



Piceance Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton 30-12E

Slot B-5

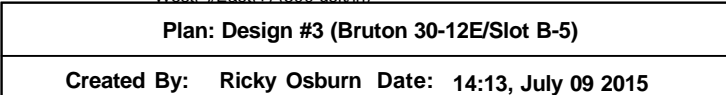
Plan: Design #3

Standard Planning Report

24 June, 2015



Archer





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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-5		
Design:	Design #3		

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		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 30-12E					
Well Position	+N/-S	-22.4 usft	Northing:	1,523,551.94 usft	Latitude:	39° 14' 53.048 N
	+E/-W	24.5 usft	Easting:	2,346,214.51 usft	Longitude:	107° 48' 31.889 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,643.0 usft

Wellbore	Slot B-5				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/06/09	9.72	65.46	51,724

Design	Design #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	105.82

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	6.00	92.00	699.5	-0.5	15.7	2.00	2.00	0.00	92.00	
1,025.8	12.16	106.28	1,021.1	-10.8	65.7	2.00	1.89	4.38	27.25	
5,194.7	12.16	106.28	5,096.4	-257.0	908.9	0.00	0.00	0.00	0.00	
5,802.9	0.00	0.00	5,700.0	-275.0	970.6	2.00	-2.00	0.00	180.00	
7,852.9	0.00	0.00	7,750.0	-275.0	970.6	0.00	0.00	0.00	0.00	Bruton 30-12E tgt



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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 30-12E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-5		
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)
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
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	2.00	92.00	500.0	-0.1	1.7	1.7	2.00	2.00	0.00
600.0	4.00	92.00	599.8	-0.2	7.0	6.8	2.00	2.00	0.00
Start DLS 2.00 TFO 27.25									
700.0	6.00	92.00	699.5	-0.5	15.7	15.2	2.00	2.00	0.00
800.0	7.83	98.73	798.7	-1.8	27.6	27.1	2.00	1.83	6.73
900.0	9.73	102.89	897.5	-4.7	42.6	42.3	2.00	1.90	4.16
1,000.0	11.66	105.70	995.8	-9.3	60.6	60.8	2.00	1.93	2.80
Start 4168.9 hold at 1025.8 MD									
1,025.8	12.16	106.28	1,021.1	-10.8	65.7	66.2	2.00	1.95	2.25
1,100.0	12.16	106.28	1,093.6	-15.2	80.7	81.8	0.00	0.00	0.00
1,200.0	12.16	106.28	1,191.3	-21.1	100.9	102.9	0.00	0.00	0.00
1,300.0	12.16	106.28	1,289.1	-27.0	121.2	123.9	0.00	0.00	0.00
1,400.0	12.16	106.28	1,386.8	-32.9	141.4	145.0	0.00	0.00	0.00
1,500.0	12.16	106.28	1,484.6	-38.8	161.6	166.1	0.00	0.00	0.00
8 5/8" Csg.									
1,538.3	12.16	106.28	1,522.0	-41.0	169.4	174.1	0.00	0.00	0.00
1,600.0	12.16	106.28	1,582.4	-44.7	181.8	187.1	0.00	0.00	0.00
1,700.0	12.16	106.28	1,680.1	-50.6	202.1	208.2	0.00	0.00	0.00
1,800.0	12.16	106.28	1,777.9	-56.5	222.3	229.3	0.00	0.00	0.00
1,900.0	12.16	106.28	1,875.6	-62.4	242.5	250.3	0.00	0.00	0.00
2,000.0	12.16	106.28	1,973.4	-68.3	262.7	271.4	0.00	0.00	0.00
2,100.0	12.16	106.28	2,071.1	-74.2	283.0	292.5	0.00	0.00	0.00
2,200.0	12.16	106.28	2,168.9	-80.1	303.2	313.6	0.00	0.00	0.00
2,300.0	12.16	106.28	2,266.6	-86.0	323.4	334.6	0.00	0.00	0.00
2,400.0	12.16	106.28	2,364.4	-91.9	343.6	355.7	0.00	0.00	0.00
2,500.0	12.16	106.28	2,462.2	-97.8	363.9	376.8	0.00	0.00	0.00
2,600.0	12.16	106.28	2,559.9	-103.7	384.1	397.8	0.00	0.00	0.00
2,700.0	12.16	106.28	2,657.7	-109.6	404.3	418.9	0.00	0.00	0.00
G Sand									
2,743.3	12.16	106.28	2,700.0	-112.2	413.1	428.0	0.00	0.00	0.00
2,800.0	12.16	106.28	2,755.4	-115.5	424.6	440.0	0.00	0.00	0.00
2,900.0	12.16	106.28	2,853.2	-121.5	444.8	461.0	0.00	0.00	0.00
3,000.0	12.16	106.28	2,950.9	-127.4	465.0	482.1	0.00	0.00	0.00
3,100.0	12.16	106.28	3,048.7	-133.3	485.2	503.2	0.00	0.00	0.00
3,200.0	12.16	106.28	3,146.4	-139.2	505.5	524.3	0.00	0.00	0.00
3,300.0	12.16	106.28	3,244.2	-145.1	525.7	545.3	0.00	0.00	0.00
3,400.0	12.16	106.28	3,341.9	-151.0	545.9	566.4	0.00	0.00	0.00
3,500.0	12.16	106.28	3,439.7	-156.9	566.1	587.5	0.00	0.00	0.00
3,600.0	12.16	106.28	3,537.5	-162.8	586.4	608.5	0.00	0.00	0.00
3,700.0	12.16	106.28	3,635.2	-168.7	606.6	629.6	0.00	0.00	0.00
3,800.0	12.16	106.28	3,733.0	-174.6	626.8	650.7	0.00	0.00	0.00
3,900.0	12.16	106.28	3,830.7	-180.5	647.0	671.7	0.00	0.00	0.00
4,000.0	12.16	106.28	3,928.5	-186.4	667.3	692.8	0.00	0.00	0.00
4,100.0	12.16	106.28	4,026.2	-192.3	687.5	713.9	0.00	0.00	0.00
4,200.0	12.16	106.28	4,124.0	-198.2	707.7	734.9	0.00	0.00	0.00
4,300.0	12.16	106.28	4,221.7	-204.1	727.9	756.0	0.00	0.00	0.00
4,400.0	12.16	106.28	4,319.5	-210.0	748.2	777.1	0.00	0.00	0.00
4,500.0	12.16	106.28	4,417.3	-215.9	768.4	798.2	0.00	0.00	0.00



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Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-12E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-5		
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	12.16	106.28	4,515.0	-221.8	788.6	819.2	0.00	0.00	0.00
Williams Fork									
4,635.8	12.16	106.28	4,550.0	-224.0	795.9	826.8	0.00	0.00	0.00
4,700.0	12.16	106.28	4,612.8	-227.8	808.8	840.3	0.00	0.00	0.00
4,800.0	12.16	106.28	4,710.5	-233.7	829.1	861.4	0.00	0.00	0.00
4,900.0	12.16	106.28	4,808.3	-239.6	849.3	882.4	0.00	0.00	0.00
5,000.0	12.16	106.28	4,906.0	-245.5	869.5	903.5	0.00	0.00	0.00
5,100.0	12.16	106.28	5,003.8	-251.4	889.7	924.6	0.00	0.00	0.00
Start Drop -2.00									
5,194.7	12.16	106.28	5,096.4	-257.0	908.9	944.5	0.00	0.00	0.00
5,200.0	12.06	106.28	5,101.5	-257.3	910.0	945.6	2.00	-2.00	0.00
5,300.0	10.06	106.28	5,199.7	-262.7	928.4	964.8	2.00	-2.00	0.00
5,400.0	8.06	106.28	5,298.4	-267.1	943.5	980.6	2.00	-2.00	0.00
5,500.0	6.06	106.28	5,397.7	-270.5	955.3	992.8	2.00	-2.00	0.00
5,600.0	4.06	106.28	5,497.3	-273.0	963.7	1,001.7	2.00	-2.00	0.00
5,700.0	2.06	106.28	5,597.1	-274.5	968.9	1,007.0	2.00	-2.00	0.00
Start 2050.0 hold at 5802.9 MD									
5,802.9	0.00	0.00	5,700.0	-275.0	970.6	1,008.8	2.00	-2.00	0.00
TOG									
5,852.9	0.00	0.00	5,750.0	-275.0	970.6	1,008.8	0.00	0.00	0.00
5,900.0	0.00	0.00	5,797.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,897.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,100.0	0.00	0.00	5,997.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,097.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,300.0	0.00	0.00	6,197.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,297.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,500.0	0.00	0.00	6,397.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,497.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,700.0	0.00	0.00	6,597.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,697.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
6,900.0	0.00	0.00	6,797.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
Cameo									
6,952.9	0.00	0.00	6,850.0	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,897.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,100.0	0.00	0.00	6,997.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,097.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,300.0	0.00	0.00	7,197.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,297.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,500.0	0.00	0.00	7,397.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,497.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
Base Cameo Coal									
7,610.9	0.00	0.00	7,508.0	-275.0	970.6	1,008.8	0.00	0.00	0.00
Rollins									
7,652.9	0.00	0.00	7,550.0	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,700.0	0.00	0.00	7,597.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,697.1	-275.0	970.6	1,008.8	0.00	0.00	0.00
TD at 7852.9									
7,852.9	0.00	0.00	7,750.0	-275.0	970.6	1,008.8	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-5		
Design:	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 30-12E tgt	0.00	0.00	7,750.0	-275.0	970.6	1,523,252.36	2,347,177.86	39° 14' 50.330 N	107° 48' 19.550 W
- plan hits target center									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,538.3	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 (°)
2,743.3	2,700.0	G Sand		0.00	
4,635.8	4,550.0	Williams Fork		0.00	
5,852.9	5,750.0	TOG		0.00	
6,952.9	6,850.0	Cameo		0.00	
7,610.9	7,508.0	Base Cameo Coal		0.00	
7,652.9	7,550.0	Rollins		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
400.0	400.0	0.0	0.0	Start Build 2.00	
700.0	699.5	-0.5	15.7	Start DLS 2.00 TFO 27.25	
1,025.8	1,021.1	-10.8	65.7	Start 4168.9 hold at 1025.8 MD	
5,194.7	5,096.4	-257.0	908.9	Start Drop -2.00	
5,802.9	5,700.0	-275.0	970.6	Start 2050.0 hold at 5802.9 MD	
7,852.9	7,750.0	-275.0	970.6	TD at 7852.9	



