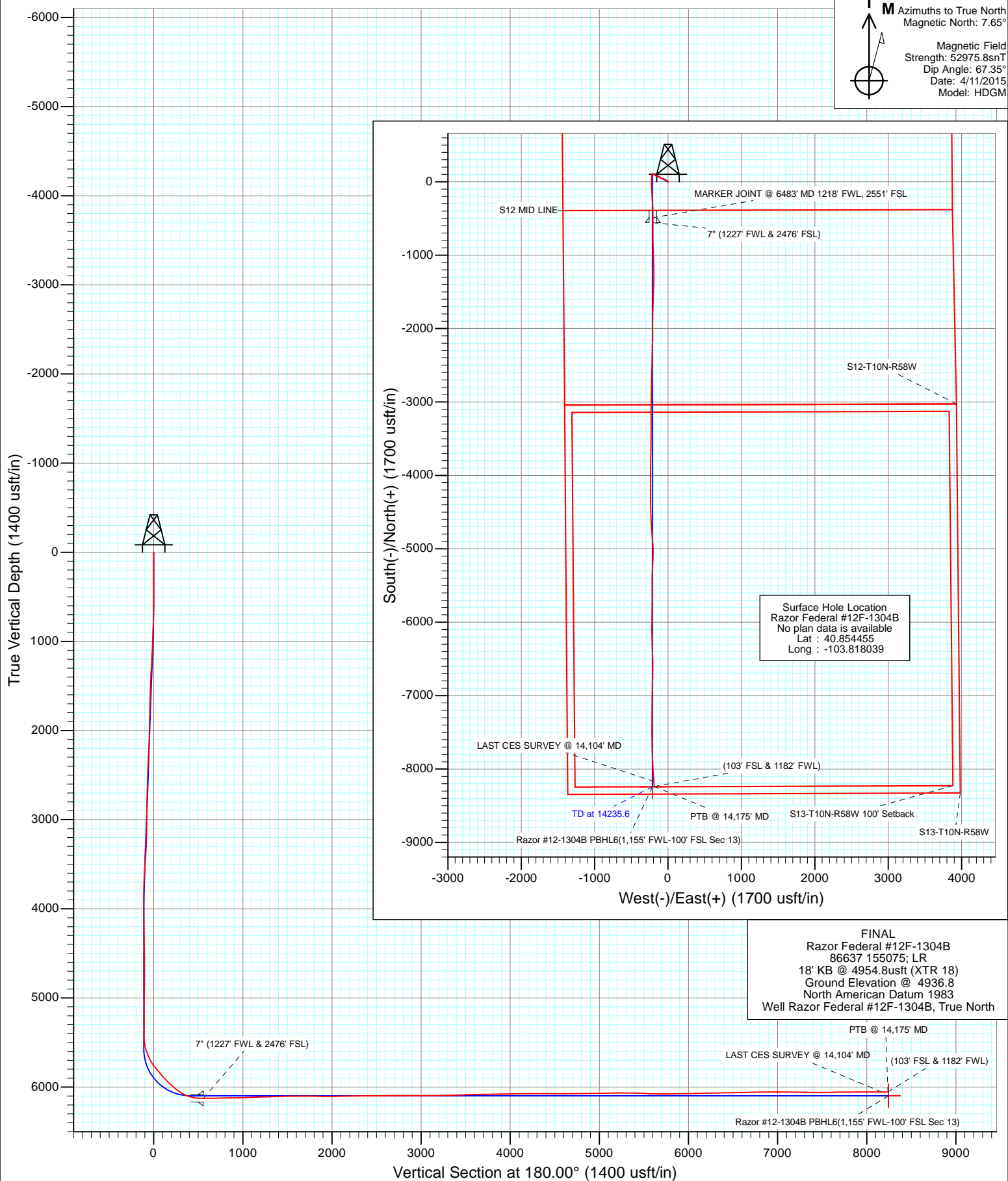




Project: Weld County, CO  
Site: S12-T10N-R58W  
Well: Razor Federal #12F-1304B  
Wellbore: HZ  
Design: FINAL



## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1304B
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Well:</b>	Razor Federal #12F-1304B	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Weld County, CO		
<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		

Site		S12-T10N-R58W			
Site Position:		Northing:	1,558,537.97 usft	Latitude:	40.854456
From:	Lat/Long	Easting:	3,465,176.15 usft	Longitude:	-103.818397
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.09 °

