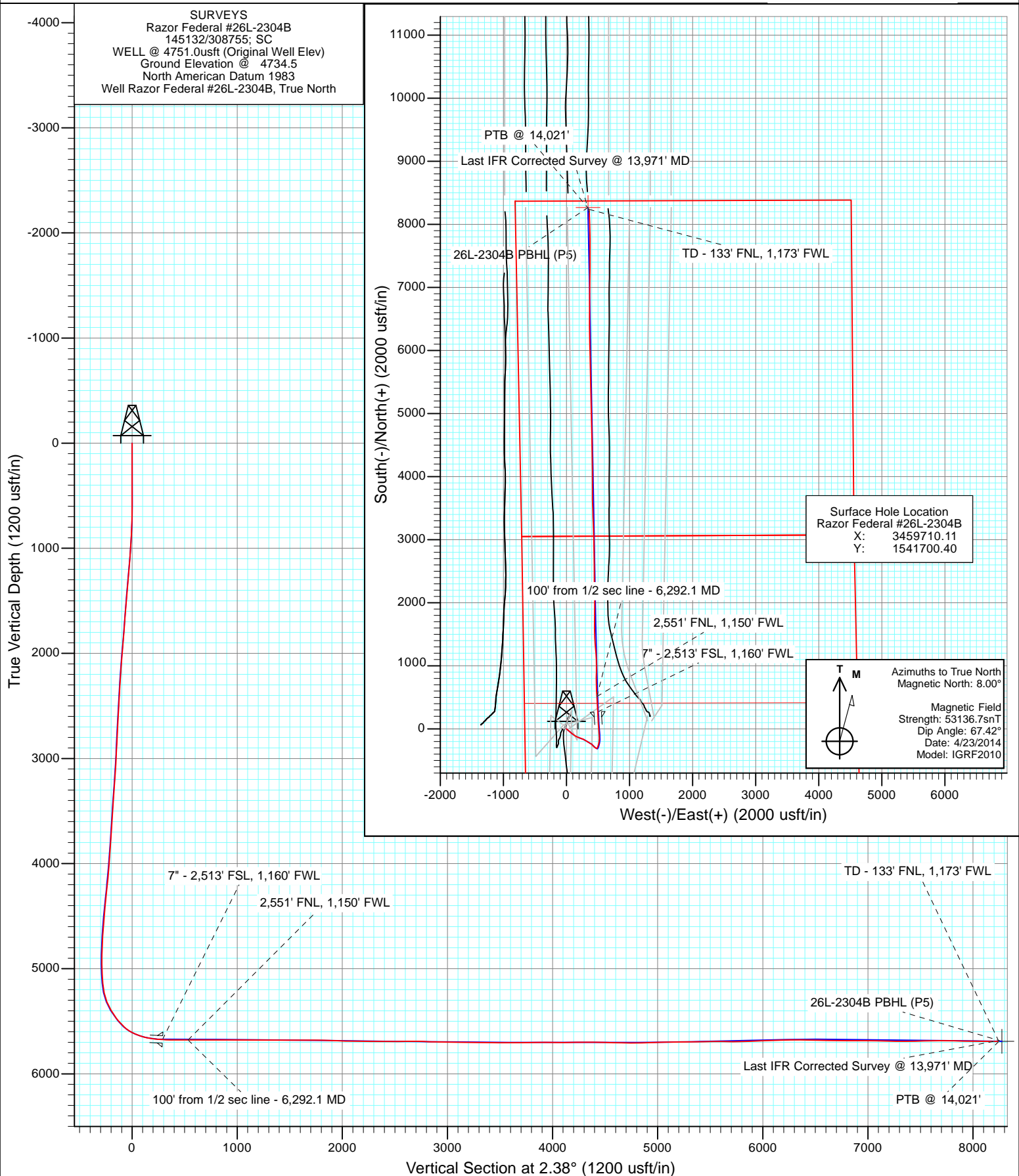


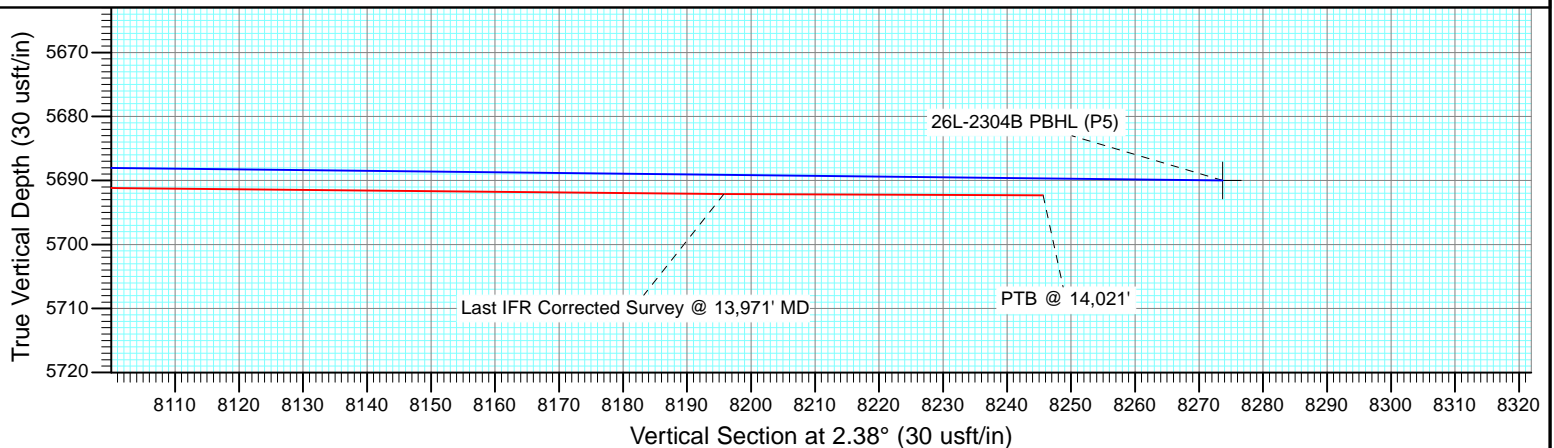
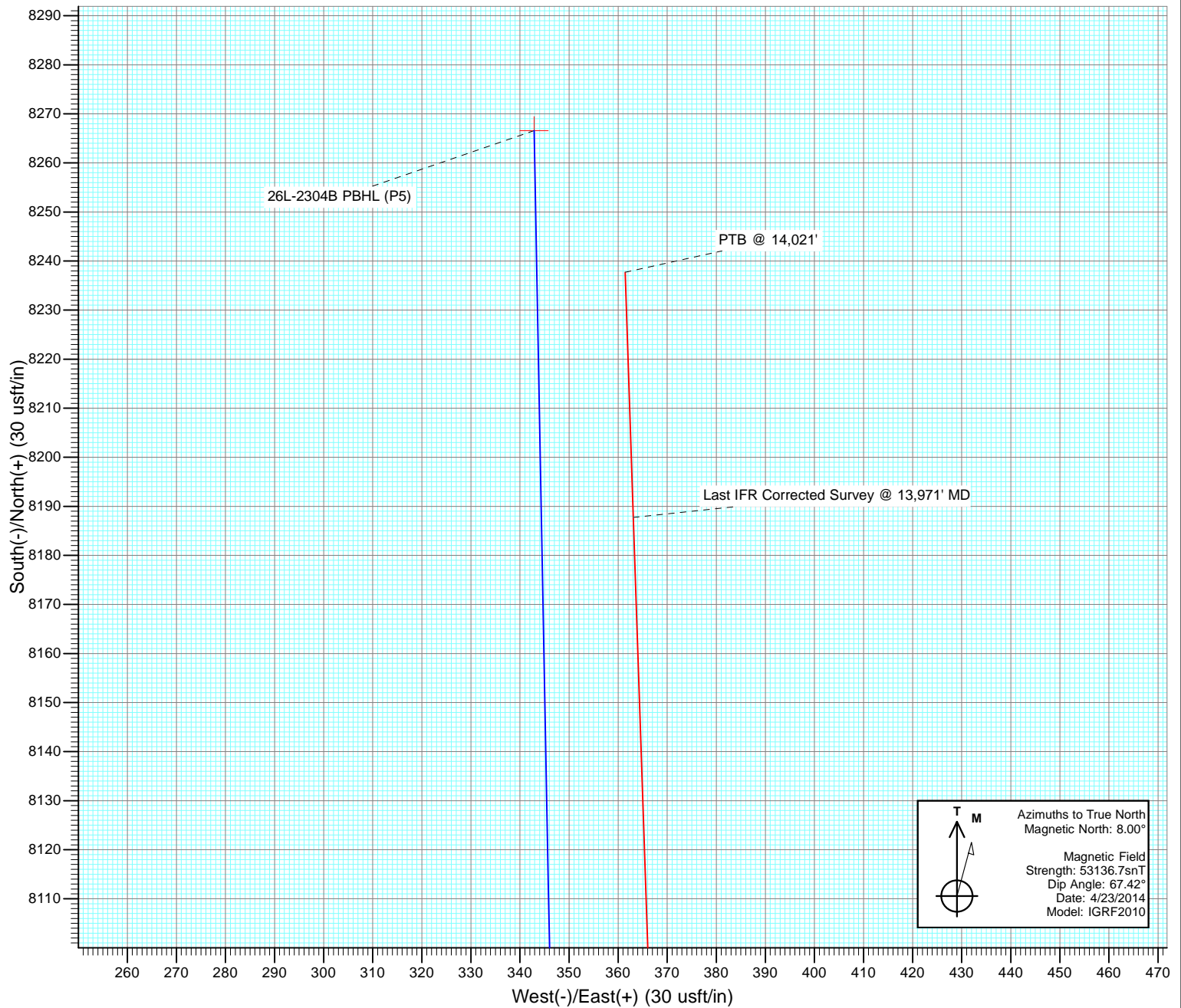


