

PICEANCE HL NAD 83

RG 25-01S-098W

RGU 24-25-198 Pad

Federal RGU 413-25-198 - Slot A1

Wellbore #1

Plan: Plan #2 20Mar11 kjs

Standard Planning Report - Geographic

29 March, 2011

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well Federal RGU 413-25-198 - Slot A1
Company:	PICEANCE HL NAD 83	TVD Reference:	KELLY BUSHING @ 6707.0usft (Frontier 10 (22' RKB) kjs)
Project:	RG 25-01S-098W	MD Reference:	KELLY BUSHING @ 6707.0usft (Frontier 10 (22' RKB) kjs)
Site:	RGU 24-25-198 Pad	North Reference:	True
Well:	Federal RGU 413-25-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 20Mar11 kjs		

Project	RG 25-01S-098W, Rio Blanco County, CO, RG 25-01S-098W		
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	RGU 24-25-198 Pad		
Site Position:		Northing:	1,775,437.60 usft
From:	Map	Easting:	2,201,845.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	0.000 in
		Latitude:	39° 55' 41.031 N
		Longitude:	108° 20' 46.545 W
		Grid Convergence:	-1.795 °

Well	Federal RGU 413-25-198 - Slot A1		
Well Position	+N/-S	0.0 usft	Northing: 1,775,465.10 usft
	+E/-W	0.0 usft	Easting: 2,201,839.70 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	Latitude: 39° 55' 41.301 N
			Longitude: 108° 20' 46.624 W
			Ground Level: 6,685.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/14/2010	10.685	66.054	52,526

Design	Plan #2 20Mar11 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	333.54

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	
700.0	14.50	333.54	693.8	65.3	-32.5	2.50	2.50	0.00	333.536	
6,925.1	14.50	333.54	6,720.6	1,460.6	-727.1	0.00	0.00	0.00	0.000	
7,891.7	0.00	0.00	7,677.0	1,569.5	-781.3	1.50	-1.50	0.00	180.000	
7,991.7	0.00	0.00	7,777.0	1,569.5	-781.3	0.00	0.00	0.00	0.000	Mesaverde (25' Radiu
12,871.7	0.00	0.00	12,657.0	1,569.5	-781.3	0.00	0.00	0.00	0.000	

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Site:	RGU 24-25-198 Pad	North Reference:	True
Well:	Federal RGU 413-25-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 20Mar11 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	1,775,465.10	2,201,839.70	39° 55' 41.301 N	108° 20' 46.624 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,775,465.10	2,201,839.70	39° 55' 41.301 N	108° 20' 46.624 W	
Start Build 2.50										
700.0	14.50	333.54	693.8	65.3	-32.5	1,775,531.44	2,201,809.23	39° 55' 41.947 N	108° 20' 47.041 W	
Hold 14.50 Inclination										
1,323.0	14.50	333.54	1,297.0	205.0	-102.0	1,775,673.19	2,201,744.12	39° 55' 43.327 N	108° 20' 47.934 W	
Green River Fm										
1,503.8	14.50	333.54	1,472.0	245.5	-122.2	1,775,714.32	2,201,725.23	39° 55' 43.728 N	108° 20' 48.193 W	
A Groove										
1,715.5	14.50	333.54	1,677.0	293.0	-145.8	1,775,762.50	2,201,703.10	39° 55' 44.197 N	108° 20' 48.496 W	
B Groove										
2,015.1	14.50	333.54	1,967.0	360.1	-179.3	1,775,830.66	2,201,671.80	39° 55' 44.860 N	108° 20' 48.925 W	
Dissolution Surface										
3,104.8	14.50	333.54	3,022.0	604.3	-300.8	1,776,078.60	2,201,557.92	39° 55' 47.274 N	108° 20' 50.486 W	
Garden Gulch										
3,285.5	14.50	333.54	3,197.0	644.9	-321.0	1,776,119.73	2,201,539.03	39° 55' 47.674 N	108° 20' 50.744 W	
Orange Marker										
3,502.4	14.50	333.54	3,407.0	693.5	-345.2	1,776,169.08	2,201,516.36	39° 55' 48.155 N	108° 20' 51.055 W	
Wasatch										
4,002.0	14.50	333.54	3,890.7	805.4	-401.0	1,776,282.75	2,201,464.16	39° 55' 49.261 N	108° 20' 51.771 W	
9 5/8"										
5,924.6	14.50	333.54	5,752.0	1,236.4	-615.5	1,776,720.19	2,201,263.24	39° 55' 53.520 N	108° 20' 54.524 W	
G' Sand										
6,280.9	14.50	333.54	6,097.0	1,316.2	-655.2	1,776,801.27	2,201,226.00	39° 55' 54.309 N	108° 20' 55.035 W	
Ft. Union										
6,925.1	14.50	333.54	6,720.6	1,460.6	-727.1	1,776,947.84	2,201,158.68	39° 55' 55.736 N	108° 20' 55.958 W	
Start Drop -1.50										
7,741.7	2.25	333.54	7,527.0	1,566.9	-780.0	1,777,055.72	2,201,109.13	39° 55' 56.786 N	108° 20' 56.637 W	
Ohio Creek										
7,891.7	0.00	0.00	7,677.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Vertical										
7,991.7	0.00	0.00	7,777.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Mesaverde - Mesaverde										
9,621.7	0.00	0.00	9,407.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Top Gas										
11,106.7	0.00	0.00	10,892.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Cameo Coals										
11,651.7	0.00	0.00	11,437.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Rollins SS										
11,786.7	0.00	0.00	11,572.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Cozzette										
12,001.7	0.00	0.00	11,787.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Corcoran										
12,391.7	0.00	0.00	12,177.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Upper Sego										
12,621.7	0.00	0.00	12,407.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
Lower Sego										
12,871.7	0.00	0.00	12,657.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W	
TD at 12871.7 - TD										

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Site:	RGU 24-25-198 Pad	North Reference:	True
Well:	Federal RGU 413-25-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 20Mar11 kjs		

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
Mesaverde (25' Radius) - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,777.0	1,569.5	-781.3	1,777,058.40	2,201,107.90	39° 55' 56.812 N	108° 20' 56.654 W

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
4,002.0	3,890.7	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,323.0	1,297.0	Green River Fm				
1,503.8	1,472.0	A Groove				
1,715.5	1,677.0	B Groove				
2,015.1	1,967.0	Dissolution Surface				
3,104.8	3,022.0	Garden Gulch				
3,285.5	3,197.0	Orange Marker				
3,502.4	3,407.0	Wasatch				
5,924.6	5,752.0	G' Sand				
6,280.9	6,097.0	Ft. Union				
7,741.7	7,527.0	Ohio Creek				
7,991.7	7,777.0	Mesaverde				
9,621.7	9,407.0	Top Gas				
11,106.7	10,892.0	Cameo Coals				
11,651.7	11,437.0	Rollins SS				
11,786.7	11,572.0	Cozzette				
12,001.7	11,787.0	Corcoran				
12,391.7	12,177.0	Upper Sego				
12,621.7	12,407.0	Lower Sego				
12,871.7	12,657.0	TD		0.000		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.0	120.0	0.0	0.0	Start Build 2.50
700.0	693.8	65.3	-32.5	Hold 14.50 Inclination
6,925.1	6,720.6	1,460.6	-727.1	Start Drop -1.50
7,891.7	7,677.0	1,569.5	-781.3	Vertical
7,991.7	7,777.0	1,569.5	-781.3	Mesaverde
12,871.7	12,657.0	1,569.5	-781.3	TD at 12871.7