

# Whiting Oil and Gas Corporation

Weld County, CO

Sec. 26-T10N-R58W

Razor #26I-2314B

Plan C

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

01 July, 2014

Well Coordinates: 1,541,695.08 N, 3,463,608.97 E (40° 48' 29.94" N, 103° 49' 30.76" W)

Ground Level: 4,712.00 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 #26I-2314B

KB 21' @ 4733.00usft (Frontier 26)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**

**Design Report for Razor #26I-2314B - 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	0.26	304.34	170.00	0.22	-0.32	0.23	0.15
262.00	0.21	323.97	262.00	0.47	-0.59	0.49	0.10
352.00	0.49	313.02	352.00	0.87	-0.97	0.89	0.32
443.00	0.31	231.84	443.00	0.98	-1.45	1.02	0.59
535.00	1.30	214.73	534.99	-0.03	-2.24	0.02	1.10
626.00	1.84	194.07	625.95	-2.30	-3.18	-2.22	0.85
717.00	2.92	185.01	716.87	-6.02	-3.74	-5.93	1.25
808.00	4.07	184.92	807.70	-11.55	-4.22	-11.44	1.26
899.00	4.28	181.52	898.46	-18.16	-4.58	-18.04	0.36
990.00	3.56	180.58	989.25	-24.38	-4.70	-24.26	0.79
1,082.00	4.48	183.62	1,081.02	-30.82	-4.96	-30.69	1.03
1,173.00	4.76	177.16	1,171.72	-38.14	-5.00	-38.01	0.65
1,265.00	5.04	178.66	1,263.39	-45.99	-4.71	-45.86	0.33
1,356.00	5.00	184.97	1,354.04	-53.94	-4.96	-53.80	0.61
1,448.00	4.56	180.46	1,445.72	-61.59	-5.34	-61.44	0.63
1,532.00	4.12	178.42	1,529.48	-67.95	-5.28	-67.80	0.56
1,635.00	4.76	171.08	1,632.17	-75.87	-4.52	-75.73	0.83
1,727.00	5.06	168.01	1,723.83	-83.61	-3.08	-83.51	0.43
1,817.00	4.81	161.25	1,813.50	-91.06	-1.05	-91.01	0.70
1,909.00	5.82	172.18	1,905.10	-99.34	0.83	-99.33	1.55
2,000.00	6.16	186.12	1,995.61	-108.76	0.94	-108.75	1.64
2,091.00	5.96	187.80	2,086.10	-118.30	-0.23	-118.26	0.29
2,182.00	5.20	175.12	2,176.68	-127.09	-0.52	-127.04	1.59
2,274.00	3.84	189.50	2,268.39	-134.28	-0.67	-134.22	1.91
2,365.00	3.47	199.51	2,359.21	-139.88	-2.09	-139.79	0.81
2,457.00	3.65	198.47	2,451.03	-145.28	-3.95	-145.14	0.21
2,549.00	3.90	204.44	2,542.83	-150.91	-6.17	-150.71	0.51
2,640.00	2.08	180.52	2,633.70	-155.38	-7.47	-155.15	2.38
2,731.00	2.27	186.46	2,724.64	-158.82	-7.69	-158.58	0.32
2,822.00	3.50	151.95	2,815.53	-163.06	-6.58	-162.85	2.28
2,914.00	3.72	154.18	2,907.35	-168.23	-3.96	-168.08	0.28
3,005.00	3.33	161.05	2,998.17	-173.39	-1.82	-173.29	0.63
3,096.00	3.19	157.76	3,089.03	-178.23	0.00	-178.18	0.26
3,188.00	3.75	163.46	3,180.86	-183.48	1.82	-183.47	0.71
3,280.00	4.50	166.82	3,272.62	-189.88	3.50	-189.91	0.86
3,371.00	4.87	168.71	3,363.31	-197.15	5.07	-197.21	0.44
3,463.00	4.21	173.00	3,455.03	-204.33	6.25	-204.42	0.81
3,555.00	4.62	171.42	3,546.75	-211.34	7.21	-211.46	0.46
3,646.00	3.93	176.86	3,637.50	-218.08	7.93	-218.21	0.88
3,738.00	3.09	186.93	3,729.33	-223.69	7.81	-223.81	1.13
3,830.00	2.61	194.11	3,821.21	-228.18	7.00	-228.29	0.65
3,921.00	3.74	169.82	3,912.08	-233.11	7.02	-233.22	1.90
4,013.00	3.28	165.77	4,003.90	-238.62	8.19	-238.75	0.57
4,104.00	3.22	160.98	4,094.76	-243.56	9.67	-243.72	0.31
4,194.00	3.25	172.13	4,184.61	-248.47	10.84	-248.67	0.70
4,286.00	2.93	168.69	4,276.48	-253.36	11.66	-253.57	0.40
4,377.00	3.46	177.73	4,367.34	-258.39	12.22	-258.61	0.80
4,469.00	2.58	183.42	4,459.21	-263.23	12.21	-263.45	1.01
4,560.00	3.79	157.19	4,550.07	-268.05	13.25	-268.29	2.05