Project: Weld County, CO
Site: S26-T10N-R58W
Well: Razor Federal #26L-2304B
Wellbore: HZ
Design: SURVEYS





Project: Weld County, CO
Site: S26-T10N-R58W
Well: Razor Federal #26L-2304B
Wellbore: HZ
Design: SURVEYS



Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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		S26-T10N-R58W			
Site Position:		Northing:	1,541,774.28 usft	Latitude:	40.808739
From:	Lat/Long	Easting:	3,459,642.55 usft	Longitude:	-103.839531
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.07 °

Well	Razor Federal #26L-2304B					
Well Position	+N/-S	0.0 usft	Northing:	1,541,700.40 usft	Latitude:	40.808533
	+E/-W	0.0 usft	Easting:	3,459,710.11 usft	Longitude:	-103.839292
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,734.5 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/23/2014	8.00	67.42	53,137

Design	SURVEYS				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	2.38	

Survey Program	Date	5/14/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
509.0	14,021.0	IFR Corrected Mud Pulse (HZ)	ISCWSA MWD	MWD - ISCWSA	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
509.0	0.28	310.63	509.0	0.8	-0.9	0.8	0.06	0.06	
601.0	0.64	128.90	601.0	0.6	-0.7	0.6	1.00	0.39	
693.0	1.98	124.75	693.0	-0.6	1.0	-0.6	1.46	1.46	
785.0	3.82	122.38	784.8	-3.1	4.9	-2.9	2.00	2.00	
876.0	5.04	127.75	875.6	-7.2	10.6	-6.8	1.41	1.34	
968.0	6.53	132.79	967.1	-13.2	17.6	-12.5	1.71	1.62	
1,059.0	7.19	127.43	1,057.5	-20.2	26.0	-19.1	1.01	0.73	
1,151.0	6.97	132.61	1,148.8	-27.5	34.6	-26.0	0.73	-0.24	
1,243.0	7.64	130.15	1,240.0	-35.2	43.4	-33.4	0.80	0.73	
1,333.0	7.89	129.49	1,329.2	-43.0	52.8	-40.8	0.29	0.28	
1,425.0	7.94	131.45	1,420.3	-51.2	62.4	-48.6	0.30	0.05	
1,517.0	7.06	132.19	1,511.5	-59.2	71.4	-56.2	0.96	-0.96	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,612.0	6.64	130.50	1,605.8	-66.7	79.9	-63.4	0.49	-0.44	
1,704.0	7.59	125.61	1,697.1	-73.7	88.8	-70.0	1.22	1.03	
1,796.0	8.02	128.62	1,788.3	-81.3	98.8	-77.1	0.64	0.47	
1,888.0	8.16	128.26	1,879.4	-89.3	108.9	-84.7	0.16	0.15	
1,979.0	7.90	126.51	1,969.5	-97.0	119.0	-92.0	0.39	-0.29	
2,071.0	9.42	122.45	2,060.4	-104.8	130.5	-99.3	1.78	1.65	
2,162.0	8.97	121.11	2,150.2	-112.5	142.8	-106.5	0.55	-0.49	
2,254.0	7.76	117.78	2,241.3	-119.1	154.5	-112.6	1.42	-1.32	
2,345.0	9.68	113.52	2,331.2	-125.0	166.9	-118.0	2.22	2.11	
2,437.0	9.32	111.83	2,421.9	-130.9	180.9	-123.3	0.49	-0.39	
2,528.0	9.52	113.17	2,511.7	-136.6	194.7	-128.4	0.33	0.22	
2,619.0	9.41	111.34	2,601.5	-142.2	208.5	-133.5	0.35	-0.12	
2,711.0	9.42	109.16	2,692.2	-147.4	222.6	-138.1	0.39	0.01	
2,802.0	8.42	106.95	2,782.1	-151.8	236.1	-141.9	1.16	-1.10	
2,893.0	9.06	114.04	2,872.1	-156.7	249.0	-146.2	1.38	0.70	
2,985.0	7.83	110.94	2,963.1	-161.9	261.4	-150.9	1.43	-1.34	
3,076.0	7.65	114.12	3,053.3	-166.6	272.8	-155.1	0.51	-0.20	
3,168.0	8.32	123.62	3,144.4	-172.8	283.9	-160.8	1.61	0.73	
3,260.0	8.07	122.58	3,235.4	-179.9	294.9	-167.5	0.32	-0.27	
3,351.0	8.31	118.27	3,325.5	-186.5	306.0	-173.6	0.72	0.26	
3,443.0	7.73	116.43	3,416.6	-192.4	317.4	-179.1	0.69	-0.63	
3,535.0	9.28	122.43	3,507.6	-199.1	329.2	-185.3	1.94	1.68	
3,625.0	8.42	121.25	3,596.5	-206.4	341.0	-192.1	0.98	-0.96	
3,717.0	6.92	116.55	3,687.7	-212.4	351.7	-197.6	1.77	-1.63	
3,808.0	7.25	124.37	3,778.0	-218.1	361.4	-202.9	1.12	0.36	
3,900.0	7.43	121.54	3,869.2	-224.5	371.2	-208.9	0.44	0.20	
3,991.0	9.08	123.27	3,959.3	-231.5	382.2	-215.4	1.83	1.81	
4,083.0	8.02	123.82	4,050.3	-239.0	393.6	-222.5	1.16	-1.15	
4,174.0	8.91	135.15	4,140.3	-247.6	403.9	-230.6	2.07	0.98	
4,266.0	7.09	136.63	4,231.4	-256.8	412.8	-239.4	1.99	-1.98	
4,358.0	9.18	132.50	4,322.5	-265.8	422.1	-248.1	2.36	2.27	
4,449.0	8.43	141.25	4,412.4	-275.9	431.7	-257.8	1.68	-0.82	
4,541.0	7.17	126.08	4,503.5	-284.6	440.5	-266.1	2.61	-1.37	
4,632.0	8.45	127.77	4,593.7	-292.0	450.4	-273.1	1.43	1.41	
4,723.0	6.21	124.14	4,684.0	-298.9	459.8	-279.6	2.51	-2.46	
4,815.0	4.77	118.64	4,775.5	-303.5	467.2	-283.9	1.66	-1.57	
4,906.0	4.19	118.47	4,866.2	-306.9	473.5	-287.0	0.64	-0.64	
4,998.0	4.22	82.83	4,958.0	-308.1	479.8	-287.9	2.80	0.03	
5,090.0	3.11	44.91	5,049.8	-305.9	484.9	-285.5	2.83	-1.21	
5,180.0	5.79	36.52	5,139.6	-300.5	489.3	-280.0	3.06	2.98	
5,272.0	13.65	25.68	5,230.2	-287.0	496.8	-266.1	8.73	8.54	
5,362.0	22.06	15.43	5,315.8	-261.1	505.9	-239.9	9.94	9.34	
5,454.0	31.12	10.02	5,398.0	-220.9	514.7	-199.4	10.18	9.85	
5,545.0	37.39	3.36	5,473.2	-170.1	520.4	-148.4	8.02	6.89	
5,576.0	39.72	359.77	5,497.4	-150.8	520.9	-129.1	10.42	7.52	
5,637.0	45.41	357.23	5,542.3	-109.6	519.8	-87.9	9.74	9.33	
5,668.0	49.79	357.47	5,563.2	-86.7	518.7	-65.1	14.14	14.13	
5,698.0	54.38	357.00	5,581.7	-63.1	517.6	-41.6	15.35	15.30	
5,728.0	59.81	355.93	5,598.0	-38.0	516.0	-16.5	18.35	18.10	
5,759.0	65.57	355.12	5,612.2	-10.5	513.9	10.8	18.72	18.58	
5,789.0	67.76	355.52	5,624.1	16.9	511.6	38.1	7.40	7.30	
5,819.0	69.50	356.08	5,635.0	44.8	509.6	65.9	6.05	5.80	
5,850.0	72.72	356.28	5,645.0	74.1	507.6	95.0	10.41	10.39	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
5,881.0	76.86	356.87	5,653.2	103.9	505.8	124.8	13.48	13.35	
5,911.0	79.37	356.79	5,659.3	133.2	504.2	154.0	8.37	8.37	
5,943.0	81.04	356.70	5,664.8	164.7	502.4	185.4	5.23	5.22	
5,974.0	84.20	356.56	5,668.8	195.4	500.6	216.0	10.20	10.19	
6,006.0	85.94	356.38	5,671.5	227.2	498.7	247.7	5.47	5.44	
6,118.0	88.40	356.89	5,677.0	338.9	492.1	359.0	2.24	2.20	
6,213.0	90.29	357.07	5,678.1	433.7	487.1	453.6	2.00	1.99	
6,292.1	90.58	357.14	5,677.5	512.7	483.1	532.3	0.38	0.37	100' from 1/2 sec line - 6,292.1 MD - 2,551' FNL,
