



Piceance Energy, LLC

Mesa County, CO

Piceance 29-07

Piceance Federal 29-08W

Wellbore #1

Plan: Design #1

Standard Planning Report

27 March, 2015

Archer



Project: Mesa County, CO
Site: Piceance 29-07
Well: Piceance Federal 29-08W
Wellbore: Wellbore #1
Design: Design #1
Latitude: 39° 15' 2.430 N
Longitude: 107° 47' 30.610 W
Ground Level: 7498.00
Well @ 7520.00usft

Archer

PROJECT DETAILS: Mesa County, CO

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Central Zone
System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Piceance Federal 29-08W, True North
Vertical (TVD) Reference: Well @ 7520.00usft
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: Well @ 7520.00usft
Calculation Method: Minimum Curvature

WELL DETAILS: Piceance Federal 29-08W

+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude	Slot
0.00	0.00	1524378.733	2351057.415	39° 15' 2.430 N	107° 47' 30.610 W	

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

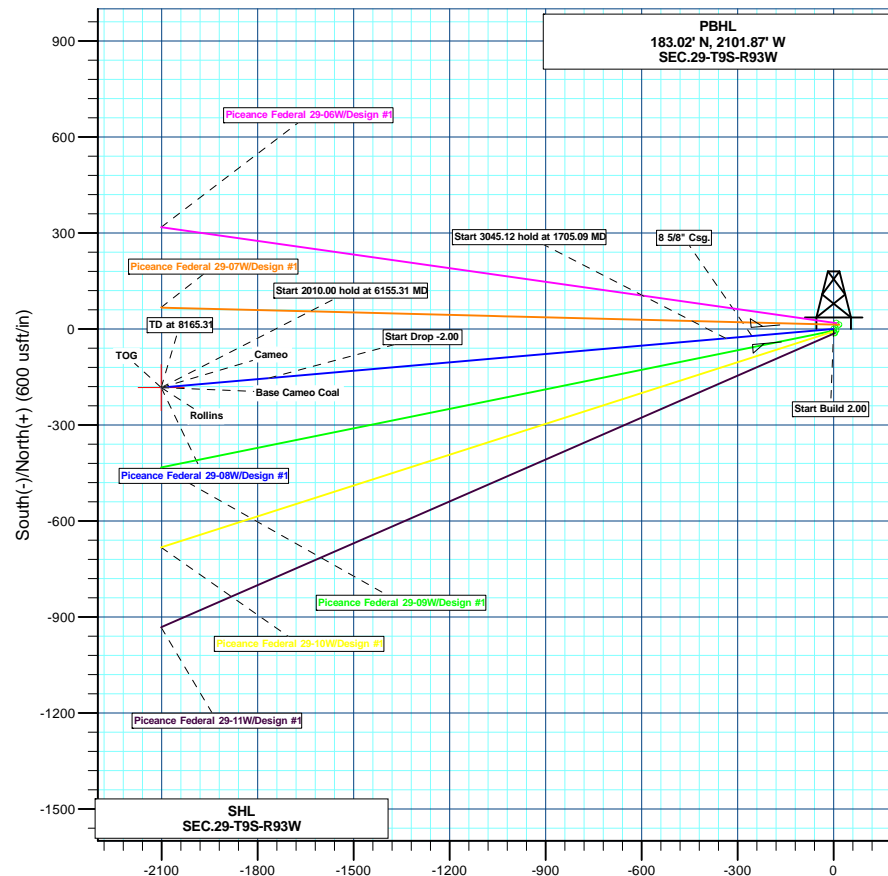
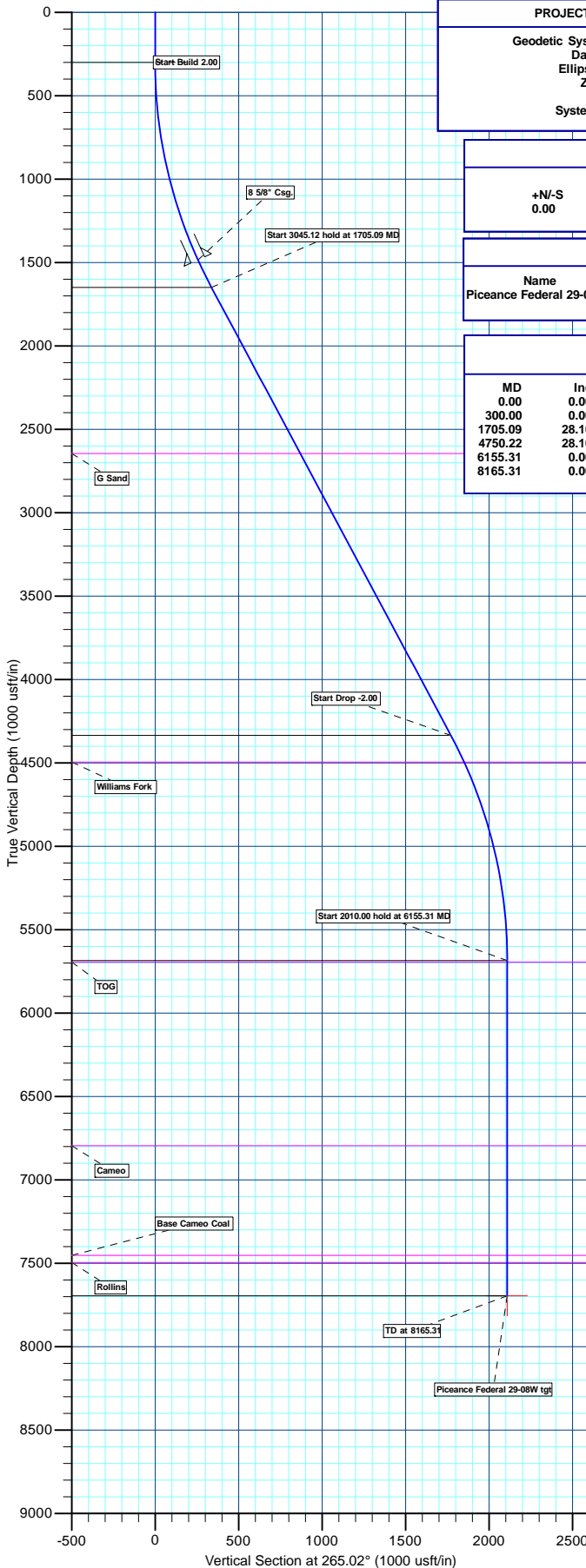
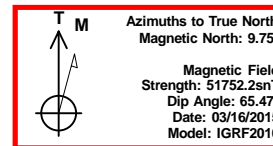
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Piceance Federal 29-08W tgt	7695.00	-183.02	-2101.87	1524248.789	2348951.598	39° 15' 0.620 N	107° 47' 57.330 W	

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
1705.09	28.10	265.02	1649.43	-29.30	-336.45	2.00	265.02	337.72	Start 3045.12 hold at 1705.09 MD
4750.22	28.10	265.02	4335.57	-153.73	-1765.42	0.00	0.00	1772.10	Start Drop -2.00
6155.31	0.00	0.00	5685.00	-183.03	-2101.87	2.00	180.00	2109.82	Start 2010.00 hold at 6155.31 MD
8165.31	0.00	0.00	7695.00	-183.03	-2101.87	0.00	0.00	2109.82	TD at 8165.31

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
2645.00	2833.71	G Sand
4495.00	4928.12	Williams Fork
5695.00	6165.31	TOG
6795.00	7265.31	Cameo
7453.00	7923.31	Base Cameo Coal
7495.00	7965.31	Rollins



Plan: Design #1 (Piceance Federal 29-08W/Wellbore #1)

Created By: Ricky Osburn Date: 11:10, March 27 2015



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #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	Piceance 29-07				
Site Position:		Northing:	1,524,470.306 usft	Latitude:	39° 15' 3.350 N
From:	Lat/Long	Easting:	2,351,118.741 usft	Longitude:	107° 47' 29.860 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.45 °

Well	Piceance Federal 29-08W					
Well Position	+N/-S	-93.09 usft	Northing:	1,524,378.733 usft	Latitude:	39° 15' 2.430 N
	+E/-W	-59.00 usft	Easting:	2,351,057.415 usft	Longitude:	107° 47' 30.610 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,498.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/03/16	9.75	65.47	51,752

Design	Design #1			
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	265.02

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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,705.09	28.10	265.02	1,649.43	-29.30	-336.45	2.00	2.00	0.00	265.02	
4,750.22	28.10	265.02	4,335.57	-153.73	-1,765.42	0.00	0.00	0.00	0.00	
6,155.31	0.00	0.00	5,685.00	-183.03	-2,101.87	2.00	-2.00	0.00	180.00	
8,165.31	0.00	0.00	7,695.00	-183.03	-2,101.87	0.00	0.00	0.00	0.00	Piceance Federal 29-08W