**Design Report for Razor #26I-2314B - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,651.00	3.68	144.54	4,640.88	-273.20	16.11	-273.51	0.91
4,746.00	3.75	158.97	4,735.68	-278.58	19.00	-278.96	0.98
4,841.00	4.10	193.24	4,830.47	-284.79	19.33	-285.18	2.46
4,936.00	1.62	184.47	4,925.35	-289.43	18.45	-289.80	2.64
5,030.00	1.42	164.07	5,019.32	-291.88	18.67	-292.25	0.61
5,062.00	1.47	157.48	5,051.31	-292.64	18.93	-293.02	0.54
5,094.00	0.71	10.85	5,083.30	-292.82	19.13	-293.20	6.56
5,125.00	5.60	348.23	5,114.25	-291.15	18.85	-291.53	15.97
5,157.00	9.27	345.38	5,145.97	-287.13	17.88	-287.48	11.52
5,189.00	12.21	342.58	5,177.41	-281.40	16.22	-281.72	9.33
5,220.00	14.88	337.70	5,207.55	-274.59	13.73	-274.85	9.36
5,252.00	18.27	335.20	5,238.21	-266.23	10.06	-266.40	10.82
5,284.00	22.58	336.76	5,268.19	-256.03	5.53	-256.09	13.57
5,315.00	26.84	337.89	5,296.35	-244.07	0.55	-244.01	13.83
5,347.00	30.45	336.45	5,324.43	-229.94	-5.41	-229.74	11.48
5,378.00	34.65	335.91	5,350.55	-214.69	-12.15	-214.32	13.58
5,410.00	38.13	334.08	5,376.31	-197.49	-20.18	-196.94	11.39
5,442.00	41.88	335.33	5,400.82	-178.90	-28.96	-178.13	11.98
5,473.00	44.68	338.13	5,423.38	-159.37	-37.35	-158.40	10.95
5,505.00	48.08	338.45	5,445.46	-137.85	-45.91	-136.68	10.65
5,537.00	51.31	341.74	5,466.16	-114.91	-54.20	-113.54	12.78
5,568.00	53.99	345.20	5,484.97	-91.29	-61.20	-89.75	12.39
5,600.00	56.38	347.96	5,503.24	-65.74	-67.28	-64.06	10.29
5,631.00	58.24	346.67	5,519.98	-40.29	-73.02	-38.48	6.95
5,663.00	61.99	347.73	5,535.92	-13.24	-79.16	-11.28	12.07
5,695.00	63.76	347.78	5,550.51	14.59	-85.20	16.69	5.53
5,726.00	65.12	347.32	5,563.89	41.90	-91.23	44.14	4.59
5,758.00	67.56	348.60	5,576.73	70.56	-97.34	72.94	8.46
5,790.00	69.96	348.68	5,588.32	99.80	-103.21	102.32	7.50
5,821.00	72.34	348.55	5,598.33	128.56	-109.00	131.21	7.69
5,853.00	75.42	347.99	5,607.22	158.66	-115.25	161.45	9.77
5,885.00	79.10	346.53	5,614.27	189.10	-122.14	192.05	12.33
5,916.00	80.69	346.32	5,619.71	218.76	-129.30	221.88	5.17
5,948.00	82.77	346.67	5,624.32	249.55	-136.69	252.85	6.59
5,980.00	86.12	345.58	5,627.41	280.47	-144.33	283.94	11.00
5,994.00	87.35	345.24	5,628.21	293.99	-147.85	297.55	9.11
6,106.00	90.52	344.37	5,630.29	402.04	-177.20	406.29	2.93
6,201.00	90.40	346.83	5,629.53	494.05	-200.82	498.85	2.59
6,296.00	88.77	348.28	5,630.22	586.81	-221.29	592.09	2.30
6,391.00	90.74	350.71	5,630.62	680.20	-238.61	685.88	3.29
6,486.00	91.14	353.77	5,629.06	774.31	-251.44	780.27	3.25
6,581.00	91.77	357.33	5,626.65	868.98	-258.80	875.09	3.80
6,676.00	90.49	358.48	5,624.78	963.89	-262.28	970.07	1.81
6,771.00	89.69	1.24	5,624.63	1,058.88	-262.51	1,065.03	3.02
6,866.00	89.29	2.66	5,625.47	1,153.82	-259.28	1,159.86	1.55
6,961.00	91.36	4.59	5,624.94	1,248.62	-253.27	1,254.48	2.98
7,056.00	90.20	4.04	5,623.64	1,343.34	-246.12	1,349.00	1.35
7,151.00	89.72	5.24	5,623.71	1,438.03	-238.44	1,443.47	1.36
7,246.00	90.22	5.43	5,623.76	1,532.61	-229.61	1,537.81	0.56
7,341.00	89.52	4.40	5,623.97	1,627.26	-221.47	1,632.23	1.31