6,308.0	90.64	357.16	5,677.4	528.6	482.3	548.1	0.38	0.37	
6,403.0	89.93	356.63	5,676.9	623.5	477.2	642.7	0.93	-0.75	
6,498.0	89.98	0.23	5,677.0	718.4	474.6	737.5	3.79	0.05	
6,592.0	89.49	0.76	5,677.4	812.4	475.4	831.4	0.77	-0.52	
6,687.0	89.93	0.41	5,677.9	907.4	476.3	926.4	0.59	0.46	
6,782.0	90.68	0.76	5,677.4	1,002.4	477.3	1,021.3	0.87	0.79	
6,877.0	89.23	356.37	5,677.4	1,097.3	474.9	1,116.1	4.87	-1.53	
6,971.0	88.62	355.66	5,679.2	1,191.1	468.4	1,209.5	1.00	-0.65	
7,066.0	90.73	355.49	5,679.7	1,285.8	461.1	1,303.8	2.23	2.22	
7,161.0	89.76	355.75	5,679.3	1,380.5	453.8	1,398.2	1.06	-1.02	
7,256.0	89.85	358.04	5,679.7	1,475.4	448.7	1,492.7	2.41	0.09	
7,351.0	89.93	0.15	5,679.8	1,570.4	447.2	1,587.5	2.22	0.08	
7,446.0	90.59	359.97	5,679.4	1,665.4	447.3	1,682.5	0.72	0.69	
7,541.0	88.79	0.67	5,679.9	1,760.4	447.8	1,777.4	2.03	-1.89	
7,636.0	88.31	0.32	5,682.3	1,855.3	448.6	1,872.3	0.63	-0.51	
7,731.0	87.43	359.35	5,685.9	1,950.3	448.3	1,967.2	1.38	-0.93	
7,825.0	89.63	359.88	5,688.3	2,044.2	447.7	2,061.0	2.41	2.34	
7,920.0	89.23	359.00	5,689.2	2,139.2	446.8	2,155.9	1.02	-0.42	
8,015.0	88.62	358.65	5,691.0	2,234.2	444.8	2,250.7	0.74	-0.64	
8,110.0	89.10	359.35	5,692.9	2,329.1	443.2	2,345.5	0.89	0.51	
8,205.0	90.90	359.71	5,692.9	2,424.1	442.4	2,440.4	1.93	1.89	
8,300.0	91.03	359.35	5,691.3	2,519.1	441.6	2,535.2	0.40	0.14	
8,395.0	90.37	359.44	5,690.1	2,614.1	440.6	2,630.1	0.70	-0.69	
8,490.0	88.66	359.71	5,690.9	2,709.1	439.9	2,725.0	1.82	-1.80	
8,584.0	87.60	359.00	5,694.0	2,803.0	438.9	2,818.8	1.36	-1.13	
8,679.0	89.76	359.09	5,696.2	2,898.0	437.3	2,913.6	2.28	2.27	
8,772.0	89.27	358.39	5,697.0	2,991.0	435.2	3,006.4	0.92	-0.53	
8,864.0	88.00	357.77	5,699.2	3,082.9	432.1	3,098.1	1.54	-1.38	
8,956.0	89.49	357.95	5,701.2	3,174.8	428.7	3,189.8	1.63	1.62	
9,049.0	88.66	357.33	5,702.7	3,267.7	424.9	3,282.5	1.11	-0.89	
9,141.0	89.85	358.74	5,703.9	3,359.6	421.7	3,374.2	2.01	1.29	
9,233.0	89.76	358.30	5,704.2	3,451.6	419.4	3,466.0	0.49	-0.10	
9,325.0	90.02	358.04	5,704.4	3,543.5	416.4	3,557.8	0.40	0.28	
9,416.0	90.81	358.12	5,703.7	3,634.5	413.4	3,648.5	0.87	0.87	
9,508.0	90.59	0.41	5,702.6	3,726.5	412.2	3,740.4	2.50	-0.24	
9,599.0	91.12	359.97	5,701.2	3,817.5	412.5	3,831.3	0.76	0.58	
9,691.0	89.49	359.09	5,700.7	3,909.5	411.7	3,923.2	2.01	-1.77	
9,783.0	89.10	358.74	5,701.9	4,001.4	410.0	4,015.0	0.57	-0.42	
9,874.0	90.51	0.23	5,702.2	4,092.4	409.2	4,105.9	2.25	1.55	
9,965.0	90.68	359.88	5,701.2	4,183.4	409.3	4,196.8	0.43	0.19	
10,057.0	92.00	0.67	5,699.1	4,275.4	409.7	4,288.7	1.67	1.43	
10,148.0	88.79	359.00	5,698.5	4,366.4	409.4	4,379.6	3.98	-3.53	
10,240.0	88.13	358.39	5,700.9	4,458.3	407.3	4,471.4	0.98	-0.72	
10,331.0	88.53	359.09	5,703.6	4,549.2	405.3	4,562.1	0.89	0.44	
10,422.0	89.19	359.88	5,705.4	4,640.2	404.5	4,653.0	1.13	0.73	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,514.0	89.49	358.56	5,706.5	4,732.2	403.3	4,744.9	1.47	0.33	
10,569.0	90.29	358.47	5,706.6	4,787.2	401.8	4,799.7	1.46	1.45	
10,661.0	92.48	359.08	5,704.3	4,879.1	399.9	4,891.5	2.47	2.38	
10,753.0	91.82	358.55	5,700.9	4,971.1	398.0	4,983.3	0.92	-0.72	
10,845.0	90.95	358.99	5,698.7	5,063.0	396.0	5,075.1	1.06	-0.95	
10,937.0	90.77	357.94	5,697.3	5,155.0	393.5	5,166.8	1.16	-0.20	
11,028.0	89.93	357.32	5,696.7	5,245.9	389.8	5,257.5	1.15	-0.92	
11,119.0	91.65	358.29	5,695.5	5,336.8	386.3	5,348.2	2.17	1.89	
11,210.0	90.55	359.52	5,693.7	5,427.8	384.6	5,439.0	1.81	-1.21	
11,302.0	90.42	358.38	5,692.9	5,519.7	382.9	5,530.9	1.25	-0.14	
11,393.0	89.85	358.29	5,692.7	5,610.7	380.2	5,621.6	0.63	-0.63	
11,484.0	88.97	359.96	5,693.7	5,701.7	378.8	5,712.5	2.07	-0.97	
11,576.0	91.87	359.61	5,693.0	5,793.7	378.5	5,804.4	3.18	3.15	
11,667.0	92.18	359.26	5,689.8	5,884.6	377.6	5,895.2	0.51	0.34	
11,760.0	92.13	358.11	5,686.3	5,977.5	375.5	5,987.9	1.24	-0.05	
11,851.0	92.31	357.32	5,682.8	6,068.4	371.8	6,078.6	0.89	0.20	
11,943.0	91.91	359.26	5,679.4	6,160.3	369.1	6,170.3	2.15	-0.43	
12,034.0	90.11	359.17	5,677.8	6,251.2	367.8	6,261.1	1.98	-1.98	
12,125.0	90.24	359.43	5,677.5	6,342.2	366.7	6,352.0	0.32	0.14	
12,216.0	88.53	0.31	5,678.5	6,433.2	366.5	6,442.9	2.11	-1.88	
12,308.0	88.88	0.22	5,680.5	6,525.2	367.0	6,534.8	0.39	0.38	
12,400.0	89.10	359.61	5,682.2	6,617.2	366.8	6,626.7	0.70	0.24	
12,491.0	89.19	0.75	5,683.5	6,708.2	367.1	6,717.6	1.26	0.10	
12,583.0	89.49	0.40	5,684.6	6,800.2	368.0	6,809.6	0.50	0.33	
12,674.0	90.15	0.93	5,684.9	6,891.1	369.1	6,900.5	0.93	0.73	
12,765.0	90.02	0.49	5,684.7	6,982.1	370.2	6,991.5	0.50	-0.14	
12,856.0	88.57	0.75	5,685.8	7,073.1	371.2	7,082.4	1.62	-1.59	
12,947.0	88.75	0.93	5,688.0	7,164.1	372.5	7,173.4	0.28	0.20	
13,039.0	88.84	359.87	5,689.9	7,256.1	373.2	7,265.3	1.16	0.10	
13,130.0	90.73	0.75	5,690.3	7,347.1	373.7	7,356.2	2.29	2.08	
13,222.0	90.68	0.75	5,689.1	7,439.0	374.9	7,448.2	0.05	-0.05	
13,313.0	91.25	0.05	5,687.6	7,530.0	375.5	7,539.1	0.99	0.63	
13,404.0	90.86	0.93	5,685.9	7,621.0	376.3	7,630.1	1.06	-0.43	
13,497.0	90.29	359.78	5,685.0	7,714.0	376.9	7,723.0	1.38	-0.61	
13,592.0	88.48	357.76	5,686.0	7,809.0	374.8	7,817.8	2.85	-1.91	
13,686.0	88.97	358.38	5,688.1	7,902.9	371.7	7,911.5	0.84	0.52	
13,781.0	89.10	358.55	5,689.7	7,997.8	369.1	8,006.3	0.23	0.14	
13,876.0	89.10	358.03	5,691.2	8,092.8	366.3	8,101.0	0.55	0.00	
13,971.0	89.76	358.11	5,692.1	8,187.7	363.1	8,195.7	0.70	0.69	Last IFR Corrected Survey @ 13,971' MD
14,021.0	89.76	358.11	5,692.3	8,237.7	361.4	8,245.6	0.00	0.00	PTB @ 14,021' - TD - 133' FNL, 1,173' FWL

