



Piceance Energy, LLC

**Mesa County, CO
Gunderson 20-09
Gunderson 20-03E**

Slot A-1

Plan: Design #1

Standard Planning Report

22 September, 2015



Project: Mesa County, CO
Site: Gunderson 20-09
Well: Gunderson 20-03E
Wellbore: Slot A-1
Design: Design #1
Latitude: 39° 15' 38.941 N
Longitude: 107° 47' 3.991 W
Ground Level: 7475.0
Well @ 7497.0usft

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 Gunderson 20-03E, True North
Vertical (TVD) Reference: Well @ 7497.0usft
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: Well @ 7497.0usft
Calculation Method: Minimum Curvature

WELL DETAILS: Gunderson 20-03E

+N/-S	+E/-W	Northing	Ground Level:	Latitude	Longitude	Slot
0.0	0.0	1528018.73	7475.0	39° 15' 38.941 N	107° 47' 3.991 W	
		2353243.52				

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Gunderson 20-03E tgt	7785.0	2528.1	-642.4	1530562.13	2352664.90	39° 16' 3.929 N	107° 47' 12.160 W	Circle (Radius: 50.0)

SECTION DETAILS

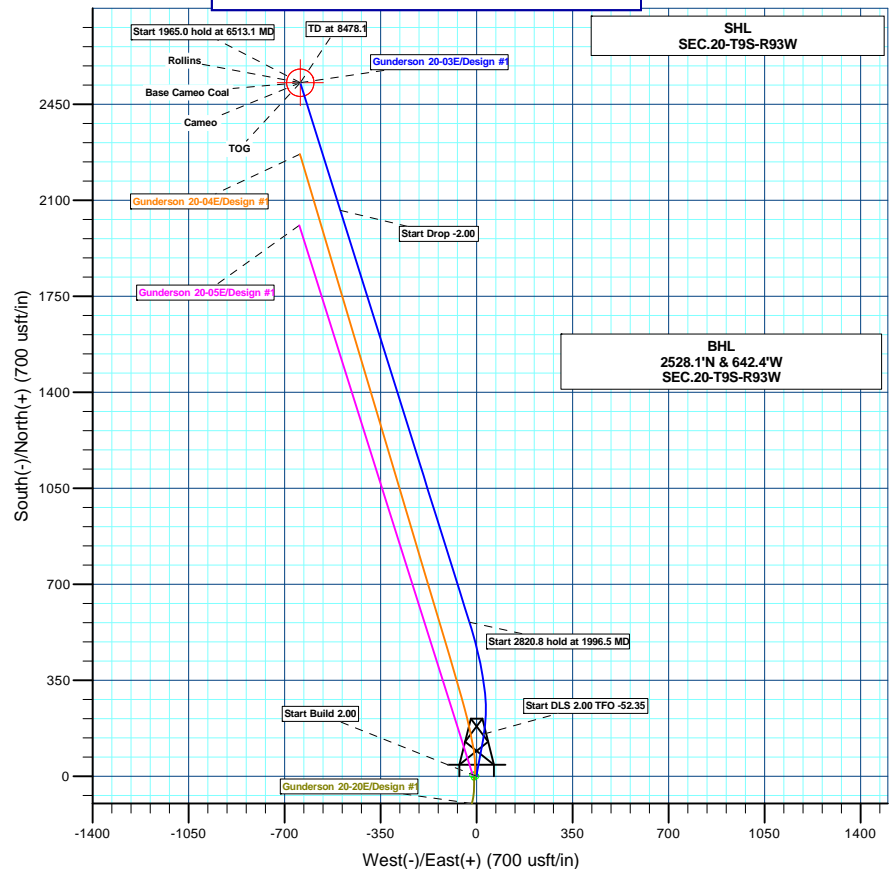
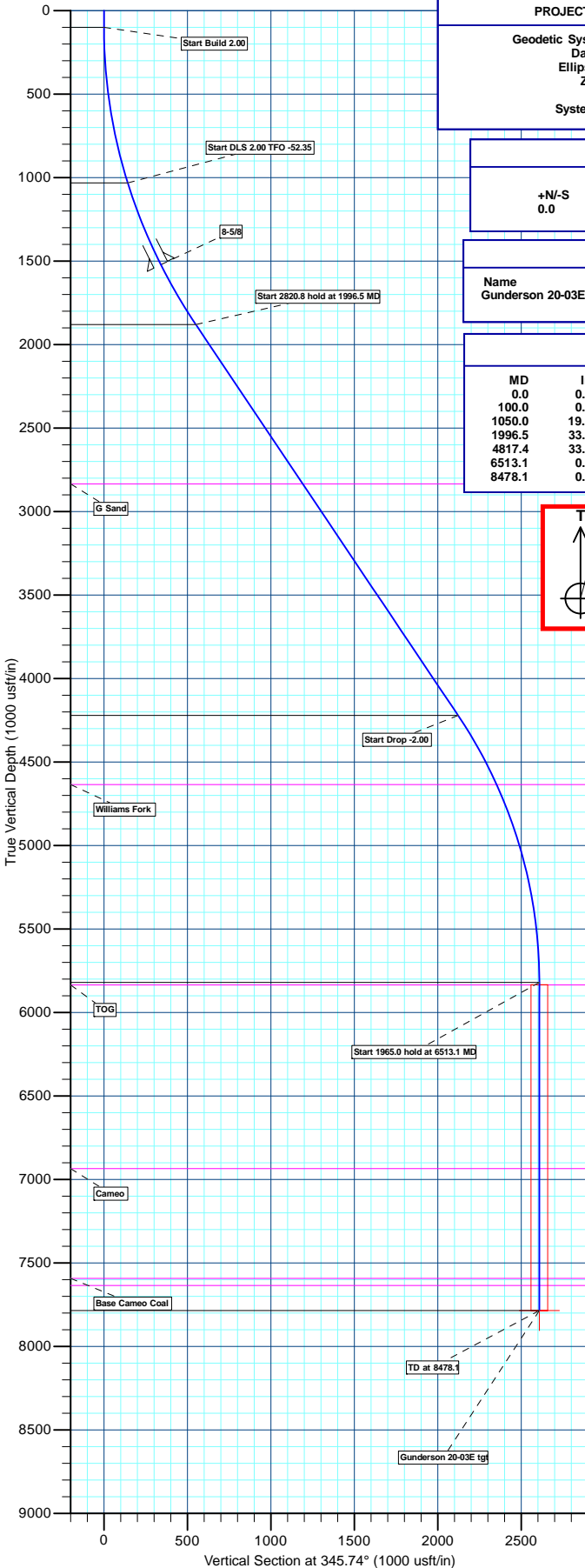
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.0	Start Build 2.00
1050.0	19.00	10.00	1032.7	153.7	27.1	2.00	10.00	142.3	Start DLS 2.00 TFO -52.35
1996.5	33.92	342.59	1880.6	561.1	-25.6	2.00	-52.35	550.2	Start 2820.8 hold at 1996.5 MD
4817.4	33.92	342.59	4221.5	2063.0	-496.6	0.00	0.00	2121.7	Start Drop -2.00
6513.1	0.00	0.00	5820.0	2528.1	-642.4	2.00	180.00	2608.4	Start 1965.0 hold at 6513.1 MD
8478.1	0.00	0.00	7785.0	2528.1	-642.4	0.00	0.00	2608.4	TD at 8478.1



