



Piceance Energy, LLC

Mesa County, CO

Piceance 29-07

Piceance 29-02E

Wellbore #1

Plan: Design #1

Standard Planning Report

27 March, 2015

Archer



Created By: Ricky Osburn Date: 10:20, March 27 2015



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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 29-02E					
Well Position	+N/-S	-18.22 usft	Northing:	1,524,452.326 usft	Latitude:	39° 15' 3.170 N
	+E/-W	-9.44 usft	Easting:	2,351,108.845 usft	Longitude:	107° 47' 29.980 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	47.27

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	
1,504.42	24.09	47.27	1,469.25	169.27	183.27	2.00	2.00	0.00	47.27	
4,841.52	24.09	47.27	4,515.75	1,093.40	1,183.81	0.00	0.00	0.00	0.00	
6,045.94	0.00	0.00	5,685.00	1,262.66	1,367.08	2.00	-2.00	0.00	180.00	
8,158.94	0.00	0.00	7,798.00	1,262.66	1,367.08	0.00	0.00	0.00	0.00	Piceance 29-02E tgt



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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	47.27	399.98	1.18	1.28	1.75	2.00	2.00	0.00
500.00	4.00	47.27	499.84	4.73	5.13	6.98	2.00	2.00	0.00
600.00	6.00	47.27	599.45	10.65	11.53	15.69	2.00	2.00	0.00
700.00	8.00	47.27	698.70	18.92	20.48	27.88	2.00	2.00	0.00
800.00	10.00	47.27	797.47	29.53	31.97	43.52	2.00	2.00	0.00
900.00	12.00	47.27	895.62	42.48	45.99	62.60	2.00	2.00	0.00
1,000.00	14.00	47.27	993.06	57.74	62.51	85.10	2.00	2.00	0.00
1,100.00	16.00	47.27	1,089.64	75.30	81.52	110.98	2.00	2.00	0.00
1,200.00	18.00	47.27	1,185.27	95.13	103.00	140.21	2.00	2.00	0.00
1,300.00	20.00	47.27	1,279.82	117.22	126.92	172.77	2.00	2.00	0.00
1,400.00	22.00	47.27	1,373.17	141.54	153.24	208.60	2.00	2.00	0.00
Start 3337.10 hold at 1504.42 MD									
1,504.42	24.09	47.27	1,469.25	169.27	183.27	249.47	2.00	2.00	0.00
8 5/8" Csg.									
1,522.00	24.09	47.27	1,485.30	174.14	188.54	256.65	0.00	0.00	0.00
1,600.00	24.09	47.27	1,556.51	195.74	211.92	288.49	0.00	0.00	0.00
1,700.00	24.09	47.27	1,647.80	223.43	241.91	329.30	0.00	0.00	0.00
1,800.00	24.09	47.27	1,739.09	251.12	271.89	370.11	0.00	0.00	0.00
1,900.00	24.09	47.27	1,830.38	278.81	301.87	410.93	0.00	0.00	0.00
2,000.00	24.09	47.27	1,921.67	306.51	331.85	451.74	0.00	0.00	0.00
2,100.00	24.09	47.27	2,012.97	334.20	361.84	492.56	0.00	0.00	0.00
2,200.00	24.09	47.27	2,104.26	361.89	391.82	533.37	0.00	0.00	0.00
2,300.00	24.09	47.27	2,195.55	389.58	421.80	574.19	0.00	0.00	0.00
2,400.00	24.09	47.27	2,286.84	417.28	451.78	615.00	0.00	0.00	0.00
2,500.00	24.09	47.27	2,378.13	444.97	481.77	655.82	0.00	0.00	0.00
2,600.00	24.09	47.27	2,469.42	472.66	511.75	696.63	0.00	0.00	0.00
2,700.00	24.09	47.27	2,560.72	500.35	541.73	737.45	0.00	0.00	0.00
2,800.00	24.09	47.27	2,652.01	528.05	571.71	778.26	0.00	0.00	0.00
2,900.00	24.09	47.27	2,743.30	555.74	601.70	819.07	0.00	0.00	0.00
G Sand									
2,905.15	24.09	47.27	2,748.00	557.17	603.24	821.18	0.00	0.00	0.00
3,000.00	24.09	47.27	2,834.59	583.43	631.68	859.89	0.00	0.00	0.00
3,100.00	24.09	47.27	2,925.88	611.12	661.66	900.70	0.00	0.00	0.00
3,200.00	24.09	47.27	3,017.17	638.82	691.64	941.52	0.00	0.00	0.00
3,300.00	24.09	47.27	3,108.47	666.51	721.63	982.33	0.00	0.00	0.00
3,400.00	24.09	47.27	3,199.76	694.20	751.61	1,023.15	0.00	0.00	0.00
3,500.00	24.09	47.27	3,291.05	721.89	781.59	1,063.96	0.00	0.00	0.00
3,600.00	24.09	47.27	3,382.34	749.59	811.57	1,104.78	0.00	0.00	0.00
3,700.00	24.09	47.27	3,473.63	777.28	841.56	1,145.59	0.00	0.00	0.00
3,800.00	24.09	47.27	3,564.92	804.97	871.54	1,186.41	0.00	0.00	0.00
3,900.00	24.09	47.27	3,656.22	832.66	901.52	1,227.22	0.00	0.00	0.00
4,000.00	24.09	47.27	3,747.51	860.36	931.50	1,268.04	0.00	0.00	0.00
4,100.00	24.09	47.27	3,838.80	888.05	961.49	1,308.85	0.00	0.00	0.00
4,200.00	24.09	47.27	3,930.09	915.74	991.47	1,349.66	0.00	0.00	0.00
4,300.00	24.09	47.27	4,021.38	943.43	1,021.45	1,390.48	0.00	0.00	0.00
4,400.00	24.09	47.27	4,112.67	971.13	1,051.43	1,431.29	0.00	0.00	0.00
4,500.00	24.09	47.27	4,203.97	998.82	1,081.42	1,472.11	0.00	0.00	0.00
4,600.00	24.09	47.27	4,295.26	1,026.51	1,111.40	1,512.92	0.00	0.00	0.00
4,700.00	24.09	47.27	4,386.55	1,054.20	1,141.38	1,553.74	0.00	0.00	0.00



