



+N/-S
0.0

+E/-W
0.0

Northing
1782396.00

Easting
2197469.80

Latitude
39° 56' 48.402 N

Longitude
108° 21' 45.489 W

Slot
B5

Well Name: Federal RGU 513-23-198

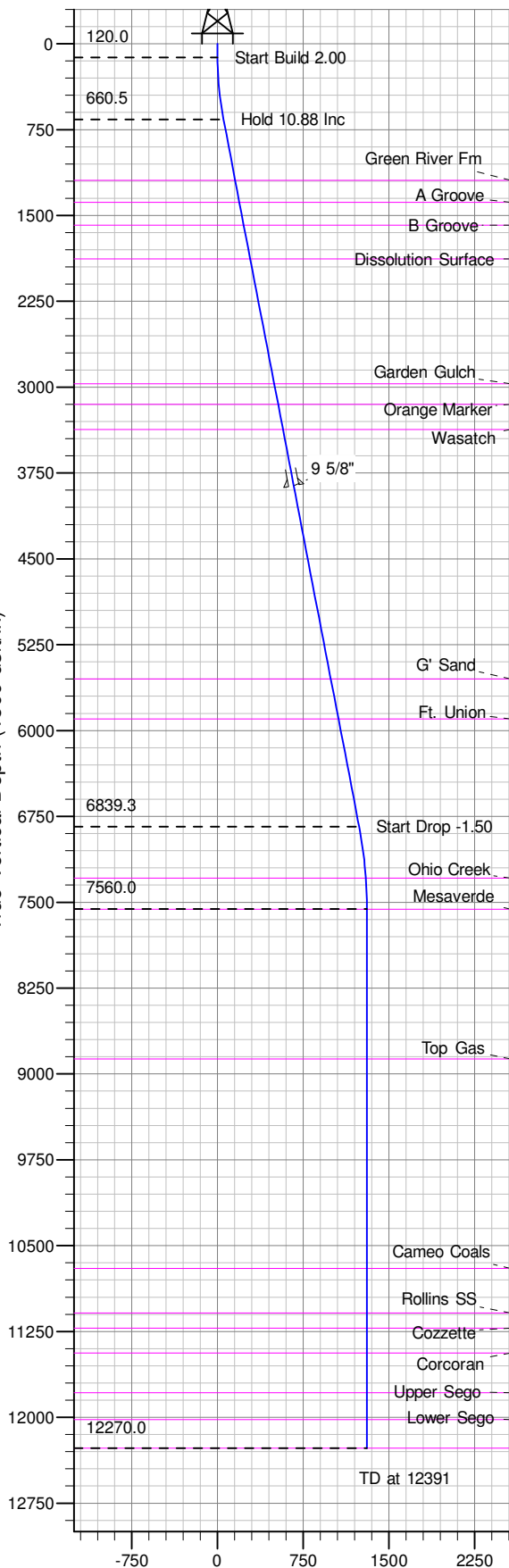
Surface Location: RGU 23-23-198 Pad

North American Datum 1983 , US State Plane 1983 , Colorado Central Zone

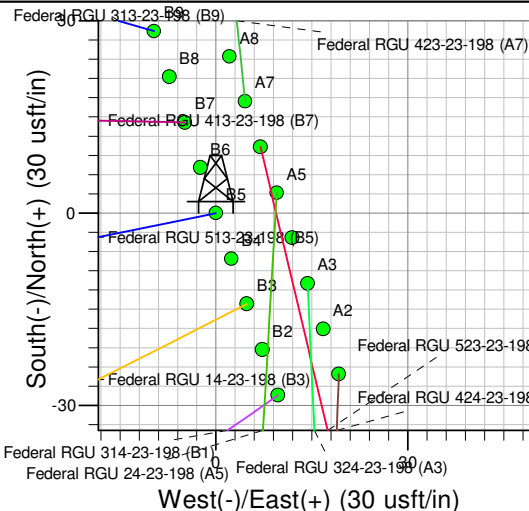
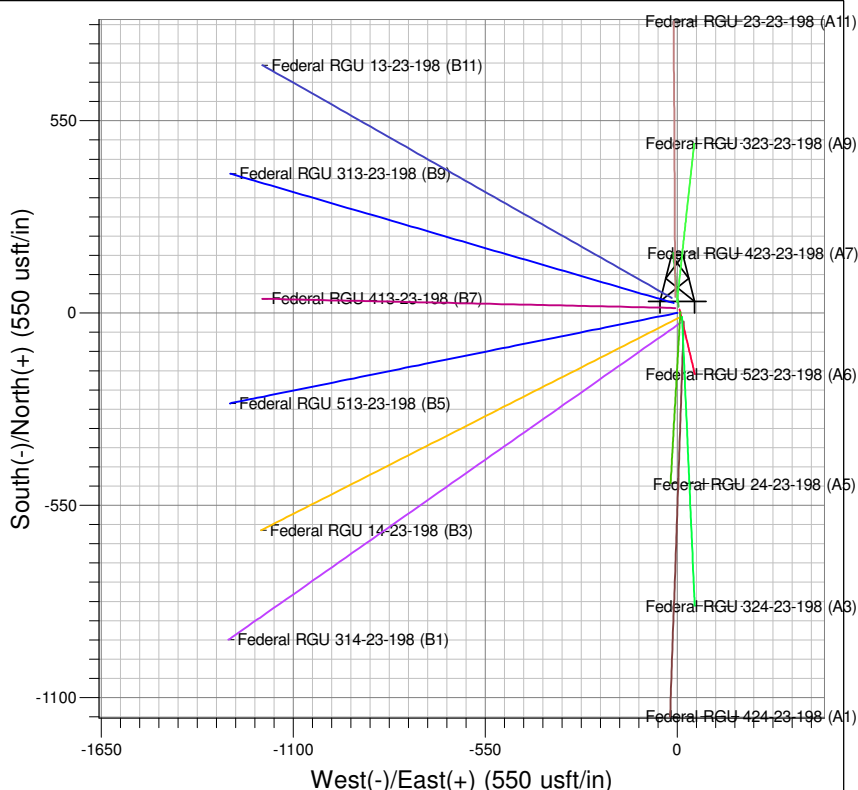
Ground Elevation: 6542.0

KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jib)

True Vertical Depth (1500 usft/in)



Vertical Section at 258.59° (1500 usft/in)



Project: RG 23-01S-098W
Site: RGU 23-23-198 Pad
Well: Federal RGU 513-23-198
Plan #1 10may10 jib

Azimuths to True North
Magnetic North: 10.72°
Magnetic Field
Strength: 52552.6snT
Dip Angle: 66.07°
Date: 5/10/2010
Model: IGRF2010

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.000	0.0	
2	120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.000	0.0	
3	663.8	10.88	258.59	660.5	-10.2	-50.4	2.00	258.585	51.5	
4	6955.6	10.88	258.59	6839.3	-245.1	-1214.0	0.00	0.000	1238.5	
5	7680.6	0.00	0.00	7560.0	-258.7	-1281.3	1.50	180.000	1307.1	Mesaverde (25' Radius) Federal RGU 513-23-198
6	12390.6	0.00	0.00	12270.0	-258.7	-1281.3	0.00	0.000	1307.1	

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
