

PICEANCE VLY NAD 83

PA 12-07S-095W

PA 23-12 Pad

PA 414-12 - Slot A1

PA 414-12

Plan: Plan #2 13Aug10 kjs

Standard Planning Report - Geographic

17 August, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 414-12 - Slot A1
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6533.0usft ((26' RKB) kjs)
Project:	PA 12-07S-095W	MD Reference:	KELLY BUSHING @ 6533.0usft ((26' RKB) kjs)
Site:	PA 23-12 Pad	North Reference:	True
Well:	PA 414-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	PA 414-12		
Design:	Plan #2 13Aug10 kjs		

Project	PA 12-07S-095W, Garfield County, CO, 12-07S-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 23-12 Pad				
Site Position:		Northing:	1,598,886.60 usft	Latitude:	39° 27' 7.594 N	
From:	Map	Easting:	2,308,331.30 usft	Longitude:	107° 56' 59.111 W	
Position Uncertainty:		0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.545 °

Well	PA 414-12 - Slot A1					
Well Position	+N/-S	0.0 usft	Northing:	1,598,867.30 usft	Latitude:	39° 27' 7.384 N
	+E/-W	0.0 usft	Easting:	2,308,258.20 usft	Longitude:	107° 57' 0.036 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,507.0 usft

Wellbore	PA 414-12				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	6/5/2007	10.827	65.827	52,654

Design	Plan #2 13Aug10 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	215.18

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	
980.1	30.10	215.18	941.0	-180.5	-127.2	3.50	3.50	0.00	215.182	
4,431.8	30.10	215.18	3,927.2	-1,595.4	-1,124.7	0.00	0.00	0.00	0.000	
6,438.6	0.00	0.00	5,843.0	-2,016.5	-1,421.5	1.50	-1.50	0.00	180.000	
6,538.6	0.00	0.00	5,943.0	-2,016.5	-1,421.5	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
8,688.6	0.00	0.00	8,093.0	-2,016.5	-1,421.5	0.00	0.00	0.00	0.000	

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Wellbore:	PA 414-12		
Design:	Plan #2 13Aug10 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	1,598,867.30	2,308,258.20	39° 27' 7.384 N	107° 57' 0.036 W
120.0	0.00	0.00	120.0	0.0	0.0	1,598,867.30	2,308,258.20	39° 27' 7.384 N	107° 57' 0.036 W
Start Build 3.50									
980.1	30.10	215.18	941.0	-180.5	-127.2	1,598,690.35	2,308,126.18	39° 27' 5.601 N	107° 57' 1.657 W
Hold 30.10 Inclination									
1,030.0	30.10	215.18	984.2	-200.9	-141.6	1,598,670.28	2,308,111.20	39° 27' 5.398 N	107° 57' 1.841 W
9 5/8"									
2,843.3	30.10	215.18	2,553.0	-944.2	-665.7	1,597,941.38	2,307,567.36	39° 26' 58.052 N	107° 57' 8.521 W
Top of "G" Sand									
2,958.9	30.10	215.18	2,653.0	-991.6	-699.1	1,597,894.92	2,307,532.70	39° 26' 57.584 N	107° 57' 8.947 W
Base of "G" Sand									
4,431.8	30.10	215.18	3,927.2	-1,595.4	-1,124.7	1,597,302.87	2,307,090.96	39° 26' 51.616 N	107° 57' 14.373 W
Start Drop -1.50									
5,217.9	18.31	215.18	4,643.0	-1,858.4	-1,310.1	1,597,044.99	2,306,898.55	39° 26' 49.017 N	107° 57' 16.736 W
Mesaverde									
6,438.6	0.00	0.00	5,843.0	-2,016.5	-1,421.5	1,596,890.00	2,306,782.90	39° 26' 47.455 N	107° 57' 18.156 W
Vertical									
6,538.6	0.00	0.00	5,943.0	-2,016.5	-1,421.5	1,596,890.00	2,306,782.90	39° 26' 47.455 N	107° 57' 18.156 W
Top Gas - Approx. Top Gas									
7,578.6	0.00	0.00	6,983.0	-2,016.5	-1,421.5	1,596,890.00	2,306,782.90	39° 26' 47.455 N	107° 57' 18.156 W
Cameo Coals									
8,538.6	0.00	0.00	7,943.0	-2,016.5	-1,421.5	1,596,890.00	2,306,782.90	39° 26' 47.455 N	107° 57' 18.156 W
Rollins SS									
8,688.6	0.00	0.00	8,093.0	-2,016.5	-1,421.5	1,596,890.00	2,306,782.90	39° 26' 47.455 N	107° 57' 18.156 W
TD at 8688.6 - TD									

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	5,943.0	-2,016.5	-1,421.5	1,596,890.00	2,306,782.90	39° 26' 47.455 N	107° 57' 18.156 W	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name			Casing Diameter (in)	Hole Diameter (in)
1,030.0	984.2	9 5/8"			9.625	12.250

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Wellbore:	PA 414-12		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,843.3	2,553.0	Top of "G" Sand				
2,958.9	2,653.0	Base of "G" Sand				
5,217.9	4,643.0	Mesaverde				
6,538.6	5,943.0	Approx. Top Gas				
7,578.6	6,983.0	Cameo Coals				
8,538.6	7,943.0	Rollins SS				
8,688.6	8,093.0	TD				

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	
980.1	941.0	-180.5	-127.2	Hold 30.10 Inclination	
4,431.8	3,927.2	-1,595.4	-1,124.7	Start Drop -1.50	
6,438.6	5,843.0	-2,016.5	-1,421.5	Vertical	
6,538.6	5,943.0	-2,016.5	-1,421.5	Top Gas	
8,688.6	8,093.0	-2,016.5	-1,421.5	TD at 8688.6	