





Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #27I-2214B
Project:	Weld County, CO	TVD Reference:	HZ @ 4773.3ft (CADE 23)
Site:	S27-T10N-R58W	MD Reference:	HZ @ 4773.3ft (CADE 23)
Well:	Razor #27I-2214B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S27-T10N-R58W			
Site Position:		Northing:	1,541,650.73 ft	Latitude:	40.808594
From:	Lat/Long	Easting:	3,455,691.89 ft	Longitude:	-103.853833
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	1.06 °

Well	Razor #27I-2214B					
Well Position	+N/-S	0.0 ft	Northing:	1,541,740.03 ft	Latitude:	40.808706
	+E/-W	0.0 ft	Easting:	3,458,297.33 ft	Longitude:	-103.844417
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,756.5 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/22/2013	8.08	67.45	53,198

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	300.93	

Survey Program	Date	10/14/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
138.0	13,470.0	Survey #1 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
138.0	0.40	331.30	138.0	0.4	-0.2	0.4	0.29	0.29		
229.0	1.80	330.70	229.0	1.9	-1.1	1.9	1.54	1.54		
352.0	4.00	296.50	351.8	5.5	-5.9	7.9	2.20	1.79		
444.0	3.80	295.40	443.6	8.3	-11.5	14.1	0.23	-0.22		
535.0	3.90	294.80	534.4	10.9	-17.0	20.2	0.12	0.11		
626.0	3.90	296.20	625.2	13.5	-22.6	26.4	0.10	0.00		
718.0	3.60	298.30	717.0	16.3	-28.0	32.4	0.36	-0.33		
810.0	3.60	300.00	808.8	19.1	-33.0	38.1	0.12	0.00		
901.0	3.60	299.00	899.6	21.9	-38.0	43.8	0.07	0.00		
992.0	3.50	298.80	990.5	24.6	-42.9	49.5	0.11	-0.11		
1,083.0	4.00	298.30	1,081.3	27.5	-48.1	55.4	0.55	0.55		
1,175.0	4.70	304.50	1,173.0	31.1	-54.1	62.4	0.92	0.76		

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Well:	Razor #27I-2214B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,267.0	4.70	306.10	1,264.7	35.5	-60.2	69.9	0.14	0.00	
1,359.0	4.60	302.20	1,356.4	39.7	-66.4	77.4	0.36	-0.11	
1,450.0	4.50	302.80	1,447.1	43.6	-72.5	84.6	0.12	-0.11	
1,545.0	3.50	296.40	1,541.9	46.9	-78.2	91.2	1.15	-1.05	
1,672.0	2.80	299.40	1,668.7	50.1	-84.4	98.1	0.57	-0.55	
1,764.0	5.70	285.40	1,760.4	52.4	-90.8	104.8	3.32	3.15	
1,855.0	5.30	281.80	1,851.0	54.5	-99.2	113.1	0.58	-0.44	
1,946.0	5.50	278.60	1,941.6	56.0	-107.6	121.1	0.40	0.22	
2,038.0	3.90	298.70	2,033.3	58.2	-114.8	128.3	2.47	-1.74	
2,130.0	4.20	293.00	2,125.1	61.0	-120.6	134.8	0.55	0.33	
2,221.0	3.80	287.60	2,215.8	63.2	-126.5	141.0	0.60	-0.44	
2,313.0	3.70	284.80	2,307.6	64.9	-132.3	146.8	0.23	-0.11	
