
2,400.0	2,346.4	2,333.2	2,186.8	10.2	14.4	59.47	-656.2	273.5	427.5	408.5	18.96	22.551		
2,500.0	2,443.2	2,429.6	2,272.3	10.7	15.3	58.68	-696.1	293.4	453.4	433.5	19.87	22.814		
2,600.0	2,540.0	2,526.0	2,357.8	11.3	16.2	57.97	-736.0	313.2	479.4	458.6	20.79	23.060		
2,700.0	2,636.8	2,622.4	2,443.3	11.8	17.1	57.33	-775.9	333.1	505.4	483.7	21.70	23.289		
2,800.0	2,733.6	2,718.8	2,528.8	12.3	18.0	56.76	-815.7	352.9	531.5	508.9	22.61	23.502		
2,900.0	2,830.4	2,815.2	2,614.3	12.9	18.9	56.24	-855.6	372.8	557.6	534.1	23.53	23.702		
3,000.0	2,927.2	2,911.6	2,699.8	13.4	19.8	55.77	-895.5	392.6	583.8	559.3	24.44	23.889		
3,100.0	3,024.0	3,008.0	2,785.3	14.0	20.7	55.34	-935.3	412.5	610.0	584.6	25.35	24.064		
3,200.0	3,120.8	3,104.4	2,870.8	14.5	21.7	54.94	-975.2	432.3	636.2	609.9	26.26	24.229		
3,300.0	3,217.7	3,200.9	2,956.3	15.0	22.6	54.57	-1,015.1	452.2	662.4	635.3	27.17	24.384		
3,400.0	3,314.5	3,297.3	3,041.9	15.6	23.5	54.23	-1,054.9	472.0	688.7	660.6	28.08	24.529		
3,500.0	3,411.3	3,393.7	3,127.4	16.1	24.4	53.92	-1,094.8	491.9	715.0	686.0	28.99	24.667		
3,600.0	3,508.1	3,490.1	3,212.9	16.6	25.3	53.63	-1,134.7	511.7	741.3	711.4	29.90	24.797		
3,700.0	3,604.9	3,586.5	3,298.4	17.2	26.2	53.36	-1,174.6	531.6	767.7	736.9	30.81	24.920		
3,800.0	3,701.7	3,682.9	3,383.9	17.7	27.1	53.11	-1,214.4	551.4	794.0	762.3	31.71	25.036		
3,900.0	3,798.5	3,779.3	3,469.4	18.3	28.0	52.87	-1,254.3	571.3	820.4	787.8	32.62	25.146		
4,000.0	3,895.3	3,875.7	3,554.9	18.8	28.9	52.65	-1,294.2	591.1	846.7	813.2	33.53	25.251		
4,100.0	3,992.1	3,972.1	3,640.4	19.3	29.8	52.44	-1,334.0	611.0	873.1	838.7	34.44	25.351		
4,200.0	4,088.9	4,068.5	3,725.9	19.9	30.7	52.24	-1,373.9	630.8	899.5	864.2	35.35	25.446		
4,300.0	4,185.7	4,164.9	3,811.4	20.4	31.7	52.06	-1,413.8	650.7	925.9	889.7	36.26	25.536		
4,400.0	4,282.5	4,261.4	3,896.9	21.0	32.6	51.88	-1,453.6	670.5	952.3	915.2	37.17	25.622		
4,500.0	4,379.4	4,357.8	3,982.4	21.5	33.5	51.72	-1,493.5	690.4	978.8	940.7	38.08	25.704		