Piceance Energy, LLC

**Mesa County, CO
Bruton 30-10 Pad
Bruton 30-12E**

**Slot B-5
Design #3**

Anticollision Report

24 June, 2015



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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	7,852.7	Design #3 (Slot B-5)	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	834.1	820.5	41.6	37.7	10.554	CC, ES, SF
Bruton 30-08B - Existing - Existing	1,203.6	1,172.0	88.3	82.7	15.865	CC, ES
Bruton 30-08B - Existing - Existing	1,400.0	1,361.2	101.1	94.4	14.988	SF
Bruton 30-10B - Existing - Existing	954.5	924.3	131.2	127.1	31.994	CC
Bruton 30-10B - Existing - Existing	1,000.0	968.8	131.3	127.0	30.212	ES
Bruton 30-10B - Existing - Existing	1,500.0	1,458.5	168.9	161.6	23.040	SF
Bruton 30-10M - Slot A-6 - Design #2	200.0	200.0	14.3	13.7	22.851	CC, ES
Bruton 30-10M - Slot A-6 - Design #2	400.0	398.7	21.2	19.7	13.991	SF
Bruton 30-11E - Slot B-6 - Design #3	400.0	400.0	10.7	9.2	7.037	CC, ES
Bruton 30-11E - Slot B-6 - Design #3	7,852.9	7,848.7	249.9	200.0	5.011	SF
Bruton 30-13E - Slot B-4 - Design #3	300.0	300.0	19.9	18.8	18.545	CC, ES
Bruton 30-13E - Slot B-4 - Design #3	7,828.3	7,842.9	250.9	201.2	5.047	SF
Bruton 30-13M - Slot A-5 - Design #2	400.0	400.0	10.0	8.5	6.545	CC, ES
Bruton 30-13M - Slot A-5 - Design #2	500.0	500.0	11.5	9.5	5.829	SF
Bruton 30-16B - Existing - Existing	100.0	81.9	157.4	157.2	868.143	CC
Bruton 30-16B - Existing - Existing	200.0	181.4	157.6	157.0	277.658	ES
Bruton 30-16B - Existing - Existing	4,300.0	4,093.7	992.6	961.1	31.541	SF
Bruton 30-21E - Slot A-4 - Design #2	100.0	100.0	22.3	22.1	126.983	CC, ES
Bruton 30-21E - Slot A-4 - Design #2	400.0	394.3	45.1	43.5	28.305	SF

Offset Design Survey Program: 98-MWD													Bruton 30-10 Pad - Bruton 30-06B - Existing - Existing		Offset Site Error: 0.0 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)						
0.0	0.0	0.0	18.0	0.0	0.0	137.59	-83.6	76.3	114.6							
100.0	100.0	82.5	100.5	0.1	0.1	137.46	-83.3	76.4	113.0	112.8	0.18	623.088				
200.0	200.0	185.1	203.1	0.3	0.3	136.99	-81.5	76.1	111.5	110.9	0.62	180.180				
300.0	300.0	288.0	305.9	0.5	0.5	136.67	-78.0	73.6	107.4	106.4	1.08	99.766				
400.0	400.0	391.0	408.6	0.8	0.8	137.24	-73.3	67.8	100.3	98.7	1.55	64.561				
500.0	500.0	492.3	509.4	1.0	1.1	47.80	-68.0	59.5	89.7	87.7	2.01	44.550				
600.0	599.8	593.0	609.4	1.2	1.4	53.72	-61.0	49.2	74.6	72.1	2.49	29.940				
700.0	699.5	691.7	706.9	1.4	1.7	66.50	-52.8	37.2	57.0	54.0	3.01	18.931				
800.0	798.7	788.1	801.9	1.7	2.0	88.72	-44.4	22.5	43.0	39.4	3.68	11.698				

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 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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		
834.1	832.5	820.5	833.7	1.8	2.2	101.35	-41.3	17.1	41.6	37.7	3.95	10.554	CC, ES, SF	
900.0	897.5	882.5	894.4	2.0	2.4	126.50	-34.8	6.3	47.3	42.9	4.38	10.814		
1,000.0	995.8	973.7	983.4	2.3	2.8	151.00	-24.2	-10.5	73.6	68.8	4.82	15.280		
1,100.0	1,093.6	1,061.5	1,068.6	2.7	3.3	163.73	-13.0	-28.7	112.2	107.0	5.21	21.548		
1,200.0	1,191.3	1,148.2	1,152.1	3.2	3.7	170.73	-0.8	-48.4	155.7	150.1	5.61	27.732		
1,300.0	1,289.1	1,234.9	1,235.3	3.6	4.2	175.09	12.6	-68.8	201.4	195.3	6.04	33.334		
1,400.0	1,386.8	1,321.2	1,317.9	4.0	4.7	178.06	26.8	-89.4	248.2	241.7	6.48	38.290		
1,500.0	1,484.6	1,406.0	1,398.7	4.5	5.2	-179.88	41.2	-110.3	296.2	289.3	6.93	42.729		
1,600.0	1,582.4	1,490.8	1,479.5	4.9	5.7	-178.49	55.2	-132.0	345.1	337.7	7.39	46.707		
1,700.0	1,680.1	1,575.7	1,560.3	5.4	6.2	-177.58	68.6	-154.5	394.6	386.7	7.85	50.291		
1,800.0	1,777.9	1,664.9	1,645.2	5.8	6.7	-176.84	82.6	-178.1	444.1	435.8	8.31	53.427		
1,900.0	1,875.6	1,751.7	1,727.8	6.3	7.2	-176.13	97.1	-200.4	493.4	484.6	8.78	56.170		
2,000.0	1,973.4	1,836.4	1,808.4	6.7	7.7	-175.50	111.7	-222.1	542.9	533.6	9.26	58.608		
2,100.0	2,071.1	1,919.6	1,887.3	7.2	8.2	-174.85	127.4	-243.4	592.9	583.2	9.75	60.833		
2,200.0	2,168.9	2,002.4	1,965.6	7.6	8.8	-174.27	143.4	-264.9	643.5	633.2	10.23	62.871		
2,300.0	2,266.6	2,085.5	2,044.1	8.1	9.3	-173.79	159.4	-286.9	694.5	683.7	10.73	64.750		
2,400.0	2,364.4	2,170.1	2,124.0	8.6	9.9	-173.43	175.2	-309.8	745.8	734.6	11.22	66.498		
2,500.0	2,462.2	2,258.2	2,207.3	9.0	10.4	-173.13	191.3	-333.8	797.0	785.3	11.70	68.095		
2,600.0	2,559.9	2,344.5	2,288.8	9.5	10.9	-172.86	207.0	-357.0	848.1	835.9	12.19	69.568		
2,700.0	2,657.7	2,436.6	2,376.0	9.9	11.5	-172.61	223.8	-381.5	898.9	886.2	12.70	70.806		
2,800.0	2,755.4	2,524.0	2,458.9	10.4	12.0	-172.39	239.5	-404.4	949.3	936.1	13.19	71.997		
2,900.0	2,853.2	2,609.2	2,539.7	10.9	12.5	-172.21	254.9	-426.8	999.8	986.1	13.68	73.087		

