

SPERRY-SUN DRILLING SERVICES

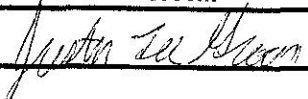
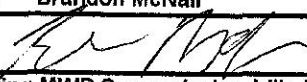
CERTIFIED SURVEY WORK SHEET

OPERATOR:	Whiting Oil & Gas
WELL:	Horsetail #30F-1942
FIELD:	Red Tail
RIG:	Xtreme rig #18
LEGALS:	Sec. 30 - T10N - R57W
COUNTY:	Weld
STATE:	Colorado
CAL. METHOD:	Minimum Curvature
MAG. DECL. APPLIED:	7.58° True
VERTICAL SEC. DIR. :	356.39°

SSDS Job Number :	CA-MJ-901619873
Start Date of Job :	10/12/14
End Date of Job :	10/22/14
Directional Drillers:	Justin Lee Groom
	Aaron Wostrel
Other SSDS DD's :	Levi George
SSDS MWD Engineers :	Brandon McNair
	Jason Obrien

	Main Hole =====>		1st Side Track =====>		2nd Side Track =====>		3rd Side Track =====>		4th Side Track =====>	
Surface	0.00	Tie On		Tie On		Tie On		Tie On		Tie On
First Survey Depth	138.00	MWD								
Last Survey Depth	1536.00	MWD								
10-3/4" Surface Csg. Shoe	1580.00									
First Survey Depth	1645.00	MWD		MWD						
Last Survey Depth	6032.00	MWD		MWD						
KOP Depth/Sidetrack MD				KOP-ST1		KOP-ST2		KOP-ST3		KOP-ST4
7-5/8" Intmdt. Csg. Shoe	6063.00									
First Survey Depth	6107.00	MWD		MWD		MWD				
Last Survey Depth	13733.00	MWD		MWD		MWD				
Bit Extrapolation to TD	13777.00	T.D.		T.D.		T.D.		T.D.		T.D.

The following Sperry-Sun Drilling Services personnel certify this information is accurate to the best of our knowledge:

Print Name :	Justin Lee Groom	Print Name:	Jason Obrien	Print Name :	
Sign Name :		Sign Name :		Sign Name :	
Print Name :	Levi George	Print Name :	Brandon McNair	Print Name :	
Sign Name :		Sign Name :		Sign Name :	

Examples of Survey Types:

TieOn	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
MWD	Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
MS	Multi-Shot Survey's ; Provided by third party vendor.
ESS	Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
Gyro	Gyro Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
SS	Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Whiting Oil and Gas Corporation

Weld County, CO

Sec. 30-T10N-R57W (Horsetail #30F Pad)

Horsetail #30F-1942

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

29 October, 2014

Well Coordinates: 1,542,708.03 N, 3,471,519.13 E (40° 48' 38.46" N, 103° 47' 47.66" W)

Ground Level: 4,780.00 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 Horsetail #30F-1942