2,404.0	3.60	284.30	2,398.5	66.3	-137.9	152.4	0.12	-0.11	
2,498.0	3.30	281.90	2,492.3	67.6	-143.4	157.8	0.35	-0.32	
2,593.0	4.40	300.80	2,587.1	70.1	-149.2	164.0	1.75	1.16	
2,688.0	4.00	297.20	2,681.8	73.4	-155.3	171.0	0.50	-0.42	
2,783.0	4.10	297.20	2,776.6	76.5	-161.3	177.7	0.11	0.11	
2,878.0	3.70	303.50	2,871.4	79.7	-166.9	184.1	0.62	-0.42	
2,973.0	3.70	301.00	2,966.2	83.0	-172.0	190.2	0.17	0.00	
3,067.0	2.80	304.20	3,060.0	85.9	-176.5	195.6	0.98	-0.96	
3,162.0	3.10	309.50	3,154.9	88.8	-180.4	200.4	0.43	0.32	
3,257.0	3.30	310.90	3,249.7	92.2	-184.5	205.7	0.23	0.21	
3,352.0	3.30	310.10	3,344.6	95.8	-188.6	211.1	0.05	0.00	
3,447.0	3.30	311.10	3,439.4	99.3	-192.8	216.4	0.06	0.00	
3,541.0	3.30	309.70	3,533.3	102.8	-196.9	221.8	0.09	0.00	
3,636.0	2.90	298.20	3,628.1	105.7	-201.1	226.9	0.78	-0.42	
3,731.0	2.80	284.30	3,723.0	107.4	-205.5	231.5	0.73	-0.11	
3,826.0	3.00	273.50	3,817.9	108.2	-210.2	235.9	0.61	0.21	
3,921.0	6.10	306.20	3,912.6	111.3	-216.8	243.2	4.13	3.26	
4,016.0	2.60	273.00	4,007.3	114.4	-223.0	250.1	4.39	-3.68	
4,111.0	0.40	118.30	4,102.3	114.3	-224.9	251.7	3.12	-2.32	
4,205.0	0.10	237.10	4,196.3	114.1	-224.7	251.4	0.49	-0.32	
4,300.0	0.20	95.10	4,291.3	114.1	-224.6	251.3	0.30	0.11	
4,395.0	0.20	122.80	4,386.3	114.0	-224.3	251.0	0.10	0.00	
4,490.0	0.40	197.80	4,481.3	113.6	-224.2	250.7	0.42	0.21	
4,585.0	0.50	194.40	4,576.3	112.9	-224.4	250.5	0.11	0.11	
4,679.0	0.80	172.30	4,670.3	111.8	-224.4	250.0	0.41	0.32	
4,774.0	0.50	149.60	4,765.3	110.8	-224.1	249.2	0.41	-0.32	
4,869.0	0.70	177.40	4,860.3	109.9	-223.9	248.5	0.37	0.21	
4,964.0	0.70	174.70	4,955.3	108.7	-223.8	247.9	0.03	0.00	
5,059.0	0.50	144.30	5,050.3	107.8	-223.5	247.1	0.39	-0.21	
5,153.0	4.90	23.60	5,144.1	111.1	-221.7	247.3	5.50	4.68	
5,185.0	10.10	21.10	5,175.9	115.0	-220.1	247.9	16.28	16.25	
5,217.0	15.10	17.60	5,207.1	121.6	-217.9	249.4	15.80	15.62	
5,248.0	17.80	23.50	5,236.8	129.8	-214.7	250.9	10.23	8.71	
5,280.0	19.50	22.80	5,267.1	139.2	-210.7	252.3	5.36	5.31	
5,311.0	22.80	18.40	5,296.0	149.7	-206.8	254.3	11.81	10.65	
5,343.0	26.90	16.50	5,325.1	162.5	-202.8	257.5	13.05	12.81	
5,375.0	30.30	16.00	5,353.2	177.2	-198.5	261.4	10.65	10.62	
5,406.0	33.30	13.90	5,379.5	193.0	-194.3	265.9	10.31	9.68	
5,438.0	37.70	12.80	5,405.6	211.1	-190.0	271.5	13.89	13.75	
5,469.0	40.20	12.00	5,429.7	230.1	-185.9	277.7	8.23	8.06	
5,501.0	41.90	8.30	5,453.8	250.8	-182.2	285.2	9.27	5.31	