**Design Report for Razor #26I-2314B - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,436.00	87.13	1.87	5,626.75	1,722.06	-216.27	1,726.87	3.66
7,530.00	89.00	359.87	5,629.92	1,815.99	-214.85	1,820.74	2.91
7,625.00	89.89	358.45	5,630.84	1,910.97	-216.24	1,915.72	1.76
7,720.00	88.86	358.97	5,631.88	2,005.94	-218.38	2,010.72	1.21
7,815.00	91.14	359.04	5,631.88	2,100.92	-220.03	2,105.71	2.40
7,910.00	90.59	1.35	5,630.45	2,195.90	-219.70	2,200.65	2.50
8,005.00	90.15	0.92	5,629.83	2,290.88	-217.82	2,295.56	0.65
8,100.00	90.57	0.26	5,629.24	2,385.87	-216.84	2,390.50	0.82
8,163.00	89.42	0.21	5,629.24	2,448.87	-216.59	2,453.47	1.83
8,289.00	88.10	4.33	5,631.97	2,574.71	-211.60	2,579.15	3.43
8,385.00	88.80	4.07	5,634.57	2,670.42	-204.57	2,674.65	0.78
8,479.00	88.56	2.12	5,636.73	2,764.25	-199.50	2,768.33	2.09
8,574.00	88.62	359.78	5,639.07	2,859.21	-197.92	2,863.22	2.46
8,669.00	89.91	359.71	5,640.29	2,954.20	-198.35	2,958.19	1.36
8,764.00	91.97	0.02	5,638.73	3,049.18	-198.57	3,053.15	2.19
8,859.00	90.84	358.62	5,636.40	3,144.14	-199.70	3,148.11	1.89
8,954.00	90.03	358.19	5,635.68	3,239.10	-202.34	3,243.10	0.97
9,045.00	90.07	359.56	5,635.60	3,330.08	-204.13	3,334.10	1.51
9,136.00	89.94	359.55	5,635.59	3,421.07	-204.83	3,425.09	0.14
9,227.00	88.86	359.16	5,636.55	3,512.06	-205.86	3,516.07	1.26
9,318.00	90.77	358.28	5,636.84	3,603.03	-207.89	3,607.06	2.31
9,410.00	90.96	0.59	5,635.45	3,695.01	-208.80	3,699.04	2.52
9,501.00	90.83	0.65	5,634.03	3,786.00	-207.81	3,789.97	0.16
9,591.00	90.31	2.35	5,633.13	3,875.96	-205.46	3,879.85	1.98
9,683.00	89.17	1.80	5,633.55	3,967.89	-202.13	3,971.67	1.38
9,774.00	89.48	1.02	5,634.62	4,058.86	-199.89	4,062.55	0.92
9,865.00	89.45	359.47	5,635.47	4,149.85	-199.50	4,153.51	1.70
9,957.00	89.57	0.31	5,636.26	4,241.85	-199.68	4,245.48	0.92
10,048.00	89.80	2.19	5,636.76	4,332.82	-197.69	4,336.38	2.08
10,139.00	89.60	1.38	5,637.24	4,423.77	-194.86	4,427.23	0.92
10,231.00	89.69	359.79	5,637.81	4,515.76	-193.92	4,519.17	1.73
10,323.00	88.25	359.39	5,639.46	4,607.74	-194.57	4,611.14	1.62
10,414.00	90.46	0.65	5,640.48	4,698.73	-194.54	4,702.10	2.80
10,505.00	89.42	359.51	5,640.58	4,789.73	-194.42	4,793.07	1.70
10,597.00	89.78	358.52	5,641.22	4,881.71	-196.00	4,885.06	1.14
10,688.00	89.29	359.35	5,641.96	4,972.69	-197.69	4,976.05	1.06
10,779.00	91.39	0.54	5,641.42	5,063.68	-197.78	5,067.02	2.65
10,870.00	89.97	359.96	5,640.34	5,154.67	-197.38	5,157.97	1.69
10,961.00	88.74	359.48	5,641.36	5,245.66	-197.82	5,248.95	1.45
11,053.00	89.32	358.86	5,642.92	5,337.64	-199.16	5,340.93	0.92
11,144.00	90.25	359.50	5,643.26	5,428.63	-200.46	5,431.92	1.24
11,236.00	90.19	359.51	5,642.91	5,520.63	-201.25	5,523.91	0.07
11,327.00	89.38	359.16	5,643.25	5,611.62	-202.31	5,614.90	0.97
11,419.00	88.27	358.66	5,645.14	5,703.58	-204.06	5,706.88	1.32
11,510.00	87.66	358.16	5,648.37	5,794.49	-206.58	5,797.82	0.87
11,602.00	88.89	358.99	5,651.14	5,886.41	-208.87	5,889.77	1.61
11,693.00	87.69	358.66	5,653.85	5,977.35	-210.73	5,980.73	1.37
11,784.00	87.95	358.51	5,657.32	6,068.26	-212.98	6,071.67	0.33
11,875.00	89.38	357.68	5,659.44	6,159.18	-216.00	6,162.63	1.82
11,967.00	88.33	0.01	5,661.28	6,251.14	-217.86	6,254.61	2.78
12,058.00	89.95	2.39	5,662.64	6,342.10	-215.95	6,345.49	3.16