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #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)
0.00	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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.00	265.02	399.98	-0.15	-1.74	1.75	2.00	2.00	0.00
500.00	4.00	265.02	499.84	-0.61	-6.95	6.98	2.00	2.00	0.00
600.00	6.00	265.02	599.45	-1.36	-15.63	15.69	2.00	2.00	0.00
700.00	8.00	265.02	698.70	-2.42	-27.77	27.88	2.00	2.00	0.00
800.00	10.00	265.02	797.47	-3.78	-43.36	43.52	2.00	2.00	0.00
900.00	12.00	265.02	895.62	-5.43	-62.37	62.60	2.00	2.00	0.00
1,000.00	14.00	265.02	993.06	-7.38	-84.78	85.10	2.00	2.00	0.00
1,100.00	16.00	265.02	1,089.64	-9.63	-110.56	110.98	2.00	2.00	0.00
1,200.00	18.00	265.02	1,185.27	-12.16	-139.68	140.21	2.00	2.00	0.00
1,300.00	20.00	265.02	1,279.82	-14.99	-172.12	172.77	2.00	2.00	0.00
1,400.00	22.00	265.02	1,373.17	-18.10	-207.82	208.60	2.00	2.00	0.00
1,500.00	24.00	265.02	1,465.21	-21.49	-246.74	247.67	2.00	2.00	0.00
8 5/8" Csg.									
1,522.00	24.44	265.02	1,485.28	-22.27	-255.73	256.70	2.00	2.00	0.00
1,600.00	26.00	265.02	1,555.84	-25.15	-288.84	289.93	2.00	2.00	0.00
Start 3045.12 hold at 1705.09 MD									
1,705.09	28.10	265.02	1,649.43	-29.30	-336.45	337.72	2.00	2.00	0.00
1,800.00	28.10	265.02	1,733.15	-33.18	-380.99	382.43	0.00	0.00	0.00
1,900.00	28.10	265.02	1,821.36	-37.26	-427.92	429.53	0.00	0.00	0.00
2,000.00	28.10	265.02	1,909.57	-41.35	-474.84	476.64	0.00	0.00	0.00
2,100.00	28.10	265.02	1,997.78	-45.43	-521.77	523.74	0.00	0.00	0.00
2,200.00	28.10	265.02	2,086.00	-49.52	-568.69	570.85	0.00	0.00	0.00
2,300.00	28.10	265.02	2,174.21	-53.61	-615.62	617.95	0.00	0.00	0.00
2,400.00	28.10	265.02	2,262.42	-57.69	-662.55	665.05	0.00	0.00	0.00
2,500.00	28.10	265.02	2,350.63	-61.78	-709.47	712.16	0.00	0.00	0.00
2,600.00	28.10	265.02	2,438.84	-65.87	-756.40	759.26	0.00	0.00	0.00
2,700.00	28.10	265.02	2,527.05	-69.95	-803.33	806.37	0.00	0.00	0.00
2,800.00	28.10	265.02	2,615.26	-74.04	-850.25	853.47	0.00	0.00	0.00
G Sand									
2,833.71	28.10	265.02	2,645.00	-75.42	-866.07	869.35	0.00	0.00	0.00
2,900.00	28.10	265.02	2,703.47	-78.12	-897.18	900.57	0.00	0.00	0.00
3,000.00	28.10	265.02	2,791.68	-82.21	-944.11	947.68	0.00	0.00	0.00
3,100.00	28.10	265.02	2,879.90	-86.30	-991.03	994.78	0.00	0.00	0.00
3,200.00	28.10	265.02	2,968.11	-90.38	-1,037.96	1,041.89	0.00	0.00	0.00
3,300.00	28.10	265.02	3,056.32	-94.47	-1,084.88	1,088.99	0.00	0.00	0.00
3,400.00	28.10	265.02	3,144.53	-98.56	-1,131.81	1,136.09	0.00	0.00	0.00
3,500.00	28.10	265.02	3,232.74	-102.64	-1,178.74	1,183.20	0.00	0.00	0.00
3,600.00	28.10	265.02	3,320.95	-106.73	-1,225.66	1,230.30	0.00	0.00	0.00
3,700.00	28.10	265.02	3,409.16	-110.81	-1,272.59	1,277.41	0.00	0.00	0.00
3,800.00	28.10	265.02	3,497.37	-114.90	-1,319.52	1,324.51	0.00	0.00	0.00
3,900.00	28.10	265.02	3,585.59	-118.99	-1,366.44	1,371.61	0.00	0.00	0.00
4,000.00	28.10	265.02	3,673.80	-123.07	-1,413.37	1,418.72	0.00	0.00	0.00
4,100.00	28.10	265.02	3,762.01	-127.16	-1,460.30	1,465.82	0.00	0.00	0.00
4,200.00	28.10	265.02	3,850.22	-131.25	-1,507.22	1,512.93	0.00	0.00	0.00
4,300.00	28.10	265.02	3,938.43	-135.33	-1,554.15	1,560.03	0.00	0.00	0.00
4,400.00	28.10	265.02	4,026.64	-139.42	-1,601.08	1,607.13	0.00	0.00	0.00
4,500.00	28.10	265.02	4,114.85	-143.50	-1,648.00	1,654.24	0.00	0.00	0.00
4,600.00	28.10	265.02	4,203.06	-147.59	-1,694.93	1,701.34	0.00	0.00	0.00
4,700.00	28.10	265.02	4,291.28	-151.68	-1,741.85	1,748.45	0.00	0.00	0.00



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Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #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)
Start Drop -2.00									
4,750.22	28.10	265.02	4,335.57	-153.73	-1,765.42	1,772.10	0.00	0.00	0.00
4,800.00	27.11	265.02	4,379.69	-155.73	-1,788.40	1,795.17	2.00	-2.00	0.00
4,900.00	25.11	265.02	4,469.48	-159.55	-1,832.23	1,839.17	2.00	-2.00	0.00
Williams Fork									
4,928.12	24.54	265.02	4,495.00	-160.57	-1,844.00	1,850.97	2.00	-2.00	0.00
5,000.00	23.11	265.02	4,560.76	-163.09	-1,872.92	1,880.01	2.00	-2.00	0.00
5,100.00	21.11	265.02	4,653.40	-166.35	-1,910.41	1,917.64	2.00	-2.00	0.00
5,200.00	19.11	265.02	4,747.30	-169.34	-1,944.65	1,952.01	2.00	-2.00	0.00
5,300.00	17.11	265.02	4,842.34	-172.03	-1,975.61	1,983.09	2.00	-2.00	0.00
5,400.00	15.11	265.02	4,938.41	-174.44	-2,003.25	2,010.83	2.00	-2.00	0.00
5,500.00	13.11	265.02	5,035.39	-176.55	-2,027.53	2,035.20	2.00	-2.00	0.00
5,600.00	11.11	265.02	5,133.17	-178.37	-2,048.42	2,056.17	2.00	-2.00	0.00
5,700.00	9.11	265.02	5,231.61	-179.89	-2,065.90	2,073.72	2.00	-2.00	0.00
5,800.00	7.11	265.02	5,330.60	-181.12	-2,079.95	2,087.82	2.00	-2.00	0.00
5,900.00	5.11	265.02	5,430.03	-182.04	-2,090.54	2,098.45	2.00	-2.00	0.00
6,000.00	3.11	265.02	5,529.77	-182.66	-2,097.68	2,105.61	2.00	-2.00	0.00
6,100.00	1.11	265.02	5,629.70	-182.98	-2,101.34	2,109.29	2.00	-2.00	0.00
Start 2010.00 hold at 6155.31 MD									
6,155.31	0.00	0.00	5,685.00	-183.03	-2,101.87	2,109.82	2.00	-2.00	0.00
TOG									
6,165.31	0.00	0.00	5,695.00	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,200.00	0.00	0.00	5,729.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,300.00	0.00	0.00	5,829.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,400.00	0.00	0.00	5,929.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,500.00	0.00	0.00	6,029.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,600.00	0.00	0.00	6,129.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,700.00	0.00	0.00	6,229.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,800.00	0.00	0.00	6,329.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
6,900.00	0.00	0.00	6,429.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,000.00	0.00	0.00	6,529.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,100.00	0.00	0.00	6,629.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,200.00	0.00	0.00	6,729.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
Cameo									
7,265.31	0.00	0.00	6,795.00	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,300.00	0.00	0.00	6,829.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,400.00	0.00	0.00	6,929.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,500.00	0.00	0.00	7,029.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,600.00	0.00	0.00	7,129.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,700.00	0.00	0.00	7,229.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,800.00	0.00	0.00	7,329.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
7,900.00	0.00	0.00	7,429.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
Base Cameo Coal									
7,923.31	0.00	0.00	7,453.00	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
Rollins									
7,965.31	0.00	0.00	7,495.00	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
8,000.00	0.00	0.00	7,529.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
8,100.00	0.00	0.00	7,629.69	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00
TD at 8165.31									
8,165.31	0.00	0.00	7,695.00	-183.03	-2,101.87	2,109.82	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7520.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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									
Piceance Federal 29-08'	0.00	0.00	7,695.00	-183.02	-2,101.87	1,524,248.789	2,348,951.598	39° 15' 0.620 N	107° 47' 57.330 W
- plan hits target center									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.00	1,485.28	8 5/8" Csg.	8-5/8	12-1/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,833.71	2,645.00	G Sand		0.00	
4,928.12	4,495.00	Williams Fork		0.00	
6,165.31	5,695.00	TOG		0.00	
7,265.31	6,795.00	Cameo		0.00	
7,923.31	7,453.00	Base Cameo Coal		0.00	
7,965.31	7,495.00	Rollins		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.00	0.00	Start Build 2.00
1,705.09	1,649.43	-29.30	-336.45	Start 3045.12 hold at 1705.09 MD
4,750.22	4,335.57	-153.73	-1,765.42	Start Drop -2.00
6,155.31	5,685.00	-183.03	-2,101.87	Start 2010.00 hold at 6155.31 MD
8,165.31	7,695.00	-183.03	-2,101.87	TD at 8165.31



Piceance Energy, LLC

Mesa County, CO

Piceance 29-07

Piceance Federal 29-08W

Wellbore #1

Design #1

Anticollision Report

27 March, 2015

Archer



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Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #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 100.00usft	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	2015/03/27		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	8,165.31	Design #1 (Wellbore #1)	MWD	MWD - Standard	

Summary						
	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance		Separation	Warning
Site Name			Between Centres (usft)	Between Ellipses (usft)	Factor	
Offset Well - Wellbore - Design						
Piceance 29-07						
Piceance Federal 29-06W - Wellbore #1 - Design #1	354.42	354.62	19.50	18.20	14.941	CC
Piceance Federal 29-06W - Wellbore #1 - Design #1	400.00	400.19	19.65	18.15	13.053	ES
Piceance Federal 29-06W - Wellbore #1 - Design #1	8,165.31	8,163.91	500.80	408.17	5.407	SF
Piceance Federal 29-07W - Wellbore #1 - Design #1	300.00	300.00	21.74	20.66	20.231	CC
Piceance Federal 29-07W - Wellbore #1 - Design #1	500.00	501.19	22.17	20.20	11.259	ES
Piceance Federal 29-07W - Wellbore #1 - Design #1	8,165.31	8,170.04	249.89	157.07	2.692	SF
Piceance Federal 29-09W - Wellbore #1 - Design #1	300.00	300.00	9.55	8.48	8.891	CC
Piceance Federal 29-09W - Wellbore #1 - Design #1	500.00	500.53	10.00	8.03	5.094	ES
Piceance Federal 29-09W - Wellbore #1 - Design #1	8,165.31	8,181.21	249.94	157.52	2.704	SF
Piceance Federal 29-10W - Wellbore #1 - Design #1	200.00	200.00	10.26	9.63	16.414	CC, ES
Piceance Federal 29-10W - Wellbore #1 - Design #1	8,165.31	8,187.48	499.89	407.95	5.437	SF
Piceance Federal 29-11W - Wellbore #1 - Design #1	200.00	200.00	13.73	13.10	21.970	CC
Piceance Federal 29-11W - Wellbore #1 - Design #1	300.00	299.90	14.05	12.99	13.247	ES
Piceance Federal 29-11W - Wellbore #1 - Design #1	8,165.31	8,229.34	749.83	657.76	8.144	SF

Offset Design													Offset Site Error:		0.00 usft
Survey Program: 0-MWD													Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
0.00	0.00	0.00	0.00	0.00	0.00	25.41	18.21	8.65	20.16						
100.00	100.00	100.00	100.00	0.09	0.09	25.41	18.21	8.65	20.16	19.99	0.18	115.002			
200.00	200.00	200.00	200.00	0.31	0.31	25.41	18.21	8.65	20.16	19.54	0.62	32.267			
300.00	300.00	300.17	300.15	0.54	0.53	20.55	18.46	6.92	19.71	18.64	1.07	18.462			
354.42	354.42	354.62	354.54	0.65	0.65	109.95	18.80	4.52	19.50	18.20	1.31	14.941	CC		
400.00	399.98	400.19	400.03	0.75	0.76	105.14	19.19	1.73	19.65	18.15	1.51	13.053	ES		
500.00	499.84	500.08	499.53	0.97	1.01	95.07	20.42	-6.89	21.03	19.05	1.97	10.649			
600.00	599.45	599.83	598.53	1.21	1.30	86.78	22.13	-18.93	23.73	21.23	2.50	9.485			
700.00	698.70	699.42	696.90	1.49	1.63	80.75	24.31	-34.34	27.58	24.48	3.10	8.895			
800.00	797.47	798.86	794.50	1.81	2.01	76.71	26.98	-53.09	32.39	28.61	3.78	8.569			
900.00	895.62	898.12	891.23	2.19	2.45	74.17	30.11	-75.15	38.02	33.47	4.55	8.359			
1,000.00	993.06	997.22	986.97	2.62	2.95	72.69	33.70	-100.47	44.39	38.98	5.42	8.193			
1,100.00	1,089.64	1,096.13	1,081.59	3.12	3.52	71.93	37.75	-128.99	51.47	45.07	6.40	8.039			
1,200.00	1,185.27	1,194.86	1,174.98	3.69	4.15	71.66	42.24	-160.66	59.21	51.70	7.51	7.886			

