

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_RAYMOND 1-30HZ PAD**

**RAYMOND FEDERAL 16C-30HZ**

**RAYMOND FEDERAL 16C-30HZ**

**Plan: RAYMOND FEDERAL 16C-30HZ Permit**

## **Standard Planning Report**

**23 August, 2012**



# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well RAYMOND FEDERAL 16C-30HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Site:</b>	WELD_RAYMOND 1-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RAYMOND FEDERAL 16C-30HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RAYMOND FEDERAL 16C-30HZ		
<b>Design:</b>	RAYMOND FEDERAL 16C-30HZ Permit		

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Site</b>	WELD_RAYMOND 1-30HZ PAD			
<b>Site Position:</b>		<b>Northing:</b>	1,316,880.04 usft	<b>Latitude:</b> 40.201187
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,192,130.99 usft	<b>Longitude:</b> -104.812158
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.44 °

<b>Well</b>	RAYMOND FEDERAL 16C-30HZ			
<b>Well Position</b>	<b>+N/-S</b>	-8.39 ft	<b>Northing:</b>	1,316,871.42 usft
	<b>+E/-W</b>	-28.77 ft	<b>Easting:</b>	3,192,102.29 usft
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 40.201164
				<b>Longitude:</b> -104.812261
				<b>Ground Level:</b> 4,858.00 ft

<b>Wellbore</b>	RAYMOND FEDERAL 16C-30HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/2/2012	8.73	66.85	52,911

<b>Design</b>	RAYMOND FEDERAL 16C-30HZ Permit			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	186.36

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,227.63	12.17	322.13	1,224.79	31.54	-24.53	3.22	3.22	-10.03	322.13	
4,066.64	12.17	322.13	4,000.00	504.00	-392.00	0.00	0.00	0.00	0.00	
5,275.72	0.00	0.00	5,200.00	604.98	-470.54	1.01	-1.01	0.00	180.00	
6,846.76	0.00	0.00	6,771.04	604.98	-470.54	0.00	0.00	0.00	0.00	
7,746.76	90.00	180.00	7,344.00	32.03	-470.54	10.00	10.00	0.00	180.00	
8,460.69	90.30	179.97	7,342.16	-681.90	-470.38	0.04	0.04	0.00	-5.01	
11,983.38	90.30	179.97	7,324.00	-4,204.54	-468.79	0.00	0.00	0.00	0.00	Raymond 16C-30HZ I

