

SPERRY-SUN DRILLING SERVICES

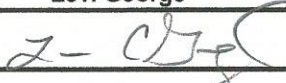
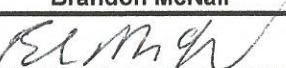
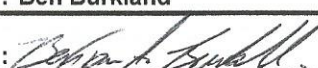
CERTIFIED SURVEY WORK SHEET

OPERATOR:	Whiting Oil & Gas
WELL:	Razor 21 SWD 1
FIELD:	Red Tail
RIG:	Pioneer 54
LEGALS:	Sec.21-T10N-R58W
COUNTY:	Weld
STATE:	Colorado
CAL. METHOD:	Min. Curv.
MAG. DECL. APPLIED:	8.02
VERTICAL SEC. DIR. :	0.000

SSDS Job Number :	902097626
Start Date of Job :	2/2/2015
End Date of Job :	2/10/2015
Lead Directional Driller:	Levi George
Other SSDS DD's :	Bogdan Cristian
SSDS MWD Engineers :	Brandon McNair
	Ben Burkland

	Main Hole =====>		1st Side Track =====>		2nd Side Track =====>		3rd Side Track =====>		4th Side Track =====>	
Surface Casing	1590.00			Tie On		Tie On		Tie On		Tie On
				MWD						
				KOP-ST1		KOP-ST2		KOP-ST3		KOP-ST4
MWD Tie-on @ Surface	0.00									
First MWD Survey Depth	231.00	MWD		MWD		MWD		MWD		MWD
Last MWD Survey Depth	8499.00	MWD		MWD		MWD		MWD		MWD
Bit Extrapolation @ TD	8550.00	T.D.		T.D.		T.D.		T.D.		T.D.

The following Sperry Drilling Services personnel, certify the above survey information to be accurate to the best of our knowledge:

Print Name : Levi George	Print Name : Bogdan Cristian	Print Name :
Sign Name : 	Sign Name : BOGDAN CRISTIAN	Sign Name :
Print Name : Brandon McNair	Print Name : Ben Burkland	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
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. 21-T10N-R58W

Razor 21 SWD 1

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

06 March, 2015

Well Coordinates: 1,547,126.68 N, 3,451,286.35 E (40° 49' 25.87" N, 103° 52' 09.68" W)