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



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Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-07 - Piceance Federal 29-06W - Wellbore #1 - Design #1													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		
1,300.00	1,279.82	1,293.40	1,267.04	4.33	4.86	71.71	47.18	-195.44	67.61	58.87	8.75	7.729		
1,400.00	1,373.17	1,391.74	1,357.66	5.04	5.63	71.98	52.55	-233.25	76.66	66.54	10.13	7.570		
1,500.00	1,465.21	1,489.88	1,446.73	5.82	6.48	72.37	58.33	-274.03	86.36	74.70	11.65	7.411		
1,600.00	1,555.84	1,587.94	1,534.29	6.68	7.39	72.85	64.54	-317.76	96.67	83.35	13.33	7.255		
1,700.00	1,644.94	1,687.39	1,622.42	7.62	8.36	74.33	71.02	-363.37	106.71	91.51	15.20	7.020		
1,800.00	1,733.15	1,786.82	1,710.53	8.61	9.34	76.63	77.49	-408.98	116.37	99.16	17.20	6.764		
1,900.00	1,821.36	1,886.25	1,798.65	9.60	10.33	78.58	83.96	-454.58	126.18	106.96	19.23	6.563		
2,000.00	1,909.57	1,985.69	1,886.77	10.61	11.32	80.25	90.44	-500.19	136.12	114.86	21.26	6.403		
2,100.00	1,997.78	2,085.12	1,974.89	11.62	12.31	81.69	96.91	-545.80	146.16	122.86	23.30	6.273		
2,200.00	2,086.00	2,184.55	2,063.01	12.63	13.31	82.95	103.38	-591.40	156.28	130.94	25.34	6.167		
2,300.00	2,174.21	2,283.98	2,151.13	13.65	14.31	84.05	109.86	-637.01	166.46	139.08	27.38	6.079		
2,400.00	2,262.42	2,383.41	2,239.25	14.66	15.31	85.03	116.33	-682.62	176.70	147.28	29.43	6.005		
2,500.00	2,350.63	2,482.85	2,327.37	15.68	16.31	85.90	122.80	-728.22	186.98	155.52	31.47	5.942		
2,600.00	2,438.84	2,582.28	2,415.48	16.71	17.31	86.67	129.28	-773.83	197.31	163.79	33.51	5.888		
2,700.00	2,527.05	2,681.71	2,503.60	17.73	18.31	87.37	135.75	-819.43	207.66	172.11	35.55	5.841		
2,800.00	2,615.26	2,781.14	2,591.72	18.75	19.31	88.01	142.22	-865.04	218.04	180.45	37.59	5.800		
2,900.00	2,703.47	2,880.58	2,679.84	19.78	20.32	88.58	148.70	-910.65	228.45	188.81	39.63	5.764		
3,000.00	2,791.68	2,980.01	2,767.96	20.81	21.32	89.11	155.17	-956.25	238.87	197.20	41.67	5.732		
3,100.00	2,879.90	3,079.44	2,856.08	21.83	22.33	89.59	161.64	-1,001.86	249.32	205.61	43.71	5.704		
3,200.00	2,968.11	3,178.87	2,944.20	22.86	23.34	90.04	168.12	-1,047.47	259.78	214.03	45.75	5.679		
3,300.00	3,056.32	3,278.30	3,032.32	23.89	24.34	90.45	174.59	-1,093.07	270.25	222.47	47.78	5.656		
3,400.00	3,144.53	3,377.74	3,120.43	24.92	25.35	90.82	181.06	-1,138.68	280.74	230.92	49.82	5.635		
3,500.00	3,232.74	3,477.17	3,208.55	25.95	26.36	91.17	187.54	-1,184.29	291.24	239.38	51.85	5.617		
3,600.00	3,320.95	3,576.60	3,296.67	26.97	27.36	91.50	194.01	-1,229.89	301.75	247.86	53.89	5.600		
3,700.00	3,409.16	3,676.03	3,384.79	28.00	28.37	91.81	200.48	-1,275.50	312.26	256.34	55.92	5.584		
3,800.00	3,497.37	3,775.46	3,472.91	29.03	29.38	92.09	206.96	-1,321.10	322.79	264.84	57.95	5.570		
3,900.00	3,585.59	3,874.90	3,561.03	30.06	30.39	92.36	213.43	-1,366.71	333.32	273.34	59.98	5.557		
4,000.00	3,673.80	3,974.33	3,649.15	31.09	31.39	92.61	219.90	-1,412.32	343.86	281.85	62.02	5.545		
4,100.00	3,762.01	4,073.76	3,737.26	32.12	32.40	92.84	226.38	-1,457.92	354.41	290.36	64.05	5.534		
4,200.00	3,850.22	4,173.19	3,825.38	33.15	33.41	93.07	232.85	-1,503.53	364.96	298.88	66.08	5.523		
4,300.00	3,938.43	4,272.62	3,913.50	34.19	34.42	93.27	239.32	-1,549.14	375.52	307.41	68.11	5.514		
4,400.00	4,026.64	4,372.06	4,001.62	35.22	35.43	93.47	245.80	-1,594.74	386.08	315.94	70.14	5.505		
4,500.00	4,114.85	4,471.49	4,089.74	36.25	36.44	93.66	252.27	-1,640.35	396.64	324.48	72.17	5.496		
4,600.00	4,203.06	4,570.92	4,177.86	37.28	37.45	93.84	258.74	-1,685.95	407.21	333.02	74.20	5.488		
4,700.00	4,291.28	4,670.35	4,265.98	38.31	38.46	94.01	265.22	-1,731.56	417.79	341.56	76.23	5.481		
4,800.00	4,379.69	4,769.79	4,354.10	39.29	39.46	94.21	271.69	-1,777.17	428.33	350.12	78.21	5.477		
4,900.00	4,469.48	4,871.18	4,444.70	40.08	40.32	94.32	278.09	-1,822.22	438.45	358.60	79.85	5.491		
5,000.00	4,560.76	4,972.80	4,537.07	40.81	41.08	94.42	284.04	-1,864.16	447.84	366.49	81.35	5.505		
5,100.00	4,653.40	5,074.56	4,631.00	41.48	41.78	94.52	289.53	-1,902.88	456.50	373.78	82.72	5.519		
5,200.00	4,747.30	5,176.44	4,726.38	42.08	42.42	94.60	294.56	-1,938.32	464.41	380.45	83.96	5.531		
5,300.00	4,842.34	5,278.43	4,823.08	42.63	42.99	94.68	299.12	-1,970.41	471.57	386.49	85.08	5.543		
5,400.00	4,938.41	5,380.53	4,920.98	43.11	43.49	94.74	303.19	-1,999.10	477.97	391.89	86.07	5.553		
5,500.00	5,035.39	5,482.73	5,019.94	43.53	43.94	94.80	306.77	-2,024.34	483.58	396.64	86.94	5.562		
5,600.00	5,133.17	5,585.01	5,119.82	43.90	44.32	94.85	309.86	-2,046.08	488.42	400.73	87.69	5.570		
5,700.00	5,231.61	5,687.36	5,220.50	44.20	44.64	94.89	312.45	-2,064.30	492.47	404.14	88.33	5.576		
5,800.00	5,330.60	5,789.76	5,321.83	44.45	44.90	94.93	314.52	-2,078.95	495.72	406.88	88.84	5.580		
5,900.00	5,430.03	5,892.22	5,423.67	44.65	45.11	94.95	316.09	-2,090.00	498.17	408.92	89.25	5.582		
6,000.00	5,529.77	5,994.71	5,525.88	44.80	45.27	94.97	317.15	-2,097.45	499.83	410.27	89.56	5.581		
6,100.00	5,629.70	6,097.22	5,628.31	44.90	45.37	94.98	317.69	-2,101.27	500.68	410.91	89.76	5.578		
6,200.00	5,729.69	6,198.61	5,729.69	44.96	45.43	0.00	317.77	-2,101.83	500.80	410.92	89.88	5.572		
6,300.00	5,829.69	6,298.61	5,829.69	45.02	45.49	0.00	317.77	-2,101.83	500.80	410.80	90.00	5.564		
6,400.00	5,929.69	6,398.61	5,929.69	45.08	45.55	0.00	317.77	-2,101.83	500.80	410.67	90.12	5.557		

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



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Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	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	
6,500.00	6,029.69	6,498.61	6,029.69	45.14	45.61	0.00	317.77	-2,101.83	500.80	410.55	90.25	5.549	
6,600.00	6,129.69	6,598.61	6,129.69	45.20	45.68	0.00	317.77	-2,101.83	500.80	410.42	90.38	5.541	
6,700.00	6,229.69	6,698.61	6,229.69	45.27	45.74	0.00	317.77	-2,101.83	500.80	410.29	90.51	5.533	
6,800.00	6,329.69	6,798.61	6,329.69	45.33	45.81	0.00	317.77	-2,101.83	500.80	410.16	90.64	5.525	
6,900.00	6,429.69	6,898.61	6,429.69	45.40	45.87	0.00	317.77	-2,101.83	500.80	410.03	90.77	5.517	
7,000.00	6,529.69	6,998.61	6,529.69	45.46	45.94	0.00	317.77	-2,101.83	500.80	409.89	90.90	5.509	
7,100.00	6,629.69	7,098.61	6,629.69	45.53	46.01	0.00	317.77	-2,101.83	500.80	409.76	91.04	5.501	
7,200.00	6,729.69	7,198.61	6,729.69	45.60	46.08	0.00	317.77	-2,101.83	500.80	409.62	91.18	5.492	
7,300.00	6,829.69	7,298.61	6,829.69	45.67	46.15	0.00	317.77	-2,101.83	500.80	409.48	91.32	5.484	
7,400.00	6,929.69	7,398.61	6,929.69	45.74	46.22	0.00	317.77	-2,101.83	500.80	409.33	91.46	5.475	
7,500.00	7,029.69	7,498.61	7,029.69	45.81	46.29	0.00	317.77	-2,101.83	500.80	409.19	91.61	5.467	
7,600.00	7,129.69	7,598.61	7,129.69	45.89	46.36	0.00	317.77	-2,101.83	500.80	409.04	91.76	5.458	
7,700.00	7,229.69	7,698.61	7,229.69	45.96	46.44	0.00	317.77	-2,101.83	500.80	408.89	91.91	5.449	
7,800.00	7,329.69	7,798.61	7,329.69	46.04	46.51	0.00	317.77	-2,101.83	500.80	408.74	92.06	5.440	
7,900.00	7,429.69	7,898.61	7,429.69	46.11	46.59	0.00	317.77	-2,101.83	500.80	408.59	92.21	5.431	
8,000.00	7,529.69	7,998.61	7,529.69	46.19	46.67	0.00	317.77	-2,101.83	500.80	408.43	92.36	5.422	
8,100.00	7,629.69	8,098.61	7,629.69	46.27	46.75	0.00	317.77	-2,101.83	500.80	408.28	92.52	5.413	
8,165.31	7,695.00	8,163.91	7,695.00	46.32	46.80	0.00	317.77	-2,101.83	500.80	408.17	92.62	5.407 SF	