Azimuths to True North
Magnetic North: 9.68°
Magnetic Field
Strength: 51706.6snT
Dip Angle: 65.47°
Date: 09/21/2015
Model: IGRF2010

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2835.0	3146.6	G Sand
4635.0	5291.4	Williams Fork
5835.0	6528.1	TOG
6935.0	7628.1	Cameo
7593.0	8286.1	Base Cameo Coal
7635.0	8328.1	Rollins



Plan: Design #1 (Gunderson 20-03E/Slot A-1)

Created By: Ricky Osburn Date: 10:05, September 22 2015



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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Gunderson 20-03E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7497.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7497.0usft
Site:	Gunderson 20-09	North Reference:	True
Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-1		
Design:	Design #1		

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

Site		Gunderson 20-09			
Site Position:		Northing:	1,527,948.13 usft	Latitude:	39° 15' 38.210 N
From:	Lat/Long	Easting:	2,353,110.33 usft	Longitude:	107° 47' 5.662 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.44 °

Well	Gunderson 20-03E					
Well Position	+N/-S	73.9 usft	Northing:	1,528,018.73 usft	Latitude:	39° 15' 38.941 N
	+E/-W	131.4 usft	Easting:	2,353,243.52 usft	Longitude:	107° 47' 3.991 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,475.0 usft

Wellbore	Slot A-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/09/21	9.68	65.47	51,707

Design	Design #1			
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	345.74

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	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,050.0	19.00	10.00	1,032.7	153.7	27.1	2.00	2.00	0.00	10.00	
1,996.5	33.92	342.59	1,880.6	561.1	-25.6	2.00	1.58	-2.90	-52.35	
4,817.4	33.92	342.59	4,221.5	2,063.0	-496.6	0.00	0.00	0.00	0.00	
6,513.1	0.00	0.00	5,820.0	2,528.1	-642.4	2.00	-2.00	0.00	180.00	
8,478.1	0.00	0.00	7,785.0	2,528.1	-642.4	0.00	0.00	0.00	0.00	Gunderson 20-03E tg



