

PICEANCE VLY NAD 83

PA 20-06S-095W

DOE 1-W-20 Pad

PA 433-20 - Slot A1

Wellbore #1

Plan: Plan #2 01Oct10 kjs

Standard Planning Report - Geographic

21 October, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 433-20 - Slot A1
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 433-20	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 433-20 - Slot A1					
Well Position	+N/-S	0.0 usft	Northing:	1,618,338.20 usft	Latitude:	39° 30' 14.630 N
	+E/-W	0.0 usft	Easting:	2,289,291.40 usft	Longitude:	108° 1' 8.631 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	349.03

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	
761.8	22.46	349.03	745.5	122.0	-23.6	3.50	3.50	0.00	349.029	
5,250.4	22.46	349.03	4,893.4	1,805.7	-350.0	0.00	0.00	0.00	0.000	
6,748.0	0.00	0.00	6,353.0	2,090.3	-405.2	1.50	-1.50	0.00	180.000	
6,848.0	0.00	0.00	6,453.0	2,090.3	-405.2	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
8,998.0	0.00	0.00	8,603.0	2,090.3	-405.2	0.00	0.00	0.00	0.000	

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Site:	DOE 1-W-20 Pad	North Reference:	True
Well:	PA 433-20	Survey Calculation Method:	Minimum Curvature
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	1,618,338.20	2,289,291.40	39° 30' 14.630 N	108° 1' 8.631 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,618,338.20	2,289,291.40	39° 30' 14.630 N	108° 1' 8.631 W	
Start Build 3.50										
761.8	22.46	349.03	745.5	122.0	-23.6	1,618,460.76	2,289,271.15	39° 30' 15.835 N	108° 1' 8.933 W	
Hold 22.46 Inclination										
900.0	22.46	349.03	873.2	173.8	-33.7	1,618,512.84	2,289,262.54	39° 30' 16.347 N	108° 1' 9.061 W	
9 5/8"										
2,993.7	22.46	349.03	2,808.0	959.2	-185.9	1,619,302.15	2,289,132.13	39° 30' 24.110 N	108° 1' 11.004 W	
Top of "G" Sand										
3,101.9	22.46	349.03	2,908.0	999.8	-193.8	1,619,342.95	2,289,125.39	39° 30' 24.511 N	108° 1' 11.104 W	
Base of "G" Sand										
5,250.4	22.46	349.03	4,893.4	1,805.7	-350.0	1,620,152.92	2,288,991.55	39° 30' 32.476 N	108° 1' 13.098 W	
Start Drop -1.50										
5,384.2	20.46	349.03	5,018.0	1,853.8	-359.4	1,620,201.23	2,288,983.57	39° 30' 32.952 N	108° 1' 13.217 W	
Mesaverde										
6,748.0	0.00	0.00	6,353.0	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	
Vertical										
6,848.0	0.00	0.00	6,453.0	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	
Top Gas - Approx. Top Gas										
8,153.0	0.00	0.00	7,758.0	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	
Cameo Coals										
8,848.0	0.00	0.00	8,453.0	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	
Rollins SS										
8,997.9	0.00	0.00	8,602.9	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	
TD										
8,998.0	0.00	0.00	8,603.0	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	
TD at 8998.0										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Top Gas (25' Radius) P/ - hit/miss target - Shape - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,453.0	2,090.3	-405.2	1,620,438.90	2,288,944.30	39° 30' 35.289 N	108° 1' 13.802 W	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)		
900.0	873.2	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 (°)	
2,993.7	2,808.0	Top of "G" Sand				
3,101.9	2,908.0	Base of "G" Sand				
5,384.2	5,018.0	Mesaverde				
6,848.0	6,453.0	Approx. Top Gas				
8,153.0	7,758.0	Cameo Coals				
8,848.0	8,453.0	Rollins SS				
8,997.9	8,602.9	TD		0.000		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
120.0	120.0	0.0	0.0	Start Build 3.50	
761.8	745.5	122.0	-23.6	Hold 22.46 Inclination	
5,250.4	4,893.4	1,805.7	-350.0	Start Drop -1.50	
6,748.0	6,353.0	2,090.3	-405.2	Vertical	
6,848.0	6,453.0	2,090.3	-405.2	Top Gas	
8,998.0	8,603.0	2,090.3	-405.2	TD at 8998.0	