**Design Report for Razor #26I-2314B - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,150.00	89.04	0.70	5,663.45	6,434.06	-213.47	6,437.36	2.09
12,242.00	90.46	1.01	5,663.85	6,526.04	-212.10	6,529.29	1.58
12,333.00	90.07	0.58	5,663.43	6,617.03	-210.84	6,620.22	0.64
12,425.00	90.43	358.98	5,663.03	6,709.03	-211.19	6,712.19	1.78
12,517.00	90.25	0.20	5,662.49	6,801.02	-211.85	6,804.18	1.34
12,609.00	90.99	0.55	5,661.49	6,893.01	-211.25	6,896.13	0.89
12,700.00	90.96	359.93	5,659.94	6,984.00	-210.87	6,987.07	0.68
12,792.00	89.66	359.52	5,659.44	7,075.99	-211.31	7,079.05	1.48
12,883.00	89.45	358.16	5,660.15	7,166.97	-213.15	7,170.05	1.51
12,974.00	90.15	359.53	5,660.47	7,257.95	-214.98	7,261.04	1.69
13,065.00	89.63	356.39	5,660.64	7,348.88	-218.22	7,352.03	3.50
13,126.00	91.05	357.46	5,660.28	7,409.79	-221.49	7,413.00	2.91
13,187.00	91.03	358.51	5,659.17	7,470.74	-223.64	7,473.98	1.72
13,248.00	90.49	0.04	5,658.36	7,531.73	-224.41	7,534.97	2.66
13,340.00	91.67	0.98	5,656.63	7,623.70	-223.59	7,626.90	1.64
13,431.00	91.67	0.43	5,653.98	7,714.66	-222.47	7,717.80	0.60
13,522.00	91.70	1.27	5,651.30	7,805.61	-221.12	7,808.69	0.92
13,617.00	90.97	1.82	5,649.09	7,900.55	-218.56	7,903.53	0.96
13,711.00	88.95	0.96	5,649.15	7,994.51	-216.28	7,997.42	2.34
13,806.00	88.18	1.10	5,651.53	8,089.47	-214.57	8,092.30	0.82
13,901.00	89.01	359.65	5,653.86	8,184.43	-213.95	8,187.22	1.76
13,996.00	90.71	359.33	5,654.10	8,279.43	-214.80	8,282.20	1.82
14,060.00	90.71	359.33	5,653.30	8,343.42	-215.55	8,346.19	0.00