120.0	120.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.00
660.5	663.8	10.88	258.59	-10.2	-50.4	51.5	51.5	Hold 10.88 Inc
6839.3	6955.6	10.88	258.59	-245.1	-1214.0	1238.5	1238.5	Start Drop -1.50
7560.0	7680.6	0.00	0.00	-258.7	-1281.3	1307.1	1307.1	Vertical
12270.0	12390.6	0.00	0.00	-258.7	-1281.3	1307.1	1307.1	TD at 12391

PICEANCE HL NAD 83

RG 23-01S-098W

RGU 23-23-198 Pad

Federal RGU 513-23-198 - Slot B5

Wellbore #1

Plan: Plan #1 10may10 jjb

Standard Planning Report - Geographic

13 July, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well Federal RGU 513-23-198 (B5) - Slot B5
Company:	PICEANCE HL NAD 83	TVD Reference:	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
Project:	RG 23-01S-098W	MD Reference:	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
Site:	RGU 23-23-198 Pad	North Reference:	True
Well:	Federal RGU 513-23-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 10may10 jjb		

Project	RG 23-01S-098W, Rio Blanco 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		RGU 23-23-198 Pad			
Site Position:		Northing:	1,782,441.90 usft	Latitude:	39° 56' 48.855 N
From:	Map	Easting:	2,197,466.10 usft	Longitude:	108° 21' 45.556 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.805 °