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Well:	Razor #27I-2214B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
5,532.0	45.80	5.10	5,476.1	272.1	-179.7	294.0	14.47	12.58	
5,564.0	47.40	3.20	5,498.1	295.3	-178.0	304.5	6.60	5.00	
5,596.0	49.50	0.30	5,519.4	319.2	-177.3	316.2	9.44	6.56	
5,627.0	54.10	357.60	5,538.5	343.6	-177.8	329.1	16.34	14.84	
5,659.0	56.90	356.90	5,556.7	369.9	-179.0	343.7	8.93	8.75	
5,691.0	58.50	355.70	5,573.8	396.9	-180.8	359.1	5.92	5.00	
5,722.0	61.50	356.10	5,589.2	423.7	-182.7	374.5	9.74	9.68	
5,754.0	61.50	356.30	5,604.5	451.7	-184.6	390.5	0.55	0.00	
5,786.0	61.80	355.20	5,619.7	479.8	-186.6	406.7	3.17	0.94	
5,817.0	63.60	354.10	5,633.9	507.3	-189.2	423.0	6.61	5.81	
5,849.0	67.20	353.50	5,647.2	536.2	-192.4	440.6	11.38	11.25	
5,880.0	72.70	353.10	5,657.9	565.1	-195.8	458.4	17.78	17.74	
5,912.0	75.20	352.80	5,666.7	595.6	-199.5	477.3	7.86	7.81	
5,944.0	75.40	352.00	5,674.8	626.3	-203.6	496.6	2.50	0.62	
5,975.0	75.20	351.60	5,682.7	656.0	-207.9	515.5	1.40	-0.65	
6,007.0	76.30	351.60	5,690.6	686.6	-212.4	535.2	3.44	3.44	
6,039.0	78.80	353.30	5,697.5	717.6	-216.5	554.6	9.38	7.81	
6,070.0	81.70	355.10	5,702.7	748.0	-219.6	572.9	10.97	9.35	
6,102.0	85.60	356.40	5,706.3	779.7	-222.0	591.2	12.84	12.19	
6,133.0	89.30	358.10	5,707.7	810.6	-223.5	608.4	13.13	11.94	
6,165.0	91.00	358.50	5,707.6	842.6	-224.4	625.6	5.46	5.31	
6,197.0	91.60	357.60	5,706.8	874.6	-225.5	643.0	3.38	1.87	
6,228.0	90.20	358.20	5,706.4	905.6	-226.6	659.9	4.91	-4.52	
6,260.0	89.90	358.90	5,706.3	937.6	-227.4	677.0	2.38	-0.94	
6,291.0	89.40	0.10	5,706.5	968.6	-227.7	693.2	4.19	-1.61	
6,323.0	89.70	0.10	5,706.8	1,000.6	-227.7	709.6	0.94	0.94	
6,399.0	91.30	359.20	5,706.1	1,076.6	-228.1	749.1	2.42	2.11	
6,493.0	89.90	359.70	5,705.1	1,170.5	-229.0	798.2	1.58	-1.49	
6,588.0	89.80	359.60	5,705.4	1,265.5	-229.6	847.5	0.15	-0.11	
6,683.0	90.20	359.80	5,705.4	1,360.5	-230.1	896.7	0.47	0.42	
6,778.0	88.90	359.70	5,706.1	1,455.5	-230.5	945.9	1.37	-1.37	
6,873.0	88.60	359.00	5,708.2	1,550.5	-231.6	995.7	0.80	-0.32	
6,968.0	88.80	358.90	5,710.3	1,645.5	-233.3	1,046.0	0.24	0.21	
7,062.0	87.30	358.90	5,713.5	1,739.4	-235.1	1,095.8	1.60	-1.60	
7,157.0	88.70	0.30	5,716.9	1,834.3	-235.8	1,145.2	2.08	1.47	
7,252.0	88.10	0.10	5,719.5	1,929.3	-235.5	1,193.7	0.67	-0.63	
7,347.0	89.30	0.50	5,721.7	2,024.3	-235.0	1,242.1	1.33	1.26	
7,442.0	90.30	3.20	5,722.0	2,119.2	-231.9	1,288.3	3.03	1.05	
7,537.0	89.90	2.60	5,721.8	2,214.1	-227.1	1,332.9	0.76	-0.42	
