

# Noble Energy

Weld County, CO

Sec. 7-T6N-R62W

Wells Ranch USX AE07-99HZ

Plan #3

Design: MWD Survey

## Sperry Drilling Services

### Final Survey Report

21 July, 2010

Well Coordinates: 1,429,107.00 N, 3,314,331.04 E (40° 30' 20.88" N, 104° 22' 10.52" W)

Ground Level: 4,904.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch USX AE07-99HZ

Viewing Datum: RKB - 16' @ 4920.00ft

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

**HALLIBURTON**

## Design Report for Wells Ranch USX AE07-99HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
794.00	1.50	265.78	793.91	-0.76	-10.36	-7.11	0.19
<b>First Sperry MWD Survey</b>							
887.00	1.59	274.49	886.88	-0.75	-12.86	-8.95	0.27
981.00	1.78	270.41	980.83	-0.64	-15.62	-11.06	0.24
1,074.00	1.82	261.65	1,073.79	-0.84	-18.53	-13.06	0.30
1,195.00	1.68	259.28	1,194.73	-1.45	-22.17	-15.33	0.13
1,288.00	1.55	253.75	1,287.70	-2.06	-24.72	-16.79	0.22
1,382.00	1.60	259.18	1,381.66	-2.66	-27.23	-18.23	0.17
1,475.00	1.88	258.00	1,474.62	-3.22	-30.00	-19.89	0.30
1,568.00	2.12	258.02	1,567.56	-3.90	-33.17	-21.76	0.26
1,693.00	1.76	260.13	1,692.49	-4.71	-37.33	-24.27	0.29
1,755.00	1.64	257.37	1,754.46	-5.06	-39.13	-25.36	0.23
1,856.00	1.40	254.69	1,855.43	-5.70	-41.73	-26.84	0.25
1,979.00	1.34	245.63	1,978.39	-6.69	-44.49	-28.19	0.18
2,042.00	1.42	250.77	2,041.37	-7.26	-45.90	-28.85	0.23
2,137.00	1.55	242.06	2,136.34	-8.25	-48.14	-29.83	0.27
2,232.00	1.70	231.96	2,231.30	-9.72	-50.39	-30.49	0.34
2,326.00	1.94	199.12	2,325.26	-12.08	-52.01	-30.08	1.12
2,422.00	1.82	190.50	2,421.21	-15.11	-52.82	-28.62	0.32
2,517.00	1.37	165.79	2,516.17	-17.70	-52.81	-26.87	0.85
2,612.00	1.22	163.60	2,611.15	-19.77	-52.25	-25.05	0.17
2,708.00	0.96	146.23	2,707.13	-21.42	-51.51	-23.39	0.44
2,803.00	0.68	121.75	2,802.12	-22.38	-50.59	-22.06	0.47
2,897.00	0.69	63.56	2,896.11	-22.42	-49.61	-21.31	0.71
2,992.00	0.53	54.85	2,991.11	-21.91	-48.74	-21.02	0.19
3,088.00	0.56	17.01	3,087.10	-21.20	-48.24	-21.13	0.37
3,184.00	0.72	33.73	3,183.10	-20.25	-47.77	-21.42	0.25
3,279.00	0.75	51.38	3,278.09	-19.37	-46.95	-21.42	0.24
3,374.00	0.62	44.20	3,373.08	-18.61	-46.11	-21.31	0.16
3,469.00	0.46	196.79	3,468.08	-18.61	-45.86	-21.13	1.11
3,564.00	0.43	206.52	3,563.08	-19.29	-46.13	-20.87	0.09
3,659.00	0.45	281.95	3,658.08	-19.54	-46.65	-21.09	0.57
3,755.00	0.44	256.78	3,754.07	-19.54	-47.38	-21.62	0.20
3,914.00	0.43	265.07	3,913.07	-19.73	-48.57	-22.36	0.04
4,040.00	0.71	220.12	4,039.06	-20.37	-49.54	-22.65	0.40
4,134.00	0.81	222.59	4,133.06	-21.31	-50.37	-22.62	0.11
4,230.00	0.63	221.83	4,229.05	-22.20	-51.18	-22.61	0.19
4,324.00	1.12	199.15	4,323.04	-23.45	-51.82	-22.24	0.63
4,419.00	1.24	200.37	4,418.02	-25.29	-52.49	-21.48	0.13
4,515.00	1.24	199.63	4,513.99	-27.24	-53.20	-20.68	0.02
4,610.00	1.02	211.07	4,608.98	-28.94	-53.98	-20.11	0.33
4,705.00	0.99	228.79	4,703.96	-30.20	-55.03	-20.03	0.33
4,800.00	1.25	210.06	4,798.94	-31.64	-56.17	-19.89	0.47
4,895.00	1.16	226.78	4,893.92	-33.19	-57.39	-19.73	0.38
4,989.00	1.31	219.21	4,987.90	-34.68	-58.76	-19.74	0.24
5,084.00	1.49	223.37	5,082.87	-36.42	-60.30	-19.69	0.22
5,179.00	1.47	227.47	5,177.84	-38.14	-62.04	-19.81	0.11
5,274.00	1.37	232.70	5,272.81	-39.65	-63.84	-20.11	0.17
5,370.00	1.53	235.70	5,368.78	-41.07	-65.82	-20.60	0.18

