

PICEANCE VLY NAD 83

PA 12-07S-095W

PA 23-12 Pad

PA 413-12 - Slot B5

Wellbore #1

Plan: Plan #2 13Aug10 kjs

Standard Planning Report - Geographic

17 August, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 413-12 - Slot B5
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6533.0usft ((26' RKB) kjs)
Project:	PA 12-07S-095W	MD Reference:	KELLY BUSHING @ 6533.0usft ((26' RKB) kjs)
Site:	PA 23-12 Pad	North Reference:	True
Well:	PA 413-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 13Aug10 kjs		

Project	PA 12-07S-095W, Garfield County, CO, 12-07S-095W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site	PA 23-12 Pad		
Site Position:		Northing:	1,598,886.60 usft
From:	Map	Easting:	2,308,331.30 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in
		Latitude:	39° 27' 7.594 N
		Longitude:	107° 56' 59.111 W
		Grid Convergence:	-1.545 °

Well	PA 413-12 - Slot B5		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	5/26/2010	10.438	65.752	52,364

Design	Plan #2 13Aug10 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	227.41

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.000	
140.0	0.00	0.00	140.0	0.0	0.0	0.00	0.00	0.00	0.000	
576.4	13.09	227.41	572.6	-33.6	-36.5	3.00	3.00	0.00	227.409	
5,129.9	13.09	227.41	5,007.7	-731.7	-795.9	0.00	0.00	0.00	0.000	
6,002.7	0.00	0.00	5,873.0	-798.9	-869.0	1.50	-1.50	0.00	180.000	
6,102.7	0.00	0.00	5,973.0	-798.9	-869.0	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
8,252.7	0.00	0.00	8,123.0	-798.9	-869.0	0.00	0.00	0.00	0.000	

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Well:	PA 413-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 13Aug10 kjs		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	1,598,880.90	2,308,286.70	39° 27' 7.526 N	107° 56' 59.677 W	
140.0	0.00	0.00	140.0	0.0	0.0	1,598,880.90	2,308,286.70	39° 27' 7.526 N	107° 56' 59.677 W	
Start Build 3.00										
576.4	13.09	227.41	572.6	-33.6	-36.5	1,598,848.30	2,308,249.26	39° 27' 7.194 N	107° 57' 0.143 W	
Hold 13.09 Inclination										
825.0	13.09	227.41	814.8	-71.7	-78.0	1,598,811.32	2,308,206.80	39° 27' 6.817 N	107° 57' 0.672 W	
9 5/8"										
2,619.9	13.09	227.41	2,563.0	-346.9	-377.3	1,598,544.34	2,307,900.17	39° 27' 4.098 N	107° 57' 4.487 W	
Top of "G" Sand										
2,722.6	13.09	227.41	2,663.0	-362.6	-394.5	1,598,529.07	2,307,882.63	39° 27' 3.942 N	107° 57' 4.706 W	
Base of "G" Sand										
4,791.4	13.09	227.41	4,678.0	-679.8	-739.5	1,598,221.35	2,307,529.22	39° 27' 0.808 N	107° 57' 9.104 W	
Mesaverde										
5,129.9	13.09	227.41	5,007.7	-731.7	-795.9	1,598,170.99	2,307,471.38	39° 27' 0.295 N	107° 57' 9.823 W	
Start Drop -1.50										
6,002.7	0.00	0.00	5,873.0	-798.9	-869.0	1,598,105.80	2,307,396.50	39° 26' 59.631 N	107° 57' 10.755 W	
Vertical										
6,102.7	0.00	0.00	5,973.0	-798.9	-869.0	1,598,105.80	2,307,396.50	39° 26' 59.631 N	107° 57' 10.755 W	
Top Gas - Approx. Top Gas										
7,137.7	0.00	0.00	7,008.0	-798.9	-869.0	1,598,105.80	2,307,396.50	39° 26' 59.631 N	107° 57' 10.755 W	
Cameo Coals										
8,102.7	0.00	0.00	7,973.0	-798.9	-869.0	1,598,105.80	2,307,396.50	39° 26' 59.631 N	107° 57' 10.755 W	
Rollins SS										
8,252.7	0.00	0.00	8,123.0	-798.9	-869.0	1,598,105.80	2,307,396.50	39° 26' 59.631 N	107° 57' 10.755 W	
TD at 8252.7 - TD										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Top Gas (25' Radius) P4 - plan hits target center - Circle (radius 25.0)	0.00	0.00	5,973.0	-798.9	-869.0	1,598,105.80	2,307,396.50	39° 26' 59.631 N	107° 57' 10.755 W	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)		
825.0	814.8	9 5/8"	9.625	12.250		

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Wellbore:	Wellbore #1		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,619.9	2,563.0	Top of "G" Sand				
2,722.6	2,663.0	Base of "G" Sand				
4,791.4	4,678.0	Mesaverde				
6,102.7	5,973.0	Approx. Top Gas				
7,137.7	7,008.0	Cameo Coals				
8,102.7	7,973.0	Rollins SS				
8,252.7	8,123.0	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
140.0	140.0	0.0	0.0	Start Build 3.00	
576.4	572.6	-33.6	-36.5	Hold 13.09 Inclination	
5,129.9	5,007.7	-731.7	-795.9	Start Drop -1.50	
6,002.7	5,873.0	-798.9	-869.0	Vertical	
6,102.7	5,973.0	-798.9	-869.0	Top Gas	
8,252.7	8,123.0	-798.9	-869.0	TD at 8252.7	