7,631.0	90.00	3.20	5,721.9	2,308.0	-222.3	1,377.1	0.65	0.11	
7,726.0	90.20	4.00	5,721.7	2,402.8	-216.4	1,420.7	0.87	0.21	
7,821.0	89.90	2.50	5,721.7	2,497.6	-211.0	1,464.9	1.61	-0.32	
7,916.0	89.30	0.30	5,722.3	2,592.6	-208.7	1,511.7	2.40	-0.63	
8,008.0	91.00	359.40	5,722.1	2,684.6	-208.9	1,559.2	2.09	1.85	
8,100.0	90.90	358.90	5,720.6	2,776.5	-210.3	1,607.6	0.55	-0.11	
8,191.0	90.70	358.60	5,719.3	2,867.5	-212.3	1,656.1	0.40	-0.22	
8,282.0	90.00	357.60	5,718.7	2,958.5	-215.3	1,705.4	1.34	-0.77	
8,374.0	91.80	357.90	5,717.3	3,050.4	-218.9	1,755.8	1.98	1.96	
8,466.0	92.00	357.40	5,714.2	3,142.2	-222.7	1,806.2	0.59	0.22	
8,557.0	91.30	358.90	5,711.6	3,233.2	-225.6	1,855.5	1.82	-0.77	
8,648.0	89.40	0.10	5,711.1	3,324.1	-226.4	1,902.9	2.47	-2.09	
8,739.0	89.50	0.10	5,711.9	3,415.1	-226.2	1,949.6	0.11	0.11	
8,831.0	90.00	0.10	5,712.3	3,507.1	-226.1	1,996.7	0.54	0.54	

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8,923.0	89.50	359.80	5,712.7	3,599.1	-226.1	2,044.1	0.63	-0.54	
9,015.0	89.10	358.40	5,713.9	3,691.1	-227.6	2,092.6	1.58	-0.43	
9,106.0	89.50	359.40	5,715.0	3,782.1	-229.3	2,140.9	1.18	0.44	
9,197.0	91.20	0.80	5,714.4	3,873.1	-229.2	2,187.5	2.42	1.87	
9,288.0	89.50	359.30	5,713.9	3,964.1	-229.1	2,234.2	2.49	-1.87	
9,380.0	89.30	358.70	5,714.8	4,056.1	-230.7	2,282.9	0.69	-0.22	
9,471.0	90.50	0.30	5,715.0	4,147.0	-231.5	2,330.3	2.20	1.32	
9,563.0	90.80	2.50	5,713.9	4,239.0	-229.3	2,375.7	2.41	0.33	
9,654.0	90.60	1.80	5,712.8	4,329.9	-225.8	2,419.5	0.80	-0.22	
9,744.0	90.50	1.40	5,712.0	4,419.9	-223.3	2,463.6	0.46	-0.11	
9,836.0	90.30	1.00	5,711.3	4,511.9	-221.4	2,509.2	0.49	-0.22	
9,927.0	90.60	0.30	5,710.6	4,602.9	-220.4	2,555.1	0.84	0.33	
10,019.0	90.60	0.50	5,709.6	4,694.9	-219.7	2,601.8	0.22	0.00	
10,110.0	89.50	0.80	5,709.6	4,785.9	-218.7	2,647.7	1.25	-1.21	
10,202.0	89.60	0.70	5,710.3	4,877.8	-217.5	2,694.0	0.15	0.11	
10,294.0	89.80	1.20	5,710.8	4,969.8	-216.0	2,740.0	0.59	0.22	
10,386.0	87.70	0.90	5,712.8	5,061.8	-214.3	2,785.8	2.31	-2.28	
10,478.0	87.70	1.10	5,716.5	5,153.7	-212.7	2,831.6	0.22	0.00	
10,569.0	87.10	1.00	5,720.6	5,244.6	-211.0	2,876.9	0.67	-0.66	
10,661.0	86.90	0.30	5,725.4	5,336.5	-210.0	2,923.3	0.79	-0.22	
10,753.0	87.80	359.80	5,729.7	5,428.4	-209.9	2,970.5	1.12	0.98	
10,844.0	87.80	359.60	5,733.2	5,519.3	-210.4	3,017.6	0.22	0.00	
10,935.0	90.80	359.30	5,734.3	5,610.3	-211.2	3,065.1	3.31	3.30	
11,027.0	90.90	358.80	5,732.9	5,702.3	-212.8	3,113.7	0.55	0.11	