# Andarko Petroleum Corporation

## Planning Report

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<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Site:</b>	WELD_RAYMOND 1-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RAYMOND FEDERAL 16C-30HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RAYMOND FEDERAL 16C-30HZ		
<b>Design:</b>	RAYMOND FEDERAL 16C-30HZ Permit		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>									
706.00	0.00	0.00	706.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills</b>									
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start DLS 3.22 TFO 322.13</b>									
900.00	1.61	322.13	899.99	0.55	-0.43	-0.50	3.22	3.22	0.00
1,000.00	4.83	322.13	999.82	4.99	-3.88	-4.53	3.22	3.22	0.00
1,100.00	8.06	322.13	1,099.18	13.85	-10.77	-12.57	3.22	3.22	0.00
1,200.00	11.28	322.13	1,197.74	27.11	-21.08	-24.61	3.22	3.22	0.00
1,227.63	12.17	322.13	1,224.79	31.54	-24.53	-28.63	3.22	3.22	0.00
<b>Start 2839.02 hold at 1227.63 MD</b>									
1,300.00	12.17	322.13	1,295.54	43.58	-33.90	-39.56	0.00	0.00	0.00
1,400.00	12.17	322.13	1,393.29	60.23	-46.84	-54.66	0.00	0.00	0.00
1,500.00	12.17	322.13	1,491.04	76.87	-59.79	-69.77	0.00	0.00	0.00
1,600.00	12.17	322.13	1,588.80	93.51	-72.73	-84.87	0.00	0.00	0.00
1,700.00	12.17	322.13	1,686.55	110.15	-85.67	-99.98	0.00	0.00	0.00
1,800.00	12.17	322.13	1,784.30	126.79	-98.62	-115.08	0.00	0.00	0.00
1,900.00	12.17	322.13	1,882.05	143.43	-111.56	-130.19	0.00	0.00	0.00
2,000.00	12.17	322.13	1,979.81	160.08	-124.50	-145.29	0.00	0.00	0.00
2,100.00	12.17	322.13	2,077.56	176.72	-137.45	-160.40	0.00	0.00	0.00
2,200.00	12.17	322.13	2,175.31	193.36	-150.39	-175.50	0.00	0.00	0.00
2,300.00	12.17	322.13	2,273.06	210.00	-163.33	-190.61	0.00	0.00	0.00
2,400.00	12.17	322.13	2,370.82	226.64	-176.28	-205.71	0.00	0.00	0.00
2,500.00	12.17	322.13	2,468.57	243.28	-189.22	-220.82	0.00	0.00	0.00
2,600.00	12.17	322.13	2,566.32	259.93	-202.16	-235.92	0.00	0.00	0.00
2,700.00	12.17	322.13	2,664.07	276.57	-215.11	-251.03	0.00	0.00	0.00
2,800.00	12.17	322.13	2,761.83	293.21	-228.05	-266.13	0.00	0.00	0.00
2,900.00	12.17	322.13	2,859.58	309.85	-241.00	-281.24	0.00	0.00	0.00
3,000.00	12.17	322.13	2,957.33	326.49	-253.94	-296.34	0.00	0.00	0.00
3,100.00	12.17	322.13	3,055.08	343.13	-266.88	-311.45	0.00	0.00	0.00
3,200.00	12.17	322.13	3,152.83	359.78	-279.83	-326.55	0.00	0.00	0.00
3,300.00	12.17	322.13	3,250.59	376.42	-292.77	-341.66	0.00	0.00	0.00
3,400.00	12.17	322.13	3,348.34	393.06	-305.71	-356.76	0.00	0.00	0.00
3,435.46	12.17	322.13	3,383.00	398.96	-310.30	-362.12	0.00	0.00	0.00
<b>Parkman</b>									
3,500.00	12.17	322.13	3,446.09	409.70	-318.66	-371.87	0.00	0.00	0.00
3,600.00	12.17	322.13	3,543.84	426.34	-331.60	-386.97	0.00	0.00	0.00
3,700.00	12.17	322.13	3,641.60	442.98	-344.54	-402.08	0.00	0.00	0.00
3,800.00	12.17	322.13	3,739.35	459.63	-357.49	-417.18	0.00	0.00	0.00
3,900.00	12.17	322.13	3,837.10	476.27	-370.43	-432.29	0.00	0.00	0.00
4,000.00	12.17	322.13	3,934.85	492.91	-383.37	-447.39	0.00	0.00	0.00
4,066.64	12.17	322.13	4,000.00	504.00	-392.00	-457.46	0.00	0.00	0.00
<b>Start Drop -1.01</b>									
4,100.00	11.84	322.13	4,032.63	509.48	-396.26	-462.43	1.01	-1.01	0.00