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Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-07 - Piceance Federal 29-07W - Wellbore #1 - Design #1													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	52.77	13.15	17.31	21.74					
100.00	100.00	100.00	100.00	0.09	0.09	52.77	13.15	17.31	21.74	21.56	0.18	123.982		
200.00	200.00	200.00	200.00	0.31	0.31	52.77	13.15	17.31	21.74	21.11	0.62	34.786		
300.00	300.00	300.00	300.00	0.54	0.54	52.77	13.15	17.31	21.74	20.66	1.07	20.231 CC		
400.00	399.98	400.60	400.57	0.75	0.75	147.30	13.20	15.54	21.84	20.33	1.52	14.405		
500.00	499.84	501.19	501.02	0.97	0.97	146.01	13.33	10.25	22.17	20.20	1.97	11.259 ES		
600.00	599.45	601.77	601.22	1.21	1.22	143.95	13.55	1.43	22.73	20.28	2.45	9.272		
700.00	698.70	702.35	701.03	1.49	1.50	141.23	13.87	-10.89	23.57	20.60	2.97	7.930		
800.00	797.47	802.92	800.34	1.81	1.83	138.02	14.27	-26.71	24.72	21.17	3.55	6.962		
900.00	895.62	903.47	899.01	2.19	2.21	134.50	14.76	-46.00	26.21	22.00	4.21	6.224		
1,000.00	993.06	1,004.00	996.93	2.62	2.64	130.84	15.33	-68.73	28.08	23.09	4.98	5.634		
1,100.00	1,089.64	1,104.51	1,093.98	3.12	3.15	127.20	16.00	-94.88	30.35	24.46	5.89	5.151		
1,200.00	1,185.27	1,205.00	1,190.02	3.69	3.72	123.70	16.74	-124.41	33.04	26.08	6.96	4.750		
1,300.00	1,279.82	1,305.46	1,284.94	4.33	4.36	120.43	17.58	-157.28	36.15	27.97	8.18	4.418		
1,400.00	1,373.17	1,405.89	1,378.63	5.04	5.08	117.42	18.49	-193.44	39.69	30.11	9.58	4.144		
1,500.00	1,465.21	1,506.30	1,470.97	5.82	5.87	114.70	19.49	-232.86	43.65	32.50	11.14	3.917		
1,600.00	1,555.84	1,606.67	1,561.83	6.68	6.74	112.26	20.57	-275.47	48.02	35.14	12.88	3.729		
1,700.00	1,644.94	1,707.01	1,651.12	7.62	7.69	110.08	21.73	-321.21	52.79	38.01	14.78	3.572		
1,800.00	1,733.15	1,806.90	1,739.10	8.61	8.68	108.25	22.93	-368.50	57.79	41.01	16.78	3.444		
1,900.00	1,821.36	1,906.76	1,827.05	9.60	9.69	106.71	24.13	-415.78	62.84	44.03	18.80	3.342		
2,000.00	1,909.57	2,006.61	1,915.00	10.61	10.70	105.40	25.33	-463.06	67.93	47.08	20.85	3.259		
2,100.00	1,997.78	2,106.47	2,002.95	11.62	11.72	104.28	26.53	-510.33	73.05	50.15	22.90	3.190		
2,200.00	2,086.00	2,206.33	2,090.90	12.63	12.74	103.30	27.73	-557.61	78.19	53.24	24.95	3.133		
2,300.00	2,174.21	2,306.19	2,178.85	13.65	13.76	102.44	28.92	-604.89	83.35	56.34	27.02	3.085		
2,400.00	2,262.42	2,406.05	2,266.80	14.66	14.79	101.68	30.12	-652.17	88.53	59.45	29.08	3.044		
2,500.00	2,350.63	2,505.91	2,354.75	15.68	15.81	101.01	31.32	-699.45	93.73	62.58	31.15	3.009		
2,600.00	2,438.84	2,605.77	2,442.70	16.71	16.84	100.41	32.52	-746.72	98.93	65.72	33.22	2.978		
2,700.00	2,527.05	2,705.63	2,530.65	17.73	17.88	99.87	33.72	-794.00	104.15	68.86	35.29	2.951		
2,800.00	2,615.26	2,805.49	2,618.60	18.75	18.91	99.38	34.92	-841.28	109.37	72.01	37.36	2.928		
2,900.00	2,703.47	2,905.35	2,706.55	19.78	19.94	98.93	36.11	-888.56	114.60	75.17	39.43	2.907		
3,000.00	2,791.68	3,005.21	2,794.50	20.81	20.98	98.52	37.31	-935.84	119.84	78.34	41.50	2.888		
3,100.00	2,879.90	3,105.07	2,882.45	21.83	22.01	98.15	38.51	-983.11	125.08	81.51	43.57	2.871		
3,200.00	2,968.11	3,204.93	2,970.40	22.86	23.05	97.81	39.71	-1,030.39	130.33	84.69	45.65	2.855		
3,300.00	3,056.32	3,304.79	3,058.35	23.89	24.08	97.49	40.91	-1,077.67	135.58	87.86	47.72	2.841		
3,400.00	3,144.53	3,404.65	3,146.30	24.92	25.12	97.20	42.11	-1,124.95	140.84	91.05	49.79	2.829		
3,500.00	3,232.74	3,504.50	3,234.25	25.95	26.15	96.93	43.30	-1,172.23	146.10	94.23	51.86	2.817		
3,600.00	3,320.95	3,604.36	3,322.20	26.97	27.19	96.68	44.50	-1,219.51	151.36	97.42	53.94	2.806		
3,700.00	3,409.16	3,704.22	3,410.15	28.00	28.23	96.44	45.70	-1,266.78	156.63	100.62	56.01	2.796		
3,800.00	3,497.37	3,804.08	3,498.10	29.03	29.27	96.22	46.90	-1,314.06	161.89	103.81	58.08	2.787		
3,900.00	3,585.59	3,903.94	3,586.05	30.06	30.31	96.01	48.10	-1,361.34	167.16	107.01	60.15	2.779		
4,000.00	3,673.80	4,003.80	3,674.00	31.09	31.34	95.82	49.30	-1,408.62	172.43	110.21	62.23	2.771		
4,100.00	3,762.01	4,103.66	3,761.95	32.12	32.38	95.64	50.49	-1,455.90	177.71	113.41	64.30	2.764		
4,200.00	3,850.22	4,203.52	3,849.90	33.15	33.42	95.47	51.69	-1,503.17	182.98	116.61	66.37	2.757		
4,300.00	3,938.43	4,303.38	3,937.85	34.19	34.46	95.30	52.89	-1,550.45	188.26	119.82	68.44	2.751		
4,400.00	4,026.64	4,403.24	4,025.80	35.22	35.50	95.15	54.09	-1,597.73	193.54	123.02	70.52	2.745		
4,500.00	4,114.85	4,503.10	4,113.75	36.25	36.54	95.01	55.29	-1,645.01	198.82	126.23	72.59	2.739		
4,600.00	4,203.06	4,602.96	4,201.70	37.28	37.58	94.87	56.49	-1,692.29	204.10	129.44	74.66	2.734		
4,700.00	4,291.28	4,702.82	4,289.65	38.31	38.62	94.74	57.68	-1,739.56	209.38	132.65	76.73	2.729		
4,800.00	4,379.69	4,802.75	4,377.93	39.29	39.59	94.70	58.87	-1,786.39	214.62	135.93	78.69	2.727		
4,900.00	4,469.48	4,902.77	4,467.71	40.08	40.39	94.74	59.99	-1,830.45	219.55	139.27	80.28	2.735		
5,000.00	4,560.76	5,002.82	4,559.00	40.81	41.13	94.77	61.03	-1,871.36	224.13	142.38	81.75	2.742		
5,100.00	4,653.40	5,102.89	4,651.68	41.48	41.81	94.81	61.98	-1,909.06	228.35	145.25	83.09	2.748		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	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	
5,200.00	4,747.30	5,202.98	4,745.65	42.08	42.42	94.84	62.85	-1,943.52	232.20	147.89	84.31	2.754	
5,300.00	4,842.34	5,303.10	4,840.79	42.63	42.96	94.86	63.64	-1,974.68	235.68	150.28	85.40	2.760	
5,400.00	4,938.41	5,403.24	4,936.98	43.11	43.45	94.89	64.35	-2,002.50	238.79	152.42	86.38	2.765	
5,500.00	5,035.39	5,503.40	5,034.10	43.53	43.87	94.91	64.97	-2,026.95	241.53	154.30	87.22	2.769	
5,600.00	5,133.17	5,603.58	5,132.03	43.90	44.24	94.93	65.50	-2,047.99	243.88	155.92	87.96	2.773	
5,700.00	5,231.61	5,703.76	5,230.66	44.20	44.55	94.95	65.95	-2,065.60	245.84	157.27	88.57	2.776	
5,800.00	5,330.60	5,803.96	5,329.85	44.45	44.80	94.96	66.31	-2,079.76	247.43	158.35	89.08	2.778	
5,900.00	5,430.03	5,904.17	5,429.48	44.65	45.00	94.97	66.58	-2,090.43	248.62	159.14	89.48	2.779	
6,000.00	5,529.77	6,004.39	5,529.43	44.80	45.15	94.98	66.76	-2,097.62	249.42	159.65	89.77	2.778	
6,100.00	5,629.70	6,104.61	5,629.58	44.90	45.25	94.98	66.85	-2,101.31	249.83	159.86	89.97	2.777	
6,200.00	5,729.69	6,204.73	5,729.69	44.96	45.31	0.00	66.87	-2,101.85	249.89	159.80	90.09	2.774	
6,300.00	5,829.69	6,304.73	5,829.69	45.02	45.37	0.00	66.87	-2,101.85	249.89	159.68	90.21	2.770	
6,400.00	5,929.69	6,404.73	5,929.69	45.08	45.43	0.00	66.87	-2,101.85	249.89	159.56	90.33	2.766	
6,500.00	6,029.69	6,504.73	6,029.69	45.14	45.49	0.00	66.87	-2,101.85	249.89	159.44	90.46	2.763	
6,600.00	6,129.69	6,604.73	6,129.69	45.20	45.55	0.00	66.87	-2,101.85	249.89	159.31	90.58	2.759	
6,700.00	6,229.69	6,704.73	6,229.69	45.27	45.62	0.00	66.87	-2,101.85	249.89	159.18	90.71	2.755	
6,800.00	6,329.69	6,804.73	6,329.69	45.33	45.68	0.00	66.87	-2,101.85	249.89	159.05	90.84	2.751	
6,900.00	6,429.69	6,904.73	6,429.69	45.40	45.75	0.00	66.87	-2,101.85	249.89	158.92	90.97	2.747	
7,000.00	6,529.69	7,004.73	6,529.69	45.46	45.81	0.00	66.87	-2,101.85	249.89	158.79	91.11	2.743	
7,100.00	6,629.69	7,104.73	6,629.69	45.53	45.88	0.00	66.87	-2,101.85	249.89	158.65	91.24	2.739	
7,200.00	6,729.69	7,204.73	6,729.69	45.60	45.95	0.00	66.87	-2,101.85	249.89	158.51	91.38	2.735	
7,300.00	6,829.69	7,304.73	6,829.69	45.67	46.02	0.00	66.87	-2,101.85	249.89	158.37	91.52	2.730	
7,400.00	6,929.69	7,404.73	6,929.69	45.74	46.09	0.00	66.87	-2,101.85	249.89	158.23	91.67	2.726	
7,500.00	7,029.69	7,504.73	7,029.69	45.81	46.17	0.00	66.87	-2,101.85	249.89	158.08	91.81	2.722	
7,600.00	7,129.69	7,604.73	7,129.69	45.89	46.24	0.00	66.87	-2,101.85	249.89	157.94	91.96	2.718	
7,700.00	7,229.69	7,704.73	7,229.69	45.96	46.31	0.00	66.87	-2,101.85	249.89	157.79	92.11	2.713	
7,800.00	7,329.69	7,804.73	7,329.69	46.04	46.39	0.00	66.87	-2,101.85	249.89	157.64	92.26	2.709	
7,900.00	7,429.69	7,904.73	7,429.69	46.11	46.46	0.00	66.87	-2,101.85	249.89	157.49	92.41	2.704	
8,000.00	7,529.69	8,004.73	7,529.69	46.19	46.54	0.00	66.87	-2,101.85	249.89	157.33	92.56	2.700	
8,100.00	7,629.69	8,104.73	7,629.69	46.27	46.62	0.00	66.87	-2,101.85	249.89	157.17	92.72	2.695	
8,165.31	7,695.00	8,170.04	7,695.00	46.32	46.67	0.00	66.87	-2,101.85	249.89	157.07	92.82	2.692 SF	