Ground Level: 4,820.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 73

Centered on Well Razor 21 SWD 1

KB 22 @ 4842.00usft (Pioneer 54)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Razor 21 SWD 1 - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40° 49' 25.870 N	103° 52' 9.680 W	1,547,126.68	3,451,286.35
231.00	0.09	333.34	231.00	0.16	-0.08	40° 49' 25.871 N	103° 52' 9.681 W	1,547,126.84	3,451,286.27
324.00	0.26	265.98	324.00	0.21	-0.32	40° 49' 25.872 N	103° 52' 9.684 W	1,547,126.89	3,451,286.03
416.00	0.21	265.51	416.00	0.18	-0.70	40° 49' 25.872 N	103° 52' 9.689 W	1,547,126.85	3,451,285.65
509.00	0.36	261.59	509.00	0.13	-1.16	40° 49' 25.871 N	103° 52' 9.695 W	1,547,126.79	3,451,285.19
601.00	0.18	264.64	601.00	0.07	-1.59	40° 49' 25.871 N	103° 52' 9.701 W	1,547,126.73	3,451,284.76
693.00	0.24	214.26	693.00	-0.10	-1.84	40° 49' 25.869 N	103° 52' 9.704 W	1,547,126.55	3,451,284.51
785.00	0.50	183.86	784.99	-0.66	-1.98	40° 49' 25.863 N	103° 52' 9.706 W	1,547,125.99	3,451,284.39
1,062.00	0.28	193.61	1,061.99	-2.52	-2.22	40° 49' 25.845 N	103° 52' 9.709 W	1,547,124.12	3,451,284.18
1,246.00	0.43	224.92	1,245.98	-3.45	-2.81	40° 49' 25.836 N	103° 52' 9.717 W	1,547,123.18	3,451,283.61
1,338.00	0.39	251.98	1,337.98	-3.79	-3.35	40° 49' 25.832 N	103° 52' 9.724 W	1,547,122.83	3,451,283.07
1,431.00	0.26	268.20	1,430.98	-3.90	-3.86	40° 49' 25.831 N	103° 52' 9.730 W	1,547,122.72	3,451,282.56
1,524.00	0.43	247.76	1,523.98	-4.03	-4.40	40° 49' 25.830 N	103° 52' 9.737 W	1,547,122.57	3,451,282.03
1,539.00	0.40	264.09	1,538.98	-4.06	-4.50	40° 49' 25.830 N	103° 52' 9.739 W	1,547,122.54	3,451,281.93
1,710.00	0.44	247.74	1,709.97	-4.37	-5.70	40° 49' 25.827 N	103° 52' 9.754 W	1,547,122.21	3,451,280.73
1,804.00	0.36	264.85	1,803.97	-4.53	-6.33	40° 49' 25.825 N	103° 52' 9.762 W	1,547,122.03	3,451,280.11
1,896.00	0.28	340.66	1,895.97	-4.35	-6.69	40° 49' 25.827 N	103° 52' 9.767 W	1,547,122.21	3,451,279.74
1,988.00	0.47	3.94	1,987.97	-3.76	-6.74	40° 49' 25.833 N	103° 52' 9.768 W	1,547,122.80	3,451,279.68
2,080.00	0.52	15.83	2,079.96	-2.98	-6.60	40° 49' 25.840 N	103° 52' 9.766 W	1,547,123.58	3,451,279.81
2,173.00	0.65	33.04	2,172.96	-2.13	-6.20	40° 49' 25.849 N	103° 52' 9.761 W	1,547,124.44	3,451,280.19