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 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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	138.08	-94.5	84.8	128.2					
100.0	100.0	82.1	100.1	0.1	0.1	138.10	-94.5	84.8	126.9	126.8	0.18	705.254		
165.7	165.7	147.7	165.7	0.2	0.2	138.13	-94.5	84.7	126.9	126.5	0.42	303.025		
200.0	200.0	181.8	199.8	0.3	0.3	138.11	-94.5	84.7	126.9	126.4	0.56	224.719		
300.0	300.0	281.6	299.6	0.5	0.5	137.96	-94.5	85.2	127.2	126.2	0.99	127.973		
400.0	400.0	380.9	398.9	0.8	0.7	137.45	-94.2	86.4	127.8	126.4	1.44	89.051		
500.0	500.0	481.1	499.0	1.0	0.9	44.13	-91.7	89.9	127.1	125.3	1.88	67.610		
600.0	599.8	578.8	596.4	1.2	1.1	42.12	-87.4	96.8	125.3	122.9	2.35	53.388		
700.0	699.5	678.4	695.3	1.4	1.4	39.41	-81.0	107.0	121.8	118.9	2.86	42.583		
800.0	798.7	777.8	793.3	1.7	1.7	28.51	-71.6	119.7	115.6	112.2	3.44	33.616		
900.0	897.5	875.8	889.5	2.0	2.1	17.93	-59.6	134.7	107.5	103.5	4.04	26.625		
1,000.0	995.8	973.2	984.3	2.3	2.5	6.08	-45.8	151.8	98.9	94.3	4.60	21.495		
1,100.0	1,093.6	1,071.1	1,079.6	2.7	2.9	-5.47	-32.0	169.4	91.4	86.3	5.08	17.966		
1,200.0	1,191.3	1,168.5	1,174.0	3.2	3.3	-19.33	-15.8	187.3	88.3	82.7	5.55	15.916		
1,203.6	1,194.8	1,172.0	1,177.3	3.2	3.3	-19.85	-15.2	188.0	88.3	82.7	5.56	15.865 CC, ES		
1,300.0	1,289.1	1,265.0	1,267.2	3.6	3.8	-33.71	1.2	205.3	91.4	85.3	6.08	15.015		
1,400.0	1,386.8	1,361.2	1,359.9	4.0	4.3	-46.48	18.8	224.0	101.1	94.4	6.75	14.988 SF		
1,500.0	1,484.6	1,458.2	1,453.3	4.5	4.8	-56.37	36.2	243.8	115.6	108.1	7.52	15.375		
1,600.0	1,582.4	1,555.8	1,547.3	4.9	5.3	-63.48	52.7	264.4	132.4	124.1	8.34	15.883		
1,700.0	1,680.1	1,654.2	1,642.1	5.4	5.7	-69.03	69.1	284.9	150.5	141.3	9.18	16.383		
1,800.0	1,777.9	1,750.9	1,735.4	5.8	6.2	-73.28	84.9	304.9	169.2	159.2	10.05	16.842		
1,900.0	1,875.6	1,844.7	1,825.6	6.3	6.7	-76.45	101.1	325.3	189.9	179.0	10.92	17.389		
2,000.0	1,973.4	1,938.4	1,915.1	6.7	7.2	-79.01	118.8	346.3	213.1	201.3	11.81	18.039		
2,100.0	2,071.1	2,035.3	2,007.4	7.2	7.8	-80.99	137.6	369.0	237.3	224.6	12.70	18.690		
2,200.0	2,168.9	2,134.2	2,101.9	7.6	8.3	-82.69	156.4	391.6	261.3	247.7	13.58	19.242		
2,300.0	2,266.6	2,229.2	2,192.7	8.1	8.8	-84.14	174.3	412.9	285.1	270.6	14.45	19.728		
2,400.0	2,364.4	2,327.9	2,286.8	8.6	9.4	-85.34	193.2	435.5	309.5	294.1	15.34	20.172		
2,500.0	2,462.2	2,424.2	2,378.8	9.0	9.9	-86.33	211.2	457.4	333.4	317.2	16.22	20.554		
2,600.0	2,559.9	2,525.3	2,475.4	9.5	10.5	-87.14	229.6	481.0	357.3	340.1	17.12	20.868		
2,700.0	2,657.7	2,621.8	2,567.8	9.9	11.0	-87.80	246.5	503.3	380.4	362.4	18.00	21.134		
2,800.0	2,755.4	2,712.5	2,654.4	10.4	11.6	-88.33	263.2	524.6	404.5	385.7	18.87	21.442		
2,900.0	2,853.2	2,812.9	2,750.1	10.9	12.1	-88.88	282.2	548.2	429.3	409.5	19.77	21.717		
3,000.0	2,950.9	2,903.0	2,836.1	11.3	12.7	-89.36	299.4	569.1	454.1	433.4	20.62	22.020		
3,100.0	3,048.7	3,005.5	2,933.8	11.8	13.2	-89.88	319.5	592.7	479.3	457.8	21.53	22.265		
3,200.0	3,146.4	3,100.5	3,024.4	12.2	13.8	-90.32	337.5	614.3	504.0	481.6	22.40	22.498		
3,300.0	3,244.2	3,203.4	3,123.0	12.7	14.3	-90.84	357.0	637.0	528.3	505.0	23.30	22.671		
3,400.0	3,341.9	3,297.0	3,212.7	13.2	14.9	-91.30	374.2	657.3	552.3	528.1	24.17	22.849		
3,500.0	3,439.7	3,393.0	3,304.5	13.6	15.4	-91.70	392.4	678.5	576.7	551.7	25.06	23.016		
3,600.0	3,537.5	3,497.3	3,404.3	14.1	16.0	-92.05	411.6	701.9	600.8	574.8	25.97	23.132		
3,700.0	3,635.2	3,595.3	3,498.3	14.5	16.5	-92.35	428.9	723.8	624.2	597.3	26.85	23.243		
3,800.0	3,733.0	3,691.3	3,590.3	15.0	17.0	-92.61	445.7	745.4	647.5	619.8	27.73	23.348		
3,900.0	3,830.7	3,782.1	3,677.0	15.5	17.6	-92.77	462.2	766.6	671.5	642.9	28.60	23.483		
4,000.0	3,928.5	3,882.4	3,772.9	15.9	18.1	-92.99	480.5	789.5	695.6	666.1	29.50	23.582		
4,100.0	4,026.2	3,973.7	3,860.1	16.4	18.6	-93.16	497.4	810.5	720.1	689.7	30.36	23.720		
4,200.0	4,124.0	4,074.8	3,956.8	16.9	19.2	-93.37	516.2	833.6	744.4	713.1	31.26	23.813		
4,300.0	4,221.7	4,167.0	4,044.8	17.3	19.7	-93.51	533.4	854.9	769.0	736.9	32.12	23.939		
4,400.0	4,319.5	4,268.8	4,142.1	17.8	20.3	-93.69	552.4	878.1	793.5	760.5	33.03	24.024		
4,500.0	4,417.3	4,365.2	4,234.4	18.3	20.8	-93.90	570.1	899.4	817.6	783.7	33.90	24.117		
4,600.0	4,515.0	4,454.6	4,319.8	18.7	21.4	-94.06	587.2	919.5	842.4	807.7	34.75	24.242		
4,700.0	4,612.8	4,553.9	4,414.8	19.2	21.9	-94.27	606.4	941.3	867.5	831.8	35.65	24.336		
4,800.0	4,710.5	4,657.0	4,513.4	19.6	22.5	-94.45	625.9	964.2	892.2	855.6	36.55	24.410		
4,900.0	4,808.3	4,757.7	4,610.0	20.1	23.0	-94.65	644.0	985.9	915.8	878.3	37.45	24.456		

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 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.0	4,906.0	4,844.2	4,692.8	20.6	23.5	-94.80	660.4	1,004.9	940.4	902.1	38.28	24.565	
5,100.0	5,003.8	4,951.9	4,795.8	21.0	24.1	-94.92	680.4	1,029.4	964.9	925.7	39.21	24.606	
5,200.0	5,101.5	5,057.7	4,897.4	21.5	24.7	-95.12	699.0	1,052.3	988.1	948.0	40.13	24.625	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	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		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)		+N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	18.0	0.0	0.0	139.45	-109.0	93.3	144.6					
100.0	100.0	83.0	101.0	0.1	0.1	139.32	-108.6	93.4	143.2	143.1	0.18	784.394		
200.0	200.0	183.8	201.8	0.3	0.3	138.91	-107.2	93.5	142.2	141.7	0.58	247.094		
300.0	300.0	284.0	302.0	0.5	0.5	138.94	-106.2	92.5	140.8	139.8	1.01	139.404		
400.0	400.0	382.3	400.2	0.8	0.7	139.73	-106.8	90.5	140.0	138.6	1.44	97.001		
500.0	500.0	481.5	499.4	1.0	0.9	49.78	-109.2	87.7	138.9	137.1	1.88	73.877		
600.0	599.8	579.2	597.0	1.2	1.1	53.51	-113.0	84.5	136.9	134.6	2.33	58.874		
700.0	699.5	676.7	694.2	1.4	1.3	58.60	-118.2	81.8	135.1	132.3	2.78	48.543		
800.0	798.7	774.6	791.9	1.7	1.6	58.45	-124.5	79.0	133.2	129.9	3.28	40.651		
900.0	897.5	871.7	888.7	2.0	1.8	62.47	-131.7	75.2	131.5	127.7	3.80	34.628		
954.5	951.2	924.3	941.1	2.2	2.0	65.73	-136.0	73.3	131.2	127.1	4.10	31.994 CC		
1,000.0	995.8	968.8	985.4	2.3	2.1	68.90	-139.7	71.8	131.3	127.0	4.35	30.212 ES		
1,100.0	1,093.6	1,067.4	1,083.7	2.7	2.3	77.99	-147.5	69.4	133.2	128.3	4.93	27.034		
1,200.0	1,191.3	1,166.0	1,182.0	3.2	2.5	87.14	-154.1	67.3	137.5	132.0	5.53	24.866		
1,300.0	1,289.1	1,262.9	1,278.7	3.6	2.7	95.51	-160.4	65.1	145.1	138.9	6.14	23.617		
1,400.0	1,386.8	1,360.3	1,375.8	4.0	3.0	103.05	-167.0	62.5	156.0	149.3	6.75	23.121		
1,500.0	1,484.6	1,458.5	1,473.8	4.5	3.2	109.51	-173.5	60.3	168.9	161.6	7.33	23.040 SF		
1,600.0	1,582.4	1,556.5	1,571.6	4.9	3.4	115.14	-179.4	58.0	183.3	175.4	7.89	23.229		
1,700.0	1,680.1	1,653.2	1,668.1	5.4	3.6	119.94	-185.1	55.7	199.1	190.7	8.44	23.602		
1,800.0	1,777.9	1,751.1	1,765.7	5.8	3.9	123.97	-191.3	53.3	216.5	207.5	8.97	24.123		
1,900.0	1,875.6	1,849.3	1,863.8	6.3	4.1	127.38	-197.3	51.4	234.3	224.8	9.50	24.652		
2,000.0	1,973.4	1,947.3	1,961.6	6.7	4.3	130.32	-203.2	49.6	252.5	242.5	10.02	25.193		
2,100.0	2,071.1	2,044.8	2,058.9	7.2	4.6	132.98	-208.4	47.6	271.3	260.7	10.53	25.752		
2,200.0	2,168.9	2,141.4	2,155.3	7.6	4.8	135.29	-213.7	45.4	290.7	279.6	11.04	26.327		
2,300.0	2,266.6	2,238.9	2,252.7	8.1	5.0	137.32	-219.1	43.0	310.7	299.1	11.55	26.908		
2,400.0	2,364.4	2,336.4	2,350.0	8.6	5.2	139.11	-224.4	40.7	330.9	318.9	12.05	27.467		
2,500.0	2,462.2	2,434.4	2,447.8	9.0	5.5	140.68	-229.9	38.5	351.4	338.9	12.55	27.997		
2,600.0	2,559.9	2,532.2	2,545.5	9.5	5.7	142.11	-235.1	36.4	372.0	358.9	13.05	28.501		
2,700.0	2,657.7	2,630.2	2,643.3	9.9	5.9	143.38	-240.4	34.4	392.6	379.1	13.55	28.970		
2,800.0	2,755.4	2,724.8	2,737.7	10.4	6.1	144.50	-245.4	32.2	413.7	399.6	14.05	29.449		
2,900.0	2,853.2	2,817.7	2,830.4	10.9	6.4	145.51	-250.5	29.2	435.7	421.2	14.54	29.970		
3,000.0	2,950.9	2,914.7	2,927.2	11.3	6.6	146.40	-256.4	25.7	458.5	443.5	15.05	30.475		
3,100.0	3,048.7	3,011.5	3,023.7	11.8	6.8	147.09	-263.3	22.4	481.4	465.8	15.57	30.924		
3,200.0	3,146.4	3,112.8	3,124.6	12.2	7.1	147.68	-271.0	19.5	504.0	487.9	16.10	31.301		
3,300.0	3,244.2	3,210.2	3,221.8	12.7	7.3	148.23	-278.0	17.1	526.2	509.5	16.62	31.657		
3,400.0	3,341.9	3,311.0	3,322.3	13.2	7.6	148.82	-284.5	14.7	548.1	530.9	17.14	31.980		
3,500.0	3,439.7	3,405.7	3,416.9	13.6	7.8	149.38	-290.1	12.4	570.0	552.4	17.64	32.312		
3,600.0	3,537.5	3,502.1	3,513.0	14.1	8.0	149.92	-295.9	9.7	592.3	574.2	18.15	32.638		
3,700.0	3,635.2	3,598.4	3,609.1	14.5	8.3	150.34	-302.4	7.1	614.8	596.1	18.67	32.935		
3,800.0	3,733.0	3,693.6	3,703.9	15.0	8.5	150.66	-309.7	4.4	637.6	618.4	19.20	33.214		
3,900.0	3,830.7	3,792.9	3,802.9	15.5	8.8	150.91	-317.8	1.7	660.4	640.7	19.74	33.453		
4,000.0	3,928.5	3,894.3	3,904.0	15.9	9.0	151.21	-325.5	-0.7	682.7	662.4	20.28	33.663		
4,100.0	4,026.2	3,988.1	3,997.5	16.4	9.2	151.51	-332.0	-2.9	705.0	684.2	20.80	33.901		
4,200.0	4,124.0	4,077.8	4,086.9	16.9	9.5	151.72	-339.1	-5.8	728.2	706.9	21.32	34.166		
4,300.0	4,221.7	4,187.3	4,196.0	17.3	9.7	151.94	-348.0	-8.8	751.1	729.2	21.88	34.330		
4,400.0	4,319.5	4,290.8	4,299.3	17.8	10.0	152.26	-354.6	-10.5	772.5	750.1	22.41	34.477		
4,500.0	4,417.3	4,383.0	4,391.3	18.3	10.2	152.58	-359.7	-12.3	794.2	771.3	22.90	34.677		
4,600.0	4,515.0	4,475.8	4,483.9	18.7	10.4	152.91	-364.7	-14.7	816.5	793.1	23.40	34.894		
4,700.0	4,612.8	4,568.4	4,576.3	19.2	10.6	153.22	-369.7	-17.7	839.5	815.6	23.89	35.132		
4,800.0	4,710.5	4,668.4	4,676.1	19.6	10.9	153.49	-375.9	-20.9	862.4	838.0	24.41	35.325		
4,900.0	4,808.3	4,766.3	4,773.7	20.1	11.1	153.70	-382.5	-23.7	885.3	860.3	24.94	35.496		
5,000.0	4,906.0	4,863.1	4,870.2	20.6	11.4	153.83	-390.1	-26.3	908.1	882.6	25.48	35.644		