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-07 - Piceance Federal 29-09W - Wellbore #1 - Design #1													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	115.07	-4.05	8.65	9.55					
100.00	100.00	100.00	100.00	0.09	0.09	115.07	-4.05	8.65	9.55	9.38	0.18	54.485		
200.00	200.00	200.00	200.00	0.31	0.31	115.07	-4.05	8.65	9.55	8.93	0.62	15.287		
300.00	300.00	300.00	300.00	0.54	0.54	115.07	-4.05	8.65	9.55	8.48	1.07	8.891 CC		
400.00	399.98	400.27	400.25	0.75	0.75	-148.96	-4.40	6.93	9.66	8.15	1.51	6.384		
500.00	499.84	500.53	500.37	0.97	0.96	-146.08	-5.44	1.78	10.00	8.03	1.96	5.094 ES		
600.00	599.45	600.79	600.24	1.21	1.21	-141.72	-7.19	-6.81	10.61	8.16	2.45	4.337		
700.00	698.70	701.05	699.74	1.49	1.49	-136.43	-9.63	-18.81	11.55	8.57	2.98	3.880		
800.00	797.47	801.29	798.73	1.81	1.81	-130.84	-12.76	-34.22	12.88	9.30	3.58	3.595		
900.00	895.62	901.52	897.11	2.19	2.19	-125.45	-16.58	-53.01	14.63	10.34	4.29	3.407		
1,000.00	993.06	1,001.73	994.73	2.62	2.63	-120.59	-21.08	-75.15	16.82	11.69	5.13	3.277		
1,100.00	1,089.64	1,101.92	1,091.49	3.12	3.13	-116.37	-26.25	-100.62	19.46	13.34	6.11	3.183		
1,200.00	1,185.27	1,202.10	1,187.26	3.69	3.70	-112.81	-32.10	-129.39	22.52	15.28	7.24	3.111		
1,300.00	1,279.82	1,302.25	1,281.93	4.33	4.34	-109.83	-38.60	-161.41	26.02	17.50	8.52	3.055		
1,400.00	1,373.17	1,402.38	1,375.37	5.04	5.05	-107.36	-45.76	-196.65	29.92	19.98	9.94	3.010		
1,500.00	1,465.21	1,502.48	1,467.48	5.82	5.84	-105.29	-53.57	-235.05	34.22	22.70	11.52	2.971		
1,600.00	1,555.84	1,602.55	1,558.13	6.68	6.70	-103.57	-62.01	-276.57	38.91	25.66	13.25	2.937		
1,700.00	1,644.94	1,702.59	1,647.22	7.62	7.64	-102.11	-71.07	-321.16	43.98	28.84	15.13	2.906		
1,800.00	1,733.15	1,802.50	1,734.88	8.61	8.64	-99.93	-80.61	-368.15	49.18	32.03	17.15	2.867		
1,900.00	1,821.36	1,902.35	1,822.35	9.60	9.65	-97.90	-90.20	-415.33	54.42	35.23	19.19	2.836		
2,000.00	1,909.57	2,002.20	1,909.81	10.61	10.68	-96.23	-99.79	-462.52	59.73	38.49	21.24	2.813		
2,100.00	1,997.78	2,102.04	1,997.28	11.62	11.70	-94.83	-109.38	-509.71	65.08	41.79	23.28	2.795		
2,200.00	2,086.00	2,201.89	2,084.75	12.63	12.74	-93.64	-118.97	-556.90	70.45	45.13	25.33	2.782		
2,300.00	2,174.21	2,301.73	2,172.21	13.65	13.77	-92.62	-128.56	-604.08	75.86	48.49	27.37	2.771		
2,400.00	2,262.42	2,401.58	2,259.68	14.66	14.81	-91.74	-138.15	-651.27	81.29	51.87	29.42	2.763		
2,500.00	2,350.63	2,501.42	2,347.15	15.68	15.85	-90.97	-147.73	-698.46	86.73	55.27	31.46	2.757		
2,600.00	2,438.84	2,601.27	2,434.62	16.71	16.90	-90.29	-157.32	-745.65	92.19	58.68	33.50	2.752		
2,700.00	2,527.05	2,701.11	2,522.08	17.73	17.94	-89.68	-166.91	-792.83	97.65	62.11	35.54	2.747		
2,800.00	2,615.26	2,800.96	2,609.55	18.75	18.98	-89.14	-176.50	-840.02	103.13	65.55	37.58	2.744		
2,900.00	2,703.47	2,900.80	2,697.02	19.78	20.03	-88.66	-186.09	-887.21	108.62	68.99	39.62	2.741		
3,000.00	2,791.68	3,000.65	2,784.48	20.81	21.08	-88.22	-195.68	-934.40	114.11	72.45	41.66	2.739		
3,100.00	2,879.90	3,100.49	2,871.95	21.83	22.12	-87.82	-205.27	-981.58	119.61	75.91	43.70	2.737		
3,200.00	2,968.11	3,200.34	2,959.42	22.86	23.17	-87.46	-214.86	-1,028.77	125.11	79.37	45.74	2.735		
3,300.00	3,056.32	3,300.19	3,046.88	23.89	24.22	-87.12	-224.44	-1,075.96	130.62	82.84	47.78	2.734		
3,400.00	3,144.53	3,400.03	3,134.35	24.92	25.27	-86.82	-234.03	-1,123.15	136.14	86.32	49.82	2.733		
3,500.00	3,232.74	3,499.88	3,221.82	25.95	26.32	-86.54	-243.62	-1,170.33	141.65	89.80	51.85	2.732		
3,600.00	3,320.95	3,599.72	3,309.29	26.97	27.37	-86.27	-253.21	-1,217.52	147.17	93.28	53.89	2.731		
3,700.00	3,409.16	3,699.57	3,396.75	28.00	28.42	-86.03	-262.80	-1,264.71	152.70	96.77	55.93	2.730		
3,800.00	3,497.37	3,799.41	3,484.22	29.03	29.47	-85.81	-272.39	-1,311.90	158.22	100.26	57.96	2.730		
3,900.00	3,585.59	3,899.26	3,571.69	30.06	30.52	-85.60	-281.98	-1,359.08	163.75	103.75	60.00	2.729		
4,000.00	3,673.80	3,999.10	3,659.15	31.09	31.57	-85.40	-291.57	-1,406.27	169.28	107.24	62.04	2.729		
4,100.00	3,762.01	4,098.95	3,746.62	32.12	32.62	-85.22	-301.15	-1,453.46	174.81	110.74	64.07	2.728		
4,200.00	3,850.22	4,198.79	3,834.09	33.15	33.67	-85.04	-310.74	-1,500.65	180.34	114.24	66.11	2.728		
4,300.00	3,938.43	4,298.64	3,921.56	34.19	34.72	-84.88	-320.33	-1,547.83	185.88	117.73	68.14	2.728		
4,400.00	4,026.64	4,398.48	4,009.02	35.22	35.78	-84.73	-329.92	-1,595.02	191.41	121.24	70.18	2.728		
4,500.00	4,114.85	4,498.33	4,096.49	36.25	36.83	-84.58	-339.51	-1,642.21	196.95	124.74	72.21	2.727		
4,600.00	4,203.06	4,598.18	4,183.96	37.28	37.88	-84.45	-349.10	-1,689.40	202.49	128.24	74.25	2.727		
4,700.00	4,291.28	4,698.02	4,271.42	38.31	38.93	-84.32	-358.69	-1,736.58	208.03	131.75	76.28	2.727		
4,800.00	4,379.69	4,798.82	4,360.07	39.29	39.92	-84.32	-368.24	-1,783.60	213.47	135.25	78.22	2.729		
4,900.00	4,469.48	4,900.21	4,450.77	40.08	40.73	-84.43	-377.26	-1,827.98	218.56	138.73	79.82	2.738		
5,000.00	4,560.76	5,001.65	4,543.07	40.81	41.48	-84.52	-385.64	-1,869.22	223.28	141.98	81.30	2.746		
5,100.00	4,653.40	5,103.14	4,636.85	41.48	42.16	-84.61	-393.36	-1,907.24	227.64	144.99	82.65	2.754		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	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		
5,200.00	4,747.30	5,204.68	4,731.99	42.08	42.78	-84.68	-400.43	-1,941.99	231.61	147.74	83.87	2.761		
5,300.00	4,842.34	5,306.26	4,828.36	42.63	43.34	-84.75	-406.82	-1,973.44	235.21	150.24	84.98	2.768		
5,400.00	4,938.41	5,407.88	4,925.85	43.11	43.84	-84.81	-412.52	-2,001.53	238.42	152.47	85.96	2.774		
5,500.00	5,035.39	5,509.53	5,024.33	43.53	44.27	-84.86	-417.54	-2,026.21	241.25	154.43	86.81	2.779		
5,600.00	5,133.17	5,611.22	5,123.66	43.90	44.65	-84.91	-421.86	-2,047.47	243.68	156.12	87.55	2.783		
5,700.00	5,231.61	5,712.92	5,223.73	44.20	44.96	-84.94	-425.48	-2,065.26	245.71	157.53	88.17	2.787		
5,800.00	5,330.60	5,814.65	5,324.40	44.45	45.22	-84.97	-428.38	-2,079.56	247.34	158.66	88.69	2.789		
5,900.00	5,430.03	5,916.40	5,425.55	44.65	45.43	-85.00	-430.57	-2,090.35	248.58	159.49	89.09	2.790		
6,000.00	5,529.77	6,018.16	5,527.03	44.80	45.58	-85.01	-432.05	-2,097.62	249.41	160.02	89.39	2.790		
6,100.00	5,629.70	6,119.92	5,628.72	44.90	45.68	-85.02	-432.81	-2,101.35	249.83	160.24	89.59	2.789		
6,200.00	5,729.69	6,220.90	5,729.69	44.96	45.74	-180.00	-432.92	-2,101.89	249.89	160.18	89.71	2.786		
6,300.00	5,829.69	6,320.90	5,829.69	45.02	45.80	-180.00	-432.92	-2,101.89	249.89	160.06	89.83	2.782		
6,400.00	5,929.69	6,420.90	5,929.69	45.08	45.86	-180.00	-432.92	-2,101.89	249.89	159.94	89.95	2.778		
6,500.00	6,029.69	6,520.90	6,029.69	45.14	45.92	-180.00	-432.92	-2,101.89	249.89	159.82	90.07	2.774		
6,600.00	6,129.69	6,620.90	6,129.69	45.20	45.98	-180.00	-432.92	-2,101.89	249.89	159.69	90.20	2.770		
6,700.00	6,229.69	6,720.90	6,229.69	45.27	46.04	-180.00	-432.92	-2,101.89	249.89	159.57	90.33	2.767		
6,800.00	6,329.69	6,820.90	6,329.69	45.33	46.11	-180.00	-432.92	-2,101.89	249.89	159.44	90.46	2.763		
6,900.00	6,429.69	6,920.90	6,429.69	45.40	46.17	-180.00	-432.92	-2,101.89	249.89	159.30	90.59	2.759		
7,000.00	6,529.69	7,020.90	6,529.69	45.46	46.23	-180.00	-432.92	-2,101.89	249.89	159.17	90.72	2.754		
7,100.00	6,629.69	7,120.90	6,629.69	45.53	46.30	-180.00	-432.92	-2,101.89	249.89	159.04	90.86	2.750		
7,200.00	6,729.69	7,220.90	6,729.69	45.60	46.37	-180.00	-432.92	-2,101.89	249.89	158.90	91.00	2.746		
7,300.00	6,829.69	7,320.90	6,829.69	45.67	46.44	-180.00	-432.92	-2,101.89	249.89	158.76	91.14	2.742		
7,400.00	6,929.69	7,420.90	6,929.69	45.74	46.50	-180.00	-432.92	-2,101.89	249.89	158.62	91.28	2.738		
7,500.00	7,029.69	7,520.90	7,029.69	45.81	46.57	-180.00	-432.92	-2,101.89	249.89	158.47	91.42	2.733		
7,600.00	7,129.69	7,620.90	7,129.69	45.89	46.65	-180.00	-432.92	-2,101.89	249.89	158.33	91.57	2.729		
7,700.00	7,229.69	7,720.90	7,229.69	45.96	46.72	-180.00	-432.92	-2,101.89	249.89	158.18	91.72	2.725		
7,800.00	7,329.69	7,820.90	7,329.69	46.04	46.79	-180.00	-432.92	-2,101.89	249.89	158.03	91.86	2.720		
7,900.00	7,429.69	7,920.90	7,429.69	46.11	46.86	-180.00	-432.92	-2,101.89	249.89	157.88	92.02	2.716		
8,000.00	7,529.69	8,020.90	7,529.69	46.19	46.94	-180.00	-432.92	-2,101.89	249.89	157.72	92.17	2.711		
8,100.00	7,629.69	8,120.90	7,629.69	46.27	47.01	-180.00	-432.92	-2,101.89	249.89	157.57	92.33	2.707		
8,141.73	7,671.43	8,162.63	7,671.43	46.30	47.05	-180.00	-432.92	-2,101.89	249.89	157.50	92.39	2.705		
8,165.31	7,695.00	8,181.21	7,690.00	46.32	47.06	-180.00	-432.92	-2,101.89	249.94	157.52	92.42	2.704 SF		



