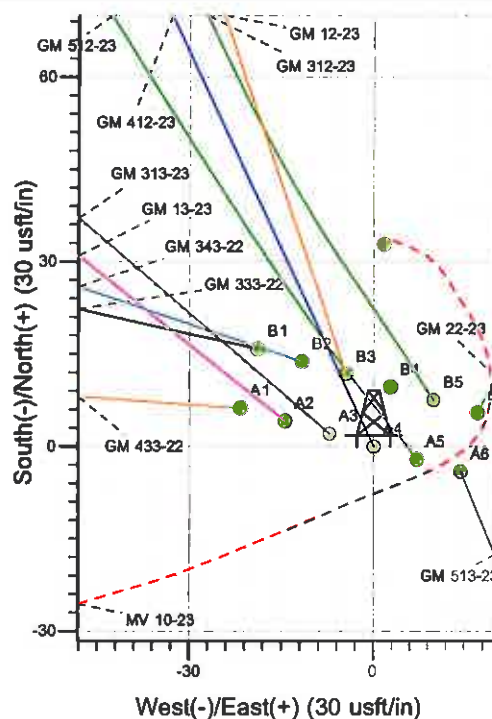
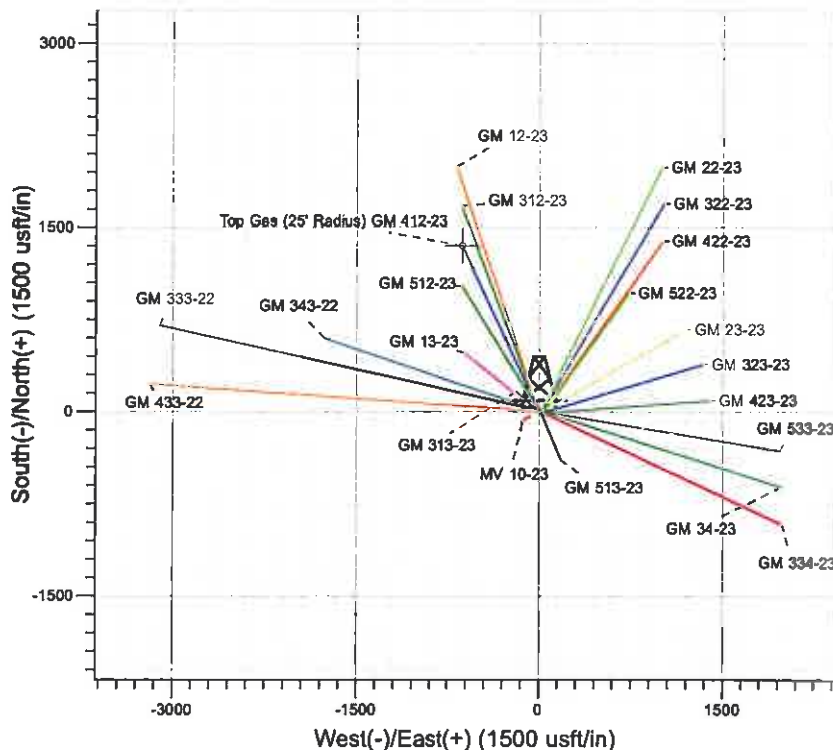
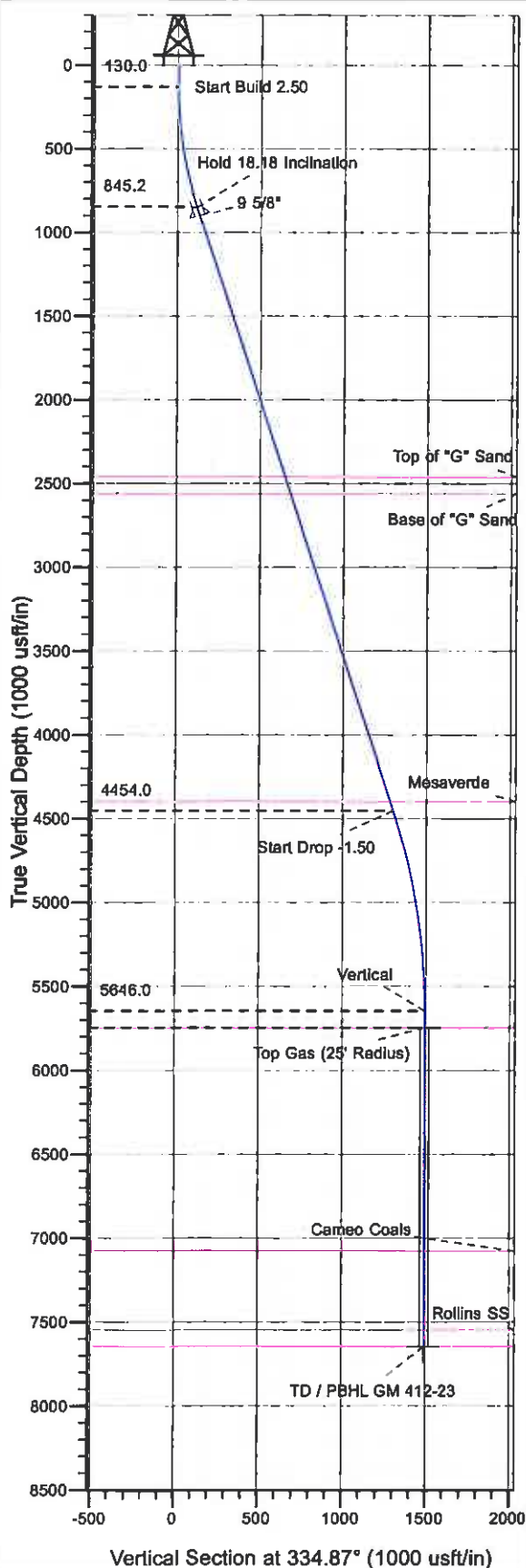