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-20E - Slot A-3 - Design #3													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	-120.97	-5.1	-8.5	9.9					
100.0	100.0	100.0	100.0	0.1	0.1	-120.97	-5.1	-8.5	9.9	9.7	0.18	56.518		
200.0	200.0	200.0	200.0	0.3	0.3	-120.97	-5.1	-8.5	9.9	9.3	0.62	15.858 CC, ES		
300.0	300.0	299.7	299.7	0.5	0.5	137.76	-6.8	-8.6	12.3	11.2	1.06	11.539 SF		
400.0	399.8	399.2	399.0	0.7	0.7	135.79	-12.0	-9.1	19.3	17.8	1.53	12.639		
500.0	499.5	497.9	497.4	1.0	1.0	134.44	-20.5	-9.8	31.0	29.0	2.04	15.232		
600.0	598.8	595.9	594.7	1.3	1.2	123.07	-32.3	-10.9	46.1	43.5	2.53	18.200		
700.0	697.7	693.2	690.8	1.6	1.6	116.39	-47.3	-12.2	63.2	60.1	3.09	20.415		
800.0	796.1	791.5	787.3	1.9	1.9	111.78	-65.8	-12.6	81.4	77.6	3.74	21.743		
900.0	894.0	890.0	883.3	2.4	2.4	107.90	-87.6	-10.6	99.4	94.9	4.49	22.115		
1,000.0	991.1	988.5	978.4	2.8	2.8	104.92	-112.8	-6.2	117.2	111.8	5.37	21.815		
1,100.0	1,087.9	1,086.8	1,072.3	3.3	3.4	103.36	-141.3	0.7	134.9	128.6	6.35	21.257		
1,200.0	1,184.7	1,184.7	1,164.5	3.8	4.0	100.56	-172.9	9.9	152.9	145.5	7.39	20.681		
1,300.0	1,281.5	1,281.8	1,254.6	4.3	4.7	96.99	-207.3	21.3	171.7	163.2	8.49	20.230		
1,400.0	1,378.3	1,377.8	1,342.0	4.9	5.4	92.93	-244.2	34.9	191.7	182.1	9.60	19.975		
1,500.0	1,475.1	1,472.2	1,426.5	5.4	6.3	88.64	-283.4	50.5	213.5	202.8	10.70	19.955		
1,600.0	1,571.9	1,565.0	1,507.8	5.9	7.1	84.31	-324.6	67.9	237.6	225.9	11.77	20.182		
1,700.0	1,668.7	1,655.7	1,585.5	6.5	8.0	80.08	-367.4	86.8	264.4	251.6	12.80	20.666		
1,800.0	1,765.5	1,749.5	1,664.9	7.0	9.0	76.14	-412.9	107.5	293.3	279.5	13.79	21.268		
1,900.0	1,862.3	1,843.4	1,744.4	7.5	10.0	72.89	-458.5	128.1	323.3	308.6	14.75	21.914		