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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Gunderson 20-03E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7497.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7497.0usft
Site:	Gunderson 20-09	North Reference:	True
Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	2.00	10.00	200.0	1.7	0.3	1.6	2.00	2.00	0.00
300.0	4.00	10.00	299.8	6.9	1.2	6.4	2.00	2.00	0.00
400.0	6.00	10.00	399.5	15.5	2.7	14.3	2.00	2.00	0.00
500.0	8.00	10.00	498.7	27.5	4.8	25.4	2.00	2.00	0.00
600.0	10.00	10.00	597.5	42.9	7.6	39.7	2.00	2.00	0.00
700.0	12.00	10.00	695.6	61.7	10.9	57.1	2.00	2.00	0.00
800.0	14.00	10.00	793.1	83.8	14.8	77.6	2.00	2.00	0.00
900.0	16.00	10.00	889.6	109.3	19.3	101.2	2.00	2.00	0.00
1,000.0	18.00	10.00	985.3	138.1	24.3	127.8	2.00	2.00	0.00
Start DLS 2.00 TFO -52.35									
1,050.0	19.00	10.00	1,032.7	153.7	27.1	142.3	2.00	2.00	0.00
1,100.0	19.63	7.64	1,079.9	170.0	29.6	157.5	2.00	1.25	-4.72
1,200.0	20.96	3.35	1,173.7	204.6	32.9	190.1	2.00	1.34	-4.29
1,300.0	22.39	359.56	1,266.6	241.5	33.8	225.7	2.00	1.43	-3.78
1,400.0	23.90	356.22	1,358.5	280.7	32.3	264.1	2.00	1.51	-3.34
1,500.0	25.48	353.26	1,449.4	322.3	28.5	305.4	2.00	1.57	-2.96
8-5/8									
1,580.9	26.79	351.11	1,522.0	357.6	23.6	340.7	2.00	1.62	-2.66
1,600.0	27.10	350.63	1,539.1	366.1	22.2	349.4	2.00	1.64	-2.51
1,700.0	28.77	348.28	1,627.4	412.2	13.6	396.1	2.00	1.67	-2.35
1,800.0	30.48	346.17	1,714.3	460.4	2.7	445.5	2.00	1.71	-2.11
1,900.0	32.21	344.26	1,799.7	510.7	-10.6	497.5	2.00	1.74	-1.91
Start 2820.8 hold at 1996.5 MD									
1,996.5	33.92	342.59	1,880.6	561.1	-25.6	550.2	2.00	1.76	-1.73
2,000.0	33.92	342.59	1,883.5	563.0	-26.2	552.1	0.00	0.00	0.00
2,100.0	33.92	342.59	1,966.5	616.2	-42.9	607.8	0.00	0.00	0.00
2,200.0	33.92	342.59	2,049.5	669.5	-59.6	663.5	0.00	0.00	0.00
2,300.0	33.92	342.59	2,132.5	722.7	-76.3	719.2	0.00	0.00	0.00
2,400.0	33.92	342.59	2,215.5	775.9	-93.0	774.9	0.00	0.00	0.00
2,500.0	33.92	342.59	2,298.4	829.2	-109.7	830.7	0.00	0.00	0.00
2,600.0	33.92	342.59	2,381.4	882.4	-126.4	886.4	0.00	0.00	0.00
2,700.0	33.92	342.59	2,464.4	935.7	-143.1	942.1	0.00	0.00	0.00
2,800.0	33.92	342.59	2,547.4	988.9	-159.8	997.8	0.00	0.00	0.00
2,900.0	33.92	342.59	2,630.4	1,042.1	-176.5	1,053.5	0.00	0.00	0.00
3,000.0	33.92	342.59	2,713.4	1,095.4	-193.2	1,109.2	0.00	0.00	0.00
3,100.0	33.92	342.59	2,796.4	1,148.6	-209.9	1,164.9	0.00	0.00	0.00
G Sand									
3,146.6	33.92	342.59	2,835.0	1,173.4	-217.6	1,190.9	0.00	0.00	0.00
3,200.0	33.92	342.59	2,879.3	1,201.9	-226.5	1,220.6	0.00	0.00	0.00
3,300.0	33.92	342.59	2,962.3	1,255.1	-243.2	1,276.4	0.00	0.00	0.00
3,400.0	33.92	342.59	3,045.3	1,308.4	-259.9	1,332.1	0.00	0.00	0.00
3,500.0	33.92	342.59	3,128.3	1,361.6	-276.6	1,387.8	0.00	0.00	0.00
3,600.0	33.92	342.59	3,211.3	1,414.8	-293.3	1,443.5	0.00	0.00	0.00
3,700.0	33.92	342.59	3,294.3	1,468.1	-310.0	1,499.2	0.00	0.00	0.00
3,800.0	33.92	342.59	3,377.3	1,521.3	-326.7	1,554.9	0.00	0.00	0.00
3,900.0	33.92	342.59	3,460.3	1,574.6	-343.4	1,610.6	0.00	0.00	0.00
4,000.0	33.92	342.59	3,543.2	1,627.8	-360.1	1,666.3	0.00	0.00	0.00
4,100.0	33.92	342.59	3,626.2	1,681.0	-376.8	1,722.1	0.00	0.00	0.00
4,200.0	33.92	342.59	3,709.2	1,734.3	-393.5	1,777.8	0.00	0.00	0.00
4,300.0	33.92	342.59	3,792.2	1,787.5	-410.2	1,833.5	0.00	0.00	0.00
4,400.0	33.92	342.59	3,875.2	1,840.8	-426.9	1,889.2	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Gunderson 20-03E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7497.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7497.0usft
Site:	Gunderson 20-09	North Reference:	True
Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,500.0	33.92	342.59	3,958.2	1,894.0	-443.6	1,944.9	0.00	0.00	0.00
4,600.0	33.92	342.59	4,041.2	1,947.2	-460.3	2,000.6	0.00	0.00	0.00
4,700.0	33.92	342.59	4,124.1	2,000.5	-477.0	2,056.3	0.00	0.00	0.00
4,800.0	33.92	342.59	4,207.1	2,053.7	-493.7	2,112.0	0.00	0.00	0.00
Start Drop -2.00									
4,817.4	33.92	342.59	4,221.5	2,063.0	-496.6	2,121.7	0.00	0.00	0.00
4,900.0	32.26	342.59	4,290.8	2,106.0	-510.1	2,166.8	2.00	-2.00	0.00
5,000.0	30.26	342.59	4,376.2	2,155.5	-525.6	2,218.6	2.00	-2.00	0.00
5,100.0	28.26	342.59	4,463.5	2,202.2	-540.2	2,267.4	2.00	-2.00	0.00
5,200.0	26.26	342.59	4,552.4	2,245.9	-553.9	2,313.1	2.00	-2.00	0.00
Williams Fork									
5,291.4	24.43	342.59	4,635.0	2,283.2	-565.6	2,352.2	2.00	-2.00	0.00
5,300.0	24.26	342.59	4,642.8	2,286.6	-566.7	2,355.7	2.00	-2.00	0.00
5,400.0	22.26	342.59	4,734.7	2,324.3	-578.5	2,395.2	2.00	-2.00	0.00
5,500.0	20.26	342.59	4,827.8	2,358.9	-589.3	2,431.4	2.00	-2.00	0.00
5,600.0	18.26	342.59	4,922.2	2,390.4	-599.2	2,464.3	2.00	-2.00	0.00
5,700.0	16.26	342.59	5,017.7	2,418.7	-608.1	2,493.9	2.00	-2.00	0.00
5,800.0	14.26	342.59	5,114.2	2,443.8	-616.0	2,520.2	2.00	-2.00	0.00
5,900.0	12.26	342.59	5,211.5	2,465.7	-622.8	2,543.1	2.00	-2.00	0.00
6,000.0	10.26	342.59	5,309.6	2,484.3	-628.7	2,562.6	2.00	-2.00	0.00
6,100.0	8.26	342.59	5,408.3	2,499.7	-633.5	2,578.7	2.00	-2.00	0.00
6,200.0	6.26	342.59	5,507.5	2,511.7	-637.3	2,591.3	2.00	-2.00	0.00
6,300.0	4.26	342.59	5,607.1	2,520.5	-640.0	2,600.5	2.00	-2.00	0.00
6,400.0	2.26	342.59	5,706.9	2,525.9	-641.7	2,606.2	2.00	-2.00	0.00
6,500.0	0.26	342.59	5,806.9	2,528.0	-642.4	2,608.4	2.00	-2.00	0.00
Start 1965.0 hold at 6513.1 MD									
6,513.1	0.00	0.00	5,820.0	2,528.1	-642.4	2,608.4	2.00	-2.00	0.00
TOG									
6,528.1	0.00	0.00	5,835.0	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
6,600.0	0.00	0.00	5,906.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
6,700.0	0.00	0.00	6,006.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,106.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,206.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,306.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,100.0	0.00	0.00	6,406.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,200.0	0.00	0.00	6,506.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,300.0	0.00	0.00	6,606.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,400.0	0.00	0.00	6,706.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,500.0	0.00	0.00	6,806.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,600.0	0.00	0.00	6,906.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
Cameo									
7,628.1	0.00	0.00	6,935.0	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,700.0	0.00	0.00	7,006.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,800.0	0.00	0.00	7,106.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
7,900.0	0.00	0.00	7,206.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
8,000.0	0.00	0.00	7,306.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
8,100.0	0.00	0.00	7,406.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
8,200.0	0.00	0.00	7,506.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
Base Cameo Coal									
8,286.1	0.00	0.00	7,593.0	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
8,300.0	0.00	0.00	7,606.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00
Rollins									
8,328.1	0.00	0.00	7,635.0	2,528.1	-642.4	2,608.4	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Gunderson 20-03E
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7497.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7497.0usft
Site:	Gunderson 20-09	North Reference:	True
Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,400.0	0.00	0.00	7,706.9	2,528.1	-642.4	2,608.4	0.00	0.00	0.00	
TD at 8478.1										
8,478.1	0.00	0.00	7,785.0	2,528.1	-642.4	2,608.4	0.00	0.00	0.00	

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										
Gunderson 20-03E tgt	0.00	0.00	7,785.0	2,528.1	-642.4	1,530,562.13	2,352,664.90	39° 16' 3.929 N	107° 47' 12.160 W	
- plan hits target center										
- Circle (radius 50.0)										

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")						
1,580.9	1,522.0	8-5/8	8-5/8	12-1/4						

Formations										
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)					
3,146.6	2,835.0	G Sand		0.00						
5,291.4	4,635.0	Williams Fork		0.00						
6,528.1	5,835.0	TOG		0.00						
7,628.1	6,935.0	Cameo		0.00						
8,286.1	7,593.0	Base Cameo Coal		0.00						
8,328.1	7,635.0	Rollins		0.00						

Plan Annotations										
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment						
		+N/-S (usft)	+E/-W (usft)							
100.0	100.0	0.0	0.0	Start Build 2.00						
1,050.0	1,032.7	153.7	27.1	Start DLS 2.00 TFO -52.35						
1,996.5	1,880.6	561.1	-25.6	Start 2820.8 hold at 1996.5 MD						
4,817.4	4,221.5	2,063.0	-496.6	Start Drop -2.00						
6,513.1	5,820.0	2,528.1	-642.4	Start 1965.0 hold at 6513.1 MD						
8,478.1	7,785.0	2,528.1	-642.4	TD at 8478.1						



Piceance Energy, LLC

Mesa County, CO

Gunderson 20-09

Gunderson 20-03E

Slot A-1

Design #1

Anticollision Report

22 September, 2015



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference	Design #1		
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	2015/09/22		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	8,478.1	Design #1 (Slot A-1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Gunderson 20-09						
Gunderson 20-04E - Slot B-1 - Design #1	100.0	100.0	9.7	9.5	55.050	CC
Gunderson 20-04E - Slot B-1 - Design #1	200.0	199.7	9.8	9.2	14.855	ES
Gunderson 20-04E - Slot B-1 - Design #1	2,900.0	2,881.0	107.3	70.1	2.888	SF
Gunderson 20-05E - Slot B-2 - Design #1	100.0	100.0	14.7	14.5	83.923	CC, ES
Gunderson 20-05E - Slot B-2 - Design #1	2,500.0	2,477.5	168.8	139.5	5.757	SF
Gunderson 20-20E - Slot A-2 - Design #1	100.0	100.0	9.9	9.7	56.510	CC, ES
Gunderson 20-20E - Slot A-2 - Design #1	300.0	298.7	21.3	20.1	17.803	SF

