

# **PICEANCE VLY NAD 83**

**RU 31-06S-094W**

**RWF 13-31 Pad**

**RWF 314-31 - Slot A2**

**Wellbore #1**

**Plan: Plan #2 08Apr10 kjs**

## **Standard Planning Report - Geographic**

**12 April, 2010**

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well RWF 314-31 - Slot A2
<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	KB H&P @ 5382.0usft (H&P)
<b>Project:</b>	RU 31-06S-094W	<b>MD Reference:</b>	KB H&P @ 5382.0usft (H&P)
<b>Site:</b>	RWF 13-31 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RWF 314-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 08Apr10 kjs		

<b>Project</b>	RU 31-06S-094W, 31-06S-094W		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		RWF 13-31 Pad			
Site Position:		Northing:	1,608,890.20 usft	Latitude:	39° 28' 47.650 N
From:	Map	Easting:	2,312,921.60 usft	Longitude:	107° 56' 4.027 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.535 °

Well	RWF 314-31 - Slot A2					
Well Position	+N/-S	0.0 usft	Northing:	1,608,893.73 usft	Latitude:	39° 28' 47.687 N
	+E/-W	0.0 usft	Easting:	2,312,928.22 usft	Longitude:	107° 56' 3.944 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,358.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	11/24/2008	10.632	65.816	52,537

<b>Design</b>	Plan #2 08Apr10 kjs				
<b>Audit Notes:</b>					
<b>Version:</b>		<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	178.10	

<b>Plan Sections</b>										
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	
120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.00	0.00	0.000	
581.5	15.00	178.11	576.3	-60.0	2.0	3.25	3.25	0.00	178.110	
2,476.8	15.00	178.11	2,407.0	-550.3	18.2	0.00	0.00	0.00	0.000	
2,767.6	25.18	178.10	2,679.7	-650.0	21.5	3.50	3.50	0.00	0.000	
4,687.2	25.18	178.10	4,417.0	-1,466.2	48.5	0.00	0.00	0.00	0.000	
5,546.1	8.00	178.10	5,237.0	-1,710.3	56.6	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
5,946.1	0.00	0.00	5,635.7	-1,738.2	57.6	2.00	-2.00	0.00	180.000	
8,097.4	0.00	0.00	7,787.0	-1,738.2	57.6	0.00	0.00	0.00	0.000	

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Planning Report - Geographic

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<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	KB H&P @ 5382.0usft (H&P)
<b>Project:</b>	RU 31-06S-094W	<b>MD Reference:</b>	KB H&P @ 5382.0usft (H&P)
<b>Site:</b>	RWF 13-31 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RWF 314-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 08Apr10 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	1,608,893.73	2,312,928.22	39° 28' 47.687 N	107° 56' 3.944 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,608,893.73	2,312,928.22	39° 28' 47.687 N	107° 56' 3.944 W	
Start Build 3.25										
581.5	15.00	178.11	576.3	-60.0	2.0	1,608,833.66	2,312,928.59	39° 28' 47.094 N	107° 56' 3.919 W	
Hold 15.00 Inclination										
1,123.7	15.00	178.11	1,100.0	-200.3	6.6	1,608,693.33	2,312,929.46	39° 28' 45.708 N	107° 56' 3.860 W	
9 5/8"										
1,959.2	15.00	178.11	1,907.0	-416.4	13.7	1,608,477.10	2,312,930.80	39° 28' 43.572 N	107° 56' 3.769 W	
Top of "G" Sand										
2,062.7	15.00	178.11	2,007.0	-443.2	14.6	1,608,450.31	2,312,930.96	39° 28' 43.307 N	107° 56' 3.758 W	
Base of "G" Sand										
2,476.8	15.00	178.11	2,407.0	-550.3	18.2	1,608,343.13	2,312,931.62	39° 28' 42.248 N	107° 56' 3.713 W	
Start Build 3.50										
2,767.6	25.18	178.10	2,679.7	-650.0	21.5	1,608,243.39	2,312,932.26	39° 28' 41.263 N	107° 56' 3.671 W	
Hold 25.18 Inclination										
4,440.8	25.18	178.10	4,194.0	-1,361.4	45.1	1,607,531.59	2,312,936.78	39° 28' 34.231 N	107° 56' 3.370 W	
Mesaverde										
4,687.2	25.18	178.10	4,417.0	-1,466.2	48.5	1,607,426.77	2,312,937.45	39° 28' 33.196 N	107° 56' 3.325 W	
Start Drop -2.00										
5,546.1	8.00	178.10	5,237.0	-1,710.3	56.6	1,607,182.50	2,312,939.00	39° 28' 30.783 N	107° 56' 3.222 W	
Top Gas - Approx. Top Gas										
5,946.1	0.00	0.00	5,635.7	-1,738.2	57.6	1,607,154.62	2,312,939.18	39° 28' 30.507 N	107° 56' 3.210 W	
Vertical										
6,962.4	0.00	0.00	6,652.0	-1,738.2	57.6	1,607,154.62	2,312,939.18	39° 28' 30.507 N	107° 56' 3.210 W	
Cameo Coals										
7,772.4	0.00	0.00	7,462.0	-1,738.2	57.6	1,607,154.62	2,312,939.18	39° 28' 30.507 N	107° 56' 3.210 W	
Coal D										
7,842.4	0.00	0.00	7,532.0	-1,738.2	57.6	1,607,154.62	2,312,939.18	39° 28' 30.507 N	107° 56' 3.210 W	
Base L. Cameo Pay										
7,947.4	0.00	0.00	7,637.0	-1,738.2	57.6	1,607,154.62	2,312,939.18	39° 28' 30.507 N	107° 56' 3.210 W	
Rollins SS										
8,097.4	0.00	0.00	7,787.0	-1,738.2	57.6	1,607,154.62	2,312,939.18	39° 28' 30.507 N	107° 56' 3.210 W	
TD										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Top Gas (25' Radius) R1	0.00	0.00	5,237.0	-1,725.1	57.0	1,607,167.70	2,312,939.00	39° 28' 30.637 N	107° 56' 3.217 W	
- plan misses target center by 14.7usft at 5547.1usft MD (5238.0 TVD, -1710.5 N, 56.6 E)										
- Circle (radius 25.0)										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,123.7	1,100.0	9 5/8"	9.625	12.250	

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<b>Project:</b>	RU 31-06S-094W	<b>MD Reference:</b>	KB H&P @ 5382.0usft (H&P)
<b>Site:</b>	RWF 13-31 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RWF 314-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 08Apr10 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,959.2	1,907.0	Top of "G" Sand				
2,062.7	2,007.0	Base of "G" Sand				
4,440.8	4,194.0	Mesaverde				
5,546.1	5,237.0	Approx. Top Gas				
6,962.4	6,652.0	Cameo Coals				
7,772.4	7,462.0	Coal D				
7,842.4	7,532.0	Base L. Cameo Pay				
7,947.4	7,637.0	Rollins SS				
8,097.4	7,787.0	TD				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.0	120.0	0.0	0.0	Start Build 3.25
581.5	576.3	-60.0	2.0	Hold 15.00 Inclination
2,476.8	2,407.0	-550.3	18.2	Start Build 3.50
2,767.6	2,679.7	-650.0	21.5	Hold 25.18 Inclination
4,687.2	4,417.0	-1,466.2	48.5	Start Drop -2.00
5,546.1	5,237.0	-1,710.3	56.6	Top Gas
5,946.1	5,635.7	-1,738.2	57.6	Vertical
8,097.4	7,787.0	-1,738.2	57.6	TD at 8097.4