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<b>Well:</b>	RAYMOND FEDERAL 16C-30HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RAYMOND FEDERAL 16C-30HZ		
<b>Design:</b>	RAYMOND FEDERAL 16C-30HZ Permit		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,200.00	10.83	322.13	4,130.68	524.99	-408.32	-476.51	1.01	-1.01	0.00	
4,300.00	9.82	322.13	4,229.05	539.13	-419.33	-489.35	1.01	-1.01	0.00	
4,358.76	9.23	322.13	4,287.00	546.81	-425.30	-496.31	1.01	-1.01	0.00	
<b>Sussex</b>										
4,400.00	8.82	322.13	4,327.73	551.91	-429.27	-500.95	1.01	-1.01	0.00	
4,500.00	7.81	322.13	4,426.68	563.32	-438.14	-511.31	1.01	-1.01	0.00	
4,600.00	6.80	322.13	4,525.87	573.36	-445.95	-520.42	1.01	-1.01	0.00	
4,700.00	5.80	322.13	4,625.26	582.02	-452.68	-528.28	1.01	-1.01	0.00	
4,800.00	4.79	322.13	4,724.84	589.30	-458.35	-534.88	1.01	-1.01	0.00	
4,900.00	3.78	322.13	4,824.56	595.20	-462.93	-540.24	1.01	-1.01	0.00	
5,000.00	2.78	322.13	4,924.39	599.71	-466.44	-544.33	1.01	-1.01	0.00	
5,100.00	1.77	322.13	5,024.31	602.84	-468.88	-547.18	1.01	-1.01	0.00	
5,200.00	0.76	322.13	5,124.29	604.59	-470.23	-548.76	1.01	-1.01	0.00	
5,275.72	0.00	0.00	5,200.00	604.98	-470.54	-549.12	1.01	-1.01	0.00	
<b>Start 1571.04 hold at 5275.72 MD</b>										
5,300.00	0.00	0.00	5,224.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,324.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,424.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,524.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,624.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,724.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,824.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,924.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,024.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,124.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,224.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,324.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,424.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,524.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,624.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,724.28	604.98	-470.54	-549.12	0.00	0.00	0.00	
6,846.76	0.00	0.00	6,771.04	604.98	-470.54	-549.12	0.00	0.00	0.00	
<b>Start Build 10.00</b>										
6,850.00	0.32	180.00	6,774.28	604.98	-470.54	-549.11	10.00	10.00	0.00	
6,900.00	5.32	180.00	6,824.21	602.51	-470.54	-546.66	10.00	10.00	0.00	
6,950.00	10.32	180.00	6,873.73	595.71	-470.54	-539.90	10.00	10.00	0.00	
7,000.00	15.32	180.00	6,922.46	584.61	-470.54	-528.87	10.00	10.00	0.00	
7,050.00	20.32	180.00	6,970.05	569.31	-470.54	-513.67	10.00	10.00	0.00	
7,088.86	24.21	180.00	7,006.00	554.59	-470.54	-499.04	10.00	10.00	0.00	
<b>Sharon Springs</b>										
7,100.00	25.32	180.00	7,016.12	549.92	-470.54	-494.40	10.00	10.00	0.00	
7,150.00	30.32	180.00	7,060.32	526.59	-470.54	-471.21	10.00	10.00	0.00	
7,150.79	30.40	180.00	7,061.00	526.20	-470.54	-470.82	10.00	10.00	0.00	
<b>Niobrara A</b>										
7,200.00	35.32	180.00	7,102.33	499.50	-470.54	-444.28	10.00	10.00	0.00	
7,204.52	35.78	180.00	7,106.00	496.87	-470.54	-441.67	10.00	10.00	0.00	
<b>Niobrara B</b>										
7,250.00	40.32	180.00	7,141.81	468.85	-470.54	-413.82	10.00	10.00	0.00	
7,300.00	45.32	180.00	7,178.47	434.87	-470.54	-380.05	10.00	10.00	0.00	
7,310.82	46.41	180.00	7,186.00	427.11	-470.54	-372.34	10.00	10.00	0.00	
<b>Niobrara C</b>										
7,350.00	50.32	180.00	7,212.03	397.83	-470.54	-343.24	10.00	10.00	0.00	
7,400.00	55.32	180.00	7,242.23	358.00	-470.54	-303.66	10.00	10.00	0.00	

