

Whiting Oil and Gas Corporation

Weld County, CO

Sec. 26-T10N-R58W

Razor #26K-3508B

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

09 April, 2014

Well Coordinates: 1,541,855.05 N, 3,461,093.27 E (40° 48' 31.99" N, 103° 50' 03.43" W)

Ground Level: 4,737.50 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Razor #26K-3508B

KB 22 ft @ 4759.50usft (Frontier 26)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Razor #26K-3508B - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170.00	0.33	177.82	170.00	-0.49	0.02	0.49	0.19
Sperry First Survey							
261.00	0.18	202.76	261.00	-0.88	-0.03	0.88	0.20
352.00	0.12	231.43	352.00	-1.07	-0.16	1.06	0.10
443.00	0.38	208.23	443.00	-1.40	-0.37	1.36	0.30
535.00	0.08	174.20	535.00	-1.73	-0.51	1.68	0.34
626.00	0.91	164.17	625.99	-2.49	-0.31	2.45	0.91
718.00	0.76	136.50	717.98	-3.64	0.31	3.65	0.46
808.00	0.61	119.59	807.98	-4.31	1.14	4.39	0.28
900.00	0.29	156.58	899.97	-4.76	1.66	4.89	0.45
992.00	0.30	186.56	991.97	-5.21	1.72	5.35	0.17
1,083.00	1.21	140.84	1,082.96	-6.20	2.30	6.38	1.12
1,175.00	1.73	145.88	1,174.93	-8.10	3.69	8.40	0.58
1,266.00	2.80	150.95	1,265.86	-11.18	5.54	11.64	1.20
1,358.00	2.74	144.14	1,357.75	-14.93	7.92	15.59	0.36
1,450.00	3.07	142.81	1,449.64	-18.67	10.70	19.57	0.37
1,511.00	3.18	143.03	1,510.54	-21.32	12.71	22.39	0.18
1,637.00	3.25	138.38	1,636.35	-26.79	17.18	28.24	0.21
1,728.00	3.10	137.52	1,727.21	-30.53	20.55	32.27	0.17
1,819.00	2.93	130.52	1,818.08	-33.85	23.98	35.90	0.45
1,911.00	5.54	138.35	1,909.82	-38.70	28.72	41.16	2.90
2,003.00	4.95	133.67	2,001.44	-44.76	34.55	47.72	0.79
2,094.00	4.80	135.69	2,092.11	-50.20	40.05	53.64	0.25
2,185.00	4.74	163.34	2,182.81	-56.52	43.78	60.28	2.50
2,276.00	4.84	161.31	2,273.49	-63.76	46.09	67.70	0.22
2,367.00	3.82	161.04	2,364.23	-70.27	48.31	74.38	1.12
2,459.00	4.35	159.68	2,455.99	-76.44	50.51	80.72	0.59
2,551.00	4.69	158.36	2,547.71	-83.20	53.11	87.70	0.39
2,642.00	4.80	155.98	2,638.39	-90.14	56.03	94.87	0.25
2,734.00	4.85	154.19	2,730.07	-97.16	59.29	102.16	0.17
2,825.00	4.60	146.31	2,820.76	-103.66	62.99	108.97	0.76
2,917.00	3.81	160.75	2,912.51	-109.61	66.05	115.17	1.43
3,008.00	3.07	165.18	3,003.35	-114.82	67.67	120.51	0.86
3,100.00	3.36	173.63	3,095.21	-119.88	68.60	125.64	0.60
3,190.00	3.62	167.81	3,185.04	-125.28	69.49	131.09	0.49
3,282.00	3.52	169.99	3,276.86	-130.90	70.59	136.79	0.18
3,374.00	3.93	167.01	3,368.67	-136.75	71.79	142.73	0.49
3,465.00	3.77	168.68	3,459.46	-142.73	73.08	148.79	0.21
3,557.00	3.77	164.46	3,551.26	-148.61	74.49	154.78	0.30
3,649.00	3.55	165.98	3,643.07	-154.28	75.99	160.57	0.26
3,740.00	2.90	168.02	3,733.93	-159.27	77.15	165.64	0.73
3,832.00	2.45	150.34	3,825.83	-163.25	78.60	169.74	1.02
3,924.00	3.64	124.73	3,917.70	-166.63	81.98	173.41	1.93
4,015.00	3.21	129.37	4,008.54	-169.89	86.32	177.05	0.56
4,107.00	4.34	129.96	4,100.34	-173.76	90.98	181.33	1.23
4,199.00	3.89	127.38	4,192.10	-177.89	96.13	185.91	0.53
4,291.00	3.61	131.31	4,283.90	-181.70	100.78	190.13	0.41
4,382.00	3.13	131.75	4,374.75	-185.24	104.79	194.02	0.53
4,473.00	4.60	142.65	4,465.54	-189.80	108.86	198.93	1.80