11,118.0	89.80	1.60	5,732.3	5,793.3	-212.4	3,160.2	3.31	-1.21	
11,208.0	89.20	0.50	5,733.1	5,883.2	-210.8	3,205.0	1.39	-0.67	
11,300.0	89.10	0.30	5,734.5	5,975.2	-210.2	3,251.8	0.24	-0.11	
11,390.0	89.40	2.40	5,735.7	6,065.2	-208.0	3,296.2	2.36	0.33	
11,482.0	88.10	3.40	5,737.7	6,157.0	-203.4	3,339.4	1.78	-1.41	
11,574.0	88.20	1.10	5,740.7	6,248.9	-199.8	3,383.6	2.50	0.11	
11,665.0	87.70	359.40	5,743.9	6,339.9	-199.4	3,430.0	1.95	-0.55	
11,756.0	86.30	359.30	5,748.7	6,430.7	-200.4	3,477.6	1.54	-1.54	
11,848.0	86.60	358.20	5,754.4	6,522.5	-202.4	3,526.5	1.24	0.33	
11,939.0	88.30	357.40	5,758.4	6,613.4	-205.9	3,576.2	2.06	1.87	
12,031.0	88.40	355.90	5,761.1	6,705.2	-211.3	3,628.0	1.63	0.11	
12,122.0	88.50	357.10	5,763.5	6,796.0	-216.8	3,679.4	1.32	0.11	
12,213.0	87.80	357.50	5,766.5	6,886.8	-221.1	3,729.8	0.89	-0.77	
12,305.0	88.30	0.30	5,769.6	6,978.7	-222.9	3,778.5	3.09	0.54	
12,395.0	87.00	0.50	5,773.3	7,068.6	-222.2	3,824.2	1.46	-1.44	
12,487.0	88.00	359.60	5,777.3	7,160.6	-222.2	3,871.4	1.46	1.09	
12,579.0	90.20	359.60	5,778.7	7,252.5	-222.8	3,919.2	2.39	2.39	
12,670.0	90.10	358.90	5,778.5	7,343.5	-224.0	3,967.0	0.78	-0.11	
12,761.0	89.10	359.00	5,779.1	7,434.5	-225.7	4,015.2	1.10	-1.10	
12,853.0	89.50	358.90	5,780.3	7,526.5	-227.4	4,063.9	0.45	0.43	
12,948.0	90.20	359.70	5,780.5	7,621.5	-228.5	4,113.8	1.12	0.74	
13,042.0	91.10	0.70	5,779.5	7,715.4	-228.2	4,161.8	1.43	0.96	
13,137.0	91.40	1.10	5,777.4	7,810.4	-226.7	4,209.3	0.53	0.32	
13,233.0	92.00	359.90	5,774.5	7,906.4	-225.9	4,257.9	1.40	0.62	
13,327.0	93.00	358.80	5,770.4	8,000.3	-226.9	4,307.1	1.58	1.06	
13,420.0	94.40	358.30	5,764.4	8,093.0	-229.3	4,356.8	1.60	1.51	Last Cathedral Survey @ 13,420' MD Projection to Bit @ 13,470'
13,470.0	94.40	358.30	5,760.6	8,142.9	-230.7	4,383.7	0.00	0.00	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #27I-2214B
Project:	Weld County, CO	TVD Reference:	HZ @ 4773.3ft (CADE 23)
Site:	S27-T10N-R58W	MD Reference:	HZ @ 4773.3ft (CADE 23)
Well:	Razor #27I-2214B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
2214B Tgt P6	0.00	0.00	5,709.0	7,688.3	-208.9	1,549,423.13	3,457,944.89	40.829808	-103.845172
- actual wellpath misses target center by 73.5ft at 13015.8ft MD (5779.9 TVD, 7689.2 N, -228.4 E)									
- Point									
Razor #27I-2214B TGT	0.00	0.00	5,760.0	6,396.5	-218.9	1,548,131.29	3,457,959.03	40.826262	-103.845208