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Project:	Mesa County, CO	MD Reference:	Well @ 7520.00usft
Site:	Piceance 29-07	North Reference:	True
Well:	Piceance 29-02E	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)
4,800.00	24.09	47.27	4,477.84	1,081.90	1,171.36	1,594.55	0.00	0.00	0.00
Start Drop -2.00									
4,841.52	24.09	47.27	4,515.75	1,093.40	1,183.81	1,611.50	0.00	0.00	0.00
4,900.00	22.92	47.27	4,569.37	1,109.22	1,200.94	1,634.82	2.00	-2.00	0.00
Williams Fork									
4,931.01	22.30	47.27	4,598.00	1,117.31	1,209.70	1,646.74	2.00	-2.00	0.00
5,000.00	20.92	47.27	4,662.14	1,134.55	1,228.37	1,672.15	2.00	-2.00	0.00
5,100.00	18.92	47.27	4,756.15	1,157.66	1,253.39	1,706.21	2.00	-2.00	0.00
5,200.00	16.92	47.27	4,851.30	1,178.53	1,275.99	1,736.98	2.00	-2.00	0.00
5,300.00	14.92	47.27	4,947.46	1,197.14	1,296.14	1,764.41	2.00	-2.00	0.00
5,400.00	12.92	47.27	5,044.52	1,213.46	1,313.81	1,788.46	2.00	-2.00	0.00
5,500.00	10.92	47.27	5,142.36	1,227.48	1,328.98	1,809.11	2.00	-2.00	0.00
5,600.00	8.92	47.27	5,240.86	1,239.16	1,341.63	1,826.34	2.00	-2.00	0.00
5,700.00	6.92	47.27	5,339.90	1,248.51	1,351.75	1,840.11	2.00	-2.00	0.00
5,800.00	4.92	47.27	5,439.36	1,255.51	1,359.33	1,850.42	2.00	-2.00	0.00
5,900.00	2.92	47.27	5,539.12	1,260.14	1,364.35	1,857.26	2.00	-2.00	0.00
6,000.00	0.92	47.27	5,639.06	1,262.41	1,366.81	1,860.61	2.00	-2.00	0.00
Start 2113.00 hold at 6045.94 MD									
6,045.94	0.00	0.00	5,685.00	1,262.66	1,367.08	1,860.97	2.00	-2.00	0.00
6,100.00	0.00	0.00	5,739.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
TOG									
6,158.94	0.00	0.00	5,798.00	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,200.00	0.00	0.00	5,839.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,300.00	0.00	0.00	5,939.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,400.00	0.00	0.00	6,039.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,500.00	0.00	0.00	6,139.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,600.00	0.00	0.00	6,239.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,700.00	0.00	0.00	6,339.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,800.00	0.00	0.00	6,439.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
6,900.00	0.00	0.00	6,539.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,000.00	0.00	0.00	6,639.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,100.00	0.00	0.00	6,739.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,200.00	0.00	0.00	6,839.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
Cameo									
7,258.94	0.00	0.00	6,898.00	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,300.00	0.00	0.00	6,939.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,400.00	0.00	0.00	7,039.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,500.00	0.00	0.00	7,139.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,600.00	0.00	0.00	7,239.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,700.00	0.00	0.00	7,339.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,800.00	0.00	0.00	7,439.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
7,900.00	0.00	0.00	7,539.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
Base Cameo Coal									
7,916.94	0.00	0.00	7,556.00	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
Rollins									
7,958.94	0.00	0.00	7,598.00	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
8,000.00	0.00	0.00	7,639.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
8,100.00	0.00	0.00	7,739.06	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00
TD at 8158.94									
8,158.94	0.00	0.00	7,798.00	1,262.66	1,367.08	1,860.97	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Piceance 29-02E tgt	0.00	0.00	7,798.00	1,262.67	1,367.08	1,525,680.111	2,352,507.337	39° 15' 15.650 N	107° 47' 12.600 W
- plan hits target center									
- Point									

Casing Points				
Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
(usft)	(usft)	Name	(")	(")
1,522.00	1,485.30	8 5/8" Csg.	8-5/8	12-1/4

Formations					
Measured Depth	Vertical Depth			Dip	Dip Direction
(usft)	(usft)	Name	Lithology	(°)	(°)
2,905.15	2,748.00	G Sand		0.00	
4,931.01	4,598.00	Williams Fork		0.00	
6,158.94	5,798.00	TOG		0.00	
7,258.94	6,898.00	Cameo		0.00	
7,916.94	7,556.00	Base Cameo Coal		0.00	
7,958.94	7,598.00	Rollins		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	Comment
300.00	300.00	0.00	0.00	Start Build 2.00
1,504.42	1,469.25	169.27	183.27	Start 3337.10 hold at 1504.42 MD
4,841.52	4,515.75	1,093.40	1,183.81	Start Drop -2.00
6,045.94	5,685.00	1,262.66	1,367.08	Start 2113.00 hold at 6045.94 MD
8,158.94	7,798.00	1,262.66	1,367.08	TD at 8158.94



Piceance Energy, LLC

Mesa County, CO

Piceance 29-07

Piceance 29-02E

Wellbore #1

Design #1

Anticollision Report

27 March, 2015

Archer



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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	8,158.94	Design #1 (Wellbore #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						
Piceance 29-07						
Piceance 29-01E - Wellbore #1 - Design #1	803.93	802.09	9.98	6.41	2.801	CC, ES
Piceance 29-01E - Wellbore #1 - Design #1	2,100.00	2,100.32	48.46	28.08	2.378	SF
Piceance 29-03E - Wellbore #1 - Design #1	300.00	300.00	9.00	7.92	8.376	CC, ES
Piceance 29-03E - Wellbore #1 - Design #1	8,158.94	8,104.24	249.91	186.19	3.922	SF
Piceance 29-04M - Wellbore #1 - Design #1	200.00	200.00	23.28	22.66	37.261	CC, ES
Piceance 29-04M - Wellbore #1 - Design #1	500.00	496.86	34.29	32.29	17.201	SF
Piceance 29-05M - Wellbore #1 - Design #1	300.00	300.00	10.02	8.95	9.329	CC, ES
Piceance 29-05M - Wellbore #1 - Design #1	400.00	399.62	12.19	10.66	8.004	SF
Piceance 29-06M - Wellbore #1 - Design #1	300.00	300.00	13.97	12.90	13.004	CC, ES
Piceance 29-06M - Wellbore #1 - Design #1	500.00	499.84	20.48	18.45	10.096	SF

Offset Design		Piceance 29-07 - Piceance 29-01E - 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		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
							+N/-S (usft)	+E/-W (usft)						
0.00	0.00	0.00	0.00	0.00	0.00	27.38	18.22	9.44	20.52					
100.00	100.00	100.00	100.00	0.09	0.09	27.38	18.22	9.44	20.52	20.35	0.18	117.066		
200.00	200.00	200.00	200.00	0.31	0.31	27.38	18.22	9.44	20.52	19.90	0.62	32.846		
300.00	300.00	300.00	300.00	0.54	0.54	27.38	18.22	9.44	20.52	19.45	1.07	19.103		
400.00	399.98	399.98	399.98	0.76	0.76	-21.70	18.22	9.44	18.89	17.35	1.54	12.257		
500.00	499.84	499.35	499.33	0.99	0.98	-26.94	19.50	10.60	15.75	13.74	2.02	7.814		
600.00	599.45	598.84	598.68	1.23	1.21	-35.85	23.33	14.08	12.96	10.47	2.49	5.200		
700.00	698.70	698.45	697.91	1.51	1.45	-50.26	29.72	19.88	10.85	7.87	2.98	3.637		
800.00	797.47	798.17	796.89	1.82	1.71	-70.40	38.67	28.02	9.98	6.44	3.54	2.821		
803.93	801.33	802.09	800.77	1.83	1.72	-71.26	39.08	28.38	9.98	6.41	3.56	2.801	CC, ES	
900.00	895.62	898.01	895.51	2.18	2.02	-91.39	50.18	38.47	10.76	6.57	4.20	2.564		
1,000.00	993.06	997.97	993.64	2.60	2.37	-107.35	64.25	51.25	13.02	8.09	4.93	2.643		
1,100.00	1,089.64	1,098.04	1,091.16	3.08	2.77	-117.57	80.86	66.34	16.24	10.55	5.69	2.855		
1,200.00	1,185.27	1,198.23	1,187.94	3.62	3.23	-123.79	100.00	83.74	20.05	13.55	6.50	3.085		
1,300.00	1,279.82	1,298.53	1,283.87	4.22	3.76	-127.56	121.67	103.42	24.26	16.88	7.38	3.287		
1,400.00	1,373.17	1,398.95	1,378.83	4.89	4.35	-129.82	145.83	125.37	28.76	20.41	8.34	3.446		
1,500.00	1,465.21	1,499.47	1,472.68	5.63	5.00	-131.12	172.48	149.58	33.51	24.10	9.41	3.562		