2,265.00	0.37	20.00	2,264.96	-1.42	-5.81	40° 49' 25.856 N	103° 52' 9.756 W	1,547,125.16	3,451,280.57
2,360.00	0.87	13.98	2,359.95	-0.43	-5.54	40° 49' 25.866 N	103° 52' 9.752 W	1,547,126.15	3,451,280.83
2,453.00	1.00	11.47	2,452.94	1.05	-5.20	40° 49' 25.880 N	103° 52' 9.748 W	1,547,122.64	3,451,281.13
2,547.00	1.37	6.34	2,546.92	2.97	-4.92	40° 49' 25.899 N	103° 52' 9.744 W	1,547,129.56	3,451,281.38
2,640.00	0.49	67.94	2,639.91	4.23	-4.43	40° 49' 25.912 N	103° 52' 9.738 W	1,547,130.83	3,451,281.85
2,733.00	0.56	69.14	2,732.90	4.54	-3.63	40° 49' 25.915 N	103° 52' 9.727 W	1,547,131.15	3,451,282.64
2,827.00	0.53	78.52	2,826.90	4.79	-2.78	40° 49' 25.917 N	103° 52' 9.716 W	1,547,131.42	3,451,283.49
2,920.00	0.53	106.93	2,919.89	4.75	-1.94	40° 49' 25.917 N	103° 52' 9.705 W	1,547,131.39	3,451,284.32
3,013.00	0.51	59.99	3,012.89	4.83	-1.17	40° 49' 25.918 N	103° 52' 9.695 W	1,547,131.49	3,451,285.09
3,107.00	0.70	30.12	3,106.89	5.54	-0.52	40° 49' 25.925 N	103° 52' 9.687 W	1,547,132.21	3,451,285.73
3,202.00	0.98	2.40	3,201.88	6.85	-0.20	40° 49' 25.938 N	103° 52' 9.683 W	1,547,133.53	3,451,286.03
3,296.00	1.09	0.99	3,295.86	8.55	-0.15	40° 49' 25.954 N	103° 52' 9.682 W	1,547,135.23	3,451,286.05
3,388.00	0.17	195.08	3,387.86	9.29	-0.17	40° 49' 25.962 N	103° 52' 9.682 W	1,547,135.97	3,451,286.01
3,481.00	0.18	177.94	3,480.86	9.01	-0.20	40° 49' 25.959 N	103° 52' 9.683 W	1,547,135.69	3,451,285.99
3,574.00	0.19	136.89	3,573.86	8.75	-0.09	40° 49' 25.956 N	103° 52' 9.681 W	1,547,135.43	3,451,286.10
3,668.00	0.12	354.97	3,667.85	8.74	0.01	40° 49' 25.956 N	103° 52' 9.680 W	1,547,135.42	3,451,286.20
3,761.00	0.83	13.51	3,760.85	9.49	0.16	40° 49' 25.964 N	103° 52' 9.678 W	1,547,136.17	3,451,286.34
3,854.00	1.20	27.35	3,853.84	11.01	0.76	40° 49' 25.979 N	103° 52' 9.670 W	1,547,137.70	3,451,286.91
3,948.00	1.39	89.91	3,947.82	11.89	2.35	40° 49' 25.987 N	103° 52' 9.649 W	1,547,138.61	3,451,288.49
4,041.00	1.33	90.43	4,040.79	11.88	4.56	40° 49' 25.987 N	103° 52' 9.621 W	1,547,138.64	3,451,290.70
4,134.00	0.83	135.49	4,133.78	11.39	6.11	40° 49' 25.982 N	103° 52' 9.600 W	1,547,138.18	3,451,292.26
4,227.00	0.90	161.31	4,226.76	10.22	6.82	40° 49' 25.971 N	103° 52' 9.591 W	1,547,137.02	3,451,292.98

