



Piceance Energy, LLC

**Mesa County, CO
Bruton 30-10 Pad
Bruton 30-11E**

Slot B-6

Plan: Design #3

Standard Planning Report

09 July, 2015



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton 30-11E
 Wellbore: Slot B-6
 Design: Design #3
 Latitude: 39° 14' 53.138 N
 Longitude: 107° 48' 31.961 W
 Ground Level: 7643.00
 Well @ 7665.00usft



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 (NE) Reference: Well Bruton 30-11E, 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 30-11E

+N-S	+E-W	Northing	Ground Level:	7643.00	Latitude	Longitude	Slot
0.00	0.00	1523561.185	Easting	2346209.082	39° 14' 53.138 N	107° 48' 31.961 W	

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
Bruton 30-11E tgt	7765.00	-34.21	978.66	1523502.117	2347186.555	39° 14' 52.800 N	107° 48' 19.520 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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
800.00	6.00	87.00	799.45	0.82	15.67	2.00	87.00	15.63	Start DLS 2.00 TFO 10.21
1103.92	12.03	92.17	1099.49	0.45	63.23	2.00	10.21	63.18	Start 4093.3 hold at 1103.9 MD
5197.23	12.03	92.17	5102.89	-31.83	915.79	0.00	0.00	916.34	Start Drop -2.00
5798.75	0.00	0.00	5700.00	-34.21	978.66	2.00	180.00	979.26	Start 2065.0 hold at 5798.7 MD
7863.75	0.00	0.00	7765.00	-34.21	978.66	0.00	0.00	979.26	TD at 7863.7

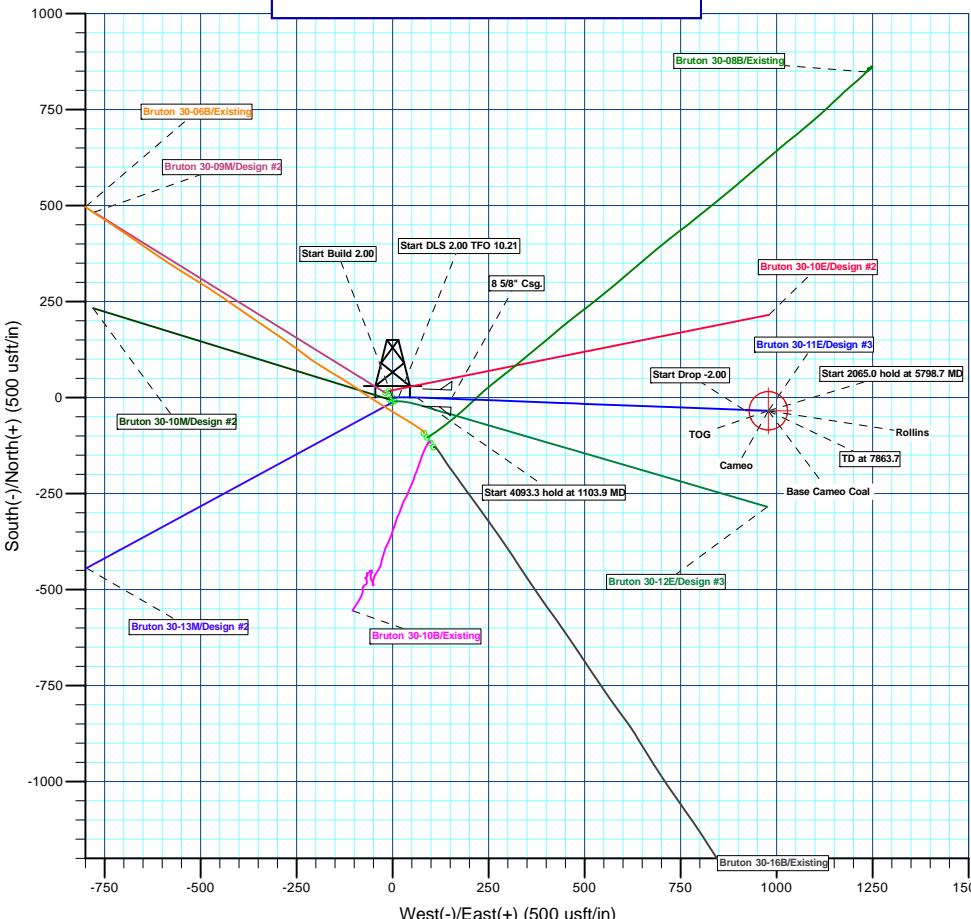
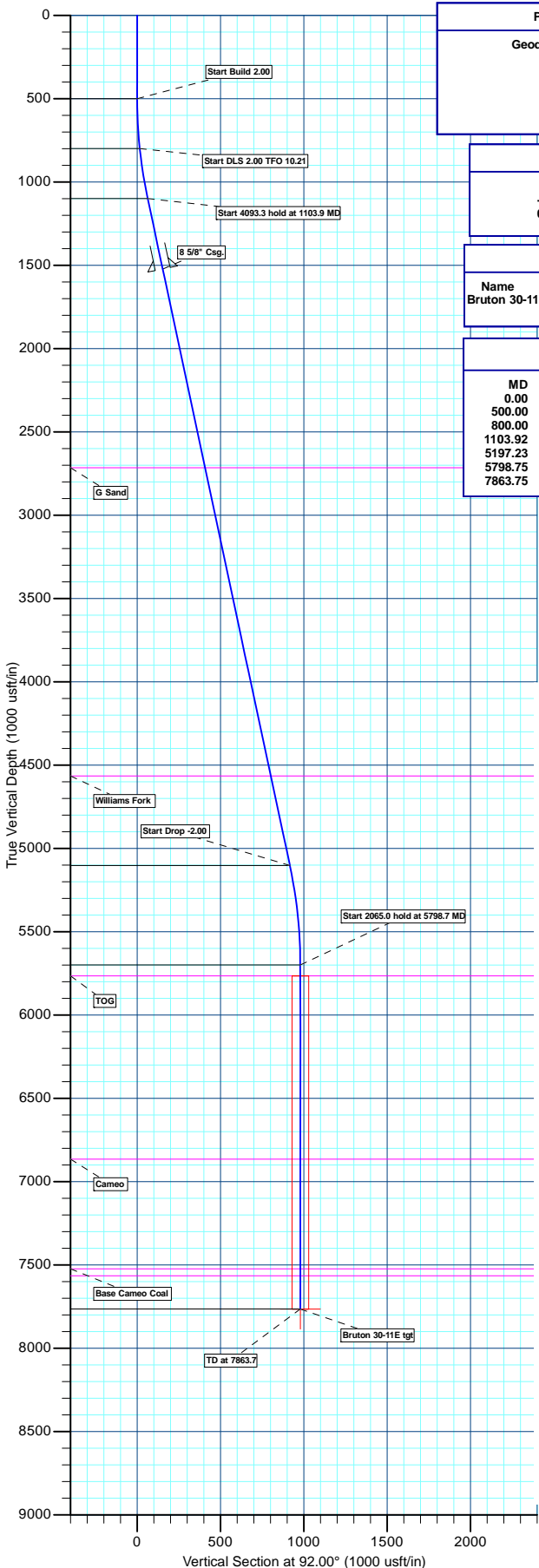
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Azimuths to True North
 Magnetic North: 9.72°

Magnetic Field
 Strength: 51724.0snT
 Dip Angle: 65.46°
 Date: 06/09/2015
 Model: IGRF2010

FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
2715.00	2755.71	G Sand
4565.00	4647.26	Williams Fork
5765.00	5863.75	TOG
6865.00	6963.75	Cameo
7523.00	7621.75	Base Cameo Coal
7565.00	7663.75	Rollins





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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-11E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7665.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7665.00usft
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-6		
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:	1,523,574.982 usft	Latitude:	39° 14' 53.270 N
From:	Lat/Long	Easting:	2,346,190.611 usft	Longitude:	107° 48' 32.200 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.46 °

Well	Bruton 30-11E					
Well Position	+N/-S	-13.32 usft	Northing:	1,523,561.185 usft	Latitude:	39° 14' 53.138 N
	+E/-W	18.82 usft	Easting:	2,346,209.082 usft	Longitude:	107° 48' 31.961 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,643.00 usft

Wellbore	Slot B-6				
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:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	92.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	6.00	87.00	799.45	0.82	15.67	2.00	2.00	0.00	87.00	
1,103.92	12.03	92.17	1,099.49	0.45	63.23	2.00	1.98	1.70	10.21	
5,197.23	12.03	92.17	5,102.89	-31.83	915.79	0.00	0.00	0.00	0.00	
5,798.75	0.00	0.00	5,700.00	-34.21	978.66	2.00	-2.00	0.00	180.00	
7,863.75	0.00	0.00	7,765.00	-34.21	978.66	0.00	0.00	0.00	0.00	Bruton 30-11E tgt