KB 17 ft @ 4797.00usft (Xtreme 18)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Horsetail #30F-1942 - 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
138.00	0.54	288.74	138.00	0.21	-0.62	0.25	0.39
First Sperry MWD Survey @ 138.00 ft							
231.00	0.86	302.48	230.99	0.72	-1.62	0.82	0.39
322.00	0.47	298.19	321.98	1.27	-2.52	1.42	0.43
414.00	0.58	318.59	413.98	1.80	-3.17	1.99	0.23
507.00	0.72	324.28	506.97	2.62	-3.82	2.86	0.17
598.00	0.58	265.21	597.97	3.05	-4.61	3.33	0.72
691.00	1.25	233.56	690.96	2.41	-5.90	2.77	0.88
782.00	2.29	219.06	781.91	0.41	-7.84	0.90	1.24
875.00	3.70	213.17	874.78	-3.55	-10.65	-2.87	1.55
966.00	5.01	215.20	965.52	-9.25	-14.55	-8.32	1.45
1,059.00	7.16	214.54	1,057.99	-17.35	-20.18	-16.04	2.31
1,151.00	9.52	218.86	1,149.01	-28.00	-28.20	-26.17	2.65
1,243.00	11.22	222.75	1,239.51	-40.49	-39.05	-37.96	2.00
1,335.00	12.59	222.31	1,329.53	-54.48	-51.88	-51.11	1.49
1,426.00	14.68	222.01	1,417.96	-70.39	-66.27	-66.08	2.30
1,536.00	13.83	218.34	1,524.57	-91.06	-83.76	-85.60	1.13
1,580.00	14.14	214.63	1,567.27	-99.60	-90.07	-93.74	2.16
10.75 Casing Pt.							
1,645.00	14.70	209.46	1,630.22	-113.32	-98.64	-106.89	2.16
1,706.00	16.31	208.10	1,689.00	-127.61	-106.48	-120.66	2.71
1,798.00	15.64	207.67	1,777.45	-149.99	-118.33	-142.25	0.74
1,889.00	14.89	207.76	1,865.24	-171.20	-129.47	-162.72	0.82
1,981.00	15.96	209.26	1,953.92	-192.70	-141.16	-183.43	1.24
2,072.00	15.54	209.89	2,041.50	-214.18	-153.35	-204.11	0.50
2,164.00	16.22	209.00	2,129.99	-236.10	-165.72	-225.21	0.79
2,256.00	16.30	208.14	2,218.31	-258.73	-178.04	-247.01	0.28
2,348.00	15.34	205.66	2,306.83	-281.08	-189.40	-268.61	1.28
2,438.00	15.04	203.35	2,393.68	-302.53	-199.18	-289.40	0.75
2,531.00	16.35	204.04	2,483.22	-325.57	-209.30	-311.75	1.42
2,622.00	16.78	202.98	2,570.44	-349.36	-219.64	-334.85	0.58
2,715.00	16.41	209.21	2,659.57	-373.19	-231.29	-357.89	1.95
2,806.00	16.01	219.17	2,746.97	-394.14	-245.50	-377.91	3.08
2,898.00	15.25	216.43	2,835.57	-413.71	-260.70	-396.49	1.15
2,990.00	13.72	213.33	2,924.64	-432.56	-273.88	-414.47	1.86
3,081.00	13.37	208.39	3,013.12	-450.83	-284.81	-432.02	1.33
3,173.00	13.81	212.29	3,102.54	-469.48	-295.73	-449.94	1.10
3,266.00	15.12	212.11	3,192.59	-489.13	-308.11	-468.78	1.41
3,358.00	15.99	211.78	3,281.22	-510.07	-321.16	-488.85	0.95
3,449.00	16.31	211.54	3,368.63	-531.61	-334.45	-509.52	0.36
3,542.00	17.35	210.67	3,457.65	-554.67	-348.35	-531.65	1.15
3,634.00	16.75	210.18	3,545.60	-577.93	-362.01	-554.01	0.67
3,726.00	13.94	216.89	3,634.32	-598.26	-375.33	-573.46	3.61
3,819.00	11.24	211.66	3,725.08	-614.94	-386.82	-589.38	3.15
3,910.00	12.09	208.32	3,814.20	-630.88	-395.99	-604.71	1.19
4,002.00	12.22	208.99	3,904.14	-647.87	-405.28	-621.09	0.21
4,094.00	13.50	213.18	3,993.83	-665.38	-415.88	-637.89	1.72
4,186.00	12.37	218.75	4,083.50	-682.05	-427.93	-653.78	1.83
4,278.00	11.04	223.22	4,173.58	-696.16	-440.13	-667.08	1.75