Design Report for Razor 21 SWD 1 - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
4,321.00	0.70	171.36	4,320.76	8.95	7.14	40° 49' 25.958 N	103° 52' 9.587 W	1,547,135.76	3,451,293.33
4,413.00	0.96	171.59	4,412.75	7.63	7.34	40° 49' 25.945 N	103° 52' 9.585 W	1,547,134.45	3,451,293.55
4,507.00	1.27	163.57	4,506.73	5.85	7.75	40° 49' 25.928 N	103° 52' 9.579 W	1,547,132.68	3,451,293.99
4,600.00	1.77	139.86	4,599.70	3.77	8.97	40° 49' 25.907 N	103° 52' 9.563 W	1,547,130.61	3,451,295.25
4,693.00	1.28	190.73	4,692.67	1.65	9.70	40° 49' 25.886 N	103° 52' 9.554 W	1,547,128.51	3,451,296.02
4,787.00	0.89	270.41	4,786.65	0.62	8.77	40° 49' 25.876 N	103° 52' 9.566 W	1,547,127.47	3,451,295.12
4,881.00	0.88	233.64	4,880.64	0.20	7.46	40° 49' 25.872 N	103° 52' 9.583 W	1,547,127.02	3,451,293.81
4,974.00	1.14	237.67	4,973.63	-0.72	6.11	40° 49' 25.863 N	103° 52' 9.601 W	1,547,126.08	3,451,292.47
5,067.00	1.20	245.30	5,066.61	-1.62	4.44	40° 49' 25.854 N	103° 52' 9.622 W	1,547,125.14	3,451,290.82
5,161.00	0.53	3.34	5,160.60	-1.60	3.57	40° 49' 25.854 N	103° 52' 9.634 W	1,547,125.15	3,451,289.95
5,255.00	0.41	354.89	5,254.60	-0.83	3.57	40° 49' 25.862 N	103° 52' 9.634 W	1,547,125.92	3,451,289.93
5,348.00	0.16	245.07	5,347.60	-0.55	3.42	40° 49' 25.864 N	103° 52' 9.636 W	1,547,126.19	3,451,289.78
5,441.00	0.24	207.33	5,440.60	-0.78	3.21	40° 49' 25.862 N	103° 52' 9.638 W	1,547,125.96	3,451,289.58
5,535.00	0.89	237.14	5,534.59	-1.35	2.51	40° 49' 25.857 N	103° 52' 9.647 W	1,547,125.38	3,451,288.89
5,628.00	1.25	244.72	5,627.58	-2.17	0.98	40° 49' 25.848 N	103° 52' 9.667 W	1,547,124.53	3,451,287.38
5,721.00	0.20	234.33	5,720.57	-2.70	-0.07	40° 49' 25.843 N	103° 52' 9.681 W	1,547,123.98	3,451,286.34
5,814.00	0.88	218.90	5,813.56	-3.35	-0.65	40° 49' 25.837 N	103° 52' 9.688 W	1,547,123.32	3,451,285.77
5,908.00	2.05	212.49	5,907.53	-5.33	-2.00	40° 49' 25.817 N	103° 52' 9.706 W	1,547,121.31	3,451,284.45
6,001.00	0.38	307.55	6,000.51	-6.55	-3.14	40° 49' 25.805 N	103° 52' 9.721 W	1,547,120.08	3,451,283.33
6,093.00	0.59	19.45	6,092.51	-5.92	-3.22	40° 49' 25.811 N	103° 52' 9.722 W	1,547,120.71	3,451,283.24
6,186.00	0.84	23.37	6,185.50	-4.84	-2.79	40° 49' 25.822 N	103° 52' 9.716 W	1,547,121.79	3,451,283.65
6,280.00	1.08	33.38	6,279.49	-3.47	-2.03	40° 49' 25.836 N	103° 52' 9.706 W	1,547,123.18	3,451,284.38
6,373.00	1.20	23.59	6,372.47	-1.84	-1.16	40° 49' 25.852 N	103° 52' 9.695 W	1,547,124.82	3,451,285.23
6,466.00	1.05	33.05	6,465.45	-0.24	-0.31	40° 49' 25.868 N	103° 52' 9.684 W	1,547,126.44	3,451,286.05
6,559.00	0.98	48.19	6,558.44	1.01	0.75	40° 49' 25.880 N	103° 52' 9.670 W	1,547,127.70	3,451,287.09
6,653.00	1.09	67.64	6,652.42	1.89	2.18	40° 49' 25.889 N	103° 52' 9.652 W	1,547,128.61	3,451,288.49
6,746.00	0.86	65.00	6,745.41	2.52	3.63	40° 49' 25.895 N	103° 52' 9.633 W	1,547,129.26	3,451,289.93
6,839.00	1.16	74.26	6,838.39	3.07	5.16	40° 49' 25.900 N	103° 52' 9.613 W	1,547,129.84	3,451,291.46
6,932.00	1.37	67.98	6,931.37	3.74	7.10	40° 49' 25.907 N	103° 52' 9.588 W	1,547,130.55	3,451,293.39
7,026.00	0.63	54.67	7,025.36	4.46	8.57	40° 49' 25.914 N	103° 52' 9.569 W	1,547,131.30	3,451,294.84
7,119.00	0.56	51.83	7,118.35	5.04	9.34	40° 49' 25.920 N	103° 52' 9.559 W	1,547,131.89	3,451,295.60
7,212.00	0.60	65.39	7,211.35	5.52	10.14	40° 49' 25.924 N	103° 52' 9.548 W	1,547,132.39	3,451,296.39
7,305.00	0.75	67.72	7,304.34	5.95	11.15	40° 49' 25.929 N	103° 52' 9.535 W	1,547,132.84	3,451,297.39
7,399.00	0.66	79.26	7,398.33	6.29	12.25	40° 49' 25.932 N	103° 52' 9.521 W	1,547,133.19	3,451,298.48
7,492.00	0.74	76.17	7,491.33	6.53	13.36	40° 49' 25.934 N	103° 52' 9.506 W	1,547,133.46	3,451,299.59
7,585.00	0.83	86.45	7,584.32	6.72	14.61	40° 49' 25.936 N	103° 52' 9.490 W	1,547,133.67	3,451,300.84
7,678.00	0.73	90.23	7,677.31	6.76	15.88	40° 49' 25.937 N	103° 52' 9.473 W	1,547,133.73	3,451,302.10
7,771.00	0.52	112.47	7,770.30	6.59	16.86	40° 49' 25.935 N	103° 52' 9.461 W	1,547,133.58	3,451,303.09
7,864.00	0.21	116.03	7,863.30	6.36	17.40	40° 49' 25.933 N	103° 52' 9.454 W	1,547,133.36	3,451,303.64
7,958.00	0.33	135.86	7,957.30	6.09	17.74	40° 49' 25.930 N	103° 52' 9.449 W	1,547,133.09	3,451,303.98
8,051.00	0.43	119.41	8,050.30	5.72	18.24	40° 49' 25.926 N	103° 52' 9.443 W	1,547,132.74	3,451,304.48
8,144.00	0.44	119.33	8,143.30	5.38	18.85	40° 49' 25.923 N	103° 52' 9.435 W	1,547,132.40	3,451,305.10