Design Report for Razor #26K-3508B - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,564.00	3.50	143.23	4,556.31	-194.92	112.73	204.39	1.21
4,656.00	2.69	141.02	4,648.18	-198.85	115.77	208.57	0.89
4,747.00	4.44	154.97	4,739.00	-203.70	118.61	213.67	2.13
4,838.00	3.97	153.06	4,829.75	-209.70	121.52	219.91	0.54
4,929.00	3.78	149.83	4,920.54	-215.10	124.46	225.55	0.32
5,025.00	3.15	146.28	5,016.37	-220.03	127.51	230.74	0.69
5,120.00	2.51	139.74	5,111.25	-223.79	130.31	234.74	0.75
5,151.00	4.32	143.97	5,142.20	-225.25	131.43	236.30	5.89
5,183.00	7.73	145.32	5,174.01	-228.00	133.37	239.21	10.66
5,214.00	11.14	140.84	5,204.59	-232.04	136.44	243.51	11.24
5,246.00	14.95	141.60	5,235.76	-237.67	140.96	249.53	11.92
5,278.00	18.08	141.28	5,266.44	-244.78	146.63	257.13	9.79
5,309.00	21.34	144.98	5,295.62	-253.16	152.88	266.04	11.26
5,341.00	24.58	147.99	5,325.08	-263.57	159.75	277.04	10.77
5,373.00	26.13	155.23	5,354.00	-275.62	166.23	289.62	10.82
5,404.00	28.95	154.47	5,381.49	-288.59	172.33	303.09	9.17
5,436.00	32.55	153.84	5,408.98	-303.31	179.46	318.40	11.29
5,468.00	35.82	152.11	5,435.45	-319.32	187.64	335.09	10.66
5,499.00	39.60	151.41	5,459.97	-336.02	196.62	352.54	12.27
5,531.00	42.93	152.37	5,484.02	-354.63	206.55	371.98	10.59
5,563.00	44.98	154.90	5,507.06	-374.53	216.41	392.70	8.43
5,594.00	48.99	154.88	5,528.20	-395.05	226.02	414.01	12.94
5,626.00	51.84	155.60	5,548.59	-417.44	236.35	437.25	9.07
5,658.00	53.88	153.27	5,567.91	-440.45	247.36	461.16	8.62
5,689.00	57.77	152.49	5,585.32	-463.27	259.05	484.95	12.72
5,721.00	62.11	150.49	5,601.35	-487.60	272.28	510.38	14.60
5,752.00	65.52	149.64	5,615.03	-511.70	286.16	535.65	11.27
5,784.00	69.65	149.14	5,627.23	-537.15	301.22	562.37	12.99
5,816.00	70.01	149.13	5,638.26	-562.93	316.63	589.45	1.13
5,848.00	72.22	150.63	5,648.62	-589.12	331.82	616.91	8.21
5,879.00	76.28	152.60	5,657.03	-615.37	346.00	644.34	14.45
5,911.00	81.43	154.10	5,663.22	-643.42	360.07	673.56	16.74
5,944.00	86.34	153.80	5,666.73	-672.89	374.48	704.22	14.91
6,054.00	90.71	153.40	5,669.56	-771.36	423.36	806.74	3.99
6,117.00	90.65	154.29	5,668.81	-827.90	451.13	865.58	1.42
6,212.00	91.26	156.29	5,667.23	-914.19	490.83	955.12	2.20
6,308.00	91.54	159.05	5,664.88	-1,002.95	527.29	1,046.84	2.89
6,403.00	92.04	161.37	5,661.92	-1,092.29	559.44	1,138.74	2.50
6,497.00	90.96	163.41	5,659.45	-1,181.85	587.87	1,230.52	2.45
6,592.00	90.31	165.22	5,658.40	-1,273.30	613.55	1,323.93	2.02
6,687.00	90.62	169.93	5,657.63	-1,366.05	633.98	1,418.15	4.97
6,781.00	90.34	172.81	5,656.84	-1,458.97	648.08	1,511.97	3.08
6,876.00	90.43	175.48	5,656.20	-1,553.47	657.77	1,606.95	2.81
6,971.00	90.65	176.68	5,655.31	-1,648.24	664.27	1,701.92	1.28
7,066.00	89.54	179.10	5,655.15	-1,743.17	667.76	1,796.77	2.80
7,161.00	87.16	179.86	5,657.89	-1,838.11	668.63	1,891.41	2.63
7,256.00	89.60	183.46	5,660.57	-1,933.01	665.87	1,985.66	4.58
7,351.00	91.85	183.01	5,659.37	-2,027.85	660.51	2,079.61	2.42
7,446.00	91.26	182.35	5,656.79	-2,122.71	656.07	2,173.67	0.93
7,541.00	89.63	181.67	5,656.05	-2,217.64	652.74	2,267.91	1.86
7,635.00	89.32	181.24	5,656.92	-2,311.61	650.36	2,361.27	0.56

