



Piceance Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton 30-13E

Slot B-4

Plan: Design #3

Standard Planning Report

24 June, 2015



Project: Mesa County, CO
Site: Bruton 30-10 Pad
Well: Bruton 30-13E
Wellbore: Slot B-4
Design: Design #3
Latitude: 39° 14' 52.879 N
Longitude: 107° 48' 31.759 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 30-13E, 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 30-13E

+N/-S	+E/-W	North	Ground Level:	Latitude	Longitude	Slot
0.00	0.00	1523534.567	7643.00	39° 14' 52.879 N	107° 48' 31.759 W	
			Easting			
			2346224.270			

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

Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude	Shape
Bruton 30-13E tgt	7735.00	-508.78	958.88	1523001.580	2347169.916	39° 14' 47.850 N	107° 48' 19.570 W	Circle (Radius: 50.00)

SECTION DETAILS

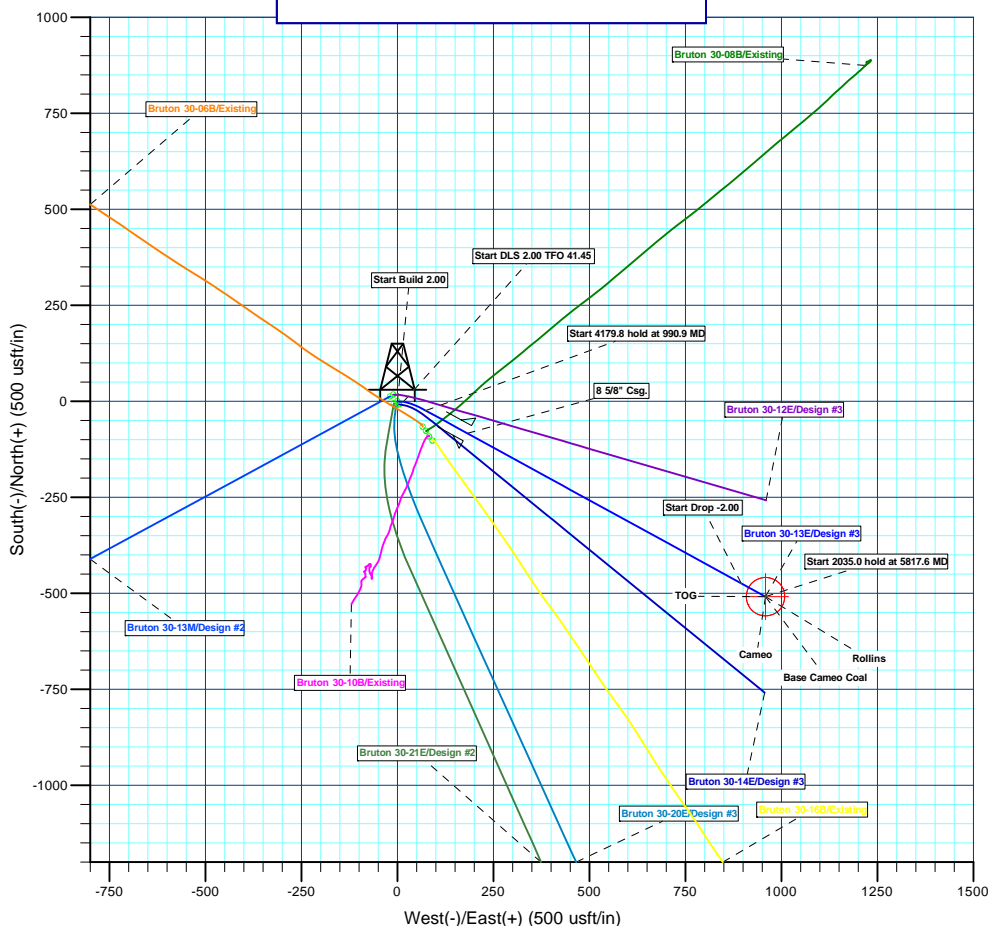
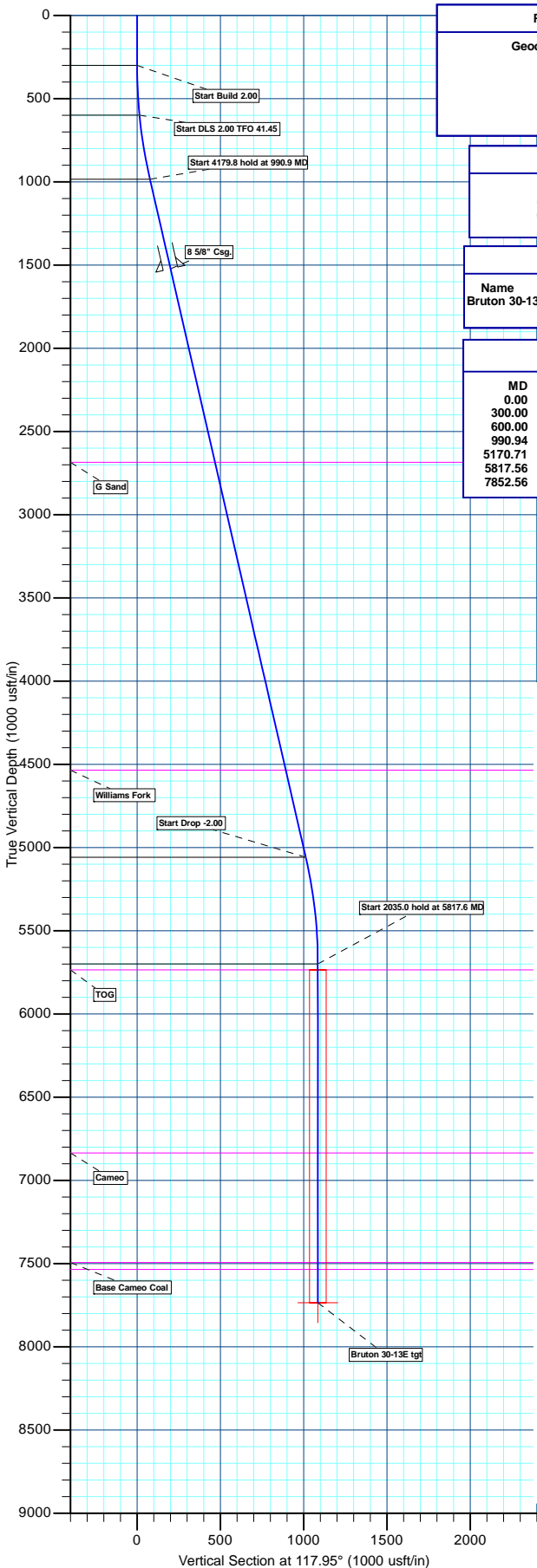
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
600.00	6.00	95.00	599.45	-1.37	15.63	2.00	95.00	14.45	Start DLS 2.00 TFO 41.45
990.94	12.94	118.72	984.96	-24.21	74.46	2.00	41.45	77.12	Start 4179.8 hold at 990.9 MD
5170.71	12.94	118.72	5058.64	-473.84	895.11	0.00	0.00	1012.80	Start Drop -2.00
5817.56	0.00	0.00	5700.00	-508.78	958.88	2.00	180.00	1085.50	Start 2035.0 hold at 5817.6 MD
7852.56	0.00	0.00	7735.00	-508.78	958.88	0.00	0.00	1085.50	TD at 7852.6



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
2685.00	2735.26	G Sand
4535.00	4633.44	Williams Fork
5735.00	5852.56	TOG
6835.00	6952.56	Cameo
7493.00	7610.56	Base Cameo Coal
7535.00	7652.56	Rollins



Plan: Design #3 (Bruton 30-13E/Slot B-4)

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



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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-4		
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 30-13E					
Well Position	+N/-S	-39.5 usft	Northing:	1,523,534.57 usft	Latitude:	39° 14' 52.879 N
	+E/-W	34.7 usft	Easting:	2,346,224.27 usft	Longitude:	107° 48' 31.759 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,643.0 usft

Wellbore	Slot B-4				
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	117.95

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
600.0	6.00	95.00	599.5	-1.4	15.6	2.00	2.00	0.00	95.00	
990.9	12.94	118.72	985.0	-24.2	74.5	2.00	1.77	6.07	41.45	
5,170.7	12.94	118.72	5,058.6	-473.8	895.1	0.00	0.00	0.00	0.00	
5,817.6	0.00	0.00	5,700.0	-508.8	958.9	2.00	-2.00	0.00	180.00	
7,852.6	0.00	0.00	7,735.0	-508.8	958.9	0.00	0.00	0.00	0.00	Bruton 30-13E tgt



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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-4		
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
Start Build 2.00									
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	2.00	95.00	400.0	-0.2	1.7	1.6	2.00	2.00	0.00
500.0	4.00	95.00	499.8	-0.6	7.0	6.4	2.00	2.00	0.00
Start DLS 2.00 TFO 41.45									
600.0	6.00	95.00	599.5	-1.4	15.6	14.5	2.00	2.00	0.00
700.0	7.61	105.04	698.7	-3.5	27.2	25.7	2.00	1.61	10.04
800.0	9.38	111.46	797.6	-8.2	41.2	40.3	2.00	1.76	6.42
900.0	11.22	115.83	896.0	-15.5	57.6	58.1	2.00	1.84	4.37
Start 4179.8 hold at 990.9 MD									
990.9	12.94	118.72	985.0	-24.2	74.5	77.1	2.00	1.89	3.18
1,000.0	12.94	118.72	993.8	-25.2	76.2	79.1	0.00	0.00	0.00
1,100.0	12.94	118.72	1,091.2	-35.9	95.9	101.5	0.00	0.00	0.00
1,200.0	12.94	118.72	1,188.7	-46.7	115.5	123.9	0.00	0.00	0.00
1,300.0	12.94	118.72	1,286.2	-57.5	135.1	146.3	0.00	0.00	0.00
1,400.0	12.94	118.72	1,383.6	-68.2	154.8	168.7	0.00	0.00	0.00
1,500.0	12.94	118.72	1,481.1	-79.0	174.4	191.1	0.00	0.00	0.00
8 5/8" Csg.									
1,542.0	12.94	118.72	1,522.0	-83.5	182.6	200.5	0.00	0.00	0.00
1,600.0	12.94	118.72	1,578.6	-89.7	194.0	213.5	0.00	0.00	0.00
1,700.0	12.94	118.72	1,676.0	-100.5	213.7	235.8	0.00	0.00	0.00
1,800.0	12.94	118.72	1,773.5	-111.2	233.3	258.2	0.00	0.00	0.00
1,900.0	12.94	118.72	1,870.9	-122.0	252.9	280.6	0.00	0.00	0.00
2,000.0	12.94	118.72	1,968.4	-132.8	272.6	303.0	0.00	0.00	0.00
2,100.0	12.94	118.72	2,065.9	-143.5	292.2	325.4	0.00	0.00	0.00
2,200.0	12.94	118.72	2,163.3	-154.3	311.8	347.8	0.00	0.00	0.00
2,300.0	12.94	118.72	2,260.8	-165.0	331.5	370.2	0.00	0.00	0.00
2,400.0	12.94	118.72	2,358.3	-175.8	351.1	392.5	0.00	0.00	0.00
2,500.0	12.94	118.72	2,455.7	-186.5	370.7	414.9	0.00	0.00	0.00
2,600.0	12.94	118.72	2,553.2	-197.3	390.4	437.3	0.00	0.00	0.00
2,700.0	12.94	118.72	2,650.6	-208.1	410.0	459.7	0.00	0.00	0.00
G Sand									
2,735.3	12.94	118.72	2,685.0	-211.9	416.9	467.6	0.00	0.00	0.00
2,800.0	12.94	118.72	2,748.1	-218.8	429.6	482.1	0.00	0.00	0.00
2,900.0	12.94	118.72	2,845.6	-229.6	449.3	504.5	0.00	0.00	0.00
3,000.0	12.94	118.72	2,943.0	-240.3	468.9	526.9	0.00	0.00	0.00
3,100.0	12.94	118.72	3,040.5	-251.1	488.5	549.3	0.00	0.00	0.00
3,200.0	12.94	118.72	3,137.9	-261.8	508.2	571.6	0.00	0.00	0.00
3,300.0	12.94	118.72	3,235.4	-272.6	527.8	594.0	0.00	0.00	0.00
3,400.0	12.94	118.72	3,332.9	-283.4	547.5	616.4	0.00	0.00	0.00
3,500.0	12.94	118.72	3,430.3	-294.1	567.1	638.8	0.00	0.00	0.00
3,600.0	12.94	118.72	3,527.8	-304.9	586.7	661.2	0.00	0.00	0.00
3,700.0	12.94	118.72	3,625.3	-315.6	606.4	683.6	0.00	0.00	0.00
3,800.0	12.94	118.72	3,722.7	-326.4	626.0	706.0	0.00	0.00	0.00
3,900.0	12.94	118.72	3,820.2	-337.1	645.6	728.3	0.00	0.00	0.00
4,000.0	12.94	118.72	3,917.6	-347.9	665.3	750.7	0.00	0.00	0.00
4,100.0	12.94	118.72	4,015.1	-358.7	684.9	773.1	0.00	0.00	0.00
4,200.0	12.94	118.72	4,112.6	-369.4	704.5	795.5	0.00	0.00	0.00
4,300.0	12.94	118.72	4,210.0	-380.2	724.2	817.9	0.00	0.00	0.00
4,400.0	12.94	118.72	4,307.5	-390.9	743.8	840.3	0.00	0.00	0.00
4,500.0	12.94	118.72	4,404.9	-401.7	763.4	862.7	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-4		
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	12.94	118.72	4,502.4	-412.5	783.1	885.0	0.00	0.00	0.00
Williams Fork									
4,633.4	12.94	118.72	4,535.0	-416.0	789.6	892.5	0.00	0.00	0.00
4,700.0	12.94	118.72	4,599.9	-423.2	802.7	907.4	0.00	0.00	0.00
4,800.0	12.94	118.72	4,697.3	-434.0	822.3	929.8	0.00	0.00	0.00
4,900.0	12.94	118.72	4,794.8	-444.7	842.0	952.2	0.00	0.00	0.00
5,000.0	12.94	118.72	4,892.3	-455.5	861.6	974.6	0.00	0.00	0.00
5,100.0	12.94	118.72	4,989.7	-466.2	881.2	997.0	0.00	0.00	0.00
Start Drop -2.00									
5,170.7	12.94	118.72	5,058.6	-473.8	895.1	1,012.8	0.00	0.00	0.00
5,200.0	12.35	118.72	5,087.2	-476.9	900.7	1,019.2	2.00	-2.00	0.00
5,300.0	10.35	118.72	5,185.3	-486.4	918.0	1,038.9	2.00	-2.00	0.00
5,400.0	8.35	118.72	5,283.9	-494.2	932.2	1,055.1	2.00	-2.00	0.00
5,500.0	6.35	118.72	5,383.1	-500.3	943.5	1,067.9	2.00	-2.00	0.00
5,600.0	4.35	118.72	5,482.7	-504.8	951.6	1,077.2	2.00	-2.00	0.00
5,700.0	2.35	118.72	5,582.5	-507.6	956.8	1,083.1	2.00	-2.00	0.00
5,800.0	0.35	118.72	5,682.4	-508.8	958.8	1,085.5	2.00	-2.00	0.00
Start 2035.0 hold at 5817.6 MD									
5,817.6	0.00	0.00	5,700.0	-508.8	958.9	1,085.5	2.00	-2.00	0.00
TOG									
5,852.6	0.00	0.00	5,735.0	-508.8	958.9	1,085.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,782.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,882.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,100.0	0.00	0.00	5,982.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,082.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,182.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,282.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,500.0	0.00	0.00	6,382.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,482.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,582.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,682.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,782.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
Cameo									
6,952.6	0.00	0.00	6,835.0	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,882.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,100.0	0.00	0.00	6,982.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,200.0	0.00	0.00	7,082.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,300.0	0.00	0.00	7,182.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,282.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,382.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,482.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
Base Cameo Coal									
7,610.6	0.00	0.00	7,493.0	-508.8	958.9	1,085.5	0.00	0.00	0.00
Rollins									
7,652.6	0.00	0.00	7,535.0	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,582.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,682.4	-508.8	958.9	1,085.5	0.00	0.00	0.00
TD at 7852.6									
7,852.6	0.00	0.00	7,735.0	-508.8	958.9	1,085.5	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-4		
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 30-13E tgt	0.00	0.00	7,735.0	-508.8	958.9	1,523,001.58	2,347,169.92	39° 14' 47.850 N	107° 48' 19.570 W
- plan hits target center									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,542.0	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 (°)
2,735.3	2,685.0	G Sand		0.00	
4,633.4	4,535.0	Williams Fork		0.00	
5,852.6	5,735.0	TOG		0.00	
6,952.6	6,835.0	Cameo		0.00	
7,610.6	7,493.0	Base Cameo Coal		0.00	
7,652.6	7,535.0	Rollins		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
300.0	300.0	0.0	0.0	Start Build 2.00	
600.0	599.5	-1.4	15.6	Start DLS 2.00 TFO 41.45	
990.9	985.0	-24.2	74.5	Start 4179.8 hold at 990.9 MD	
5,170.7	5,058.6	-473.8	895.1	Start Drop -2.00	
5,817.6	5,700.0	-508.8	958.9	Start 2035.0 hold at 5817.6 MD	
7,852.6	7,735.0	-508.8	958.9	TD at 7852.6	