Design Report for Razor 21 SWD 1 - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
8,236.00	0.44	112.64	8,235.29	5.07	19.48	40° 49' 25.920 N	103° 52' 9.427 W	1,547,132.11	3,451,305.74
8,329.00	0.49	102.57	8,328.29	4.84	20.20	40° 49' 25.918 N	103° 52' 9.417 W	1,547,131.90	3,451,306.46
8,423.00	0.42	39.54	8,422.29	5.02	20.81	40° 49' 25.919 N	103° 52' 9.409 W	1,547,132.08	3,451,307.07
8,499.00	0.50	59.33	8,498.29	5.41	21.28	40° 49' 25.923 N	103° 52' 9.403 W	1,547,132.48	3,451,307.53
8,550.00	0.50	59.33	8,549.28	5.63	21.66	40° 49' 25.926 N	103° 52' 9.398 W	1,547,132.71	3,451,307.91

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
231.00	231.00	0.16	-0.08	First Sperry MWD Survey @ 231.00 ft
8,499.00	8,498.29	5.41	21.28	Final Sperry MWD Survey @ 8499.00 ft
8,550.00	8,549.28	5.63	21.66	Straight Line Projection to TD @ 8550.00 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	227.96	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
231.00	1,539.00	Surface_Sperry_MWD	MWD
1,710.00	8,499.00	Vertical_Sperry_MWD	MWD
8,550.00	8,550.00	Projection to Bit_BLIND	BLIND

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,590.00	1,589.98	9 5/8" Casing Pt.	9-5/8	13-1/2

Design Report for Razor 21 SWD 1 - Actual Field Surveys

Design Targets

Shape	Target Name	TVD (usft)	Northing (usft)	Easting (usft)	+N/-S usft	+E/-W usft	Created	Updated
Polygon	Razor 21B-0909A_Sec 21,	-17.30	1,549,445.77	3,451,560.50	2,313.64	316.75	10/4/2013	10/28/2013

Directional Difficulty Index

Average Dogleg over Survey:	0.40 °/100usft	Maximum Dogleg over Survey:	2.28 °/100usft at 6,001.00 usft
Net Tortousity applicable to Plans:	0.40 °/100usft	Directional Difficulty Index:	3.525

Audit Info

North Reference Sheet for Sec. 21-T10N-R58W - Razor 21 SWD 1 - Plan A

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 @ 4842.00usft (Pioneer 54). Northing and Easting are relative to Razor 21 SWD 1

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: 1.00000683

Grid Coordinates of Well: 1,547,126.68 usft N, 3,451,286.35 usft E

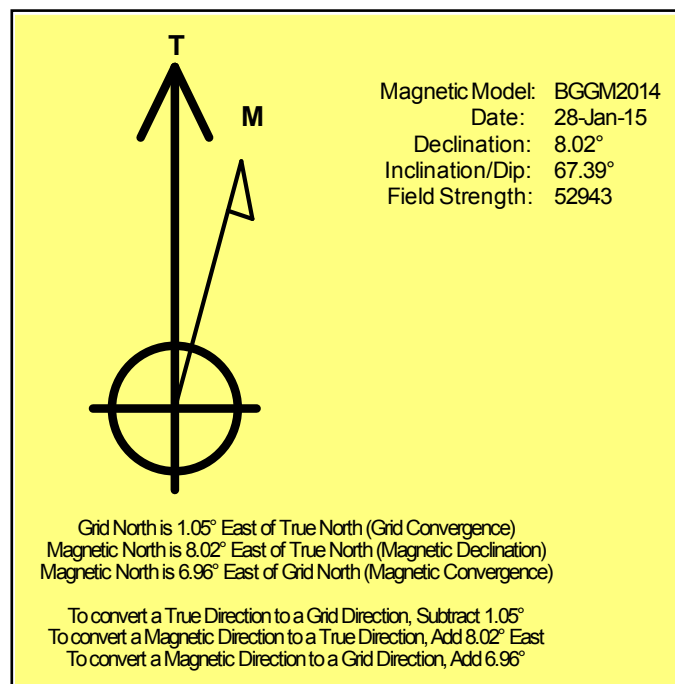
Geographical Coordinates of Well: 40° 49' 25.87" N, 103° 52' 09.68" W