Design Report for Horsetail #30F-1942 - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,369.00	8.66	226.25	4,263.24	-707.25	-451.04	-677.46	2.68
4,462.00	6.25	227.87	4,355.44	-715.49	-459.86	-685.13	2.60
4,553.00	4.35	228.83	4,446.05	-721.08	-466.13	-690.32	2.09
4,645.00	2.09	236.91	4,537.90	-724.29	-470.16	-693.28	2.50
4,736.00	1.79	258.02	4,628.85	-725.50	-472.94	-694.30	0.85
4,828.00	1.82	272.40	4,720.80	-725.73	-475.81	-694.36	0.49
4,919.00	0.50	226.19	4,811.78	-725.95	-477.54	-694.46	1.67
5,012.00	0.46	226.07	4,904.78	-726.49	-478.10	-694.96	0.04
5,101.00	0.58	1.21	4,993.78	-726.28	-478.35	-694.75	1.08
5,148.00	3.73	358.53	5,040.74	-724.52	-478.38	-692.98	6.70
5,195.00	8.95	356.78	5,087.44	-719.34	-478.63	-687.79	11.11
5,240.00	14.39	359.82	5,131.49	-710.24	-478.84	-678.70	12.16
5,287.00	19.47	5.49	5,176.44	-696.59	-478.11	-665.13	11.35
5,329.00	21.43	5.10	5,215.79	-681.98	-476.76	-650.63	4.68
5,372.00	23.74	3.99	5,255.49	-665.52	-475.46	-634.29	5.46
5,417.00	25.71	1.86	5,296.37	-646.73	-474.51	-615.59	4.80
5,459.00	29.92	0.23	5,333.50	-627.14	-474.17	-596.06	10.19
5,504.00	35.53	0.85	5,371.35	-602.82	-473.93	-571.81	12.49
5,549.00	39.98	0.98	5,406.92	-575.28	-473.49	-544.35	9.89
5,593.00	42.68	1.00	5,439.95	-546.23	-472.99	-515.39	6.14
5,635.00	45.15	1.10	5,470.21	-517.11	-472.45	-486.35	5.88
5,680.00	49.62	2.31	5,500.67	-484.01	-471.46	-453.39	10.13
5,725.00	55.64	2.33	5,527.97	-448.30	-470.01	-417.84	13.38
5,754.00	58.04	1.96	5,543.83	-424.04	-469.10	-393.68	8.34
5,783.00	60.25	1.82	5,558.70	-399.16	-468.28	-368.90	7.63
5,812.00	64.53	1.38	5,572.14	-373.48	-467.57	-343.32	14.82
5,842.00	68.85	0.88	5,584.01	-345.94	-467.02	-315.87	14.48
5,872.00	72.96	0.28	5,593.82	-317.60	-466.74	-287.60	13.83
5,902.00	75.55	359.91	5,601.96	-288.72	-466.69	-258.79	8.71
5,932.00	78.39	359.75	5,608.72	-259.50	-466.78	-229.61	9.48
5,962.00	79.80	0.04	5,614.40	-230.04	-466.83	-200.21	4.79
5,991.00	82.86	359.80	5,618.77	-201.38	-466.87	-171.60	10.58
6,032.00	89.01	359.54	5,621.67	-160.50	-467.11	-130.79	15.01
6,063.00	90.17	359.20	5,621.90	-129.50	-467.45	-99.83	3.89
7 5/8" Casing Pt. ~ 199' FML ~ 2455' FN ~1421' FWL							
6,107.00	91.81	358.72	5,621.14	-85.52	-468.25	-55.89	3.89
6,148.00	92.37	358.00	5,619.64	-44.56	-469.42	-14.94	2.22
6,235.00	89.58	359.29	5,618.16	42.39	-471.48	71.97	3.53
6,322.00	89.92	358.28	5,618.54	129.37	-473.32	158.89	1.22
6,407.00	88.03	356.15	5,620.06	214.24	-477.45	243.86	3.35
6,497.00	85.68	356.58	5,625.00	303.92	-483.15	333.72	2.65
6,586.00	85.87	357.91	5,631.56	392.57	-487.41	422.47	1.51
6,676.00	88.34	358.78	5,636.10	482.41	-490.01	512.29	2.91
6,760.00	90.71	359.80	5,636.80	566.40	-491.05	596.17	3.07
6,847.00	91.57	1.80	5,635.07	653.37	-489.83	682.89	2.50
6,937.00	89.91	0.79	5,633.91	743.33	-487.80	772.55	2.16
7,026.00	88.55	0.69	5,635.10	832.31	-486.65	861.29	1.53
7,113.00	89.85	2.04	5,636.32	919.28	-484.58	947.95	2.15
7,203.00	89.88	2.00	5,636.53	1,009.22	-481.41	1,037.51	0.06
7,290.00	89.72	1.53	5,636.83	1,096.18	-478.73	1,124.13	0.57
7,377.00	89.82	1.66	5,637.18	1,183.15	-476.31	1,210.77	0.19