Piceance Energy, LLC

**Mesa County, CO
Bruton 30-10 Pad
Bruton 30-13E**

**Slot B-4
Design #3**

Anticollision Report

24 June, 2015



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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	7,851.9	Design #3 (Slot B-4)	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	746.9	730.9	29.5	26.1	8.595	CC, ES, SF
Bruton 30-08B - Existing - Existing	1,035.1	1,005.3	65.6	60.9	13.943	CC, ES
Bruton 30-08B - Existing - Existing	1,100.0	1,067.6	67.7	62.6	13.329	SF
Bruton 30-10B - Existing - Existing	1,000.0	968.7	98.9	94.3	21.855	CC, ES
Bruton 30-10B - Existing - Existing	1,300.0	1,262.5	117.7	111.3	18.412	SF
Bruton 30-12E - Slot B-5 - Design #3	300.0	300.0	19.9	18.8	18.545	CC, ES
Bruton 30-12E - Slot B-5 - Design #3	7,852.6	7,837.9	250.9	201.2	5.045	SF
Bruton 30-13M - Slot A-5 - Design #2	300.0	300.0	22.7	21.6	21.089	CC, ES
Bruton 30-13M - Slot A-5 - Design #2	500.0	499.8	29.0	27.0	14.454	SF
Bruton 30-14E - Slot B-3 - Design #3	200.0	200.0	9.2	8.6	14.732	CC, ES
Bruton 30-14E - Slot B-3 - Design #3	7,826.7	7,855.7	249.9	200.0	5.006	SF
Bruton 30-16B - Existing - Existing	100.0	81.8	137.8	137.6	760.148	CC
Bruton 30-16B - Existing - Existing	200.0	181.4	138.0	137.4	243.140	ES
Bruton 30-16B - Existing - Existing	5,200.0	5,034.6	986.2	947.2	25.243	SF
Bruton 30-20E - Slot A-3 - Design #1	100.0	100.0	13.7	13.5	78.133	CC, ES
Bruton 30-20E - Slot A-3 - Design #1	400.0	397.6	28.5	27.0	18.809	SF
Bruton 30-20E - Slot A-3 - Design #2	100.0	100.0	13.7	13.5	78.133	CC, ES
Bruton 30-20E - Slot A-3 - Design #2	400.0	397.6	28.5	27.0	18.809	SF
Bruton 30-20E - Slot A-3 - Design #3	200.0	200.0	13.7	13.1	21.922	CC, ES
Bruton 30-20E - Slot A-3 - Design #3	400.0	398.7	20.8	19.4	14.106	SF
Bruton 30-21E - Slot A-4 - Design #1	100.0	100.0	10.2	10.0	57.909	CC, ES
Bruton 30-21E - Slot A-4 - Design #1	300.0	298.6	18.6	17.6	17.321	SF
Bruton 30-21E - Slot A-4 - Design #2	100.0	100.0	10.2	10.0	57.909	CC, ES
Bruton 30-21E - Slot A-4 - Design #2	300.0	298.6	18.6	17.6	17.321	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	Warning				
0.0	0.0	0.0	18.0	0.0	0.0	135.13	-66.4	66.1	95.4								
100.0	100.0	82.4	100.4	0.1	0.1	134.98	-66.1	66.2	93.6	93.4	0.18	516.030					
200.0	200.0	184.5	202.5	0.3	0.3	134.36	-64.4	65.9	92.2	91.5	0.62	149.125					
300.0	300.0	286.9	304.8	0.5	0.5	133.85	-61.0	63.5	88.1	87.0	1.07	82.032					