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 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	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)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.0	5,003.8	4,963.8	4,970.6	21.0	11.6	153.96	-398.0	-29.0	931.0	905.0	26.02	35.780	
5,200.0	5,101.5	5,065.5	5,071.9	21.5	11.9	154.11	-405.4	-31.0	953.0	926.4	26.56	35.879	
5,300.0	5,199.7	5,165.3	5,171.4	21.8	12.1	154.36	-413.2	-33.0	973.5	946.5	27.07	35.959	
5,400.0	5,298.4	5,269.4	5,275.3	22.1	12.4	154.52	-420.2	-34.5	990.2	962.7	27.56	35.929	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-10M - Slot A-6 - Design #2													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	
0.0	0.0	0.0	0.0	0.0	0.0	-72.18	4.4	-13.6	14.3					
100.0	100.0	100.0	100.0	0.1	0.1	-72.18	4.4	-13.6	14.3	14.1	0.18	81.445		
200.0	200.0	200.0	200.0	0.3	0.3	-72.18	4.4	-13.6	14.3	13.7	0.62	22.851 CC, ES		
300.0	300.0	299.5	299.4	0.5	0.5	-72.25	4.9	-15.2	16.0	14.9	1.07	15.014		
400.0	400.0	398.7	398.5	0.8	0.8	-72.41	6.4	-20.2	21.2	19.7	1.52	13.991 SF		
500.0	500.0	497.2	496.7	1.0	1.0	-165.33	8.9	-28.3	31.5	29.5	1.99	15.819		
600.0	599.8	594.4	593.2	1.2	1.3	-166.68	12.3	-39.5	48.6	46.1	2.49	19.559		
700.0	699.5	690.4	688.1	1.4	1.6	-167.77	16.6	-53.4	72.1	69.1	2.99	24.081		
800.0	798.7	786.6	783.0	1.7	1.9	-175.13	21.1	-67.9	99.5	96.0	3.48	28.629		
900.0	897.5	881.8	877.0	2.0	2.3	-179.27	25.5	-82.3	130.2	126.2	3.95	32.915		
1,000.0	995.8	975.9	969.9	2.3	2.6	178.22	29.9	-96.5	164.0	159.5	4.43	36.990		
1,100.0	1,093.6	1,069.1	1,062.0	2.7	2.9	178.09	34.2	-110.6	200.1	195.2	4.87	41.098		
1,200.0	1,191.3	1,162.3	1,154.0	3.2	3.3	178.44	38.6	-124.7	236.3	231.0	5.30	44.580		
1,300.0	1,289.1	1,255.5	1,246.0	3.6	3.6	178.70	42.9	-138.7	272.6	266.8	5.75	47.437		
1,400.0	1,386.8	1,348.7	1,338.1	4.0	4.0	178.89	47.2	-152.8	308.8	302.6	6.19	49.852		
1,500.0	1,484.6	1,441.9	1,430.1	4.5	4.3	179.05	51.6	-166.9	345.0	338.4	6.65	51.892		
1,600.0	1,582.4	1,535.1	1,522.1	4.9	4.7	179.17	55.9	-181.0	381.3	374.2	7.11	53.636		
1,700.0	1,680.1	1,628.3	1,614.2	5.4	5.0	179.28	60.3	-195.1	417.5	410.0	7.57	55.141		
1,800.0	1,777.9	1,721.5	1,706.2	5.8	5.3	179.36	64.6	-209.1	453.8	445.7	8.04	56.451		
1,900.0	1,875.6	1,814.7	1,798.2	6.3	5.7	179.44	68.9	-223.2	490.0	481.5	8.51	57.601		
2,000.0	1,973.4	1,907.9	1,890.2	6.7	6.0	179.50	73.3	-237.3	526.3	517.3	8.98	58.616		
2,100.0	2,071.1	2,001.1	1,982.3	7.2	6.4	179.56	77.6	-251.4	562.5	553.1	9.45	59.519		
2,200.0	2,168.9	2,094.3	2,074.3	7.6	6.7	179.61	81.9	-265.4	598.8	588.9	9.93	60.326		
2,300.0	2,266.6	2,187.5	2,166.3	8.1	7.1	179.65	86.3	-279.5	635.0	624.6	10.40	61.052		
2,400.0	2,364.4	2,280.7	2,258.3	8.6	7.4	179.69	90.6	-293.6	671.3	660.4	10.88	61.708		
2,500.0	2,462.2	2,373.9	2,350.4	9.0	7.8	179.72	94.9	-307.7	707.5	696.2	11.36	62.304		
2,600.0	2,559.9	2,467.1	2,442.4	9.5	8.1	179.76	99.3	-321.7	743.8	732.0	11.83	62.847		
2,700.0	2,657.7	2,560.3	2,534.4	9.9	8.5	179.78	103.6	-335.8	780.0	767.7	12.31	63.344		
2,800.0	2,755.4	2,653.5	2,626.4	10.4	8.8	179.81	107.9	-349.9	816.3	803.5	12.79	63.800		
2,900.0	2,853.2	2,746.7	2,718.5	10.9	9.2	179.83	112.3	-364.0	852.5	839.3	13.28	64.221		
3,000.0	2,950.9	2,839.9	2,810.5	11.3	9.5	179.85	116.6	-378.0	888.8	875.0	13.76	64.610		
3,100.0	3,048.7	2,933.1	2,902.5	11.8	9.8	179.87	120.9	-392.1	925.1	910.8	14.24	64.970		
3,200.0	3,146.4	3,026.2	2,994.5	12.2	10.2	179.89	125.3	-406.2	961.3	946.6	14.72	65.305		
3,300.0	3,244.2	3,119.4	3,086.6	12.7	10.5	179.91	129.6	-420.3	997.6	982.4	15.20	65.617		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-11E - Slot B-6 - 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	-31.88	9.1	-5.7	10.7					
100.0	100.0	100.0	100.0	0.1	0.1	-31.88	9.1	-5.7	10.7	10.5	0.18	61.165		
200.0	200.0	200.0	200.0	0.3	0.3	-31.88	9.1	-5.7	10.7	10.1	0.62	17.161		
300.0	300.0	300.0	300.0	0.5	0.5	-31.88	9.1	-5.7	10.7	9.6	1.07	9.981		
400.0	400.0	400.0	400.0	0.8	0.8	-31.88	9.1	-5.7	10.7	9.2	1.52	7.037	CC, ES	
500.0	500.0	500.0	500.0	1.0	1.0	-130.93	9.1	-5.7	11.8	9.8	1.97	5.987		
600.0	599.8	600.2	600.2	1.2	1.2	-141.07	9.2	-3.9	14.4	12.0	2.41	5.971		
700.0	699.5	700.6	700.4	1.4	1.4	-147.09	9.5	1.3	17.5	14.6	2.87	6.098		
800.0	798.7	801.1	800.5	1.7	1.6	-155.08	9.9	10.1	21.1	17.8	3.36	6.301		
900.0	897.5	901.7	900.4	2.0	1.9	-156.56	10.3	22.4	25.3	21.4	3.86	6.553		
1,000.0	995.8	1,002.4	999.8	2.3	2.2	-154.98	10.1	38.2	29.9	25.5	4.41	6.793		
1,100.0	1,093.6	1,103.2	1,098.7	2.7	2.6	-149.95	9.6	57.4	34.4	29.4	5.00	6.873		
1,200.0	1,191.3	1,203.0	1,196.4	3.2	3.0	-143.93	8.8	78.2	37.8	32.2	5.68	6.662		
1,300.0	1,289.1	1,302.9	1,294.1	3.6	3.4	-138.96	8.0	99.0	41.7	35.3	6.43	6.479		
1,400.0	1,386.8	1,402.8	1,391.8	4.0	3.8	-134.86	7.2	119.8	45.8	38.5	7.24	6.326		
1,500.0	1,484.6	1,502.6	1,489.4	4.5	4.2	-131.45	6.4	140.6	50.1	42.0	8.07	6.200		
1,600.0	1,582.4	1,602.5	1,587.1	4.9	4.6	-128.58	5.6	161.4	54.5	45.6	8.94	6.099		
1,700.0	1,680.1	1,702.4	1,684.8	5.4	5.1	-126.15	4.8	182.2	59.1	49.2	9.81	6.018		
1,800.0	1,777.9	1,802.2	1,782.5	5.8	5.5	-124.07	4.1	203.0	63.7	53.0	10.70	5.952		
1,900.0	1,875.6	1,902.1	1,880.1	6.3	6.0	-122.27	3.3	223.8	68.4	56.8	11.60	5.899		
2,000.0	1,973.4	2,002.0	1,977.8	6.7	6.4	-120.71	2.5	244.6	73.2	60.7	12.50	5.855		
2,100.0	2,071.1	2,101.8	2,075.5	7.2	6.8	-119.34	1.7	265.4	78.0	64.6	13.41	5.819		
2,200.0	2,168.9	2,201.7	2,173.2	7.6	7.3	-118.13	0.9	286.2	82.9	68.6	14.32	5.790		
2,300.0	2,266.6	2,301.6	2,270.8	8.1	7.7	-117.05	0.1	307.0	87.8	72.6	15.23	5.765		
2,400.0	2,364.4	2,401.4	2,368.5	8.6	8.2	-116.09	-0.7	327.8	92.7	76.6	16.14	5.744		
2,500.0	2,462.2	2,501.3	2,466.2	9.0	8.6	-115.23	-1.5	348.6	97.7	80.6	17.05	5.727		
2,600.0	2,559.9	2,601.2	2,563.9	9.5	9.1	-114.45	-2.2	369.4	102.6	84.7	17.97	5.712		
2,700.0	2,657.7	2,701.0	2,661.5	9.9	9.5	-113.74	-3.0	390.2	107.6	88.7	18.88	5.699		
2,800.0	2,755.4	2,800.9	2,759.2	10.4	10.0	-113.09	-3.8	411.0	112.6	92.8	19.80	5.688		
2,900.0	2,853.2	2,900.8	2,856.9	10.9	10.4	-112.50	-4.6	431.8	117.6	96.9	20.71	5.679		
3,000.0	2,950.9	3,000.6	2,954.5	11.3	10.9	-111.96	-5.4	452.6	122.6	101.0	21.63	5.671		
3,100.0	3,048.7	3,100.5	3,052.2	11.8	11.4	-111.46	-6.2	473.4	127.7	105.1	22.54	5.664		
3,200.0	3,146.4	3,200.4	3,149.9	12.2	11.8	-111.00	-7.0	494.2	132.7	109.3	23.46	5.657		
3,300.0	3,244.2	3,300.2	3,247.6	12.7	12.3	-110.57	-7.8	515.0	137.8	113.4	24.38	5.652		
3,400.0	3,341.9	3,400.1	3,345.2	13.2	12.7	-110.17	-8.5	535.8	142.8	117.5	25.29	5.647		
3,500.0	3,439.7	3,500.0	3,442.9	13.6	13.2	-109.80	-9.3	556.6	147.9	121.7	26.21	5.643		
3,600.0	3,537.5	3,599.8	3,540.6	14.1	13.6	-109.45	-10.1	577.4	153.0	125.8	27.12	5.639		
3,700.0	3,635.2	3,699.7	3,638.3	14.5	14.1	-109.13	-10.9	598.2	158.0	130.0	28.04	5.636		
3,800.0	3,733.0	3,799.6	3,735.9	15.0	14.5	-108.83	-11.7	619.0	163.1	134.2	28.96	5.633		
3,900.0	3,830.7	3,899.4	3,833.6	15.5	15.0	-108.54	-12.5	639.8	168.2	138.3	29.87	5.631		
4,000.0	3,928.5	3,999.3	3,931.3	15.9	15.4	-108.27	-13.3	660.6	173.3	142.5	30.79	5.628		
4,100.0	4,026.2	4,099.2	4,029.0	16.4	15.9	-108.02	-14.1	681.4	178.4	146.7	31.70	5.626		
4,200.0	4,124.0	4,199.1	4,126.6	16.9	16.4	-107.78	-14.9	702.2	183.5	150.9	32.62	5.625		
4,300.0	4,221.7	4,298.9	4,224.3	17.3	16.8	-107.55	-15.6	723.0	188.6	155.0	33.54	5.623		
4,400.0	4,319.5	4,398.8	4,322.0	17.8	17.3	-107.34	-16.4	743.8	193.7	159.2	34.45	5.622		
4,500.0	4,417.3	4,498.7	4,419.7	18.3	17.7	-107.14	-17.2	764.6	198.8	163.4	35.37	5.620		
4,600.0	4,515.0	4,598.5	4,517.3	18.7	18.2	-106.94	-18.0	785.4	203.9	167.6	36.28	5.619		
4,700.0	4,612.8	4,698.4	4,615.0	19.2	18.6	-106.76	-18.8	806.2	209.0	171.8	37.20	5.618		
4,800.0	4,710.5	4,798.3	4,712.7	19.6	19.1	-106.58	-19.6	827.0	214.1	176.0	38.12	5.617		
4,900.0	4,808.3	4,898.1	4,810.4	20.1	19.5	-106.42	-20.4	847.8	219.2	180.2	39.03	5.616		
5,000.0	4,906.0	4,998.0	4,908.0	20.6	20.0	-106.26	-21.2	868.6	224.3	184.4	39.95	5.616		
5,100.0	5,003.8	5,097.9	5,005.7	21.0	20.5	-106.11	-21.9	889.4	229.4	188.6	40.86	5.615		