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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-11E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7665.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7665.00usft
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-6		
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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	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	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00										
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	2.00	87.00	599.98	0.09	1.74	1.74	2.00	2.00	2.00	0.00
700.00	4.00	87.00	699.84	0.37	6.97	6.95	2.00	2.00	2.00	0.00
Start DLS 2.00 TFO 10.21										
800.00	6.00	87.00	799.45	0.82	15.67	15.63	2.00	2.00	2.00	0.00
900.00	7.98	89.56	898.70	1.15	27.83	27.77	2.00	1.98	1.98	2.56
1,000.00	9.96	91.10	997.48	1.04	43.42	43.36	2.00	1.99	1.99	1.54
Start 4093.3 hold at 1103.9 MD										
1,103.92	12.03	92.17	1,099.49	0.45	63.23	63.18	2.00	1.99	1.99	1.03
1,200.00	12.03	92.17	1,193.45	-0.30	83.24	83.20	0.00	0.00	0.00	0.00
1,300.00	12.03	92.17	1,291.26	-1.09	104.07	104.04	0.00	0.00	0.00	0.00
1,400.00	12.03	92.17	1,389.06	-1.88	124.90	124.89	0.00	0.00	0.00	0.00
1,500.00	12.03	92.17	1,486.86	-2.67	145.72	145.73	0.00	0.00	0.00	0.00
8 5/8" Csg.										
1,535.92	12.03	92.17	1,522.00	-2.95	153.21	153.22	0.00	0.00	0.00	0.00
1,600.00	12.03	92.17	1,584.67	-3.46	166.55	166.57	0.00	0.00	0.00	0.00
1,700.00	12.03	92.17	1,682.47	-4.25	187.38	187.41	0.00	0.00	0.00	0.00
1,800.00	12.03	92.17	1,780.28	-5.04	208.21	208.26	0.00	0.00	0.00	0.00
1,900.00	12.03	92.17	1,878.08	-5.82	229.04	229.10	0.00	0.00	0.00	0.00
2,000.00	12.03	92.17	1,975.88	-6.61	249.87	249.94	0.00	0.00	0.00	0.00
2,100.00	12.03	92.17	2,073.69	-7.40	270.69	270.79	0.00	0.00	0.00	0.00
2,200.00	12.03	92.17	2,171.49	-8.19	291.52	291.63	0.00	0.00	0.00	0.00
2,300.00	12.03	92.17	2,269.29	-8.98	312.35	312.47	0.00	0.00	0.00	0.00
2,400.00	12.03	92.17	2,367.10	-9.77	333.18	333.32	0.00	0.00	0.00	0.00
2,500.00	12.03	92.17	2,464.90	-10.56	354.01	354.16	0.00	0.00	0.00	0.00
2,600.00	12.03	92.17	2,562.71	-11.34	374.83	375.00	0.00	0.00	0.00	0.00
2,700.00	12.03	92.17	2,660.51	-12.13	395.66	395.84	0.00	0.00	0.00	0.00
G Sand										
2,755.71	12.03	92.17	2,715.00	-12.57	407.27	407.46	0.00	0.00	0.00	0.00
2,800.00	12.03	92.17	2,758.31	-12.92	416.49	416.69	0.00	0.00	0.00	0.00
2,900.00	12.03	92.17	2,856.12	-13.71	437.32	437.53	0.00	0.00	0.00	0.00
3,000.00	12.03	92.17	2,953.92	-14.50	458.15	458.37	0.00	0.00	0.00	0.00
3,100.00	12.03	92.17	3,051.72	-15.29	478.97	479.22	0.00	0.00	0.00	0.00
3,200.00	12.03	92.17	3,149.53	-16.08	499.80	500.06	0.00	0.00	0.00	0.00
3,300.00	12.03	92.17	3,247.33	-16.87	520.63	520.90	0.00	0.00	0.00	0.00
3,400.00	12.03	92.17	3,345.14	-17.65	541.46	541.74	0.00	0.00	0.00	0.00
3,500.00	12.03	92.17	3,442.94	-18.44	562.29	562.59	0.00	0.00	0.00	0.00
3,600.00	12.03	92.17	3,540.74	-19.23	583.11	583.43	0.00	0.00	0.00	0.00
3,700.00	12.03	92.17	3,638.55	-20.02	603.94	604.27	0.00	0.00	0.00	0.00
3,800.00	12.03	92.17	3,736.35	-20.81	624.77	625.12	0.00	0.00	0.00	0.00
3,900.00	12.03	92.17	3,834.15	-21.60	645.60	645.96	0.00	0.00	0.00	0.00
4,000.00	12.03	92.17	3,931.96	-22.39	666.43	666.80	0.00	0.00	0.00	0.00
4,100.00	12.03	92.17	4,029.76	-23.17	687.25	687.64	0.00	0.00	0.00	0.00
4,200.00	12.03	92.17	4,127.57	-23.96	708.08	708.49	0.00	0.00	0.00	0.00
4,300.00	12.03	92.17	4,225.37	-24.75	728.91	729.33	0.00	0.00	0.00	0.00
4,400.00	12.03	92.17	4,323.17	-25.54	749.74	750.17	0.00	0.00	0.00	0.00
4,500.00	12.03	92.17	4,420.98	-26.33	770.57	771.02	0.00	0.00	0.00	0.00
4,600.00	12.03	92.17	4,518.78	-27.12	791.39	791.86	0.00	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-11E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7665.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7665.00usft
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-6		
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)	
Williams Fork										
4,647.26	12.03	92.17	4,565.00	-27.49	801.24	801.71	0.00	0.00	0.00	
4,700.00	12.03	92.17	4,616.58	-27.91	812.22	812.70	0.00	0.00	0.00	
4,800.00	12.03	92.17	4,714.39	-28.70	833.05	833.54	0.00	0.00	0.00	
4,900.00	12.03	92.17	4,812.19	-29.48	853.88	854.39	0.00	0.00	0.00	
5,000.00	12.03	92.17	4,910.00	-30.27	874.71	875.23	0.00	0.00	0.00	
5,100.00	12.03	92.17	5,007.80	-31.06	895.53	896.07	0.00	0.00	0.00	
Start Drop -2.00										
5,197.23	12.03	92.17	5,102.89	-31.83	915.79	916.34	0.00	0.00	0.00	
5,200.00	11.97	92.17	5,105.60	-31.85	916.36	916.91	2.00	-2.00	0.00	
5,300.00	9.97	92.17	5,203.77	-32.57	935.38	935.95	2.00	-2.00	0.00	
5,400.00	7.97	92.17	5,302.54	-33.16	950.97	951.55	2.00	-2.00	0.00	
5,500.00	5.97	92.17	5,401.79	-33.62	963.11	963.69	2.00	-2.00	0.00	
5,600.00	3.97	92.17	5,501.41	-33.95	971.77	972.36	2.00	-2.00	0.00	
5,700.00	1.97	92.17	5,601.27	-34.14	976.96	977.55	2.00	-2.00	0.00	
Start 2065.0 hold at 5798.7 MD										
5,798.75	0.00	0.00	5,700.00	-34.21	978.66	979.26	2.00	-2.00	0.00	
5,800.00	0.00	0.00	5,701.25	-34.21	978.66	979.26	0.00	0.00	0.00	
TOG										
5,863.75	0.00	0.00	5,765.00	-34.21	978.66	979.26	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,801.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,901.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,001.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,101.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,201.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,301.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,401.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,501.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,601.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,701.25	-34.21	978.66	979.26	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,801.25	-34.21	978.66	979.26	0.00	0.00	0.00	
Cameo										
6,963.75	0.00	0.00	6,865.00	-34.21	978.66	979.26	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,901.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,001.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,101.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,201.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,301.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,401.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,501.25	-34.21	978.66	979.26	0.00	0.00	0.00	
Base Cameo Coal										
7,621.75	0.00	0.00	7,523.00	-34.21	978.66	979.26	0.00	0.00	0.00	
Rollins										
7,663.75	0.00	0.00	7,565.00	-34.21	978.66	979.26	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,601.25	-34.21	978.66	979.26	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,701.25	-34.21	978.66	979.26	0.00	0.00	0.00	
TD at 7863.7										
7,863.75	0.00	0.00	7,765.00	-34.21	978.66	979.26	0.00	0.00	0.00	



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Bruton 30-11E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7665.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7665.00usft
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-6		
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
Bruton 30-11E tgt - hit/miss target - Shape	0.00	0.00	7,765.00	-34.21	978.66	1,523,502.117	2,347,186.555	39° 14' 52.800 N	107° 48' 19.520 W
- plan hits target center - Circle (radius 50.00)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,535.92	1,522.00	8 5/8" Csg.	8-5/8	12-1/4	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,755.71	2,715.00	G Sand		0.00	
4,647.26	4,565.00	Williams Fork		0.00	
5,863.75	5,765.00	TOG		0.00	
6,963.75	6,865.00	Cameo		0.00	
7,621.75	7,523.00	Base Cameo Coal		0.00	
7,663.75	7,565.00	Rollins		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
500.00	500.00	0.00	0.00	Start Build 2.00	
800.00	799.45	0.82	15.67	Start DLS 2.00 TFO 10.21	
1,103.92	1,099.49	0.45	63.23	Start 4093.3 hold at 1103.9 MD	
5,197.23	5,102.89	-31.83	915.79	Start Drop -2.00	
5,798.75	5,700.00	-34.21	978.66	Start 2065.0 hold at 5798.7 MD	
7,863.75	7,765.00	-34.21	978.66	TD at 7863.7	



Piceance Energy, LLC

**Mesa County, CO
Bruton 30-10 Pad
Bruton 30-11E**

**Slot B-6
Design #3**

Anticollision Report

09 July, 2015



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	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 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	2015/07/09		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	7,863.72	Design #3 (Slot B-6)	MWD	MWD - Standard

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	895.36	884.50	47.55	43.24	11.034	CC
Bruton 30-06B - Existing - Existing	900.00	888.92	47.57	43.23	10.948	ES, SF
Bruton 30-08B - Existing - Existing	1,359.28	1,326.57	108.94	102.50	16.916	CC, ES
Bruton 30-08B - Existing - Existing	1,800.00	1,758.88	137.75	128.85	15.484	SF
Bruton 30-09M - Slot A-7 - Design #2	500.00	500.00	21.95	19.98	11.123	CC, ES
Bruton 30-09M - Slot A-7 - Design #2	600.00	599.98	23.36	20.94	9.653	SF
Bruton 30-10B - Existing - Existing	438.03	420.09	150.62	149.01	93.515	CC
Bruton 30-10B - Existing - Existing	800.00	775.11	151.25	148.03	46.871	ES
Bruton 30-10B - Existing - Existing	1,600.00	1,556.42	212.12	204.47	27.757	SF
Bruton 30-10E - Slot B-7 - Design #2	500.00	500.00	19.82	17.85	10.045	CC, ES
Bruton 30-10E - Slot B-7 - Design #2	7,863.75	7,872.48	249.90	199.78	4.986	SF
Bruton 30-10M - Slot A-6 - Design #2	200.00	200.00	9.24	8.61	14.780	CC, ES
Bruton 30-10M - Slot A-6 - Design #2	400.00	399.25	14.82	13.31	9.758	SF
Bruton 30-12E - Slot B-5 - Design #3	400.00	400.00	10.72	9.20	7.037	CC, ES
Bruton 30-12E - Slot B-5 - Design #3	7,835.96	7,840.11	249.90	200.07	5.015	SF
Bruton 30-13M - Slot A-5 - Design #2	500.00	500.00	14.19	12.21	7.189	CC, ES
Bruton 30-13M - Slot A-5 - Design #2	600.00	599.98	14.75	12.34	6.113	SF
Bruton 30-16B - Existing - Existing	100.00	81.85	168.00	167.82	926.638	CC
Bruton 30-16B - Existing - Existing	200.00	181.34	168.19	167.63	296.352	ES
Bruton 30-16B - Existing - Existing	3,700.00	3,453.14	987.40	961.24	37.756	SF

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 98-MWD												Offset Well Error:	0.00 usft
Reference: Bruton 30-10 Pad - Bruton 30-06B - Existing - Existing													
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis			Distance				Warning		
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Minimum Separation (usft)	Separation Factor
0.00	0.00	0.00	18.00	0.00	0.00	138.50	-92.66	81.99	125.02				
100.00	100.00	82.54	100.54	0.09	0.09	138.38	-92.36	82.05	123.54	123.36	0.18	681.550	
200.00	200.00	185.42	203.40	0.31	0.31	137.96	-90.62	81.72	122.07	121.45	0.62	197.089	
300.00	300.00	288.62	306.50	0.54	0.54	137.71	-87.11	79.25	117.95	116.87	1.08	109.381	
400.00	400.00	391.84	409.45	0.76	0.79	138.30	-82.41	73.43	110.78	109.22	1.56	71.211	
500.00	500.00	493.54	510.66	0.99	1.07	139.82	-77.04	65.06	101.40	99.34	2.05	49.389	
600.00	599.98	595.17	611.50	1.20	1.37	56.21	-69.99	54.61	88.53	86.05	2.49	35.592	
700.00	699.84	694.91	710.14	1.41	1.70	63.83	-61.60	42.38	72.11	69.13	2.98	24.210	

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 98-MWD													Offset Well Error:	0.00 usft
Reference				Offset		Semi Major Axis			Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
800.00	799.45	792.89	806.58	1.65	2.06	81.53	-53.04	27.40	55.58	52.01	3.56	15.593		
895.36	894.11	884.50	896.33	1.89	2.43	109.89	-43.71	11.58	47.55	43.24	4.31	11.034	CC	
900.00	898.70	888.92	900.64	1.91	2.45	111.55	-43.23	10.80	47.57	43.23	4.35	10.948	ES, SF	
1,000.00	997.48	982.10	991.56	2.20	2.87	144.17	-32.28	-6.45	60.26	55.29	4.98	12.108		
1,100.00	1,095.65	1,071.88	1,078.57	2.55	3.30	163.29	-20.71	-25.28	91.82	86.41	5.41	16.985		
1,200.00	1,193.45	1,159.97	1,163.41	2.94	3.77	173.90	-8.18	-45.44	132.38	126.59	5.79	22.865		
1,300.00	1,291.26	1,247.96	1,247.78	3.35	4.26	-179.92	5.58	-66.24	175.89	169.69	6.21	28.341		
1,400.00	1,389.06	1,335.09	1,331.12	3.77	4.76	-175.94	20.07	-87.15	220.91	214.26	6.65	33.231		
1,500.00	1,486.86	1,420.80	1,412.86	4.19	5.26	-173.28	34.59	-108.41	267.30	260.20	7.11	37.615		
1,600.00	1,584.67	1,506.11	1,494.11	4.62	5.77	-171.52	48.57	-130.39	314.77	307.20	7.58	41.547		
1,700.00	1,682.47	1,591.99	1,575.81	5.06	6.27	-170.35	61.93	-153.23	363.01	354.96	8.05	45.088		
1,800.00	1,780.28	1,682.84	1,662.26	5.50	6.79	-169.33	76.47	-177.04	411.08	402.54	8.54	48.145		
1,900.00	1,878.08	1,769.87	1,745.10	5.94	7.31	-168.46	91.02	-199.40	458.93	449.90	9.03	50.813		
2,000.00	1,975.88	1,856.12	1,827.07	6.39	7.84	-167.65	106.27	-221.50	507.02	497.48	9.54	53.147		
2,100.00	2,073.69	1,940.37	1,906.91	6.84	8.38	-166.87	122.31	-243.09	555.53	545.48	10.05	55.265		
2,200.00	2,171.49	2,024.26	1,986.26	7.28	8.93	-166.19	138.49	-265.01	604.61	594.04	10.57	57.193		
2,300.00	2,269.29	2,108.23	2,065.56	7.73	9.48	-165.63	154.65	-287.36	654.16	643.07	11.09	58.986		
2,400.00	2,367.10	2,194.35	2,146.91	8.18	10.01	-165.21	170.53	-310.78	704.04	692.43	11.61	60.653		
2,500.00	2,464.90	2,282.68	2,230.40	8.63	10.54	-164.85	186.60	-334.69	753.76	741.64	12.12	62.166		
2,600.00	2,562.71	2,371.35	2,314.25	9.09	11.07	-164.53	202.82	-358.54	803.39	790.74	12.65	63.528		
2,700.00	2,660.51	2,462.83	2,400.89	9.54	11.62	-164.23	219.47	-382.70	852.57	839.40	13.18	64.703		
2,800.00	2,758.31	2,550.24	2,483.77	9.99	12.14	-163.99	235.10	-405.67	901.57	887.87	13.70	65.822		
2,900.00	2,856.12	2,637.64	2,566.60	10.44	12.68	-163.75	251.12	-428.52	950.59	936.36	14.23	66.821		
3,000.00	2,953.92	2,736.38	2,660.43	10.90	13.27	-163.54	268.50	-453.84	998.97	984.18	14.78	67.576		