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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		
400.0	400.0	389.2	406.8	0.8	0.8	40.20	-56.3	57.8	79.6	78.1	1.55	51.251		
500.0	499.8	489.6	506.7	1.0	1.1	45.17	-51.0	49.6	66.4	64.4	2.03	32.678		
600.0	599.5	589.1	605.5	1.2	1.4	56.73	-44.2	39.4	49.4	46.9	2.52	19.569		
700.0	698.7	686.3	701.6	1.5	1.7	74.94	-36.1	27.7	32.7	29.6	3.11	10.528		
746.9	745.1	730.9	745.6	1.6	1.8	96.01	-32.3	21.3	29.5	26.1	3.43	8.595 CC, ES, SF		
800.0	797.6	781.0	794.9	1.8	2.0	122.19	-27.9	13.5	34.1	30.4	3.76	9.076		
900.0	896.0	873.5	885.6	2.1	2.4	149.63	-18.7	-2.3	60.9	56.7	4.21	14.465		
1,000.0	993.8	963.0	973.0	2.5	2.8	159.91	-8.4	-18.6	98.5	93.9	4.66	21.159		
1,100.0	1,091.2	1,049.2	1,056.6	3.0	3.2	166.41	2.5	-36.2	141.8	136.7	5.08	27.942		
1,200.0	1,188.7	1,134.0	1,138.4	3.4	3.6	170.05	14.2	-55.3	188.1	182.6	5.51	34.146		
1,300.0	1,286.2	1,219.0	1,220.1	3.9	4.1	172.52	27.2	-75.2	236.2	230.2	5.95	39.686		
1,400.0	1,383.6	1,304.2	1,301.6	4.4	4.6	174.35	41.1	-95.5	285.2	278.8	6.40	44.563		
1,500.0	1,481.1	1,387.6	1,381.2	4.8	5.1	175.67	55.2	-115.9	335.1	328.2	6.85	48.911		
1,600.0	1,578.6	1,471.7	1,461.4	5.3	5.6	176.58	69.2	-137.3	385.7	378.4	7.31	52.797		
1,700.0	1,676.0	1,556.0	1,541.6	5.8	6.1	177.15	82.7	-159.5	436.8	429.1	7.76	56.285		
1,800.0	1,773.5	1,642.9	1,624.3	6.3	6.6	177.55	96.1	-182.6	488.1	479.9	8.22	59.366		
1,900.0	1,870.9	1,729.3	1,706.5	6.8	7.1	178.01	110.5	-204.8	539.1	530.4	8.69	62.063		
2,000.0	1,968.4	1,812.9	1,786.0	7.2	7.6	178.42	124.6	-226.3	590.3	581.1	9.15	64.476		
2,100.0	2,065.9	1,894.3	1,863.3	7.7	8.1	178.88	139.7	-247.1	642.0	632.3	9.62	66.697		
2,200.0	2,163.3	1,975.6	1,940.2	8.2	8.6	179.31	155.3	-268.1	694.2	684.1	10.10	68.737		
2,300.0	2,260.8	2,057.1	2,017.3	8.7	9.1	179.67	171.1	-289.5	747.0	736.4	10.58	70.605		
2,400.0	2,358.3	2,140.7	2,096.3	9.2	9.7	179.96	186.9	-312.0	800.0	788.9	11.06	72.333		
2,500.0	2,455.7	2,227.6	2,178.3	9.7	10.2	-179.84	202.8	-335.7	853.0	841.4	11.54	73.923		
2,600.0	2,553.2	2,313.3	2,259.3	10.1	10.7	-179.66	218.4	-358.8	905.8	893.8	12.02	75.386		
2,700.0	2,650.6	2,402.3	2,343.6	10.6	11.3	-179.48	234.7	-382.6	958.4	945.9	12.50	76.667		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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	136.03	-77.4	74.6	109.0					
100.0	100.0	82.1	100.1	0.1	0.1	136.05	-77.4	74.6	107.5	107.3	0.18	597.059		
165.7	165.7	147.7	165.7	0.2	0.2	136.09	-77.4	74.5	107.4	107.0	0.42	256.374		
200.0	200.0	181.8	199.8	0.3	0.3	136.07	-77.4	74.5	107.4	106.9	0.56	190.207		
300.0	300.0	281.6	299.6	0.5	0.5	135.89	-77.3	75.0	107.7	106.7	0.99	108.372		
400.0	400.0	381.0	399.0	0.8	0.7	40.90	-77.0	76.3	107.1	105.6	1.44	74.566		
500.0	499.8	481.1	499.0	1.0	0.9	40.54	-74.6	79.7	103.7	101.8	1.90	54.604		
600.0	599.5	579.2	596.7	1.2	1.1	39.17	-70.3	86.7	99.0	96.6	2.39	41.362		
700.0	698.7	678.7	695.5	1.5	1.4	25.97	-63.9	96.8	92.2	89.2	2.94	31.376		
800.0	797.6	777.5	793.1	1.8	1.7	12.74	-54.5	109.4	82.6	79.0	3.51	23.502		
900.0	896.0	874.8	888.4	2.1	2.1	-3.69	-42.6	124.3	72.5	68.4	4.06	17.861		
1,000.0	993.8	971.3	982.4	2.5	2.5	-25.03	-28.9	141.3	66.1	61.6	4.53	14.586		
1,035.1	1,028.0	1,005.3	1,015.6	2.7	2.6	-32.22	-24.3	147.3	65.6	60.9	4.70	13.943 CC, ES		
1,100.0	1,091.2	1,067.6	1,076.2	3.0	2.9	-45.48	-15.4	158.6	67.7	62.6	5.08	13.329 SF		
1,200.0	1,188.7	1,163.2	1,168.8	3.4	3.3	-64.06	0.4	176.2	79.3	73.5	5.83	13.610		
1,300.0	1,286.2	1,258.2	1,260.7	3.9	3.8	-77.39	17.1	193.8	98.2	91.5	6.69	14.685		
1,400.0	1,383.6	1,353.2	1,352.2	4.4	4.2	-86.07	34.4	212.3	121.8	114.2	7.56	16.102		
1,500.0	1,481.1	1,449.6	1,445.0	4.8	4.7	-91.65	51.8	231.8	147.3	138.9	8.43	17.475		
1,600.0	1,578.6	1,546.4	1,538.2	5.3	5.2	-95.21	68.2	252.2	173.1	163.8	9.28	18.657		
1,700.0	1,676.0	1,643.6	1,631.8	5.8	5.7	-97.90	84.5	272.5	199.1	189.0	10.11	19.683		
1,800.0	1,773.5	1,739.5	1,724.4	6.3	6.1	-99.97	100.2	292.3	224.9	214.0	10.96	20.532		
1,900.0	1,870.9	1,831.6	1,813.0	6.8	6.6	-101.39	115.8	312.2	251.9	240.1	11.80	21.341		
2,000.0	1,968.4	1,923.0	1,900.4	7.2	7.1	-102.47	133.0	332.6	280.8	268.1	12.66	22.177		
2,100.0	2,065.9	2,017.9	1,990.8	7.7	7.7	-103.24	151.4	354.7	310.7	297.1	13.53	22.966		
2,200.0	2,163.3	2,115.5	2,084.0	8.2	8.2	-103.91	170.0	377.2	340.2	325.8	14.39	23.648		
2,300.0	2,260.8	2,210.1	2,174.4	8.7	8.7	-104.56	187.8	398.4	369.4	354.1	15.24	24.241		
2,400.0	2,358.3	2,306.1	2,266.1	9.2	9.3	-105.05	206.2	420.4	399.1	383.0	16.10	24.783		
2,500.0	2,455.7	2,402.6	2,358.2	9.7	9.8	-105.50	224.3	442.2	428.2	411.2	16.97	25.229		
2,600.0	2,553.2	2,501.5	2,452.7	10.1	10.4	-105.81	242.5	465.3	457.3	439.5	17.85	25.613		
2,700.0	2,650.6	2,598.8	2,545.8	10.6	10.9	-106.10	259.6	487.7	485.5	466.8	18.73	25.917		
2,800.0	2,748.1	2,688.4	2,631.4	11.1	11.4	-106.29	275.7	508.8	514.2	494.7	19.59	26.250		
2,900.0	2,845.6	2,784.0	2,722.5	11.6	12.0	-106.49	294.0	531.2	544.0	523.6	20.47	26.577		
3,000.0	2,943.0	2,875.9	2,810.2	12.1	12.5	-106.69	311.2	552.6	573.4	552.1	21.33	26.888		
3,100.0	3,040.5	2,972.1	2,901.8	12.6	13.1	-106.90	330.3	574.8	603.9	581.6	22.20	27.198		
3,200.0	3,137.9	3,069.5	2,994.9	13.1	13.6	-107.10	348.7	597.1	633.4	610.3	23.08	27.443		
3,300.0	3,235.4	3,168.4	3,089.4	13.6	14.2	-107.34	367.6	619.2	663.0	639.0	23.96	27.674		
3,400.0	3,332.9	3,265.8	3,182.8	14.0	14.7	-107.61	385.6	640.3	691.8	667.0	24.83	27.865		
3,500.0	3,430.3	3,357.3	3,270.4	14.5	15.2	-107.81	402.7	660.4	721.0	695.3	25.68	28.072		
3,600.0	3,527.8	3,458.6	3,367.3	15.0	15.8	-108.00	421.8	683.0	750.4	723.8	26.58	28.229		
3,700.0	3,625.3	3,558.8	3,463.3	15.5	16.3	-108.14	439.6	705.5	778.7	751.2	27.47	28.350		
3,800.0	3,722.7	3,655.1	3,555.6	16.0	16.8	-108.29	456.5	727.0	806.9	778.5	28.34	28.471		
3,900.0	3,820.2	3,744.4	3,641.1	16.5	17.3	-108.36	472.4	747.5	835.3	806.1	29.20	28.610		
4,000.0	3,917.6	3,841.1	3,733.4	17.0	17.9	-108.42	490.1	770.1	864.4	834.3	30.08	28.735		
4,100.0	4,015.1	3,932.5	3,820.8	17.5	18.4	-108.52	506.8	790.8	893.3	862.4	30.94	28.870		
4,200.0	4,112.6	4,030.0	3,913.9	18.0	19.0	-108.59	525.0	813.3	922.7	890.9	31.83	28.992		
4,300.0	4,210.0	4,122.6	4,002.5	18.4	19.5	-108.68	542.2	834.3	951.8	919.1	32.69	29.114		
4,400.0	4,307.5	4,219.8	4,095.2	18.9	20.0	-108.73	560.4	856.9	981.3	947.7	33.58	29.225		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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		
0.0	0.0	0.0	18.0	0.0	0.0	137.88	-91.9	83.1	125.2					
100.0	100.0	82.8	100.8	0.1	0.1	137.74	-91.5	83.2	123.7	123.5	0.18	677.232		
200.0	200.0	183.5	201.5	0.3	0.3	137.25	-90.1	83.3	122.7	122.1	0.58	213.261		
300.0	300.0	283.9	301.9	0.5	0.5	137.26	-89.1	82.3	121.3	120.3	1.01	120.086		
400.0	400.0	382.3	400.2	0.8	0.7	43.76	-89.7	80.3	119.2	117.7	1.44	82.492		
500.0	499.8	481.4	499.3	1.0	0.9	47.40	-92.1	77.5	115.5	113.6	1.90	60.936		
600.0	599.5	579.1	596.9	1.2	1.1	53.23	-95.9	74.3	111.3	108.9	2.36	47.153		
700.0	698.7	676.6	694.2	1.5	1.3	50.49	-101.1	71.6	107.3	104.4	2.85	37.590		
800.0	797.6	774.4	791.7	1.8	1.6	52.92	-107.3	68.8	103.0	99.7	3.37	30.535		
900.0	896.0	871.4	888.4	2.1	1.8	59.60	-114.6	65.0	99.7	95.8	3.93	25.372		
979.6	973.9	948.7	965.4	2.5	2.0	67.08	-120.9	62.3	98.9	94.5	4.40	22.459		
1,000.0	993.8	968.7	985.3	2.5	2.1	69.24	-122.6	61.6	98.9	94.3	4.52	21.855 CC, ES		
1,100.0	1,091.2	1,067.3	1,083.6	3.0	2.3	81.75	-130.4	59.2	101.6	96.4	5.14	19.749		
1,200.0	1,188.7	1,165.6	1,181.6	3.4	2.5	93.24	-136.9	57.1	107.7	101.9	5.77	18.651		
1,300.0	1,286.2	1,262.5	1,278.3	3.9	2.7	103.18	-143.2	54.9	117.7	111.3	6.39	18.412 SF		
1,400.0	1,383.6	1,360.1	1,375.6	4.4	3.0	111.47	-149.9	52.3	131.3	124.3	6.99	18.794		
1,500.0	1,481.1	1,458.1	1,473.4	4.8	3.2	118.16	-156.3	50.1	146.6	139.1	7.55	19.424		
1,600.0	1,578.6	1,555.8	1,570.9	5.3	3.4	123.70	-162.3	47.9	163.4	155.3	8.08	20.211		
1,700.0	1,676.0	1,652.7	1,667.6	5.8	3.6	128.24	-167.9	45.5	181.3	172.7	8.61	21.072		
1,800.0	1,773.5	1,750.7	1,765.4	6.3	3.9	131.86	-174.1	43.1	200.5	191.3	9.13	21.959		
1,900.0	1,870.9	1,849.0	1,863.5	6.8	4.1	134.87	-180.2	41.2	219.7	210.1	9.65	22.779		
2,000.0	1,968.4	1,946.6	1,960.8	7.2	4.3	137.40	-186.0	39.4	239.3	229.2	10.16	23.560		
2,100.0	2,065.9	2,043.7	2,057.8	7.7	4.6	139.68	-191.3	37.4	259.4	248.7	10.66	24.335		
2,200.0	2,163.3	2,140.4	2,154.3	8.2	4.8	141.63	-196.5	35.2	280.0	268.8	11.16	25.085		
2,300.0	2,260.8	2,237.9	2,251.7	8.7	5.0	143.31	-201.9	32.8	301.1	289.4	11.67	25.805		
2,400.0	2,358.3	2,335.6	2,349.2	9.2	5.2	144.77	-207.3	30.6	322.2	310.1	12.17	26.477		
2,500.0	2,455.7	2,433.3	2,446.7	9.7	5.5	146.04	-212.7	28.4	343.5	330.8	12.67	27.102		
2,600.0	2,553.2	2,531.1	2,544.3	10.1	5.7	147.21	-217.9	26.2	364.8	351.7	13.18	27.688		
2,700.0	2,650.6	2,629.1	2,642.2	10.6	5.9	148.23	-223.2	24.2	386.2	372.5	13.68	28.225		
2,800.0	2,748.1	2,723.4	2,736.4	11.1	6.1	149.13	-228.2	22.0	407.9	393.7	14.18	28.761		
2,900.0	2,845.6	2,816.8	2,829.6	11.6	6.4	149.91	-233.3	19.0	430.6	415.9	14.68	29.322		
3,000.0	2,943.0	2,914.9	2,927.4	12.1	6.6	150.56	-239.3	15.5	453.7	438.5	15.21	29.838		
3,100.0	3,040.5	3,013.2	3,025.3	12.6	6.8	151.04	-246.3	12.2	476.6	460.9	15.74	30.272		
3,200.0	3,137.9	3,114.5	3,126.3	13.1	7.1	151.42	-254.0	9.3	499.1	482.8	16.30	30.628		
3,300.0	3,235.4	3,211.0	3,222.6	13.6	7.3	151.81	-260.9	6.9	521.2	504.4	16.83	30.979		
3,400.0	3,332.9	3,310.8	3,322.1	14.0	7.6	152.25	-267.4	4.5	543.3	525.9	17.35	31.309		
3,500.0	3,430.3	3,405.1	3,416.3	14.5	7.8	152.68	-273.0	2.2	565.5	547.6	17.86	31.653		
3,600.0	3,527.8	3,501.8	3,512.8	15.0	8.0	153.09	-278.7	-0.5	588.0	569.6	18.38	31.986		
3,700.0	3,625.3	3,600.3	3,611.0	15.5	8.3	153.40	-285.4	-3.2	610.4	591.5	18.92	32.267		
3,800.0	3,722.7	3,696.5	3,706.8	16.0	8.5	153.60	-292.8	-5.9	633.0	613.5	19.47	32.519		