2,000.0	1,959.1	1,937.3	1,823.8	8.1	11.0	70.19	-504.0	148.8	354.1	338.4	15.69	22.565		
2,100.0	2,056.0	2,031.2	1,903.3	8.6	12.0	67.91	-549.6	169.4	385.5	368.9	16.62	23.201		
2,200.0	2,152.8	2,125.0	1,982.7	9.1	13.0	65.97	-595.2	190.1	417.4	399.9	17.53	23.812		
2,300.0	2,249.6	2,218.9	2,062.2	9.7	14.0	64.31	-640.7	210.7	449.7	431.3	18.44	24.392		
2,400.0	2,346.4	2,312.8	2,141.6	10.2	15.0	62.86	-686.3	231.4	482.3	462.9	19.34	24.940		
2,500.0	2,443.2	2,406.7	2,221.1	10.7	16.0	61.60	-731.8	252.0	515.1	494.9	20.23	25.456		
2,600.0	2,540.0	2,500.6	2,300.5	11.3	17.0	60.49	-777.4	272.7	548.1	527.0	21.13	25.941		
2,700.0	2,636.8	2,594.5	2,379.9	11.8	18.0	59.50	-822.9	293.3	581.3	559.3	22.02	26.395		
2,800.0	2,733.6	2,688.3	2,459.4	12.3	19.0	58.61	-868.5	314.0	614.6	591.7	22.91	26.822		
2,900.0	2,830.4	2,782.2	2,538.8	12.9	20.0	57.82	-914.1	334.7	648.0	624.2	23.81	27.223		
3,000.0	2,927.2	2,876.1	2,618.3	13.4	21.0	57.11	-959.6	355.3	681.6	656.9	24.70	27.599		
3,100.0	3,024.0	2,970.0	2,697.7	14.0	22.1	56.46	-1,005.2	376.0	715.2	689.6	25.59	27.952		
3,200.0	3,120.8	3,063.9	2,777.2	14.5	23.1	55.87	-1,050.7	396.6	748.9	722.4	26.48	28.285		
3,300.0	3,217.7	3,157.8	2,856.6	15.0	24.1	55.33	-1,096.3	417.3	782.6	755.3	27.37	28.598		
3,400.0	3,314.5	3,251.6	2,936.1	15.6	25.1	54.84	-1,141.8	437.9	816.5	788.2	28.26	28.894		
3,500.0	3,411.3	3,345.5	3,015.5	16.1	26.1	54.38	-1,187.4	458.6	850.3	821.2	29.15	29.173		
3,600.0	3,508.1	3,439.4	3,095.0	16.6	27.1	53.96	-1,233.0	479.2	884.2	854.2	30.04	29.437		
3,700.0	3,604.9	3,533.3	3,174.4	17.2	28.2	53.57	-1,278.5	499.9	918.2	887.3	30.93	29.687		
3,800.0	3,701.7	3,627.2	3,253.9	17.7	29.2	53.21	-1,324.1	520.5	952.2	920.4	31.82	29.923		
3,900.0	3,798.5	3,721.1	3,333.3	18.3	30.2	52.87	-1,369.6	541.2	986.2	953.5	32.71	30.148		