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Razor Federal #26L-230	0.00	0.00	5,690.0	2,383.3	452.6	1,544,091.73	3,460,117.98	40.815074	-103.837657
- actual wellpath misses target center by 10.4usft at 8164.0usft MD (5693.3 TVD, 2383.2 N, 442.7 E)									
- Point									
26L-2304B PBHL (P5)	0.00	1.07	5,690.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 34.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
26L-2304B PBHL (P3)	0.00	1.07	5,665.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 43.9usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	4,987.5	404.0	1,546,694.61	3,460,020.66	40.822222	-103.837832
- actual wellpath misses target center by 6.5usft at 10769.3usft MD (5700.4 TVD, 4987.4 N, 397.6 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	3,485.1	432.0	1,545,192.96	3,460,076.81	40.818098	-103.837731
- actual wellpath misses target center by 14.4usft at 9266.0usft MD (5704.3 TVD, 3484.6 N, 418.3 E)									
- Point									
26L-2304B VP (P3)	0.00	1.08	5,044.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.4usft at 5085.2usft MD (5045.0 TVD, -306.1 N, 484.7 E)									
- Point									
26L-2304B TGT	0.00	1.07	5,675.0	7,766.7	352.8	1,549,472.36	3,459,917.45	40.829850	-103.838017
- actual wellpath misses target center by 25.4usft at 13550.1usft MD (5685.2 TVD, 7767.1 N, 376.1 E)									
- Point									
26L-2304B VP	0.00	1.08	5,054.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.1usft at 5094.9usft MD (5054.7 TVD, -305.7 N, 485.1 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,670.0	6,490.0	376.0	1,548,196.26	3,459,964.51	40.826346	-103.837933
- actual wellpath misses target center by 13.4usft at 12272.6usft MD (5679.8 TVD, 6489.8 N, 366.8 E)									
- Point									
26L-2304B PBHL	0.00	1.07	5,675.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 38.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,675.0	1,181.4	475.0	1,542,890.47	3,460,162.90	40.811775	-103.837576
- actual wellpath misses target center by 7.1usft at 6960.8usft MD (5679.0 TVD, 1180.9 N, 469.2 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,048.0	5,674.1	7" - 2,513' FSL, 1,160' FWL		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,292.1	5,677.5	512.7	483.1	100' from 1/2 sec line - 6,292.1 MD	
6,292.1	5,677.5	512.7	483.1	2,551' FNL, 1341' FWL	
13,971.0	5,692.1	8,187.7	363.1	Last IFR Corrected Survey @ 13,971' MD	
14,021.0	5,692.3	8,237.7	361.4	PTB @ 14,021'	
14,021.0	5,692.3	8,237.7	361.4	TD - 133' FNL, 1,173' FWL	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Razor Federal #26L-230	0.00	0.00	5,690.0	2,383.3	452.6	1,544,091.73	3,460,117.98	40.815074	-103.837657
- actual wellpath misses target center by 10.4usft at 8164.0usft MD (5693.3 TVD, 2383.2 N, 442.7 E)									
- Point									
26L-2304B PBHL (P5)	0.00	1.07	5,690.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 34.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
26L-2304B PBHL (P3)	0.00	1.07	5,665.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 43.9usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	4,987.5	404.0	1,546,694.61	3,460,020.66	40.822222	-103.837832
- actual wellpath misses target center by 6.5usft at 10769.3usft MD (5700.4 TVD, 4987.4 N, 397.6 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	3,485.1	432.0	1,545,192.96	3,460,076.81	40.818098	-103.837731
- actual wellpath misses target center by 14.4usft at 9266.0usft MD (5704.3 TVD, 3484.6 N, 418.3 E)									
- Point									
26L-2304B VP (P3)	0.00	1.08	5,044.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.4usft at 5085.2usft MD (5045.0 TVD, -306.1 N, 484.7 E)									
- Point									
26L-2304B TGT	0.00	1.07	5,675.0	7,766.7	352.8	1,549,472.36	3,459,917.45	40.829850	-103.838017
- actual wellpath misses target center by 25.4usft at 13550.1usft MD (5685.2 TVD, 7767.1 N, 376.1 E)									
- Point									
26L-2304B VP	0.00	1.08	5,054.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.1usft at 5094.9usft MD (5054.7 TVD, -305.7 N, 485.1 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,670.0	6,490.0	376.0	1,548,196.26	3,459,964.51	40.826346	-103.837933
- actual wellpath misses target center by 13.4usft at 12272.6usft MD (5679.8 TVD, 6489.8 N, 366.8 E)									
- Point									
26L-2304B PBHL	0.00	1.07	5,675.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 38.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,675.0	1,181.4	475.0	1,542,890.47	3,460,162.90	40.811775	-103.837576
- actual wellpath misses target center by 7.1usft at 6960.8usft MD (5679.0 TVD, 1180.9 N, 469.2 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,048.0	5,674.1	7" - 2,513' FSL, 1,160' FWL		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,292.1	5,677.5	512.7	483.1	100' from 1/2 sec line - 6,292.1 MD	
6,292.1	5,677.5	512.7	483.1	2,551' FNL, 1341' FWL	
13,971.0	5,692.1	8,187.7	363.1	Last IFR Corrected Survey @ 13,971' MD	
14,021.0	5,692.3	8,237.7	361.4	PTB @ 14,021'	
14,021.0	5,692.3	8,237.7	361.4	TD - 133' FNL, 1,173' FWL	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Razor Federal #26L-230	0.00	0.00	5,690.0	2,383.3	452.6	1,544,091.73	3,460,117.98	40.815074	-103.837657