Well Name: GM 412-23  
 Surface Location: MV 10-23 Pad  
 North American Datum 1983 , US State Plane 1983 , Colorado Central Zone  
 Ground Elevation: 5976.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1619647.54	2271219.94	39° 30' 22.550 N	108° 4' 59.575 W	A4

KELLY BUSHING @ 6002.0usft (Nabors 576 (26' RKB) kjs)



Project: GV 23-06S-096W  
 Site: MV 10-23 Pad  
 Well: GM 412-23  
 Design #1 04Oct10 kjs

Azimuths to True North  
 Magnetic North: 10.48°  
 Magnetic Field  
 Strength: 52314.3nT  
 Dip Angle: 65.75°  
 Date: 10/4/2010  
 Model: IGRF2010

#### ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
130.0	130.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.50
845.2	857.4	18.18	334.87	103.6	-48.6	114.5	114.5	Hold 18.18 Inclination
4454.0	4655.8	18.18	334.87	1178.8	-552.0	1299.9	1299.9	Start Drop -1.50
5646.0	5868.1	0.00	0.00	1349.8	-833.0	1490.6	1490.6	Vertical
5746.0	5988.1	0.00	0.00	1349.8	-833.0	1490.6	1490.6	Top Gas
7846.0	7888.1	0.00	0.00	1349.8	-833.0	1490.6	1490.6	TD at 7888.1

# **PICEANCE VLY NAD 83**

**GV 23-06S-096W**

**MV 10-23 Pad**

**GM 412-23 - Slot A4**

**Wellbore #1**

**Plan: Design #1 04Oct10 kjs**

## **Standard Planning Report - Geographic**

**09 February, 2011**

**Williams**  
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well GM 412-23 - Slot A4
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6002.0usft (Nabors 576 (26' RKB) kjs)
Project:	GV 23-06S-096W	MD Reference:	KELLY BUSHING @ 6002.0usft (Nabors 576 (26' RKB) kjs)
Site:	MV 10-23 Pad	North Reference:	True
Well:	GM 412-23	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 04Oct10 kjs		

Project	GV 23-06S-096W, Garfield County, CO, 23-06S-096W		
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	MV 10-23 Pad		
Site Position:		Northing:	1,619,663.89 usft
From:	Map	Easting:	2,271,201.54 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in
		Latitude:	39° 30' 22.707 N
		Longitude:	108° 4' 59.816 W
		Grid Convergence:	-1.629 °

Well	GM 412-23 - Slot A4		
Well Position	+N/-S	0.0 usft	Northing: 1,619,647.54 usft
	+E/-W	0.0 usft	Easting: 2,271,219.94 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	Ground Level: 5,976.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	10/4/2010	10.482
			Dip Angle
			(°)
			Field Strength
			(nT)
			65.750
			52,314

Design	Design #1 04Oct10 kjs		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			334.87