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-07 - Piceance Federal 29-10W - Wellbore #1 - Design #1													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	-152.60	-9.11	-4.72	10.26					
100.00	100.00	100.00	100.00	0.09	0.09	-152.60	-9.11	-4.72	10.26	10.08	0.18	58.499		
200.00	200.00	200.00	200.00	0.31	0.31	-152.60	-9.11	-4.72	10.26	9.63	0.62	16.414	CC, ES	
300.00	300.00	299.71	299.69	0.54	0.52	-146.53	-9.64	-6.37	11.56	10.50	1.06	10.900		
400.00	399.98	399.27	399.11	0.75	0.74	-44.10	-11.22	-11.32	14.67	13.17	1.50	9.793		
500.00	499.84	498.70	498.16	0.97	0.99	-41.35	-13.86	-19.53	18.35	16.39	1.96	9.369		
600.00	599.45	597.99	596.71	1.21	1.28	-41.19	-17.55	-31.00	22.48	20.03	2.45	9.169		
700.00	698.70	697.14	694.65	1.49	1.61	-42.42	-22.27	-45.69	27.04	24.06	2.98	9.066		
800.00	797.47	796.13	791.84	1.81	2.00	-44.39	-28.01	-63.56	32.05	28.48	3.57	8.988		
900.00	895.62	894.97	888.17	2.19	2.44	-46.73	-34.76	-84.58	37.54	33.32	4.22	8.892		
1,000.00	993.06	993.63	983.52	2.62	2.94	-49.21	-42.51	-108.71	43.57	38.59	4.97	8.758		
1,100.00	1,089.64	1,092.13	1,077.78	3.12	3.50	-51.69	-51.25	-135.91	50.16	44.31	5.84	8.584		
1,200.00	1,185.27	1,190.44	1,170.83	3.69	4.13	-54.10	-60.95	-166.11	57.33	50.49	6.84	8.377		
1,300.00	1,279.82	1,288.58	1,262.57	4.33	4.83	-56.38	-71.60	-199.27	65.12	57.13	7.99	8.150		
1,400.00	1,373.17	1,386.53	1,352.90	5.04	5.59	-58.52	-83.19	-235.34	73.52	64.23	9.29	7.915		
1,500.00	1,465.21	1,484.29	1,441.71	5.82	6.43	-60.50	-95.69	-274.24	82.55	71.81	10.75	7.682		
1,600.00	1,555.84	1,581.87	1,528.90	6.68	7.33	-62.33	-109.08	-315.92	92.21	79.85	12.36	7.458		
1,700.00	1,644.94	1,680.16	1,615.34	7.62	8.30	-64.18	-123.39	-360.48	102.30	88.14	14.16	7.225		
1,800.00	1,733.15	1,779.59	1,702.52	8.61	9.30	-66.52	-138.01	-405.99	112.04	95.92	16.12	6.950		
1,900.00	1,821.36	1,879.01	1,789.70	9.60	10.31	-68.50	-152.63	-451.50	121.94	103.82	18.11	6.732		
2,000.00	1,909.57	1,978.44	1,876.88	10.61	11.33	-70.18	-167.25	-497.01	131.95	111.83	20.13	6.557		
2,100.00	1,997.78	2,077.87	1,964.07	11.62	12.35	-71.62	-181.87	-542.53	142.07	119.92	22.15	6.414		
2,200.00	2,086.00	2,177.30	2,051.25	12.63	13.37	-72.87	-196.49	-588.04	152.26	128.07	24.18	6.296		
2,300.00	2,174.21	2,276.73	2,138.43	13.65	14.39	-73.96	-211.11	-633.55	162.51	136.29	26.22	6.197		
2,400.00	2,262.42	2,376.16	2,225.61	14.66	15.42	-74.92	-225.73	-679.07	172.82	144.55	28.27	6.114		
2,500.00	2,350.63	2,475.58	2,312.79	15.68	16.44	-75.78	-240.36	-724.58	183.16	152.85	30.31	6.043		
2,600.00	2,438.84	2,575.01	2,399.98	16.71	17.47	-76.54	-254.98	-770.09	193.55	161.19	32.36	5.981		
2,700.00	2,527.05	2,674.44	2,487.16	17.73	18.50	-77.22	-269.60	-815.61	203.96	169.55	34.41	5.928		
2,800.00	2,615.26	2,773.87	2,574.34	18.75	19.53	-77.84	-284.22	-861.12	214.40	177.94	36.46	5.881		
2,900.00	2,703.47	2,873.30	2,661.52	19.78	20.56	-78.40	-298.84	-906.63	224.86	186.36	38.51	5.840		
3,000.00	2,791.68	2,972.73	2,748.71	20.81	21.59	-78.91	-313.46	-952.15	235.35	194.79	40.56	5.803		
3,100.00	2,879.90	3,072.15	2,835.89	21.83	22.63	-79.38	-328.08	-997.66	245.84	203.24	42.61	5.770		
3,200.00	2,968.11	3,171.58	2,923.07	22.86	23.66	-79.81	-342.70	-1,043.17	256.36	211.70	44.66	5.740		
3,300.00	3,056.32	3,271.01	3,010.25	23.89	24.69	-80.20	-357.32	-1,088.69	266.89	220.18	46.71	5.714		
3,400.00	3,144.53	3,370.44	3,097.44	24.92	25.72	-80.57	-371.94	-1,134.20	277.42	228.66	48.76	5.690		
3,500.00	3,232.74	3,469.87	3,184.62	25.95	26.76	-80.91	-386.56	-1,179.71	287.97	237.16	50.81	5.668		
3,600.00	3,320.95	3,569.29	3,271.80	26.97	27.79	-81.22	-401.18	-1,225.22	298.53	245.67	52.86	5.648		
3,700.00	3,409.16	3,668.72	3,358.98	28.00	28.82	-81.52	-415.80	-1,270.74	309.10	254.19	54.91	5.629		
3,800.00	3,497.37	3,768.15	3,446.16	29.03	29.86	-81.79	-430.42	-1,316.25	319.67	262.71	56.96	5.612		
3,900.00	3,585.59	3,867.58	3,533.35	30.06	30.89	-82.05	-445.05	-1,361.76	330.25	271.24	59.01	5.597		
4,000.00	3,673.80	3,967.01	3,620.53	31.09	31.93	-82.29	-459.67	-1,407.28	340.84	279.78	61.06	5.582		
4,100.00	3,762.01	4,066.44	3,707.71	32.12	32.96	-82.51	-474.29	-1,452.79	351.43	288.32	63.11	5.569		
4,200.00	3,850.22	4,165.86	3,794.89	33.15	34.00	-82.72	-488.91	-1,498.30	362.03	296.87	65.16	5.556		
4,300.00	3,938.43	4,265.29	3,882.08	34.19	35.03	-82.92	-503.53	-1,543.82	372.63	305.42	67.21	5.545		
4,400.00	4,026.64	4,364.72	3,969.26	35.22	36.07	-83.11	-518.15	-1,589.33	383.23	313.98	69.25	5.534		
4,500.00	4,114.85	4,464.15	4,056.44	36.25	37.10	-83.29	-532.77	-1,634.84	393.84	322.54	71.30	5.523		
4,600.00	4,203.06	4,563.58	4,143.62	37.28	38.14	-83.46	-547.39	-1,680.36	404.46	331.11	73.35	5.514		
4,700.00	4,291.28	4,663.00	4,230.81	38.31	39.17	-83.62	-562.01	-1,725.87	415.07	339.67	75.40	5.505		
4,800.00	4,379.69	4,762.98	4,318.48	39.29	40.20	-83.83	-576.71	-1,771.61	425.73	348.34	77.40	5.501		
4,900.00	4,469.48	4,867.18	4,410.94	40.08	41.08	-84.00	-591.39	-1,817.34	436.05	357.00	79.05	5.516		
5,000.00	4,560.76	4,971.57	4,505.27	40.81	41.86	-84.16	-605.07	-1,859.91	445.64	365.08	80.56	5.532		
5,100.00	4,653.40	5,076.15	4,601.33	41.48	42.58	-84.31	-617.71	-1,899.24	454.48	372.53	81.95	5.546		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-07 - Piceance Federal 29-10W - Wellbore #1 - Design #1													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		
5,200.00	4,747.30	5,180.90	4,699.01	42.08	43.24	-84.44	-629.28	-1,935.27	462.57	379.36	83.21	5.559		
5,300.00	4,842.34	5,285.82	4,798.15	42.63	43.83	-84.56	-639.77	-1,967.93	469.89	385.54	84.34	5.571		
5,400.00	4,938.41	5,390.88	4,898.63	43.11	44.36	-84.66	-649.16	-1,997.14	476.42	391.07	85.35	5.582		
5,500.00	5,035.39	5,496.07	5,000.29	43.53	44.83	-84.75	-657.42	-2,022.86	482.17	395.93	86.24	5.591		
5,600.00	5,133.17	5,601.38	5,102.98	43.90	45.23	-84.83	-664.54	-2,045.03	487.12	400.11	87.01	5.599		
5,700.00	5,231.61	5,706.79	5,206.56	44.20	45.56	-84.89	-670.51	-2,063.61	491.26	403.61	87.65	5.605		
5,800.00	5,330.60	5,812.28	5,310.87	44.45	45.84	-84.94	-675.31	-2,078.55	494.59	406.41	88.18	5.609		
5,900.00	5,430.03	5,917.83	5,415.75	44.65	46.06	-84.98	-678.93	-2,089.84	497.10	408.51	88.59	5.611		
6,000.00	5,529.77	6,023.43	5,521.04	44.80	46.22	-85.00	-681.38	-2,097.44	498.79	409.89	88.90	5.611		
6,100.00	5,629.70	6,129.06	5,626.58	44.90	46.32	-85.02	-682.63	-2,101.34	499.66	410.55	89.11	5.607		
6,200.00	5,729.69	6,232.17	5,729.69	44.96	46.39	-180.00	-682.81	-2,101.91	499.79	410.55	89.23	5.601		
6,300.00	5,829.69	6,332.17	5,829.69	45.02	46.44	-180.00	-682.81	-2,101.91	499.79	410.44	89.35	5.594		
6,400.00	5,929.69	6,432.17	5,929.69	45.08	46.50	-180.00	-682.81	-2,101.91	499.79	410.31	89.47	5.586		
6,500.00	6,029.69	6,532.17	6,029.69	45.14	46.56	-180.00	-682.81	-2,101.91	499.79	410.19	89.60	5.578		
6,600.00	6,129.69	6,632.17	6,129.69	45.20	46.62	-180.00	-682.81	-2,101.91	499.79	410.07	89.72	5.570		
6,700.00	6,229.69	6,732.17	6,229.69	45.27	46.68	-180.00	-682.81	-2,101.91	499.79	409.94	89.85	5.563		
6,800.00	6,329.69	6,832.17	6,329.69	45.33	46.74	-180.00	-682.81	-2,101.91	499.79	409.81	89.98	5.555		
6,900.00	6,429.69	6,932.17	6,429.69	45.40	46.80	-180.00	-682.81	-2,101.91	499.79	409.68	90.11	5.546		
7,000.00	6,529.69	7,032.17	6,529.69	45.46	46.86	-180.00	-682.81	-2,101.91	499.79	409.54	90.24	5.538		
7,100.00	6,629.69	7,132.17	6,629.69	45.53	46.93	-180.00	-682.81	-2,101.91	499.79	409.41	90.38	5.530		
7,200.00	6,729.69	7,232.17	6,729.69	45.60	46.99	-180.00	-682.81	-2,101.91	499.79	409.27	90.52	5.522		
7,300.00	6,829.69	7,332.17	6,829.69	45.67	47.06	-180.00	-682.81	-2,101.91	499.79	409.13	90.66	5.513		
7,400.00	6,929.69	7,432.17	6,929.69	45.74	47.13	-180.00	-682.81	-2,101.91	499.79	408.99	90.80	5.504		
7,500.00	7,029.69	7,532.17	7,029.69	45.81	47.19	-180.00	-682.81	-2,101.91	499.79	408.85	90.94	5.496		
7,600.00	7,129.69	7,632.17	7,129.69	45.89	47.26	-180.00	-682.81	-2,101.91	499.79	408.70	91.09	5.487		
7,700.00	7,229.69	7,732.17	7,229.69	45.96	47.33	-180.00	-682.81	-2,101.91	499.79	408.55	91.23	5.478		
7,800.00	7,329.69	7,832.17	7,329.69	46.04	47.40	-180.00	-682.81	-2,101.91	499.79	408.40	91.38	5.469		
7,900.00	7,429.69	7,932.17	7,429.69	46.11	47.47	-180.00	-682.81	-2,101.91	499.79	408.25	91.54	5.460		
8,000.00	7,529.69	8,032.17	7,529.69	46.19	47.55	-180.00	-682.81	-2,101.91	499.79	408.10	91.69	5.451		
8,100.00	7,629.69	8,132.17	7,629.69	46.27	47.62	-180.00	-682.81	-2,101.91	499.79	407.94	91.84	5.442		
8,139.60	7,669.30	8,171.78	7,669.30	46.30	47.65	-180.00	-682.81	-2,101.91	499.79	407.88	91.91	5.438		
8,165.31	7,695.00	8,187.48	7,685.00	46.32	47.66	-180.00	-682.81	-2,101.91	499.89	407.95	91.94	5.437 SF		