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 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-11E - Slot B-6 - 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	5,101.5	5,197.7	5,103.4	21.5	20.9	-105.97	-22.7	910.2	234.6	192.8	41.78	5.615		
5,300.0	5,199.7	5,297.3	5,201.1	21.8	21.2	-105.89	-23.4	929.3	239.2	196.8	42.45	5.636		
5,400.0	5,298.4	5,397.0	5,299.5	22.1	21.5	-105.83	-24.0	944.9	243.0	200.0	43.03	5.648		
5,500.0	5,397.7	5,496.6	5,398.5	22.3	21.8	-105.79	-24.5	957.1	246.0	202.5	43.52	5.653		
5,600.0	5,497.3	5,596.4	5,497.8	22.5	22.0	-105.76	-24.8	965.9	248.2	204.2	43.93	5.649		
5,700.0	5,597.1	5,696.1	5,597.4	22.7	22.1	-105.74	-25.0	971.2	249.5	205.2	44.25	5.637		
5,800.0	5,697.1	5,795.9	5,697.1	22.8	22.3	-105.74	-25.1	973.0	249.9	205.4	44.50	5.616		
5,900.0	5,797.1	5,895.8	5,797.1	22.9	22.4	0.54	-25.1	973.0	249.9	205.2	44.73	5.587		
6,000.0	5,897.1	5,995.8	5,897.1	23.0	22.5	0.54	-25.1	973.0	249.9	204.9	44.96	5.558		
6,100.0	5,997.1	6,095.8	5,997.1	23.2	22.6	0.54	-25.1	973.0	249.9	204.7	45.20	5.528		
6,200.0	6,097.1	6,195.8	6,097.1	23.3	22.7	0.54	-25.1	973.0	249.9	204.5	45.45	5.499		
6,300.0	6,197.1	6,295.8	6,197.1	23.4	22.9	0.54	-25.1	973.0	249.9	204.2	45.69	5.469		
6,400.0	6,297.1	6,395.8	6,297.1	23.5	23.0	0.54	-25.1	973.0	249.9	204.0	45.94	5.440		
6,500.0	6,397.1	6,495.8	6,397.1	23.6	23.1	0.54	-25.1	973.0	249.9	203.7	46.19	5.410		
6,600.0	6,497.1	6,595.8	6,497.1	23.8	23.2	0.54	-25.1	973.0	249.9	203.5	46.45	5.380		
6,700.0	6,597.1	6,695.8	6,597.1	23.9	23.4	0.54	-25.1	973.0	249.9	203.2	46.71	5.351		
6,800.0	6,697.1	6,795.8	6,697.1	24.0	23.5	0.54	-25.1	973.0	249.9	202.9	46.97	5.321		
6,900.0	6,797.1	6,895.8	6,797.1	24.1	23.6	0.54	-25.1	973.0	249.9	202.7	47.23	5.291		
7,000.0	6,897.1	6,995.8	6,897.1	24.3	23.8	0.54	-25.1	973.0	249.9	202.4	47.50	5.262		
7,100.0	6,997.1	7,095.8	6,997.1	24.4	23.9	0.54	-25.1	973.0	249.9	202.1	47.76	5.232		
7,200.0	7,097.1	7,195.8	7,097.1	24.5	24.0	0.54	-25.1	973.0	249.9	201.9	48.04	5.202		
7,300.0	7,197.1	7,295.8	7,197.1	24.7	24.2	0.54	-25.1	973.0	249.9	201.6	48.31	5.173		
7,400.0	7,297.1	7,395.8	7,297.1	24.8	24.3	0.54	-25.1	973.0	249.9	201.3	48.59	5.143		
7,500.0	7,397.1	7,495.8	7,397.1	24.9	24.5	0.54	-25.1	973.0	249.9	201.0	48.87	5.114		
7,600.0	7,497.1	7,595.8	7,497.1	25.1	24.6	0.54	-25.1	973.0	249.9	200.8	49.15	5.085		
7,700.0	7,597.1	7,695.8	7,597.1	25.2	24.8	0.54	-25.1	973.0	249.9	200.5	49.43	5.055		
7,800.0	7,697.1	7,795.8	7,697.1	25.3	24.9	0.54	-25.1	973.0	249.9	200.2	49.72	5.026		
7,852.9	7,750.0	7,848.7	7,750.0	25.4	25.0	0.54	-25.1	973.0	249.9	200.0	49.87	5.011 SF		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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	149.22	-17.1	10.2	19.9					
100.0	100.0	100.0	100.0	0.1	0.1	149.22	-17.1	10.2	19.9	19.7	0.18	113.646		
200.0	200.0	200.0	200.0	0.3	0.3	149.22	-17.1	10.2	19.9	19.3	0.62	31.886		
300.0	300.0	300.0	300.0	0.5	0.5	149.22	-17.1	10.2	19.9	18.8	1.07	18.545 CC, ES		
400.0	400.0	399.6	399.5	0.8	0.7	145.39	-17.3	11.9	21.0	19.5	1.51	13.889		
500.0	500.0	499.0	498.8	1.0	1.0	46.98	-17.7	17.1	23.4	21.5	1.94	12.060		
600.0	599.8	598.3	597.7	1.2	1.2	42.16	-18.5	25.6	26.2	23.8	2.39	10.936		
700.0	699.5	697.3	696.0	1.4	1.5	40.79	-20.6	37.1	29.5	26.6	2.87	10.280		
800.0	798.7	796.1	793.8	1.7	1.8	36.05	-25.1	50.8	33.3	29.9	3.38	9.858		
900.0	897.5	894.8	890.9	2.0	2.1	35.05	-32.1	66.8	37.2	33.3	3.92	9.498		
1,000.0	995.8	993.3	987.3	2.3	2.5	36.18	-41.6	85.1	41.4	36.9	4.52	9.175		
1,100.0	1,093.6	1,093.2	1,084.6	2.7	2.9	39.91	-52.3	104.7	45.2	40.0	5.16	8.743		
1,200.0	1,191.3	1,193.1	1,182.0	3.2	3.4	43.61	-63.1	124.3	49.0	43.1	5.87	8.354		
1,300.0	1,289.1	1,293.0	1,279.3	3.6	3.9	46.76	-73.8	144.0	53.0	46.4	6.61	8.015		
1,400.0	1,386.8	1,392.9	1,376.7	4.0	4.3	49.47	-84.6	163.6	57.2	49.8	7.40	7.725		
1,500.0	1,484.6	1,492.7	1,474.0	4.5	4.8	51.80	-95.3	183.2	61.4	53.2	8.21	7.478		
1,600.0	1,582.4	1,592.6	1,571.4	4.9	5.3	53.82	-106.1	202.8	65.8	56.7	9.05	7.267		
1,700.0	1,680.1	1,692.5	1,668.7	5.4	5.8	55.60	-116.8	222.4	70.2	60.3	9.90	7.088		
1,800.0	1,777.9	1,792.4	1,766.1	5.8	6.2	57.16	-127.5	242.0	74.7	63.9	10.77	6.934		
1,900.0	1,875.6	1,892.3	1,863.4	6.3	6.7	58.54	-138.3	261.6	79.2	67.6	11.64	6.802		
2,000.0	1,973.4	1,992.1	1,960.7	6.7	7.2	59.78	-149.0	281.2	83.8	71.2	12.53	6.687		
2,100.0	2,071.1	2,092.0	2,058.1	7.2	7.7	60.88	-159.8	300.8	88.4	75.0	13.42	6.587		
2,200.0	2,168.9	2,191.9	2,155.4	7.6	8.2	61.88	-170.5	320.4	93.0	78.7	14.31	6.499		
2,300.0	2,266.6	2,291.8	2,252.8	8.1	8.6	62.78	-181.3	340.1	97.7	82.5	15.21	6.422		
2,400.0	2,364.4	2,391.7	2,350.1	8.6	9.1	63.60	-192.0	359.7	102.4	86.2	16.11	6.353		
2,500.0	2,462.2	2,491.5	2,447.5	9.0	9.6	64.35	-202.8	379.3	107.1	90.0	17.02	6.292		
2,600.0	2,559.9	2,591.4	2,544.8	9.5	10.1	65.03	-213.5	398.9	111.8	93.9	17.92	6.237		
2,700.0	2,657.7	2,691.3	2,642.2	9.9	10.6	65.66	-224.2	418.5	116.5	97.7	18.83	6.187		
2,800.0	2,755.4	2,791.2	2,739.5	10.4	11.1	66.24	-235.0	438.1	121.3	101.5	19.74	6.143		
2,900.0	2,853.2	2,891.1	2,836.8	10.9	11.6	66.77	-245.7	457.7	126.0	105.4	20.65	6.102		
3,000.0	2,950.9	2,990.9	2,934.2	11.3	12.0	67.27	-256.5	477.3	130.8	109.2	21.56	6.065		
3,100.0	3,048.7	3,090.8	3,031.5	11.8	12.5	67.73	-267.2	496.9	135.6	113.1	22.48	6.031		
3,200.0	3,146.4	3,190.7	3,128.9	12.2	13.0	68.16	-278.0	516.6	140.3	116.9	23.39	6.000		
3,300.0	3,244.2	3,290.6	3,226.2	12.7	13.5	68.57	-288.7	536.2	145.1	120.8	24.30	5.971		
3,400.0	3,341.9	3,390.5	3,323.6	13.2	14.0	68.94	-299.5	555.8	149.9	124.7	25.22	5.945		
3,500.0	3,439.7	3,490.3	3,420.9	13.6	14.5	69.29	-310.2	575.4	154.7	128.6	26.14	5.920		
3,600.0	3,537.5	3,590.2	3,518.3	14.1	15.0	69.63	-320.9	595.0	159.5	132.5	27.05	5.898		
3,700.0	3,635.2	3,690.1	3,615.6	14.5	15.5	69.94	-331.7	614.6	164.4	136.4	27.97	5.876		
3,800.0	3,733.0	3,790.0	3,713.0	15.0	15.9	70.23	-342.4	634.2	169.2	140.3	28.89	5.857		
3,900.0	3,830.7	3,889.9	3,810.3	15.5	16.4	70.51	-353.2	653.8	174.0	144.2	29.80	5.838		
4,000.0	3,928.5	3,989.7	3,907.6	15.9	16.9	70.77	-363.9	673.4	178.8	148.1	30.72	5.821		
4,100.0	4,026.2	4,089.6	4,005.0	16.4	17.4	71.02	-374.7	693.0	183.7	152.0	31.64	5.805		
4,200.0	4,124.0	4,189.5	4,102.3	16.9	17.9	71.26	-385.4	712.7	188.5	155.9	32.56	5.790		
4,300.0	4,221.7	4,289.4	4,199.7	17.3	18.4	71.49	-396.2	732.3	193.3	159.9	33.48	5.775		
4,400.0	4,319.5	4,389.3	4,297.0	17.8	18.9	71.70	-406.9	751.9	198.2	163.8	34.39	5.762		
4,500.0	4,417.3	4,489.1	4,394.4	18.3	19.4	71.90	-417.6	771.5	203.0	167.7	35.31	5.749		
4,600.0	4,515.0	4,589.0	4,491.7	18.7	19.9	72.10	-428.4	791.1	207.9	171.6	36.23	5.737		
4,700.0	4,612.8	4,688.9	4,589.1	19.2	20.3	72.28	-439.1	810.7	212.7	175.6	37.15	5.726		
4,800.0	4,710.5	4,788.8	4,686.4	19.6	20.8	72.46	-449.9	830.3	217.6	179.5	38.07	5.715		
4,900.0	4,808.3	4,888.7	4,783.7	20.1	21.3	72.63	-460.6	849.9	222.4	183.4	38.99	5.705		
5,000.0	4,906.0	4,988.5	4,881.1	20.6	21.8	72.79	-471.4	869.5	227.3	187.4	39.91	5.695		
5,100.0	5,003.8	5,088.4	4,978.4	21.0	22.3	72.95	-482.1	889.2	232.1	191.3	40.83	5.685		