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 29-02E
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 29-02E	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 29-01E - 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		
1,600.00	1,556.51	1,600.13	1,565.33	6.40	5.73	-130.02	201.58	176.02	37.43	26.75	10.68	3.505		
1,700.00	1,647.80	1,700.79	1,656.55	7.19	6.52	-124.91	233.07	204.63	39.48	27.13	12.35	3.196		
1,800.00	1,739.09	1,801.05	1,745.93	7.98	7.37	-116.04	266.70	235.18	40.46	26.00	14.46	2.799		
1,900.00	1,830.38	1,900.81	1,834.45	8.78	8.24	-106.63	300.74	266.11	42.14	25.53	16.61	2.537		
2,000.00	1,921.67	2,000.56	1,922.96	9.58	9.12	-98.15	334.79	297.04	44.87	26.27	18.60	2.412		
2,100.00	2,012.97	2,100.32	2,011.48	10.38	10.01	-90.77	368.83	327.97	48.46	28.08	20.38	2.378 SF		
2,200.00	2,104.26	2,200.07	2,099.99	11.19	10.90	-84.49	402.88	358.90	52.74	30.78	21.96	2.401		
2,300.00	2,195.55	2,299.83	2,188.51	12.00	11.80	-79.21	436.92	389.83	57.55	34.16	23.40	2.460		
2,400.00	2,286.84	2,399.58	2,277.03	12.81	12.70	-74.77	470.97	420.77	62.78	38.06	24.72	2.540		
2,500.00	2,378.13	2,499.34	2,365.54	13.62	13.60	-71.04	505.02	451.70	68.32	42.36	25.96	2.632		
2,600.00	2,469.42	2,599.09	2,454.06	14.43	14.50	-67.87	539.06	482.63	74.12	46.96	27.15	2.730		
2,700.00	2,560.72	2,698.84	2,542.58	15.25	15.41	-65.17	573.11	513.56	80.10	51.79	28.31	2.829		
2,800.00	2,652.01	2,798.60	2,631.09	16.06	16.32	-62.85	607.15	544.49	86.24	56.79	29.44	2.929		
2,900.00	2,743.30	2,898.35	2,719.61	16.87	17.22	-60.84	641.20	575.42	92.49	61.93	30.56	3.027		
3,000.00	2,834.59	2,998.11	2,808.13	17.69	18.13	-59.08	675.25	606.35	98.85	67.18	31.67	3.121		
3,100.00	2,925.88	3,097.86	2,896.64	18.51	19.04	-57.54	709.29	637.28	105.29	72.52	32.77	3.213		
3,200.00	3,017.17	3,197.62	2,985.16	19.32	19.95	-56.18	743.34	668.22	111.80	77.92	33.88	3.300		
3,300.00	3,108.47	3,297.37	3,073.68	20.14	20.86	-54.96	777.38	699.15	118.36	83.38	34.98	3.384		
3,400.00	3,199.76	3,397.13	3,162.19	20.95	21.77	-53.88	811.43	730.08	124.97	88.89	36.08	3.464		
3,500.00	3,291.05	3,496.88	3,250.71	21.77	22.68	-52.90	845.48	761.01	131.62	94.44	37.18	3.540		
3,600.00	3,382.34	3,596.64	3,339.23	22.59	23.59	-52.02	879.52	791.94	138.30	100.02	38.28	3.613		
3,700.00	3,473.63	3,696.39	3,427.74	23.40	24.51	-51.22	913.57	822.87	145.02	105.64	39.38	3.682		
3,800.00	3,564.92	3,796.15	3,516.26	24.22	25.42	-50.49	947.61	853.80	151.76	111.27	40.48	3.748		
3,900.00	3,656.22	3,895.90	3,604.77	25.04	26.33	-49.83	981.66	884.73	158.52	116.93	41.59	3.811		
4,000.00	3,747.51	3,995.66	3,693.29	25.86	27.25	-49.21	1,015.71	915.66	165.30	122.60	42.70	3.871		
4,100.00	3,838.80	4,095.41	3,781.81	26.67	28.16	-48.65	1,049.75	946.60	172.10	128.29	43.81	3.928		
4,200.00	3,930.09	4,195.17	3,870.32	27.49	29.07	-48.13	1,083.80	977.53	178.91	133.99	44.92	3.983		
4,300.00	4,021.38	4,294.92	3,958.84	28.31	29.99	-47.64	1,117.84	1,008.46	185.74	139.71	46.03	4.035		
4,400.00	4,112.67	4,394.68	4,047.36	29.13	30.90	-47.20	1,151.89	1,039.39	192.58	145.43	47.14	4.085		
4,500.00	4,203.97	4,494.43	4,135.87	29.95	31.81	-46.78	1,185.94	1,070.32	199.43	151.17	48.26	4.132		
4,600.00	4,295.26	4,594.19	4,224.39	30.77	32.73	-46.39	1,219.98	1,101.25	206.29	156.91	49.38	4.178		
4,700.00	4,386.55	4,693.94	4,312.91	31.58	33.64	-46.02	1,254.03	1,132.18	213.16	162.67	50.49	4.222		
4,800.00	4,477.84	4,796.28	4,403.88	32.40	34.53	-45.73	1,288.73	1,163.71	219.79	168.16	51.63	4.257		
4,900.00	4,569.37	4,902.36	4,499.61	33.16	35.26	-45.92	1,322.53	1,194.42	224.52	171.65	52.87	4.247		
5,000.00	4,662.14	5,008.57	4,597.09	33.77	35.94	-46.16	1,353.72	1,222.76	228.69	174.72	53.98	4.237		
5,100.00	4,756.15	5,114.90	4,696.19	34.32	36.57	-46.37	1,382.25	1,248.68	232.51	177.52	54.99	4.228		
5,200.00	4,851.30	5,221.33	4,796.74	34.83	37.14	-46.56	1,408.06	1,272.13	235.95	180.05	55.90	4.221		
5,300.00	4,947.46	5,327.87	4,898.61	35.28	37.66	-46.72	1,431.11	1,293.07	239.03	182.32	56.72	4.214		
5,400.00	5,044.52	5,434.48	5,001.66	35.69	38.12	-46.87	1,451.36	1,311.46	241.73	184.30	57.43	4.209		
5,500.00	5,142.36	5,541.18	5,105.72	36.05	38.52	-46.99	1,468.76	1,327.27	244.06	186.01	58.05	4.204		
5,600.00	5,240.86	5,647.93	5,210.65	36.36	38.87	-47.08	1,483.29	1,340.47	246.00	187.43	58.56	4.201		
5,700.00	5,339.90	5,754.74	5,316.29	36.62	39.16	-47.16	1,494.93	1,351.04	247.55	188.57	58.97	4.198		
5,800.00	5,439.36	5,861.59	5,422.48	36.82	39.39	-47.22	1,503.64	1,358.96	248.71	189.42	59.29	4.195		
5,900.00	5,539.12	5,968.47	5,529.07	36.98	39.57	-47.26	1,509.42	1,364.21	249.48	189.98	59.50	4.193		
6,000.00	5,639.06	6,075.37	5,635.89	37.09	39.69	-47.27	1,512.25	1,366.78	249.86	190.25	59.61	4.192		
6,100.00	5,739.06	6,178.54	5,739.06	37.16	39.76	0.00	1,512.56	1,367.07	249.90	190.18	59.71	4.185		
6,200.00	5,839.06	6,278.54	5,839.06	37.24	39.83	0.00	1,512.56	1,367.07	249.90	190.01	59.89	4.173		
6,300.00	5,939.06	6,378.54	5,939.06	37.31	39.89	0.00	1,512.56	1,367.07	249.90	189.83	60.07	4.160		
6,400.00	6,039.06	6,478.54	6,039.06	37.38	39.96	0.00	1,512.56	1,367.07	249.90	189.64	60.25	4.147		
6,500.00	6,139.06	6,578.54	6,139.06	37.46	40.03	0.00	1,512.56	1,367.07	249.90	189.46	60.44	4.135		
6,600.00	6,239.06	6,678.54	6,239.06	37.53	40.10	0.00	1,512.56	1,367.07	249.90	189.27	60.63	4.122		
6,700.00	6,339.06	6,778.54	6,339.06	37.61	40.17	0.00	1,512.56	1,367.07	249.90	189.08	60.82	4.109		