Design Report for Horsetail #30F-1942 - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,465.00	89.69	1.26	5,637.56	1,271.12	-474.06	1,298.43	0.48
7,554.00	89.82	0.93	5,637.94	1,360.10	-472.36	1,387.13	0.40
7,644.00	89.72	1.48	5,638.30	1,450.08	-470.47	1,476.81	0.62
7,730.00	89.97	1.09	5,638.53	1,536.06	-468.54	1,562.49	0.54
7,820.00	90.49	357.38	5,638.17	1,626.03	-469.74	1,652.37	4.16
7,909.00	91.02	355.53	5,637.00	1,714.85	-475.25	1,741.35	2.16
7,999.00	91.26	353.58	5,635.21	1,804.42	-483.78	1,831.29	2.18
8,089.00	90.86	354.59	5,633.54	1,893.92	-493.06	1,921.20	1.21
8,176.00	87.63	357.85	5,634.69	1,980.70	-498.79	2,008.16	5.27
8,266.00	87.66	359.51	5,638.39	2,070.60	-500.86	2,098.01	1.84
8,310.00	88.98	0.05	5,639.68	2,114.58	-501.03	2,141.92	3.24
8,353.00	90.74	1.42	5,639.78	2,157.57	-500.48	2,184.79	5.19
8,398.00	90.99	2.04	5,639.10	2,202.55	-499.12	2,229.59	1.49
8,443.00	89.97	0.28	5,638.73	2,247.54	-498.21	2,274.43	4.52
8,534.00	90.65	2.12	5,638.23	2,338.51	-496.30	2,365.10	2.16
8,627.00	89.73	359.75	5,637.92	2,431.49	-494.79	2,457.80	2.73
8,718.00	90.06	0.58	5,638.09	2,522.49	-494.53	2,548.61	0.98
8,810.00	89.41	1.68	5,638.52	2,614.47	-492.71	2,640.29	1.39
8,903.00	90.50	1.38	5,638.59	2,707.43	-490.23	2,732.91	1.22
8,995.00	90.55	359.30	5,637.75	2,799.42	-489.68	2,824.69	2.26
9,087.00	90.46	359.46	5,636.94	2,891.41	-490.68	2,916.56	0.20
9,178.00	89.54	358.25	5,636.94	2,982.39	-492.50	3,007.47	1.67
9,223.00	89.60	357.89	5,637.27	3,027.36	-494.01	3,052.45	0.81
9,271.00	89.86	0.28	5,637.50	3,075.35	-494.78	3,100.39	5.01
9,362.00	89.51	0.18	5,638.00	3,166.35	-494.41	3,191.19	0.40
9,455.00	90.31	1.70	5,638.15	3,259.34	-492.89	3,283.89	1.85
9,547.00	90.52	2.14	5,637.48	3,351.28	-489.80	3,375.46	0.53
9,639.00	90.25	357.88	5,636.86	3,443.26	-489.79	3,467.25	4.64
9,731.00	90.25	355.21	5,636.46	3,535.08	-495.33	3,559.24	2.90
9,776.00	90.65	353.52	5,636.11	3,579.86	-499.75	3,604.21	3.86
9,822.00	90.25	354.68	5,635.75	3,625.62	-504.48	3,650.17	2.67
9,867.00	90.86	355.33	5,635.31	3,670.44	-508.40	3,695.16	1.98
9,914.00	90.18	355.85	5,634.88	3,717.30	-512.01	3,742.15	1.82
9,945.00	90.49	355.91	5,634.70	3,748.22	-514.24	3,773.15	1.02
9,975.00	90.12	355.64	5,634.54	3,778.14	-516.45	3,803.15	1.53
10,006.00	89.44	356.88	5,634.66	3,809.07	-518.47	3,834.15	4.56
10,051.00	89.66	359.09	5,635.01	3,854.04	-520.05	3,879.12	4.94
10,097.00	90.92	359.62	5,634.78	3,900.03	-520.57	3,925.06	2.97
10,142.00	90.44	1.12	5,634.25	3,945.03	-520.28	3,969.95	3.50
10,189.00	90.91	1.43	5,633.69	3,992.01	-519.23	4,016.77	1.20
10,235.00	90.28	0.48	5,633.22	4,038.00	-518.47	4,062.63	2.48
10,280.00	88.59	2.05	5,633.66	4,082.99	-517.47	4,107.46	5.13
10,326.00	88.49	2.73	5,634.83	4,128.93	-515.56	4,153.19	1.49
10,372.00	89.10	1.97	5,635.80	4,174.88	-513.67	4,198.93	2.12
10,417.00	89.29	1.06	5,636.43	4,219.86	-512.48	4,243.75	2.07
10,463.00	89.26	3.34	5,637.01	4,265.82	-510.71	4,289.50	4.96
10,509.00	88.58	3.83	5,637.88	4,311.72	-507.84	4,335.13	1.82
10,555.00	89.29	3.42	5,638.74	4,357.62	-504.93	4,380.76	1.78
10,601.00	91.12	3.93	5,638.57	4,403.53	-501.98	4,426.39	4.13
10,647.00	91.39	2.64	5,637.56	4,449.44	-499.35	4,472.04	2.86
10,739.00	90.80	3.63	5,635.81	4,541.28	-494.32	4,563.39	1.25

