

PICEANCE VLY NAD 83

PA 20-06S-095W

DOE 1-W-20 Pad

PA 443-20 - Slot B2

Wellbore #1

Plan: Plan #2 01Oct10 kjs

Standard Planning Report - Geographic

22 October, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 443-20 - Slot B2
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6256.0usft (SSD 577 (26' RKB) kjs)
Project:	PA 20-06S-095W	MD Reference:	KELLY BUSHING @ 6256.0usft (SSD 577 (26' RKB) kjs)
Site:	DOE 1-W-20 Pad	North Reference:	True
Well:	PA 443-20	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 01Oct10 kjs		

Project	PA 20-06S-095W, Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		DOE 1-W-20 Pad			
Site Position:		Northing:	1,618,275.70 usft	Latitude:	39° 30' 14.005 N
From:	Map	Easting:	2,289,265.87 usft	Longitude:	108° 1' 8.935 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.589 °

Well	PA 443-20 - Slot B2					
Well Position	+N/-S	0.0 usft	Northing:	1,618,327.50 usft	Latitude:	39° 30' 14.526 N
	+E/-W	0.0 usft	Easting:	2,289,297.80 usft	Longitude:	108° 1' 8.546 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,230.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/22/2010	10.511	65.773	52,365

Design	Plan #2 01Oct10 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	30.82

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	
130.0	0.00	0.00	130.0	0.0	0.0	0.00	0.00	0.00	0.000	
795.2	21.62	30.82	779.5	106.5	63.5	3.25	3.25	0.00	30.822	
5,346.6	21.62	30.82	5,010.8	1,546.5	922.7	0.00	0.00	0.00	0.000	
6,787.8	0.00	0.00	6,418.0	1,777.2	1,060.3	1.50	-1.50	0.00	180.000	
6,887.8	0.00	0.00	6,518.0	1,777.2	1,060.3	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
9,037.8	0.00	0.00	8,668.0	1,777.2	1,060.3	0.00	0.00	0.00	0.000	

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Wellbore:	Wellbore #1		
Design:	Plan #2 01Oct10 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	1,618,327.50	2,289,297.80	39° 30' 14.526 N	108° 1' 8.546 W	
130.0	0.00	0.00	130.0	0.0	0.0	1,618,327.50	2,289,297.80	39° 30' 14.526 N	108° 1' 8.546 W	
Start Build 3.25										
795.2	21.62	30.82	779.5	106.5	63.5	1,618,432.18	2,289,364.26	39° 30' 15.578 N	108° 1' 7.735 W	
Hold 21.62 Inclination										
904.0	21.62	30.82	880.7	140.9	84.1	1,618,466.03	2,289,385.76	39° 30' 15.918 N	108° 1' 7.473 W	
9 5/8"										
2,987.9	21.62	30.82	2,818.0	800.2	477.4	1,619,114.18	2,289,797.25	39° 30' 22.435 N	108° 1' 2.454 W	
Top of "G" Sand										
3,095.5	21.62	30.82	2,918.0	834.3	497.7	1,619,147.63	2,289,818.49	39° 30' 22.771 N	108° 1' 2.195 W	
Base of "G" Sand										
5,346.6	21.62	30.82	5,010.8	1,546.5	922.7	1,619,847.78	2,290,263.00	39° 30' 29.810 N	108° 0' 56.773 W	
Start Drop -1.50										
5,381.2	21.10	30.82	5,043.0	1,557.3	929.1	1,619,858.42	2,290,269.75	39° 30' 29.917 N	108° 0' 56.691 W	
Mesaverde										
6,787.8	0.00	0.00	6,418.0	1,777.2	1,060.3	1,620,074.60	2,290,407.00	39° 30' 32.090 N	108° 0' 55.017 W	
Vertical										
6,887.8	0.00	0.00	6,518.0	1,777.2	1,060.3	1,620,074.60	2,290,407.00	39° 30' 32.090 N	108° 0' 55.017 W	
Top Gas - Approx. Top Gas										
8,147.8	0.00	0.00	7,778.0	1,777.2	1,060.3	1,620,074.60	2,290,407.00	39° 30' 32.090 N	108° 0' 55.017 W	
Cameo Coals										
8,887.8	0.00	0.00	8,518.0	1,777.2	1,060.3	1,620,074.60	2,290,407.00	39° 30' 32.090 N	108° 0' 55.017 W	
Rollins SS										
9,037.8	0.00	0.00	8,668.0	1,777.2	1,060.3	1,620,074.60	2,290,407.00	39° 30' 32.090 N	108° 0' 55.017 W	
TD at 9037.8										

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	6,518.0	1,777.2	1,060.3	1,620,074.60	2,290,407.00	39° 30' 32.090 N	108° 0' 55.017 W	

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name			Casing Diameter (in)	Hole Diameter (in)				
904.0	880.7	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 (°)	
2,987.9	2,818.0	Top of "G" Sand				
3,095.5	2,918.0	Base of "G" Sand				
5,381.2	5,043.0	Mesaverde				
6,887.8	6,518.0	Approx. Top Gas				
8,147.8	7,778.0	Cameo Coals				
8,887.8	8,518.0	Rollins SS				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
130.0	130.0	0.0	0.0	Start Build 3.25	
795.2	779.5	106.5	63.5	Hold 21.62 Inclination	
5,346.6	5,010.8	1,546.5	922.7	Start Drop -1.50	
6,787.8	6,418.0	1,777.2	1,060.3	Vertical	
6,887.8	6,518.0	1,777.2	1,060.3	Top Gas	
9,037.8	8,668.0	1,777.2	1,060.3	TD at 9037.8	