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft	
Survey Program: 128-MWD													Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.00	0.00	0.00	18.00	0.00	0.00	138.86	-103.58	90.48	138.71						
100.00	100.00	82.09	100.09	0.09	0.09	138.88	-103.59	90.44	137.51	137.33	0.18	763.958			
165.63	165.63	147.63	165.63	0.24	0.18	138.91	-103.59	90.35	137.46	137.04	0.42	328.339			
200.00	200.00	181.75	199.75	0.31	0.25	138.89	-103.59	90.40	137.49	136.93	0.56	243.450			
300.00	300.00	281.58	299.58	0.54	0.46	138.75	-103.56	90.83	137.74	136.75	0.99	138.613			
400.00	400.00	380.86	398.85	0.76	0.67	138.27	-103.27	92.11	138.39	136.95	1.44	96.409			
500.00	500.00	481.10	498.99	0.99	0.90	136.54	-100.81	95.53	138.89	137.00	1.89	73.541			
600.00	599.98	578.49	596.04	1.20	1.14	46.78	-96.54	102.48	139.65	137.31	2.34	59.718			
700.00	699.84	677.97	694.78	1.41	1.41	43.57	-90.18	112.62	139.23	136.40	2.83	49.236			
800.00	799.45	777.33	792.88	1.65	1.73	39.63	-80.76	125.27	136.78	133.40	3.38	40.472			
900.00	898.70	875.57	889.21	1.91	2.09	32.24	-68.74	140.34	132.79	128.82	3.97	33.410			
1,000.00	997.48	973.46	984.57	2.20	2.48	24.90	-54.85	157.51	127.70	123.13	4.57	27.942			
1,100.00	1,095.65	1,072.51	1,080.99	2.55	2.89	17.90	-40.88	175.33	121.14	115.97	5.16	23.458			
1,200.00	1,193.45	1,171.37	1,176.76	2.94	3.33	10.09	-24.45	193.54	114.13	108.44	5.69	20.052			
1,300.00	1,291.26	1,269.00	1,271.12	3.35	3.81	1.06	-7.20	211.71	109.68	103.51	6.17	17.770			
1,359.28	1,349.24	1,326.57	1,326.61	3.60	4.10	-4.70	3.35	222.87	108.94	102.50	6.44	16.916	CC, ES		
1,400.00	1,389.06	1,366.17	1,364.74	3.77	4.30	-8.67	10.60	230.71	109.28	102.66	6.62	16.508			
1,500.00	1,486.86	1,463.67	1,458.57	4.19	4.80	-17.90	28.04	250.63	112.91	105.82	7.09	15.936			
1,600.00	1,584.67	1,562.12	1,553.36	4.62	5.28	-25.89	44.65	271.41	119.54	111.93	7.61	15.708			
1,700.00	1,682.47	1,661.50	1,649.15	5.06	5.75	-32.99	61.21	292.07	127.88	119.67	8.21	15.572			
1,800.00	1,780.28	1,758.88	1,743.06	5.50	6.24	-38.96	77.16	312.29	137.75	128.85	8.90	15.484	SF		
1,900.00	1,878.08	1,854.54	1,834.94	5.94	6.76	-44.04	93.77	333.10	150.36	140.70	9.66	15.570			
2,000.00	1,975.88	1,949.95	1,926.09	6.39	7.30	-48.48	111.96	354.66	165.89	155.41	10.48	15.829			
2,100.00	2,073.69	2,048.31	2,019.79	6.84	7.86	-52.15	131.02	377.65	183.04	171.71	11.33	16.149			
2,200.00	2,171.49	2,148.38	2,115.38	7.28	8.40	-55.30	149.95	400.43	200.04	187.84	12.20	16.394			
2,300.00	2,269.29	2,244.04	2,206.79	7.73	8.93	-57.89	168.10	422.01	217.46	204.38	13.08	16.630			
2,400.00	2,367.10	2,344.44	2,302.66	8.18	9.49	-60.16	187.21	444.90	235.44	221.46	13.98	16.842			
2,500.00	2,464.90	2,440.84	2,394.75	8.63	10.03	-61.96	205.18	467.01	253.44	238.58	14.86	17.050			
2,600.00	2,562.71	2,542.71	2,492.14	9.09	10.60	-63.51	223.56	490.60	271.23	255.46	15.77	17.197			
2,700.00	2,660.51	2,639.29	2,584.53	9.54	11.14	-64.74	240.54	513.04	288.78	272.13	16.65	17.339			
2,800.00	2,758.31	2,732.98	2,673.88	9.99	11.69	-65.83	258.03	535.12	307.61	290.07	17.54	17.540			
2,900.00	2,856.12	2,833.79	2,770.05	10.44	12.26	-66.91	276.98	558.67	326.55	308.11	18.45	17.703			
3,000.00	2,953.92	2,927.14	2,859.01	10.90	12.80	-67.88	295.19	580.29	346.17	326.84	19.33	17.912			
3,100.00	3,051.72	3,029.67	2,956.82	11.35	13.38	-68.83	314.95	603.86	365.59	345.34	20.25	18.055			
3,200.00	3,149.53	3,127.29	3,050.06	11.80	13.93	-69.68	333.58	626.00	384.82	363.67	21.15	18.198			
3,300.00	3,247.33	3,229.11	3,147.59	12.26	14.48	-70.59	352.60	648.18	403.39	381.32	22.07	18.278			
3,400.00	3,345.14	3,325.29	3,239.75	12.71	15.02	-71.36	370.41	669.19	421.92	398.95	22.97	18.369			
3,500.00	3,442.94	3,422.73	3,332.94	13.17	15.57	-72.05	388.95	690.78	441.11	417.23	23.88	18.473			
3,600.00	3,540.74	3,525.71	3,431.54	13.62	16.14	-72.64	407.49	713.98	459.50	434.71	24.80	18.531			
3,700.00	3,638.55	3,624.37	3,526.15	14.08	16.67	-73.18	424.89	735.90	477.49	451.79	25.70	18.582			
3,800.00	3,736.35	3,719.66	3,617.41	14.53	17.21	-73.60	441.68	757.59	495.66	469.08	26.58	18.647			
3,900.00	3,834.15	3,816.16	3,709.54	14.99	17.76	-73.95	459.32	780.21	514.71	487.24	27.47	18.738			
4,000.00	3,931.96	3,913.82	3,802.98	15.45	18.31	-74.35	477.12	802.34	533.49	505.12	28.37	18.806			
4,100.00	4,029.76	4,011.16	3,895.91	15.90	18.86	-74.70	495.33	824.85	552.90	523.64	29.26	18.897			
4,200.00	4,127.57	4,108.83	3,989.32	16.36	19.41	-75.06	513.36	846.99	571.94	541.79	30.16	18.965			
4,300.00	4,225.37	4,206.72	4,082.72	16.81	19.97	-75.34	531.74	869.78	591.50	560.45	31.05	19.050			
4,400.00	4,323.17	4,307.88	4,179.51	17.27	20.53	-75.70	550.46	892.49	610.57	578.61	31.96	19.105			
4,500.00	4,420.98	4,401.90	4,269.53	17.72	21.05	-76.03	567.91	913.25	629.62	596.78	32.84	19.173			
4,600.00	4,518.78	4,498.14	4,361.46	18.18	21.60	-76.34	586.49	934.87	649.50	615.77	33.73	19.256			
4,700.00	4,616.58	4,598.10	4,457.10	18.64	22.16	-76.70	605.74	956.64	669.18	634.54	34.64	19.316			
4,800.00	4,714.39	4,705.45	4,559.87	19.09	22.75	-77.02	625.60	980.43	688.26	652.68	35.58	19.345			
4,900.00	4,812.19	4,795.40	4,646.19	19.55	23.24	-77.31	641.91	999.78	706.83	670.39	36.44	19.396			

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 128-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.00	4,910.00	4,893.67	4,740.12	20.01	23.80	-77.56	660.63	1,021.76	726.52	689.17	37.35	19.454		
5,100.00	5,007.80	5,002.71	4,844.53	20.46	24.40	-77.79	680.30	1,046.30	745.27	706.98	38.29	19.466		
5,200.00	5,105.60	5,103.18	4,941.18	20.92	24.93	-78.11	697.80	1,067.39	763.05	723.85	39.19	19.470		
5,300.00	5,203.77	5,193.15	5,027.65	21.25	25.41	-78.62	713.84	1,086.37	781.63	741.67	39.96	19.562		
5,400.00	5,302.54	5,293.53	5,124.00	21.53	25.95	-78.90	732.17	1,107.75	801.36	760.69	40.67	19.702		
5,500.00	5,401.79	5,377.57	5,204.63	21.77	26.41	-79.05	748.07	1,125.31	822.33	781.07	41.25	19.933		
5,600.00	5,501.41	5,484.46	5,307.09	21.98	26.99	-78.93	768.95	1,147.47	844.55	802.74	41.81	20.200		
5,700.00	5,601.27	5,611.27	5,429.69	22.13	27.62	-78.53	790.92	1,171.26	864.83	822.54	42.29	20.451		
5,800.00	5,701.25	5,742.63	5,557.79	22.26	28.19	14.22	810.55	1,192.67	883.17	840.52	42.65	20.706		
5,900.00	5,801.25	5,857.37	5,670.58	22.37	28.62	15.01	823.99	1,208.79	898.07	855.19	42.89	20.941		
6,000.00	5,901.25	5,993.47	5,805.13	22.49	29.06	15.70	837.86	1,223.80	910.96	867.80	43.15	21.110		
6,100.00	6,001.25	6,131.29	5,942.30	22.62	29.39	16.14	846.80	1,233.56	919.04	875.61	43.43	21.161		
6,200.00	6,101.25	6,262.77	6,073.60	22.74	29.61	16.29	852.04	1,237.66	923.73	880.01	43.72	21.129		
6,300.00	6,201.25	6,376.00	6,186.80	22.86	29.74	16.27	854.48	1,237.95	925.86	881.87	43.99	21.046		
6,400.00	6,301.25	6,473.84	6,284.63	22.99	29.84	16.20	856.14	1,237.40	927.33	883.08	44.25	20.955		
6,500.00	6,401.25	6,572.33	6,383.09	23.12	29.96	16.22	858.22	1,238.34	929.62	885.11	44.51	20.886		
6,600.00	6,501.25	6,683.71	6,494.44	23.25	30.09	16.36	858.72	1,240.72	930.61	885.85	44.77	20.788		
6,700.00	6,601.25	6,786.96	6,597.67	23.38	30.21	16.44	858.98	1,242.23	931.27	886.25	45.02	20.684		
6,800.00	6,701.25	6,878.86	6,689.57	23.51	30.32	16.49	859.21	1,243.18	931.83	886.56	45.28	20.581		
6,900.00	6,801.25	6,974.34	6,785.03	23.64	30.44	16.58	860.45	1,244.98	933.59	888.07	45.53	20.506		
7,000.00	6,901.25	7,076.70	6,887.36	23.78	30.57	16.64	861.69	1,246.43	935.16	889.36	45.80	20.419		
7,100.00	7,001.25	7,182.68	6,993.33	23.91	30.70	16.73	862.54	1,248.17	936.41	890.34	46.07	20.326		
7,200.00	7,101.25	7,293.16	7,103.81	24.05	30.82	16.79	862.59	1,249.19	936.72	890.36	46.35	20.208		
7,300.00	7,201.25	7,401.96	7,212.60	24.19	30.92	16.82	861.65	1,249.51	935.97	889.34	46.63	20.071		
7,400.00	7,301.25	7,511.76	7,322.38	24.33	31.01	16.81	859.91	1,248.73	934.25	887.33	46.92	19.911		
7,500.00	7,401.25	7,620.31	7,430.88	24.47	31.08	16.73	857.36	1,246.63	931.44	884.23	47.21	19.729		
7,600.00	7,501.25	7,723.32	7,533.81	24.61	31.13	16.60	854.65	1,243.61	928.08	880.58	47.50	19.538		
7,700.00	7,601.25	7,823.82	7,634.21	24.76	31.17	16.43	851.97	1,239.99	924.49	876.70	47.79	19.344		
7,800.00	7,701.25	7,921.69	7,731.97	24.90	31.21	16.24	849.58	1,236.08	921.03	872.94	48.08	19.154		
7,863.75	7,765.00	7,970.00	7,780.23	25.00	31.23	16.14	848.48	1,234.08	919.03	870.78	48.25	19.047		