Well	Razor Federal #12F-1304B					
Well Position	+N/-S	0.0 usft	Northing:	1,558,539.82 usft	Latitude:	40.854455
	+E/-W	0.0 usft	Easting:	3,465,275.26 usft	Longitude:	-103.818039
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,936.8 usft

<b>Wellbore</b>	HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	4/11/2015	7.65	67.35	52,976

<b>Design</b>	FINAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	180.00	

<b>Survey Program</b>	<b>Date</b>	5/27/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
164.0	14,175.0	Survey #1 (HZ)	ISCWSA MWD	MWD - ISCWSA	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usf)</b>	<b>Build Rate (°/100u)</b>	<b>Formations / Comments</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
164.0	0.62	83.69	164.0	0.1	0.9	-0.1	0.38	0.38		
257.0	0.14	57.40	257.0	0.2	1.5	-0.2	0.54	-0.52		
348.0	0.41	103.24	348.0	0.2	1.9	-0.2	0.36	0.30		
441.0	0.56	116.17	441.0	-0.1	2.6	0.1	0.20	0.16		
533.0	0.46	95.45	533.0	-0.3	3.4	0.3	0.23	-0.11		
625.0	0.87	10.66	625.0	0.3	3.9	-0.3	1.03	0.45		
718.0	2.00	319.11	718.0	2.3	3.0	-2.3	1.73	1.22		
807.0	3.50	309.18	806.8	5.2	-0.2	-5.2	1.76	1.69		
895.0	3.18	306.31	894.7	8.3	-4.2	-8.3	0.41	-0.36		
984.0	4.24	306.14	983.5	11.7	-8.9	-11.7	1.19	1.19		
1,074.0	4.41	304.85	1,073.3	15.6	-14.4	-15.6	0.22	0.19		
1,163.0	5.80	298.20	1,161.9	19.7	-21.2	-19.7	1.69	1.56		

