

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 34-31 Pad

RWF 444-31 - Slot A1

Wellbore #1

Plan: Design #1 18Feb10 kjs

Standard Planning Report - Geographic

05 May, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well RWF 444-31 - Slot A1
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5733.0usft (SSD 537 (26' KB) kjs)
Project:	RU 31-06S-094W	MD Reference:	WELL @ 5733.0usft (SSD 537 (26' KB) kjs)
Site:	RWF 34-31 Pad	North Reference:	True
Well:	RWF 444-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 18Feb10 kjs		

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

Site		RWF 34-31 Pad			
Site Position:		Northing:	1,607,154.40 usft	Latitude:	39° 28' 30.868 N
From:	Map	Easting:	2,314,309.20 usft	Longitude:	107° 55' 45.744 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.532 °

Well	RWF 444-31 - Slot A1					
Well Position	+N/-S	0.0 usft	Northing:	1,607,104.38 usft	Latitude:	39° 28' 30.379 N
	+E/-W	0.0 usft	Easting:	2,314,329.17 usft	Longitude:	107° 55' 45.473 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,707.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/18/2010	10.490	65.770	52,383

Design	Design #1 18Feb10 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	92.28

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	
120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.00	0.00	0.000	
936.5	28.58	92.28	903.1	-7.9	199.3	3.50	3.50	0.00	92.282	
4,701.8	28.58	92.28	4,209.7	-79.7	1,998.9	0.00	0.00	0.00	0.000	
6,130.7	0.00	0.00	5,580.0	-93.6	2,347.7	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
8,680.7	0.00	0.00	8,130.0	-93.6	2,347.7	0.00	0.00	0.00	0.000	

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Site:	RWF 34-31 Pad	North Reference:	True
Well:	RWF 444-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 18Feb10 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	1,607,104.38	2,314,329.17	39° 28' 30.379 N	107° 55' 45.473 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,607,104.38	2,314,329.17	39° 28' 30.379 N	107° 55' 45.473 W	
Start Build 3.50										
936.5	28.58	92.28	903.1	-7.9	199.3	1,607,091.12	2,314,528.16	39° 28' 30.300 N	107° 55' 42.931 W	
Hold 28.58 Inclination										
2,436.1	28.58	92.28	2,220.0	-36.5	916.0	1,607,043.40	2,315,243.91	39° 28' 30.018 N	107° 55' 33.790 W	
Top of "G" Sand										
2,550.0	28.58	92.28	2,320.0	-38.7	970.5	1,607,039.78	2,315,298.26	39° 28' 29.996 N	107° 55' 33.096 W	
Base of "G" Sand										
2,663.9	28.58	92.28	2,420.0	-40.8	1,024.9	1,607,036.16	2,315,352.61	39° 28' 29.975 N	107° 55' 32.402 W	
9 5/8"										
4,701.8	28.58	92.28	4,209.7	-79.7	1,998.9	1,606,971.31	2,316,325.27	39° 28' 29.591 N	107° 55' 19.980 W	
Start Drop -2.00										
5,077.1	21.07	92.28	4,550.0	-85.9	2,156.3	1,606,960.84	2,316,482.36	39° 28' 29.529 N	107° 55' 17.974 W	
Mesaverde										
6,130.7	0.00	0.00	5,580.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
Top Gas - Approx. Top Gas										
7,565.7	0.00	0.00	7,015.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
Cameo Coals										
8,365.7	0.00	0.00	7,815.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
Coal D										
8,435.7	0.00	0.00	7,885.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
Base L. Cameo Pay										
8,530.7	0.00	0.00	7,980.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
Rollins SS										
8,680.7	0.00	0.00	8,130.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
TD at 8680.7 - TD										

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										
Top Gas (25' Radius) R\	0.00	0.00	5,580.0	-93.6	2,347.7	1,606,948.10	2,316,673.50	39° 28' 29.453 N	107° 55' 15.533 W	
- plan hits target center										
- Circle (radius 25.0)										

Casing Points							Casing Diameter (in)	Hole Diameter (in)
Measured Depth (usft)	Vertical Depth (usft)	Name						
2,663.9	2,420.0	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 (°)	
2,436.1	2,220.0	Top of "G" Sand				
2,550.0	2,320.0	Base of "G" Sand				
5,077.1	4,550.0	Mesaverde				
6,130.7	5,580.0	Approx. Top Gas				
7,565.7	7,015.0	Cameo Coals				
8,365.7	7,815.0	Coal D				
8,435.7	7,885.0	Base L. Cameo Pay				
8,530.7	7,980.0	Rollins SS				
8,680.7	8,130.0	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
120.0	120.0	0.0	0.0	Start Build 3.50	
936.5	903.1	-7.9	199.3	Hold 28.58 Inclination	
4,701.8	4,209.7	-79.7	1,998.9	Start Drop -2.00	
6,130.7	5,580.0	-93.6	2,347.7	Top Gas	
8,680.7	8,130.0	-93.6	2,347.7	TD at 8680.7	