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-55.66	12.38	-18.12	21.95					
100.00	100.00	100.00	100.00	0.09	0.09	-55.66	12.38	-18.12	21.95	21.78	0.18	125.207		
200.00	200.00	200.00	200.00	0.31	0.31	-55.66	12.38	-18.12	21.95	21.33	0.62	35.130		
300.00	300.00	300.00	300.00	0.54	0.54	-55.66	12.38	-18.12	21.95	20.88	1.07	20.431		
400.00	400.00	400.00	400.00	0.76	0.76	-55.66	12.38	-18.12	21.95	20.43	1.52	14.404		
500.00	500.00	500.00	500.00	0.99	0.99	-55.66	12.38	-18.12	21.95	19.98	1.97	11.123 CC, ES		
600.00	599.98	599.98	599.98	1.20	1.21	-145.24	12.38	-18.12	23.36	20.94	2.42	9.653 SF		
700.00	699.84	698.84	698.82	1.41	1.43	-150.93	13.28	-19.57	29.54	26.66	2.87	10.284		
800.00	799.45	796.75	796.59	1.65	1.65	-155.79	15.94	-23.87	42.43	39.08	3.35	12.682		
900.00	898.70	893.06	892.55	1.91	1.87	-161.09	20.27	-30.86	62.03	58.20	3.83	16.188		
1,000.00	997.48	987.17	986.00	2.20	2.11	-163.82	26.13	-40.34	88.18	83.86	4.32	20.402		
1,100.00	1,095.65	1,078.55	1,076.32	2.55	2.38	-165.31	33.37	-52.03	120.63	115.82	4.82	25.051		
1,200.00	1,193.45	1,167.86	1,164.15	2.94	2.67	-165.49	41.90	-65.80	157.65	152.39	5.26	29.959		
1,300.00	1,291.26	1,260.32	1,254.87	3.35	3.00	-165.49	51.30	-80.98	195.73	190.02	5.71	34.292		
1,400.00	1,389.06	1,352.79	1,345.60	3.77	3.34	-165.49	60.69	-96.16	233.81	227.66	6.16	37.961		
1,500.00	1,486.86	1,445.25	1,436.32	4.19	3.69	-165.49	70.09	-111.33	271.90	265.28	6.62	41.076		
1,600.00	1,584.67	1,537.71	1,527.05	4.62	4.06	-165.49	79.49	-126.51	309.98	302.88	7.09	43.696		
1,700.00	1,682.47	1,630.18	1,617.77	5.06	4.42	-165.49	88.88	-141.69	348.06	340.49	7.57	45.997		
1,800.00	1,780.28	1,722.64	1,708.50	5.50	4.80	-165.50	98.28	-156.87	386.14	378.10	8.05	47.982		
1,900.00	1,878.08	1,815.11	1,799.23	5.94	5.17	-165.50	107.68	-172.05	424.23	415.69	8.53	49.716		
2,000.00	1,975.88	1,907.57	1,889.95	6.39	5.55	-165.50	117.07	-187.22	462.31	453.29	9.02	51.243		
2,100.00	2,073.69	2,000.04	1,980.68	6.84	5.93	-165.50	126.47	-202.40	500.39	490.88	9.51	52.596		
2,200.00	2,171.49	2,092.50	2,071.40	7.28	6.31	-165.50	135.86	-217.58	538.47	528.46	10.01	53.800		
2,300.00	2,269.29	2,184.97	2,162.13	7.73	6.70	-165.50	145.26	-232.76	576.56	566.05	10.51	54.880		
2,400.00	2,367.10	2,277.43	2,252.85	8.18	7.08	-165.50	154.66	-247.93	614.64	603.63	11.00	55.852		
2,500.00	2,464.90	2,369.90	2,343.58	8.63	7.47	-165.50	164.05	-263.11	652.72	641.21	11.51	56.732		
2,600.00	2,562.71	2,462.36	2,434.30	9.09	7.86	-165.50	173.45	-278.29	690.80	678.79	12.01	57.531		
2,700.00	2,660.51	2,554.83	2,525.03	9.54	8.25	-165.50	182.85	-293.47	728.88	716.37	12.51	58.260		
2,800.00	2,758.31	2,647.29	2,615.75	9.99	8.64	-165.50	192.24	-308.65	766.97	753.95	13.02	58.928		
2,900.00	2,856.12	2,739.76	2,706.48	10.44	9.03	-165.50	201.64	-323.82	805.05	791.53	13.52	59.541		
3,000.00	2,953.92	2,832.22	2,797.20	10.90	9.42	-165.50	211.04	-339.00	843.13	829.10	14.03	60.107		
3,100.00	3,051.72	2,924.69	2,887.93	11.35	9.81	-165.50	220.43	-354.18	881.21	866.68	14.53	60.630		
3,200.00	3,149.53	3,017.15	2,978.65	11.80	10.20	-165.50	229.83	-369.36	919.30	904.25	15.04	61.114		
3,300.00	3,247.33	3,109.62	3,069.38	12.26	10.59	-165.50	239.23	-384.54	957.38	941.83	15.55	61.565		
3,400.00	3,345.14	3,202.08	3,160.10	12.71	10.98	-165.50	248.62	-399.71	995.46	979.40	16.06	61.984		

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 130-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	18.00	0.00	0.00	140.05	-118.15	98.98	155.18					
100.00	100.00	83.05	101.04	0.09	0.10	139.93	-117.74	99.03	153.85	153.67	0.18	843.002		
200.00	200.00	183.96	201.95	0.31	0.26	139.56	-116.30	99.13	152.82	152.25	0.58	265.490		
300.00	300.00	284.00	301.98	0.54	0.47	139.59	-115.30	98.16	151.44	150.43	1.01	149.887		
400.00	400.00	382.26	400.22	0.76	0.68	140.32	-115.95	96.18	150.65	149.20	1.44	104.375		
438.03	438.03	420.09	438.02	0.85	0.76	140.77	-116.67	95.26	150.62	149.01	1.61	93.515	CC	
500.00	500.00	481.49	499.38	0.99	0.90	141.71	-118.29	93.39	150.72	148.83	1.88	80.039		
600.00	599.98	579.27	597.02	1.20	1.12	57.11	-122.15	90.14	150.89	148.56	2.32	64.924		
700.00	699.84	676.83	694.41	1.41	1.34	60.70	-127.34	87.49	151.07	148.30	2.76	54.663		
800.00	799.45	775.11	792.45	1.65	1.58	65.70	-133.61	84.64	151.25	148.03	3.23	46.871	ES	
900.00	898.70	872.44	889.43	1.91	1.83	69.70	-140.91	80.86	151.91	148.20	3.72	40.881		
1,000.00	997.48	969.56	986.16	2.20	2.07	75.59	-148.88	77.48	154.16	149.93	4.22	36.499		
1,100.00	1,095.65	1,068.25	1,084.51	2.55	2.29	82.60	-156.65	75.01	158.03	153.27	4.76	33.171		
1,200.00	1,193.45	1,166.66	1,182.68	2.94	2.51	90.62	-163.21	72.96	163.59	158.25	5.34	30.654		
1,300.00	1,291.26	1,263.28	1,279.07	3.35	2.74	97.99	-169.51	70.75	172.11	166.19	5.93	29.037		
1,400.00	1,389.06	1,360.33	1,375.86	3.77	2.97	104.71	-176.14	68.14	183.74	177.23	6.52	28.197		
1,500.00	1,486.86	1,458.41	1,473.70	4.19	3.20	110.55	-182.58	65.97	197.24	190.15	7.09	27.827		
1,600.00	1,584.67	1,556.42	1,571.51	4.62	3.42	115.71	-188.51	63.71	212.12	204.47	7.64	27.757	SF	
1,700.00	1,682.47	1,652.64	1,667.54	5.06	3.65	120.15	-194.12	61.40	228.36	220.18	8.18	27.902		
1,800.00	1,780.28	1,750.10	1,764.77	5.50	3.88	123.99	-200.31	59.00	246.24	237.52	8.72	28.240		
1,900.00	1,878.08	1,848.04	1,862.50	5.94	4.11	127.27	-206.35	57.06	264.63	255.38	9.25	28.623		
2,000.00	1,975.88	1,946.24	1,960.51	6.39	4.34	130.12	-212.24	55.26	283.53	273.76	9.76	29.037		
2,100.00	2,073.69	2,043.65	2,057.76	6.84	4.56	132.72	-217.49	53.24	302.78	292.51	10.27	29.471		
2,200.00	2,171.49	2,139.91	2,153.85	7.28	4.79	134.99	-222.69	51.06	322.71	311.93	10.78	29.939		
2,300.00	2,269.29	2,237.23	2,251.00	7.73	5.01	137.03	-228.08	48.70	343.29	332.01	11.28	30.430		
2,400.00	2,367.10	2,334.36	2,347.95	8.18	5.24	138.83	-233.43	46.44	364.16	352.38	11.78	30.914		
2,500.00	2,464.90	2,432.29	2,445.70	8.63	5.47	140.43	-238.87	44.24	385.29	373.01	12.28	31.381		
2,600.00	2,562.71	2,529.90	2,543.15	9.09	5.69	141.89	-244.07	42.11	406.51	393.74	12.77	31.826		
2,700.00	2,660.51	2,627.53	2,640.62	9.54	5.92	143.18	-249.32	40.10	427.87	414.60	13.27	32.247		
2,800.00	2,758.31	2,722.34	2,735.27	9.99	6.14	144.34	-254.37	37.92	449.61	435.85	13.76	32.678		
2,900.00	2,856.12	2,814.54	2,827.29	10.44	6.36	145.41	-259.38	34.98	472.30	458.06	14.24	33.162		
3,000.00	2,953.92	2,910.13	2,922.63	10.90	6.59	146.38	-265.25	31.49	495.87	481.13	14.74	33.651		
3,100.00	3,051.72	3,005.34	3,017.55	11.35	6.83	147.16	-271.94	28.31	519.75	504.51	15.24	34.108		
3,200.00	3,149.53	3,105.91	3,117.78	11.80	7.08	147.84	-279.60	25.36	543.64	527.88	15.76	34.502		
3,300.00	3,247.33	3,204.14	3,215.73	12.26	7.32	148.46	-286.67	22.90	567.04	550.77	16.27	34.861		
3,400.00	3,345.14	3,305.77	3,317.12	12.71	7.56	149.10	-293.28	20.47	590.07	573.30	16.77	35.177		
3,500.00	3,442.94	3,400.64	3,411.79	13.17	7.78	149.70	-298.95	18.18	612.94	595.68	17.27	35.496		
3,600.00	3,540.74	3,497.00	3,507.94	13.62	8.01	150.28	-304.66	15.52	636.17	618.40	17.76	35.811		
3,700.00	3,638.55	3,591.00	3,601.70	14.08	8.25	150.76	-310.95	12.94	659.76	641.49	18.27	36.120		
3,800.00	3,736.35	3,684.36	3,694.75	14.53	8.48	151.13	-318.04	10.30	683.84	665.07	18.78	36.421		
3,900.00	3,834.15	3,781.66	3,791.69	14.99	8.73	151.45	-325.98	7.61	708.16	688.86	19.30	36.691		
4,000.00	3,931.96	3,886.05	3,895.74	15.45	8.99	151.79	-334.01	5.17	731.90	712.07	19.83	36.906		
4,100.00	4,029.76	3,980.08	3,989.51	15.90	9.22	152.13	-340.53	2.95	755.39	735.05	20.33	37.148		
4,200.00	4,127.57	4,068.00	4,077.13	16.36	9.44	152.40	-347.35	0.20	779.89	759.05	20.83	37.433		
4,300.00	4,225.37	4,175.01	4,183.72	16.81	9.72	152.67	-356.15	-2.89	804.42	783.04	21.38	37.630		
4,400.00	4,323.17	4,283.93	4,292.39	17.27	9.97	153.00	-363.28	-4.68	827.14	805.23	21.91	37.759		
4,500.00	4,420.98	4,376.22	4,384.52	17.72	10.19	153.33	-368.44	-6.46	849.78	827.39	22.39	37.945		
4,600.00	4,518.78	4,469.29	4,477.43	18.18	10.40	153.67	-373.44	-8.81	872.91	850.03	22.88	38.147		
4,700.00	4,616.58	4,560.37	4,568.33	18.64	10.62	154.01	-378.32	-11.79	896.73	873.36	23.37	38.378		
4,800.00	4,714.39	4,658.20	4,665.93	19.09	10.86	154.31	-384.31	-14.91	920.78	896.91	23.87	38.577		
4,900.00	4,812.19	4,754.76	4,762.23	19.55	11.10	154.55	-390.77	-17.70	944.81	920.43	24.38	38.759		
5,000.00	4,910.00	4,849.29	4,856.44	20.01	11.34	154.72	-398.05	-20.22	969.03	944.14	24.89	38.929		