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 29-02E
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 29-02E	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	
6,800.00	6,439.06	6,878.54	6,439.06	37.69	40.24	0.00	1,512.56	1,367.07	249.90	188.88	61.01	4.096	
6,900.00	6,539.06	6,978.54	6,539.06	37.77	40.32	0.00	1,512.56	1,367.07	249.90	188.69	61.21	4.083	
7,000.00	6,639.06	7,078.54	6,639.06	37.85	40.39	0.00	1,512.56	1,367.07	249.90	188.49	61.41	4.069	
7,100.00	6,739.06	7,178.54	6,739.06	37.93	40.47	0.00	1,512.56	1,367.07	249.90	188.29	61.61	4.056	
7,200.00	6,839.06	7,278.54	6,839.06	38.01	40.55	0.00	1,512.56	1,367.07	249.90	188.08	61.82	4.043	
7,300.00	6,939.06	7,378.54	6,939.06	38.10	40.62	0.00	1,512.56	1,367.07	249.90	187.88	62.02	4.029	
7,400.00	7,039.06	7,478.54	7,039.06	38.18	40.70	0.00	1,512.56	1,367.07	249.90	187.67	62.23	4.016	
7,500.00	7,139.06	7,578.54	7,139.06	38.27	40.78	0.00	1,512.56	1,367.07	249.90	187.45	62.44	4.002	
7,600.00	7,239.06	7,678.54	7,239.06	38.36	40.86	0.00	1,512.56	1,367.07	249.90	187.24	62.66	3.988	
7,700.00	7,339.06	7,778.54	7,339.06	38.45	40.95	0.00	1,512.56	1,367.07	249.90	187.02	62.88	3.974	
7,800.00	7,439.06	7,878.54	7,439.06	38.53	41.03	0.00	1,512.56	1,367.07	249.90	186.80	63.10	3.961	
7,900.00	7,539.06	7,978.54	7,539.06	38.63	41.11	0.00	1,512.56	1,367.07	249.90	186.58	63.32	3.947	
8,000.00	7,639.06	8,078.54	7,639.06	38.72	41.20	0.00	1,512.56	1,367.07	249.90	186.36	63.54	3.933	
8,100.00	7,739.06	8,178.54	7,739.06	38.81	41.29	0.00	1,512.56	1,367.07	249.90	186.13	63.77	3.919	
8,158.94	7,798.00	8,237.48	7,798.00	38.87	41.32	0.00	1,512.56	1,367.07	249.90	186.02	63.88	3.912	