Design Report for Razor #26K-3508B - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,727.00	90.25	181.41	5,657.26	-2,403.58	648.23	2,452.66	1.03
7,818.00	87.87	179.10	5,658.75	-2,494.56	647.82	2,543.22	3.64
7,909.00	89.04	179.35	5,661.21	-2,585.51	649.05	2,633.91	1.31
8,001.00	90.99	177.89	5,661.18	-2,677.48	651.27	2,725.70	2.65
8,092.00	92.84	179.23	5,658.14	-2,768.39	653.55	2,816.44	2.51
8,183.00	93.12	179.13	5,653.41	-2,859.26	654.85	2,907.05	0.33
8,244.00	92.19	179.20	5,650.59	-2,920.19	655.74	2,967.80	1.53
8,305.00	90.22	179.25	5,649.30	-2,981.17	656.57	3,028.60	3.23
8,366.00	89.69	180.88	5,649.35	-3,042.17	656.50	3,089.34	2.81
8,457.00	87.16	179.76	5,651.85	-3,133.12	655.99	3,179.87	3.04
8,549.00	88.80	180.04	5,655.10	-3,225.06	656.15	3,271.44	1.81
8,641.00	90.55	179.97	5,655.62	-3,317.06	656.14	3,363.05	1.90
8,732.00	89.88	181.34	5,655.28	-3,408.05	655.10	3,453.57	1.68
8,824.00	87.87	181.48	5,657.08	-3,500.00	652.84	3,544.93	2.19
8,915.00	88.40	181.55	5,660.04	-3,590.92	650.43	3,635.25	0.59
9,007.00	89.97	182.12	5,661.35	-3,682.86	647.49	3,726.54	1.82
9,098.00	88.67	179.93	5,662.43	-3,773.83	645.86	3,816.99	2.80
9,189.00	89.04	179.69	5,664.25	-3,864.81	646.16	3,907.62	0.48
9,281.00	89.29	179.68	5,665.59	-3,956.80	646.67	3,999.27	0.27
9,372.00	88.89	182.16	5,667.04	-4,047.77	645.21	4,089.73	2.76
9,464.00	90.40	182.97	5,667.61	-4,139.67	641.09	4,180.87	1.86
9,555.00	89.91	181.78	5,667.36	-4,230.59	637.32	4,271.07	1.41
9,646.00	88.12	180.71	5,668.92	-4,321.55	635.34	4,361.47	2.29
9,738.00	88.52	180.28	5,671.62	-4,413.51	634.55	4,452.97	0.64
9,828.00	90.62	182.99	5,672.30	-4,503.45	631.98	4,542.31	3.81
9,920.00	88.21	177.85	5,673.24	-4,595.41	631.31	4,633.82	6.17
10,012.00	90.52	179.40	5,674.26	-4,687.37	633.51	4,725.60	3.02
10,103.00	91.14	177.89	5,672.94	-4,778.33	635.66	4,816.38	1.79
10,195.00	90.86	177.30	5,671.33	-4,870.23	639.52	4,908.25	0.71
10,256.00	90.83	177.04	5,670.43	-4,931.15	642.54	4,969.19	0.43
10,317.00	90.37	175.70	5,669.79	-4,992.02	646.40	5,030.16	2.32
10,378.00	88.21	176.41	5,670.55	-5,052.87	650.59	5,091.14	3.73
10,439.00	86.14	177.21	5,673.56	-5,113.70	653.98	5,152.02	3.64
10,500.00	86.64	177.63	5,677.40	-5,174.52	656.72	5,212.84	1.07
10,561.00	87.87	179.66	5,680.32	-5,235.42	658.16	5,273.62	3.89
10,652.00	89.08	178.87	5,682.74	-5,326.38	659.33	5,364.31	1.59
10,743.00	90.28	179.06	5,683.25	-5,417.36	660.97	5,455.06	1.34
10,835.00	89.01	181.39	5,683.82	-5,509.35	660.61	5,546.63	2.88
10,926.00	91.26	182.11	5,683.60	-5,600.30	657.84	5,636.95	2.60
11,018.00	89.66	181.24	5,682.87	-5,692.26	655.15	5,728.28	1.98
11,110.00	88.89	180.13	5,684.03	-5,784.24	654.05	5,819.78	1.47
11,202.00	88.18	179.27	5,686.38	-5,876.21	654.53	5,911.41	1.21
11,293.00	88.89	179.95	5,688.71	-5,967.18	655.15	6,002.05	1.08
11,385.00	91.36	180.37	5,688.51	-6,059.17	654.89	6,093.64	2.72
11,476.00	89.94	180.24	5,687.48	-6,150.16	654.41	6,184.21	1.57
11,568.00	91.14	183.53	5,686.61	-6,242.09	651.38	6,275.48	3.81
11,660.00	88.74	182.00	5,686.71	-6,333.97	646.94	6,366.58	3.09
11,752.00	91.51	182.96	5,686.50	-6,425.88	642.96	6,457.73	3.19
11,843.00	89.94	180.29	5,685.35	-6,516.82	640.38	6,548.07	3.40
11,934.00	91.14	182.07	5,684.50	-6,607.79	638.51	6,638.49	2.36