- actual wellpath misses target center by 10.4usft at 8164.0usft MD (5693.3 TVD, 2383.2 N, 442.7 E)									
- Point									
26L-2304B PBHL (P5)	0.00	1.07	5,690.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 34.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
26L-2304B PBHL (P3)	0.00	1.07	5,665.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 43.9usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	4,987.5	404.0	1,546,694.61	3,460,020.66	40.822222	-103.837832
- actual wellpath misses target center by 6.5usft at 10769.3usft MD (5700.4 TVD, 4987.4 N, 397.6 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	3,485.1	432.0	1,545,192.96	3,460,076.81	40.818098	-103.837731
- actual wellpath misses target center by 14.4usft at 9266.0usft MD (5704.3 TVD, 3484.6 N, 418.3 E)									
- Point									
26L-2304B VP (P3)	0.00	1.08	5,044.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.4usft at 5085.2usft MD (5045.0 TVD, -306.1 N, 484.7 E)									
- Point									
26L-2304B TGT	0.00	1.07	5,675.0	7,766.7	352.8	1,549,472.36	3,459,917.45	40.829850	-103.838017
- actual wellpath misses target center by 25.4usft at 13550.1usft MD (5685.2 TVD, 7767.1 N, 376.1 E)									
- Point									
26L-2304B VP	0.00	1.08	5,054.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.1usft at 5094.9usft MD (5054.7 TVD, -305.7 N, 485.1 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,670.0	6,490.0	376.0	1,548,196.26	3,459,964.51	40.826346	-103.837933
- actual wellpath misses target center by 13.4usft at 12272.6usft MD (5679.8 TVD, 6489.8 N, 366.8 E)									
- Point									
26L-2304B PBHL	0.00	1.07	5,675.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 38.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,675.0	1,181.4	475.0	1,542,890.47	3,460,162.90	40.811775	-103.837576
- actual wellpath misses target center by 7.1usft at 6960.8usft MD (5679.0 TVD, 1180.9 N, 469.2 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,048.0	5,674.1	7" - 2,513' FSL, 1,160' FWL		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,292.1	5,677.5	512.7	483.1	100' from 1/2 sec line - 6,292.1 MD	
6,292.1	5,677.5	512.7	483.1	2,551' FNL, 1341' FWL	
13,971.0	5,692.1	8,187.7	363.1	Last IFR Corrected Survey @ 13,971' MD	
14,021.0	5,692.3	8,237.7	361.4	PTB @ 14,021'	
14,021.0	5,692.3	8,237.7	361.4	TD - 133' FNL, 1,173' FWL	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Razor Federal #26L-230	0.00	0.00	5,690.0	2,383.3	452.6	1,544,091.73	3,460,117.98	40.815074	-103.837657
- actual wellpath misses target center by 10.4usft at 8164.0usft MD (5693.3 TVD, 2383.2 N, 442.7 E)									
- Point									
26L-2304B PBHL (P5)	0.00	1.07	5,690.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 34.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
26L-2304B PBHL (P3)	0.00	1.07	5,665.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 43.9usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	4,987.5	404.0	1,546,694.61	3,460,020.66	40.822222	-103.837832
- actual wellpath misses target center by 6.5usft at 10769.3usft MD (5700.4 TVD, 4987.4 N, 397.6 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,700.0	3,485.1	432.0	1,545,192.96	3,460,076.81	40.818098	-103.837731
- actual wellpath misses target center by 14.4usft at 9266.0usft MD (5704.3 TVD, 3484.6 N, 418.3 E)									
- Point									
26L-2304B VP (P3)	0.00	1.08	5,044.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.4usft at 5085.2usft MD (5045.0 TVD, -306.1 N, 484.7 E)									
- Point									
26L-2304B TGT	0.00	1.07	5,675.0	7,766.7	352.8	1,549,472.36	3,459,917.45	40.829850	-103.838017
- actual wellpath misses target center by 25.4usft at 13550.1usft MD (5685.2 TVD, 7767.1 N, 376.1 E)									
- Point									
26L-2304B VP	0.00	1.08	5,054.1	-309.5	502.8	1,541,400.40	3,460,218.61	40.807683	-103.837476
- actual wellpath misses target center by 18.1usft at 5094.9usft MD (5054.7 TVD, -305.7 N, 485.1 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,670.0	6,490.0	376.0	1,548,196.26	3,459,964.51	40.826346	-103.837933
- actual wellpath misses target center by 13.4usft at 12272.6usft MD (5679.8 TVD, 6489.8 N, 366.8 E)									
- Point									
26L-2304B PBHL	0.00	1.07	5,675.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- actual wellpath misses target center by 38.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									
Razor Federal #26L-230	0.00	0.00	5,675.0	1,181.4	475.0	1,542,890.47	3,460,162.90	40.811775	-103.837576
- actual wellpath misses target center by 7.1usft at 6960.8usft MD (5679.0 TVD, 1180.9 N, 469.2 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,048.0	5,674.1	7" - 2,513' FSL, 1,160' FWL		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,292.1	5,677.5	512.7	483.1	100' from 1/2 sec line - 6,292.1 MD	
6,292.1	5,677.5	512.7	483.1	2,551' FNL, 1341' FWL	
13,971.0	5,692.1	8,187.7	363.1	Last IFR Corrected Survey @ 13,971' MD	
14,021.0	5,692.3	8,237.7	361.4	PTB @ 14,021'	
14,021.0	5,692.3	8,237.7	361.4	TD - 133' FNL, 1,173' FWL	