3,900.0	3,820.2	3,796.8	3,806.8	16.5	8.8	153.75	-301.0	-8.6	655.4	635.4	20.03	32.722		
4,000.0	3,917.6	3,895.8	3,905.4	17.0	9.0	153.94	-308.5	-10.9	677.4	656.8	20.58	32.923		
4,100.0	4,015.1	3,989.7	3,999.2	17.5	9.2	154.16	-315.0	-13.2	699.6	678.5	21.10	33.151		
4,200.0	4,112.6	4,086.6	4,091.6	18.0	9.5	154.29	-322.4	-16.2	722.5	700.9	21.65	33.380		
4,300.0	4,210.0	4,190.1	4,198.8	18.4	9.8	154.41	-331.1	-19.1	744.9	722.7	22.22	33.522		
4,400.0	4,307.5	4,290.1	4,298.5	18.9	10.0	154.66	-337.4	-20.6	766.3	743.6	22.75	33.684		
4,500.0	4,404.9	4,381.8	4,390.1	19.4	10.2	154.92	-342.5	-22.4	788.2	765.0	23.25	33.897		
4,600.0	4,502.4	4,474.2	4,482.4	19.9	10.4	155.19	-347.5	-24.8	810.7	787.0	23.76	34.125		
4,700.0	4,599.9	4,567.3	4,575.2	20.4	10.6	155.44	-352.5	-27.9	834.0	809.7	24.27	34.367		
4,800.0	4,697.3	4,669.4	4,677.1	20.9	10.9	155.64	-358.8	-31.1	857.0	832.2	24.80	34.550		
4,900.0	4,794.8	4,768.9	4,776.3	21.4	11.1	155.79	-365.6	-34.0	879.7	854.3	25.35	34.707		
5,000.0	4,892.3	4,867.4	4,874.5	21.9	11.4	155.86	-373.3	-36.6	902.1	876.2	25.90	34.829		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 130-MWD Bruton 30-10 Pad - Bruton 30-10B - Existing - Existing												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	4,989.7	4,967.7	4,974.4	22.4	11.6	155.93	-381.1	-39.3	924.6	898.1	26.46	34.946	
5,200.0	5,087.2	5,069.0	5,075.4	22.8	11.9	156.08	-388.6	-41.2	946.2	919.2	27.01	35.025	
5,300.0	5,185.3	5,168.8	5,175.0	23.2	12.1	156.25	-396.3	-43.3	965.5	938.0	27.53	35.067	
5,400.0	5,283.9	5,271.0	5,276.9	23.4	12.4	156.35	-403.2	-44.8	981.3	953.2	28.02	35.019	
5,500.0	5,383.1	5,362.4	5,368.1	23.7	12.6	156.38	-409.1	-46.2	994.0	965.5	28.45	34.938	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-12E - Slot B-5 - 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	-30.78	17.1	-10.2	19.9					
100.0	100.0	100.0	100.0	0.1	0.1	-30.78	17.1	-10.2	19.9	19.7	0.18	113.646		
200.0	200.0	200.0	200.0	0.3	0.3	-30.78	17.1	-10.2	19.9	19.3	0.62	31.886		
300.0	300.0	300.0	300.0	0.5	0.5	-30.78	17.1	-10.2	19.9	18.8	1.07	18.545 CC, ES		
400.0	400.0	400.0	400.0	0.8	0.8	-129.63	17.1	-10.2	21.0	19.5	1.52	13.799		
500.0	499.8	500.4	500.4	1.0	1.0	-136.06	17.1	-8.4	23.4	21.5	1.97	11.891		
600.0	599.5	601.0	600.8	1.2	1.2	-140.89	16.9	-3.2	26.2	23.8	2.44	10.753		
700.0	698.7	701.7	701.1	1.5	1.4	-152.13	16.6	5.7	29.6	26.7	2.94	10.073		
800.0	797.6	802.7	801.4	1.8	1.7	-156.44	15.3	17.8	33.4	30.0	3.45	9.673		
900.0	896.0	903.7	901.2	2.1	2.0	-157.51	12.3	33.0	37.4	33.4	4.01	9.337		
1,000.0	993.8	1,004.9	1,000.6	2.5	2.4	-156.29	7.5	51.3	41.7	37.1	4.61	9.044		
1,100.0	1,091.2	1,105.1	1,098.6	3.0	2.8	-152.00	1.7	71.5	45.4	40.1	5.24	8.657		
1,200.0	1,188.7	1,205.0	1,196.2	3.4	3.2	-148.33	-4.2	91.7	49.2	43.3	5.94	8.290		
1,300.0	1,286.2	1,304.8	1,293.8	3.9	3.6	-145.21	-10.1	111.9	53.3	46.6	6.68	7.967		
1,400.0	1,383.6	1,404.7	1,391.5	4.4	4.0	-142.53	-16.0	132.1	57.4	49.9	7.47	7.689		
1,500.0	1,481.1	1,504.6	1,489.1	4.8	4.5	-140.22	-21.9	152.4	61.7	53.4	8.28	7.450		
1,600.0	1,578.6	1,604.5	1,586.7	5.3	4.9	-138.21	-27.8	172.6	66.0	56.9	9.11	7.246		
1,700.0	1,676.0	1,704.4	1,684.4	5.8	5.4	-136.45	-33.7	192.8	70.5	60.5	9.96	7.072		
1,800.0	1,773.5	1,804.2	1,782.0	6.3	5.8	-134.90	-39.6	213.0	74.9	64.1	10.83	6.922		
1,900.0	1,870.9	1,904.1	1,879.7	6.8	6.3	-133.53	-45.5	233.2	79.5	67.8	11.70	6.792		
2,000.0	1,968.4	2,004.0	1,977.3	7.2	6.7	-132.30	-51.4	253.4	84.0	71.5	12.58	6.680		
2,100.0	2,065.9	2,103.9	2,074.9	7.7	7.2	-131.20	-57.3	273.6	88.7	75.2	13.47	6.581		
2,200.0	2,163.3	2,203.8	2,172.6	8.2	7.7	-130.21	-63.2	293.8	93.3	78.9	14.36	6.495		
2,300.0	2,260.8	2,303.6	2,270.2	8.7	8.1	-129.32	-69.1	314.0	98.0	82.7	15.26	6.418		
2,400.0	2,358.3	2,403.5	2,367.8	9.2	8.6	-128.50	-75.0	334.2	102.6	86.5	16.16	6.350		
2,500.0	2,455.7	2,503.4	2,465.5	9.7	9.0	-127.76	-80.9	354.4	107.3	90.3	17.07	6.290		
2,600.0	2,553.2	2,603.3	2,563.1	10.1	9.5	-127.08	-86.8	374.6	112.1	94.1	17.97	6.235		
2,700.0	2,650.6	2,703.2	2,660.8	10.6	9.9	-126.45	-92.7	394.8	116.8	97.9	18.88	6.186		
2,800.0	2,748.1	2,803.0	2,758.4	11.1	10.4	-125.88	-98.6	415.0	121.5	101.7	19.79	6.142		
2,900.0	2,845.6	2,902.9	2,856.0	11.6	10.9	-125.34	-104.5	435.2	126.3	105.6	20.70	6.101		
3,000.0	2,943.0	3,002.8	2,953.7	12.1	11.3	-124.85	-110.4	455.4	131.1	109.5	21.61	6.064		
3,100.0	3,040.5	3,102.7	3,051.3	12.6	11.8	-124.39	-116.3	475.6	135.8	113.3	22.52	6.031		
3,200.0	3,137.9	3,202.6	3,148.9	13.1	12.3	-123.96	-122.2	495.8	140.6	117.2	23.44	6.000		
3,300.0	3,235.4	3,302.4	3,246.6	13.6	12.7	-123.56	-128.1	516.0	145.4	121.1	24.35	5.971		
3,400.0	3,332.9	3,402.3	3,344.2	14.0	13.2	-123.18	-134.0	536.2	150.2	124.9	25.27	5.945		
3,500.0	3,430.3	3,502.2	3,441.9	14.5	13.6	-122.83	-139.9	556.4	155.0	128.8	26.18	5.921		
3,600.0	3,527.8	3,602.1	3,539.5	15.0	14.1	-122.50	-145.8	576.6	159.8	132.7	27.10	5.898		
3,700.0	3,625.3	3,702.0	3,637.1	15.5	14.6	-122.19	-151.7	596.8	164.6	136.6	28.02	5.877		
3,800.0	3,722.7	3,801.8	3,734.8	16.0	15.0	-121.90	-157.6	617.0	169.5	140.5	28.93	5.857		
3,900.0	3,820.2	3,901.7	3,832.4	16.5	15.5	-121.62	-163.5	637.2	174.3	144.4	29.85	5.839		
4,000.0	3,917.6	4,001.6	3,930.1	17.0	15.9	-121.36	-169.4	657.4	179.1	148.3	30.77	5.822		
4,100.0	4,015.1	4,101.5	4,027.7	17.5	16.4	-121.11	-175.3	677.6	183.9	152.3	31.69	5.806		
4,200.0	4,112.6	4,201.4	4,125.3	18.0	16.9	-120.87	-181.2	697.8	188.8	156.2	32.60	5.790		
4,300.0	4,210.0	4,301.2	4,223.0	18.4	17.3	-120.65	-187.1	718.0	193.6	160.1	33.52	5.776		
4,400.0	4,307.5	4,401.1	4,320.6	18.9	17.8	-120.44	-193.0	738.2	198.5	164.0	34.44	5.763		
4,500.0	4,404.9	4,501.0	4,418.2	19.4	18.3	-120.23	-198.9	758.4	203.3	167.9	35.36	5.750		
4,600.0	4,502.4	4,600.9	4,515.9	19.9	18.7	-120.04	-204.8	778.6	208.2	171.9	36.28	5.738		
4,700.0	4,599.9	4,700.8	4,613.5	20.4	19.2	-119.85	-210.7	798.8	213.0	175.8	37.20	5.726		
4,800.0	4,697.3	4,800.7	4,711.2	20.9	19.6	-119.68	-216.6	819.0	217.8	179.7	38.11	5.716		
4,900.0	4,794.8	4,900.5	4,808.8	21.4	20.1	-119.51	-222.5	839.2	222.7	183.7	39.03	5.705		
5,000.0	4,892.3	5,000.4	4,906.4	21.9	20.6	-119.35	-228.4	859.4	227.6	187.6	39.95	5.696		
5,100.0	4,989.7	5,100.3	5,004.1	22.4	21.0	-119.19	-234.3	879.6	232.4	191.5	40.87	5.686		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-12E - Slot B-5 - 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	5,087.2	5,200.0	5,101.5	22.8	21.5	-119.04	-240.2	899.8	237.2	195.4	41.78	5.677		
5,300.0	5,185.3	5,297.6	5,197.3	23.2	21.8	-118.83	-245.4	917.8	241.3	198.8	42.47	5.681		
5,400.0	5,283.9	5,395.2	5,293.7	23.4	22.1	-118.66	-249.8	932.6	244.6	201.6	43.06	5.681		
5,500.0	5,383.1	5,492.8	5,390.5	23.7	22.3	-118.53	-253.2	944.4	247.3	203.7	43.57	5.676		
5,600.0	5,482.7	5,590.5	5,487.7	23.9	22.5	-118.44	-255.7	952.9	249.2	205.2	43.98	5.666		
5,700.0	5,582.5	5,688.1	5,585.2	24.1	22.7	-118.38	-257.2	958.2	250.4	206.1	44.30	5.652		
5,800.0	5,682.4	5,785.8	5,682.9	24.2	22.8	-118.36	-257.9	960.4	250.9	206.4	44.54	5.633		
5,900.0	5,782.4	5,885.3	5,782.4	24.3	22.9	0.36	-257.9	960.4	250.9	206.1	44.76	5.605		
6,000.0	5,882.4	5,985.3	5,882.4	24.4	23.0	0.36	-257.9	960.4	250.9	205.9	44.99	5.577		
6,100.0	5,982.4	6,085.3	5,982.4	24.5	23.1	0.36	-257.9	960.4	250.9	205.7	45.22	5.548		
6,200.0	6,082.4	6,185.3	6,082.4	24.6	23.3	0.36	-257.9	960.4	250.9	205.5	45.46	5.520		
6,300.0	6,182.4	6,285.3	6,182.4	24.7	23.4	0.36	-257.9	960.4	250.9	205.2	45.70	5.491		
6,400.0	6,282.4	6,385.3	6,282.4	24.8	23.5	0.36	-257.9	960.4	250.9	205.0	45.94	5.462		
6,500.0	6,382.4	6,485.3	6,382.4	24.9	23.6	0.36	-257.9	960.4	250.9	204.7	46.18	5.433		
6,600.0	6,482.4	6,585.3	6,482.4	25.0	23.7	0.36	-257.9	960.4	250.9	204.5	46.43	5.404		
6,700.0	6,582.4	6,685.3	6,582.4	25.1	23.9	0.36	-257.9	960.4	250.9	204.2	46.68	5.375		
6,800.0	6,682.4	6,785.3	6,682.4	25.3	24.0	0.36	-257.9	960.4	250.9	204.0	46.93	5.346		
6,900.0	6,782.4	6,885.3	6,782.4	25.4	24.1	0.36	-257.9	960.4	250.9	203.7	47.19	5.317		
7,000.0	6,882.4	6,985.3	6,882.4	25.5	24.2	0.36	-257.9	960.4	250.9	203.5	47.45	5.288		
7,100.0	6,982.4	7,085.3	6,982.4	25.6	24.4	0.36	-257.9	960.4	250.9	203.2	47.71	5.259		
7,200.0	7,082.4	7,185.3	7,082.4	25.7	24.5	0.36	-257.9	960.4	250.9	202.9	47.98	5.230		
7,300.0	7,182.4	7,285.3	7,182.4	25.9	24.6	0.36	-257.9	960.4	250.9	202.7	48.24	5.201		
7,400.0	7,282.4	7,385.3	7,282.4	26.0	24.8	0.36	-257.9	960.4	250.9	202.4	48.52	5.172		
7,500.0	7,382.4	7,485.3	7,382.4	26.1	24.9	0.36	-257.9	960.4	250.9	202.1	48.79	5.143		
7,600.0	7,482.4	7,585.3	7,482.4	26.2	25.0	0.36	-257.9	960.4	250.9	201.8	49.06	5.114		
7,700.0	7,582.4	7,685.3	7,582.4	26.4	25.2	0.36	-257.9	960.4	250.9	201.6	49.34	5.085		
7,800.0	7,682.4	7,785.3	7,682.4	26.5	25.3	0.36	-257.9	960.4	250.9	201.3	49.62	5.056		
7,852.6	7,735.0	7,837.9	7,735.0	26.5	25.4	0.36	-257.9	960.4	250.9	201.2	49.73	5.045 SF		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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
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	-56.87	12.4	-19.0	22.7				
100.0	100.0	100.0	100.0	0.1	0.1	-56.87	12.4	-19.0	22.7	22.5	0.18	129.237	
200.0	200.0	200.0	200.0	0.3	0.3	-56.87	12.4	-19.0	22.7	22.0	0.62	36.261	
300.0	300.0	300.0	300.0	0.5	0.5	-56.87	12.4	-19.0	22.7	21.6	1.07	21.089 CC, ES	
400.0	400.0	400.0	400.0	0.8	0.8	-153.80	12.4	-19.0	24.2	22.7	1.53	15.817	
500.0	499.8	499.8	499.8	1.0	1.0	-158.34	12.4	-19.0	29.0	27.0	2.01	14.454 SF	
600.0	599.5	599.5	599.5	1.2	1.2	-163.24	12.4	-19.0	37.2	34.7	2.50	14.894	
700.0	698.7	697.6	697.6	1.5	1.4	-177.40	11.6	-20.4	50.0	47.1	2.97	16.837	
800.0	797.6	794.4	794.3	1.8	1.6	173.23	9.2	-24.8	68.4	64.9	3.43	19.913	
900.0	896.0	889.6	889.1	2.1	1.8	166.88	5.4	-31.8	92.1	88.2	3.91	23.561	