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 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,200.0	5,101.5	5,189.0	5,076.5	21.5	22.8	73.11	-492.9	908.9	237.0	195.2	41.74	5.677	
5,300.0	5,199.7	5,293.1	5,178.5	21.8	23.1	73.42	-502.9	927.1	241.2	198.7	42.45	5.682	
5,400.0	5,298.4	5,397.3	5,281.3	22.1	23.4	73.66	-511.1	942.1	244.7	201.6	43.06	5.682	
5,500.0	5,397.7	5,501.6	5,384.7	22.3	23.7	73.84	-517.5	953.8	247.4	203.8	43.58	5.677	
5,600.0	5,497.3	5,605.9	5,488.5	22.5	23.9	73.97	-522.1	962.2	249.3	205.3	44.00	5.667	
5,700.0	5,597.1	5,710.2	5,592.7	22.7	24.1	74.05	-524.9	967.3	250.5	206.2	44.33	5.651	
5,800.0	5,697.1	5,814.5	5,697.0	22.8	24.2	74.08	-525.9	969.1	250.9	206.3	44.57	5.629	
5,900.0	5,797.1	5,914.7	5,797.1	22.9	24.3	-179.64	-525.9	969.1	250.9	206.1	44.80	5.601	
6,000.0	5,897.1	6,014.7	5,897.1	23.0	24.4	-179.64	-525.9	969.1	250.9	205.9	45.02	5.573	
6,100.0	5,997.1	6,114.7	5,997.1	23.2	24.5	-179.64	-525.9	969.1	250.9	205.7	45.26	5.544	
6,200.0	6,097.1	6,214.7	6,097.1	23.3	24.6	-179.64	-525.9	969.1	250.9	205.4	45.49	5.515	
6,300.0	6,197.1	6,314.7	6,197.1	23.4	24.7	-179.64	-525.9	969.1	250.9	205.2	45.73	5.487	
6,400.0	6,297.1	6,414.7	6,297.1	23.5	24.8	-179.64	-525.9	969.1	250.9	204.9	45.97	5.458	
6,500.0	6,397.1	6,514.7	6,397.1	23.6	24.9	-179.64	-525.9	969.1	250.9	204.7	46.22	5.429	
6,600.0	6,497.1	6,614.7	6,497.1	23.8	25.0	-179.64	-525.9	969.1	250.9	204.4	46.47	5.400	
6,700.0	6,597.1	6,714.7	6,597.1	23.9	25.2	-179.64	-525.9	969.1	250.9	204.2	46.72	5.371	
6,800.0	6,697.1	6,814.7	6,697.1	24.0	25.3	-179.64	-525.9	969.1	250.9	203.9	46.97	5.342	
6,900.0	6,797.1	6,914.7	6,797.1	24.1	25.4	-179.64	-525.9	969.1	250.9	203.7	47.23	5.313	
7,000.0	6,897.1	7,014.7	6,897.1	24.3	25.5	-179.64	-525.9	969.1	250.9	203.4	47.49	5.284	
7,100.0	6,997.1	7,114.7	6,997.1	24.4	25.6	-179.64	-525.9	969.1	250.9	203.2	47.75	5.255	
7,200.0	7,097.1	7,214.7	7,097.1	24.5	25.8	-179.64	-525.9	969.1	250.9	202.9	48.02	5.226	
7,300.0	7,197.1	7,314.7	7,197.1	24.7	25.9	-179.64	-525.9	969.1	250.9	202.6	48.28	5.197	
7,400.0	7,297.1	7,414.7	7,297.1	24.8	26.0	-179.64	-525.9	969.1	250.9	202.4	48.56	5.168	
7,500.0	7,397.1	7,514.7	7,397.1	24.9	26.1	-179.64	-525.9	969.1	250.9	202.1	48.83	5.139	
7,600.0	7,497.1	7,614.7	7,497.1	25.1	26.3	-179.64	-525.9	969.1	250.9	201.8	49.10	5.110	
7,700.0	7,597.1	7,714.7	7,597.1	25.2	26.4	-179.64	-525.9	969.1	250.9	201.5	49.38	5.081	
7,800.0	7,697.1	7,814.7	7,697.1	25.3	26.5	-179.64	-525.9	969.1	250.9	201.3	49.65	5.053	
7,828.3	7,725.4	7,842.9	7,725.4	25.4	26.5	-179.64	-525.9	969.1	250.9	201.2	49.71	5.047 SF	
7,852.9	7,750.0	7,852.6	7,735.0	25.4	26.5	-179.64	-525.9	969.1	251.4	201.6	49.76	5.052	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design		Bruton 30-10 Pad - Bruton 30-13M - Slot A-5 - 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		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
							+N/-S (usft)	+E/-W (usft)							
0.0	0.0	0.0	0.0	0.0	0.0	-118.34	-4.7	-8.8	10.0						
100.0	100.0	100.0	100.0	0.1	0.1	-118.34	-4.7	-8.8	10.0	9.8	0.18	56.894			
200.0	200.0	200.0	200.0	0.3	0.3	-118.34	-4.7	-8.8	10.0	9.3	0.62	15.963			
300.0	300.0	300.0	300.0	0.5	0.5	-118.34	-4.7	-8.8	10.0	8.9	1.07	9.284			
400.0	400.0	400.0	400.0	0.8	0.8	-118.34	-4.7	-8.8	10.0	8.5	1.52	6.545 CC, ES			
500.0	500.0	500.0	500.0	1.0	1.0	154.04	-4.7	-8.8	11.5	9.5	1.98	5.829 SF			
600.0	599.8	599.8	599.8	1.2	1.2	162.05	-4.7	-8.8	16.4	13.9	2.44	6.705			
700.0	699.5	698.6	698.6	1.4	1.4	166.99	-5.5	-10.3	26.4	23.5	2.91	9.081			
800.0	798.7	796.1	796.0	1.7	1.6	162.67	-7.9	-14.7	42.9	39.5	3.37	12.719			
900.0	897.5	891.9	891.4	2.0	1.8	160.22	-11.8	-21.8	65.1	61.3	3.84	16.961			
1,000.0	995.8	985.5	984.3	2.3	2.0	158.55	-17.1	-31.5	93.2	88.8	4.33	21.527			
1,100.0	1,093.6	1,076.8	1,074.6	2.7	2.3	158.73	-23.6	-43.6	126.0	121.2	4.79	26.300			
1,200.0	1,191.3	1,166.1	1,162.4	3.2	2.6	158.80	-31.3	-57.8	161.7	156.4	5.26	30.725			
1,300.0	1,289.1	1,258.8	1,253.3	3.6	2.9	158.65	-40.0	-73.9	198.7	193.0	5.75	34.589			
1,400.0	1,386.8	1,351.6	1,344.3	4.0	3.3	158.54	-48.8	-90.0	235.8	229.6	6.24	37.816			
1,500.0	1,484.6	1,444.5	1,435.3	4.5	3.7	158.47	-57.5	-106.2	272.9	266.2	6.74	40.514			
1,600.0	1,582.4	1,537.4	1,526.4	4.9	4.0	158.41	-66.3	-122.3	310.0	302.7	7.26	42.727			
1,700.0	1,680.1	1,630.2	1,617.4	5.4	4.4	158.36	-75.0	-138.4	347.1	339.3	7.78	44.639			
1,800.0	1,777.9	1,723.1	1,708.5	5.8	4.8	158.32	-83.7	-154.6	384.2	375.9	8.30	46.268			
1,900.0	1,875.6	1,816.0	1,799.5	6.3	5.2	158.29	-92.5	-170.7	421.3	412.4	8.84	47.672			
2,000.0	1,973.4	1,908.9	1,890.5	6.7	5.6	158.27	-101.2	-186.8	458.3	449.0	9.37	48.893			
2,100.0	2,071.1	2,001.7	1,981.6	7.2	6.0	158.25	-110.0	-203.0	495.4	485.5	9.92	49.963			
2,200.0	2,168.9	2,094.6	2,072.6	7.6	6.4	158.23	-118.7	-219.1	532.5	522.0	10.46	50.906			
2,300.0	2,266.6	2,187.5	2,163.6	8.1	6.8	158.21	-127.5	-235.2	569.6	558.6	11.01	51.743			
2,400.0	2,364.4	2,280.3	2,254.7	8.6	7.2	158.20	-136.2	-251.4	606.7	595.1	11.56	52.490			
2,500.0	2,462.2	2,373.2	2,345.7	9.0	7.6	158.18	-144.9	-267.5	643.8	631.7	12.11	53.161			
2,600.0	2,559.9	2,466.1	2,436.8	9.5	8.0	158.17	-153.7	-283.7	680.8	668.2	12.66	53.766			
2,700.0	2,657.7	2,558.9	2,527.8	9.9	8.4	158.16	-162.4	-299.8	717.9	704.7	13.22	54.314			
2,800.0	2,755.4	2,651.8	2,618.8	10.4	8.8	158.15	-171.2	-315.9	755.0	741.2	13.77	54.813			
2,900.0	2,853.2	2,744.7	2,709.9	10.9	9.2	158.14	-179.9	-332.1	792.1	777.8	14.33	55.269			
3,000.0	2,950.9	2,837.5	2,800.9	11.3	9.6	158.14	-188.7	-348.2	829.2	814.3	14.89	55.687			
3,100.0	3,048.7	2,930.4	2,891.9	11.8	10.0	158.13	-197.4	-364.3	866.3	850.8	15.45	56.071			
3,200.0	3,146.4	3,023.3	2,983.0	12.2	10.4	158.12	-206.2	-380.5	903.4	887.3	16.01	56.426			
3,300.0	3,244.2	3,116.2	3,074.0	12.7	10.8	158.12	-214.9	-396.6	940.4	923.9	16.57	56.754			
3,400.0	3,341.9	3,209.0	3,165.1	13.2	11.2	158.11	-223.6	-412.7	977.5	960.4	17.13	57.058			