Design Report for Horsetail #30F-1942 - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
10,829.00	90.10	358.46	5,635.10	4,631.23	-492.68	4,653.06	5.80
10,922.00	90.38	358.46	5,634.71	4,724.20	-495.18	4,746.00	0.30
11,013.00	89.66	1.71	5,634.68	4,815.19	-495.04	4,836.79	3.66
11,106.00	91.33	4.54	5,633.87	4,908.03	-489.97	4,929.14	3.53
11,151.00	90.86	4.87	5,633.01	4,952.87	-486.28	4,973.66	1.28
11,198.00	90.74	5.19	5,632.36	4,999.69	-482.16	5,020.12	0.73
11,289.00	90.67	4.26	5,631.24	5,090.37	-474.67	5,110.15	1.02
11,381.00	89.82	0.77	5,630.84	5,182.26	-470.63	5,201.61	3.90
11,426.00	89.41	358.58	5,631.15	5,227.26	-470.89	5,246.53	4.95
11,472.00	88.71	358.09	5,631.90	5,273.23	-472.22	5,292.50	1.86
11,517.00	87.96	359.21	5,633.21	5,318.20	-473.28	5,337.44	2.99
11,565.00	87.63	359.51	5,635.06	5,366.16	-473.82	5,385.34	0.93
11,657.00	88.77	359.86	5,637.94	5,458.11	-474.32	5,477.14	1.30
11,749.00	89.61	0.31	5,639.25	5,550.10	-474.19	5,568.94	1.04
11,840.00	92.31	1.09	5,637.72	5,641.08	-473.07	5,659.66	3.09
11,933.00	92.10	0.82	5,634.14	5,733.99	-471.53	5,752.30	0.37
12,026.00	90.71	0.31	5,631.86	5,826.96	-470.61	5,845.02	1.59
12,117.00	90.41	0.68	5,630.97	5,917.95	-469.82	5,935.79	0.52
12,210.00	91.57	359.30	5,629.37	6,010.93	-469.84	6,028.58	1.94
12,301.00	90.77	357.35	5,627.51	6,101.87	-472.50	6,119.51	2.32
12,393.00	89.48	358.12	5,627.31	6,193.79	-476.13	6,211.48	1.63
12,439.00	90.20	358.28	5,627.44	6,239.77	-477.58	6,257.46	1.60
12,485.00	88.07	0.61	5,628.13	6,285.76	-478.03	6,303.38	6.86
12,531.00	87.35	0.21	5,629.97	6,331.72	-477.70	6,349.23	1.79
12,577.00	88.41	1.08	5,631.67	6,377.68	-477.18	6,395.07	2.98
12,669.00	89.84	2.26	5,633.07	6,469.63	-474.50	6,486.67	2.02
12,760.00	89.29	359.30	5,633.77	6,560.61	-473.26	6,577.39	3.31
12,853.00	89.17	0.55	5,635.02	6,653.60	-473.38	6,670.20	1.35
12,944.00	90.75	1.49	5,635.08	6,744.58	-471.76	6,760.90	2.02
13,036.00	91.54	0.34	5,633.24	6,836.55	-470.29	6,852.59	1.52
13,127.00	88.90	359.97	5,632.89	6,927.54	-470.05	6,943.39	2.93
13,219.00	88.34	359.36	5,635.11	7,019.51	-470.58	7,035.21	0.90
13,310.00	88.83	359.89	5,637.35	7,110.48	-471.18	7,126.04	0.79
13,403.00	88.52	1.01	5,639.50	7,203.45	-470.45	7,218.78	1.25
13,494.00	89.38	1.61	5,641.17	7,294.41	-468.37	7,309.43	1.15
13,585.00	90.52	1.56	5,641.25	7,385.37	-465.85	7,400.05	1.25
13,678.00	92.42	1.03	5,638.87	7,478.31	-463.75	7,492.68	2.12
13,733.00	93.15	359.57	5,636.19	7,533.25	-463.46	7,547.48	2.97
Final Sperry MWD Survey @ 13733.00 ft							
13,777.00	93.15	359.57	5,633.78	7,577.18	-463.79	7,591.35	0.00
Straight Line Projection to TD @ 13777.00 ft ~ 46' FNL ~1495' FWL							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
138.00	138.00	0.21	-0.62	First Sperry MWD Survey @ 138.00 ft
13,733.00	5,636.19	7,533.25	-463.46	Final Sperry MWD Survey @ 13733.00 ft
13,777.00	5,633.78	7,577.18	-463.79	Straight Line Projection to TD @ 13777.00 ft ~ 46' FNL ~1495' FWL