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1304B
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Well:</b>	Razor Federal #12F-1304B	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
1,253.0	6.00	299.59	1,251.4	24.2	-29.3	-24.2	0.27	0.22	
1,340.0	6.29	304.28	1,337.9	29.1	-37.2	-29.1	0.67	0.33	
1,430.0	6.26	289.02	1,427.4	33.5	-45.9	-33.5	1.85	-0.03	
1,519.0	6.79	291.35	1,515.8	37.0	-55.4	-37.0	0.67	0.60	
1,607.0	5.14	290.48	1,603.3	40.3	-63.9	-40.3	1.88	-1.87	
1,696.0	4.21	284.46	1,692.0	42.5	-70.8	-42.5	1.18	-1.04	
1,786.0	3.81	287.01	1,781.8	44.2	-76.8	-44.2	0.49	-0.44	
1,820.0	3.96	284.02	1,815.7	44.8	-79.1	-44.8	0.74	0.44	
1,971.0	4.02	286.20	1,966.4	47.5	-89.2	-47.5	0.11	0.04	
2,062.0	5.11	282.48	2,057.1	49.3	-96.2	-49.3	1.24	1.20	
2,154.0	3.45	322.96	2,148.8	52.4	-101.9	-52.4	3.63	-1.80	
2,245.0	3.89	314.82	2,239.7	56.8	-105.7	-56.8	0.75	0.48	
2,337.0	3.88	312.51	2,331.4	61.1	-110.2	-61.1	0.17	-0.01	
2,430.0	3.70	312.15	2,424.2	65.2	-114.8	-65.2	0.20	-0.19	
2,522.0	3.18	304.20	2,516.1	68.6	-119.1	-68.6	0.77	-0.57	
2,613.0	3.72	306.42	2,606.9	71.8	-123.6	-71.8	0.61	0.59	
2,706.0	4.42	279.19	2,699.7	74.2	-129.5	-74.2	2.18	0.75	
2,797.0	4.31	278.06	2,790.4	75.2	-136.4	-75.2	0.15	-0.12	
2,889.0	4.26	280.61	2,882.2	76.3	-143.2	-76.3	0.21	-0.05	
2,981.0	4.21	279.43	2,973.9	77.5	-149.8	-77.5	0.11	-0.05	
3,073.0	4.25	280.50	3,065.7	78.7	-156.5	-78.7	0.10	0.04	
3,165.0	4.13	287.75	3,157.4	80.3	-163.0	-80.3	0.59	-0.13	
3,257.0	3.69	292.55	3,249.2	82.4	-168.9	-82.4	0.60	-0.48	
3,349.0	6.50	309.97	3,340.8	86.9	-175.7	-86.9	3.45	3.05	
3,441.0	5.55	307.33	3,432.3	93.0	-183.2	-93.0	1.08	-1.03	
3,532.0	6.30	305.65	3,522.8	98.5	-190.7	-98.5	0.85	0.82	
3,624.0	6.37	306.72	3,614.3	104.5	-198.9	-104.5	0.15	0.08	
3,716.0	5.01	291.02	3,705.8	109.0	-206.8	-109.0	2.23	-1.48	
3,808.0	2.86	304.47	3,797.6	111.8	-212.4	-111.8	2.53	-2.34	
3,900.0	0.64	134.87	3,889.6	112.7	-213.9	-112.7	3.79	-2.41	
3,993.0	0.58	161.64	3,982.6	111.9	-213.4	-111.9	0.31	-0.06	
4,085.0	1.00	189.40	4,074.6	110.7	-213.4	-110.7	0.61	0.46	
4,176.0	0.70	151.30	4,165.6	109.4	-213.3	-109.4	0.68	-0.33	
4,269.0	0.70	161.10	4,258.5	108.4	-212.8	-108.4	0.13	0.00	
4,360.0	0.90	169.70	4,349.5	107.1	-212.5	-107.1	0.26	0.22	
4,453.0	1.10	207.90	4,442.5	105.6	-212.8	-105.6	0.73	0.22	
4,544.0	1.70	236.50	4,533.5	104.1	-214.3	-104.1	0.99	0.66	
4,637.0	0.30	66.50	4,626.5	103.4	-215.3	-103.4	2.15	-1.51	
4,729.0	0.30	31.80	4,718.5	103.7	-214.9	-103.7	0.19	0.00	
4,821.0	0.60	1.50	4,810.5	104.4	-214.8	-104.4	0.41	0.33	
4,914.0	0.60	2.10	4,903.5	105.4	-214.7	-105.4	0.01	0.00	
5,006.0	0.60	32.40	4,995.5	106.3	-214.5	-106.3	0.34	0.00	
5,098.0	0.30	336.50	5,087.5	106.9	-214.3	-106.9	0.54	-0.33	
5,190.0	0.40	295.70	5,179.5	107.3	-214.7	-107.3	0.28	0.11	
5,282.0	0.40	271.60	5,271.5	107.4	-215.3	-107.4	0.18	0.00	
5,373.0	0.60	277.50	5,362.5	107.5	-216.1	-107.5	0.23	0.22	
5,465.0	0.70	292.20	5,454.5	107.8	-217.1	-107.8	0.21	0.11	
5,557.0	13.40	187.90	5,545.6	97.4	-219.1	-97.4	14.77	13.80	
5,602.0	20.03	186.80	5,588.7	84.5	-220.7	-84.5	14.75	14.73	
5,645.0	21.70	186.73	5,628.9	69.3	-222.5	-69.3	3.88	3.88	
5,689.0	23.36	182.52	5,669.5	52.5	-223.9	-52.5	5.26	3.77	
5,734.0	29.03	181.44	5,709.9	32.7	-224.5	-32.7	12.64	12.60	
5,776.0	35.76	182.24	5,745.3	10.2	-225.3	-10.2	16.06	16.02	