Gunderson 20-09 - Gunderson 20-04E - Slot B-1 - Design #1												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	-33.88	8.0	-5.4	9.7				
100.0	100.0	100.0	100.0	0.1	0.1	-33.88	8.0	-5.4	9.7	9.5	0.18	55.050	CC
200.0	200.0	199.7	199.7	0.3	0.3	-45.27	9.7	-5.4	9.8	9.2	0.66	14.855	ES
300.0	299.8	299.4	299.3	0.6	0.6	-49.11	15.0	-5.4	10.4	9.3	1.16	9.015	
400.0	399.5	399.1	398.6	0.8	0.8	-54.59	23.6	-5.4	11.5	9.9	1.67	6.912	
500.0	498.7	498.8	497.5	1.1	1.1	-60.63	35.7	-5.4	13.2	11.0	2.22	5.938	
600.0	597.5	598.4	595.9	1.4	1.4	-66.82	51.2	-5.5	15.6	12.8	2.86	5.461	
700.0	695.6	697.8	693.6	1.8	1.8	-74.27	69.9	-6.9	19.7	16.1	3.60	5.457	
800.0	793.1	797.1	790.3	2.2	2.2	-81.11	91.6	-9.6	25.7	21.2	4.46	5.761	
900.0	889.6	896.1	886.1	2.7	2.7	-86.47	116.2	-13.6	33.8	28.4	5.42	6.227	
1,000.0	985.3	994.8	980.7	3.3	3.2	-90.42	143.9	-18.9	43.9	37.4	6.49	6.761	
1,100.0	1,079.9	1,093.2	1,074.0	3.9	3.8	-90.96	174.4	-25.6	55.7	48.0	7.66	7.271	
1,200.0	1,173.7	1,191.5	1,166.2	4.5	4.5	-88.25	207.8	-33.5	66.9	58.0	8.90	7.521	
1,300.0	1,266.6	1,289.9	1,257.2	5.2	5.2	-85.14	244.0	-42.8	77.2	67.0	10.23	7.543	
1,400.0	1,358.5	1,388.2	1,346.7	5.9	5.9	-81.92	283.1	-53.3	86.4	74.8	11.66	7.413	
1,500.0	1,449.4	1,486.4	1,434.8	6.7	6.7	-78.69	324.9	-65.0	94.7	81.5	13.17	7.188	
1,600.0	1,539.1	1,584.6	1,521.3	7.5	7.6	-75.48	369.4	-78.1	101.9	87.2	14.76	6.904	
1,700.0	1,627.4	1,684.3	1,608.3	8.3	8.6	-72.96	416.2	-92.0	107.4	91.0	16.46	6.528	
1,800.0	1,714.3	1,784.2	1,695.5	9.2	9.5	-71.93	463.1	-106.0	110.3	92.1	18.26	6.041	
1,900.0	1,799.7	1,884.2	1,782.6	10.2	10.4	-72.30	509.9	-120.0	110.7	90.5	20.19	5.483	
2,000.0	1,883.5	1,983.9	1,869.6	11.2	11.4	-74.22	556.7	-133.9	108.8	86.5	22.24	4.890	

