

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 13-31 Pad

RWF 514-31 - Slot A1

Wellbore #1

Plan: Plan #2 09Apr10 kjs

Standard Planning Report - Geographic

12 April, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well RWF 514-31 - Slot A1
Company:	PICEANCE VLY NAD 83	TVD Reference:	KB H&P @ 5382.0usft (H&P)
Project:	RU 31-06S-094W	MD Reference:	KB H&P @ 5382.0usft (H&P)
Site:	RWF 13-31 Pad	North Reference:	True
Well:	RWF 514-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 09Apr10 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 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 514-31 - Slot A1					
Well Position	+N/-S	0.0 usft	Northing:	1,608,890.20 usft	Latitude:	39° 28' 47.650 N
	+E/-W	0.0 usft	Easting:	2,312,921.60 usft	Longitude:	107° 56' 4.027 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,358.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/21/2008	10.633	65.816	52,537

Design	Plan #2 09Apr10 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	181.37	

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	
917.4	27.91	181.37	886.3	-190.4	-4.6	3.50	3.50	0.00	181.374	
3,811.9	27.91	181.37	3,444.0	-1,544.8	-37.1	0.00	0.00	0.00	0.000	
5,672.6	0.00	0.00	5,232.0	-1,989.0	-47.7	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
8,222.6	0.00	0.00	7,782.0	-1,989.0	-47.7	0.00	0.00	0.00	0.000	

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Site:	RWF 13-31 Pad	North Reference:	True
Well:	RWF 514-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 09Apr10 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	1,608,890.20	2,312,921.60	39° 28' 47.650 N	107° 56' 4.027 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,608,890.20	2,312,921.60	39° 28' 47.650 N	107° 56' 4.027 W	
Start Build 3.50										
917.4	27.91	181.37	886.3	-190.4	-4.6	1,608,700.03	2,312,911.94	39° 28' 45.769 N	107° 56' 4.086 W	
Hold 27.91 Inclination										
2,072.5	27.91	181.37	1,907.0	-730.9	-17.5	1,608,160.04	2,312,884.49	39° 28' 40.427 N	107° 56' 4.251 W	
Top of "G" Sand										
2,185.7	27.91	181.37	2,007.0	-783.8	-18.8	1,608,107.14	2,312,881.80	39° 28' 39.903 N	107° 56' 4.267 W	
Base of "G" Sand										
2,298.8	27.91	181.37	2,107.0	-836.8	-20.1	1,608,054.24	2,312,879.11	39° 28' 39.380 N	107° 56' 4.284 W	
9 5/8"										
3,811.9	27.91	181.37	3,444.0	-1,544.8	-37.1	1,607,346.92	2,312,843.16	39° 28' 32.382 N	107° 56' 4.500 W	
Start Drop -1.50										
4,624.5	15.72	181.37	4,197.0	-1,846.1	-44.3	1,607,045.91	2,312,827.86	39° 28' 29.404 N	107° 56' 4.592 W	
Mesaverde										
5,672.6	0.00	0.00	5,232.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
Top Gas - Approx. Top Gas										
7,087.6	0.00	0.00	6,647.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
Cameo Coals										
7,882.6	0.00	0.00	7,442.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
Coal D										
7,952.6	0.00	0.00	7,512.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
Base L. Cameo Pay										
8,072.6	0.00	0.00	7,632.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
Rollins SS										
8,222.6	0.00	0.00	7,782.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
TD at 8222.6 - 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) R1	0.00	0.00	5,232.0	-1,989.0	-47.7	1,606,903.20	2,312,820.60	39° 28' 27.992 N	107° 56' 4.636 W	
- plan hits target center										
- Circle (radius 25.0)										

Casing Points							Casing Diameter (in)	Hole Diameter (in)
Measured Depth (usft)	Vertical Depth (usft)	Name						
2,298.8	2,107.0	9 5/8"					9.625	12.250

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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,072.5	1,907.0	Top of "G" Sand				
2,185.7	2,007.0	Base of "G" Sand				
4,624.5	4,197.0	Mesaverde				
5,672.6	5,232.0	Approx. Top Gas				
7,087.6	6,647.0	Cameo Coals				
7,882.6	7,442.0	Coal D				
7,952.6	7,512.0	Base L. Cameo Pay				
8,072.6	7,632.0	Rollins SS				
8,222.6	7,782.0	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 3.50
917.4	886.3	-190.4	-4.6	Hold 27.91 Inclination
3,811.9	3,444.0	-1,544.8	-37.1	Start Drop -1.50
5,672.6	5,232.0	-1,989.0	-47.7	Top Gas
8,222.6	7,782.0	-1,989.0	-47.7	TD at 8222.6