

PICEANCE VLY NAD 83

PA 21-06S-095W

PA 22-21 Pad

PA 512-21 - Slot B6

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 512-21 - Slot B6
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 512-21	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	Latitude:	39° 30' 38.635 N
From:	Map	Easting:	2,292,411.75 usft	Longitude:	108° 0' 29.662 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.582 °

Well	PA 512-21 - Slot B6					
Well Position	+N/-S	0.0 usft	Northing:	1,620,689.87 usft	Latitude:	39° 30' 38.734 N
	+E/-W	0.0 usft	Easting:	2,292,474.40 usft	Longitude:	108° 0' 28.865 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,023.0 usft

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	335.88

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	
780.5	12.61	350.00	775.4	68.1	-12.0	2.00	2.00	0.00	350.000	
3,780.5	12.61	350.00	3,703.1	713.0	-125.7	0.00	0.00	0.00	0.000	
4,352.8	10.39	307.26	4,264.8	806.0	-177.8	1.50	-0.39	-7.47	-124.915	
5,940.0	10.39	307.26	5,826.0	979.3	-405.6	0.00	0.00	0.00	0.000	
6,632.8	0.00	0.00	6,515.0	1,017.3	-455.5	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
8,782.8	0.00	0.00	8,665.0	1,017.3	-455.5	0.00	0.00	0.00	0.000	TD / PBHL PA 512-21

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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	1,620,689.87	2,292,474.40	39° 30' 38.734 N	108° 0' 28.865 W	
150.0	0.00	0.00	150.0	0.0	0.0	1,620,689.87	2,292,474.40	39° 30' 38.734 N	108° 0' 28.865 W	
780.5	12.61	350.00	775.4	68.1	-12.0	1,620,758.22	2,292,464.28	39° 30' 39.406 N	108° 0' 29.018 W	
3,780.5	12.61	350.00	3,703.1	713.0	-125.7	1,621,406.08	2,292,368.40	39° 30' 45.781 N	108° 0' 30.470 W	
4,352.8	10.39	307.26	4,264.8	806.0	-177.8	1,621,500.43	2,292,318.96	39° 30' 46.700 N	108° 0' 31.133 W	
5,940.0	10.39	307.26	5,826.0	979.3	-405.6	1,621,680.00	2,292,096.00	39° 30' 48.413 N	108° 0' 34.041 W	
6,632.8	0.00	0.00	6,515.0	1,017.3	-455.5	1,621,719.30	2,292,047.20	39° 30' 48.788 N	108° 0' 34.677 W	
8,782.8	0.00	0.00	8,665.0	1,017.3	-455.5	1,621,719.30	2,292,047.20	39° 30' 48.788 N	108° 0' 34.677 W	

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Top Gas (25' Radius) P# - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,515.0	1,017.3	-455.5	1,621,719.30	2,292,047.20	39° 30' 48.788 N	108° 0' 34.677 W	
TD / PBHL PA 512-21 - plan hits target center - Point	0.00	0.00	8,665.0	1,017.3	-455.5	1,621,719.30	2,292,047.20	39° 30' 48.788 N	108° 0' 34.677 W	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
878.0	870.6	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,865.4	2,810.0	Top of "G" Sand		0.000		
2,967.8	2,910.0	Base of "G" Sand		0.000		
5,186.7	5,085.0	Mesaverde		0.000		
6,632.8	6,515.0	Approx. Top Gas		0.000		
7,902.8	7,785.0	Cameo Coals		0.000		
8,632.8	8,515.0	Rollins SS		0.000		
8,782.8	8,665.0	TD		0.000		

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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 2.00
780.5	775.4	68.1	-12.0	Hold 12.61 Inclination
3,780.5	3,703.1	713.0	-125.7	Start DLS 1.50 TFO -124.915
4,352.8	4,264.8	806.0	-177.8	Hold 10.39 Inclination
5,940.0	5,826.0	979.3	-405.6	Start Drop -1.50
6,632.8	6,515.0	1,017.3	-455.5	Top Gas
8,782.8	8,665.0	1,017.3	-455.5	TD at 8782.8