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 Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson 20-09 - Gunderson 20-04E - Slot B-1 - Design #1													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		
2,100.0	1,966.5	2,083.6	1,956.5	12.2	12.3	-78.28	603.5	-147.8	106.2	81.8	24.34	4.362		
2,200.0	2,049.5	2,183.3	2,043.4	13.3	13.3	-82.53	650.3	-161.8	104.2	77.7	26.41	3.944		
2,300.0	2,132.5	2,283.0	2,130.3	14.3	14.2	-86.91	697.0	-175.7	102.7	74.3	28.41	3.616		
2,400.0	2,215.5	2,382.6	2,217.3	15.4	15.2	-91.40	743.8	-189.7	101.9	71.6	30.29	3.364		
2,477.5	2,279.8	2,459.9	2,284.7	16.2	15.9	-94.91	780.0	-200.5	101.7	70.1	31.65	3.213		
2,500.0	2,298.4	2,482.3	2,304.2	16.4	16.1	-95.93	790.5	-203.6	101.7	69.7	32.03	3.176		
2,600.0	2,381.4	2,582.0	2,391.1	17.5	17.1	-100.44	837.3	-217.5	102.2	68.6	33.60	3.042		
2,700.0	2,464.4	2,681.6	2,478.0	18.6	18.0	-104.89	884.0	-231.5	103.3	68.3	34.97	2.953		
2,800.0	2,547.4	2,781.3	2,564.9	19.7	19.0	-109.22	930.8	-245.4	105.0	68.8	36.15	2.904		
2,900.0	2,630.4	2,881.0	2,651.9	20.7	19.9	-113.39	977.5	-259.4	107.3	70.1	37.14	2.888 SF		
3,000.0	2,713.4	2,980.7	2,738.8	21.8	20.9	-117.36	1,024.3	-273.3	110.1	72.2	37.96	2.901		
3,100.0	2,796.4	3,080.3	2,825.7	22.9	21.8	-121.12	1,071.0	-287.2	113.4	74.8	38.62	2.937		
3,200.0	2,879.3	3,180.0	2,912.6	24.0	22.8	-124.65	1,117.8	-301.2	117.2	78.1	39.16	2.994		
3,300.0	2,962.3	3,279.7	2,999.5	25.1	23.7	-127.95	1,164.5	-315.1	121.5	81.9	39.59	3.068		
3,400.0	3,045.3	3,379.4	3,086.4	26.2	24.7	-131.02	1,211.3	-329.1	126.1	86.1	39.94	3.156		
3,500.0	3,128.3	3,479.0	3,173.4	27.3	25.7	-133.87	1,258.0	-343.0	131.0	90.7	40.24	3.255		
3,600.0	3,211.3	3,578.7	3,260.3	28.4	26.6	-136.51	1,304.8	-356.9	136.2	95.7	40.50	3.363		
3,700.0	3,294.3	3,678.4	3,347.2	29.5	27.6	-138.94	1,351.5	-370.9	141.7	101.0	40.74	3.478		
3,800.0	3,377.3	3,778.1	3,434.1	30.6	28.5	-141.20	1,398.3	-384.8	147.4	106.5	40.97	3.599		
3,900.0	3,460.3	3,877.7	3,521.0	31.7	29.5	-143.28	1,445.1	-398.7	153.4	112.2	41.20	3.723		
4,000.0	3,543.2	3,977.4	3,608.0	32.7	30.4	-145.20	1,491.8	-412.7	159.5	118.1	41.44	3.849		
4,100.0	3,626.2	4,077.1	3,694.9	33.8	31.4	-146.98	1,538.6	-426.6	165.8	124.1	41.69	3.977		
4,200.0	3,709.2	4,176.8	3,781.8	34.9	32.4	-148.63	1,585.3	-440.6	172.3	130.3	41.96	4.105		
4,300.0	3,792.2	4,276.4	3,868.7	36.0	33.3	-150.16	1,632.1	-454.5	178.8	136.6	42.26	4.232		
4,400.0	3,875.2	4,376.1	3,955.6	37.1	34.3	-151.58	1,678.8	-468.4	185.5	143.0	42.57	4.358		
4,500.0	3,958.2	4,475.8	4,042.5	38.2	35.2	-152.90	1,725.6	-482.4	192.3	149.4	42.91	4.483		
4,600.0	4,041.2	4,575.4	4,129.5	39.3	36.2	-154.13	1,772.3	-496.3	199.2	156.0	43.27	4.604		
4,700.0	4,124.1	4,675.1	4,216.4	40.4	37.1	-155.27	1,819.1	-510.3	206.2	162.6	43.66	4.724		
4,800.0	4,207.1	4,774.8	4,303.3	41.5	38.1	-156.35	1,865.8	-524.2	213.3	169.2	44.06	4.840		
4,900.0	4,290.8	4,874.6	4,390.3	42.5	39.1	-157.27	1,912.6	-538.1	219.3	174.8	44.54	4.924		
5,000.0	4,376.2	4,968.3	4,472.7	43.3	39.8	-157.89	1,955.5	-550.9	223.5	178.5	44.98	4.968		
5,100.0	4,463.5	5,061.4	4,555.8	44.1	40.4	-158.46	1,995.6	-562.9	227.4	182.1	45.38	5.012		
5,200.0	4,552.4	5,154.3	4,640.2	44.9	41.1	-158.98	2,032.9	-574.0	231.2	185.5	45.74	5.055		
5,300.0	4,642.8	5,247.1	4,725.6	45.5	41.6	-159.44	2,067.6	-584.4	234.8	188.7	46.05	5.099		
5,400.0	4,734.7	5,339.9	4,812.1	46.2	42.2	-159.87	2,099.6	-593.9	238.2	191.8	46.31	5.142		
5,500.0	4,827.8	5,432.5	4,899.6	46.8	42.7	-160.26	2,128.9	-602.6	241.3	194.8	46.53	5.186		
5,600.0	4,922.2	5,525.0	4,987.9	47.3	43.1	-160.60	2,155.4	-610.5	244.2	197.5	46.70	5.230		
5,700.0	5,017.7	5,617.4	5,076.9	47.8	43.5	-160.91	2,179.1	-617.6	246.9	200.1	46.81	5.272		
5,800.0	5,114.2	5,709.8	5,166.6	48.3	43.9	-161.18	2,200.1	-623.8	249.4	202.6	46.87	5.326		
5,900.0	5,211.5	5,800.0	5,254.9	48.7	44.2	-161.42	2,217.9	-629.1	251.7	204.9	46.78	5.380		
6,000.0	5,309.6	5,894.3	5,347.8	49.0	44.5	-161.63	2,233.6	-633.8	253.7	206.9	46.82	5.418		
6,100.0	5,408.3	5,986.5	5,439.0	49.3	44.8	-161.80	2,246.1	-637.6	255.4	208.7	46.71	5.469		
6,200.0	5,507.5	6,078.6	5,530.6	49.5	45.0	-161.95	2,255.8	-640.5	257.0	210.4	46.54	5.521		
6,300.0	5,607.1	6,170.7	5,622.4	49.7	45.1	-162.07	2,262.7	-642.5	258.2	211.9	46.32	5.575		
6,400.0	5,706.9	6,262.7	5,714.3	49.8	45.2	-162.15	2,268.8	-643.7	259.3	213.2	46.05	5.631		
6,500.0	5,806.9	6,355.3	5,806.9	49.9	45.3	-162.21	2,268.0	-644.1	260.0	214.3	45.76	5.683		
6,600.0	5,906.9	6,455.3	5,906.9	50.0	45.4	-179.62	2,268.0	-644.1	260.1	214.1	45.96	5.658		
6,700.0	6,006.9	6,555.3	6,006.9	50.0	45.4	-179.62	2,268.0	-644.1	260.1	213.9	46.18	5.631		
6,800.0	6,106.9	6,655.3	6,106.9	50.1	45.5	-179.62	2,268.0	-644.1	260.1	213.6	46.41	5.604		
6,900.0	6,206.9	6,755.3	6,206.9	50.1	45.5	-179.62	2,268.0	-644.1	260.1	213.4	46.64	5.576		
7,000.0	6,306.9	6,855.3	6,306.9	50.2	45.6	-179.62	2,268.0	-644.1	260.1	213.2	46.87	5.549		
7,100.0	6,406.9	6,955.3	6,406.9	50.2	45.7	-179.62	2,268.0	-644.1	260.1	213.0	47.10	5.521		

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 Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson 20-09 - Gunderson 20-04E - Slot B-1 - Design #1												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	
7,200.0	6,506.9	7,055.3	6,506.9	50.3	45.7	-179.62	2,268.0	-644.1	260.1	212.7	47.34	5.494	
7,300.0	6,606.9	7,155.3	6,606.9	50.4	45.8	-179.62	2,268.0	-644.1	260.1	212.5	47.58	5.466	
7,400.0	6,706.9	7,255.3	6,706.9	50.4	45.8	-179.62	2,268.0	-644.1	260.1	212.2	47.82	5.438	
7,500.0	6,806.9	7,355.3	6,806.9	50.5	45.9	-179.62	2,268.0	-644.1	260.1	212.0	48.07	5.410	
7,600.0	6,906.9	7,455.3	6,906.9	50.5	46.0	-179.62	2,268.0	-644.1	260.1	211.7	48.32	5.382	
7,700.0	7,006.9	7,555.3	7,006.9	50.6	46.0	-179.62	2,268.0	-644.1	260.1	211.5	48.57	5.354	
7,800.0	7,106.9	7,655.3	7,106.9	50.7	46.1	-179.62	2,268.0	-644.1	260.1	211.2	48.82	5.326	
7,900.0	7,206.9	7,755.3	7,206.9	50.7	46.2	-179.62	2,268.0	-644.1	260.1	211.0	49.08	5.298	
8,000.0	7,306.9	7,855.3	7,306.9	50.8	46.3	-179.62	2,268.0	-644.1	260.1	210.7	49.34	5.271	
8,100.0	7,406.9	7,955.3	7,406.9	50.8	46.3	-179.62	2,268.0	-644.1	260.1	210.5	49.61	5.243	
8,200.0	7,506.9	8,055.3	7,506.9	50.9	46.4	-179.62	2,268.0	-644.1	260.1	210.2	49.87	5.215	
8,300.0	7,606.9	8,155.3	7,606.9	51.0	46.5	-179.62	2,268.0	-644.1	260.1	209.9	50.14	5.187	
8,400.0	7,706.9	8,255.3	7,706.9	51.0	46.5	-179.62	2,268.0	-644.1	260.1	209.6	50.41	5.159	
8,451.1	7,757.9	8,306.3	7,757.9	51.1	46.6	-179.62	2,268.0	-644.1	260.1	209.5	50.55	5.145	
8,478.1	7,785.0	8,330.4	7,782.0	51.1	46.6	-179.62	2,268.0	-644.1	260.1	209.6	50.43	5.157	