Design Report for Razor #26K-3508B - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,026.00	90.59	177.93	5,683.11	-6,699.76	638.51	6,730.07	4.54
12,117.00	90.89	178.58	5,681.93	-6,790.71	641.28	6,820.90	0.79
12,208.00	91.76	178.73	5,679.83	-6,881.66	643.42	6,911.66	0.97
12,303.00	89.23	178.54	5,679.01	-6,976.62	645.68	7,006.44	2.67
12,366.00	90.37	178.08	5,679.23	-7,039.60	647.54	7,069.31	1.95
Straight Line Projection							
12,415.00	90.37	178.08	5,678.91	-7,088.57	649.18	7,118.23	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
170.00	170.00	-0.49	0.02	Sperry First Survey
12,366.00	5,679.23	-7,039.60	647.54	Straight Line Projection

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Razor 26K-3508B WP6	174.77	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
170.00	1,511.00	Surface_Sperry MWD Surveys	MWD+IFR1+MS+sag
1,637.00	5,944.00	Vertical and Build_Sperry MWD Surveys	MWD+IFR1+MS+sag
6,054.00	12,366.00	Lateral_Sperry MWD Surveys	MWD+IFR1+MS+sag

Design Report for Razor #26K-3508B - Actual Field Surveys**Wellbore 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 26K-3508B W - actual wellpath misses target center by 1.98usft at 8980.06usft MD (5661.23 TVD, -3655.93 N, 648.45 E) - Point	0.00	0.00	5,660.00	-3,656.00	650.00	1,538,211.89	3,461,811.83	40° 47' 55.865 N	103° 49' 54.978 W
Razor 26K-3508B W - actual wellpath misses target center by 14.96usft at 7272.74usft MD (5660.63 TVD, -1949.72 N, 664.88 E) - Point	0.00	0.00	5,662.00	-1,948.90	650.00	1,539,918.69	3,461,779.76	40° 48' 12.732 N	103° 49' 54.977 W
Razor 26K-3508B W - actual wellpath misses target center by 10.78usft at 6463.53usft MD (5660.13 TVD, -1149.84 N, 578.11 E) - Point	0.00	0.00	5,662.00	-1,153.10	568.00	1,540,712.82	3,461,682.83	40° 48' 20.596 N	103° 49' 56.043 W