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Razor 26I-2314B BHL	358.59	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
170.00	1,532.00	Surface_Sperry MWD Surveys	MWD+IFR1+MS+sag
1,635.00	5,994.00	Vertical and Build_Sperry MWD Surveys	MWD+IFR1+MS+sag
6,106.00	13,996.00	Lateral_Sperry MWD Surveys	MWD+IFR1+MS+sag

**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 26I-2314B BH	0.00	0.00	5,640.00	8,358.31	-206.17	1,550,048.05	3,463,244.99	40° 49' 52.529 N	103° 49' 33.442 W
- actual wellpath misses target center by 22.06usft at 14060.00usft MD (5653.30 TVD, 8343.42 N, -215.55 E)									
- Point									

Design Report for Razor #26l-2314B - Actual Field Surveys

Directional Difficulty Index

Average Dogleg over Survey:	1.98 °/100usft	Maximum Dogleg over Survey:	15.97 °/100usft at 5,125.00 usft
Net Tortousity applicable to Plans:	0.83 °/100usft	Directional Difficulty Index:	6.792

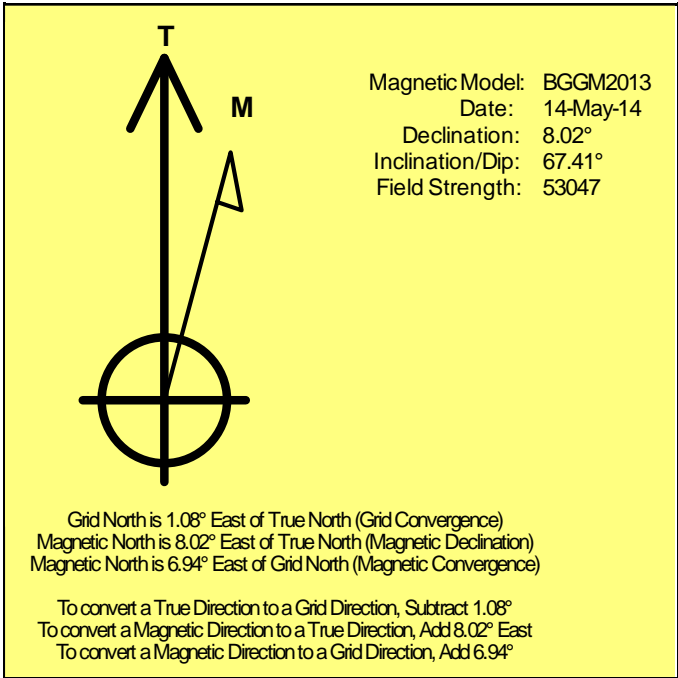
Audit Info

North Reference Sheet for Sec. 26-T10N-R58W - Razor #26I-2314B - 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 21' @ 4733.00usft (Frontier 26). Northing and Easting are relative to Razor #26I-2314B  
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: 1.00000415

Grid Coordinates of Well: 1,541,695.08 usft N, 3,463,608.97 usft E  
Geographical Coordinates of Well: 40° 48' 29.94" N, 103° 49' 30.76" W  
Grid Convergence at Surface is: 1.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,060.00usft  
the Bottom Hole Displacement is 8,346.20usft in the Direction of 358.52° (True).  
Magnetic Convergence at surface is: -6.94° (14 May 2014, , BGGM2013)