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Site:</b>	WELD_RAYMOND 1-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RAYMOND FEDERAL 16C-30HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RAYMOND FEDERAL 16C-30HZ		
<b>Design:</b>	RAYMOND FEDERAL 16C-30HZ Permit		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,450.00	60.32	180.00	7,268.85	315.69	-470.54	-261.61	10.00	10.00	0.00	
7,500.00	65.32	180.00	7,291.68	271.23	-470.54	-217.42	10.00	10.00	0.00	
7,550.00	70.32	180.00	7,310.55	224.94	-470.54	-171.41	10.00	10.00	0.00	
7,573.49	72.67	180.00	7,318.00	202.66	-470.54	-149.27	10.00	10.00	0.00	
<b>Fort Hays</b>										
7,600.00	75.32	180.00	7,325.31	177.19	-470.54	-123.95	10.00	10.00	0.00	
7,650.00	80.32	180.00	7,335.85	128.33	-470.54	-75.39	10.00	10.00	0.00	
7,671.02	82.43	180.00	7,339.00	107.55	-470.54	-54.74	10.00	10.00	0.00	
<b>Codell</b>										
7,700.00	85.32	180.00	7,342.09	78.73	-470.54	-26.11	10.00	10.00	0.00	
7,746.76	90.00	180.00	7,344.00	32.02	-470.54	20.31	10.00	10.00	0.00	
<b>Start DLS 0.04 TFO -5.01 - 7"</b>										
7,800.00	90.02	180.00	7,343.99	-21.22	-470.54	73.23	0.04	0.04	0.00	
7,900.00	90.06	179.99	7,343.91	-121.22	-470.54	172.61	0.04	0.04	0.00	
8,000.00	90.10	179.99	7,343.77	-221.22	-470.52	271.99	0.04	0.04	0.00	
8,100.00	90.15	179.99	7,343.55	-321.21	-470.50	371.37	0.04	0.04	0.00	
8,200.00	90.19	179.98	7,343.26	-421.21	-470.48	470.75	0.04	0.04	0.00	
8,300.00	90.23	179.98	7,342.89	-521.21	-470.45	570.13	0.04	0.04	0.00	
8,400.00	90.27	179.98	7,342.46	-621.21	-470.41	669.51	0.04	0.04	0.00	
8,460.69	90.30	179.97	7,342.16	-681.90	-470.38	729.83	0.04	0.04	0.00	
<b>Start 3522.69 hold at 8460.69 MD</b>										
8,500.00	90.30	179.97	7,341.96	-721.21	-470.36	768.89	0.00	0.00	0.00	
8,600.00	90.30	179.97	7,341.44	-821.21	-470.32	868.27	0.00	0.00	0.00	
8,700.00	90.30	179.97	7,340.93	-921.21	-470.27	967.65	0.00	0.00	0.00	
8,800.00	90.30	179.97	7,340.41	-1,021.21	-470.23	1,067.02	0.00	0.00	0.00	
8,900.00	90.30	179.97	7,339.89	-1,121.21	-470.18	1,166.40	0.00	0.00	0.00	
9,000.00	90.30	179.97	7,339.38	-1,221.20	-470.14	1,265.78	0.00	0.00	0.00	
9,100.00	90.30	179.97	7,338.86	-1,321.20	-470.09	1,365.16	0.00	0.00	0.00	
9,200.00	90.30	179.97	7,338.35	-1,421.20	-470.05	1,464.54	0.00	0.00	0.00	
9,300.00	90.30	179.97	7,337.83	-1,521.20	-470.00	1,563.91	0.00	0.00	0.00	
9,400.00	90.30	179.97	7,337.32	-1,621.20	-469.96	1,663.29	0.00	0.00	0.00	
9,500.00	90.30	179.97	7,336.80	-1,721.20	-469.91	1,762.67	0.00	0.00	0.00	
9,600.00	90.30	179.97	7,336.29	-1,821.20	-469.87	1,862.05	0.00	0.00	0.00	
9,700.00	90.30	179.97	7,335.77	-1,921.20	-469.82	1,961.42	0.00	0.00	0.00	
9,800.00	90.30	179.97	7,335.26	-2,021.19	-469.78	2,060.80	0.00	0.00	0.00	
9,900.00	90.30	179.97	7,334.74	-2,121.19	-469.73	2,160.18	0.00	0.00	0.00	
10,000.00	90.30	179.97	7,334.22	-2,221.19	-469.69	2,259.56	0.00	0.00	0.00	
10,100.00	90.30	179.97	7,333.71	-2,321.19	-469.64	2,358.94	0.00	0.00	0.00	
10,200.00	90.30	179.97	7,333.19	-2,421.19	-469.60	2,458.31	0.00	0.00	0.00	
10,300.00	90.30	179.97	7,332.68	-2,521.19	-469.55	2,557.69	0.00	0.00	0.00	
10,400.00	90.30	179.97	7,332.16	-2,621.19	-469.51	2,657.07	0.00	0.00	0.00	
10,500.00	90.30	179.97	7,331.65	-2,721.18	-469.46	2,756.45	0.00	0.00	0.00	
10,600.00	90.30	179.97	7,331.13	-2,821.18	-469.42	2,855.83	0.00	0.00	0.00	
10,700.00	90.30	179.97	7,330.62	-2,921.18	-469.37	2,955.20	0.00	0.00	0.00	
10,800.00	90.30	179.97	7,330.10	-3,021.18	-469.33	3,054.58	0.00	0.00	0.00	
10,900.00	90.30	179.97	7,329.58	-3,121.18	-469.28	3,153.96	0.00	0.00	0.00	
11,000.00	90.30	179.97	7,329.07	-3,221.18	-469.24	3,253.34	0.00	0.00	0.00	
11,100.00	90.30	179.97	7,328.55	-3,321.18	-469.19	3,352.71	0.00	0.00	0.00	
11,200.00	90.30	179.97	7,328.04	-3,421.18	-469.15	3,452.09	0.00	0.00	0.00	
11,300.00	90.30	179.97	7,327.52	-3,521.17	-469.10	3,551.47	0.00	0.00	0.00	
11,400.00	90.30	179.97	7,327.01	-3,621.17	-469.06	3,650.85	0.00	0.00	0.00	
11,500.00	90.30	179.97	7,326.49	-3,721.17	-469.01	3,750.23	0.00	0.00	0.00	
11,600.00	90.30	179.97	7,325.98	-3,821.17	-468.96	3,849.60	0.00	0.00	0.00	

# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well RAYMOND FEDERAL 16C-30HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Site:</b>	WELD_RAYMOND 1-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RAYMOND FEDERAL 16C-30HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RAYMOND FEDERAL 16C-30HZ		
<b>Design:</b>	RAYMOND FEDERAL 16C-30HZ Permit		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,700.00	90.30	179.97	7,325.46	-3,921.17	-468.92	3,948.98	0.00	0.00	0.00
11,800.00	90.30	179.97	7,324.95	-4,021.17	-468.87	4,048.36	0.00	0.00	0.00
11,900.00	90.30	179.97	7,324.43	-4,121.17	-468.83	4,147.74	0.00	0.00	0.00
11,983.38	90.30	179.97	7,324.00	-4,204.54	-468.79	4,230.60	0.00	0.00	0.00
TD at 11983.38 - Raymond 16C-30HZ BHL									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Raymond 16C-30HZ BH - plan hits target center - Point	0.00	0.00	7,324.00	-4,204.54	-468.79	1,312,663.38	3,191,666.12	40.189622	-104.813939

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
700.00	700.00	9 5/8"	9-5/8	12-1/4	
7,746.76	7,344.00	7"	7	8-3/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
706.00	706.00	Fox Hills				
3,435.46	3,383.00	Parkman				
4,358.76	4,287.00	Sussex				
7,088.86	7,006.00	Sharon Springs				
7,150.79	7,061.00	Niobrara A				
7,204.52	7,106.00	Niobrara B				
7,310.82	7,186.00	Niobrara C				
7,573.49	7,318.00	Fort Hays				
7,671.02	7,339.00	Codell				

# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Well RAYMOND FEDERAL 16C-30HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	16' RKB + 4858' GL @ 4874.00ft
<b>Site:</b>	WELD_RAYMOND 1-30HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	RAYMOND FEDERAL 16C-30HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RAYMOND FEDERAL 16C-30HZ		
<b>Design:</b>	RAYMOND FEDERAL 16C-30HZ Permit		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
850.00	850.00	0.00	0.00	Start DLS 3.22 TFO 322.13	
1,227.63	1,224.79	31.54	-24.53	Start 2839.02 hold at 1227.63 MD	
4,066.64	4,000.00	504.00	-392.00	Start Drop -1.01	
5,275.72	5,200.00	604.98	-470.54	Start 1571.04 hold at 5275.72 MD	
6,846.76	6,771.04	604.98	-470.54	Start Build 10.00	
7,746.76	7,344.00	32.03	-470.54	Start DLS 0.04 TFO -5.01	
8,460.69	7,342.16	-681.90	-470.38	Start 3522.69 hold at 8460.69 MD	
11,983.38	7,324.00	-4,204.54	-468.79	TD at 11983.38	