Design Report for Horsetail #30F-1942 - Actual Field Surveys**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Horsetail #30F-1942_Rev C0_BHL Tgt	356.39	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
138.00	1,536.00	Surface_Sperry MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
1,645.00	6,032.00	Vertical & Build_Sperry MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
6,107.00	13,733.00	Lateral_Sperry MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
13,777.00	13,777.00	Projection to Bit_BLIND	BLIND

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,580.00	1,567.27	10.75 Casing Pt.	10-3/4	14-1/4
6,063.00	5,621.90	7 5/8" Casing Pt. ~ 199' FML ~ 2455' FN ~1421' FWL	7-5/8	7-5/8

Design Report for Horsetail #30F-1942 - 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
Horsetail #30F_SL	0.00	0.00	0.00	0.04	-29.99	1,542,707.50	3,471,489.15	40° 48' 38.460 N	103° 47' 48.050 W
- actual wellpath misses target center by 29.99usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	2,310.76	3,337.76	1,545,081.96	3,474,781.92	
Point 2				0.00	2,319.65	673.60	1,545,039.67	3,472,118.07	
Point 3				0.00	2,332.83	-1,886.76	1,545,003.67	3,469,557.91	
Point 4				0.00	-320.64	-1,856.24	1,542,351.26	3,469,639.40	
Point 5				0.00	-2,961.00	-1,783.35	1,539,712.78	3,469,762.99	
Point 6				0.00	-2,993.48	730.50	1,539,728.59	3,472,277.01	
Point 7				0.00	-3,008.56	3,390.81	1,539,764.61	3,474,937.14	
Point 8				0.00	-348.90	3,364.14	1,542,423.28	3,474,859.38	
Point 9				0.00	2,310.76	3,337.76	1,545,081.96	3,474,781.92	
Point 10				0.00	4,959.13	3,301.97	1,547,729.16	3,474,695.26	
Point 11				0.00	7,625.00	3,266.19	1,550,393.87	3,474,608.28	
Point 12				0.00	7,622.97	609.53	1,550,340.80	3,471,952.14	
Point 13				0.00	7,621.94	-1,929.53	1,550,291.00	3,469,413.55	
Point 14				0.00	4,974.29	-1,907.32	1,547,644.26	3,469,486.62	
Point 15				0.00	2,332.83	-1,886.76	1,545,003.67	3,469,557.91	
Horsetail #30F_Mid-Sε	0.00	0.00	0.00	0.04	-29.99	1,542,707.50	3,471,489.15	40° 48' 38.460 N	103° 47' 48.050 W
- actual wellpath misses target center by 29.99usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	-220.64	-1,856.24	1,542,451.24	3,469,637.48	
Point 2				0.00	-248.90	3,364.14	1,542,523.26	3,474,857.46	
Mertens 19 100' radius	0.00	0.00	0.00	6,971.24	1,460.71	1,549,706.08	3,472,845.67	40° 49' 47.341 N	103° 47' 28.658 W
- actual wellpath misses target center by 5954.76usft at 13127.00usft MD (5632.89 TVD, 6927.54 N, -470.05 E)									
- Circle (radius 100.00)									
Horsetail #30F_Mid-Sε	0.00	0.00	0.00	0.04	-29.99	1,542,707.50	3,471,489.15	40° 48' 38.460 N	103° 47' 48.050 W
- actual wellpath misses target center by 29.99usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	-320.64	-1,856.24	1,542,351.26	3,469,639.40	
Point 2				0.00	-348.90	3,364.14	1,542,423.28	3,474,859.38	
Horsetail #30F_SB	0.00	0.00	0.00	0.04	-29.99	1,542,707.50	3,471,489.15	40° 48' 38.460 N	103° 47' 48.050 W
- actual wellpath misses target center by 29.99usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	2,332.83	-1,786.76	1,545,005.59	3,469,657.90	
Point 2				0.00	-320.64	-1,756.24	1,542,353.18	3,469,739.38	
Point 3				0.00	-2,861.00	-1,683.35	1,539,814.68	3,469,861.05	
Point 4				0.00	-2,893.48	730.50	1,539,828.57	3,472,275.09	
Point 5				0.00	-2,908.56	3,290.81	1,539,862.67	3,474,835.23	
Point 6				0.00	-348.90	3,264.14	1,542,421.36	3,474,759.40	
Point 7				0.00	2,310.76	3,237.76	1,545,080.04	3,474,681.94	
Point 8				0.00	4,959.13	3,201.97	1,547,727.24	3,474,595.28	
Point 9				0.00	7,525.00	3,166.19	1,550,291.96	3,474,510.22	
Point 10				0.00	7,522.97	609.53	1,550,240.82	3,471,954.06	
Point 11				0.00	7,521.94	-1,829.53	1,550,192.94	3,469,515.46	
Point 12				0.00	4,974.29	-1,807.32	1,547,646.18	3,469,586.60	
Point 13				0.00	2,332.83	-1,786.76	1,545,005.59	3,469,657.90	
Horsetail 19N-1924M	0.00	0.00	-6.70	2,979.44	642.76	1,545,699.29	3,472,104.55	40° 49' 7.899 N	103° 47' 39.300 W
- actual wellpath misses target center by 3048.00usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									
Horsetail #30F-1942_F	0.00	0.00	5,628.00	7,522.85	-474.30	1,550,220.42	3,470,900.41	40° 49' 52.792 N	103° 47' 53.830 W
- actual wellpath misses target center by 13.96usft at 13722.96usft MD (5636.73 TVD, 7523.22 N, -463.41 E)									
- Point									