- actual wellpath misses target center by 23.2ft at 11722.6ft MD (5746.7 TVD, 6397.4 N, -200.0 E)									
- Point									
2214B Tgt	0.00	0.00	5,736.3	7,688.3	-208.9	1,549,423.13	3,457,944.89	40.829808	-103.845172
- actual wellpath misses target center by 47.8ft at 13015.5ft MD (5779.9 TVD, 7688.9 N, -228.4 E)									
- Point									
2214B Tgt P8	0.00	0.00	5,765.0	8,187.5	-218.9	1,549,922.01	3,457,925.62	40.831178	-103.845208
- actual wellpath misses target center by 46.4ft at 13470.0ft MD (5760.6 TVD, 8142.9 N, -230.7 E)									
- Point									
2214B Tgt P7	0.00	0.00	5,709.0	8,187.5	-218.9	1,549,922.01	3,457,925.62	40.831178	-103.845208
- actual wellpath misses target center by 69.2ft at 13470.0ft MD (5760.6 TVD, 8142.9 N, -230.7 E)									
- Point									
2214B BHL P5	0.00	0.00	5,697.0	8,187.5	-218.9	1,549,922.01	3,457,925.62	40.831178	-103.845208
- actual wellpath misses target center by 78.6ft at 13470.0ft MD (5760.6 TVD, 8142.9 N, -230.7 E)									
- Point									
Razor #27I-2214B TGT	0.00	0.00	5,720.0	4,996.0	-218.9	1,546,731.03	3,457,985.15	40.822418	-103.845208
- actual wellpath misses target center by 9.7ft at 10320.3ft MD (5711.0 TVD, 4996.1 N, -215.4 E)									
- Point									
2214B BHL	0.00	0.00	5,736.3	8,187.5	-218.9	1,549,922.01	3,457,925.62	40.831178	-103.845208
- actual wellpath misses target center by 52.2ft at 13470.0ft MD (5760.6 TVD, 8142.9 N, -230.7 E)									
- Point									
2214B Tgt P5	0.00	0.00	5,697.0	7,688.3	-208.9	1,549,423.13	3,457,944.89	40.829808	-103.845172
- actual wellpath misses target center by 85.2ft at 13015.9ft MD (5779.9 TVD, 7689.3 N, -228.4 E)									
- Point									
Razor #27I-2214B TGT	0.00	0.00	5,720.0	2,995.3	-219.0	1,544,730.68	3,458,022.47	40.816927	-103.845208
- actual wellpath misses target center by 2.7ft at 8318.9ft MD (5718.5 TVD, 2995.3 N, -216.8 E)									
- Point									
Razor #27I-2214B TGT	0.00	0.00	5,735.0	5,796.3	-218.9	1,547,531.19	3,457,970.22	40.824615	-103.845208
- actual wellpath misses target center by 7.1ft at 11120.9ft MD (5732.4 TVD, 5796.2 N, -212.4 E)									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name		Casing Diameter (in)	Hole Diameter (in)
6,630.0	5,705.4	7" - 1662' FNL, 962' FEL			

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
13,420.0	5,764.4	8,093.0	-229.3	Last Cathedral Survey @ 13,420' MD	
13,470.0	5,760.6	8,142.9	-230.7	Projection to Bit @ 13,470'	

Checked By: _____ Approved By: _____ Date: _____