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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 29-03E - 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	-154.08	-8.09	-3.93	9.00					
100.00	100.00	100.00	100.00	0.09	0.09	-154.08	-8.09	-3.93	9.00	8.82	0.18	51.330		
200.00	200.00	200.00	200.00	0.31	0.31	-154.08	-8.09	-3.93	9.00	8.37	0.62	14.402		
300.00	300.00	300.00	300.00	0.54	0.54	-154.08	-8.09	-3.93	9.00	7.92	1.07	8.376 CC, ES		
400.00	399.98	399.98	399.98	0.76	0.76	162.06	-8.09	-3.93	10.64	9.10	1.54	6.901		
500.00	499.84	500.32	500.30	0.99	0.98	165.73	-7.05	-2.52	14.05	12.03	2.02	6.942		
600.00	599.45	600.78	600.61	1.23	1.21	166.78	-3.89	1.71	17.59	15.07	2.51	6.999		
700.00	698.70	701.36	700.80	1.51	1.45	166.50	1.36	8.77	21.21	18.19	3.01	7.038		
800.00	797.47	802.05	800.73	1.82	1.72	165.46	8.73	18.66	24.91	21.38	3.53	7.060		
900.00	895.62	902.85	900.27	2.18	2.03	163.98	18.20	31.37	28.72	24.65	4.07	7.063		
1,000.00	993.06	1,003.77	999.31	2.60	2.39	162.21	29.76	46.91	32.64	28.00	4.64	7.040		
1,100.00	1,089.64	1,104.79	1,097.70	3.08	2.81	160.27	43.42	65.25	36.68	31.43	5.25	6.987		
1,200.00	1,185.27	1,205.91	1,195.33	3.62	3.28	158.22	59.16	86.39	40.88	34.95	5.93	6.897		
1,300.00	1,279.82	1,307.14	1,292.06	4.22	3.83	156.11	76.97	110.31	45.24	38.55	6.68	6.769		
1,400.00	1,373.17	1,408.47	1,387.77	4.89	4.44	153.98	96.82	136.97	49.77	42.24	7.53	6.609		
1,500.00	1,465.21	1,509.89	1,482.33	5.63	5.11	151.86	118.71	166.37	54.49	46.00	8.49	6.417		
1,600.00	1,556.51	1,609.90	1,574.82	6.40	5.83	149.88	141.44	196.90	59.24	49.69	9.54	6.208		
1,700.00	1,647.80	1,709.77	1,667.17	7.19	6.56	148.20	164.15	227.39	64.03	53.38	10.65	6.012		
1,800.00	1,739.09	1,809.64	1,759.52	7.98	7.30	146.75	186.86	257.89	68.87	57.06	11.81	5.834		
1,900.00	1,830.38	1,909.51	1,851.86	8.78	8.04	145.50	209.57	288.39	73.74	60.75	13.00	5.674		
2,000.00	1,921.67	2,009.38	1,944.21	9.58	8.79	144.40	232.27	318.88	78.65	64.44	14.21	5.533		
2,100.00	2,012.97	2,109.25	2,036.56	10.38	9.54	143.43	254.98	349.38	83.59	68.13	15.46	5.408		
2,200.00	2,104.26	2,209.12	2,128.91	11.19	10.30	142.57	277.69	379.88	88.54	71.83	16.72	5.297		
2,300.00	2,195.55	2,308.99	2,221.25	12.00	11.06	141.80	300.40	410.37	93.52	75.53	17.99	5.199		
2,400.00	2,286.84	2,408.85	2,313.60	12.81	11.82	141.11	323.11	440.87	98.51	79.23	19.27	5.111		
2,500.00	2,378.13	2,508.72	2,405.95	13.62	12.58	140.48	345.81	471.37	103.51	82.94	20.57	5.032		
2,600.00	2,469.42	2,608.59	2,498.30	14.43	13.34	139.91	368.52	501.86	108.52	86.65	21.87	4.962		
2,700.00	2,560.72	2,708.46	2,590.64	15.25	14.10	139.39	391.23	532.36	113.54	90.36	23.18	4.898		
2,800.00	2,652.01	2,808.33	2,682.99	16.06	14.87	138.92	413.94	562.86	118.57	94.08	24.50	4.840		
2,900.00	2,743.30	2,908.20	2,775.34	16.87	15.63	138.49	436.65	593.35	123.61	97.79	25.82	4.788		
3,000.00	2,834.59	3,008.07	2,867.69	17.69	16.40	138.08	459.35	623.85	128.66	101.51	27.14	4.740		
3,100.00	2,925.88	3,107.94	2,960.03	18.51	17.16	137.71	482.06	654.35	133.71	105.24	28.47	4.696		
3,200.00	3,017.17	3,207.81	3,052.38	19.32	17.93	137.37	504.77	684.84	138.76	108.96	29.80	4.656		
3,300.00	3,108.47	3,307.67	3,144.73	20.14	18.70	137.05	527.48	715.34	143.82	112.68	31.14	4.619		
3,400.00	3,199.76	3,407.54	3,237.08	20.95	19.47	136.75	550.18	745.84	148.89	116.41	32.47	4.585		
3,500.00	3,291.05	3,507.41	3,329.43	21.77	20.23	136.47	572.89	776.33	153.96	120.14	33.81	4.553		
3,600.00	3,382.34	3,607.28	3,421.77	22.59	21.00	136.21	595.60	806.83	159.03	123.87	35.15	4.524		
3,700.00	3,473.63	3,707.15	3,514.12	23.40	21.77	135.97	618.31	837.33	164.10	127.60	36.50	4.496		
3,800.00	3,564.92	3,807.02	3,606.47	24.22	22.54	135.74	641.02	867.82	169.18	131.34	37.84	4.471		
3,900.00	3,656.22	3,906.89	3,698.82	25.04	23.31	135.52	663.72	898.32	174.26	135.07	39.19	4.447		
4,000.00	3,747.51	4,006.76	3,791.16	25.86	24.08	135.32	686.43	928.82	179.34	138.81	40.54	4.424		
4,100.00	3,838.80	4,106.62	3,883.51	26.67	24.84	135.13	709.14	959.31	184.43	142.54	41.88	4.403		
4,200.00	3,930.09	4,206.49	3,975.86	27.49	25.61	134.94	731.85	989.81	189.51	146.28	43.23	4.384		
4,300.00	4,021.38	4,306.36	4,068.21	28.31	26.38	134.77	754.55	1,020.31	194.60	150.02	44.58	4.365		
4,400.00	4,112.67	4,406.23	4,160.55	29.13	27.15	134.61	777.26	1,050.80	199.69	153.76	45.93	4.347		
4,500.00	4,203.97	4,506.10	4,252.90	29.95	27.92	134.45	799.97	1,081.30	204.78	157.50	47.29	4.331		
4,600.00	4,295.26	4,605.97	4,345.25	30.77	28.69	134.30	822.68	1,111.80	209.88	161.24	48.64	4.315		
4,700.00	4,386.55	4,705.84	4,437.60	31.58	29.46	134.16	845.39	1,142.29	214.97	164.98	49.99	4.300		
4,800.00	4,477.84	4,805.71	4,529.94	32.40	30.23	134.03	868.09	1,172.79	220.07	168.72	51.35	4.286		
4,900.00	4,569.37	4,904.19	4,621.06	33.16	30.96	133.86	890.40	1,202.75	224.84	172.18	52.67	4.269		
5,000.00	4,662.14	5,000.00	4,710.60	33.77	31.52	133.65	910.76	1,230.10	228.98	175.22	53.75	4.260		
5,100.00	4,756.15	5,094.66	4,800.13	34.32	32.02	133.47	929.11	1,254.73	232.75	178.01	54.74	4.252		