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1304B
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Well:</b>	Razor Federal #12F-1304B	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
5,820.0	39.52	179.69	5,780.2	-16.6	-225.7	16.6	9.25	8.55	
5,863.0	40.04	178.60	5,813.2	-44.1	-225.3	44.1	2.02	1.21	
5,908.0	40.23	178.18	5,847.6	-73.1	-224.5	73.1	0.73	0.42	
5,953.0	40.88	177.16	5,881.8	-102.4	-223.3	102.4	2.06	1.44	
5,997.0	43.76	177.27	5,914.3	-132.0	-221.8	132.0	6.55	6.55	
6,042.0	46.49	176.91	5,946.1	-163.8	-220.2	163.8	6.09	6.07	
6,087.0	48.25	176.02	5,976.6	-196.8	-218.2	196.8	4.17	3.91	
6,132.0	49.50	175.59	6,006.2	-230.7	-215.7	230.7	2.87	2.78	
6,179.0	51.60	175.20	6,036.0	-266.8	-212.8	266.8	4.51	4.47	
6,221.0	57.43	176.61	6,060.4	-300.9	-210.3	300.9	14.15	13.88	
6,266.0	63.55	178.33	6,082.5	-340.0	-208.6	340.0	14.00	13.60	
6,296.0	68.22	178.60	6,094.8	-367.4	-207.9	367.4	15.59	15.57	
6,326.0	72.70	178.70	6,104.8	-395.7	-207.2	395.7	14.94	14.93	
6,356.0	76.42	178.90	6,112.8	-424.6	-206.6	424.6	12.42	12.40	
6,386.0	80.09	179.39	6,118.9	-453.9	-206.2	453.9	12.34	12.23	
6,410.0	83.13	179.61	6,122.4	-477.7	-206.0	477.7	12.70	12.67	
6,425.0	85.41	180.02	6,123.9	-492.6	-205.9	492.6	15.44	15.20	
6,445.0	87.79	180.43	6,125.1	-512.5	-206.0	512.5	12.07	11.90	
6,588.0	91.88	180.08	6,125.5	-655.5	-206.6	655.5	2.87	2.86	
6,678.0	91.21	179.71	6,123.1	-745.5	-206.5	745.5	0.85	-0.74	
6,768.0	90.48	179.58	6,121.8	-835.5	-205.9	835.5	0.82	-0.81	
6,857.0	90.56	177.10	6,121.0	-924.4	-203.3	924.4	2.79	0.09	
6,943.0	92.13	176.78	6,118.9	-1,010.3	-198.8	1,010.3	1.86	1.83	
7,031.0	91.99	178.74	6,115.8	-1,098.1	-195.3	1,098.1	2.23	-0.16	
7,120.0	92.61	180.06	6,112.2	-1,187.1	-194.4	1,187.1	1.64	0.70	
7,210.0	92.27	179.64	6,108.4	-1,277.0	-194.2	1,277.0	0.60	-0.38	
7,297.0	92.08	181.28	6,105.1	-1,363.9	-194.9	1,363.9	1.90	-0.22	
7,387.0	90.98	181.60	6,102.7	-1,453.9	-197.1	1,453.9	1.27	-1.22	
7,477.0	90.48	181.83	6,101.5	-1,543.8	-199.8	1,543.8	0.61	-0.56	
7,566.0	89.86	182.37	6,101.3	-1,632.7	-203.1	1,632.7	0.92	-0.70	
7,656.0	90.08	182.91	6,101.3	-1,722.6	-207.2	1,722.6	0.65	0.24	
7,745.0	88.60	180.80	6,102.3	-1,811.6	-210.1	1,811.6	2.90	-1.66	
7,835.0	89.13	180.23	6,104.1	-1,901.6	-210.9	1,901.6	0.86	0.59	
7,924.0	90.66	180.56	6,104.3	-1,990.6	-211.5	1,990.6	1.76	1.72	
8,014.0	90.82	180.04	6,103.1	-2,080.6	-212.0	2,080.6	0.60	0.18	
8,104.0	90.56	179.90	6,102.0	-2,170.5	-211.9	2,170.5	0.33	-0.29	
8,190.0	91.81	181.29	6,100.3	-2,256.5	-212.8	2,256.5	2.17	1.45	
8,280.0	91.31	182.08	6,097.8	-2,346.4	-215.5	2,346.4	1.04	-0.56	
8,370.0	90.37	181.38	6,096.5	-2,436.4	-218.2	2,436.4	1.30	-1.04	
8,460.0	89.84	181.42	6,096.3	-2,526.4	-220.4	2,526.4	0.59	-0.59	
8,549.0	90.30	181.76	6,096.2	-2,615.3	-222.9	2,615.3	0.64	0.52	
8,639.0	89.64	181.26	6,096.3	-2,705.3	-225.2	2,705.3	0.92	-0.73	
8,728.0	90.69	180.92	6,096.0	-2,794.3	-226.9	2,794.3	1.24	1.18	
8,818.0	90.19	181.18	6,095.3	-2,884.3	-228.6	2,884.3	0.63	-0.56	
8,910.0	90.45	180.65	6,094.8	-2,976.2	-230.0	2,976.2	0.64	0.28	
9,002.0	89.70	180.05	6,094.7	-3,068.2	-230.6	3,068.2	1.04	-0.82	
9,093.0	90.64	179.68	6,094.4	-3,159.2	-230.4	3,159.2	1.11	1.03	
9,186.0	89.93	180.20	6,093.9	-3,252.2	-230.3	3,252.2	0.95	-0.76	
9,279.0	92.36	180.15	6,092.1	-3,345.2	-230.6	3,345.2	2.61	2.61	
9,371.0	92.45	180.67	6,088.2	-3,437.1	-231.2	3,437.1	0.57	0.10	
9,463.0	91.80	180.48	6,084.8	-3,529.1	-232.2	3,529.1	0.74	-0.71	
9,555.0	90.83	181.02	6,082.7	-3,621.0	-233.4	3,621.0	1.21	-1.05	
9,646.0	90.30	181.76	6,081.8	-3,712.0	-235.6	3,712.0	1.00	-0.58	