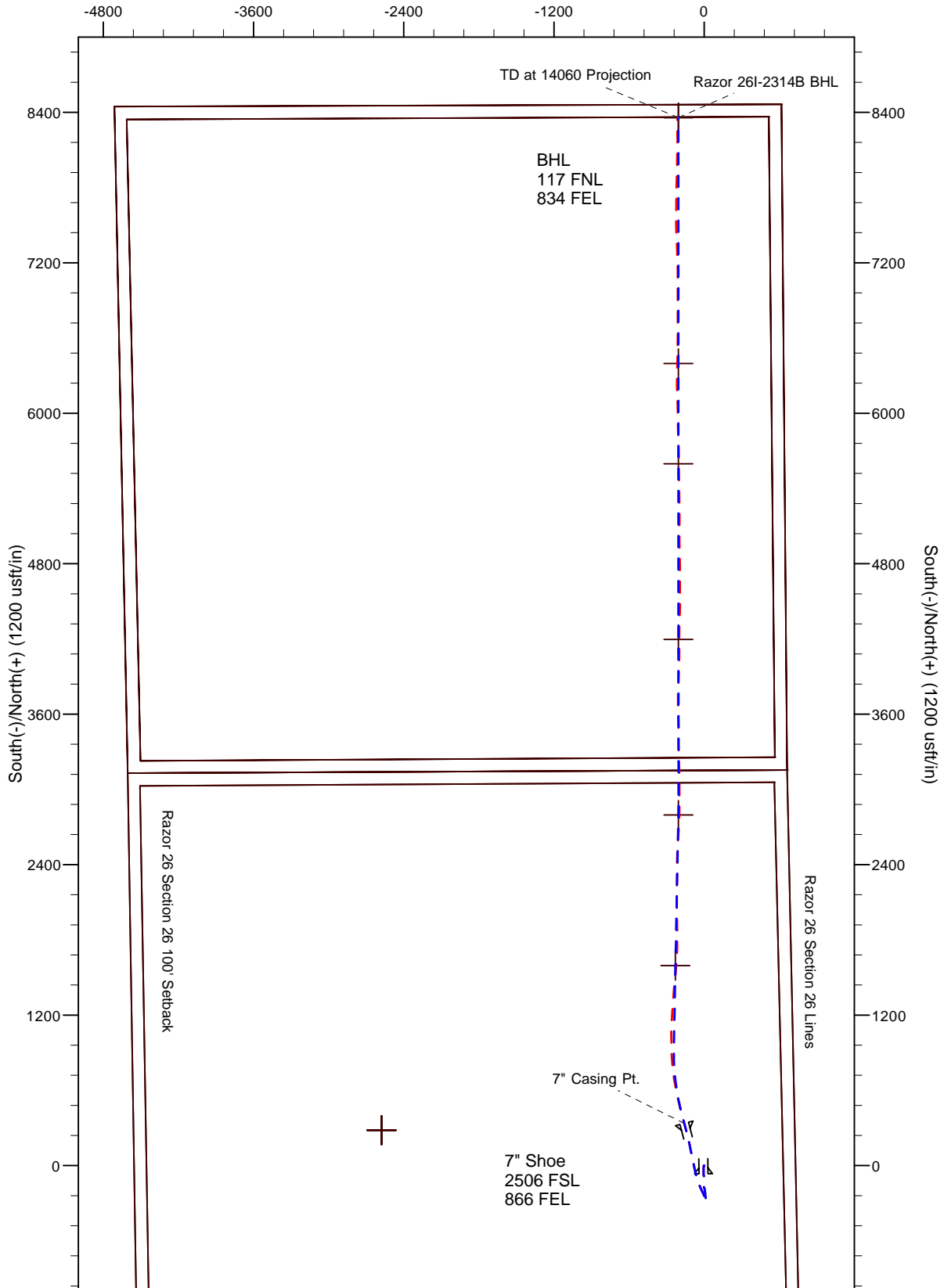
# Whiting Oil and Gas Corporation

## LEGEND

--- Razor #26I-2314B, Plan C, Actual Field Surveys V0

--- Rev C0

West(-)/East(+) (1200 usft/in)





## LEGEND

- Razor #26I-2314B, Plan C, Actual Field Surveys V0
- Rev C0