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



# Archer

## Anticollision Report

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-14E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7665.0usft
<b>Reference Site:</b>	Bruton 30-10 Pad	<b>MD Reference:</b>	Well @ 7665.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bruton 30-14E	<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 B-3	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #3	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-21E - Slot A-4 - Design #2													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	-77.65	2.9	-13.3	13.6					
100.0	100.0	100.0	100.0	0.1	0.1	-77.65	2.9	-13.3	13.6	13.5	0.18	77.718		
146.2	146.2	146.2	146.2	0.2	0.2	-80.00	2.4	-13.4	13.6	13.2	0.38	35.868 CC		
200.0	200.0	199.9	199.9	0.3	0.3	-88.59	0.3	-13.8	13.8	13.2	0.62	22.319 ES		
300.0	300.0	299.3	298.9	0.5	0.6	147.30	-7.3	-15.1	18.3	17.2	1.10	16.545 SF		
400.0	399.8	397.5	396.3	0.7	0.8	131.97	-19.9	-17.3	30.8	29.1	1.63	18.838		
500.0	499.5	493.9	491.1	1.0	1.2	125.31	-36.9	-20.3	50.2	48.0	2.19	22.958		
600.0	598.8	588.3	583.0	1.3	1.6	111.37	-58.2	-24.1	74.5	71.8	2.74	27.255		
700.0	697.7	680.9	671.9	1.6	2.1	102.92	-83.4	-28.5	102.1	98.7	3.36	30.409		
800.0	796.1	771.7	758.0	1.9	2.7	97.41	-112.2	-33.6	132.6	128.5	4.06	32.629		
900.0	894.0	867.9	848.0	2.4	3.3	93.34	-145.8	-37.4	163.5	158.6	4.85	33.718		
1,000.0	991.1	964.8	938.0	2.8	4.0	90.38	-181.6	-37.8	192.8	187.0	5.74	33.592		
1,100.0	1,087.9	1,062.1	1,027.5	3.3	4.7	89.49	-219.6	-34.7	221.0	214.3	6.72	32.900		
1,200.0	1,184.7	1,159.3	1,116.0	3.8	5.4	87.82	-259.5	-28.2	248.8	241.1	7.74	32.150		
1,300.0	1,281.5	1,256.2	1,202.8	4.3	6.2	85.62	-301.1	-18.1	276.3	267.5	8.79	31.429		
1,400.0	1,378.3	1,352.3	1,287.7	4.9	7.0	83.04	-344.2	-4.8	303.9	294.1	9.78	31.069		
1,500.0	1,475.1	1,447.4	1,370.2	5.4	7.9	80.21	-388.4	11.7	332.0	321.1	10.86	30.557		
1,600.0	1,571.9	1,541.2	1,450.2	5.9	8.8	77.23	-433.6	31.1	360.9	349.0	11.89	30.353		
1,700.0	1,668.7	1,635.1	1,529.6	6.5	9.8	74.49	-479.2	51.5	390.7	377.8	12.90	30.291		
1,800.0	1,765.5	1,728.9	1,609.0	7.0	10.7	72.13	-524.9	71.9	421.2	407.3	13.89	30.331		
1,900.0	1,862.3	1,822.8	1,688.5	7.5	11.7	70.09	-570.5	92.3	452.3	437.4	14.86	30.432		
2,000.0	1,959.1	1,916.6	1,767.9	8.1	12.7	68.31	-616.1	112.7	483.8	468.0	15.83	30.571		
2,100.0	2,056.0	2,010.5	1,847.3	8.6	13.7	66.74	-661.8	133.1	515.8	499.0	16.78	30.734		
2,200.0	2,152.8	2,104.4	1,926.8	9.1	14.7	65.35	-707.4	153.5	548.0	530.3	17.73	30.911		
2,300.0	2,249.6	2,198.2	2,006.2	9.7	15.7	64.12	-753.1	173.9	580.5	561.9	18.67	31.095		
2,400.0	2,346.4	2,292.1	2,085.6	10.2	16.6	63.01	-798.7	194.3	613.3	593.6	19.60	31.280		
2,500.0	2,443.2	2,385.9	2,165.1	10.7	17.6	62.02	-844.4	214.7	646.2	625.6	20.54	31.465		
2,600.0	2,540.0	2,479.8	2,244.5	11.3	18.7	61.12	-890.0	235.1	679.2	657.8	21.46	31.647		
2,700.0	2,636.8	2,573.6	2,323.9	11.8	19.7	60.30	-935.6	255.5	712.4	690.1	22.39	31.824		
2,800.0	2,733.6	2,667.5	2,403.4	12.3	20.7	59.56	-981.3	275.9	745.8	722.5	23.31	31.997		
2,900.0	2,830.4	2,761.3	2,482.8	12.9	21.7	58.88	-1,026.9	296.3	779.2	755.0	24.23	32.163		
3,000.0	2,927.2	2,855.2	2,562.2	13.4	22.7	58.25	-1,072.6	316.7	812.7	787.6	25.14	32.324		
3,100.0	3,024.0	2,949.1	2,641.7	14.0	23.7	57.68	-1,118.2	337.1	846.3	820.3	26.06	32.478		
3,200.0	3,120.8	3,042.9	2,721.1	14.5	24.7	57.14	-1,163.9	357.5	880.0	853.0	26.97	32.626		
3,300.0	3,217.7	3,136.8	2,800.5	15.0	25.7	56.65	-1,209.5	377.9	913.7	885.8	27.88	32.769		
3,400.0	3,314.5	3,230.6	2,880.0	15.6	26.7	56.19	-1,255.1	398.3	947.5	918.7	28.79	32.905		
3,500.0	3,411.3	3,324.5	2,959.4	16.1	27.7	55.77	-1,300.8	418.7	981.3	951.6	29.70	33.036		

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



# Archer

## Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-14E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.0usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Bruton 30-14E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-3	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7665.0usft