## Design Report for Wells Ranch USX AE07-99HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,465.00	1.23	230.65	5,463.75	-42.43	-67.65	-21.03	0.34
5,561.00	1.09	182.69	5,559.74	-44.00	-68.49	-20.59	0.99
5,656.00	0.80	182.67	5,654.72	-45.56	-68.56	-19.58	0.31
5,751.00	0.87	174.80	5,749.71	-46.94	-68.53	-18.62	0.14
5,846.00	0.35	185.58	5,844.71	-47.95	-68.49	-17.91	0.56
5,874.00	0.77	190.25	5,872.71	-48.22	-68.53	-17.76	1.51
5,989.00	2.50	149.55	5,987.66	-51.14	-67.40	-14.94	1.72
6,021.00	5.22	148.49	6,019.58	-52.98	-66.29	-12.88	8.50
6,052.00	7.83	144.17	6,050.38	-55.90	-64.31	-9.45	8.56
6,084.00	9.96	142.35	6,081.99	-59.86	-61.35	-4.59	6.71
6,116.00	11.68	139.92	6,113.42	-64.53	-57.57	1.36	5.56
6,148.00	13.00	138.29	6,144.68	-69.69	-53.09	8.15	4.27
6,180.00	13.72	138.53	6,175.82	-75.22	-48.18	15.51	2.26
6,211.00	15.34	136.96	6,205.82	-80.98	-42.95	23.25	5.38
6,243.00	16.77	136.57	6,236.57	-87.42	-36.89	32.08	4.48
6,275.00	18.52	135.95	6,267.07	-94.43	-30.18	41.76	5.50
6,307.00	20.71	136.53	6,297.21	-102.19	-22.75	52.48	6.87
6,339.00	23.12	138.15	6,326.90	-110.98	-14.66	64.38	7.76
6,370.00	25.34	139.16	6,355.16	-120.53	-6.26	77.03	7.28
6,402.00	27.68	138.21	6,383.80	-131.25	3.17	91.23	7.43
6,434.00	30.13	138.06	6,411.81	-142.77	13.49	106.63	7.66
6,466.00	32.30	138.33	6,439.17	-155.13	24.54	123.13	6.80
6,497.00	34.79	138.99	6,465.01	-168.00	35.86	140.17	8.12
6,529.00	37.67	139.44	6,490.82	-182.32	48.21	158.95	9.04
6,560.00	40.68	139.90	6,514.85	-197.24	60.88	178.39	9.75
6,592.00	43.54	139.69	6,538.58	-213.63	74.73	199.68	8.95
6,624.00	46.63	138.48	6,561.18	-230.75	89.57	222.19	10.02
6,655.00	48.97	138.06	6,582.00	-247.88	104.86	245.04	7.61
6,687.00	52.04	137.72	6,602.35	-266.20	121.41	269.63	9.63
6,719.00	55.00	137.63	6,621.37	-285.22	138.74	295.26	9.25
6,750.00	58.44	138.19	6,638.38	-304.45	156.11	321.06	11.20
6,782.00	61.93	136.50	6,654.29	-324.86	174.92	348.73	11.83
6,814.00	66.83	134.19	6,668.12	-345.37	195.20	377.54	16.64
6,846.00	71.91	133.27	6,679.39	-366.06	216.83	407.47	16.10
6,878.00	74.53	130.18	6,688.63	-386.44	239.70	438.10	12.35
6,910.00	77.98	129.64	6,696.24	-406.38	263.54	469.14	10.91
6,942.00	82.94	129.26	6,701.54	-426.43	287.90	500.64	15.54
7,058.00	88.83	130.26	6,709.86	-500.40	376.80	616.14	5.15
7,122.00	89.81	130.39	6,710.62	-541.81	425.59	680.08	1.54
7,153.00	91.73	130.89	6,710.20	-562.00	449.11	711.06	6.40
7,217.00	89.20	130.85	6,709.68	-603.87	497.50	775.02	3.95
7,281.00	90.37	130.82	6,709.92	-645.72	545.92	838.99	1.83
7,345.00	89.44	131.73	6,710.03	-687.93	594.02	902.97	2.03
7,409.00	91.30	131.63	6,709.61	-730.49	641.82	966.96	2.91
7,473.00	88.27	131.19	6,709.85	-772.82	689.81	1,030.93	4.78
7,505.00	87.04	131.34	6,711.16	-793.90	713.84	1,062.90	3.87
7,568.00	86.66	131.07	6,714.63	-835.34	761.17	1,125.78	0.74
7,632.00	86.85	130.58	6,718.25	-877.12	809.52	1,189.65	0.82
7,695.00	89.26	130.00	6,720.39	-917.83	857.54	1,252.55	3.93
7,759.00	89.51	129.79	6,721.07	-958.87	906.64	1,316.48	0.51
7,823.00	90.43	130.33	6,721.11	-1,000.06	955.63	1,380.41	1.67