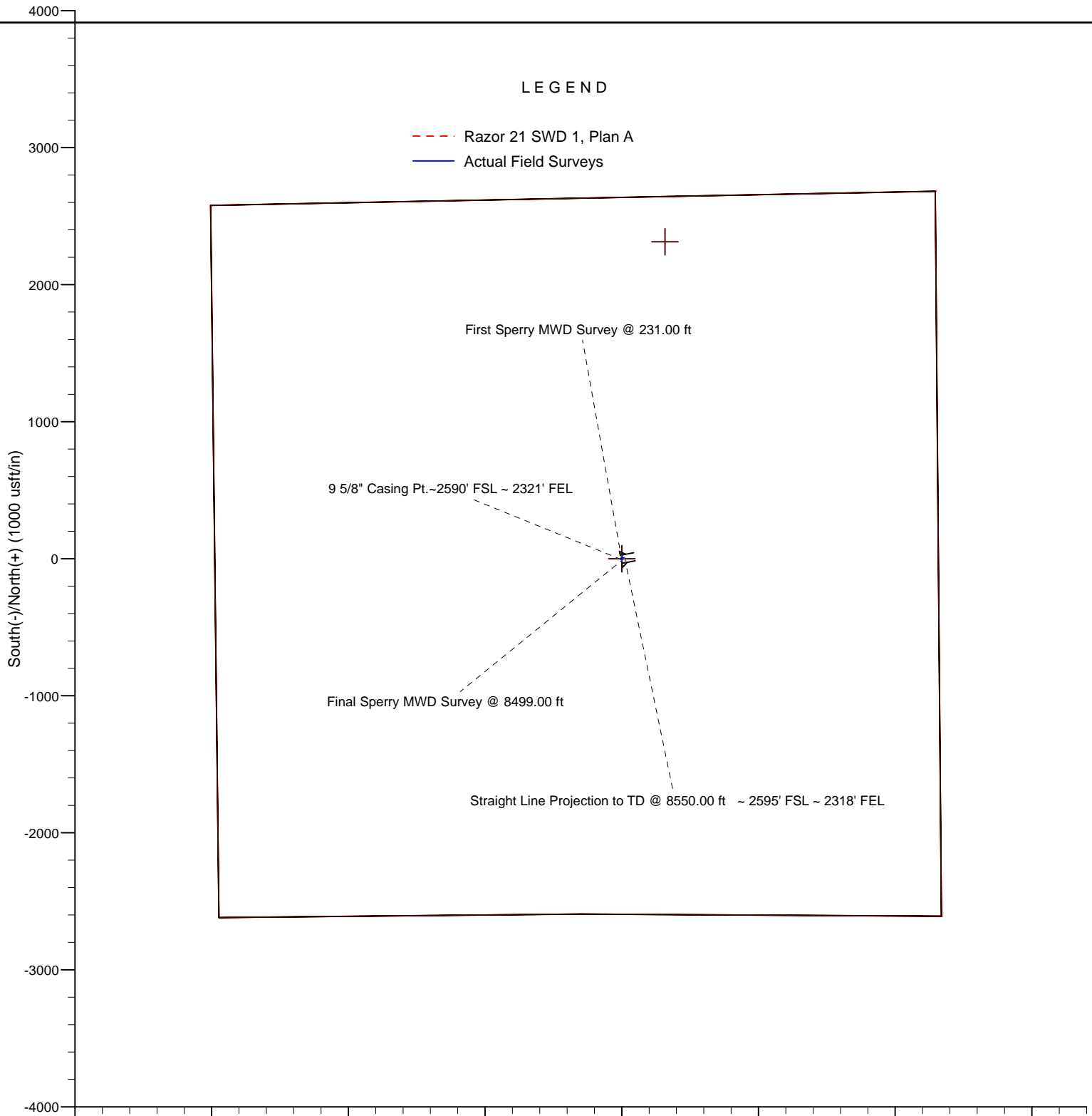
Grid Convergence at Surface is: 1.05°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,550.00usft

the Bottom Hole Displacement is 22.38usft in the Direction of 75.42° (True).

Magnetic Convergence at surface is: -6.96° (28 January 2015, , BGGM2014)





"Halliburton Energy Services, Inc. ("Halliburton") recommends having the distances to the section or setback lines verified by a Registered Land Surveyor. Halliburton does not certify the location given: it is an estimated setback/section line crossing location. Halliburton's depth measurement is an estimate generated by a mathematical algorithm based on rough data collected after the well is drilled. While Halliburton attempts to provide the most accurate data, anything that generates a footage for a point not already specifically identified on a survey plat needs to be verified by a Registered Land Surveyor.

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