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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		
0.0	0.0	0.0	18.0	0.0	0.0	139.68	-120.0	101.8	158.4					
100.0	100.0	81.9	99.9	0.1	0.1	139.57	-119.8	102.1	157.4	157.2	0.18	868.143 CC		
200.0	200.0	181.4	199.4	0.3	0.3	139.20	-119.3	103.0	157.6	157.0	0.57	277.658 ES		
300.0	300.0	280.0	298.0	0.5	0.5	138.91	-119.3	104.0	158.3	157.3	1.00	158.464		
400.0	400.0	371.0	388.9	0.8	0.7	138.62	-121.0	106.6	161.7	160.3	1.43	113.062		
500.0	500.0	465.4	483.1	1.0	0.9	46.84	-126.4	111.7	168.3	166.5	1.87	89.800		
600.0	599.8	558.7	575.7	1.2	1.2	48.29	-135.5	118.0	176.7	174.4	2.32	76.218		
700.0	699.5	650.2	666.0	1.4	1.5	50.44	-147.6	126.0	186.9	184.1	2.78	67.178		
800.0	798.7	742.8	756.8	1.7	1.8	46.25	-162.5	136.3	198.5	195.2	3.28	60.483		
900.0	897.5	836.3	848.0	2.0	2.2	44.71	-179.6	148.3	210.3	206.5	3.81	55.140		
1,000.0	995.8	927.7	936.3	2.3	2.7	44.52	-198.6	161.7	222.7	218.3	4.39	50.774		
1,100.0	1,093.6	1,025.6	1,030.6	2.7	3.2	46.69	-220.0	177.2	235.0	230.0	5.00	47.027		
1,200.0	1,191.3	1,119.4	1,120.6	3.2	3.7	48.91	-241.2	193.1	248.9	243.3	5.63	44.177		
1,300.0	1,289.1	1,211.8	1,208.7	3.6	4.2	50.94	-263.9	209.3	265.3	259.0	6.31	42.034		
1,400.0	1,386.8	1,309.0	1,300.9	4.0	4.8	52.79	-288.9	226.8	283.2	276.2	7.03	40.277		
1,500.0	1,484.6	1,403.0	1,389.9	4.5	5.4	54.32	-313.6	244.3	302.2	294.5	7.77	38.906		
1,600.0	1,582.4	1,499.1	1,480.6	4.9	6.0	55.63	-339.6	262.7	322.3	313.7	8.54	37.748		
1,700.0	1,680.1	1,595.2	1,571.0	5.4	6.6	56.65	-365.7	282.0	342.9	333.6	9.32	36.784		
1,800.0	1,777.9	1,688.9	1,659.1	5.8	7.2	57.66	-392.1	300.3	364.4	354.3	10.11	36.050		
1,900.0	1,875.6	1,781.8	1,746.1	6.3	7.9	58.67	-419.4	317.8	387.1	376.2	10.91	35.490		
2,000.0	1,973.4	1,872.9	1,831.0	6.7	8.5	59.47	-447.1	335.9	411.2	399.5	11.72	35.087		
2,100.0	2,071.1	1,975.0	1,926.2	7.2	9.2	60.23	-478.1	356.3	435.3	422.8	12.57	34.640		
2,200.0	2,168.9	2,064.8	2,009.6	7.6	9.8	60.78	-505.5	374.7	459.8	446.5	13.37	34.395		
2,300.0	2,266.6	2,163.7	2,101.3	8.1	10.5	61.19	-536.0	396.2	484.9	470.7	14.22	34.092		
2,400.0	2,364.4	2,268.2	2,198.3	8.6	11.2	61.54	-567.1	418.9	508.9	493.8	15.08	33.748		
2,500.0	2,462.2	2,366.6	2,290.3	9.0	11.8	61.96	-595.8	439.2	532.1	516.2	15.92	33.428		
2,600.0	2,559.9	2,459.9	2,377.4	9.5	12.5	62.34	-623.3	458.3	555.6	538.9	16.75	33.165		
2,700.0	2,657.7	2,552.6	2,463.7	9.9	13.1	62.71	-651.3	477.2	580.0	562.3	17.60	32.949		
2,800.0	2,755.4	2,647.4	2,551.7	10.4	13.8	63.04	-680.3	496.9	604.7	586.3	18.46	32.763		
2,900.0	2,853.2	2,739.4	2,637.0	10.9	14.5	63.33	-709.1	516.0	630.2	610.9	19.31	32.642		
3,000.0	2,950.9	2,839.9	2,730.3	11.3	15.2	63.64	-740.5	536.6	655.6	635.4	20.18	32.480		
3,100.0	3,048.7	2,933.7	2,817.1	11.8	15.8	63.82	-769.5	557.0	680.9	659.8	21.03	32.376		
3,200.0	3,146.4	3,023.6	2,899.9	12.2	16.5	63.91	-798.0	577.3	707.1	685.2	21.87	32.327		
3,300.0	3,244.2	3,132.2	3,000.2	12.7	17.3	64.01	-831.5	601.8	732.5	709.7	22.78	32.149		
3,400.0	3,341.9	3,219.8	3,081.4	13.2	17.9	64.17	-858.8	620.4	758.0	734.4	23.60	32.110		
3,500.0	3,439.7	3,305.6	3,160.6	13.6	18.5	64.40	-886.9	637.8	784.8	760.4	24.43	32.121		
3,600.0	3,537.5	3,411.5	3,258.4	14.1	19.3	64.67	-921.3	659.2	811.4	786.1	25.35	32.009		
3,700.0	3,635.2	3,499.3	3,339.5	14.5	19.9	64.85	-949.9	677.4	838.3	812.1	26.19	32.012		
3,800.0	3,733.0	3,603.4	3,435.4	15.0	20.7	65.02	-983.8	699.3	865.2	838.1	27.10	31.928		
3,900.0	3,830.7	3,708.1	3,532.2	15.5	21.4	65.14	-1,016.6	721.8	890.9	862.9	28.00	31.822		
4,000.0	3,928.5	3,802.9	3,619.9	15.9	22.1	65.25	-1,046.4	742.1	916.7	887.8	28.86	31.762		
4,100.0	4,026.2	3,906.3	3,715.7	16.4	22.8	65.35	-1,078.3	764.5	942.0	912.2	29.76	31.653		
4,200.0	4,124.0	4,001.0	3,803.5	16.9	23.5	65.43	-1,107.2	784.9	966.9	936.3	30.61	31.586		
4,300.0	4,221.7	4,093.7	3,889.4	17.3	24.1	65.58	-1,136.4	803.8	992.6	961.1	31.47	31.541 SF		