Cathedral Energy Services

Survey Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Checked By: _____ Approved By: _____ Date: _____

Whiting Petroleum Corporation

Weld County, CO

S26-T10N-R58W

Razor Federal #26L-2304B

HZ

Design: SURVEYS

Survey Report - Geographic

14 May, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	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	S26-T10N-R58W				
Site Position:		Northing:	1,541,774.28 usft	Latitude:	40.808739
From:	Lat/Long	Easting:	3,459,642.55 usft	Longitude:	-103.839531
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.07 °

Well	Razor Federal #26L-2304B					
Well Position	+N/-S	0.0 usft	Northing:	1,541,700.40 usft	Latitude:	40.808533
	+E/-W	0.0 usft	Easting:	3,459,710.11 usft	Longitude:	-103.839292
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,734.5 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/23/2014	8.00	67.42	53,137

Design	SURVEYS				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	2.38	

Survey Program	Date	5/14/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
509.0	14,021.0	IFR Corrected Mud Pulse (HZ)	ISCWSA MWD	MWD - ISCWSA	

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	1,541,700.40	3,459,710.11	40.808533	-103.839292
509.0	0.28	310.63	509.0	0.8	-0.9	1,541,701.20	3,459,709.15	40.808535	-103.839296
601.0	0.64	128.90	601.0	0.6	-0.7	1,541,701.02	3,459,709.38	40.808535	-103.839295
693.0	1.98	124.75	693.0	-0.6	1.0	1,541,699.83	3,459,711.11	40.808531	-103.839289
785.0	3.82	122.38	784.8	-3.1	4.9	1,541,697.35	3,459,715.05	40.808524	-103.839275
876.0	5.04	127.75	875.6	-7.2	10.6	1,541,693.39	3,459,720.85	40.808513	-103.839254
968.0	6.53	132.79	967.1	-13.2	17.6	1,541,687.50	3,459,727.99	40.808497	-103.839229
1,059.0	7.19	127.43	1,057.5	-20.2	26.0	1,541,680.68	3,459,736.44	40.808477	-103.839198
1,151.0	6.97	132.61	1,148.8	-27.5	34.6	1,541,673.56	3,459,745.26	40.808457	-103.839167
1,243.0	7.64	130.15	1,240.0	-35.2	43.4	1,541,666.00	3,459,754.18	40.808436	-103.839135
1,333.0	7.89	129.49	1,329.2	-43.0	52.8	1,541,658.39	3,459,763.67	40.808415	-103.839102
1,425.0	7.94	131.45	1,420.3	-51.2	62.4	1,541,650.35	3,459,773.45	40.808392	-103.839067

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,517.0	7.06	132.19	1,511.5	-59.2	71.4	1,541,642.52	3,459,782.55	40.808370	-103.839035
1,612.0	6.64	130.50	1,605.8	-66.7	79.9	1,541,635.19	3,459,791.20	40.808350	-103.839004
1,704.0	7.59	125.61	1,697.1	-73.7	88.8	1,541,628.37	3,459,800.31	40.808331	-103.838971
1,796.0	8.02	128.62	1,788.3	-81.3	98.8	1,541,621.01	3,459,810.40	40.808310	-103.838935
1,888.0	8.16	128.26	1,879.4	-89.3	108.9	1,541,613.16	3,459,820.69	40.808288	-103.838899
1,979.0	7.90	126.51	1,969.5	-97.0	119.0	1,541,605.63	3,459,830.93	40.808267	-103.838862
2,071.0	9.42	122.45	2,060.4	-104.8	130.5	1,541,598.04	3,459,842.51	40.808245	-103.838821
2,162.0	8.97	121.11	2,150.2	-112.5	142.8	1,541,590.61	3,459,855.01	40.808224	-103.838776
2,254.0	7.76	117.78	2,241.3	-119.1	154.5	1,541,584.23	3,459,866.77	40.808206	-103.838734
2,345.0	9.68	113.52	2,331.2	-125.0	166.9	1,541,578.55	3,459,879.33	40.808190	-103.838689
2,437.0	9.32	111.83	2,421.9	-130.9	180.9	1,541,572.95	3,459,893.45	40.808174	-103.838639
2,528.0	9.52	113.17	2,511.7	-136.6	194.7	1,541,567.51	3,459,907.31	40.808158	-103.838589
2,619.0	9.41	111.34	2,601.5	-142.2	208.5	1,541,562.10	3,459,921.26	40.808143	-103.838539
2,711.0	9.42	109.16	2,692.2	-147.4	222.6	1,541,557.16	3,459,935.47	40.808128	-103.838488
2,802.0	8.42	106.95	2,782.1	-151.8	236.1	1,541,553.03	3,459,948.96	40.808116	-103.838440
2,893.0	9.06	114.04	2,872.1	-156.7	249.0	1,541,548.41	3,459,961.96	40.808103	-103.838393
2,985.0	7.83	110.94	2,963.1	-161.9	261.4	1,541,543.45	3,459,974.53	40.808089	-103.838348
3,076.0	7.65	114.12	3,053.3	-166.6	272.8	1,541,538.97	3,459,985.93	40.808076	-103.838307
3,168.0	8.32	123.62	3,144.4	-172.8	283.9	1,541,533.00	3,459,997.18	40.808059	-103.838267
3,260.0	8.07	122.58	3,235.4	-179.9	294.9	1,541,526.04	3,460,008.29	40.808039	-103.838227
3,351.0	8.31	118.27	3,325.5	-186.5	306.0	1,541,519.70	3,460,019.59	40.808021	-103.838187
3,443.0	7.73	116.43	3,416.6	-192.4	317.4	1,541,514.01	3,460,031.09	40.808005	-103.838146
3,535.0	9.28	122.43	3,507.6	-199.1	329.2	1,541,507.50	3,460,043.02	40.807986	-103.838103
3,625.0	8.42	121.25	3,596.5	-206.4	341.0	1,541,500.41	3,460,054.91	40.807966	-103.838060
3,717.0	6.92	116.55	3,687.7	-212.4	351.7	1,541,494.64	3,460,065.74	40.807950	-103.838022
3,808.0	7.25	124.37	3,778.0	-218.1	361.4	1,541,489.13	3,460,075.49	40.807934	-103.837987
3,900.0	7.43	121.54	3,869.2	-224.5	371.2	1,541,482.93	3,460,085.47	40.807917	-103.837951
3,991.0	9.08	123.27	3,959.3	-231.5	382.2	1,541,476.12	3,460,096.62	40.807898	-103.837911
4,083.0	8.02	123.82	4,050.3	-239.0	393.6	1,541,468.78	3,460,108.16	40.807877	-103.837870
4,174.0	8.91	135.15	4,140.3	-247.6	403.9	1,541,460.44	3,460,118.56	40.807853	-103.837833
4,266.0	7.09	136.63	4,231.4	-256.8	412.8	1,541,451.43	3,460,127.66	40.807828	-103.837801
4,358.0	9.18	132.50	4,322.5	-265.8	422.1	1,541,442.52	3,460,137.14	40.807803	-103.837767
4,449.0	8.43	141.25	4,412.4	-275.9	431.7	1,541,432.59	3,460,146.85	40.807775	-103.837733
4,541.0	7.17	126.08	4,503.5	-284.6	440.5	1,541,424.12	3,460,155.87	40.807752	-103.837701
4,632.0	8.45	127.77	4,593.7	-292.0	450.4	1,541,416.86	3,460,165.89	40.807731	-103.837665
4,723.0	6.21	124.14	4,684.0	-298.9	459.8	1,541,410.18	3,460,175.37	40.807713	-103.837632
4,815.0	4.77	118.64	4,775.5	-303.5	467.2	1,541,405.70	3,460,182.93	40.807700	-103.837605
4,906.0	4.19	118.47	4,866.2	-306.9	473.5	1,541,402.42	3,460,189.24	40.807690	-103.837582
4,998.0	4.22	82.83	4,958.0	-308.1	479.8	1,541,401.35	3,460,195.57	40.807687	-103.837559
5,090.0	3.11	44.91	5,049.8	-305.9	484.9	1,541,403.64	3,460,200.65	40.807693	-103.837541
5,180.0	5.79	36.52	5,139.6	-300.5	489.3	1,541,409.10	3,460,204.98	40.807708	-103.837525
5,272.0	13.65	25.68	5,230.2	-287.0	496.8	1,541,422.77	3,460,212.20	40.807745	-103.837498
5,362.0	22.06	15.43	5,315.8	-261.1	505.9	1,541,448.85	3,460,220.83	40.807816	-103.837465
5,454.0	31.12	10.02	5,398.0	-220.9	514.7	1,541,489.17	3,460,228.83	40.807927	-103.837433
5,545.0	37.39	3.36	5,473.2	-170.1	520.4	1,541,540.07	3,460,233.60	40.808066	-103.837412
5,576.0	39.72	359.77	5,497.4	-150.8	520.9	1,541,559.38	3,460,233.75	40.808119	-103.837411
5,637.0	45.41	357.23	5,542.3	-109.6	519.8	1,541,600.58	3,460,231.85	40.808232	-103.837415
5,668.0	49.79	357.47	5,563.2	-86.7	518.7	1,541,623.42	3,460,230.36	40.808295	-103.837418
5,698.0	54.38	357.00	5,581.7	-63.1	517.6	1,541,647.02	3,460,228.78	40.808360	-103.837423
5,728.0	59.81	355.93	5,598.0	-38.0	516.0	1,541,672.12	3,460,226.75	40.808429	-103.837428
5,759.0	65.57	355.12	5,612.2	-10.5	513.9	1,541,699.52	3,460,224.08	40.808504	-103.837436
5,789.0	67.76	355.52	5,624.1	16.9	511.6	1,541,726.93	3,460,221.32	40.808579	-103.837444
5,819.0	69.50	356.08	5,635.0	44.8	509.6	1,541,754.75	3,460,218.75	40.808656	-103.837452
5,850.0	72.72	356.28	5,645.0	74.1	507.6	1,541,783.97	3,460,216.25	40.808736	-103.837459
5,881.0	76.86	356.87	5,653.2	103.9	505.8	1,541,813.78	3,460,213.91	40.808818	-103.837465

