

PICEANCE VLY NAD 83

PA 20-06S-095W

DOE 1-W-20 Pad

PA 421-29 - Slot B12

Wellbore #1

Plan: Plan #2 01Oct10 kjs

Standard Planning Report - Geographic

18 November, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 421-29 - Slot B12
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 421-29	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 421-29 - Slot B12					
Well Position	+N/-S	0.0 usft	Northing:	1,618,258.00 usft	Latitude:	39° 30' 13.831 N
	+E/-W	0.0 usft	Easting:	2,289,269.30 usft	Longitude:	108° 1' 8.885 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	65.772	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	229.82

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	
120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.00	0.00	0.000	
348.6	8.00	204.00	347.8	-14.6	-6.5	3.50	3.50	0.00	204.000	
797.9	20.18	230.48	783.2	-92.8	-79.3	3.00	2.71	5.89	41.296	
5,024.5	20.18	230.48	4,750.3	-1,020.6	-1,204.1	0.00	0.00	0.00	0.000	
6,369.8	0.00	0.00	6,068.0	-1,169.8	-1,385.0	1.50	-1.50	0.00	180.000	
8,619.8	0.00	75.31	8,318.0	-1,169.8	-1,385.0	0.00	0.00	3.35	75.314	TD / PBHL PA 421-29

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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	1,618,258.00	2,289,269.30	39° 30' 13.831 N	108° 1' 8.885 W
120.0	0.00	0.00	120.0	0.0	0.0	1,618,258.00	2,289,269.30	39° 30' 13.831 N	108° 1' 8.885 W
Start Build 3.50									
348.6	8.00	204.00	347.8	-14.6	-6.5	1,618,243.63	2,289,262.42	39° 30' 13.687 N	108° 1' 8.968 W
Begin 3°/100 Build & Turn									
797.9	20.18	230.48	783.2	-92.8	-79.3	1,618,167.43	2,289,187.43	39° 30' 12.914 N	108° 1' 9.897 W
Hold 20.18 Inclination									
2,896.5	20.18	230.48	2,753.0	-553.5	-637.8	1,617,722.43	2,288,616.36	39° 30' 8.361 N	108° 1' 17.022 W
Top of "G" Sand									
3,003.1	20.18	230.48	2,853.0	-576.8	-666.2	1,617,699.84	2,288,587.37	39° 30' 8.130 N	108° 1' 17.384 W
Base of "G" Sand									
3,109.6	20.18	230.48	2,953.0	-600.2	-694.5	1,617,677.25	2,288,558.38	39° 30' 7.899 N	108° 1' 17.746 W
9 5/8"									
5,024.5	20.18	230.48	4,750.3	-1,020.6	-1,204.1	1,617,271.22	2,288,037.32	39° 30' 3.744 N	108° 1' 24.247 W
Start Drop -1.50									
5,138.6	18.47	230.48	4,858.0	-1,044.6	-1,233.3	1,617,248.00	2,288,007.53	39° 30' 3.507 N	108° 1' 24.619 W
Mesaverde									
6,369.8	0.00	0.00	6,068.0	-1,169.8	-1,385.0	1,617,127.09	2,287,852.36	39° 30' 2.269 N	108° 1' 26.555 W
Vertical									
6,469.8	0.01	255.31	6,168.0	-1,169.8	-1,385.1	1,617,127.08	2,287,852.35	39° 30' 2.269 N	108° 1' 26.555 W
Top Gas - Approx. Top Gas									
7,859.8	0.00	0.00	7,558.0	-1,169.8	-1,385.0	1,617,127.09	2,287,852.37	39° 30' 2.269 N	108° 1' 26.555 W
Cameo Coals									
8,469.8	0.00	0.00	8,168.0	-1,169.8	-1,385.0	1,617,127.09	2,287,852.39	39° 30' 2.269 N	108° 1' 26.555 W
Rollins SS									
8,619.8	0.00	75.31	8,318.0	-1,169.8	-1,385.0	1,617,127.10	2,287,852.40	39° 30' 2.269 N	108° 1' 26.554 W
TD at 8619.8 - 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) P/	0.00	0.00	6,168.0	-1,169.8	-1,385.0	1,617,127.10	2,287,852.40	39° 30' 2.269 N	108° 1' 26.554 W	
- plan misses target center by 0.1usft at 6469.8usft MD (6168.0 TVD, -1169.8 N, -1385.1 E)										
- Circle (radius 25.0)										
TD / PBHL PA 421-29	0.00	0.00	8,318.0	-1,169.8	-1,385.0	1,617,127.10	2,287,852.40	39° 30' 2.269 N	108° 1' 26.554 W	
- plan hits target center										
- Point										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (in)	Hole Diameter (in)
3,109.6	2,953.0	9 5/8"		9.625	12.250

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Project:	PA 20-06S-095W	MD Reference:	KELLY BUSHING @ 6256.0usft (SSD 577 (26' RKB) kjs)
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Wellbore:	Wellbore #1		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,896.5	2,753.0	Top of "G" Sand				
3,003.1	2,853.0	Base of "G" Sand				
5,138.6	4,858.0	Mesaverde				
6,469.8	6,168.0	Approx. Top Gas				
7,859.8	7,558.0	Cameo Coals				
8,469.8	8,168.0	Rollins SS				
8,619.8	8,318.0	TD		0.000		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
120.0	120.0	0.0	0.0	Start Build 3.50	
348.6	347.8	-14.6	-6.5	Begin 3"/100 Build & Turn	
797.9	783.2	-92.8	-79.3	Hold 20.18 Inclination	
5,024.5	4,750.3	-1,020.6	-1,204.1	Start Drop -1.50	
6,369.8	6,068.0	-1,169.8	-1,385.0	Vertical	
6,469.8	6,168.0	-1,169.8	-1,385.0	Top Gas	
8,619.8	8,318.0	-1,169.8	-1,385.0	TD at 8619.8	