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-07 - Piceance Federal 29- 11W - Wellbore #1 - Design #1													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	163.35	-13.15	3.93	13.73					
100.00	100.00	100.00	100.00	0.09	0.09	163.35	-13.15	3.93	13.73	13.55	0.18	78.302		
200.00	200.00	200.00	200.00	0.31	0.31	163.35	-13.15	3.93	13.73	13.10	0.62	21.970 CC		
300.00	300.00	299.90	299.88	0.54	0.52	170.42	-13.85	2.34	14.05	12.99	1.06	13.247 ES		
400.00	399.98	399.66	399.49	0.75	0.74	-82.42	-15.94	-2.44	15.81	14.32	1.49	10.610		
500.00	499.84	499.26	498.72	0.97	0.99	-74.50	-19.40	-10.38	19.14	17.19	1.95	9.816		
600.00	599.45	598.71	597.42	1.21	1.28	-70.37	-24.24	-21.45	23.69	21.23	2.46	9.634		
700.00	698.70	697.97	695.47	1.49	1.61	-68.71	-30.43	-35.63	29.27	26.24	3.03	9.667		
800.00	797.47	797.04	792.73	1.81	2.00	-68.51	-37.96	-52.88	35.80	32.13	3.67	9.750		
900.00	895.62	895.90	889.07	2.19	2.44	-69.11	-46.81	-73.15	43.26	38.85	4.41	9.812		
1,000.00	993.06	994.52	984.38	2.62	2.94	-70.11	-56.96	-96.39	51.66	46.40	5.25	9.830		
1,100.00	1,089.64	1,092.91	1,078.52	3.12	3.51	-71.30	-68.39	-122.56	61.00	54.77	6.22	9.802		
1,200.00	1,185.27	1,191.04	1,171.39	3.69	4.13	-72.54	-81.07	-151.60	71.29	63.97	7.32	9.736		
1,300.00	1,279.82	1,288.91	1,262.88	4.33	4.83	-73.76	-94.98	-183.45	82.54	73.98	8.56	9.644		
1,400.00	1,373.17	1,386.50	1,352.87	5.04	5.58	-74.92	-110.08	-218.04	94.75	84.81	9.94	9.535		
1,500.00	1,465.21	1,483.81	1,441.27	5.82	6.41	-76.01	-126.35	-255.31	107.91	96.45	11.46	9.416		
1,600.00	1,555.84	1,580.82	1,527.97	6.68	7.30	-77.01	-143.76	-295.18	122.01	108.88	13.13	9.294		
1,700.00	1,644.94	1,677.53	1,612.89	7.62	8.25	-77.92	-162.28	-337.58	137.03	122.09	14.94	9.170		
1,800.00	1,733.15	1,775.38	1,697.51	8.61	9.27	-78.69	-181.94	-382.62	152.99	136.13	16.86	9.074		
1,900.00	1,821.36	1,874.07	1,782.72	9.60	10.31	-79.27	-201.86	-428.23	169.07	150.27	18.81	8.989		
2,000.00	1,909.57	1,972.75	1,867.94	10.61	11.36	-79.74	-221.78	-473.84	185.17	164.40	20.77	8.915		
2,100.00	1,997.78	2,071.44	1,953.15	11.62	12.42	-80.14	-241.69	-519.45	201.28	178.54	22.74	8.850		
2,200.00	2,086.00	2,170.12	2,038.37	12.63	13.48	-80.48	-261.61	-565.06	217.40	192.68	24.73	8.792		
2,300.00	2,174.21	2,268.81	2,123.58	13.65	14.54	-80.78	-281.53	-610.67	233.53	206.81	26.71	8.741		
2,400.00	2,262.42	2,367.49	2,208.80	14.66	15.60	-81.03	-301.45	-656.29	249.66	220.95	28.71	8.696		
2,500.00	2,350.63	2,466.18	2,294.01	15.68	16.66	-81.26	-321.36	-701.90	265.79	235.09	30.71	8.656		
2,600.00	2,438.84	2,564.86	2,379.23	16.71	17.73	-81.46	-341.28	-747.51	281.93	249.22	32.71	8.620		
2,700.00	2,527.05	2,663.55	2,464.44	17.73	18.80	-81.63	-361.20	-793.12	298.07	263.36	34.71	8.587		
2,800.00	2,615.26	2,762.23	2,549.66	18.75	19.86	-81.79	-381.11	-838.73	314.22	277.50	36.72	8.558		
2,900.00	2,703.47	2,860.92	2,634.87	19.78	20.93	-81.93	-401.03	-884.34	330.36	291.64	38.72	8.531		
3,000.00	2,791.68	2,959.60	2,720.09	20.81	22.00	-82.06	-420.95	-929.95	346.51	305.77	40.73	8.507		
3,100.00	2,879.90	3,058.29	2,805.30	21.83	23.07	-82.18	-440.86	-975.57	362.66	319.91	42.74	8.484		
3,200.00	2,968.11	3,156.97	2,890.52	22.86	24.14	-82.29	-460.78	-1,021.18	378.81	334.05	44.76	8.464		
3,300.00	3,056.32	3,255.66	2,975.73	23.89	25.21	-82.39	-480.70	-1,066.79	394.96	348.19	46.77	8.445		
3,400.00	3,144.53	3,354.34	3,060.95	24.92	26.28	-82.48	-500.61	-1,112.40	411.11	362.33	48.78	8.427		
3,500.00	3,232.74	3,453.03	3,146.16	25.95	27.35	-82.57	-520.53	-1,158.01	427.27	376.47	50.80	8.411		
3,600.00	3,320.95	3,551.71	3,231.38	26.97	28.43	-82.65	-540.45	-1,203.62	443.42	390.61	52.81	8.396		
3,700.00	3,409.16	3,650.40	3,316.59	28.00	29.50	-82.72	-560.36	-1,249.23	459.57	404.74	54.83	8.382		
3,800.00	3,497.37	3,749.08	3,401.81	29.03	30.57	-82.79	-580.28	-1,294.84	475.73	418.88	56.85	8.369		
3,900.00	3,585.59	3,847.76	3,487.03	30.06	31.64	-82.85	-600.20	-1,340.46	491.89	433.02	58.86	8.356		
4,000.00	3,673.80	3,946.45	3,572.24	31.09	32.72	-82.91	-620.11	-1,386.07	508.04	447.16	60.88	8.345		
4,100.00	3,762.01	4,045.13	3,657.46	32.12	33.79	-82.97	-640.03	-1,431.68	524.20	461.30	62.90	8.334		
4,200.00	3,850.22	4,143.82	3,742.67	33.15	34.86	-83.02	-659.95	-1,477.29	540.36	475.44	64.92	8.324		
4,300.00	3,938.43	4,242.50	3,827.89	34.19	35.93	-83.07	-679.86	-1,522.90	556.52	489.58	66.94	8.314		
4,400.00	4,026.64	4,341.19	3,913.10	35.22	37.01	-83.12	-699.78	-1,568.51	572.68	503.72	68.96	8.305		
4,500.00	4,114.85	4,439.87	3,998.32	36.25	38.08	-83.16	-719.70	-1,614.12	588.84	517.86	70.98	8.296		
4,600.00	4,203.06	4,538.56	4,083.53	37.28	39.16	-83.20	-739.61	-1,659.73	605.00	532.00	73.00	8.288		
4,700.00	4,291.28	4,637.24	4,168.75	38.31	40.23	-83.24	-759.53	-1,705.35	621.16	546.14	75.02	8.280		
4,800.00	4,379.69	4,737.44	4,255.29	39.29	41.30	-83.40	-779.73	-1,751.61	637.35	560.34	77.01	8.276		
4,900.00	4,469.48	4,845.77	4,350.17	40.08	42.27	-83.64	-800.65	-1,799.52	652.94	574.19	78.75	8.292		
5,000.00	4,560.76	4,954.55	4,447.36	40.81	43.12	-83.86	-820.20	-1,844.29	667.44	587.13	80.31	8.310		
5,100.00	4,653.40	5,063.77	4,546.74	41.48	43.91	-84.06	-838.33	-1,885.80	680.83	599.08	81.75	8.328		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