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1304B
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Well:</b>	Razor Federal #12F-1304B	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
9,737.0	91.63	180.31	6,080.3	-3,803.0	-237.2	3,803.0	2.16	1.46	
9,829.0	91.75	180.42	6,077.6	-3,894.9	-237.8	3,894.9	0.18	0.13	
9,920.0	91.92	181.14	6,074.6	-3,985.9	-239.0	3,985.9	0.81	0.19	
10,011.0	89.80	178.86	6,073.3	-4,076.8	-239.0	4,076.8	3.42	-2.33	
10,103.0	89.97	180.52	6,073.5	-4,168.8	-238.5	4,168.8	1.81	0.18	
10,196.0	90.10	181.75	6,073.4	-4,261.8	-240.4	4,261.8	1.33	0.14	
10,288.0	89.41	177.93	6,073.8	-4,353.8	-240.1	4,353.8	4.22	-0.75	
10,380.0	90.54	177.39	6,073.8	-4,445.7	-236.4	4,445.7	1.36	1.23	
10,472.0	90.15	177.79	6,073.3	-4,537.6	-232.5	4,537.6	0.61	-0.42	
10,563.0	89.75	177.97	6,073.4	-4,628.6	-229.1	4,628.6	0.48	-0.44	
10,656.0	90.82	176.51	6,072.9	-4,721.5	-224.7	4,721.5	1.95	1.15	
10,748.0	90.43	175.72	6,071.9	-4,813.2	-218.4	4,813.2	0.96	-0.42	
10,840.0	89.90	174.93	6,071.6	-4,904.9	-210.9	4,904.9	1.03	-0.58	
10,931.0	91.80	177.90	6,070.3	-4,995.7	-205.2	4,995.7	3.87	2.09	
11,023.0	91.98	180.02	6,067.2	-5,087.7	-203.6	5,087.7	2.31	0.20	
11,115.0	90.91	183.65	6,064.9	-5,179.6	-206.5	5,179.6	4.11	-1.16	
11,207.0	89.16	183.85	6,064.9	-5,271.4	-212.5	5,271.4	1.91	-1.90	
11,298.0	88.29	180.44	6,066.9	-5,362.3	-215.9	5,362.3	3.87	-0.96	
11,390.0	87.73	179.98	6,070.1	-5,454.2	-216.3	5,454.2	0.79	-0.61	
11,483.0	87.96	179.47	6,073.6	-5,547.1	-215.8	5,547.1	0.60	0.25	
11,574.0	90.10	180.88	6,075.1	-5,638.1	-216.1	5,638.1	2.82	2.35	
11,667.0	88.88	180.31	6,076.0	-5,731.1	-217.1	5,731.1	1.45	-1.31	
11,759.0	90.31	180.71	6,076.6	-5,823.1	-217.9	5,823.1	1.61	1.55	
11,851.0	91.57	180.66	6,075.1	-5,915.1	-219.0	5,915.1	1.37	1.37	
11,943.0	91.70	181.06	6,072.5	-6,007.0	-220.4	6,007.0	0.46	0.14	
12,035.0	90.97	179.31	6,070.3	-6,099.0	-220.7	6,099.0	2.06	-0.79	
12,126.0	91.06	178.83	6,068.7	-6,190.0	-219.2	6,190.0	0.54	0.10	
12,219.0	91.05	178.58	6,067.0	-6,282.9	-217.1	6,282.9	0.27	-0.01	
12,310.0	90.83	177.75	6,065.5	-6,373.9	-214.2	6,373.9	0.94	-0.24	
12,403.0	91.05	177.56	6,064.0	-6,466.8	-210.4	6,466.8	0.31	0.24	
12,495.0	91.33	180.15	6,062.1	-6,558.7	-208.5	6,558.7	2.83	0.30	
12,588.0	91.24	180.28	6,060.0	-6,651.7	-208.9	6,651.7	0.17	-0.10	
12,680.0	91.81	181.36	6,057.5	-6,743.7	-210.2	6,743.7	1.33	0.62	
12,772.0	90.67	181.16	6,055.6	-6,835.6	-212.2	6,835.6	1.26	-1.24	
12,864.0	91.07	181.48	6,054.2	-6,927.6	-214.3	6,927.6	0.56	0.43	
12,956.0	89.24	181.15	6,053.9	-7,019.6	-216.5	7,019.6	2.02	-1.99	
13,048.0	88.82	180.59	6,055.5	-7,111.5	-217.8	7,111.5	0.76	-0.46	
13,139.0	89.08	180.75	6,057.1	-7,202.5	-218.9	7,202.5	0.34	0.29	
13,231.0	89.00	180.79	6,058.7	-7,294.5	-220.1	7,294.5	0.10	-0.09	
13,323.0	89.88	179.97	6,059.6	-7,386.5	-220.8	7,386.5	1.31	0.96	
13,414.0	89.71	179.43	6,059.9	-7,477.5	-220.3	7,477.5	0.62	-0.19	
13,507.0	91.38	179.48	6,059.0	-7,570.5	-219.4	7,570.5	1.80	1.80	
13,599.0	91.67	179.18	6,056.6	-7,662.4	-218.3	7,662.4	0.45	0.32	
13,691.0	89.85	178.33	6,055.3	-7,754.4	-216.3	7,754.4	2.18	-1.98	
13,749.0	90.23	177.97	6,055.3	-7,812.4	-214.4	7,812.4	0.90	0.66	
13,830.0	90.97	177.18	6,054.5	-7,893.3	-211.0	7,893.3	1.34	0.91	
13,921.0	89.98	175.70	6,053.7	-7,984.1	-205.4	7,984.1	1.96	-1.09	
14,013.0	89.94	176.66	6,053.8	-8,075.9	-199.2	8,075.9	1.04	-0.04	
14,104.0	89.84	176.43	6,053.9	-8,166.7	-193.8	8,166.7	0.28	-0.11	LAST CES SURVEY @ 14,104' MD
14,175.0	89.84	176.43	6,054.1	-8,237.6	-189.3	8,237.6	0.00	0.00	PTB @ 14,175' MD - (103' FSL & 1182' FWL)