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



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	176.35	-22.2	1.4	22.3				
100.0	100.0	100.0	100.0	0.1	0.1	176.35	-22.2	1.4	22.3	22.1	0.18	126.983 CC, ES	
200.0	200.0	198.8	198.7	0.3	0.3	177.75	-24.7	1.0	24.8	24.2	0.61	40.840	
300.0	300.0	297.1	296.7	0.5	0.5	-179.38	-32.2	-0.3	32.4	31.3	1.07	30.231	
400.0	400.0	394.3	393.1	0.8	0.8	-176.77	-44.5	-2.5	45.1	43.5	1.59	28.305 SF	
500.0	500.0	489.9	487.2	1.0	1.2	94.31	-61.3	-5.5	63.0	60.9	2.04	30.884	
600.0	599.8	583.4	578.3	1.2	1.6	98.09	-82.1	-9.2	86.2	83.7	2.52	34.205	
700.0	699.5	674.1	665.5	1.4	2.1	101.49	-106.6	-13.5	115.1	112.0	3.03	37.928	
800.0	798.7	762.0	748.8	1.7	2.6	97.56	-134.1	-18.3	148.7	145.1	3.57	41.604	
900.0	897.5	853.2	834.3	2.0	3.2	95.44	-165.6	-22.3	184.7	180.6	4.15	44.491	
1,000.0	995.8	944.6	919.4	2.3	3.8	93.72	-199.1	-23.3	221.1	216.4	4.79	46.165	
1,100.0	1,093.6	1,036.0	1,003.6	2.7	4.5	93.98	-234.3	-21.2	257.9	252.4	5.52	46.731	
1,200.0	1,191.3	1,127.1	1,086.8	3.2	5.2	94.02	-271.2	-16.0	295.3	289.0	6.30	46.863	
1,300.0	1,289.1	1,217.6	1,168.4	3.6	5.9	93.39	-309.5	-7.8	333.2	326.1	7.12	46.793	
1,400.0	1,386.8	1,307.3	1,248.1	4.0	6.6	92.31	-348.9	3.2	371.8	363.8	7.95	46.752	
1,500.0	1,484.6	1,395.9	1,325.7	4.5	7.4	90.93	-389.4	17.1	411.2	402.4	8.81	46.667	
1,600.0	1,582.4	1,483.1	1,400.8	4.9	8.3	89.35	-430.6	33.4	451.5	441.8	9.69	46.583	
1,700.0	1,680.1	1,571.3	1,475.7	5.4	9.1	87.65	-473.3	52.3	492.9	482.3	10.58	46.566	
1,800.0	1,777.9	1,661.3	1,551.8	5.8	10.0	86.14	-517.1	71.9	534.7	523.2	11.49	46.545	
1,900.0	1,875.6	1,751.3	1,628.0	6.3	11.0	84.84	-560.9	91.5	576.7	564.3	12.39	46.545	
2,000.0	1,973.4	1,841.3	1,704.2	6.7	11.9	83.72	-604.6	111.0	619.0	605.7	13.30	46.557	
2,100.0	2,071.1	1,931.3	1,780.3	7.2	12.8	82.74	-648.4	130.6	661.4	647.2	14.20	46.577	
2,200.0	2,168.9	2,021.3	1,856.5	7.6	13.8	81.88	-692.2	150.2	704.0	688.9	15.11	46.604	
2,300.0	2,266.6	2,111.3	1,932.7	8.1	14.7	81.12	-735.9	169.7	746.7	730.7	16.01	46.635	
2,400.0	2,364.4	2,201.3	2,008.8	8.6	15.7	80.44	-779.7	189.3	789.5	772.6	16.92	46.668	
2,500.0	2,462.2	2,291.3	2,085.0	9.0	16.6	79.83	-823.5	208.8	832.4	814.5	17.82	46.702	
2,600.0	2,559.9	2,381.3	2,161.2	9.5	17.6	79.27	-867.3	228.4	875.3	856.6	18.73	46.737	
2,700.0	2,657.7	2,471.3	2,237.3	9.9	18.6	78.77	-911.0	248.0	918.3	898.7	19.63	46.773	
2,800.0	2,755.4	2,561.3	2,313.5	10.4	19.5	78.32	-954.8	267.5	961.4	940.8	20.54	46.808	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-12E
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 30-12E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-5	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7665.0usft

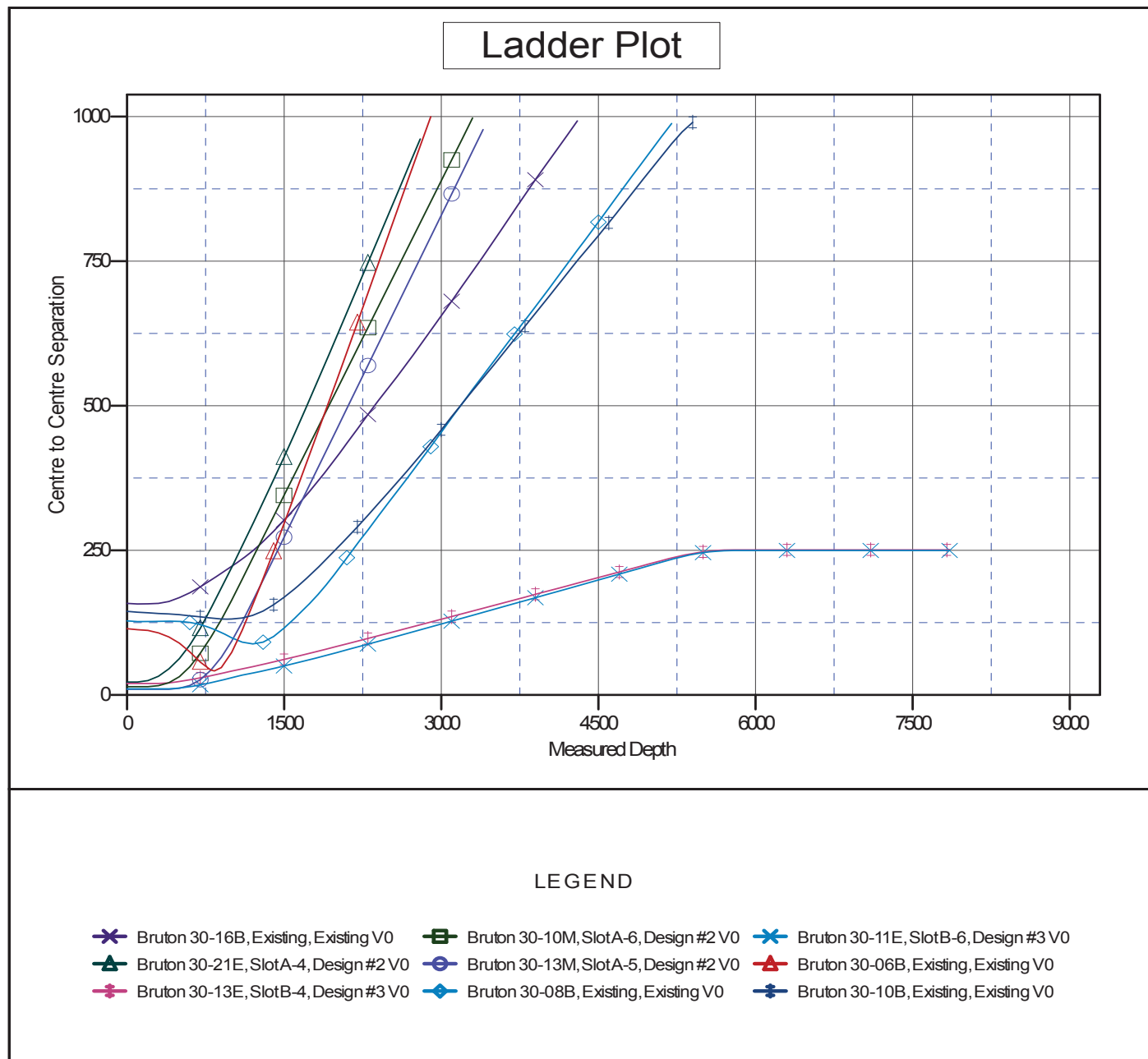
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-12E

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.46°



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



Archer

Anticollision Report

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