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 29-02E
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 29-02E	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	4,851.30	5,189.84	4,891.13	34.83	32.49	133.31	945.77	1,277.11	236.15	180.52	55.63	4.245	
5,300.00	4,947.46	5,285.00	4,982.98	35.28	32.91	133.17	960.61	1,297.03	239.19	182.76	56.43	4.239	
5,400.00	5,044.52	5,380.13	5,075.58	35.69	33.28	133.06	973.61	1,314.50	241.86	184.72	57.14	4.233	
5,500.00	5,142.36	5,475.23	5,168.83	36.05	33.61	132.96	984.77	1,329.49	244.15	186.40	57.74	4.228	
5,600.00	5,240.86	5,570.32	5,262.63	36.36	33.89	132.88	994.07	1,341.98	246.05	187.80	58.25	4.224	
5,700.00	5,339.90	5,665.40	5,356.88	36.62	34.13	132.82	1,001.51	1,351.97	247.58	188.91	58.67	4.220	
5,800.00	5,439.36	5,760.46	5,451.49	36.82	34.32	132.77	1,007.08	1,359.45	248.72	189.74	58.98	4.217	
5,900.00	5,539.12	5,855.52	5,546.34	36.98	34.47	132.74	1,010.77	1,364.40	249.48	190.27	59.21	4.214	
6,000.00	5,639.06	5,950.57	5,641.33	37.09	34.57	132.72	1,012.57	1,366.82	249.85	190.52	59.34	4.211	
6,100.00	5,739.06	6,048.29	5,739.06	37.16	34.65	180.00	1,012.77	1,367.09	249.89	190.43	59.46	4.203	
6,200.00	5,839.06	6,148.29	5,839.06	37.24	34.73	180.00	1,012.77	1,367.09	249.89	190.25	59.64	4.190	
6,300.00	5,939.06	6,248.29	5,939.06	37.31	34.81	180.00	1,012.77	1,367.09	249.89	190.07	59.82	4.177	
6,400.00	6,039.06	6,348.29	6,039.06	37.38	34.89	180.00	1,012.77	1,367.09	249.89	189.88	60.01	4.164	
6,500.00	6,139.06	6,448.29	6,139.06	37.46	34.97	180.00	1,012.77	1,367.09	249.89	189.69	60.20	4.151	
6,600.00	6,239.06	6,548.29	6,239.06	37.53	35.05	180.00	1,012.77	1,367.09	249.89	189.50	60.39	4.138	
6,700.00	6,339.06	6,648.29	6,339.06	37.61	35.14	180.00	1,012.77	1,367.09	249.89	189.31	60.59	4.125	
6,800.00	6,439.06	6,748.29	6,439.06	37.69	35.22	180.00	1,012.77	1,367.09	249.89	189.11	60.78	4.111	
6,900.00	6,539.06	6,848.29	6,539.06	37.77	35.31	180.00	1,012.77	1,367.09	249.89	188.91	60.98	4.098	
7,000.00	6,639.06	6,948.29	6,639.06	37.85	35.40	180.00	1,012.77	1,367.09	249.89	188.71	61.19	4.084	
7,100.00	6,739.06	7,048.29	6,739.06	37.93	35.48	180.00	1,012.77	1,367.09	249.89	188.50	61.39	4.070	
7,200.00	6,839.06	7,148.29	6,839.06	38.01	35.57	180.00	1,012.77	1,367.09	249.89	188.29	61.60	4.057	
7,300.00	6,939.06	7,248.29	6,939.06	38.10	35.66	180.00	1,012.77	1,367.09	249.89	188.08	61.81	4.043	
7,400.00	7,039.06	7,348.29	7,039.06	38.18	35.76	180.00	1,012.77	1,367.09	249.89	187.87	62.02	4.029	
7,500.00	7,139.06	7,448.29	7,139.06	38.27	35.85	180.00	1,012.77	1,367.09	249.89	187.65	62.24	4.015	
7,600.00	7,239.06	7,548.29	7,239.06	38.36	35.94	180.00	1,012.77	1,367.09	249.89	187.44	62.46	4.001	
7,700.00	7,339.06	7,648.29	7,339.06	38.45	36.04	180.00	1,012.77	1,367.09	249.89	187.22	62.68	3.987	
7,800.00	7,439.06	7,748.29	7,439.06	38.53	36.14	180.00	1,012.77	1,367.09	249.89	186.99	62.90	3.973	
7,900.00	7,539.06	7,848.29	7,539.06	38.63	36.23	180.00	1,012.77	1,367.09	249.89	186.77	63.13	3.959	
8,000.00	7,639.06	7,948.29	7,639.06	38.72	36.33	180.00	1,012.77	1,367.09	249.89	186.54	63.35	3.944	
8,100.00	7,739.06	8,048.29	7,739.06	38.81	36.43	180.00	1,012.77	1,367.09	249.89	186.31	63.58	3.930	
8,138.24	7,777.30	8,086.53	7,777.30	38.85	36.47	180.00	1,012.77	1,367.09	249.89	186.22	63.67	3.925	
8,158.94	7,798.00	8,104.24	7,795.00	38.87	36.49	180.00	1,012.77	1,367.09	249.91	186.19	63.72	3.922 SF	



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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		
0.00	0.00	0.00	0.00	0.00	0.00	1.94	23.27	0.79	23.28					
100.00	100.00	100.00	100.00	0.09	0.09	1.94	23.27	0.79	23.28	23.11	0.18	132.801		
200.00	200.00	200.00	200.00	0.31	0.31	1.94	23.27	0.79	23.28	22.66	0.62	37.261 CC, ES		
300.00	300.00	299.26	299.24	0.54	0.54	-0.07	24.78	-0.03	24.79	23.72	1.07	23.091		
400.00	399.98	398.30	398.14	0.76	0.77	-54.78	29.31	-2.47	28.43	26.90	1.53	18.565		
500.00	499.84	496.86	496.33	0.99	1.01	-66.89	36.80	-6.51	34.29	32.29	1.99	17.201 SF		
600.00	599.45	594.69	593.44	1.23	1.29	-79.42	47.16	-12.10	43.90	41.43	2.47	17.763		
700.00	698.70	691.97	689.57	1.51	1.60	-89.78	60.28	-19.17	58.02	55.02	3.00	19.349		
800.00	797.47	790.05	786.34	1.82	1.94	-98.29	74.36	-26.76	74.72	71.14	3.57	20.910		
900.00	895.62	887.67	882.65	2.18	2.29	-105.55	88.37	-34.31	93.39	89.18	4.21	22.172		
1,000.00	993.06	984.71	978.39	2.60	2.63	-111.84	102.29	-41.82	114.39	109.48	4.91	23.303		
1,100.00	1,089.64	1,081.05	1,073.45	3.08	2.99	-117.30	116.12	-49.28	137.98	132.33	5.65	24.424		
1,200.00	1,185.27	1,176.58	1,167.70	3.62	3.33	-122.03	129.83	-56.67	164.34	157.92	6.42	25.599		
1,300.00	1,279.82	1,271.18	1,261.03	4.22	3.68	-126.15	143.41	-63.99	193.60	186.40	7.21	26.853		
1,400.00	1,373.17	1,364.74	1,353.34	4.89	4.03	-129.71	156.84	-71.23	225.86	217.85	8.01	28.202		
1,500.00	1,465.21	1,457.14	1,444.50	5.63	4.37	-132.81	170.10	-78.38	261.15	252.34	8.81	29.632		
1,600.00	1,556.51	1,548.86	1,535.00	6.40	4.71	-135.85	183.26	-85.47	298.44	288.83	9.61	31.064		
1,700.00	1,647.80	1,640.59	1,625.50	7.19	5.05	-138.24	196.42	-92.57	336.31	325.92	10.39	32.366		
1,800.00	1,739.09	1,732.31	1,715.99	7.98	5.39	-140.15	209.59	-99.67	374.58	363.42	11.17	33.542		
1,900.00	1,830.38	1,824.04	1,806.49	8.78	5.73	-141.71	222.75	-106.77	413.16	401.22	11.94	34.601		
2,000.00	1,921.67	1,915.76	1,896.99	9.58	6.08	-143.00	235.92	-113.86	451.95	439.24	12.71	35.555		
2,100.00	2,012.97	2,007.49	1,987.48	10.38	6.42	-144.10	249.08	-120.96	490.91	477.43	13.48	36.416		
2,200.00	2,104.26	2,099.21	2,077.98	11.19	6.76	-145.03	262.24	-128.06	529.99	515.74	14.25	37.195		
2,300.00	2,195.55	2,190.93	2,168.48	12.00	7.10	-145.83	275.41	-135.16	569.18	554.17	15.02	37.902		
2,400.00	2,286.84	2,282.66	2,258.97	12.81	7.44	-146.54	288.57	-142.25	608.46	592.67	15.79	38.545		
2,500.00	2,378.13	2,374.38	2,349.47	13.62	7.79	-147.15	301.73	-149.35	647.80	631.25	16.55	39.132		
2,600.00	2,469.42	2,466.11	2,439.97	14.43	8.13	-147.70	314.90	-156.45	687.20	669.88	17.32	39.669		
2,700.00	2,560.72	2,557.83	2,530.46	15.25	8.47	-148.19	328.06	-163.55	726.65	708.55	18.09	40.163		
2,800.00	2,652.01	2,649.56	2,620.96	16.06	8.82	-148.62	341.23	-170.64	766.13	747.27	18.86	40.618		
2,900.00	2,743.30	2,741.28	2,711.46	16.87	9.16	-149.02	354.39	-177.74	805.65	786.02	19.63	41.038		
3,000.00	2,834.59	2,833.01	2,801.96	17.69	9.50	-149.38	367.55	-184.84	845.20	824.80	20.40	41.428		
3,100.00	2,925.88	2,924.73	2,892.45	18.51	9.85	-149.70	380.72	-191.94	884.78	863.61	21.17	41.789		
3,200.00	3,017.17	3,016.45	2,982.95	19.32	10.19	-150.00	393.88	-199.03	924.38	902.43	21.94	42.126		
3,300.00	3,108.47	3,108.18	3,073.45	20.14	10.53	-150.27	407.05	-206.13	963.99	941.28	22.71	42.440		