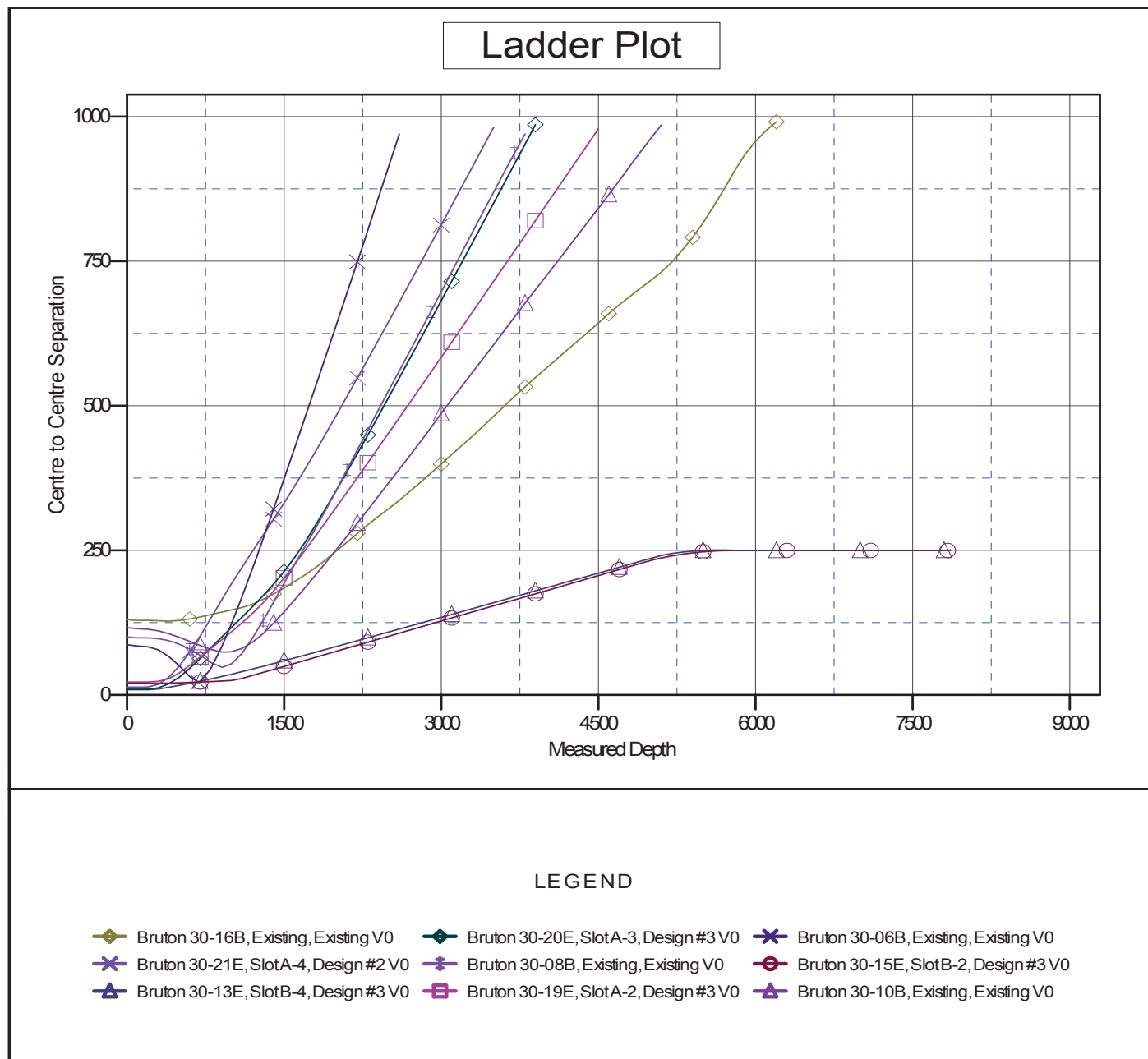
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-14E

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.46°





# Archer

## Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-14E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.0usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Bruton 30-14E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-3	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7665.0usft  
Offset Depths are relative to Offset Datum  
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-14E  
Coordinate System is US State Plane 1983, Colorado Central Zone  
Grid Convergence at Surface is: -1.46°