Cathedral Energy Services

Survey Report - Geographic

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Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,911.0	79.37	356.79	5,659.3	133.2	504.2	1,541,843.06	3,460,211.74	40.808899	-103.837471
5,943.0	81.04	356.70	5,664.8	164.7	502.4	1,541,874.50	3,460,209.36	40.808985	-103.837477
5,974.0	84.20	356.56	5,668.8	195.4	500.6	1,541,905.14	3,460,206.97	40.809069	-103.837484
6,006.0	85.94	356.38	5,671.5	227.2	498.7	1,541,936.92	3,460,204.42	40.809157	-103.837491
6,118.0	88.40	356.89	5,677.0	338.9	492.1	1,542,048.44	3,460,195.76	40.809463	-103.837515
6,213.0	90.29	357.07	5,678.1	433.7	487.1	1,542,143.19	3,460,188.98	40.809723	-103.837533
6,292.1	90.58	357.14	5,677.5	512.7	483.1	1,542,222.11	3,460,183.51	40.809940	-103.837547
100' from 1/2 sec line - 6,292.1 MD - 2,551' FNL, 1341' FWL									
6,308.0	90.64	357.16	5,677.4	528.6	482.3	1,542,237.96	3,460,182.42	40.809984	-103.837550
6,403.0	89.93	356.63	5,676.9	623.5	477.2	1,542,332.70	3,460,175.50	40.810244	-103.837569
6,498.0	89.98	0.23	5,677.0	718.4	474.6	1,542,427.59	3,460,171.12	40.810505	-103.837578
6,592.0	89.49	0.76	5,677.4	812.4	475.4	1,542,521.58	3,460,170.17	40.810763	-103.837575
6,687.0	89.93	0.41	5,677.9	907.4	476.3	1,542,616.57	3,460,169.37	40.811023	-103.837572
6,782.0	90.68	0.76	5,677.4	1,002.4	477.3	1,542,711.57	3,460,168.56	40.811284	-103.837568
6,877.0	89.23	356.37	5,677.4	1,097.3	474.9	1,542,806.45	3,460,164.40	40.811545	-103.837577
6,971.0	88.62	355.66	5,679.2	1,191.1	468.4	1,542,900.07	3,460,156.11	40.811802	-103.837600
7,066.0	90.73	355.49	5,679.7	1,285.8	461.1	1,542,994.62	3,460,147.01	40.812062	-103.837627
7,161.0	89.76	355.75	5,679.3	1,380.5	453.8	1,543,089.19	3,460,137.98	40.812322	-103.837653
7,256.0	89.85	358.04	5,679.7	1,475.4	448.7	1,543,183.93	3,460,131.06	40.812582	-103.837671
7,351.0	89.93	0.15	5,679.8	1,570.4	447.2	1,543,278.87	3,460,127.79	40.812843	-103.837677
7,446.0	90.59	359.97	5,679.4	1,665.4	447.3	1,543,373.85	3,460,126.11	40.813104	-103.837676
7,541.0	88.79	0.67	5,679.9	1,760.4	447.8	1,543,468.84	3,460,124.86	40.813365	-103.837675
7,636.0	88.31	0.32	5,682.3	1,855.3	448.6	1,543,563.80	3,460,123.90	40.813625	-103.837672
7,731.0	87.43	359.35	5,685.9	1,950.3	448.3	1,543,658.71	3,460,121.85	40.813886	-103.837673
7,825.0	89.63	359.88	5,688.3	2,044.2	447.7	1,543,752.65	3,460,119.46	40.814144	-103.837675
7,920.0	89.23	359.00	5,689.2	2,139.2	446.8	1,543,847.60	3,460,116.75	40.814404	-103.837678
8,015.0	88.62	358.65	5,691.0	2,234.2	444.8	1,543,942.51	3,460,113.02	40.814665	-103.837685
8,110.0	89.10	359.35	5,692.9	2,329.1	443.2	1,544,037.43	3,460,109.59	40.814926	-103.837691
8,205.0	90.90	359.71	5,692.9	2,424.1	442.4	1,544,132.39	3,460,107.03	40.815186	-103.837694
8,300.0	91.03	359.35	5,691.3	2,519.1	441.6	1,544,227.34	3,460,104.47	40.815447	-103.837697
8,395.0	90.37	359.44	5,690.1	2,614.1	440.6	1,544,322.29	3,460,101.69	40.815708	-103.837700
8,490.0	88.66	359.71	5,690.9	2,709.1	439.9	1,544,417.25	3,460,099.21	40.815968	-103.837703
8,584.0	87.60	359.00	5,694.0	2,803.0	438.9	1,544,511.16	3,460,096.39	40.816226	-103.837707
8,679.0	89.76	359.09	5,696.2	2,898.0	437.3	1,544,606.07	3,460,093.03	40.816487	-103.837713
8,772.0	89.27	358.39	5,697.0	2,991.0	435.2	1,544,698.99	3,460,089.25	40.816742	-103.837720
8,864.0	88.00	357.77	5,699.2	3,082.9	432.1	1,544,790.83	3,460,084.44	40.816994	-103.837731
8,956.0	89.49	357.95	5,701.2	3,174.8	428.7	1,544,882.66	3,460,079.29	40.817247	-103.837743
9,049.0	88.66	357.33	5,702.7	3,267.7	424.9	1,544,975.48	3,460,073.72	40.817502	-103.837757
9,141.0	89.85	358.74	5,703.9	3,359.6	421.7	1,545,067.34	3,460,068.84	40.817754	-103.837769
9,233.0	89.76	358.30	5,704.2	3,451.6	419.4	1,545,159.25	3,460,064.75	40.818006	-103.837777
9,325.0	90.02	358.04	5,704.4	3,543.5	416.4	1,545,251.13	3,460,060.09	40.818259	-103.837788
9,416.0	90.81	358.12	5,703.7	3,634.5	413.4	1,545,342.00	3,460,055.34	40.818508	-103.837799
9,508.0	90.59	0.41	5,702.6	3,726.5	412.2	1,545,433.94	3,460,052.43	40.818761	-103.837803
9,599.0	91.12	359.97	5,701.2	3,817.5	412.5	1,545,524.92	3,460,051.03	40.819011	-103.837802
9,691.0	89.49	359.09	5,700.7	3,909.5	411.7	1,545,616.88	3,460,048.55	40.819263	-103.837805
9,783.0	89.10	358.74	5,701.9	4,001.4	410.0	1,545,708.81	3,460,045.09	40.819516	-103.837811
9,874.0	90.51	0.23	5,702.2	4,092.4	409.2	1,545,799.77	3,460,042.57	40.819765	-103.837814
9,965.0	90.68	359.88	5,701.2	4,183.4	409.3	1,545,890.75	3,460,040.95	40.820015	-103.837814
10,057.0	92.00	0.67	5,699.1	4,275.4	409.7	1,545,982.71	3,460,039.67	40.820267	-103.837812
10,148.0	88.79	359.00	5,698.5	4,366.4	409.4	1,546,073.67	3,460,037.70	40.820517	-103.837813
10,240.0	88.13	358.39	5,700.9	4,458.3	407.3	1,546,165.56	3,460,033.89	40.820770	-103.837821
10,331.0	88.53	359.09	5,703.6	4,549.2	405.3	1,546,256.45	3,460,030.19	40.821019	-103.837828
10,422.0	89.19	359.88	5,705.4	4,640.2	404.5	1,546,347.39	3,460,027.66	40.821269	-103.837831
10,514.0	89.49	358.56	5,706.5	4,732.2	403.3	1,546,439.34	3,460,024.69	40.821521	-103.837835
10,569.0	90.29	358.47	5,706.6	4,787.2	401.8	1,546,494.28	3,460,022.24	40.821672	-103.837840