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 29-02E
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 29-02E	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	
0.00	0.00	0.00	0.00	0.00	0.00	-59.69	5.06	-8.65	10.02				
100.00	100.00	100.00	100.00	0.09	0.09	-59.69	5.06	-8.65	10.02	9.85	0.18	57.170	
200.00	200.00	200.00	200.00	0.31	0.31	-59.69	5.06	-8.65	10.02	9.40	0.62	16.041	
300.00	300.00	300.00	300.00	0.54	0.54	-59.69	5.06	-8.65	10.02	8.95	1.07	9.329 CC, ES	
400.00	399.98	399.62	399.60	0.76	0.76	-111.69	6.43	-9.71	12.19	10.66	1.52	8.004 SF	
500.00	499.84	498.92	498.76	0.99	0.99	-119.16	10.53	-12.86	18.93	16.94	1.99	9.505	
600.00	599.45	597.56	597.02	1.23	1.23	-124.07	17.29	-18.07	30.43	27.94	2.49	12.219	
700.00	698.70	695.70	694.48	1.51	1.50	-127.02	26.47	-25.13	46.42	43.40	3.02	15.352	
800.00	797.47	793.88	791.90	1.82	1.78	-130.36	36.11	-32.55	65.09	61.51	3.58	18.189	
900.00	895.62	891.49	888.76	2.18	2.07	-133.80	45.70	-39.93	86.25	82.08	4.16	20.709	
1,000.00	993.06	988.42	984.94	2.60	2.37	-137.02	55.22	-47.25	110.10	105.32	4.78	23.054	
1,100.00	1,089.64	1,084.55	1,080.33	3.08	2.66	-139.93	64.66	-54.52	136.78	131.37	5.40	25.308	
1,200.00	1,185.27	1,179.77	1,174.81	3.62	2.96	-142.51	74.01	-61.72	166.40	160.35	6.05	27.523	
1,300.00	1,279.82	1,273.95	1,268.26	4.22	3.25	-144.78	83.26	-68.84	199.01	192.32	6.70	29.718	
1,400.00	1,373.17	1,366.98	1,360.58	4.89	3.55	-146.78	92.40	-75.87	234.66	227.31	7.35	31.919	
1,500.00	1,465.21	1,458.75	1,451.64	5.63	3.83	-148.52	101.42	-82.81	273.34	265.33	8.01	34.122	
1,600.00	1,556.51	1,549.79	1,541.98	6.40	4.12	-150.34	110.36	-89.69	313.80	305.14	8.66	36.254	
1,700.00	1,647.80	1,640.83	1,632.32	7.19	4.41	-151.76	119.30	-96.57	354.47	345.17	9.30	38.105	
1,800.00	1,739.09	1,731.87	1,722.66	7.98	4.70	-152.89	128.24	-103.45	395.28	385.33	9.95	39.718	
1,900.00	1,830.38	1,822.91	1,813.00	8.78	4.98	-153.81	137.19	-110.34	436.20	425.60	10.61	41.131	
2,000.00	1,921.67	1,913.96	1,903.34	9.58	5.27	-154.57	146.13	-117.22	477.20	465.94	11.26	42.376	
2,100.00	2,012.97	2,005.00	1,993.68	10.38	5.56	-155.21	155.07	-124.10	518.26	506.34	11.92	43.480	
2,200.00	2,104.26	2,096.04	2,084.02	11.19	5.85	-155.76	164.02	-130.98	559.36	546.78	12.58	44.463	
2,300.00	2,195.55	2,187.08	2,174.36	12.00	6.14	-156.23	172.96	-137.86	600.50	587.26	13.24	45.344	
2,400.00	2,286.84	2,278.12	2,264.70	12.81	6.43	-156.64	181.90	-144.75	641.67	627.76	13.91	46.136	
2,500.00	2,378.13	2,369.16	2,355.04	13.62	6.72	-157.00	190.84	-151.63	682.86	668.29	14.57	46.853	
2,600.00	2,469.42	2,460.20	2,445.38	14.43	7.01	-157.33	199.79	-158.51	724.08	708.83	15.24	47.503	
2,700.00	2,560.72	2,551.25	2,535.72	15.25	7.30	-157.61	208.73	-165.39	765.31	749.39	15.91	48.096	
2,800.00	2,652.01	2,642.29	2,626.05	16.06	7.59	-157.87	217.67	-172.28	806.55	789.97	16.58	48.638	
2,900.00	2,743.30	2,733.33	2,716.39	16.87	7.88	-158.10	226.61	-179.16	847.81	830.55	17.25	49.136	
3,000.00	2,834.59	2,824.37	2,806.73	17.69	8.17	-158.31	235.56	-186.04	889.08	871.15	17.93	49.594	
3,100.00	2,925.88	2,915.41	2,897.07	18.51	8.46	-158.50	244.50	-192.92	930.35	911.75	18.60	50.018	
3,200.00	3,017.17	3,006.45	2,987.41	19.32	8.75	-158.68	253.44	-199.80	971.64	952.36	19.27	50.410	

