

PICEANCE VLY NAD 83

AP 20-06S-095W

AP 21-20-695 Pad

AP 421-20-695 - Slot B4

Wellbore #1

Plan: Plan #2 16Aug11 kjs

Standard Planning Report - Geographic

23 August, 2011

Williams

Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well AP 421-20-695 - Slot B4
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6935.0usft (Nabors 574 (26' RKB) kjs)
Project:	AP 20-06S-095W	MD Reference:	KELLY BUSHING @ 6935.0usft (Nabors 574 (26' RKB) kjs)
Site:	AP 21-20-695 Pad	North Reference:	True
Well:	AP 421-20-695	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 16Aug11 kjs		

Project	AP 20-06S-095W, Garfield County, CO, 20-06S-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	AP 21-20-695 Pad			
Site Position:		Northing:	1,623,258.80 usft	Latitude: 39° 31' 2.984 N
From:	Map	Easting:	2,288,342.20 usft	Longitude: 108° 1' 22.480 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence: -1.591 °

Well	AP 421-20-695 - Slot B4			
Well Position	+N/-S	0.0 usft	Northing:	1,623,249.80 usft
	+E/-W	0.0 usft	Easting:	2,288,333.60 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	Ground Level: 6,909.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	7/16/2010	10.461	65.788	52,373

Design	Plan #2 16Aug11 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	228.50

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	
431.1	7.00	265.00	430.3	-1.7	-18.9	2.25	2.25	0.00	265.000	
650.9	8.03	227.27	648.3	-13.2	-43.5	2.25	0.47	-17.17	-97.361	
6,663.0	8.03	227.27	6,601.5	-583.1	-660.3	0.00	0.00	0.00	0.000	
7,198.2	0.00	0.00	7,135.0	-608.5	-687.8	1.50	-1.50	0.00	180.000	
9,448.2	0.00	0.00	9,385.0	-608.5	-687.8	0.00	0.00	0.00	0.000	

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Wellbore:	Wellbore #1		
Design:	Plan #2 16Aug11 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	1,623,249.80	2,288,333.60	39° 31' 2.892 N	108° 1' 22.587 W
120.0	0.00	0.00	120.0	0.0	0.0	1,623,249.80	2,288,333.60	39° 31' 2.892 N	108° 1' 22.587 W
Start Build 2.25									
431.1	7.00	265.00	430.3	-1.7	-18.9	1,623,248.67	2,288,314.65	39° 31' 2.876 N	108° 1' 22.828 W
Begin 2.25°/100 Build & Turn									
650.9	8.03	227.27	648.3	-13.2	-43.5	1,623,237.77	2,288,289.72	39° 31' 2.761 N	108° 1' 23.142 W
Hold 8.03 Inclination									
1,045.0	8.03	227.27	1,038.6	-50.6	-84.0	1,623,201.55	2,288,248.26	39° 31' 2.392 N	108° 1' 23.658 W
9 5/8"									
3,752.9	8.03	227.27	3,720.0	-307.2	-361.8	1,622,952.72	2,287,963.46	39° 30' 59.856 N	108° 1' 27.203 W
Top of "G" Sand									
3,853.9	8.03	227.27	3,820.0	-316.8	-372.1	1,622,943.44	2,287,952.83	39° 30' 59.761 N	108° 1' 27.335 W
Base of "G" Sand									
5,929.3	8.03	227.27	5,875.0	-513.5	-585.0	1,622,752.75	2,287,734.56	39° 30' 57.817 N	108° 1' 30.052 W
Mesaverde									
6,663.0	8.03	227.27	6,601.5	-583.1	-660.3	1,622,685.33	2,287,657.39	39° 30' 57.130 N	108° 1' 31.012 W
Start Drop -1.50									
7,198.2	0.00	0.00	7,135.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W
Vertical									
7,298.2	0.00	0.00	7,235.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W
Top Gas - Approx. Top Gas - Top Gas (25' Radius) AP 421-20-695									
8,633.2	0.00	0.00	8,570.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W
Cameo Coals									
9,298.2	0.00	0.00	9,235.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W
Rollins SS									
9,448.2	0.00	0.00	9,385.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W
TD at 9448.2 - TD / PBHL AP 421-20-695									

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) AF - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,235.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W
TD / PBHL AP 421-20-6' - plan hits target center - Point	0.00	0.00	9,385.0	-608.5	-687.8	1,622,660.70	2,287,629.20	39° 30' 56.879 N	108° 1' 31.363 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,045.0	1,038.6	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 (°)	
3,752.9	3,720.0	Top of "G" Sand				
3,853.9	3,820.0	Base of "G" Sand				
5,929.3	5,875.0	Mesaverde				
7,298.2	7,235.0	Approx. Top Gas				
8,633.2	8,570.0	Cameo Coals				
9,298.2	9,235.0	Rollins SS				
9,448.2	9,385.0	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 2.25	
431.1	430.3	-1.7	-18.9	Begin 2.25°/100 Build & Turn	
650.9	648.3	-13.2	-43.5	Hold 8.03 Inclination	
6,663.0	6,601.5	-583.1	-660.3	Start Drop -1.50	
7,198.2	7,135.0	-608.5	-687.8	Vertical	
7,298.2	7,235.0	-608.5	-687.8	Top Gas	
9,448.2	9,385.0	-608.5	-687.8	TD at 9448.2	

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsed	Departure	Annotation
120.0	120.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.25
430.3	431.1	7.00	265.00	-1.7	-18.9	15.3	19.0	Begin 2.25"/100 Build & Turn
648.3	650.9	8.03	227.27	-13.2	-43.5	41.4	46.9	Hold 8.03 Inclination
6601.5	6663.0	8.03	227.27	-583.1	-660.3	880.9	886.5	Start Drop -1.50
7135.0	7198.2	0.00	0.00	-608.5	-687.8	918.3	924.0	Vertical
7235.0	7298.2	0.00	0.00	-608.5	-687.8	918.3	924.0	Top Gas
9385.0	9448.2	0.00	0.00	-608.5	-687.8	918.3	924.0	TD at 9448.2