1,000.0	993.8	982.7	981.5	2.5	2.0	162.67	0.2	-41.4	121.0	116.6	4.40	27.523	
1,100.0	1,091.2	1,073.9	1,071.7	3.0	2.3	161.58	-6.2	-53.4	153.4	148.5	4.86	31.581	
1,200.0	1,188.7	1,163.4	1,159.8	3.4	2.6	160.30	-13.9	-67.5	188.2	182.8	5.35	35.180	
1,300.0	1,286.2	1,256.2	1,250.7	3.9	2.9	159.10	-22.7	-83.6	224.3	218.5	5.87	38.236	
1,400.0	1,383.6	1,349.3	1,342.0	4.4	3.3	158.23	-31.4	-99.8	260.6	254.2	6.40	40.731	
1,500.0	1,481.1	1,442.5	1,433.3	4.8	3.6	157.57	-40.2	-116.0	296.9	289.9	6.94	42.774	
1,600.0	1,578.6	1,535.6	1,524.7	5.3	4.0	157.06	-49.0	-132.2	333.2	325.7	7.50	44.401	
1,700.0	1,676.0	1,628.8	1,616.0	5.8	4.4	156.64	-57.7	-148.4	369.5	361.4	8.07	45.793	
1,800.0	1,773.5	1,721.9	1,707.3	6.3	4.8	156.30	-66.5	-164.6	405.8	397.2	8.64	46.957	
1,900.0	1,870.9	1,815.0	1,798.6	6.8	5.2	156.02	-75.3	-180.7	442.2	432.9	9.22	47.945	
2,000.0	1,968.4	1,908.2	1,889.9	7.2	5.6	155.78	-84.0	-196.9	478.5	468.7	9.81	48.792	
2,100.0	2,065.9	2,001.3	1,981.2	7.7	6.0	155.57	-92.8	-213.1	514.9	504.5	10.40	49.526	
2,200.0	2,163.3	2,094.5	2,072.5	8.2	6.4	155.39	-101.6	-229.3	551.2	540.2	10.99	50.165	
2,300.0	2,260.8	2,187.6	2,163.8	8.7	6.8	155.24	-110.4	-245.5	587.6	576.0	11.58	50.727	
2,400.0	2,358.3	2,280.7	2,255.1	9.2	7.2	155.10	-119.1	-261.6	624.0	611.8	12.18	51.224	
2,500.0	2,455.7	2,373.9	2,346.4	9.7	7.6	154.97	-127.9	-277.8	660.3	647.6	12.78	51.667	
2,600.0	2,553.2	2,467.0	2,437.7	10.1	8.0	154.86	-136.7	-294.0	696.7	683.3	13.38	52.063	
2,700.0	2,650.6	2,560.2	2,529.0	10.6	8.4	154.76	-145.4	-310.2	733.1	719.1	13.98	52.420	
2,800.0	2,748.1	2,653.3	2,620.3	11.1	8.8	154.67	-154.2	-326.4	769.5	754.9	14.59	52.742	
2,900.0	2,845.6	2,746.5	2,711.6	11.6	9.2	154.59	-163.0	-342.6	805.9	790.7	15.19	53.035	
3,000.0	2,943.0	2,839.6	2,802.9	12.1	9.6	154.52	-171.7	-358.7	842.2	826.4	15.80	53.302	
3,100.0	3,040.5	2,932.7	2,894.2	12.6	10.0	154.45	-180.5	-374.9	878.6	862.2	16.41	53.546	
3,200.0	3,137.9	3,025.9	2,985.5	13.1	10.4	154.38	-189.3	-391.1	915.0	898.0	17.02	53.771	
3,300.0	3,235.4	3,119.0	3,076.8	13.6	10.8	154.33	-198.0	-407.3	951.4	933.8	17.63	53.977	
3,400.0	3,332.9	3,212.2	3,168.1	14.0	11.2	154.27	-206.8	-423.5	987.8	969.5	18.24	54.168	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-14E - Slot B-3 - 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	150.51	-8.0	4.5	9.2					
100.0	100.0	100.0	100.0	0.1	0.1	150.51	-8.0	4.5	9.2	9.0	0.18	52.506		
200.0	200.0	200.0	200.0	0.3	0.3	150.51	-8.0	4.5	9.2	8.6	0.62	14.732 CC, ES		
300.0	300.0	299.8	299.7	0.5	0.5	143.11	-8.3	6.2	10.4	9.3	1.06	9.790		
400.0	400.0	399.4	399.2	0.8	0.7	38.24	-9.2	11.4	13.2	11.7	1.50	8.814		
500.0	499.8	498.9	498.3	1.0	1.0	32.91	-10.7	19.9	16.5	14.5	1.97	8.365		
600.0	599.5	598.2	597.0	1.2	1.3	33.94	-13.9	31.0	20.0	17.6	2.45	8.152		
700.0	698.7	697.4	695.1	1.5	1.6	29.00	-20.0	44.0	23.8	20.8	2.97	8.016		
800.0	797.6	796.4	792.6	1.8	1.9	27.50	-28.9	58.9	27.6	24.1	3.51	7.867		
900.0	896.0	895.3	889.4	2.1	2.3	27.93	-40.6	75.5	31.6	27.5	4.10	7.701		
1,000.0	993.8	994.1	985.4	2.5	2.8	29.68	-55.0	93.9	35.7	31.0	4.75	7.526		
1,100.0	1,091.2	1,094.0	1,082.0	3.0	3.3	33.69	-70.9	113.3	40.1	34.7	5.42	7.396		
1,200.0	1,188.7	1,193.8	1,178.7	3.4	3.8	36.89	-86.7	132.7	44.7	38.5	6.15	7.261		
1,300.0	1,286.2	1,293.7	1,275.4	3.9	4.3	39.49	-102.5	152.1	49.3	42.4	6.92	7.130		
1,400.0	1,383.6	1,393.6	1,372.1	4.4	4.8	41.64	-118.3	171.5	54.1	46.4	7.71	7.011		
1,500.0	1,481.1	1,493.4	1,468.8	4.8	5.4	43.44	-134.1	190.9	58.9	50.4	8.53	6.902		
1,600.0	1,578.6	1,593.3	1,565.4	5.3	5.9	44.97	-150.0	210.3	63.8	54.4	9.37	6.806		
1,700.0	1,676.0	1,693.2	1,662.1	5.8	6.4	46.28	-165.8	229.7	68.7	58.4	10.21	6.722		
1,800.0	1,773.5	1,793.0	1,758.8	6.3	6.9	47.41	-181.6	249.1	73.6	62.5	11.07	6.647		
1,900.0	1,870.9	1,892.9	1,855.5	6.8	7.5	48.41	-197.4	268.5	78.5	66.6	11.94	6.581		
2,000.0	1,968.4	1,992.8	1,952.2	7.2	8.0	49.28	-213.2	287.9	83.5	70.7	12.81	6.522		
2,100.0	2,065.9	2,092.7	2,048.8	7.7	8.5	50.06	-229.1	307.3	88.5	74.8	13.68	6.470		
2,200.0	2,163.3	2,192.5	2,145.5	8.2	9.1	50.75	-244.9	326.7	93.5	79.0	14.56	6.423		
2,300.0	2,260.8	2,292.4	2,242.2	8.7	9.6	51.37	-260.7	346.1	98.6	83.1	15.45	6.381		
2,400.0	2,358.3	2,392.3	2,338.9	9.2	10.2	51.93	-276.5	365.5	103.6	87.3	16.33	6.343		
2,500.0	2,455.7	2,492.1	2,435.6	9.7	10.7	52.44	-292.4	384.9	108.6	91.4	17.22	6.308		
2,600.0	2,553.2	2,592.0	2,532.2	10.1	11.2	52.91	-308.2	404.3	113.7	95.6	18.11	6.277		
2,700.0	2,650.6	2,691.9	2,628.9	10.6	11.8	53.33	-324.0	423.7	118.7	99.7	19.00	6.248		
2,800.0	2,748.1	2,791.7	2,725.6	11.1	12.3	53.72	-339.8	443.1	123.8	103.9	19.90	6.222		
2,900.0	2,845.6	2,891.6	2,822.3	11.6	12.8	54.08	-355.6	462.5	128.9	108.1	20.79	6.198		
3,000.0	2,943.0	2,991.5	2,919.0	12.1	13.4	54.41	-371.5	481.8	133.9	112.3	21.69	6.176		
3,100.0	3,040.5	3,091.3	3,015.7	12.6	13.9	54.72	-387.3	501.2	139.0	116.4	22.59	6.155		
3,200.0	3,137.9	3,191.2	3,112.3	13.1	14.4	55.01	-403.1	520.6	144.1	120.6	23.48	6.136		
3,300.0	3,235.4	3,291.1	3,209.0	13.6	15.0	55.27	-418.9	540.0	149.2	124.8	24.38	6.118		
3,400.0	3,332.9	3,390.9	3,305.7	14.0	15.5	55.52	-434.7	559.4	154.3	129.0	25.28	6.102		
3,500.0	3,430.3	3,490.8	3,402.4	14.5	16.1	55.76	-450.6	578.8	159.4	133.2	26.18	6.086		
3,600.0	3,527.8	3,590.7	3,499.1	15.0	16.6	55.98	-466.4	598.2	164.5	137.4	27.08	6.072		
3,700.0	3,625.3	3,690.5	3,595.7	15.5	17.1	56.18	-482.2	617.6	169.5	141.6	27.98	6.058		
3,800.0	3,722.7	3,790.4	3,692.4	16.0	17.7	56.37	-498.0	637.0	174.6	145.8	28.89	6.046		
3,900.0	3,820.2	3,890.3	3,789.1	16.5	18.2	56.56	-513.9	656.4	179.7	150.0	29.79	6.034		
4,000.0	3,917.6	3,990.1	3,885.8	17.0	18.7	56.73	-529.7	675.8	184.8	154.1	30.69	6.023		
4,100.0	4,015.1	4,090.0	3,982.5	17.5	19.3	56.89	-545.5	695.2	189.9	158.3	31.59	6.012		
4,200.0	4,112.6	4,189.9	4,079.1	18.0	19.8	57.05	-561.3	714.6	195.0	162.5	32.50	6.002		
4,300.0	4,210.0	4,289.8	4,175.8	18.4	20.4	57.20	-577.1	734.0	200.1	166.7	33.40	5.992		
4,400.0	4,307.5	4,389.6	4,272.5	18.9	20.9	57.34	-593.0	753.4	205.3	170.9	34.30	5.983		
4,500.0	4,404.9	4,489.5	4,369.2	19.4	21.4	57.47	-608.8	772.8	210.4	175.2	35.21	5.975		
4,600.0	4,502.4	4,589.4	4,465.9	19.9	22.0	57.59	-624.6	792.2	215.5	179.4	36.11	5.967		
4,700.0	4,599.9	4,689.2	4,562.5	20.4	22.5	57.72	-640.4	811.6	220.6	183.6	37.02	5.959		
4,800.0	4,697.3	4,789.1	4,659.2	20.9	23.1	57.83	-656.2	831.0	225.7	187.8	37.92	5.952		
4,900.0	4,794.8	4,889.0	4,755.9	21.4	23.6	57.94	-672.1	850.4	230.8	192.0	38.83	5.944		
5,000.0	4,892.3	4,988.8	4,852.6	21.9	24.1	58.05	-687.9	869.8	235.9	196.2	39.73	5.938		
5,100.0	4,989.7	5,089.8	4,950.3	22.4	24.7	58.16	-703.8	889.3	241.0	200.3	40.63	5.931		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-14E - Slot B-3 - 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	5,087.2	5,195.7	5,053.5	22.8	25.1	58.71	-719.0	907.9	244.5	202.9	41.57	5.882		
5,300.0	5,185.3	5,301.6	5,157.4	23.2	25.4	59.40	-731.7	923.5	247.0	204.6	42.38	5.827		
5,400.0	5,283.9	5,407.5	5,262.1	23.4	25.7	60.02	-742.0	936.1	248.8	205.7	43.09	5.774		
5,500.0	5,383.1	5,513.4	5,367.3	23.7	25.9	60.57	-749.8	945.7	250.0	206.3	43.70	5.721		
5,600.0	5,482.7	5,619.3	5,472.8	23.9	26.1	61.06	-755.2	952.3	250.6	206.4	44.21	5.668		
5,700.0	5,582.5	5,725.1	5,578.5	24.1	26.3	61.48	-758.1	955.8	250.5	205.9	44.62	5.615		
5,800.0	5,682.4	5,829.0	5,682.4	24.2	26.4	61.81	-758.7	956.5	249.9	205.0	44.93	5.563		
5,845.5	5,727.9	5,874.5	5,727.9	24.2	26.4	61.85	-758.7	956.5	249.8	204.8	45.04	5.547		
5,900.0	5,782.4	5,929.0	5,782.4	24.3	26.5	-179.46	-758.7	956.5	249.9	204.8	45.14	5.536		
6,000.0	5,882.4	6,029.0	5,882.4	24.4	26.6	-179.46	-758.7	956.5	249.9	204.5	45.37	5.509		
6,100.0	5,982.4	6,129.0	5,982.4	24.5	26.6	-179.46	-758.7	956.5	249.9	204.3	45.59	5.482		
6,200.0	6,082.4	6,229.0	6,082.4	24.6	26.7	-179.46	-758.7	956.5	249.9	204.1	45.82	5.454		
6,300.0	6,182.4	6,329.0	6,182.4	24.7	26.8	-179.46	-758.7	956.5	249.9	203.9	46.05	5.427		
6,400.0	6,282.4	6,429.0	6,282.4	24.8	26.9	-179.46	-758.7	956.5	249.9	203.6	46.28	5.400		
6,500.0	6,382.4	6,529.0	6,382.4	24.9	27.0	-179.46	-758.7	956.5	249.9	203.4	46.52	5.372		
6,600.0	6,482.4	6,629.0	6,482.4	25.0	27.1	-179.46	-758.7	956.5	249.9	203.1	46.76	5.344		
6,700.0	6,582.4	6,729.0	6,582.4	25.1	27.2	-179.46	-758.7	956.5	249.9	202.9	47.00	5.317		
6,800.0	6,682.4	6,829.0	6,682.4	25.3	27.3	-179.46	-758.7	956.5	249.9	202.7	47.25	5.289		
6,900.0	6,782.4	6,929.0	6,782.4	25.4	27.5	-179.46	-758.7	956.5	249.9	202.4	47.50	5.261		
7,000.0	6,882.4	7,029.0	6,882.4	25.5	27.6	-179.46	-758.7	956.5	249.9	202.2	47.75	5.234		
7,100.0	6,982.4	7,129.0	6,982.4	25.6	27.7	-179.46	-758.7	956.5	249.9	201.9	48.01	5.206		
7,200.0	7,082.4	7,229.0	7,082.4	25.7	27.8	-179.46	-758.7	956.5	249.9	201.6	48.26	5.178		
7,300.0	7,182.4	7,329.0	7,182.4	25.9	27.9	-179.46	-758.7	956.5	249.9	201.4	48.52	5.150		
7,400.0	7,282.4	7,429.0	7,282.4	26.0	28.0	-179.46	-758.7	956.5	249.9	201.1	48.79	5.122		
7,500.0	7,382.4	7,529.0	7,382.4	26.1	28.1	-179.46	-758.7	956.5	249.9	200.9	49.05	5.095		
7,600.0	7,482.4	7,629.0	7,482.4	26.2	28.2	-179.46	-758.7	956.5	249.9	200.6	49.32	5.067		
7,700.0	7,582.4	7,729.0	7,582.4	26.4	28.3	-179.46	-758.7	956.5	249.9	200.3	49.59	5.039		
7,800.0	7,682.4	7,829.0	7,682.4	26.5	28.5	-179.46	-758.7	956.5	249.9	200.0	49.87	5.011		
7,826.7	7,709.1	7,855.7	7,709.1	26.5	28.5	-179.46	-758.7	956.5	249.9	200.0	49.92	5.006 SF		
7,852.6	7,735.0	7,864.6	7,718.0	26.5	28.5	-179.46	-758.7	956.5	250.5	200.5	49.95	5.014		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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	138.31	-102.9	91.6	138.9					
100.0	100.0	81.8	99.8	0.1	0.1	138.18	-102.7	91.9	137.8	137.6	0.18	760.148 CC		
200.0	200.0	181.4	199.4	0.3	0.3	137.76	-102.2	92.8	138.0	137.4	0.57	243.140 ES		