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													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	-74.20	4.0	-14.2	14.7					
100.0	100.0	100.0	100.0	0.1	0.1	-74.20	4.0	-14.2	14.7	14.5	0.18	83.923 CC, ES		
200.0	200.0	199.7	199.7	0.3	0.3	-85.22	5.7	-14.7	15.5	14.9	0.64	24.144		
300.0	299.8	299.4	299.2	0.6	0.6	-87.75	10.6	-16.2	17.9	16.7	1.12	15.894		
400.0	399.5	399.0	398.4	0.8	0.8	-90.72	18.9	-18.8	21.9	20.2	1.64	13.325		
500.0	498.7	498.4	497.2	1.1	1.1	-93.39	30.4	-22.5	27.5	25.3	2.22	12.415		
600.0	597.5	597.8	595.3	1.4	1.4	-95.51	45.1	-27.1	34.8	32.0	2.87	12.132		
700.0	695.6	696.9	692.6	1.8	1.8	-97.11	63.1	-32.8	43.8	40.2	3.62	12.105		
800.0	793.1	795.7	788.9	2.2	2.2	-98.27	84.2	-39.4	54.4	49.9	4.46	12.181		
900.0	889.6	894.4	884.2	2.7	2.7	-99.11	108.4	-47.1	66.6	61.2	5.42	12.290		
1,000.0	985.3	992.7	978.3	3.3	3.3	-99.71	135.6	-55.7	80.3	73.9	6.48	12.405		
1,100.0	1,079.9	1,090.7	1,071.1	3.9	3.9	-97.88	165.8	-65.2	95.3	87.7	7.64	12.479		
1,200.0	1,173.7	1,188.8	1,162.8	4.5	4.5	-93.83	199.0	-75.6	109.3	100.4	8.89	12.296		
1,300.0	1,266.6	1,286.9	1,253.2	5.2	5.3	-89.95	235.2	-87.1	121.8	111.5	10.24	11.898		
1,400.0	1,358.5	1,385.1	1,342.4	5.9	6.0	-86.26	274.3	-99.4	132.9	121.2	11.69	11.372		
1,500.0	1,449.4	1,484.5	1,431.9	6.7	6.9	-83.31	315.7	-112.5	142.2	128.9	13.24	10.742		
1,600.0	1,539.1	1,584.3	1,521.6	7.5	7.7	-81.70	357.2	-125.6	149.1	134.2	14.87	10.029		
1,700.0	1,627.4	1,684.0	1,611.4	8.3	8.5	-81.30	398.7	-138.7	153.7	137.2	16.58	9.274		
1,800.0	1,714.3	1,783.8	1,701.1	9.2	9.4	-82.05	440.2	-151.7	156.3	138.0	18.36	8.514		
1,900.0	1,799.7	1,883.3	1,790.7	10.2	10.2	-83.96	481.6	-164.8	157.2	137.0	20.20	7.783		
2,000.0	1,883.5	1,982.5	1,879.9	11.2	11.1	-87.12	522.9	-177.8	156.9	134.8	22.04	7.117		
2,050.9	1,925.8	2,032.9	1,925.3	11.7	11.5	-89.70	543.8	-184.4	156.7	133.7	22.95	6.827		
2,100.0	1,966.5	2,081.5	1,969.0	12.2	11.9	-92.18	564.1	-190.8	156.9	133.0	23.80	6.589		
2,200.0	2,049.5	2,180.5	2,058.1	13.3	12.7	-97.21	605.3	-203.8	158.1	132.7	25.43	6.216		
2,300.0	2,132.5	2,279.5	2,147.2	14.3	13.6	-102.12	646.5	-216.8	160.5	133.6	26.90	5.968		
2,400.0	2,215.5	2,378.5	2,236.3	15.4	14.4	-106.86	687.7	-229.8	164.1	135.9	28.20	5.821		
2,500.0	2,298.4	2,477.5	2,325.4	16.4	15.3	-111.36	728.9	-242.8	168.8	139.5	29.33	5.757 SF		
2,600.0	2,381.4	2,576.6	2,414.5	17.5	16.1	-115.60	770.1	-255.8	174.5	144.2	30.30	5.760		
2,700.0	2,464.4	2,675.6	2,503.6	18.6	17.0	-119.56	811.3	-268.8	181.1	150.0	31.15	5.816		
2,800.0	2,547.4	2,774.6	2,592.7	19.7	17.8	-123.22	852.5	-281.8	188.5	156.7	31.88	5.915		
2,900.0	2,630.4	2,873.6	2,681.8	20.7	18.7	-126.60	893.7	-294.8	196.7	164.2	32.52	6.048		
3,000.0	2,713.4	2,972.6	2,770.9	21.8	19.5	-129.71	934.9	-307.8	205.4	172.3	33.09	6.208		
3,100.0	2,796.4	3,071.6	2,860.0	22.9	20.4	-132.56	976.1	-320.8	214.8	181.1	33.62	6.389		
3,200.0	2,879.3	3,170.7	2,949.1	24.0	21.2	-135.16	1,017.3	-333.8	224.6	190.5	34.11	6.584		
3,300.0	2,962.3	3,269.7	3,038.2	25.1	22.1	-137.55	1,058.5	-346.8	234.8	200.2	34.58	6.791		
3,400.0	3,045.3	3,368.7	3,127.3	26.2	22.9	-139.73	1,099.7	-359.8	245.4	210.4	35.03	7.005		
3,500.0	3,128.3	3,467.7	3,216.3	27.3	23.8	-141.74	1,140.9	-372.8	256.3	220.8	35.49	7.223		
3,600.0	3,211.3	3,566.7	3,305.4	28.4	24.6	-143.57	1,182.1	-385.8	267.5	231.6	35.94	7.444		
3,700.0	3,294.3	3,665.7	3,394.5	29.5	25.5	-145.26	1,223.3	-398.8	279.0	242.6	36.40	7.665		
3,800.0	3,377.3	3,764.7	3,483.6	30.6	26.3	-146.82	1,264.5	-411.7	290.7	253.8	36.87	7.884		
3,900.0	3,460.3	3,863.8	3,572.7	31.7	27.2	-148.25	1,305.7	-424.7	302.6	265.2	37.35	8.101		
4,000.0	3,543.2	3,962.8	3,661.8	32.7	28.0	-149.58	1,346.9	-437.7	314.6	276.8	37.84	8.314		
4,100.0	3,626.2	4,061.8	3,750.9	33.8	28.9	-150.81	1,388.1	-450.7	326.8	288.5	38.35	8.523		
4,200.0	3,709.2	4,160.8	3,840.0	34.9	29.7	-151.95	1,429.3	-463.7	339.2	300.3	38.87	8.727		
4,300.0	3,792.2	4,259.8	3,929.1	36.0	30.6	-153.01	1,470.5	-476.7	351.7	312.3	39.40	8.926		
4,400.0	3,875.2	4,358.8	4,018.2	37.1	31.4	-154.00	1,511.7	-489.7	364.3	324.3	39.94	9.120		
4,500.0	3,958.2	4,457.9	4,107.3	38.2	32.3	-154.92	1,552.9	-502.7	376.9	336.4	40.50	9.307		
4,600.0	4,041.2	4,556.9	4,196.4	39.3	33.1	-155.78	1,594.1	-515.7	389.7	348.6	41.07	9.489		
4,700.0	4,124.1	4,655.9	4,285.5	40.4	34.0	-156.59	1,635.3	-528.7	402.6	360.9	41.65	9.665		
4,800.0	4,207.1	4,754.9	4,374.6	41.5	34.8	-157.34	1,676.5	-541.7	415.5	373.3	42.24	9.836		
4,900.0	4,290.8	4,854.1	4,463.8	42.5	35.7	-158.07	1,717.8	-554.7	427.4	384.5	42.85	9.975		
5,000.0	4,376.2	4,946.3	4,546.9	43.3	36.4	-158.58	1,755.7	-566.7	436.7	393.3	43.39	10.064		