Razor 26K-3508B R - actual wellpath misses target center by 17.69usft at 12415.00usft MD (5678.91 TVD, -7088.57 N, 649.18 E) - Point	0.00	0.00	5,667.00	-7,101.62	650.00	1,534,766.86	3,461,876.55	40° 47' 21.818 N	103° 49' 54.979 W
Razor 26K-3508B W - actual wellpath misses target center by 16.38usft at 10085.51usft MD (5673.27 TVD, -4760.86 N, 635.06 E) - Point	0.00	0.00	5,680.00	-4,760.60	650.00	1,537,107.48	3,461,832.58	40° 47' 44.950 N	103° 49' 54.978 W
Razor 26K-3508B W - actual wellpath misses target center by 15.38usft at 12415.00usft MD (5678.91 TVD, -7088.57 N, 649.18 E) - Point	0.00	0.00	5,687.00	-7,101.62	650.00	1,534,766.86	3,461,876.55	40° 47' 21.818 N	103° 49' 54.979 W
Razor 26K-3508B W - actual wellpath misses target center by 7.55usft at 11090.68usft MD (5683.68 TVD, -5764.93 N, 654.13 E) - Point	0.00	0.00	5,690.00	-5,764.80	650.00	1,536,103.45	3,461,851.44	40° 47' 35.028 N	103° 49' 54.979 W

Directional Difficulty Index

Average Dogleg over Survey:	2.18 °/100usft	Maximum Dogleg over Survey:	16.74 °/100usft at 5,911.00 usft
Net Tortousity applicable to Plans:	0.90 °/100usft	Directional Difficulty Index:	6.631

Audit Info

North Reference Sheet for Sec. 26-T10N-R58W - Razor #26K-3508B - Plan C

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to KB 22 ft @ 4759.50usft (Frontier 26). Northing and Easting are relative to Razor #26K-3508B

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 1.00000425

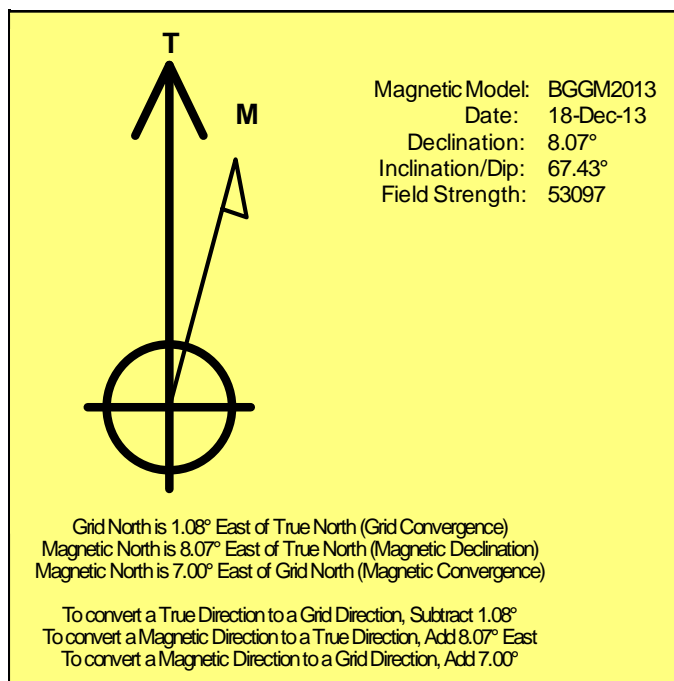
Grid Coordinates of Well: 1,541,855.05 usft N, 3,461,093.27 usft E

Geographical Coordinates of Well: 40° 48' 31.99" N, 103° 50' 03.43" W

Grid Convergence at Surface is: 1.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,415.00usft
the Bottom Hole Displacement is 7,118.23usft in the Direction of 174.77° (True).