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	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: 0.00 usft	
Survey Program: 130-MWD												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	5,007.80	4,948.19	4,954.99	20.46	11.59	154.88	-405.87	-22.96	993.43	968.02	25.42	39.085	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft		
Survey Program: 0-MWD													Bruton 30-10 Pad - Bruton 30-10E - Slot B-7 - Design #2		Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	0.00	0.00	0.00	0.00	-28.13	17.48	-9.35	19.82							
100.00	100.00	100.00	100.00	0.09	0.09	-28.13	17.48	-9.35	19.82	19.65	0.18	113.072				
200.00	200.00	200.00	200.00	0.31	0.31	-28.13	17.48	-9.35	19.82	19.20	0.62	31.725				
300.00	300.00	300.00	300.00	0.54	0.54	-28.13	17.48	-9.35	19.82	18.75	1.07	18.451				
400.00	400.00	400.00	400.00	0.76	0.76	-28.13	17.48	-9.35	19.82	18.30	1.52	13.008				
500.00	500.00	500.00	500.00	0.99	0.99	-28.13	17.48	-9.35	19.82	17.85	1.97	10.045	CC, ES			
600.00	599.98	599.98	599.98	1.20	1.21	-119.51	17.48	-9.35	20.63	18.21	2.41	8.542				
700.00	699.84	700.24	700.22	1.41	1.43	-126.88	17.83	-7.63	22.76	19.91	2.85	7.985				
800.00	799.45	800.61	800.45	1.65	1.64	-132.16	18.86	-2.46	25.60	22.30	3.30	7.753				
900.00	898.70	901.10	900.54	1.91	1.87	-137.73	20.59	6.16	29.17	25.39	3.78	7.710				
1,000.00	997.48	1,001.67	1,000.36	2.20	2.13	-140.14	23.00	18.22	33.55	29.25	4.30	7.805				
1,100.00	1,095.65	1,102.31	1,099.74	2.55	2.43	-140.56	26.11	33.72	38.69	33.82	4.86	7.954				
1,200.00	1,193.45	1,203.04	1,198.59	2.94	2.77	-137.86	29.90	52.66	43.29	37.81	5.48	7.906				
1,300.00	1,291.26	1,303.20	1,296.33	3.35	3.16	-132.81	34.20	74.14	46.56	40.36	6.20	7.514				
1,400.00	1,389.06	1,403.06	1,393.73	3.77	3.57	-128.24	38.53	95.75	50.05	43.06	6.99	7.162				
1,500.00	1,486.86	1,502.93	1,491.13	4.19	4.00	-124.29	42.86	117.36	53.81	45.98	7.83	6.874				
1,600.00	1,584.67	1,602.79	1,588.54	4.62	4.43	-120.87	47.19	138.97	57.80	49.10	8.70	6.641				
1,700.00	1,682.47	1,702.66	1,685.94	5.06	4.88	-117.91	51.52	160.58	61.97	52.37	9.60	6.455				
1,800.00	1,780.28	1,802.52	1,783.34	5.50	5.33	-115.32	55.85	182.20	66.28	55.77	10.51	6.305				
1,900.00	1,878.08	1,902.39	1,880.74	5.94	5.78	-113.05	60.18	203.81	70.71	59.28	11.43	6.185				
2,000.00	1,975.88	2,002.25	1,978.15	6.39	6.24	-111.05	64.50	225.42	75.23	62.88	12.36	6.088				
2,100.00	2,073.69	2,102.12	2,075.55	6.84	6.69	-109.28	68.83	247.03	79.84	66.56	13.29	6.009				
2,200.00	2,171.49	2,201.98	2,172.95	7.28	7.16	-107.70	73.16	268.65	84.52	70.30	14.22	5.944				
2,300.00	2,269.29	2,301.85	2,270.35	7.73	7.62	-106.29	77.49	290.26	89.25	74.10	15.15	5.891				
2,400.00	2,367.10	2,401.71	2,367.76	8.18	8.08	-105.03	81.82	311.87	94.03	77.95	16.08	5.847				
2,500.00	2,464.90	2,501.58	2,465.16	8.63	8.55	-103.88	86.15	333.48	98.86	81.84	17.02	5.810				
2,600.00	2,562.71	2,601.45	2,562.56	9.09	9.02	-102.84	90.48	355.09	103.72	85.77	17.95	5.779				
2,700.00	2,660.51	2,701.31	2,659.96	9.54	9.49	-101.90	94.81	376.71	108.61	89.73	18.88	5.753				
2,800.00	2,758.31	2,801.18	2,757.37	9.99	9.95	-101.04	99.13	398.32	113.52	93.71	19.81	5.731				
2,900.00	2,856.12	2,901.04	2,854.77	10.44	10.42	-100.25	103.46	419.93	118.46	97.72	20.74	5.712				
3,000.00	2,953.92	3,000.91	2,952.17	10.90	10.89	-99.52	107.79	441.54	123.43	101.76	21.67	5.696				
3,100.00	3,051.72	3,100.77	3,049.57	11.35	11.37	-98.85	112.12	463.15	128.40	105.81	22.60	5.682				
3,200.00	3,149.53	3,200.64	3,146.97	11.80	11.84	-98.23	116.45	484.77	133.40	109.88	23.53	5.671				
3,300.00	3,247.33	3,300.50	3,244.38	12.26	12.31	-97.65	120.78	506.38	138.41	113.96	24.45	5.660				
3,400.00	3,345.14	3,400.37	3,341.78	12.71	12.78	-97.12	125.11	527.99	143.43	118.06	25.38	5.652				
3,500.00	3,442.94	3,500.23	3,439.18	13.17	13.25	-96.62	129.44	549.60	148.47	122.16	26.30	5.644				
3,600.00	3,540.74	3,600.10	3,536.58	13.62	13.72	-96.15	133.76	571.22	153.51	126.28	27.23	5.638				
3,700.00	3,638.55	3,699.96	3,633.99	14.08	14.20	-95.71	138.09	592.83	158.57	130.41	28.15	5.632				
3,800.00	3,736.35	3,799.83	3,731.39	14.53	14.67	-95.30	142.42	614.44	163.63	134.55	29.08	5.627				
3,900.00	3,834.15	3,899.69	3,828.79	14.99	15.14	-94.92	146.75	636.05	168.70	138.70	30.00	5.623				
4,000.00	3,931.96	3,999.56	3,926.19	15.45	15.62	-94.55	151.08	657.66	173.78	142.86	30.92	5.620				
4,100.00	4,029.76	4,099.42	4,023.60	15.90	16.09	-94.21	155.41	679.28	178.87	147.02	31.85	5.616				
4,200.00	4,127.57	4,199.29	4,121.00	16.36	16.56	-93.89	159.74	700.89	183.96	151.19	32.77	5.614				
4,300.00	4,225.37	4,299.15	4,218.40	16.81	17.04	-93.58	164.06	722.50	189.05	155.36	33.69	5.611				
4,400.00	4,323.17	4,399.02	4,315.80	17.27	17.51	-93.29	168.39	744.11	194.16	159.54	34.61	5.609				
4,500.00	4,420.98	4,498.88	4,413.20	17.72	17.98	-93.02	172.72	765.72	199.26	163.73	35.53	5.608				
4,600.00	4,518.78	4,598.75	4,510.61	18.18	18.46	-92.76	177.05	787.34	204.37	167.92	36.45	5.606				
4,700.00	4,616.58	4,698.61	4,608.01	18.64	18.93	-92.51	181.38	808.95	209.49	172.11	37.37	5.605				
4,800.00	4,714.39	4,798.48	4,705.41	19.09	19.41	-92.27	185.71	830.56	214.61	176.31	38.29	5.604				
4,900.00	4,812.19	4,898.34	4,802.81	19.55	19.88	-92.05	190.04	852.17	219.73	180.51	39.21	5.603				
5,000.00	4,910.00	4,998.21	4,900.22	20.01	20.36	-91.83	194.37	873.79	224.85	184.72	40.13	5.602				
5,100.00	5,007.80	5,098.07	4,997.62	20.46	20.83	-91.63	198.69	895.40	229.98	188.93	41.05	5.602				