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 Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson 20-09 - Gunderson 20-05E - Slot B-2 - Design #1													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		
5,100.0	4,463.5	5,033.3	4,626.5	44.1	36.9	-159.01	1,789.5	-577.3	445.3	401.5	43.83	10.160		
5,200.0	4,552.4	5,120.2	4,706.9	44.9	37.4	-159.41	1,820.8	-587.2	453.6	409.3	44.23	10.254		
5,300.0	4,642.8	5,206.9	4,788.1	45.5	37.9	-159.78	1,849.7	-596.3	461.4	416.8	44.58	10.349		
5,400.0	4,734.7	5,300.0	4,876.3	46.2	38.4	-160.13	1,878.2	-605.3	468.8	423.9	44.98	10.424		
5,500.0	4,827.8	5,379.7	4,952.6	46.8	38.8	-160.42	1,900.3	-612.3	475.8	430.6	45.13	10.541		
5,600.0	4,922.2	5,465.9	5,035.7	47.3	39.2	-160.69	1,922.0	-619.1	482.3	437.0	45.33	10.639		
5,700.0	5,017.7	5,551.9	5,119.3	47.8	39.5	-160.94	1,941.3	-625.2	488.4	442.9	45.48	10.739		
5,800.0	5,114.2	5,637.8	5,203.4	48.3	39.8	-161.17	1,958.1	-630.5	494.0	448.4	45.57	10.841		
5,900.0	5,211.5	5,723.6	5,287.8	48.7	40.1	-161.37	1,972.5	-635.1	499.2	453.6	45.60	10.946		
6,000.0	5,309.6	5,809.3	5,372.6	49.0	40.3	-161.56	1,984.5	-638.9	503.9	458.3	45.58	11.054		
6,100.0	5,408.3	5,900.0	5,462.7	49.3	40.5	-161.72	1,994.5	-642.0	508.1	462.5	45.64	11.134		
6,200.0	5,507.5	5,980.3	5,542.7	49.5	40.6	-161.86	2,001.2	-644.1	511.8	466.5	45.38	11.280		
6,300.0	5,607.1	6,065.7	5,627.9	49.7	40.8	-161.98	2,005.8	-645.6	515.1	469.9	45.19	11.399		
6,400.0	5,706.9	6,151.0	5,713.2	49.8	40.9	-162.08	2,008.1	-646.3	517.9	472.9	44.95	11.522		
6,500.0	5,806.9	6,244.7	5,806.9	49.9	40.9	-162.15	2,008.3	-646.4	519.7	474.8	44.94	11.566		
6,600.0	5,906.9	6,344.7	5,906.9	50.0	41.0	-179.56	2,008.3	-646.4	519.8	474.6	45.15	11.511		
6,700.0	6,006.9	6,444.7	6,006.9	50.0	41.0	-179.56	2,008.3	-646.4	519.8	474.4	45.38	11.453		
6,800.0	6,106.9	6,544.7	6,106.9	50.1	41.1	-179.56	2,008.3	-646.4	519.8	474.1	45.61	11.395		
6,900.0	6,206.9	6,644.7	6,206.9	50.1	41.2	-179.56	2,008.3	-646.4	519.8	473.9	45.85	11.337		
7,000.0	6,306.9	6,744.7	6,306.9	50.2	41.2	-179.56	2,008.3	-646.4	519.8	473.7	46.09	11.278		
7,100.0	6,406.9	6,844.7	6,406.9	50.2	41.3	-179.56	2,008.3	-646.4	519.8	473.4	46.33	11.219		
7,200.0	6,506.9	6,944.7	6,506.9	50.3	41.4	-179.56	2,008.3	-646.4	519.8	473.2	46.57	11.160		
7,300.0	6,606.9	7,044.7	6,606.9	50.4	41.5	-179.56	2,008.3	-646.4	519.8	472.9	46.82	11.101		
7,400.0	6,706.9	7,144.7	6,706.9	50.4	41.5	-179.56	2,008.3	-646.4	519.8	472.7	47.07	11.042		
7,500.0	6,806.9	7,244.7	6,806.9	50.5	41.6	-179.56	2,008.3	-646.4	519.8	472.4	47.32	10.983		
7,600.0	6,906.9	7,344.7	6,906.9	50.5	41.7	-179.56	2,008.3	-646.4	519.8	472.2	47.58	10.924		
7,700.0	7,006.9	7,444.7	7,006.9	50.6	41.8	-179.56	2,008.3	-646.4	519.8	471.9	47.84	10.865		
7,800.0	7,106.9	7,544.7	7,106.9	50.7	41.8	-179.56	2,008.3	-646.4	519.8	471.7	48.10	10.806		
7,900.0	7,206.9	7,644.7	7,206.9	50.7	41.9	-179.56	2,008.3	-646.4	519.8	471.4	48.36	10.747		
8,000.0	7,306.9	7,744.7	7,306.9	50.8	42.0	-179.56	2,008.3	-646.4	519.8	471.1	48.63	10.688		
8,100.0	7,406.9	7,844.7	7,406.9	50.8	42.1	-179.56	2,008.3	-646.4	519.8	470.9	48.90	10.629		
8,200.0	7,506.9	7,944.7	7,506.9	50.9	42.1	-179.56	2,008.3	-646.4	519.8	470.6	49.17	10.570		
8,300.0	7,606.9	8,044.7	7,606.9	51.0	42.2	-179.56	2,008.3	-646.4	519.8	470.3	49.45	10.511		
8,400.0	7,706.9	8,144.7	7,706.9	51.0	42.3	-179.56	2,008.3	-646.4	519.8	470.0	49.73	10.452		
8,410.1	7,716.9	8,154.7	7,716.9	51.1	42.3	-179.56	2,008.3	-646.4	519.8	470.0	49.76	10.446		
8,478.1	7,785.0	8,214.8	7,777.0	51.1	42.4	-179.56	2,008.3	-646.4	519.8	470.1	49.70	10.460		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson 20-09 - Gunderson 20-20E - Slot A-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-120.98	-5.1	-8.5	9.9					
100.0	100.0	100.0	100.0	0.1	0.1	-120.98	-5.1	-8.5	9.9	9.7	0.18	56.510 CC, ES		
200.0	200.0	199.7	199.7	0.3	0.3	-144.15	-6.8	-8.5	12.3	11.6	0.64	19.035		
300.0	299.8	298.7	298.5	0.6	0.5	-162.65	-12.0	-8.5	21.3	20.1	1.19	17.803 SF		
400.0	399.5	396.3	395.7	0.8	0.8	-172.51	-20.4	-8.5	37.8	36.0	1.75	21.567		
500.0	498.7	491.8	490.5	1.1	1.1	-177.25	-31.8	-8.5	61.3	59.0	2.30	26.704		
600.0	597.5	584.7	582.4	1.4	1.4	-179.67	-46.0	-8.6	91.5	88.7	2.83	32.366		
700.0	695.6	674.6	670.8	1.8	1.7	179.51	-62.1	-9.9	127.9	124.6	3.34	38.258		
800.0	793.1	761.1	755.4	2.2	2.1	179.46	-79.9	-12.6	170.2	166.3	3.85	44.206		
900.0	889.6	843.8	835.8	2.7	2.5	179.72	-98.8	-16.5	217.9	213.6	4.34	50.177		
1,000.0	985.3	922.3	911.7	3.3	2.9	-179.90	-118.7	-21.3	271.0	266.1	4.82	56.170		
1,100.0	1,079.9	1,000.0	986.1	3.9	3.3	-176.73	-140.0	-27.2	328.8	323.6	5.28	62.252		
1,200.0	1,173.7	1,067.3	1,050.1	4.5	3.7	-171.49	-159.8	-33.3	390.4	384.7	5.73	68.161		
1,300.0	1,266.6	1,134.2	1,113.3	5.2	4.1	-166.91	-180.8	-40.1	455.2	449.1	6.16	73.878		
1,400.0	1,358.5	1,200.0	1,174.9	5.9	4.6	-162.86	-202.6	-47.5	523.2	516.6	6.57	79.606		
1,500.0	1,449.4	1,257.2	1,228.1	6.7	5.0	-159.14	-222.5	-54.7	593.9	586.9	6.98	85.130		
1,600.0	1,539.1	1,313.4	1,279.9	7.5	5.4	-155.72	-243.0	-62.3	667.3	660.0	7.38	90.400		
1,700.0	1,627.4	1,369.3	1,331.0	8.3	5.8	-152.56	-264.1	-70.3	743.2	735.4	7.79	95.344		
1,800.0	1,714.3	1,431.9	1,388.1	9.2	6.3	-149.76	-288.0	-79.5	820.5	812.3	8.25	99.420		
1,900.0	1,799.7	1,492.6	1,443.5	10.2	6.8	-147.16	-311.1	-88.5	899.1	890.4	8.73	103.025		
2,000.0	1,883.5	1,551.3	1,497.1	11.2	7.2	-144.83	-333.6	-97.1	978.9	969.6	9.22	106.191		



