

PICEANCE VLY NAD 83

PA 21-06S-095W

PA 22-21 Pad

PA 421-21 - Slot A4

Wellbore #1

Plan: Design #1 18Mar10 kjs

Standard Planning Report - Geographic

20 April, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 421-21 - Slot A4
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6049.0usft (Nabors 577 (26' KB)JMS)
Project:	PA 21-06S-095W	MD Reference:	KELLY BUSHING @ 6049.0usft (Nabors 577 (26' KB)JMS)
Site:	PA 22-21 Pad	North Reference:	True
Well:	PA 421-21	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 18Mar10 kjs		

Project	PA 21-06S-095W, Garfield County, CO, 21-06S-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 22-21 Pad		
Site Position:		Northing:	1,620,681.59 usft
From:	Map	Easting:	2,292,411.75 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in
		Latitude:	39° 30' 38.635 N
		Longitude:	108° 0' 29.662 W
		Grid Convergence:	-1.582 °

Well	PA 421-21 - Slot A4		
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)
	IGRF2010	3/18/2010	10.520	65.783	52,382

Design	Design #1 18Mar10 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	27.61

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	
150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.00	0.000	
794.1	17.71	27.61	783.9	87.5	45.8	2.75	2.75	0.00	27.612	
6,005.7	17.71	27.61	5,748.4	1,492.5	780.6	0.00	0.00	0.00	0.000	
6,891.3	0.00	0.00	6,620.0	1,612.8	843.6	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
9,041.3	0.00	0.00	8,770.0	1,612.8	843.6	0.00	0.00	0.00	0.000	

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Wellbore:	Wellbore #1		
Design:	Design #1 18Mar10 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	1,620,699.35	2,292,489.76	39° 30' 38.832 N	108° 0' 28.673 W	
150.0	0.00	0.00	150.0	0.0	0.0	1,620,699.35	2,292,489.76	39° 30' 38.832 N	108° 0' 28.673 W	
794.1	17.71	27.61	783.9	87.5	45.8	1,620,785.56	2,292,537.93	39° 30' 39.697 N	108° 0' 28.089 W	
6,005.7	17.71	27.61	5,748.4	1,492.5	780.6	1,622,169.65	2,293,311.27	39° 30' 53.582 N	108° 0' 18.712 W	
6,891.3	0.00	0.00	6,620.0	1,612.8	843.6	1,622,288.20	2,293,377.50	39° 30' 54.771 N	108° 0' 17.909 W	
9,041.3	0.00	0.00	8,770.0	1,612.8	843.6	1,622,288.20	2,293,377.50	39° 30' 54.771 N	108° 0' 17.909 W	

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) P/	0.00	0.00	6,620.0	1,612.8	843.6	1,622,288.20	2,293,377.50	39° 30' 54.771 N	108° 0' 17.909 W	
- plan hits target center										
- Circle (radius 25.0)										

Casing Points							Casing Diameter (in)	Hole Diameter (in)
Measured Depth (usft)	Vertical Depth (usft)	Name						
904.0	888.6	9 5/8"					9.625	12.250

Formations							Dip (°)	Dip Direction (°)
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology					
2,942.0	2,830.0	Top of "G" sand					0.000	
3,047.0	2,930.0	Base of "G" Sand					0.000	
5,351.2	5,125.0	Mesaverde					0.000	
6,891.3	6,620.0	Approx Top Gas					0.000	
8,136.3	7,865.0	Cameo Coals					0.000	
8,891.3	8,620.0	Rollins SS					0.000	
9,041.3	8,770.0	TD					0.000	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
150.0	150.0	0.0	0.0	Start Build 2.75	
794.1	783.9	87.5	45.8	Hold 17.71 Inclination	
6,005.7	5,748.4	1,492.5	780.6	Start Drop -2.00	
6,891.3	6,620.0	1,612.8	843.6	Top Gas	
9,041.3	8,770.0	1,612.8	843.6	TD at 9041.3	