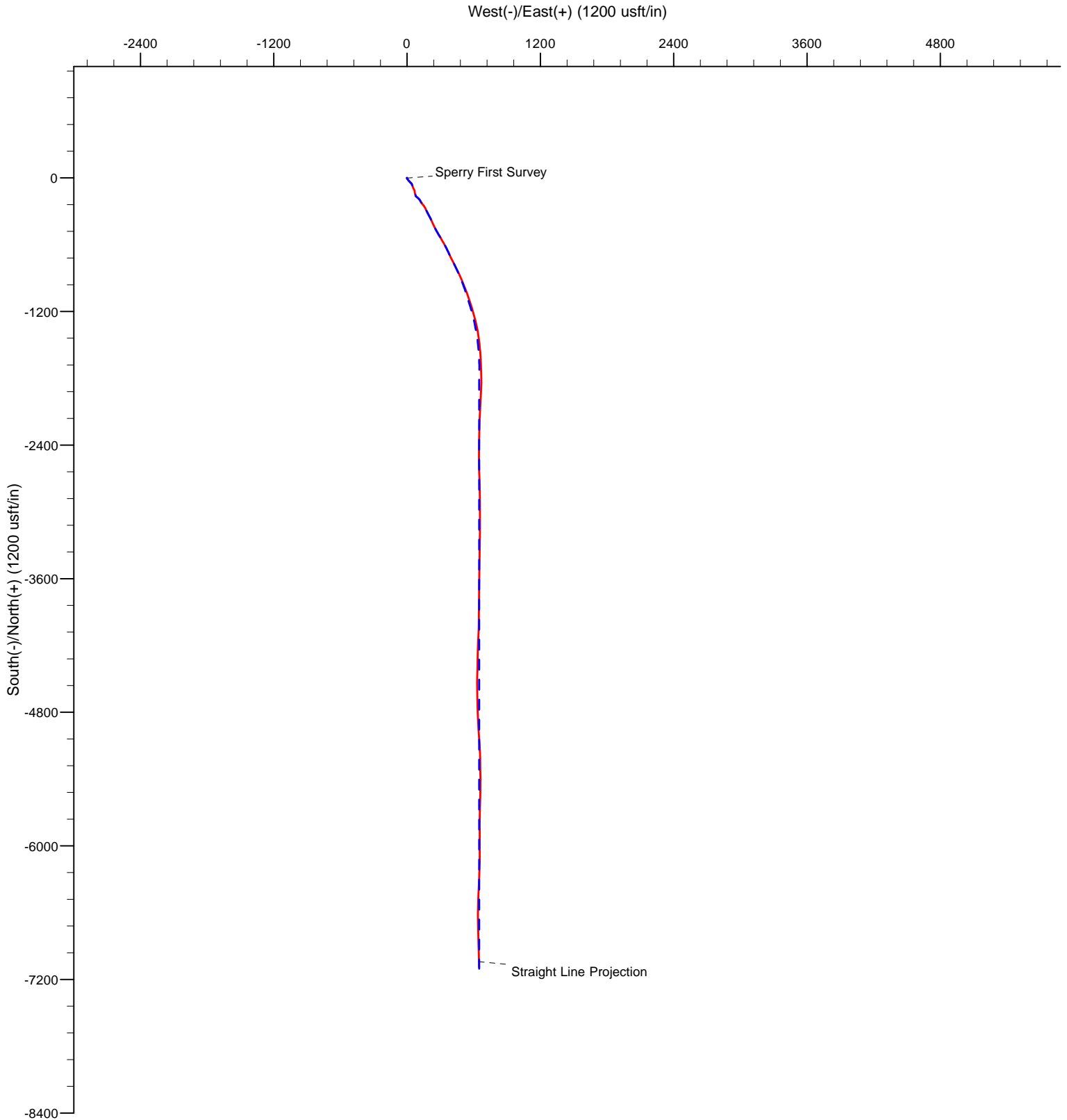
Magnetic Convergence at surface is: -7.00° (18 December 2013, , BGGM2013)



Whiting Oil and Gas Corporation

LEGEND

- Razor #26K-3508B, Plan C, Actual Field Surveys V0
- Rev C0



LEGEND

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- Rev C0