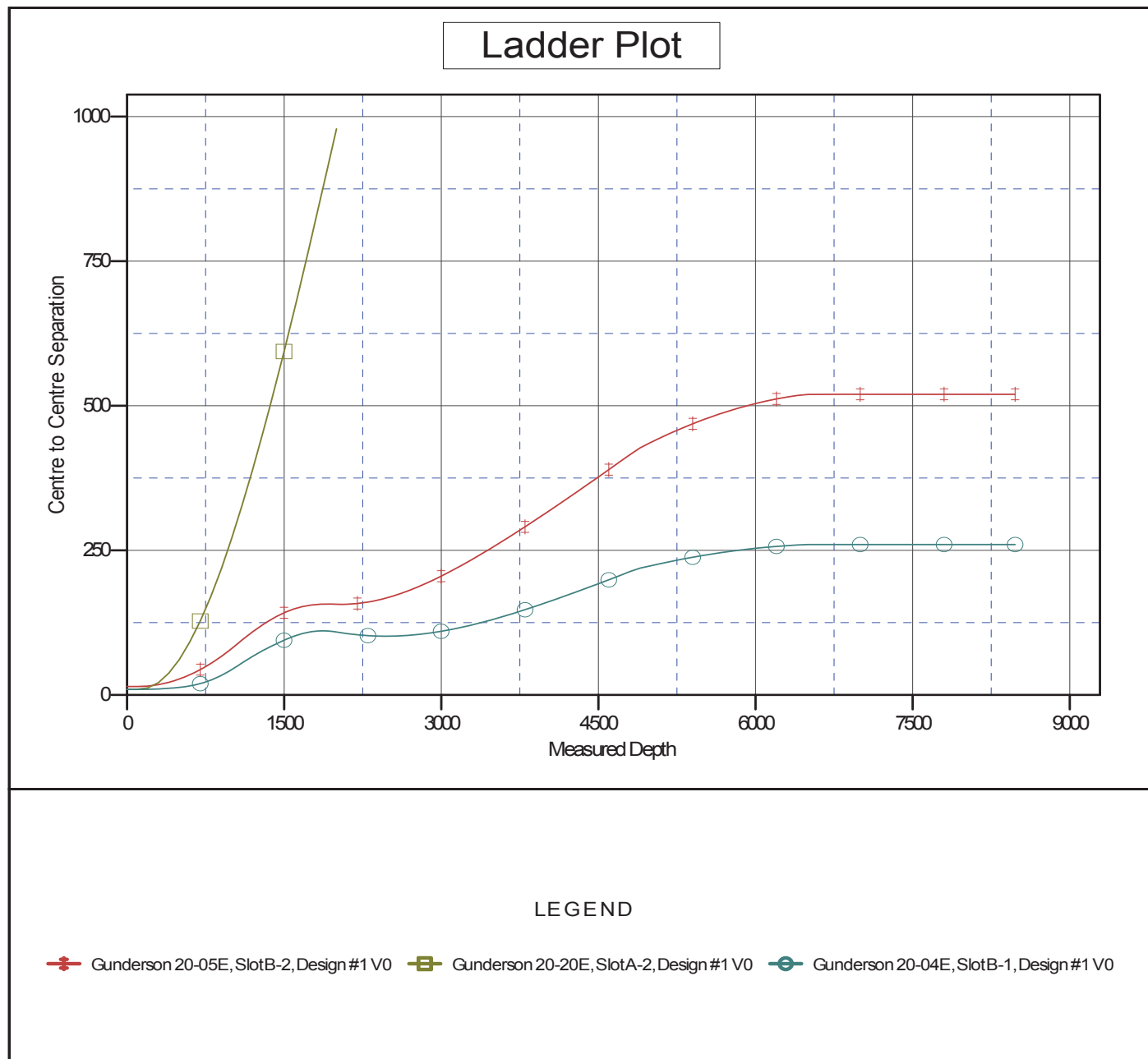
Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7497.0usft
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Gunderson 20-03E
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.44°





Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Gunderson 20-03E
Project:	Mesa County, CO	TVD Reference:	Well @ 7497.0usft
Reference Site:	Gunderson 20-09	MD Reference:	Well @ 7497.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Gunderson 20-03E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7497.0usft

Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Gunderson 20-03E

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.44°