Design Report for Horsetail #30F-1942 - Actual Field Surveys

Directional Difficulty Index

Average Dogleg over Survey:	2.33 °/100usft	Maximum Dogleg over Survey:	15.01 °/100usft at 6,032.00 usft
Net Tortousity applicable to Plans:	1.46 °/100usft	Directional Difficulty Index:	6.859

Audit Info

North Reference Sheet for Sec. 30-T10N-R57W (Horsetail #30F Pad) - Horsetail #30F-1942 - 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 17 ft @ 4797.00usft (Xtreme 18). Northing and Easting are relative to Horsetail #30F-1942

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: 1.00000455

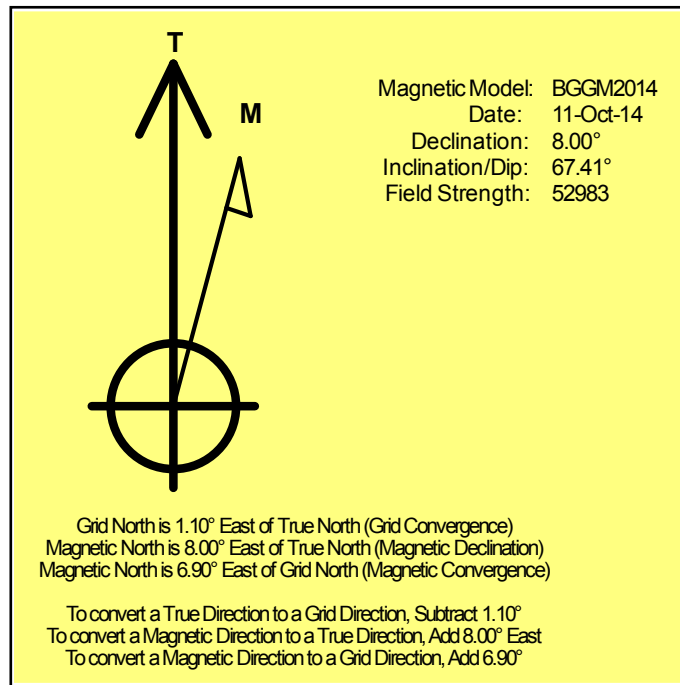
Grid Coordinates of Well: 1,542,708.03 usft N, 3,471,519.13 usft E