300.0	300.0	280.0	298.0	0.5	0.5	137.44	-102.2	93.9	138.8	137.8	1.00	138.889		
400.0	400.0	374.1	392.0	0.8	0.7	42.54	-104.0	96.6	140.9	139.5	1.43	98.206		
500.0	499.8	467.5	485.1	1.0	0.9	43.77	-109.5	101.6	145.0	143.1	1.89	76.879		
600.0	599.5	561.6	578.6	1.2	1.2	46.35	-118.8	108.0	150.8	148.5	2.36	64.019		
700.0	698.7	654.5	670.2	1.5	1.5	39.43	-131.2	116.2	158.2	155.3	2.86	55.363		
800.0	797.6	748.5	762.3	1.8	1.9	35.93	-146.4	126.8	166.3	162.9	3.39	49.103		
900.0	896.0	843.2	854.6	2.1	2.3	34.35	-163.8	139.1	174.2	170.3	3.95	44.109		
1,000.0	993.8	937.0	945.3	2.5	2.7	34.12	-183.5	152.9	182.5	177.9	4.55	40.109		
1,100.0	1,091.2	1,035.4	1,040.1	3.0	3.2	36.58	-205.0	168.6	191.0	185.9	5.16	37.010		
1,200.0	1,188.7	1,130.7	1,131.3	3.4	3.8	38.51	-226.7	184.9	201.3	195.5	5.81	34.662		
1,300.0	1,286.2	1,225.5	1,221.7	3.9	4.3	40.37	-250.3	201.5	213.9	207.4	6.49	32.956		
1,400.0	1,383.6	1,323.3	1,314.5	4.4	4.9	41.96	-275.4	219.3	227.8	220.6	7.21	31.578		
1,500.0	1,481.1	1,419.2	1,405.2	4.8	5.5	43.31	-300.9	237.1	242.8	234.8	7.96	30.514		
1,600.0	1,578.6	1,516.6	1,497.1	5.3	6.1	44.38	-327.2	256.0	258.6	249.9	8.72	29.643		
1,700.0	1,676.0	1,613.6	1,588.3	5.8	6.8	45.19	-353.7	275.5	275.0	265.5	9.50	28.944		
1,800.0	1,773.5	1,708.8	1,677.8	6.3	7.4	46.11	-380.7	293.8	292.3	282.0	10.29	28.412		
1,900.0	1,870.9	1,803.2	1,766.1	6.8	8.0	47.02	-408.7	311.7	310.9	299.8	11.09	28.023		
2,000.0	1,968.4	1,898.9	1,855.2	7.2	8.7	47.68	-438.0	331.0	330.8	318.9	11.91	27.776		
2,100.0	2,065.9	1,998.3	1,947.9	7.7	9.3	48.31	-468.0	350.8	350.2	337.4	12.74	27.496		
2,200.0	2,163.3	2,092.4	2,035.2	8.2	10.0	48.72	-497.0	370.4	370.5	357.0	13.54	27.356		
2,300.0	2,260.8	2,193.5	2,128.9	8.7	10.7	48.94	-527.9	392.5	390.9	376.5	14.38	27.189		
2,400.0	2,358.3	2,296.3	2,224.6	9.2	11.4	49.18	-558.2	414.6	410.0	394.8	15.20	26.971		
2,500.0	2,455.7	2,394.1	2,316.0	9.7	12.0	49.53	-586.7	434.6	428.6	412.6	16.03	26.741		
2,600.0	2,553.2	2,488.8	2,404.3	10.1	12.7	49.83	-614.8	454.1	447.8	430.9	16.86	26.566		
2,700.0	2,650.6	2,584.2	2,493.1	10.6	13.3	50.14	-643.9	473.5	467.7	450.0	17.70	26.425		
2,800.0	2,748.1	2,679.2	2,581.3	11.1	14.0	50.38	-673.1	493.3	488.1	469.5	18.54	26.328		
2,900.0	2,845.6	2,776.4	2,671.3	11.6	14.7	50.63	-703.6	513.4	509.1	489.7	19.39	26.259		
3,000.0	2,943.0	2,875.2	2,763.0	12.1	15.4	50.86	-734.3	533.9	529.8	509.5	20.24	26.172		
3,100.0	3,040.5	2,968.3	2,849.0	12.6	16.1	50.91	-763.2	554.5	550.7	529.7	21.06	26.148		
3,200.0	3,137.9	3,069.3	2,942.0	13.1	16.9	50.92	-795.2	577.4	572.4	550.5	21.92	26.118		
3,300.0	3,235.4	3,168.2	3,033.6	13.6	17.5	50.96	-825.5	599.4	592.9	570.1	22.75	26.059		
3,400.0	3,332.9	3,257.4	3,116.1	14.0	18.2	51.13	-853.8	617.9	614.3	590.7	23.57	26.064		
3,500.0	3,430.3	3,355.6	3,206.7	14.5	18.9	51.38	-886.2	637.7	636.8	612.4	24.44	26.055		
3,600.0	3,527.8	3,452.1	3,295.9	15.0	19.6	51.58	-917.2	657.4	658.6	633.3	25.30	26.032		
3,700.0	3,625.3	3,548.9	3,385.1	15.5	20.3	51.73	-949.0	677.6	681.1	654.9	26.16	26.037		
3,800.0	3,722.7	3,655.0	3,483.1	16.0	21.1	51.84	-983.0	700.1	702.9	675.8	27.05	25.986		
3,900.0	3,820.2	3,752.3	3,573.1	16.5	21.7	51.90	-1,013.3	721.1	723.8	695.9	27.89	25.951		
4,000.0	3,917.6	3,853.9	3,667.1	17.0	22.5	51.97	-1,045.1	742.9	744.9	716.1	28.76	25.899		
4,100.0	4,015.1	3,955.0	3,760.8	17.5	23.2	52.02	-1,076.0	764.8	765.3	735.7	29.62	25.840		
4,200.0	4,112.6	4,045.8	3,845.0	18.0	23.8	52.10	-1,104.1	784.0	785.9	755.5	30.44	25.821		
4,300.0	4,210.0	4,150.0	3,941.7	18.4	24.5	52.27	-1,136.8	804.9	806.8	775.5	31.33	25.752		
4,400.0	4,307.5	4,247.1	4,031.9	18.9	25.2	52.39	-1,166.7	824.7	827.2	795.0	32.19	25.695		
4,500.0	4,404.9	4,338.0	4,116.2	19.4	25.9	52.45	-1,195.0	844.1	848.0	815.0	33.03	25.677		
4,600.0	4,502.4	4,437.6	4,208.2	19.9	26.6	52.48	-1,226.2	865.6	869.2	835.4	33.89	25.648		
4,700.0	4,599.9	4,542.6	4,305.5	20.4	27.4	52.51	-1,258.7	888.3	889.9	855.1	34.77	25.594		
4,800.0	4,697.3	4,651.6	4,406.8	20.9	28.1	52.53	-1,291.0	912.0	909.4	873.7	35.66	25.500		
4,900.0	4,794.8	4,744.1	4,493.0	21.4	28.7	52.59	-1,318.6	931.4	928.9	892.4	36.49	25.454		
5,000.0	4,892.3	4,854.1	4,595.7	21.9	29.5	52.67	-1,350.6	954.2	947.5	910.1	37.40	25.333		
5,100.0	4,989.7	4,942.4	4,678.1	22.4	30.1	52.76	-1,376.6	972.1	966.5	928.3	38.22	25.287		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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	
5,200.0	5,087.2	5,034.6	4,764.1	22.8	30.7	52.97	-1,404.4	990.3	986.2	947.2	39.07	25.243 SF	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-20E - Slot A-3 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	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	-163.18	-13.1	-4.0	13.7					
100.0	100.0	100.0	100.0	0.1	0.1	-163.18	-13.1	-4.0	13.7	13.5	0.18	78.133 CC, ES		
200.0	200.0	199.5	199.5	0.3	0.3	-166.11	-14.8	-3.7	15.3	14.7	0.61	25.182		
300.0	300.0	298.8	298.7	0.5	0.5	-172.09	-19.9	-2.8	20.1	19.1	1.06	19.075		
400.0	400.0	397.6	397.1	0.8	0.8	90.61	-28.4	-1.1	28.5	27.0	1.52	18.809 SF		
500.0	499.8	495.6	494.3	1.0	1.1	91.35	-40.5	2.1	40.6	38.6	1.98	20.508		
600.0	599.5	592.7	589.9	1.2	1.4	92.78	-56.2	7.1	56.3	53.8	2.49	22.593		
700.0	698.7	688.7	683.8	1.5	1.8	84.07	-75.3	13.8	74.5	71.4	3.05	24.454		
800.0	797.6	784.0	776.0	1.8	2.3	78.57	-97.7	22.1	94.0	90.3	3.67	25.597		
900.0	896.0	878.4	866.3	2.1	2.9	74.87	-123.3	32.0	114.7	110.4	4.38	26.180		
1,000.0	993.8	971.9	954.6	2.5	3.5	72.52	-151.9	43.3	136.7	131.5	5.18	26.372		
1,100.0	1,091.2	1,064.2	1,040.5	3.0	4.1	72.64	-183.4	56.1	160.9	154.9	6.04	26.643		
1,200.0	1,188.7	1,155.0	1,123.5	3.4	4.8	72.01	-217.3	70.1	188.2	181.3	6.91	27.224		
1,300.0	1,286.2	1,244.0	1,203.4	3.9	5.6	70.95	-253.4	85.2	218.5	210.7	7.79	28.044		
1,400.0	1,383.6	1,330.9	1,280.0	4.4	6.4	69.67	-291.3	101.3	251.7	243.1	8.66	29.066		
1,500.0	1,481.1	1,419.5	1,356.5	4.8	7.3	68.29	-332.3	118.9	287.7	278.2	9.54	30.163		
1,600.0	1,578.6	1,512.4	1,436.5	5.3	8.2	67.10	-375.7	137.5	324.3	313.9	10.43	31.099		
1,700.0	1,676.0	1,605.3	1,516.4	5.8	9.2	66.15	-419.1	156.1	361.0	349.7	11.32	31.891		
1,800.0	1,773.5	1,698.2	1,596.4	6.3	10.1	65.38	-462.6	174.7	397.8	385.5	12.21	32.568		
1,900.0	1,870.9	1,791.0	1,676.4	6.8	11.1	64.73	-506.0	193.4	434.6	421.5	13.11	33.152		
2,000.0	1,968.4	1,883.9	1,756.3	7.2	12.0	64.19	-549.4	212.0	471.4	457.4	14.00	33.660		
2,100.0	2,065.9	1,976.8	1,836.3	7.7	13.0	63.73	-592.8	230.6	508.3	493.4	14.90	34.107		
2,200.0	2,163.3	2,069.7	1,916.3	8.2	13.9	63.32	-636.2	249.2	545.2	529.4	15.80	34.503		
2,300.0	2,260.8	2,162.6	1,996.2	8.7	14.9	62.97	-679.6	267.8	582.1	565.4	16.70	34.855		
2,400.0	2,358.3	2,255.4	2,076.2	9.2	15.8	62.66	-723.0	286.5	619.0	601.4	17.60	35.170		
2,500.0	2,455.7	2,348.3	2,156.2	9.7	16.8	62.39	-766.5	305.1	656.0	637.5	18.50	35.455		
2,600.0	2,553.2	2,441.2	2,236.1	10.1	17.7	62.14	-809.9	323.7	693.0	673.6	19.40	35.712		
2,700.0	2,650.6	2,534.1	2,316.1	10.6	18.7	61.92	-853.3	342.3	729.9	709.6	20.31	35.946		
2,800.0	2,748.1	2,626.9	2,396.1	11.1	19.6	61.72	-896.7	360.9	766.9	745.7	21.21	36.159		
2,900.0	2,845.6	2,719.8	2,476.1	11.6	20.6	61.54	-940.1	379.6	803.9	781.8	22.11	36.355		
3,000.0	2,943.0	2,812.7	2,556.0	12.1	21.6	61.38	-983.5	398.2	840.9	817.9	23.02	36.535		
3,100.0	3,040.5	2,905.6	2,636.0	12.6	22.5	61.23	-1,026.9	416.8	877.9	854.0	23.92	36.702		
3,200.0	3,137.9	2,998.5	2,716.0	13.1	23.5	61.09	-1,070.4	435.4	914.9	890.1	24.82	36.855		
3,300.0	3,235.4	3,091.3	2,795.9	13.6	24.4	60.96	-1,113.8	454.0	951.9	926.2	25.73	36.998		
3,400.0	3,332.9	3,184.2	2,875.9	14.0	25.4	60.84	-1,157.2	472.7	988.9	962.3	26.63	37.131		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-20E - Slot A-3 - 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	-163.18	-13.1	-4.0	13.7					
100.0	100.0	100.0	100.0	0.1	0.1	-163.18	-13.1	-4.0	13.7	13.5	0.18	78.133 CC, ES		
200.0	200.0	199.5	199.5	0.3	0.3	-166.11	-14.8	-3.7	15.3	14.7	0.61	25.182		
300.0	300.0	298.8	298.7	0.5	0.5	-172.09	-19.9	-2.8	20.1	19.1	1.06	19.075		
400.0	400.0	397.6	397.1	0.8	0.8	90.61	-28.4	-1.1	28.5	27.0	1.52	18.809 SF		
500.0	499.8	495.6	494.3	1.0	1.1	91.35	-40.5	2.1	40.6	38.6	1.98	20.508		
600.0	599.5	592.7	589.9	1.2	1.4	92.78	-56.2	7.1	56.3	53.8	2.49	22.593		
700.0	698.7	688.7	683.8	1.5	1.8	84.07	-75.3	13.8	74.5	71.4	3.05	24.454		
800.0	797.6	784.0	776.0	1.8	2.3	78.57	-97.7	22.1	94.0	90.3	3.67	25.597		
900.0	896.0	878.4	866.3	2.1	2.9	74.87	-123.3	32.0	114.7	110.4	4.38	26.180		
1,000.0	993.8	971.9	954.6	2.5	3.5	72.52	-151.9	43.3	136.7	131.5	5.18	26.372		
1,100.0	1,091.2	1,064.2	1,040.5	3.0	4.1	72.64	-183.4	56.1	160.9	154.9	6.04	26.643		
1,200.0	1,188.7	1,155.0	1,123.5	3.4	4.8	72.01	-217.3	70.1	188.2	181.3	6.91	27.224		
1,300.0	1,286.2	1,244.0	1,203.4	3.9	5.6	70.95	-253.4	85.2	218.5	210.7	7.79	28.044		
1,400.0	1,383.6	1,330.9	1,280.0	4.4	6.4	69.67	-291.3	101.3	251.7	243.1	8.66	29.066		
1,500.0	1,481.1	1,419.5	1,356.5	4.8	7.3	68.29	-332.3	118.9	287.7	278.2	9.54	30.163		
1,600.0	1,578.6	1,512.4	1,436.5	5.3	8.2	67.10	-375.7	137.5	324.3	313.9	10.43	31.099		
1,700.0	1,676.0	1,605.3	1,516.4	5.8	9.2	66.15	-419.1	156.1	361.0	349.7	11.32	31.891		
1,800.0	1,773.5	1,698.2	1,596.4	6.3	10.1	65.38	-462.6	174.7	397.8	385.5	12.21	32.568		
1,900.0	1,870.9	1,791.0	1,676.4	6.8	11.1	64.73	-506.0	193.4	434.6	421.5	13.11	33.152		
2,000.0	1,968.4	1,883.9	1,756.3	7.2	12.0	64.19	-549.4	212.0	471.4	457.4	14.00	33.660		
2,100.0	2,065.9	1,976.8	1,836.3	7.7	13.0	63.73	-592.8	230.6	508.3	493.4	14.90	34.107		
2,200.0	2,163.3	2,069.7	1,916.3	8.2	13.9	63.32	-636.2	249.2	545.2	529.4	15.80	34.503		
2,300.0	2,260.8	2,162.6	1,996.2	8.7	14.9	62.97	-679.6	267.8	582.1	565.4	16.70	34.855		
2,400.0	2,358.3	2,255.4	2,076.2	9.2	15.8	62.66	-723.0	286.5	619.0	601.4	17.60	35.170		