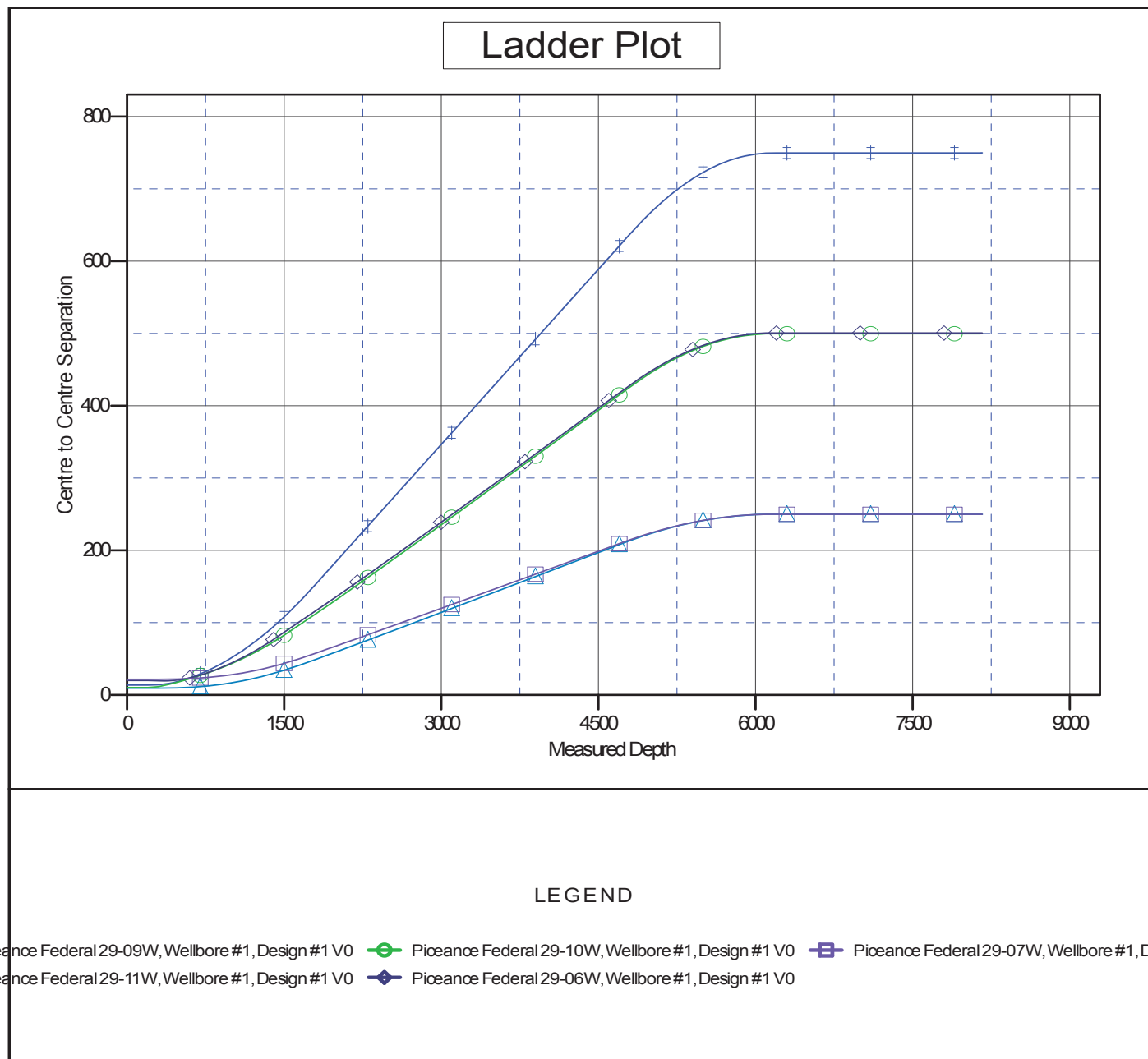
Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,200.00	4,747.30	5,173.39	4,648.14	42.08	44.63	-84.23	-854.98	-1,923.94	693.09	610.02	83.07	8.343		
5,300.00	4,842.34	5,283.39	4,751.42	42.63	45.28	-84.39	-870.12	-1,958.61	704.19	619.93	84.26	8.358		
5,400.00	4,938.41	5,393.73	4,856.40	43.11	45.86	-84.53	-883.70	-1,989.72	714.12	628.80	85.32	8.370		
5,500.00	5,035.39	5,504.37	4,962.91	43.53	46.37	-84.65	-895.69	-2,017.16	722.86	636.61	86.25	8.381		
5,600.00	5,133.17	5,615.29	5,070.76	43.90	46.81	-84.76	-906.04	-2,040.87	730.38	643.33	87.05	8.390		
5,700.00	5,231.61	5,726.44	5,179.76	44.20	47.18	-84.84	-914.74	-2,060.78	736.69	648.96	87.73	8.397		
5,800.00	5,330.60	5,837.79	5,289.71	44.45	47.49	-84.91	-921.74	-2,076.82	741.76	653.47	88.29	8.402		
5,900.00	5,430.03	5,949.28	5,400.42	44.65	47.73	-84.96	-927.03	-2,088.95	745.59	656.86	88.73	8.403		
6,000.00	5,529.77	6,060.89	5,511.66	44.80	47.90	-85.00	-930.60	-2,097.12	748.16	659.11	89.05	8.402		
6,100.00	5,629.70	6,172.56	5,623.23	44.90	48.02	-85.02	-932.44	-2,101.32	749.49	660.22	89.26	8.396		
6,200.00	5,729.69	6,279.03	5,729.69	44.96	48.08	-180.00	-932.70	-2,101.93	749.68	660.29	89.39	8.387		
6,300.00	5,829.69	6,379.03	5,829.69	45.02	48.14	-180.00	-932.70	-2,101.93	749.68	660.17	89.51	8.376		
6,400.00	5,929.69	6,479.03	5,929.69	45.08	48.19	-180.00	-932.70	-2,101.93	749.68	660.05	89.63	8.364		
6,500.00	6,029.69	6,579.03	6,029.69	45.14	48.24	-180.00	-932.70	-2,101.93	749.68	659.93	89.75	8.353		
6,600.00	6,129.69	6,679.03	6,129.69	45.20	48.30	-180.00	-932.70	-2,101.93	749.68	659.81	89.87	8.341		
6,700.00	6,229.69	6,779.03	6,229.69	45.27	48.36	-180.00	-932.70	-2,101.93	749.68	659.68	90.00	8.330		
6,800.00	6,329.69	6,879.03	6,329.69	45.33	48.42	-180.00	-932.70	-2,101.93	749.68	659.55	90.13	8.318		
6,900.00	6,429.69	6,979.03	6,429.69	45.40	48.47	-180.00	-932.70	-2,101.93	749.68	659.42	90.26	8.306		
7,000.00	6,529.69	7,079.03	6,529.69	45.46	48.53	-180.00	-932.70	-2,101.93	749.68	659.29	90.39	8.294		
7,100.00	6,629.69	7,179.03	6,629.69	45.53	48.60	-180.00	-932.70	-2,101.93	749.68	659.15	90.53	8.281		
7,200.00	6,729.69	7,279.03	6,729.69	45.60	48.66	-180.00	-932.70	-2,101.93	749.68	659.02	90.66	8.269		
7,300.00	6,829.69	7,379.03	6,829.69	45.67	48.72	-180.00	-932.70	-2,101.93	749.68	658.88	90.80	8.256		
7,400.00	6,929.69	7,479.03	6,929.69	45.74	48.78	-180.00	-932.70	-2,101.93	749.68	658.74	90.94	8.244		
7,500.00	7,029.69	7,579.03	7,029.69	45.81	48.85	-180.00	-932.70	-2,101.93	749.68	658.60	91.08	8.231		
7,600.00	7,129.69	7,679.03	7,129.69	45.89	48.91	-180.00	-932.70	-2,101.93	749.68	658.45	91.23	8.218		
7,700.00	7,229.69	7,779.03	7,229.69	45.96	48.98	-180.00	-932.70	-2,101.93	749.68	658.30	91.37	8.204		
7,800.00	7,329.69	7,879.03	7,329.69	46.04	49.05	-180.00	-932.70	-2,101.93	749.68	658.16	91.52	8.191		
7,900.00	7,429.69	7,979.03	7,429.69	46.11	49.12	-180.00	-932.70	-2,101.93	749.68	658.01	91.67	8.178		
8,000.00	7,529.69	8,079.03	7,529.69	46.19	49.19	-180.00	-932.70	-2,101.93	749.68	657.85	91.83	8.164		
8,100.00	7,629.69	8,179.03	7,629.69	46.27	49.26	-180.00	-932.70	-2,101.93	749.68	657.70	91.98	8.150		
8,137.05	7,666.74	8,216.08	7,666.74	46.30	49.28	-180.00	-932.70	-2,101.93	749.68	657.64	92.04	8.145		
8,165.31	7,695.00	8,229.34	7,680.00	46.32	49.29	-180.00	-932.70	-2,101.93	749.83	657.76	92.07	8.144 SF		



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-08W
Project:	Mesa County, CO	TVD Reference:	Well @ 7520.00usft
Reference Site:	Piceance 29-07	MD Reference:	Well @ 7520.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Piceance Federal 29-08W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7520.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 29-08W
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.45°





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