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	
857.4	18.18	334.87	845.2	103.6	-48.6	2.50	2.50	0.00	334.872	
4,655.8	18.18	334.87	4,454.0	1,176.8	-552.0	0.00	0.00	0.00	0.000	
5,868.1	0.00	0.00	5,646.0	1,349.6	-633.0	1.50	-1.50	0.00	180.000	
5,968.1	0.00	0.00	5,746.0	1,349.6	-633.0	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
7,868.1	0.00	0.00	7,646.0	1,349.6	-633.0	0.00	0.00	0.00	0.000	

**Williams**  
Planning Report - Geographic

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Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 6002.0usft (Nabors 576 (26' RKB) kjs)
Project:	GV 23-06S-096W	MD Reference:	KELLY BUSHING @ 6002.0usft (Nabors 576 (26' RKB) kjs)
Site:	MV 10-23 Pad	North Reference:	True
Well:	GM 412-23	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 04Oct10 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	1,619,647.54	2,271,219.94	39° 30' 22.550 N	108° 4' 59.575 W
130.0	0.00	0.00	130.0	0.0	0.0	1,619,647.54	2,271,219.94	39° 30' 22.550 N	108° 4' 59.575 W
<b>Start Build 2.50</b>									
857.4	18.18	334.87	845.2	103.8	-48.6	1,619,752.50	2,271,174.30	39° 30' 23.575 N	108° 5' 0.195 W
<b>Hold 18.18 Inclination</b>									
907.0	18.18	334.87	892.4	117.6	-55.2	1,619,766.70	2,271,168.13	39° 30' 23.713 N	108° 5' 0.279 W
<b>9 5/8"</b>									
2,557.0	18.18	334.87	2,460.0	583.9	-273.8	1,620,238.92	2,270,882.81	39° 30' 28.321 N	108° 5' 3.069 W
<b>Top of "G" Sand</b>									
2,662.3	18.18	334.87	2,560.0	613.6	-287.8	1,620,269.04	2,270,949.72	39° 30' 28.615 N	108° 5' 3.247 W
<b>Base of "G" Sand</b>									
4,596.9	18.18	334.87	4,398.0	1,160.2	-544.2	1,620,822.70	2,270,708.99	39° 30' 34.017 N	108° 5' 6.518 W
<b>Mesaverde</b>									
4,655.8	18.18	334.87	4,454.0	1,176.8	-552.0	1,620,839.55	2,270,701.68	39° 30' 34.181 N	108° 5' 6.618 W
<b>Start Drop -1.50</b>									
5,868.1	0.00	0.00	5,846.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
<b>Vertical</b>									
5,968.1	0.00	0.00	5,746.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
<b>Top Gas - Approx. Top Gas</b>									
7,299.1	0.00	0.00	7,077.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
<b>Cameo Coals</b>									
7,768.1	0.00	0.00	7,546.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
<b>Rollins SS</b>									
7,868.1	0.00	0.00	7,646.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
<b>TD at 7868.1 - TD</b>									

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) GI	0.00	0.00	5,746.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
- plan hits target center									
- Circle (radius 25.0)									
TD / PBHL GM 412-23	0.00	0.00	7,646.0	1,349.6	-633.0	1,621,014.50	2,270,625.60	39° 30' 35.888 N	108° 5' 7.651 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
907.0	892.4	9 5/8"	9.825	12.250	

**Williams**  
Planning Report - Geographic

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Project:	GV 23-06S-096W	MD Reference:	KELLY BUSHING @ 6002.0usft (Nabors 576 (26' RKB) kjs)
Site:	MV 10-23 Pad	North Reference:	True
Well:	GM 412-23	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 04Oct10 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,557.0	2,460.0	Top of "G" Sand				
2,662.3	2,560.0	Base of "G" Sand				
4,596.8	4,396.0	Mesaverde				
5,968.1	5,746.0	Approx. Top Gas				
7,299.1	7,077.0	Cameo Coals				
7,768.1	7,546.0	Rollins SS				
7,868.1	7,646.0	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 2.50	
857.4	845.2	103.6	-48.6	Hold 18.18 Inclination	
4,655.8	4,454.0	1,176.8	-552.0	Start Drop -1.50	
5,868.1	5,646.0	1,349.6	-633.0	Vertical	
5,968.1	5,746.0	1,349.6	-633.0	Top Gas	
7,868.1	7,646.0	1,349.6	-633.0	TD at 7868.1	