## Survey Report

<b>Company:</b>	Whiting Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12F-1304B
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Site:</b>	S12-T10N-R58W	<b>MD Reference:</b>	18' KB @ 4954.8usft (XTR 18)
<b>Well:</b>	Razor Federal #12F-1304B	<b>North Reference:</b>	True
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

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
Razor #12-1304B PBHL - actual wellpath misses target center by 156.0usft at 14175.0usft MD (6054.1 TVD, -8237.6 N, -189.3 E) - Point	0.00	0.00	5,900.0	-8,242.2	-212.9	1,550,295.04	3,465,218.69	40.831833	-103.818808
Razor #12-1304B PBHL - actual wellpath misses target center by 79.8usft at 14175.0usft MD (6054.1 TVD, -8237.6 N, -189.3 E) - Point	0.00	0.00	5,978.0	-8,242.2	-212.9	1,550,295.04	3,465,218.69	40.831833	-103.818808
Razor #12-1304B PBHL - actual wellpath misses target center by 144.2usft at 14175.0usft MD (6054.1 TVD, -8237.6 N, -189.3 E) - Point	0.00	0.00	5,912.0	-8,242.2	-212.9	1,550,295.04	3,465,218.69	40.831833	-103.818808
Razor #12-1304B PBHL - actual wellpath misses target center by 49.1usft at 14175.0usft MD (6054.1 TVD, -8237.6 N, -189.3 E) - Point	0.00	0.00	6,097.0	-8,242.2	-212.9	1,550,295.04	3,465,218.69	40.831833	-103.818808

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
6,489.1	6,126.3	7" (1227' FWL & 2476' FSL)		0	0

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
14,104.0	6,053.9	-8,166.7	-193.8	LAST CES SURVEY @ 14,104' MD	
14,175.0	6,054.1	-8,237.6	-189.3	PTB @ 14,175' MD	
14,175.0	6,054.1	-8,237.6	-189.3	(103' FSL & 1182' FWL)	

Checked By: _____	Approved By: _____	Date: _____
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