Cathedral Energy Services

Survey Report - Geographic

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor Federal #26L-2304B
Project:	Weld County, CO	TVD Reference:	WELL @ 4751.0usft (Original Well Elev)
Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,661.0	92.48	359.08	5,704.3	4,879.1	399.9	1,546,586.17	3,460,018.55	40.821925	-103.837847
10,753.0	91.82	358.55	5,700.9	4,971.1	398.0	1,546,678.04	3,460,014.93	40.822177	-103.837854
10,845.0	90.95	358.99	5,698.7	5,063.0	396.0	1,546,769.93	3,460,011.23	40.822429	-103.837861
10,937.0	90.77	357.94	5,697.3	5,155.0	393.5	1,546,861.83	3,460,007.04	40.822682	-103.837870
11,028.0	89.93	357.32	5,696.7	5,245.9	389.8	1,546,952.66	3,460,001.58	40.822931	-103.837884
11,119.0	91.65	358.29	5,695.5	5,336.8	386.3	1,547,043.50	3,459,996.39	40.823181	-103.837897
11,210.0	90.55	359.52	5,693.7	5,427.8	384.6	1,547,134.41	3,459,992.95	40.823430	-103.837903
11,302.0	90.42	358.38	5,692.9	5,519.7	382.9	1,547,226.34	3,459,989.54	40.823683	-103.837909
11,393.0	89.85	358.29	5,692.7	5,610.7	380.2	1,547,317.24	3,459,985.20	40.823933	-103.837918
11,484.0	88.97	359.96	5,693.7	5,701.7	378.8	1,547,408.18	3,459,982.10	40.824182	-103.837923
11,576.0	91.87	359.61	5,693.0	5,793.7	378.5	1,547,500.14	3,459,980.03	40.824435	-103.837925
11,667.0	92.18	359.26	5,689.8	5,884.6	377.6	1,547,591.05	3,459,977.43	40.824684	-103.837928
11,760.0	92.13	358.11	5,686.3	5,977.5	375.5	1,547,683.90	3,459,973.56	40.824939	-103.837936
11,851.0	92.31	357.32	5,682.8	6,068.4	371.8	1,547,774.67	3,459,968.24	40.825189	-103.837949
11,943.0	91.91	359.26	5,679.4	6,160.3	369.1	1,547,866.50	3,459,963.77	40.825441	-103.837959
12,034.0	90.11	359.17	5,677.8	6,251.2	367.8	1,547,957.43	3,459,960.82	40.825691	-103.837963
12,125.0	90.24	359.43	5,677.5	6,342.2	366.7	1,548,048.39	3,459,958.01	40.825940	-103.837967
12,216.0	88.53	0.31	5,678.5	6,433.2	366.5	1,548,139.36	3,459,956.10	40.826190	-103.837968
12,308.0	88.88	0.22	5,680.5	6,525.2	367.0	1,548,231.33	3,459,954.80	40.826443	-103.837966
12,400.0	89.10	359.61	5,682.2	6,617.2	366.8	1,548,323.29	3,459,952.94	40.826695	-103.837967
12,491.0	89.19	0.75	5,683.5	6,708.2	367.1	1,548,414.27	3,459,951.52	40.826945	-103.837966
12,583.0	89.49	0.40	5,684.6	6,800.2	368.0	1,548,506.26	3,459,950.72	40.827197	-103.837962
12,674.0	90.15	0.93	5,684.9	6,891.1	369.1	1,548,597.25	3,459,950.07	40.827447	-103.837959
12,765.0	90.02	0.49	5,684.7	6,982.1	370.2	1,548,688.25	3,459,949.50	40.827697	-103.837955
12,856.0	88.57	0.75	5,685.8	7,073.1	371.2	1,548,779.24	3,459,948.78	40.827946	-103.837951
12,947.0	88.75	0.93	5,688.0	7,164.1	372.5	1,548,870.21	3,459,948.41	40.828196	-103.837946
13,039.0	88.84	359.87	5,689.9	7,256.1	373.2	1,548,962.19	3,459,947.33	40.828449	-103.837944
13,130.0	90.73	0.75	5,690.3	7,347.1	373.7	1,549,053.17	3,459,946.12	40.828698	-103.837942
13,222.0	90.68	0.75	5,689.1	7,439.0	374.9	1,549,145.16	3,459,945.60	40.828951	-103.837938
13,313.0	91.25	0.05	5,687.6	7,530.0	375.5	1,549,236.14	3,459,944.53	40.829200	-103.837935
13,404.0	90.86	0.93	5,685.9	7,621.0	376.3	1,549,327.12	3,459,943.60	40.829450	-103.837933
13,497.0	90.29	359.78	5,685.0	7,714.0	376.9	1,549,420.11	3,459,942.44	40.829705	-103.837931
13,592.0	88.48	357.76	5,686.0	7,809.0	374.8	1,549,515.02	3,459,938.62	40.829966	-103.837938
13,686.0	88.97	358.38	5,688.1	7,902.9	371.7	1,549,608.86	3,459,933.70	40.830224	-103.837949
13,781.0	89.10	358.55	5,689.7	7,997.8	369.1	1,549,703.75	3,459,929.38	40.830484	-103.837958
13,876.0	89.10	358.03	5,691.2	8,092.8	366.3	1,549,798.63	3,459,924.76	40.830745	-103.837969
13,971.0	89.76	358.11	5,692.1	8,187.7	363.1	1,549,893.49	3,459,919.79	40.831006	-103.837980
Last IFR Corrected Survey @ 13,971' MD									
14,021.0	89.76	358.11	5,692.3	8,237.7	361.4	1,549,943.45	3,459,917.20	40.831143	-103.837986
PTB @ 14,021' - TD - 133' FNL, 1,173' FWL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
26L-2304B PBHL (P5)	0.00	1.07	5,690.0	8,266.6	342.9	1,549,971.96	3,459,898.12	40.831222	-103.838053
- hit/miss target									
- Shape									
- actual wellpath misses target center by 34.4usft at 14021.0usft MD (5692.3 TVD, 8237.7 N, 361.4 E)									
- Point									

Cathedral Energy Services

Survey Report - Geographic

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Site:	S26-T10N-R58W	MD Reference:	WELL @ 4751.0usft (Original Well Elev)
Well:	Razor Federal #26L-2304B	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,048.0	5,674.1	7" - 2,513' FSL, 1,160' FWL		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,292.1	5,677.5	512.7	483.1	100' from 1/2 sec line - 6,292.1 MD	
6,292.1	5,677.5	512.7	483.1	2,551' FNL, 1341' FWL	
13,971.0	5,692.1	8,187.7	363.1	Last IFR Corrected Survey @ 13,971' MD	
14,021.0	5,692.3	8,237.7	361.4	PTB @ 14,021'	
14,021.0	5,692.3	8,237.7	361.4	TD - 133' FNL, 1,173' FWL	

Checked By: _____ Approved By: _____ Date: _____