

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSection	Departure	Annotation
500.0	500.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.00
1841.7	1896.4	27.93	182.12	-333.4	-12.3	333.6	333.6	Hold 27.93 Inclination
3800.3	4113.1	27.93	182.12	-1370.9	-50.7	1371.8	1371.8	Start Drop -1.50
5190.0	5574.9	6.00	182.12	-1794.5	-66.3	1795.7	1795.7	Top Gas
5589.3	5974.9	0.00	0.00	-1815.4	-67.1	1816.7	1816.7	Vertical
7740.0	8125.6	0.00	0.00	-1815.4	-67.1	1816.7	1816.7	TD at 8125.6

PICEANCE VLY NAD 83

RU 34-06S-094W

RMV 83-34 Pad

RWF 531-3 - Slot B2-5

Wellbore #1

Plan: Design #1 14Apr10 JMS

Standard Planning Report - Geographic

29 April, 2010

Williams

Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well RWF 531-3 - Slot B2-5
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 5650.0usft (H&P 24' KB)
Project:	RU 34-06S-094W	MD Reference:	KELLY BUSHING @ 5650.0usft (H&P 24' KB)
Site:	RMV 83-34 Pad	North Reference:	True
Well:	RWF 531-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 14Apr10 JMS		

Project	RU 34-06S-094W, Garfield County, CO, 34-06S-094W		
Map System:	US State Plane 1983	System Datum:	Ground Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site		RMV 83-34 Pad			
Site Position:		Northing:	1,607,043.10 usft	Latitude:	39° 28' 34.035 N
From:	Map	Easting:	2,330,648.70 usft	Longitude:	107° 52' 17.399 W
Position Uncertainty:	0.0 usft	Slot Radius:	0.000 in	Grid Convergence:	-1.496 °

Well	RWF 531-3 - Slot B2-5					
Well Position	+N/-S	0.0 usft	Northing:	1,607,111.40 usft	Latitude:	39° 28' 34.722 N
	+E/-W	0.0 usft	Easting:	2,330,695.80 usft	Longitude:	107° 52' 16.821 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,626.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/14/2010	10.445	65.778	52,377

Design	Design #1 14Apr10 JMS			
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	182.12

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.000	
1,896.4	27.93	182.12	1,841.7	-333.4	-12.3	2.00	2.00	0.00	182.116	
4,113.1	27.93	182.12	3,800.3	-1,370.9	-50.7	0.00	0.00	0.00	0.000	
5,574.9	6.00	182.12	5,190.0	-1,794.5	-66.3	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
5,974.9	0.00	0.00	5,589.3	-1,815.4	-67.1	1.50	-1.50	44.47	180.000	
8,125.6	0.00	0.00	7,740.0	-1,815.4	-67.1	0.00	0.00	0.00	0.000	

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Site:	RMV 83-34 Pad	North Reference:	True
Well:	RWF 531-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 14Apr10 JMS		

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	1,607,111.40	2,330,695.80	39° 28' 34.722 N	107° 52' 16.821 W
500.0	0.00	0.00	500.0	0.0	0.0	1,607,111.40	2,330,695.80	39° 28' 34.722 N	107° 52' 16.821 W
Start Build 2.00									
1,629.0	22.58	182.12	1,600.0	-219.5	-8.1	1,606,892.24	2,330,681.97	39° 28' 32.553 N	107° 52' 16.924 W
Top of "G" Sand									
1,738.2	24.76	182.12	1,700.0	-263.3	-9.7	1,606,848.49	2,330,679.21	39° 28' 32.120 N	107° 52' 16.945 W
Base of "G" Sand									
1,849.3	26.99	182.12	1,800.0	-311.7	-11.5	1,606,800.08	2,330,676.15	39° 28' 31.641 N	107° 52' 16.968 W
9 5/8"									
1,896.4	27.93	182.12	1,841.7	-333.4	-12.3	1,606,778.45	2,330,674.79	39° 28' 31.427 N	107° 52' 16.978 W
Hold 27.93 Inclination									
4,113.1	27.93	182.12	3,800.3	-1,370.9	-50.7	1,605,742.35	2,330,609.39	39° 28' 21.173 N	107° 52' 17.467 W
Start Drop -1.50									
4,423.3	23.27	182.12	4,080.0	-1,504.8	-55.6	1,605,608.61	2,330,600.95	39° 28' 19.849 N	107° 52' 17.530 W
Mesaverde									
5,574.9	6.00	182.12	5,190.0	-1,794.5	-66.3	1,605,319.30	2,330,582.68	39° 28' 16.986 N	107° 52' 17.666 W
Top Gas - Approx. Top Gas									
5,974.9	0.00	0.00	5,589.3	-1,815.4	-67.1	1,605,298.42	2,330,581.37	39° 28' 16.779 N	107° 52' 17.676 W
Vertical									
7,125.6	0.00	0.00	6,740.0	-1,815.4	-67.1	1,605,298.42	2,330,581.37	39° 28' 16.779 N	107° 52' 17.676 W
Cameo Coals									
7,795.6	0.00	0.00	7,410.0	-1,815.4	-67.1	1,605,298.42	2,330,581.37	39° 28' 16.779 N	107° 52' 17.676 W
Coal D									
7,895.6	0.00	0.00	7,510.0	-1,815.4	-67.1	1,605,298.42	2,330,581.37	39° 28' 16.779 N	107° 52' 17.676 W
Base L. Cameo Pay									
7,975.6	0.00	0.00	7,590.0	-1,815.4	-67.1	1,605,298.42	2,330,581.37	39° 28' 16.779 N	107° 52' 17.676 W
Rollins SS									
8,125.6	0.00	0.00	7,740.0	-1,815.4	-67.1	1,605,298.42	2,330,581.37	39° 28' 16.779 N	107° 52' 17.676 W
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) RI	0.00	0.00	5,190.0	-1,813.5	-67.1	1,605,300.30	2,330,581.40	39° 28' 16.798 N	107° 52' 17.676 W
- plan misses target center by 19.0usft at 5575.9usft MD (5191.0 TVD, -1794.6 N, -66.3 E)									
- Circle (radius 25.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,849.3	1,800.0	9 5/8"	9.625	12.250

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Site:	RMV 83-34 Pad	North Reference:	True
Well:	RWF 531-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 14Apr10 JMS		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,629.0	1,600.0	Top of "G" Sand				
1,738.2	1,700.0	Base of "G" Sand				
4,423.3	4,080.0	Mesaverde				
5,574.9	5,190.0	Approx. Top Gas				
7,125.6	6,740.0	Cameo Coals				
7,795.6	7,410.0	Coal D				
7,895.6	7,510.0	Base L. Cameo Pay				
7,975.6	7,590.0	Rollins SS				
8,125.6	7,740.0	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			Comment
		+N/-S (usft)	+E/-W (usft)		
500.0	500.0	0.0	0.0		Start Build 2.00
1,896.4	1,841.7	-333.4	-12.3		Hold 27.93 Inclination
4,113.1	3,800.3	-1,370.9	-50.7		Start Drop -1.50
5,574.9	5,190.0	-1,794.5	-66.3		Top Gas
5,974.9	5,589.3	-1,815.4	-67.1		Vertical
8,125.6	7,740.0	-1,815.4	-67.1		TD at 8125.6