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft		
Survey Program: 0-MWD													Bruton 30-10 Pad - Bruton 30-10E - Slot B-7 - Design #2		Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
5,200.00	5,105.60	5,198.41	5,095.52	20.92	21.29	-91.46	203.02	916.98	235.08	193.13	41.96	5.603				
5,300.00	5,203.77	5,300.02	5,195.20	21.25	21.63	-91.57	206.88	936.27	239.61	196.98	42.63	5.621				
5,400.00	5,302.54	5,401.69	5,295.57	21.53	21.93	-91.66	210.05	952.09	243.31	200.11	43.21	5.632				
5,500.00	5,401.79	5,503.41	5,396.51	21.77	22.18	-91.73	212.52	964.41	246.20	202.50	43.70	5.634				
5,600.00	5,501.41	5,605.17	5,497.86	21.98	22.39	-91.77	214.28	973.22	248.26	204.15	44.11	5.628				
5,700.00	5,601.27	5,706.96	5,599.50	22.13	22.55	-91.80	215.34	978.49	249.49	205.06	44.43	5.615				
5,800.00	5,701.25	5,808.73	5,701.25	22.26	22.67	0.36	215.68	980.22	249.90	205.22	44.68	5.593				
5,900.00	5,801.25	5,908.73	5,801.25	22.37	22.79	0.36	215.68	980.22	249.90	204.99	44.91	5.565				
6,000.00	5,901.25	6,008.73	5,901.25	22.49	22.91	0.36	215.68	980.22	249.90	204.75	45.15	5.535				
6,100.00	6,001.25	6,108.73	6,001.25	22.62	23.03	0.36	215.68	980.22	249.90	204.50	45.39	5.505				
6,200.00	6,101.25	6,208.73	6,101.25	22.74	23.15	0.36	215.68	980.22	249.90	204.26	45.64	5.475				
6,300.00	6,201.25	6,308.73	6,201.25	22.86	23.27	0.36	215.68	980.22	249.90	204.01	45.89	5.445				
6,400.00	6,301.25	6,408.73	6,301.25	22.99	23.40	0.36	215.68	980.22	249.90	203.75	46.15	5.415				
6,500.00	6,401.25	6,508.73	6,401.25	23.12	23.53	0.36	215.68	980.22	249.90	203.50	46.40	5.385				
6,600.00	6,501.25	6,608.73	6,501.25	23.25	23.66	0.36	215.68	980.22	249.90	203.24	46.66	5.356				
6,700.00	6,601.25	6,708.73	6,601.25	23.38	23.79	0.36	215.68	980.22	249.90	202.97	46.92	5.326				
6,800.00	6,701.25	6,808.73	6,701.25	23.51	23.92	0.36	215.68	980.22	249.90	202.71	47.19	5.296				
6,900.00	6,801.25	6,908.73	6,801.25	23.64	24.05	0.36	215.68	980.22	249.90	202.44	47.46	5.266				
7,000.00	6,901.25	7,008.73	6,901.25	23.78	24.19	0.36	215.68	980.22	249.90	202.17	47.73	5.236				
7,100.00	7,001.25	7,108.73	7,001.25	23.91	24.32	0.36	215.68	980.22	249.90	201.90	48.00	5.206				
7,200.00	7,101.25	7,208.73	7,101.25	24.05	24.46	0.36	215.68	980.22	249.90	201.62	48.28	5.176				
7,300.00	7,201.25	7,308.73	7,201.25	24.19	24.60	0.36	215.68	980.22	249.90	201.34	48.56	5.147				
7,400.00	7,301.25	7,408.73	7,301.25	24.33	24.74	0.36	215.68	980.22	249.90	201.06	48.84	5.117				
7,500.00	7,401.25	7,508.73	7,401.25	24.47	24.88	0.36	215.68	980.22	249.90	200.78	49.12	5.087				
7,600.00	7,501.25	7,608.73	7,501.25	24.61	25.02	0.36	215.68	980.22	249.90	200.49	49.41	5.058				
7,700.00	7,601.25	7,708.73	7,601.25	24.76	25.16	0.36	215.68	980.22	249.90	200.20	49.69	5.029				
7,800.00	7,701.25	7,808.73	7,701.25	24.90	25.30	0.36	215.68	980.22	249.90	199.92	49.98	5.000				
7,863.75	7,765.00	7,872.48	7,765.00	25.00	25.35	0.36	215.68	980.22	249.90	199.78	50.12	4.986 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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft		
Survey Program: 0-MWD													Bruton 30-10 Pad - Bruton 30-10M - Slot A-6 - Design #2		Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	0.00	0.00	0.00	0.00	-120.84	-4.73	-7.93	9.24							
100.00	100.00	100.00	100.00	0.09	0.09	-120.84	-4.73	-7.93	9.24	9.06	0.18	52.679				
200.00	200.00	200.00	200.00	0.31	0.31	-120.84	-4.73	-7.93	9.24	8.61	0.62	14.780	CC, ES			
300.00	299.74	299.74	299.72	0.54	0.53	-113.77	-4.22	-9.59	10.48	9.41	1.07	9.814				
400.00	400.00	399.25	399.09	0.76	0.76	-100.50	-2.70	-14.55	14.82	13.31	1.52	9.758	SF			
500.00	500.00	498.27	497.73	0.99	1.01	-90.43	-0.17	-22.76	22.87	20.88	1.99	11.473				
600.00	599.98	596.34	595.08	1.20	1.29	-171.81	3.32	-34.09	36.31	33.85	2.46	14.781				
700.00	699.84	693.45	691.06	1.41	1.61	-169.32	7.67	-48.20	56.33	53.39	2.95	19.112				
800.00	799.45	790.52	786.91	1.65	1.94	-168.52	12.18	-62.86	80.33	76.91	3.42	23.457				
900.00	898.70	886.70	881.88	1.91	2.28	-170.89	16.65	-77.38	107.67	103.77	3.90	27.576				
1,000.00	997.48	981.87	975.86	2.20	2.63	-172.34	21.08	-91.76	138.35	133.97	4.38	31.556				
1,100.00	1,095.65	1,075.92	1,068.72	2.55	2.97	-173.34	25.46	-105.96	172.34	167.47	4.86	35.434				
1,200.00	1,193.45	1,169.31	1,160.94	2.94	3.31	-173.38	29.80	-120.07	208.08	202.79	5.30	39.290				
1,300.00	1,291.26	1,262.70	1,253.16	3.35	3.65	-173.39	34.14	-134.17	243.83	238.09	5.74	42.483				
1,400.00	1,389.06	1,356.10	1,345.38	3.77	3.99	-173.40	38.49	-148.28	279.58	273.39	6.19	45.179				
1,500.00	1,486.86	1,449.49	1,437.59	4.19	4.34	-173.41	42.83	-162.38	315.32	308.68	6.64	47.461				
1,600.00	1,584.67	1,542.88	1,529.81	4.62	4.68	-173.41	47.17	-176.49	351.07	343.97	7.10	49.415				
1,700.00	1,682.47	1,636.27	1,622.03	5.06	5.03	-173.42	51.52	-190.59	386.82	379.25	7.57	51.103				
1,800.00	1,780.28	1,729.67	1,714.25	5.50	5.37	-173.42	55.86	-204.70	422.57	414.53	8.04	52.574				
1,900.00	1,878.08	1,823.06	1,806.47	5.94	5.72	-173.42	60.21	-218.81	458.31	449.80	8.51	53.865				
2,000.00	1,975.88	1,916.45	1,898.69	6.39	6.07	-173.42	64.55	-232.91	494.06	485.08	8.98	55.006				
2,100.00	2,073.69	2,009.84	1,990.91	6.84	6.41	-173.43	68.89	-247.02	529.81	520.35	9.46	56.021				
2,200.00	2,171.49	2,103.23	2,083.13	7.28	6.76	-173.43	73.24	-261.12	565.56	555.62	9.93	56.930				
2,300.00	2,269.29	2,196.63	2,175.34	7.73	7.11	-173.43	77.58	-275.23	601.30	590.89	10.41	57.747				
2,400.00	2,367.10	2,290.02	2,267.56	8.18	7.45	-173.43	81.93	-289.33	637.05	626.16	10.89	58.486				
2,500.00	2,464.90	2,383.41	2,359.78	8.63	7.80	-173.43	86.27	-303.44	672.80	661.42	11.37	59.157				
2,600.00	2,562.71	2,476.80	2,452.00	9.09	8.15	-173.43	90.61	-317.54	708.55	696.69	11.85	59.769				
2,700.00	2,660.51	2,570.20	2,544.22	9.54	8.50	-173.43	94.96	-331.65	744.29	731.96	12.34	60.329				
2,800.00	2,758.31	2,663.59	2,636.44	9.99	8.85	-173.43	99.30	-345.75	780.04	767.22	12.82	60.843				
2,900.00	2,856.12	2,756.98	2,728.66	10.44	9.19	-173.43	103.64	-359.86	815.79	802.48	13.30	61.317				
3,000.00	2,953.92	2,850.37	2,820.87	10.90	9.54	-173.44	107.99	-373.96	851.54	837.75	13.79	61.756				
3,100.00	3,051.72	2,943.77	2,913.09	11.35	9.89	-173.44	112.33	-388.07	887.28	873.01	14.27	62.162				
3,200.00	3,149.53	3,037.16	3,005.31	11.80	10.24	-173.44	116.68	-402.18	923.03	908.27	14.76	62.540				
3,300.00	3,247.33	3,130.55	3,097.53	12.26	10.58	-173.44	121.02	-416.28	958.78	943.53	15.24	62.892				
3,400.00	3,345.14	3,223.94	3,189.75	12.71	10.93	-173.44	125.36	-430.39	994.52	978.79	15.73	63.221				

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft		
Survey Program: 0-MWD													Bruton 30-10 Pad - Bruton 30-12E - Slot B-5 - Design #3		Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	0.00	0.00	0.00	0.00	148.12	-9.11	5.66	10.72							
100.00	100.00	100.00	100.00	0.09	0.09	148.12	-9.11	5.66	10.72	10.55	0.18	61.165				
200.00	200.00	200.00	200.00	0.31	0.31	148.12	-9.11	5.66	10.72	10.10	0.62	17.161				
300.00	300.00	300.00	300.00	0.54	0.54	148.12	-9.11	5.66	10.72	9.65	1.07	9.981				
400.00	400.00	400.00	400.00	0.76	0.76	148.12	-9.11	5.66	10.72	9.20	1.52	7.037	CC, ES			
500.00	500.00	499.75	499.73	0.99	0.97	141.09	-9.17	7.40	11.78	9.82	1.96	6.009				
600.00	599.98	599.36	599.20	1.20	1.19	43.96	-9.35	12.59	14.40	12.01	2.39	6.030				
700.00	699.84	698.85	698.31	1.41	1.42	37.93	-9.65	21.23	17.49	14.66	2.83	6.175				
800.00	799.45	798.12	796.86	1.65	1.68	36.55	-10.83	33.05	21.09	17.79	3.30	6.393				
900.00	898.70	897.23	894.82	1.91	1.98	36.54	-13.69	47.82	25.20	21.41	3.79	6.646				
1,000.00	997.48	996.17	992.05	2.20	2.33	39.22	-18.20	65.50	29.79	25.46	4.33	6.880				
1,100.00	1,095.65	1,095.71	1,089.39	2.55	2.72	43.64	-24.01	85.51	34.24	29.29	4.94	6.926				
1,200.00	1,193.45	1,195.58	1,187.02	2.94	3.14	49.67	-29.90	105.71	37.71	32.08	5.63	6.701				
1,300.00	1,291.26	1,295.45	1,284.64	3.35	3.57	54.67	-35.80	125.90	41.54	35.15	6.38	6.506				
1,400.00	1,389.06	1,395.31	1,382.27	3.77	4.00	58.80	-41.70	146.10	45.62	38.43	7.19	6.345				
1,500.00	1,486.86	1,495.18	1,479.89	4.19	4.44	62.23	-47.60	166.30	49.91	41.87	8.03	6.214				
1,600.00	1,584.67	1,595.05	1,577.52	4.62	4.89	65.12	-53.50	186.50	54.34	45.44	8.90	6.109				
1,700.00	1,682.47	1,694.92	1,675.14	5.06	5.34	67.57	-59.39	206.70	58.89	49.11	9.77	6.025				
1,800.00	1,780.28	1,794.78	1,772.77	5.50	5.79	69.66	-65.29	226.90	63.53	52.87	10.67	5.957				
1,900.00	1,878.08	1,894.65	1,870.39	5.94	6.24	71.46	-71.19	247.10	68.25	56.68	11.56	5.902				
2,000.00	1,975.88	1,994.52	1,968.02	6.39	6.70	73.03	-77.09	267.30	73.02	60.55	12.47	5.857				
2,100.00	2,073.69	2,094.38	2,065.64	6.84	7.15	74.41	-82.98	287.50	77.84	64.47	13.37	5.821				
2,200.00	2,171.49	2,194.25	2,163.27	7.28	7.61	75.63	-88.88	307.70	82.71	68.42	14.28	5.790				
2,300.00	2,269.29	2,294.12	2,260.89	7.73	8.07	76.71	-94.78	327.90	87.60	72.41	15.19	5.765				
2,400.00	2,367.10	2,393.99	2,358.52	8.18	8.53	77.67	-100.68	348.09	92.52	76.42	16.11	5.744				
2,500.00	2,464.90	2,493.85	2,456.15	8.63	8.98	78.54	-106.57	368.29	97.47	80.45	17.02	5.726				
2,600.00	2,562.71	2,593.72	2,553.77	9.09	9.44	79.32	-112.47	388.49	102.44	84.50	17.94	5.711				
2,700.00	2,660.51	2,693.59	2,651.40	9.54	9.90	80.03	-118.37	408.69	107.42	88.57	18.85	5.698				
2,800.00	2,758.31	2,793.46	2,749.02	9.99	10.36	80.68	-124.27	428.89	112.42	92.65	19.77	5.687				
2,900.00	2,856.12	2,893.32	2,846.65	10.44	10.82	81.28	-130.17	449.09	117.43	96.75	20.68	5.678				
3,000.00	2,953.92	2,993.19	2,944.27	10.90	11.28	81.82	-136.06	469.29	122.45	100.86	21.60	5.670				
3,100.00	3,051.72	3,093.06	3,041.90	11.35	11.74	82.32	-141.96	489.49	127.49	104.97	22.51	5.663				
3,200.00	3,149.53	3,192.92	3,139.52	11.80	12.21	82.78	-147.86	509.69	132.53	109.10	23.43	5.657				
3,300.00	3,247.33	3,292.79	3,237.15	12.26	12.67	83.21	-153.76	529.89	137.58	113.24	24.35	5.651				
3,400.00	3,345.14	3,392.66	3,334.77	12.71	13.13	83.61	-159.65	550.09	142.64	117.38	25.26	5.646				
3,500.00	3,442.94	3,492.53	3,432.40	13.17	13.59	83.98	-165.55	570.29	147.70	121.52	26.18	5.642				
3,600.00	3,540.74	3,592.39	3,530.02	13.62	14.05	84.33	-171.45	590.48	152.77	125.68	27.09	5.639				
3,700.00	3,638.55	3,692.26	3,627.65	14.08	14.51	84.66	-177.35	610.68	157.85	129.84	28.01	5.635				
3,800.00	3,736.35	3,792.13	3,725.27	14.53	14.98	84.96	-183.24	630.88	162.93	134.00	28.93	5.632				
3,900.00	3,834.15	3,892.00	3,822.90	14.99	15.44	85.25	-189.14	651.08	168.01	138.17	29.84	5.630				
4,000.00	3,931.96	3,991.86	3,920.52	15.45	15.90	85.52	-195.04	671.28	173.10	142.34	30.76	5.628				
4,100.00	4,029.76	4,091.73	4,018.15	15.90	16.36	85.77	-200.94	691.48	178.19	146.52	31.68	5.626				
4,200.00	4,127.57	4,191.60	4,115.77	16.36	16.82	86.01	-206.84	711.68	183.29	150.70	32.59	5.624				
4,300.00	4,225.37	4,291.46	4,213.40	16.81	17.29	86.24	-212.73	731.88	188.39	154.88	33.51	5.622				
4,400.00	4,323.17	4,391.33	4,311.02	17.27	17.75	86.45	-218.63	752.08	193.49	159.06	34.42	5.621				
4,500.00	4,420.98	4,491.20	4,408.65	17.72	18.21	86.65	-224.53	772.28	198.59	163.25	35.34	5.620				
4,600.00	4,518.78	4,591.07	4,506.27	18.18	18.67	86.85	-230.43	792.48	203.70	167.44	36.26	5.618				
4,700.00	4,616.58	4,690.93	4,603.90	18.64	19.14	87.03	-236.32	812.67	208.80	171.63	37.17	5.617				
4,800.00	4,714.39	4,790.80	4,701.52	19.09	19.60	87.21	-242.22	832.87	213.91	175.83	38.09	5.616				
4,900.00	4,812.19	4,890.67	4,799.15	19.55	20.06	87.37	-248.12	853.07	219.03	180.02	39.00	5.616				
5,000.00	4,910.00	4,990.54	4,896.78	20.01	20.52	87.53	-254.02	873.27	224.14	184.22	39.92	5.615				
5,100.00	5,007.80	5,090.40	4,994.40	20.46	20.99	87.69	-259.92	893.47	229.26	188.42	40.83	5.614				