Well	Federal RGU 513-23-198 - Slot B5					
Well Position	+N/-S	0.0 usft	Northing:	1,782,396.00 usft	Latitude:	39° 56' 48.402 N
	+E/-W	0.0 usft	Easting:	2,197,469.80 usft	Longitude:	108° 21' 45.489 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,542.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/10/2010	10.718	66.071	52,553

Design	Plan #1 10may10 jjb			
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	258.59

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	
663.8	10.88	258.59	660.5	-10.2	-50.4	2.00	2.00	0.00	258.585	
6,955.6	10.88	258.59	6,839.3	-245.1	-1,214.0	0.00	0.00	0.00	0.000	
7,680.6	0.00	0.00	7,560.0	-258.7	-1,281.3	1.50	-1.50	0.00	180.000	Mesaverde (25' Radiu
12,390.6	0.00	0.00	12,270.0	-258.7	-1,281.3	0.00	0.00	0.00	0.000	

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well Federal RGU 513-23-198 (B5) - Slot B5
Company:	PICEANCE HL NAD 83	TVD Reference:	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
Project:	RG 23-01S-098W	MD Reference:	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
Site:	RGU 23-23-198 Pad	North Reference:	True
Well:	Federal RGU 513-23-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 10may10 jjb		

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	1,782,396.00	2,197,469.80	39° 56' 48.402 N	108° 21' 45.489 W
120.0	0.00	0.00	120.0	0.0	0.0	1,782,396.00	2,197,469.80	39° 56' 48.402 N	108° 21' 45.489 W
663.8	10.88	258.59	660.5	-10.2	-50.4	1,782,387.41	2,197,419.07	39° 56' 48.302 N	108° 21' 46.137 W
6,955.6	10.88	258.59	6,839.3	-245.1	-1,214.0	1,782,189.25	2,196,248.64	39° 56' 45.980 N	108° 22' 1.077 W
7,680.6	0.00	0.00	7,560.0	-258.7	-1,281.3	1,782,177.80	2,196,181.00	39° 56' 45.846 N	108° 22' 1.940 W
12,390.6	0.00	0.00	12,270.0	-258.7	-1,281.3	1,782,177.80	2,196,181.00	39° 56' 45.846 N	108° 22' 1.940 W

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									
Mesaverde (50' Radius)	0.00	0.00	7,560.0	-258.7	-1,281.3	1,782,177.80	2,196,181.00	39° 56' 45.846 N	108° 22' 1.940 W
- plan hits target center									
- Circle (radius 50.0)									
Mesaverde (25' Radius)	0.00	0.00	7,560.0	-258.7	-1,281.3	1,782,177.80	2,196,181.00	39° 56' 45.846 N	108° 22' 1.940 W
- plan hits target center									
- Circle (radius 25.0)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
3,923.0	3,861.2	9 5/8"	9.625	13.500	

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well Federal RGU 513-23-198 (B5) - Slot B5
Company:	PICEANCE HL NAD 83	TVD Reference:	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
Project:	RG 23-01S-098W	MD Reference:	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
Site:	RGU 23-23-198 Pad	North Reference:	True
Well:	Federal RGU 513-23-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 10may10 jjb		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,208.0	1,195.0	Green River Fm				
1,401.5	1,385.0	A Groove				
1,605.2	1,585.0	B Groove				
1,905.6	1,880.0	Dissolution Surface				
3,015.5	2,970.0	Garden Gulch				
3,198.8	3,150.0	Orange Marker				
3,422.8	3,370.0	Wasatch				
5,642.7	5,550.0	G' Sand				
5,999.1	5,900.0	Ft. Union				
7,410.4	7,290.0	Ohio Creek				
7,680.6	7,560.0	Mesaverde				
8,990.6	8,870.0	Top Gas				
10,820.6	10,700.0	Cameo Coals				
11,210.6	11,090.0	Rollins SS				
11,340.6	11,220.0	Cozzette				
11,560.6	11,440.0	Corcoran				
11,905.6	11,785.0	Upper Sego				
12,140.6	12,020.0	Lower Sego				
12,390.6	12,270.0	TD		0.000		

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 2.00	
663.8	660.5	-10.2	-50.4	Hold 10.88 Inc	
6,955.6	6,839.3	-245.1	-1,214.0	Start Drop -1.50	
7,680.6	7,560.0	-258.7	-1,281.3	Vertical	
12,390.6	12,270.0	-258.7	-1,281.3	TD at 12391	