2,500.0	2,455.7	2,348.3	2,156.2	9.7	16.8	62.39	-766.5	305.1	656.0	637.5	18.50	35.455		
2,600.0	2,553.2	2,441.2	2,236.1	10.1	17.7	62.14	-809.9	323.7	693.0	673.6	19.40	35.712		
2,700.0	2,650.6	2,534.1	2,316.1	10.6	18.7	61.92	-853.3	342.3	729.9	709.6	20.31	35.946		
2,800.0	2,748.1	2,626.9	2,396.1	11.1	19.6	61.72	-896.7	360.9	766.9	745.7	21.21	36.159		
2,900.0	2,845.6	2,719.8	2,476.1	11.6	20.6	61.54	-940.1	379.6	803.9	781.8	22.11	36.355		
3,000.0	2,943.0	2,812.7	2,556.0	12.1	21.6	61.38	-983.5	398.2	840.9	817.9	23.02	36.535		
3,100.0	3,040.5	2,905.6	2,636.0	12.6	22.5	61.23	-1,026.9	416.8	877.9	854.0	23.92	36.702		
3,200.0	3,137.9	2,998.5	2,716.0	13.1	23.5	61.09	-1,070.4	435.4	914.9	890.1	24.82	36.855		
3,300.0	3,235.4	3,091.3	2,795.9	13.6	24.4	60.96	-1,113.8	454.0	951.9	926.2	25.73	36.998		
3,400.0	3,332.9	3,184.2	2,875.9	14.0	25.4	60.84	-1,157.2	472.7	988.9	962.3	26.63	37.131		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	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	-163.18	-13.1	-4.0	13.7					
100.0	100.0	100.0	100.0	0.1	0.1	-163.18	-13.1	-4.0	13.7	13.5	0.18	78.133		
200.0	200.0	200.0	200.0	0.3	0.3	-163.18	-13.1	-4.0	13.7	13.1	0.62	21.922 CC, ES		
300.0	300.0	299.5	299.5	0.5	0.5	-164.49	-14.8	-4.1	15.4	14.4	1.05	14.672		
400.0	400.0	398.7	398.6	0.8	0.7	102.50	-20.0	-4.6	20.8	19.4	1.48	14.106 SF		
500.0	499.8	497.4	496.8	1.0	1.0	108.33	-28.5	-5.3	30.6	28.7	1.93	15.837		
600.0	599.5	595.1	593.8	1.2	1.2	113.68	-40.2	-6.3	45.0	42.5	2.43	18.497		
700.0	698.7	691.7	689.3	1.5	1.6	107.81	-55.1	-7.6	62.9	60.0	2.94	21.375		
800.0	797.6	788.6	784.5	1.8	1.9	104.10	-73.2	-8.1	82.6	79.1	3.51	23.510		
900.0	896.0	885.3	878.8	2.1	2.3	100.97	-94.5	-6.2	103.1	98.9	4.17	24.724		
1,000.0	993.8	981.7	971.9	2.5	2.8	98.57	-119.0	-2.0	124.1	119.2	4.93	25.172		
1,100.0	1,091.2	1,077.7	1,063.6	3.0	3.3	98.14	-146.6	4.4	146.1	140.4	5.78	25.296		
1,200.0	1,188.7	1,173.0	1,153.5	3.4	3.9	96.50	-176.9	13.2	169.3	162.6	6.68	25.345		
1,300.0	1,286.2	1,267.2	1,241.1	3.9	4.6	94.14	-209.9	24.0	194.0	186.4	7.62	25.463		
1,400.0	1,383.6	1,360.0	1,326.0	4.4	5.3	91.37	-245.2	36.8	220.4	211.8	8.57	25.706		
1,500.0	1,481.1	1,451.2	1,407.9	4.8	6.1	88.42	-282.5	51.4	248.8	239.3	9.53	26.104		
1,600.0	1,578.6	1,540.6	1,486.6	5.3	6.9	85.43	-321.6	67.7	279.6	269.1	10.48	26.672		
1,700.0	1,676.0	1,627.9	1,561.9	5.8	7.7	82.49	-362.0	85.4	312.9	301.5	11.41	27.415		
1,800.0	1,773.5	1,717.8	1,638.1	6.3	8.7	79.63	-405.5	105.0	348.4	336.1	12.34	28.225		
1,900.0	1,870.9	1,809.8	1,715.9	6.8	9.6	77.21	-450.2	125.3	384.8	371.5	13.27	28.997		
2,000.0	1,968.4	1,901.8	1,793.8	7.2	10.6	75.20	-494.8	145.5	421.6	407.4	14.18	29.723		
2,100.0	2,065.9	1,993.8	1,871.7	7.7	11.6	73.50	-539.5	165.8	458.8	443.7	15.09	30.399		
2,200.0	2,163.3	2,085.9	1,949.5	8.2	12.5	72.06	-584.1	186.0	496.3	480.3	16.00	31.026		
2,300.0	2,260.8	2,177.9	2,027.4	8.7	13.5	70.82	-628.8	206.2	534.1	517.2	16.90	31.605		
2,400.0	2,358.3	2,269.9	2,105.3	9.2	14.5	69.74	-673.4	226.5	572.0	554.2	17.80	32.142		
2,500.0	2,455.7	2,361.9	2,183.1	9.7	15.5	68.80	-718.1	246.7	610.1	591.4	18.69	32.638		
2,600.0	2,553.2	2,453.9	2,261.0	10.1	16.5	67.96	-762.8	267.0	648.3	628.7	19.59	33.097		
2,700.0	2,650.6	2,545.9	2,338.9	10.6	17.5	67.22	-807.4	287.2	686.7	666.2	20.48	33.523		
2,800.0	2,748.1	2,637.9	2,416.7	11.1	18.5	66.56	-852.1	307.4	725.1	703.7	21.38	33.918		
2,900.0	2,845.6	2,730.0	2,494.6	11.6	19.5	65.96	-896.7	327.7	763.6	741.3	22.27	34.286		
3,000.0	2,943.0	2,822.0	2,572.5	12.1	20.5	65.42	-941.4	347.9	802.1	778.9	23.16	34.628		
3,100.0	3,040.5	2,914.0	2,650.3	12.6	21.4	64.93	-986.0	368.2	840.7	816.7	24.06	34.948		
3,200.0	3,137.9	3,006.0	2,728.2	13.1	22.4	64.48	-1,030.7	388.4	879.4	854.4	24.95	35.248		
3,300.0	3,235.4	3,098.0	2,806.1	13.6	23.4	64.07	-1,075.3	408.6	918.1	892.2	25.84	35.528		
3,400.0	3,332.9	3,190.0	2,884.0	14.0	24.4	63.69	-1,120.0	428.9	956.8	930.1	26.73	35.791		
3,500.0	3,430.3	3,282.1	2,961.8	14.5	25.4	63.34	-1,164.6	449.1	995.6	968.0	27.63	36.038		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design Bruton 30-10 Pad - Bruton 30-21E - Slot A-4 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	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	-120.15	-5.1	-8.8	10.2					
100.0	100.0	100.0	100.0	0.1	0.1	-120.15	-5.1	-8.8	10.2	10.0	0.18	57.909 CC, ES		
200.0	200.0	199.6	199.5	0.3	0.3	-129.67	-7.7	-9.2	12.0	11.4	0.61	19.637		
300.0	300.0	298.6	298.2	0.5	0.6	-145.29	-15.3	-10.6	18.6	17.6	1.08	17.321 SF		
400.0	400.0	396.5	395.3	0.8	0.8	112.46	-27.7	-12.8	31.5	29.9	1.57	20.027		
500.0	499.8	492.7	490.0	1.0	1.2	111.46	-44.7	-15.8	50.6	48.5	2.07	24.420		
600.0	599.5	586.6	581.3	1.2	1.6	112.10	-65.8	-19.5	75.6	73.0	2.61	28.987		
700.0	698.7	678.0	669.2	1.5	2.1	103.08	-90.6	-23.9	105.2	102.0	3.15	33.356		
800.0	797.6	767.1	753.6	1.8	2.7	97.66	-118.7	-28.8	138.0	134.2	3.76	36.693		
900.0	896.0	861.0	841.6	2.1	3.3	93.92	-151.3	-32.7	172.0	167.5	4.43	38.802		
1,000.0	993.8	955.3	929.3	2.5	3.9	91.17	-186.0	-33.4	205.1	199.9	5.19	39.516		
1,100.0	1,091.2	1,049.9	1,016.3	3.0	4.6	91.02	-222.7	-30.8	237.8	231.7	6.04	39.385		
1,200.0	1,188.7	1,144.2	1,102.3	3.4	5.3	90.04	-261.2	-24.9	270.5	263.6	6.93	39.049		
1,300.0	1,286.2	1,238.0	1,186.6	3.9	6.1	88.51	-301.2	-15.8	303.4	295.6	7.86	38.629		
1,400.0	1,383.6	1,331.0	1,269.1	4.4	6.9	86.60	-342.5	-3.5	336.8	328.0	8.75	38.497		
1,500.0	1,481.1	1,422.9	1,349.2	4.8	7.7	84.45	-384.9	11.6	370.8	361.1	9.71	38.169		
1,600.0	1,578.6	1,513.4	1,426.6	5.3	8.6	82.14	-428.1	29.6	405.7	395.1	10.66	38.070		
1,700.0	1,676.0	1,605.2	1,504.3	5.8	9.5	79.87	-472.7	49.5	441.6	430.0	11.60	38.054		
1,800.0	1,773.5	1,697.2	1,582.2	6.3	10.4	77.93	-517.4	69.5	477.9	465.4	12.54	38.106		
1,900.0	1,870.9	1,789.2	1,660.0	6.8	11.4	76.25	-562.2	89.5	514.7	501.3	13.48	38.194		
2,000.0	1,968.4	1,881.1	1,737.9	7.2	12.3	74.80	-606.9	109.5	551.9	537.5	14.41	38.306		
2,100.0	2,065.9	1,973.1	1,815.7	7.7	13.3	73.53	-651.6	129.5	589.3	573.9	15.33	38.433		
2,200.0	2,163.3	2,065.1	1,893.5	8.2	14.2	72.41	-696.4	149.5	626.9	610.6	16.25	38.567		
2,300.0	2,260.8	2,157.1	1,971.4	8.7	15.2	71.41	-741.1	169.5	664.7	647.5	17.17	38.704		
2,400.0	2,358.3	2,249.1	2,049.2	9.2	16.2	70.52	-785.8	189.5	702.7	684.6	18.09	38.842		
2,500.0	2,455.7	2,341.1	2,127.1	9.7	17.2	69.72	-830.5	209.5	740.8	721.8	19.00	38.978		
2,600.0	2,553.2	2,433.0	2,204.9	10.1	18.2	69.00	-875.3	229.4	779.0	759.1	19.92	39.111		
2,700.0	2,650.6	2,525.0	2,282.8	10.6	19.1	68.35	-920.0	249.4	817.3	796.5	20.83	39.240		
2,800.0	2,748.1	2,617.0	2,360.6	11.1	20.1	67.75	-964.7	269.4	855.7	834.0	21.74	39.365		
2,900.0	2,845.6	2,709.0	2,438.5	11.6	21.1	67.20	-1,009.5	289.4	894.2	871.5	22.65	39.485		
3,000.0	2,943.0	2,801.0	2,516.3	12.1	22.1	66.70	-1,054.2	309.4	932.7	909.1	23.55	39.600		
3,100.0	3,040.5	2,893.0	2,594.2	12.6	23.1	66.24	-1,098.9	329.4	971.3	946.8	24.46	39.710		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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)	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	-120.15	-5.1	-8.8	10.2					
100.0	100.0	100.0	100.0	0.1	0.1	-120.15	-5.1	-8.8	10.2	10.0	0.18	57.909 CC, ES		
200.0	200.0	199.6	199.5	0.3	0.3	-129.67	-7.7	-9.2	12.0	11.4	0.61	19.637		
300.0	300.0	298.6	298.2	0.5	0.6	-145.29	-15.3	-10.6	18.6	17.6	1.08	17.321 SF		
400.0	400.0	396.5	395.3	0.8	0.8	112.46	-27.7	-12.8	31.5	29.9	1.57	20.027		
500.0	499.8	492.7	490.0	1.0	1.2	111.46	-44.7	-15.8	50.6	48.5	2.07	24.420		
600.0	599.5	586.6	581.3	1.2	1.6	112.10	-65.8	-19.5	75.6	73.0	2.61	28.987		
700.0	698.7	678.0	669.2	1.5	2.1	103.08	-90.6	-23.9	105.2	102.0	3.15	33.356		
800.0	797.6	767.1	753.6	1.8	2.7	97.66	-118.7	-28.8	138.0	134.2	3.76	36.693		
900.0	896.0	861.0	841.6	2.1	3.3	93.92	-151.3	-32.7	172.0	167.5	4.43	38.802		
1,000.0	993.8	955.3	929.3	2.5	3.9	91.17	-186.0	-33.4	205.1	199.9	5.19	39.516		
1,100.0	1,091.2	1,049.9	1,016.3	3.0	4.6	91.02	-222.7	-30.8	237.8	231.7	6.04	39.385		
1,200.0	1,188.7	1,144.2	1,102.3	3.4	5.3	90.04	-261.2	-24.9	270.5	263.6	6.93	39.049		
1,300.0	1,286.2	1,238.0	1,186.6	3.9	6.1	88.51	-301.2	-15.8	303.4	295.6	7.86	38.629		
1,400.0	1,383.6	1,331.0	1,269.1	4.4	6.9	86.60	-342.5	-3.5	336.8	328.0	8.75	38.497		
1,500.0	1,481.1	1,422.9	1,349.2	4.8	7.7	84.45	-384.9	11.6	370.8	361.1	9.71	38.169		
1,600.0	1,578.6	1,513.4	1,426.6	5.3	8.6	82.14	-428.1	29.6	405.7	395.1	10.66	38.070		
1,700.0	1,676.0	1,605.2	1,504.3	5.8	9.5	79.87	-472.7	49.5	441.6	430.0	11.60	38.054		
1,800.0	1,773.5	1,697.2	1,582.2	6.3	10.4	77.93	-517.4	69.5	477.9	465.4	12.54	38.106		
1,900.0	1,870.9	1,789.2	1,660.0	6.8	11.4	76.25	-562.2	89.5	514.7	501.3	13.48	38.194		
2,000.0	1,968.4	1,881.1	1,737.9	7.2	12.3	74.80	-606.9	109.5	551.9	537.5	14.41	38.306		
2,100.0	2,065.9	1,973.1	1,815.7	7.7	13.3	73.53	-651.6	129.5	589.3	573.9	15.33	38.433		
2,200.0	2,163.3	2,065.1	1,893.5	8.2	14.2	72.41	-696.4	149.5	626.9	610.6	16.25	38.567		
2,300.0	2,260.8	2,157.1	1,971.4	8.7	15.2	71.41	-741.1	169.5	664.7	647.5	17.17	38.704		
2,400.0	2,358.3	2,249.1	2,049.2	9.2	16.2	70.52	-785.8	189.5	702.7	684.6	18.09	38.842		
2,500.0	2,455.7	2,341.1	2,127.1	9.7	17.2	69.72	-830.5	209.5	740.8	721.8	19.00	38.978		
2,600.0	2,553.2	2,433.0	2,204.9	10.1	18.2	69.00	-875.3	229.4	779.0	759.1	19.92	39.111		
2,700.0	2,650.6	2,525.0	2,282.8	10.6	19.1	68.35	-920.0	249.4	817.3	796.5	20.83	39.240		
2,800.0	2,748.1	2,617.0	2,360.6	11.1	20.1	67.75	-964.7	269.4	855.7	834.0	21.74	39.365		
2,900.0	2,845.6	2,709.0	2,438.5	11.6	21.1	67.20	-1,009.5	289.4	894.2	871.5	22.65	39.485		
3,000.0	2,943.0	2,801.0	2,516.3	12.1	22.1	66.70	-1,054.2	309.4	932.7	909.1	23.55	39.600		
3,100.0	3,040.5	2,893.0	2,594.2	12.6	23.1	66.24	-1,098.9	329.4	971.3	946.8	24.46	39.710		