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft	
Survey Program: 0-MWD													Offset Well Error:		0.00 usft
Bruton 30-10 Pad - Bruton 30-12E - Slot B-5 - Design #3															
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			
5,200.00	5,105.60	5,190.27	5,092.03	20.92	21.45	87.83	-265.81	913.67	234.37	192.62	41.75	5.614			
5,300.00	5,203.77	5,292.37	5,192.17	21.25	21.79	88.00	-271.39	932.76	239.11	196.68	42.43	5.635			
5,400.00	5,302.54	5,394.65	5,293.13	21.53	22.09	88.14	-275.96	948.43	243.00	199.98	43.02	5.649			
5,500.00	5,401.79	5,496.98	5,394.66	21.77	22.34	88.24	-279.53	960.64	246.02	202.50	43.52	5.653			
5,600.00	5,501.41	5,599.36	5,496.63	21.98	22.54	88.31	-282.08	969.37	248.19	204.25	43.93	5.649			
5,700.00	5,601.27	5,701.77	5,598.88	22.13	22.71	88.36	-283.60	974.59	249.48	205.22	44.26	5.637			
5,800.00	5,701.25	5,804.16	5,701.25	22.26	22.83	-179.46	-284.10	976.31	249.90	205.40	44.51	5.615			
5,900.00	5,801.25	5,904.16	5,801.25	22.37	22.94	-179.46	-284.10	976.31	249.90	205.17	44.74	5.586			
6,000.00	5,901.25	6,004.16	5,901.25	22.49	23.05	-179.46	-284.10	976.31	249.90	204.93	44.97	5.557			
6,100.00	6,001.25	6,104.16	6,001.25	22.62	23.17	-179.46	-284.10	976.31	249.90	204.69	45.21	5.527			
6,200.00	6,101.25	6,204.16	6,101.25	22.74	23.28	-179.46	-284.10	976.31	249.90	204.45	45.46	5.498			
6,300.00	6,201.25	6,304.16	6,201.25	22.86	23.40	-179.46	-284.10	976.31	249.90	204.20	45.70	5.468			
6,400.00	6,301.25	6,404.16	6,301.25	22.99	23.52	-179.46	-284.10	976.31	249.90	203.95	45.95	5.438			
6,500.00	6,401.25	6,504.16	6,401.25	23.12	23.64	-179.46	-284.10	976.31	249.90	203.70	46.20	5.409			
6,600.00	6,501.25	6,604.16	6,501.25	23.25	23.77	-179.46	-284.10	976.31	249.90	203.45	46.46	5.379			
6,700.00	6,601.25	6,704.16	6,601.25	23.38	23.89	-179.46	-284.10	976.31	249.90	203.19	46.72	5.349			
6,800.00	6,701.25	6,804.16	6,701.25	23.51	24.02	-179.46	-284.10	976.31	249.90	202.93	46.98	5.320			
6,900.00	6,801.25	6,904.16	6,801.25	23.64	24.14	-179.46	-284.10	976.31	249.90	202.66	47.24	5.290			
7,000.00	6,901.25	7,004.16	6,901.25	23.78	24.27	-179.46	-284.10	976.31	249.90	202.40	47.51	5.260			
7,100.00	7,001.25	7,104.16	7,001.25	23.91	24.40	-179.46	-284.10	976.31	249.90	202.13	47.78	5.231			
7,200.00	7,101.25	7,204.16	7,101.25	24.05	24.53	-179.46	-284.10	976.31	249.90	201.86	48.05	5.201			
7,300.00	7,201.25	7,304.16	7,201.25	24.19	24.66	-179.46	-284.10	976.31	249.90	201.58	48.32	5.172			
7,400.00	7,301.25	7,404.16	7,301.25	24.33	24.80	-179.46	-284.10	976.31	249.90	201.31	48.60	5.142			
7,500.00	7,401.25	7,504.16	7,401.25	24.47	24.93	-179.46	-284.10	976.31	249.90	201.03	48.88	5.113			
7,600.00	7,501.25	7,604.16	7,501.25	24.61	25.07	-179.46	-284.10	976.31	249.90	200.74	49.16	5.083			
7,700.00	7,601.25	7,704.16	7,601.25	24.76	25.21	-179.46	-284.10	976.31	249.90	200.46	49.45	5.054			
7,800.00	7,701.25	7,804.16	7,701.25	24.90	25.35	-179.46	-284.10	976.31	249.90	200.17	49.73	5.025			
7,835.96	7,737.21	7,840.11	7,737.21	24.96	25.40	-179.46	-284.10	976.31	249.90	200.07	49.84	5.015 SF			
7,863.75	7,765.00	7,852.90	7,750.00	25.00	25.42	-179.46	-284.10	976.31	250.35	200.46	49.89	5.018			

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 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-167.32	-13.84	-3.12	14.19					
100.00	100.00	100.00	100.00	0.09	0.09	-167.32	-13.84	-3.12	14.19	14.01	0.18	80.919		
200.00	200.00	200.00	200.00	0.31	0.31	-167.32	-13.84	-3.12	14.19	13.56	0.62	22.704		
300.00	300.00	300.00	300.00	0.54	0.54	-167.32	-13.84	-3.12	14.19	13.11	1.07	13.204		
400.00	400.00	400.00	400.00	0.76	0.76	-167.32	-13.84	-3.12	14.19	12.66	1.52	9.309		
500.00	500.00	500.00	500.00	0.99	0.99	-167.32	-13.84	-3.12	14.19	12.21	1.97	7.189	CC, ES	
600.00	599.98	599.98	599.98	1.20	1.21	112.21	-13.84	-3.12	14.75	12.34	2.41	6.113	SF	
700.00	699.84	699.26	699.24	1.41	1.42	130.49	-14.66	-4.63	18.99	16.14	2.85	6.668		
800.00	799.45	797.52	797.36	1.65	1.61	146.77	-17.08	-9.10	30.64	27.33	3.31	9.255		
900.00	898.70	894.13	893.61	1.91	1.82	153.21	-21.03	-16.38	49.72	45.94	3.79	13.134		
1,000.00	997.48	988.53	987.34	2.20	2.06	156.57	-26.37	-26.24	75.54	71.27	4.27	17.694		
1,100.00	1,095.65	1,080.20	1,077.95	2.55	2.32	158.35	-32.97	-38.42	107.70	102.94	4.76	22.621		
1,200.00	1,193.45	1,169.87	1,166.12	2.94	2.61	160.08	-40.76	-52.78	144.52	139.31	5.21	27.726		
1,300.00	1,291.26	1,261.55	1,255.99	3.35	2.95	161.06	-49.39	-68.71	182.84	177.17	5.66	32.279		
1,400.00	1,389.06	1,353.88	1,346.50	3.77	3.30	161.71	-58.08	-84.76	221.19	215.07	6.12	36.140		
1,500.00	1,486.86	1,446.22	1,437.01	4.19	3.66	162.17	-66.77	-100.80	259.55	252.97	6.58	39.420		
1,600.00	1,584.67	1,538.55	1,527.52	4.62	4.04	162.51	-75.47	-116.84	297.93	290.86	7.07	42.163		
1,700.00	1,682.47	1,630.88	1,618.03	5.06	4.42	162.77	-84.16	-132.88	336.31	328.76	7.55	44.552		
1,800.00	1,780.28	1,723.21	1,708.54	5.50	4.80	162.98	-92.85	-148.92	374.70	366.66	8.04	46.615		
1,900.00	1,878.08	1,815.54	1,799.05	5.94	5.19	163.15	-101.55	-164.96	413.09	404.56	8.53	48.412		
2,000.00	1,975.88	1,907.87	1,889.56	6.39	5.58	163.29	-110.24	-181.01	451.49	442.45	9.03	49.988		
2,100.00	2,073.69	2,000.20	1,980.07	6.84	5.97	163.41	-118.93	-197.05	489.88	480.35	9.53	51.379		
2,200.00	2,171.49	2,092.53	2,070.58	7.28	6.37	163.51	-127.63	-213.09	528.28	518.24	10.04	52.615		
2,300.00	2,269.29	2,184.86	2,161.09	7.73	6.77	163.60	-136.32	-229.13	566.68	556.13	10.55	53.719		
2,400.00	2,367.10	2,277.19	2,251.60	8.18	7.17	163.68	-145.01	-245.17	605.08	594.02	11.06	54.711		
2,500.00	2,464.90	2,369.52	2,342.11	8.63	7.57	163.74	-153.71	-261.21	643.48	631.91	11.57	55.605		
2,600.00	2,562.71	2,461.85	2,432.62	9.09	7.97	163.80	-162.40	-277.26	681.88	669.79	12.09	56.417		
2,700.00	2,660.51	2,554.18	2,523.13	9.54	8.37	163.86	-171.09	-293.30	720.28	707.68	12.60	57.155		
2,800.00	2,758.31	2,646.51	2,613.64	9.99	8.77	163.90	-179.79	-309.34	758.68	745.56	13.12	57.829		
2,900.00	2,856.12	2,738.84	2,704.15	10.44	9.17	163.95	-188.48	-325.38	797.09	783.45	13.64	58.448		
3,000.00	2,953.92	2,831.17	2,794.66	10.90	9.58	163.99	-197.17	-341.42	835.49	821.33	14.16	59.017		
3,100.00	3,051.72	2,923.50	2,885.17	11.35	9.98	164.02	-205.86	-357.47	873.89	859.22	14.68	59.542		
3,200.00	3,149.53	3,015.83	2,975.68	11.80	10.39	164.06	-214.56	-373.51	912.30	897.10	15.20	60.028		
3,300.00	3,247.33	3,108.17	3,066.19	12.26	10.79	164.09	-223.25	-389.55	950.70	934.98	15.72	60.479		
3,400.00	3,345.14	3,200.50	3,156.70	12.71	11.20	164.11	-231.94	-405.59	989.10	972.86	16.24	60.898		

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



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 128-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	18.00	0.00	0.00	140.22	-129.08	107.47	168.92					
100.00	100.00	81.85	99.85	0.09	0.09	140.11	-128.90	107.74	168.00	167.82	0.18	926.638 CC		
200.00	200.00	181.34	199.34	0.31	0.26	139.77	-128.41	108.63	168.19	167.63	0.57	296.352 ES		
300.00	300.00	280.00	297.99	0.54	0.46	139.49	-128.43	109.71	168.93	167.93	1.00	169.072		
400.00	400.00	371.00	388.93	0.76	0.67	139.21	-130.15	112.31	172.26	170.83	1.43	120.460		
500.00	500.00	462.00	479.65	0.99	0.90	139.10	-135.24	117.15	180.08	178.20	1.88	95.872		
600.00	599.98	554.00	571.01	1.20	1.15	52.64	-144.10	123.31	190.81	188.50	2.31	82.495		
700.00	699.84	645.00	660.88	1.41	1.45	53.98	-155.98	131.14	203.42	200.67	2.75	73.887		
800.00	799.45	739.56	753.64	1.65	1.81	55.85	-171.05	141.57	217.92	214.69	3.23	67.519		
900.00	898.70	829.00	840.85	1.91	2.20	55.43	-187.29	152.98	233.49	229.78	3.72	62.850		
1,000.00	997.48	921.49	930.36	2.20	2.66	56.31	-206.30	166.38	250.23	245.97	4.25	58.839		
1,100.00	1,095.65	1,018.67	1,023.94	2.55	3.15	57.97	-227.58	181.69	267.18	262.33	4.85	55.119		
1,200.00	1,193.45	1,110.00	1,111.59	2.94	3.64	60.52	-248.08	197.14	284.73	279.26	5.47	52.077		
1,300.00	1,291.26	1,201.27	1,198.64	3.35	4.17	62.85	-270.33	213.13	304.89	298.75	6.14	49.658		
1,400.00	1,389.06	1,297.06	1,289.63	3.77	4.73	65.02	-294.92	230.27	326.90	320.04	6.86	47.686		
1,500.00	1,486.86	1,389.36	1,377.05	4.19	5.29	66.78	-319.06	247.40	350.01	342.42	7.59	46.129		
1,600.00	1,584.67	1,483.84	1,466.22	4.62	5.90	68.34	-344.57	265.38	374.37	366.01	8.36	44.802		
1,700.00	1,682.47	1,578.63	1,555.47	5.06	6.53	69.59	-370.31	284.30	399.40	390.26	9.14	43.677		
1,800.00	1,780.28	1,670.91	1,642.19	5.50	7.13	70.72	-396.03	302.52	425.25	415.32	9.93	42.814		
1,900.00	1,878.08	1,761.97	1,727.58	5.94	7.72	71.84	-422.57	319.74	452.28	441.55	10.73	42.151		
2,000.00	1,975.88	1,850.97	1,810.63	6.39	8.35	72.79	-449.45	337.05	480.64	469.10	11.54	41.648		
2,100.00	2,073.69	1,950.87	1,903.60	6.84	9.03	73.66	-479.97	357.21	509.64	497.25	12.39	41.135		
2,200.00	2,171.49	2,040.32	1,986.94	7.28	9.63	74.35	-507.02	375.21	538.42	525.22	13.20	40.785		
2,300.00	2,269.29	2,135.10	2,074.75	7.73	10.31	74.90	-536.35	395.49	568.23	554.17	14.05	40.436		
2,400.00	2,367.10	2,238.93	2,171.10	8.18	11.01	75.37	-567.62	418.29	597.38	582.45	14.93	40.013		
2,500.00	2,464.90	2,338.53	2,264.05	8.63	11.64	75.86	-596.70	439.17	625.43	609.65	15.78	39.630		
2,600.00	2,562.71	2,430.76	2,350.21	9.09	12.26	76.32	-623.73	457.94	653.51	636.89	16.62	39.309		
2,700.00	2,660.51	2,520.98	2,434.26	9.54	12.90	76.73	-650.76	476.48	682.32	664.85	17.47	39.052		
2,800.00	2,758.31	2,614.14	2,520.88	9.99	13.56	77.13	-679.24	495.57	711.77	693.43	18.34	38.816		
2,900.00	2,856.12	2,703.74	2,604.01	10.44	14.21	77.46	-706.96	514.26	741.67	722.48	19.19	38.654		
3,000.00	2,953.92	2,801.33	2,694.45	10.90	14.89	77.82	-737.63	534.37	772.05	751.98	20.07	38.471		
3,100.00	3,051.72	2,896.52	2,782.71	11.35	15.56	78.11	-767.11	554.38	802.05	781.11	20.94	38.305		
3,200.00	3,149.53	2,983.50	2,863.03	11.80	16.21	78.27	-794.27	573.83	832.55	810.77	21.79	38.217		
3,300.00	3,247.33	3,089.38	2,960.59	12.26	17.00	78.43	-827.65	597.84	863.45	840.74	22.72	38.012		
3,400.00	3,345.14	3,180.57	3,045.06	12.71	17.63	78.60	-855.56	617.91	893.30	869.73	23.57	37.907		
3,500.00	3,442.94	3,262.99	3,121.29	13.17	18.22	78.82	-881.88	634.91	924.26	899.87	24.39	37.898		
3,600.00	3,540.74	3,360.64	3,211.37	13.62	18.92	79.10	-914.04	654.58	956.18	930.89	25.28	37.821		
3,700.00	3,638.55	3,453.14	3,296.89	14.08	19.59	79.34	-943.81	673.44	987.40	961.24	26.15	37.756 SF		

