

Surface Location: GV 84-1 Pad - West Cellar
North American Datum 1983 , US State Plane 1983 , Colorado Central Zone
Ground Elevation: 6027.0
E-W Northing Easting Latitude Longitude
0.0 1603947.50 2307248.80 39° 27' 57.308 N 107° 57' 14.649 W
WELL @ 6051.0usft (Original Well Elev)

PICEANCE VLY NAD 83

PA 01-07S-095W

GV 84-1 Pad - West Cellar

PA 344-2 - Slot A2

Wellbore #1

Plan: Design #1 22Mar11 kjs

Standard Planning Report - Geographic

16 May, 2011

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 344-2 - Slot A2
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 6051.0usft (Original Well Elev)
Project:	PA 01-07S-095W	MD Reference:	WELL @ 6051.0usft (Original Well Elev)
Site:	GV 84-1 Pad - West Cellar	North Reference:	True
Well:	PA 344-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 22Mar11 kjs		

Project	PA 01-07S-095W. 01-07S-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	GV 84-1 Pad - West Cellar		
Site Position:		Northing:	1,603,932.89 usft
From:	Map	Easting:	2,307,221.63 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in
		Latitude:	39° 27' 57.156 N
		Longitude:	107° 57' 14.990 W
		Grid Convergence:	-1.548 °

Well	PA 344-2 - Slot A2		
Well Position	+N/-S	0.0 usft	Northing: 1,603,947.50 usft
	+E/-W	0.0 usft	Easting: 2,307,248.80 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	Latitude: 39° 27' 57.308 N
			Longitude: 107° 57' 14.649 W
			Ground Level: 6,027.0 usft

Wellbore	Wellbore #1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/22/2011	10.360	65.729	52,262

Design	Design #1 22Mar11 kjs
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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	213.31

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	
1,364.5	37.04	213.31	1,280.3	-322.0	-211.6	3.00	3.00	0.00	213.311	
2,679.9	37.04	213.31	2,330.4	-984.1	-646.7	0.00	0.00	0.00	0.000	
5,148.9	0.00	0.00	4,631.0	-1,628.1	-1,069.9	1.50	-1.50	0.00	180.000	
5,248.9	0.00	0.00	4,731.0	-1,628.1	-1,069.9	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
8,328.9	0.00	0.00	7,811.0	-1,628.1	-1,069.9	0.00	0.00	0.00	0.000	

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Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 344-2 - Slot A2
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 6051.0usft (Original Well Elev)
Project:	PA 01-07S-095W	MD Reference:	WELL @ 6051.0usft (Original Well Elev)
Site:	GV 84-1 Pad - West Cellar	North Reference:	True
Well:	PA 344-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 22Mar11 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	1,603,947.50	2,307,248.80	39° 27' 57.308 N	107° 57' 14.649 W
130.0	0.00	0.00	130.0	0.0	0.0	1,603,947.50	2,307,248.80	39° 27' 57.308 N	107° 57' 14.649 W
Start Build 3.00									
1,364.5	37.04	213.31	1,280.3	-322.0	-211.6	1,603,631.36	2,307,028.60	39° 27' 54.126 N	107° 57' 17.347 W
Hold 37.04 Inclination									
1,465.0	37.04	213.31	1,360.5	-372.6	-244.8	1,603,581.69	2,306,994.01	39° 27' 53.626 N	107° 57' 17.771 W
9 5/8"									
2,536.6	37.04	213.31	2,216.0	-912.0	-599.3	1,603,052.07	2,306,625.12	39° 27' 48.294 N	107° 57' 22.290 W
Top of "G" Sand									
2,661.9	37.04	213.31	2,316.0	-975.0	-640.7	1,602,990.16	2,306,581.99	39° 27' 47.671 N	107° 57' 22.819 W
Base of "G" Sand									
2,679.9	37.04	213.31	2,330.4	-984.1	-646.7	1,602,981.27	2,306,575.80	39° 27' 47.582 N	107° 57' 22.895 W
Start Drop -1.50									
4,893.7	3.83	213.31	4,376.0	-1,620.9	-1,065.2	1,602,355.99	2,306,140.27	39° 27' 41.287 N	107° 57' 28.230 W
Mesaverde									
5,148.9	0.00	0.00	4,631.0	-1,628.1	-1,069.9	1,602,349.00	2,306,135.40	39° 27' 41.217 N	107° 57' 28.290 W
Vertical									
5,248.9	0.00	0.00	4,731.0	-1,628.1	-1,069.9	1,602,349.00	2,306,135.40	39° 27' 41.217 N	107° 57' 28.290 W
Top Gas - Approx. Top Gas									
7,248.9	0.00	0.00	6,731.0	-1,628.1	-1,069.9	1,602,349.00	2,306,135.40	39° 27' 41.217 N	107° 57' 28.290 W
Cameo Coals									
8,178.9	0.00	0.00	7,661.0	-1,628.1	-1,069.9	1,602,349.00	2,306,135.40	39° 27' 41.217 N	107° 57' 28.290 W
Rollins SS									
8,328.9	0.00	0.00	7,811.0	-1,628.1	-1,069.9	1,602,349.00	2,306,135.40	39° 27' 41.217 N	107° 57' 28.290 W
TD at 8328.9 - 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	4,731.0	-1,628.1	-1,069.9	1,602,349.00	2,306,135.40	39° 27' 41.217 N	107° 57' 28.290 W
- plan hits target center									
- Circle (radius 25.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,465.0	1,360.5	9 5/8"	9.625	12.250

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Well:	PA 344-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 22Mar11 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,536.6	2,216.0	Top of "G" Sand				
2,661.9	2,316.0	Base of "G" Sand				
4,893.7	4,376.0	Mesaverde				
5,248.9	4,731.0	Approx. Top Gas				
7,248.9	6,731.0	Cameo Coals				
8,178.9	7,661.0	Rollins SS				
8,328.9	7,811.0	TD				

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 3.00	
1,364.5	1,280.3	-322.0	-211.6	Hold 37.04 Inclination	
2,679.9	2,330.4	-984.1	-646.7	Start Drop -1.50	
5,148.9	4,631.0	-1,628.1	-1,069.9	Vertical	
5,248.9	4,731.0	-1,628.1	-1,069.9	Top Gas	
8,328.9	7,811.0	-1,628.1	-1,069.9	TD at 8328.9	