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 29-02E
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 29-02E	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		
0.00	0.00	0.00	0.00	0.00	0.00	-106.84	-4.05	-13.37	13.97					
100.00	100.00	100.00	100.00	0.09	0.09	-106.84	-4.05	-13.37	13.97	13.80	0.18	79.692		
200.00	200.00	200.00	200.00	0.31	0.31	-106.84	-4.05	-13.37	13.97	13.35	0.62	22.360		
300.00	300.00	300.00	300.00	0.54	0.54	-106.84	-4.05	-13.37	13.97	12.90	1.07	13.004 CC, ES		
400.00	399.98	399.98	399.98	0.76	0.76	-156.91	-4.05	-13.37	15.56	14.02	1.54	10.103		
500.00	499.84	499.84	499.84	0.99	0.99	-162.63	-4.05	-13.37	20.48	18.45	2.03	10.096 SF		
600.00	599.45	599.45	599.45	1.23	1.21	-167.76	-4.05	-13.37	28.91	26.39	2.53	11.436		
700.00	698.70	698.70	698.70	1.51	1.43	-171.34	-4.05	-13.37	40.91	37.87	3.03	13.492		
800.00	797.47	797.47	797.47	1.82	1.66	-173.70	-4.05	-13.37	56.42	52.89	3.54	15.956		
900.00	895.62	894.83	894.81	2.18	1.87	-174.09	-3.17	-14.67	75.92	71.88	4.04	18.810		
1,000.00	993.06	990.90	990.76	2.60	2.08	-172.67	-0.47	-18.63	99.89	95.35	4.54	22.015		
1,100.00	1,089.64	1,085.33	1,084.86	3.08	2.30	-170.61	3.93	-25.12	128.41	123.36	5.05	25.428		
1,200.00	1,185.27	1,179.83	1,178.90	3.62	2.53	-168.93	9.18	-32.85	160.88	155.31	5.57	28.866		
1,300.00	1,279.82	1,273.19	1,271.79	4.22	2.76	-167.97	14.37	-40.49	196.64	190.54	6.10	32.215		
1,400.00	1,373.17	1,365.28	1,363.43	4.89	3.00	-167.42	19.49	-48.03	235.58	228.94	6.64	35.468		
1,500.00	1,465.21	1,456.00	1,453.71	5.63	3.24	-167.13	24.53	-55.45	277.64	270.45	7.19	38.636		
1,600.00	1,556.51	1,545.93	1,543.20	6.40	3.48	-167.14	29.53	-62.81	321.37	313.66	7.71	41.688		
1,700.00	1,647.80	1,635.86	1,632.69	7.19	3.72	-167.16	34.53	-70.17	365.10	356.85	8.25	44.249		
1,800.00	1,739.09	1,725.79	1,722.18	7.98	3.96	-167.17	39.53	-77.53	408.84	400.04	8.80	46.462		
1,900.00	1,830.38	1,815.72	1,811.66	8.78	4.21	-167.18	44.53	-84.89	452.57	443.21	9.36	48.362		
2,000.00	1,921.67	1,905.65	1,901.15	9.58	4.46	-167.19	49.52	-92.25	496.31	486.38	9.92	50.009		
2,100.00	2,012.97	1,995.58	1,990.64	10.38	4.71	-167.20	54.52	-99.60	540.04	529.54	10.50	51.447		
2,200.00	2,104.26	2,085.51	2,080.13	11.19	4.96	-167.20	59.52	-106.96	583.77	572.70	11.08	52.710		
2,300.00	2,195.55	2,175.44	2,169.62	12.00	5.21	-167.21	64.52	-114.32	627.51	615.85	11.66	53.826		
2,400.00	2,286.84	2,265.37	2,259.11	12.81	5.46	-167.21	69.52	-121.68	671.24	659.00	12.24	54.819		
2,500.00	2,378.13	2,355.30	2,348.59	13.62	5.71	-167.21	74.52	-129.04	714.98	702.14	12.83	55.707		
2,600.00	2,469.42	2,445.22	2,438.08	14.43	5.97	-167.22	79.52	-136.40	758.71	745.28	13.43	56.504		
2,700.00	2,560.72	2,535.15	2,527.57	15.25	6.22	-167.22	84.51	-143.76	802.45	788.42	14.02	57.223		
2,800.00	2,652.01	2,625.08	2,617.06	16.06	6.48	-167.22	89.51	-151.12	846.18	831.56	14.62	57.875		
2,900.00	2,743.30	2,715.01	2,706.55	16.87	6.73	-167.23	94.51	-158.48	889.91	874.69	15.22	58.468		
3,000.00	2,834.59	2,804.94	2,796.04	17.69	6.99	-167.23	99.51	-165.84	933.65	917.83	15.82	59.009		
3,100.00	2,925.88	2,894.87	2,885.53	18.51	7.24	-167.23	104.51	-173.20	977.38	960.96	16.43	59.505		

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



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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

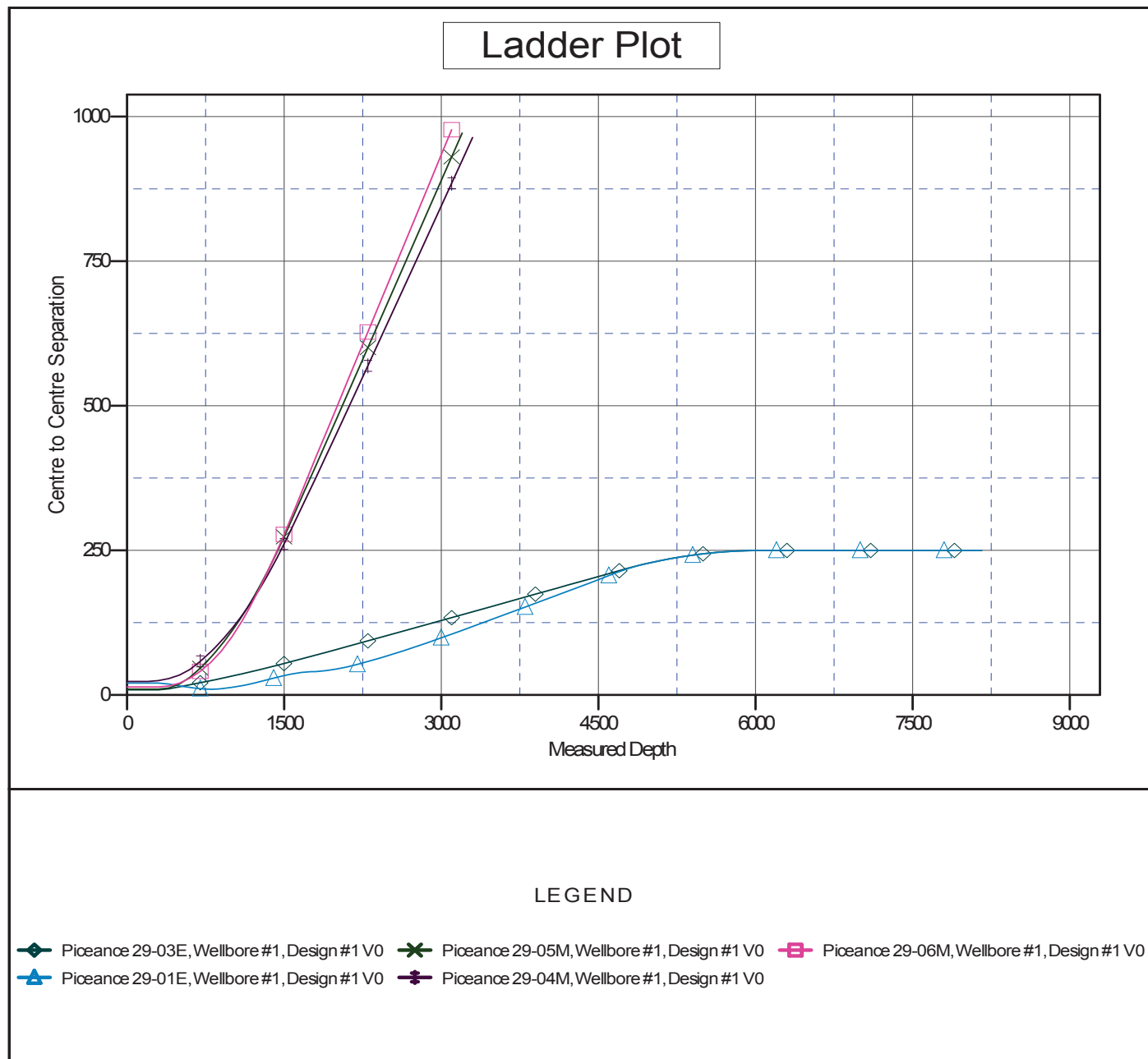
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance 29-02E

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.45°





Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance 29-02E
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 29-02E	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 29-02E

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.45°