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7665.0usft

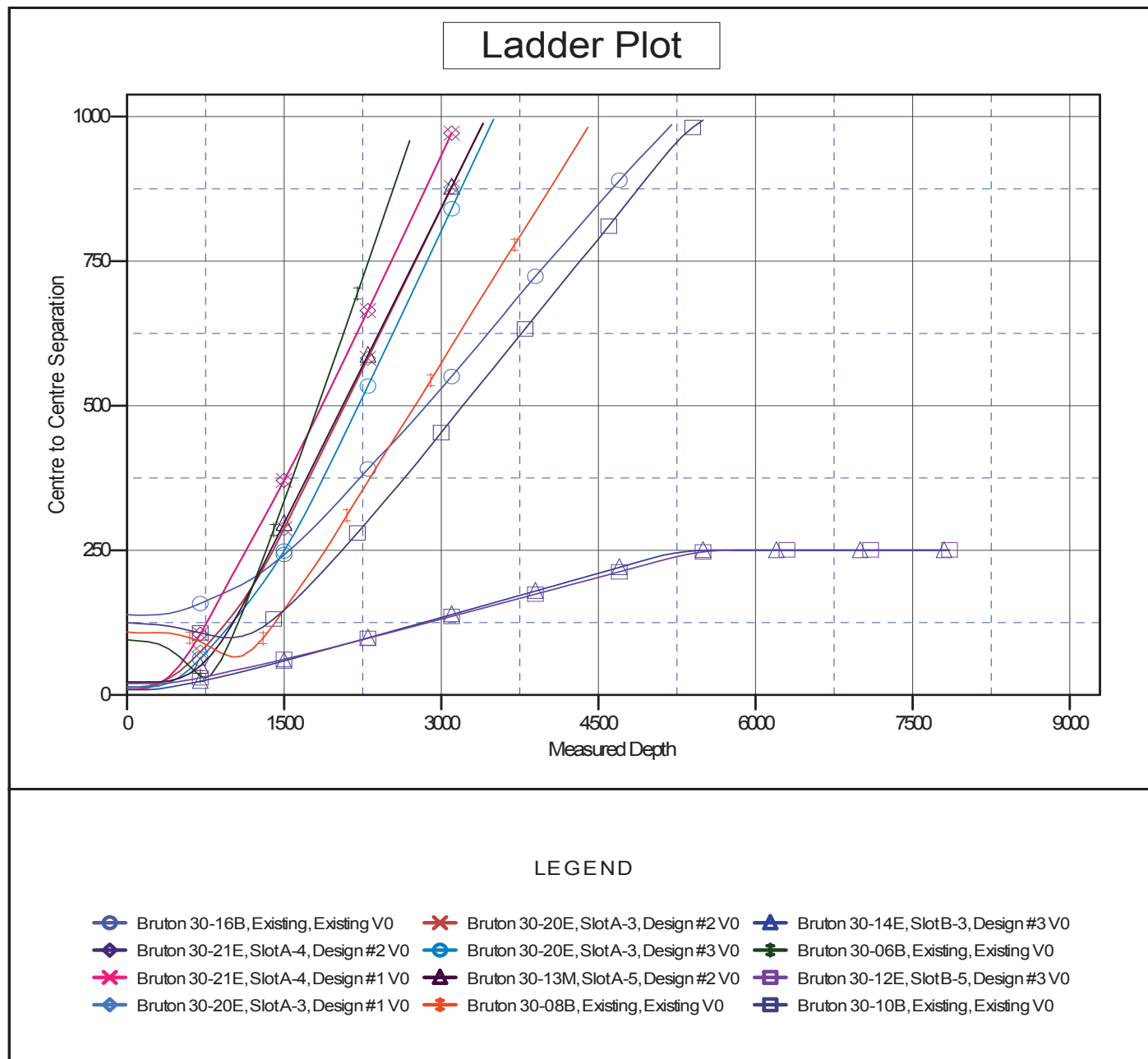
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-13E

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 30-13E
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 30-13E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-4	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

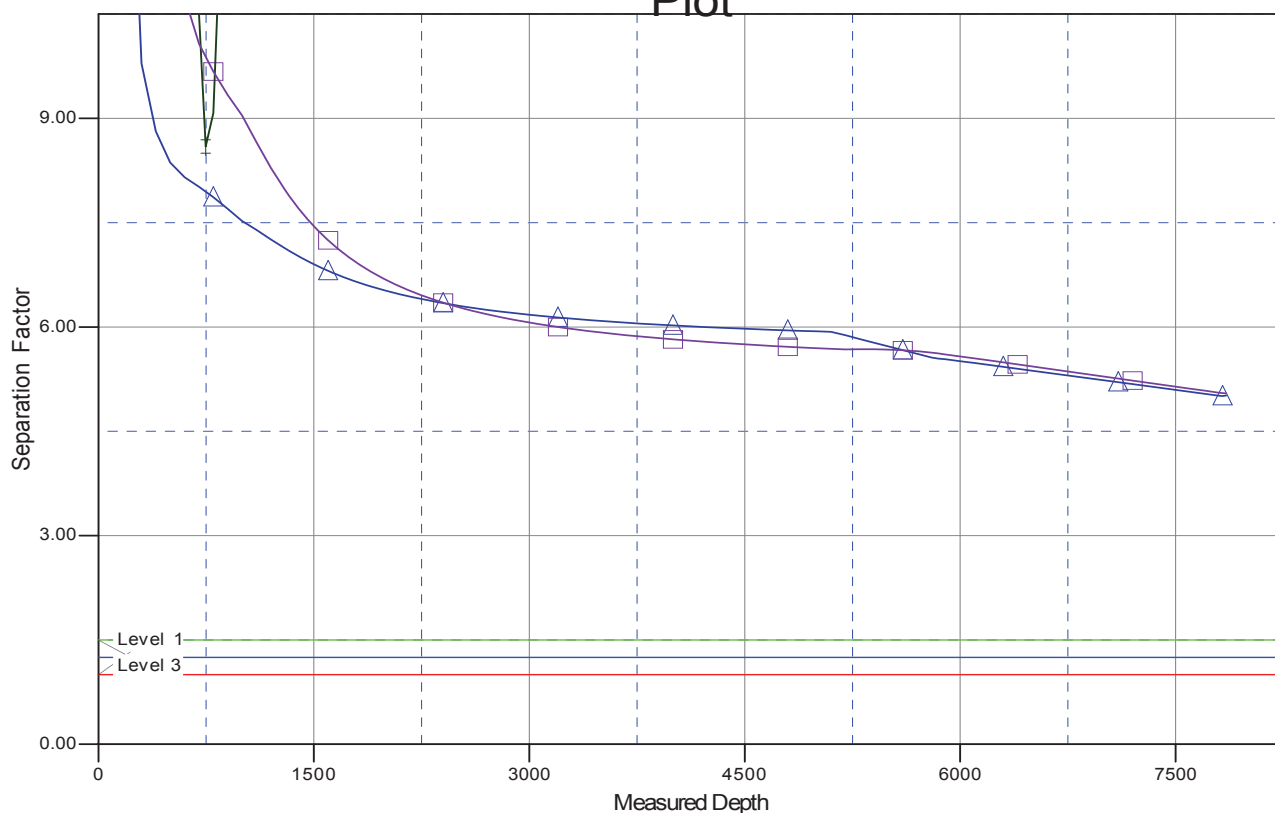
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-13E

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.46°

Separation Factor Plot



LEGEND

- Bruton 30-16B, Existing, Existing V0
- Bruton 30-21E, SlotA-4, Design #2 V0
- Bruton 30-21E, SlotA-4, Design #1 V0
- Bruton 30-20E, SlotA-3, Design #1 V0
- Bruton 30-20E, SlotA-3, Design #2 V0
- Bruton 30-14E, SlotB-3, Design #3 V0
- Bruton 30-06B, Existing, Existing V0
- Bruton 30-13M, SlotA-5, Design #2 V0
- Bruton 30-12E, SlotB-5, Design #3 V0
- Bruton 30-08B, Existing, Existing V0
- Bruton 30-10B, Existing, Existing V0