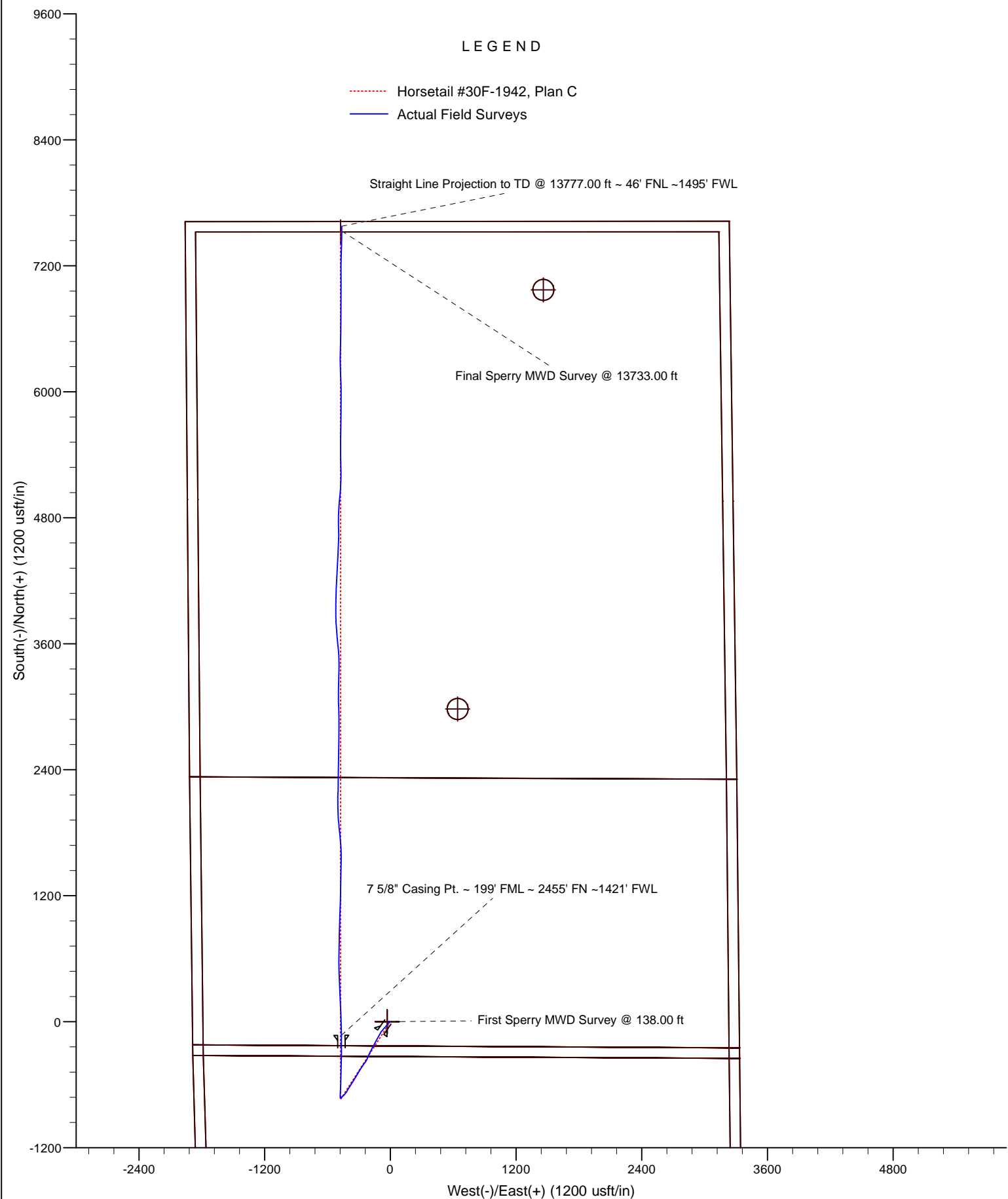
Geographical Coordinates of Well: 40° 48' 38.46" N, 103° 47' 47.66" W

Grid Convergence at Surface is: 1.10°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,777.00usft the Bottom Hole Displacement is 7,591.36usft in the Direction of 356.50° (True).

Magnetic Convergence at surface is: -6.90° (11 October 2014, , BGGM2014)





Project: Weld County, CO

Site: Sec. 30-T10N-R57W (Horsetail #30F Pad)

Well: Horsetail #30F-1942

Whiting Oil and Gas Corporation

HALLIBURTON

Sperry Drilling