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



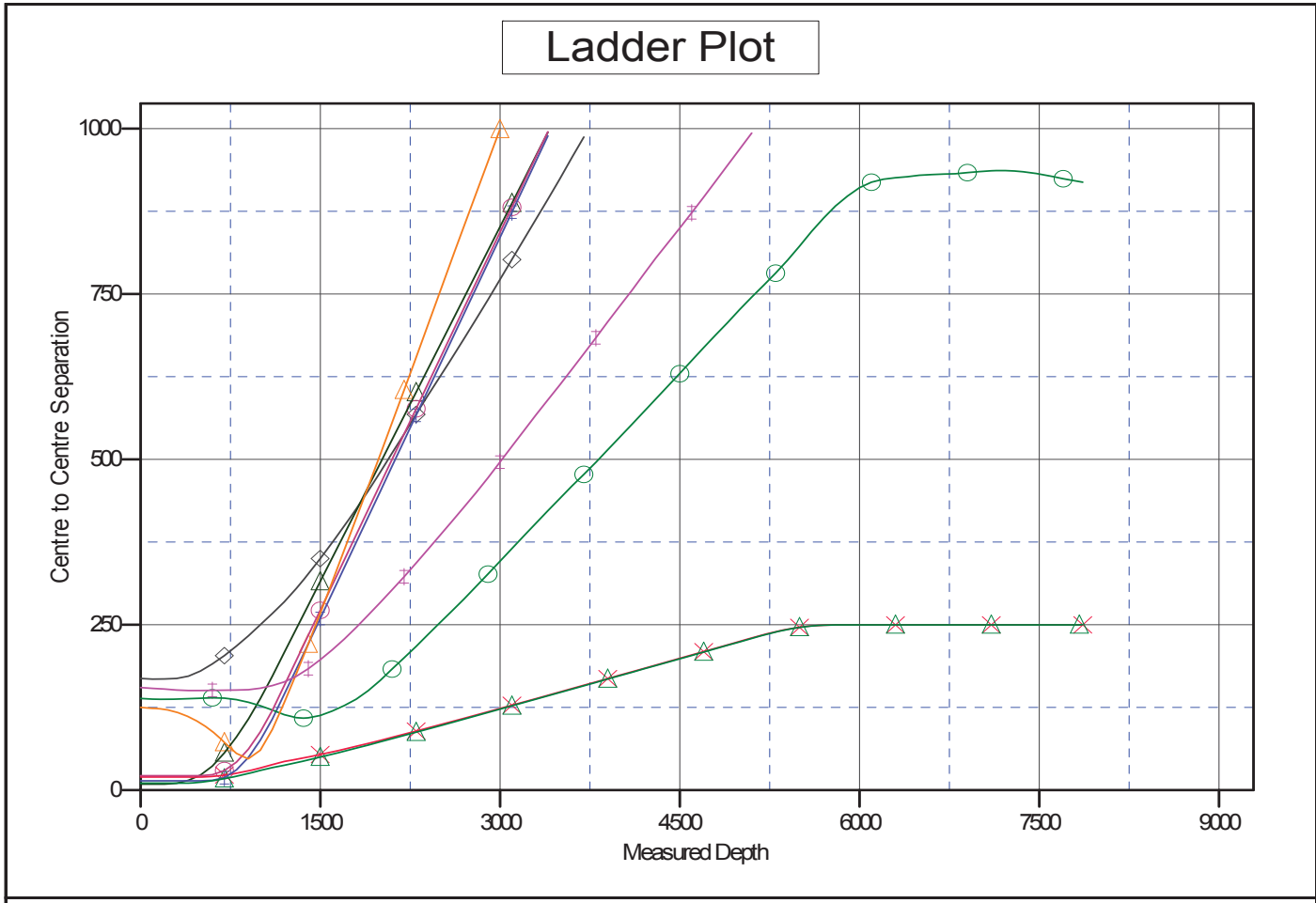
Archer

Anticollision Report

Company: Piceance Energy, LLC	Local Co-ordinate Reference: Well Bruton 30-11E	
Project: Mesa County, CO	TVD Reference: Well @ 7665.00usft	
Reference Site: Bruton 30-10 Pad	MD Reference: Well @ 7665.00usft	
Site Error: 0.00 usft	North Reference: True	
Reference Well: Bruton 30-11E	Survey Calculation Method: Minimum Curvature	
Well Error: 0.00 usft	Output errors are at 2.00 sigma	
Reference Wellbore Slot B-6	Database: EDMDBBW	
Reference Design: Design #3	Offset TVD Reference: Reference Datum	

Reference Depths are relative to Well @ 7665.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-11E
 Coordinate System is US State Plane 1983, Colorado Central Zone
 Grid Convergence at Surface is: -1.46°



LEGEND

- ◆ Bruton 30-16B, Existing, Existing V0
- ▲ Bruton 30-10M, SlotA-6, Design #2 V0
- ✕ Bruton 30-10E, SlotB-7, Design #2 V0
- ◆ Bruton 30-13M, SlotA-5, Design #2 V0
- Bruton 30-08B, Existing, Existing V0
- Bruton 30-09M, SlotA-7, Design #2 V0
- ▲ Bruton 30-06B, Existing, Existing V0
- ▲ Bruton 30-12E, SlotB-5, Design #3 V0
- ✕ Bruton 30-10B, Existing, Existing V0

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



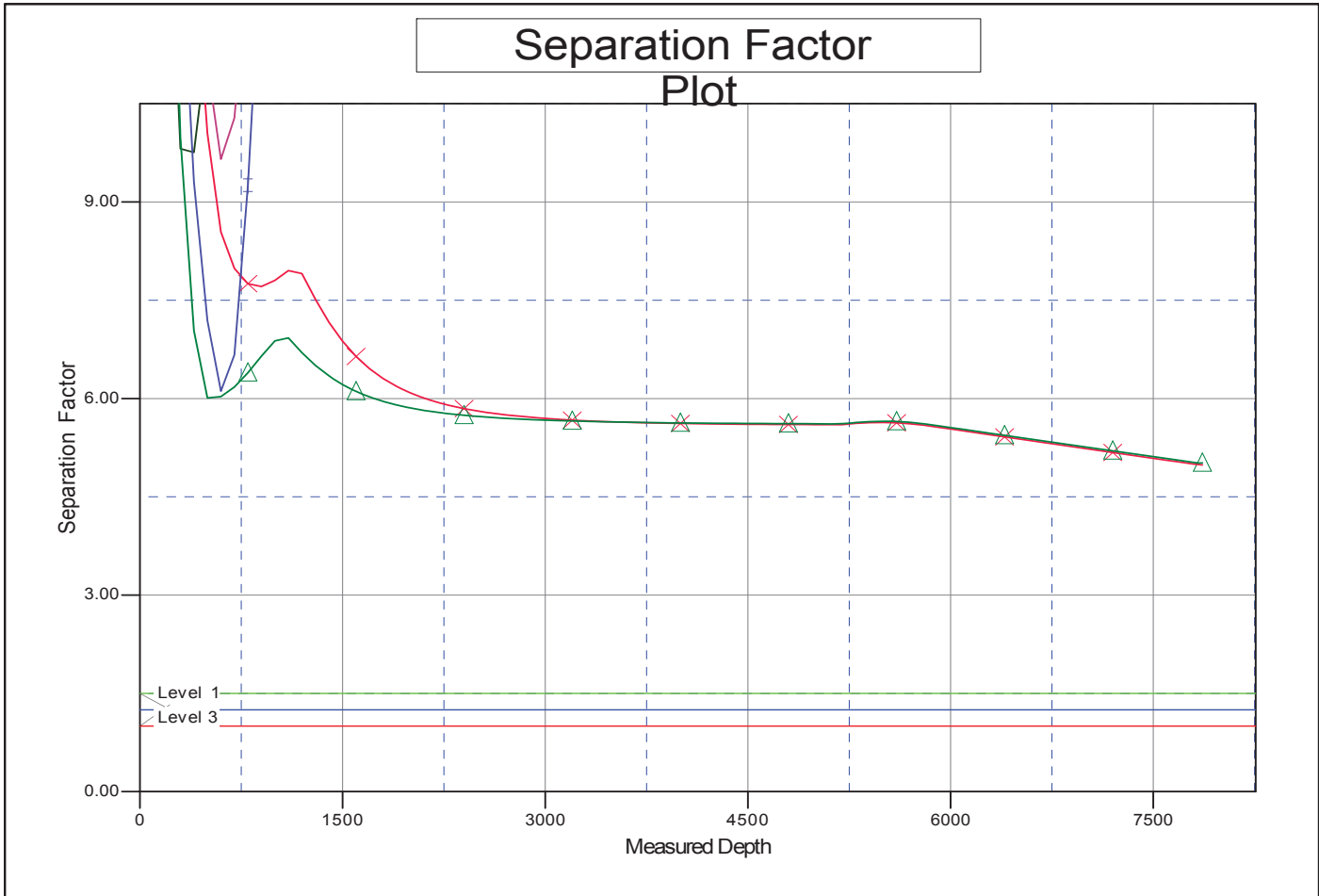
Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Bruton 30-11E
Project:	Mesa County, CO	TVD Reference:	Well @ 7665.00usft
Reference Site:	Bruton 30-10 Pad	MD Reference:	Well @ 7665.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Bruton 30-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-6	Database:	EDMDBBW
Reference Design:	Design #3	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7665.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Bruton 30-11E
 Coordinate System is US State Plane 1983, Colorado Central Zone
 Grid Convergence at Surface is: -1.46°



LEGEND

- ◆ Bruton 30-16B, Existing, Existing V0
 ◆ Bruton 30-13M, SlotA-5, Design #2 V0
 ▲ Bruton 30-06B, Existing, Existing V0
- ▲ Bruton 30-10M, SlotA-6, Design #2 V0
 ● Bruton 30-08B, Existing, Existing V0
 ▲ Bruton 30-12E, SlotB-5, Design #3 V0
- ✕ Bruton 30-10E, SlotB-7, Design #2 V0
 ● Bruton 30-09M, SlotA-7, Design #2 V0
 ✕ Bruton 30-10B, Existing, Existing V0

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