## Design Report for Wells Ranch USX AE07-99HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,886.00	92.28	131.44	6,719.62	-1,041.29	1,003.24	1,443.36	3.42
7,950.00	92.10	130.96	6,717.17	-1,083.41	1,051.36	1,507.29	0.80
8,014.00	89.07	130.57	6,716.52	-1,125.19	1,099.82	1,571.25	4.77
8,078.00	89.38	130.82	6,717.38	-1,166.92	1,148.34	1,635.20	0.62
8,142.00	88.58	130.47	6,718.52	-1,208.60	1,196.90	1,699.16	1.36
8,193.00	89.01	131.41	6,719.60	-1,242.01	1,235.41	1,750.12	2.03
8,256.00	88.52	128.50	6,720.95	-1,282.45	1,283.69	1,813.03	4.68
8,320.00	88.64	123.54	6,722.54	-1,320.07	1,335.42	1,876.56	7.75
8,384.00	90.37	120.86	6,723.09	-1,354.17	1,389.57	1,939.50	4.98
8,448.00	89.69	123.83	6,723.06	-1,388.40	1,443.63	2,002.46	4.76
8,512.00	89.57	125.65	6,723.47	-1,424.87	1,496.22	2,065.85	2.85
8,576.00	90.49	126.81	6,723.44	-1,462.70	1,547.84	2,129.45	2.31
8,639.00	91.73	126.58	6,722.22	-1,500.33	1,598.35	2,192.09	2.00
8,703.00	92.60	126.68	6,719.80	-1,538.49	1,649.67	2,255.70	1.37
8,767.00	92.78	125.41	6,716.80	-1,576.11	1,701.36	2,319.20	2.00
8,831.00	92.47	125.97	6,713.87	-1,613.41	1,753.29	2,382.67	1.00
8,895.00	93.03	125.60	6,710.80	-1,650.79	1,805.14	2,446.13	1.05
8,959.00	93.03	124.79	6,707.41	-1,687.62	1,857.37	2,509.51	1.26
9,022.00	90.19	125.51	6,705.64	-1,723.87	1,908.86	2,571.94	4.65
9,086.00	90.37	126.06	6,705.33	-1,761.30	1,960.77	2,635.48	0.90
9,150.00	90.49	125.86	6,704.85	-1,798.88	2,012.58	2,699.04	0.36
9,214.00	90.06	125.28	6,704.54	-1,836.11	2,064.63	2,762.56	1.13
9,245.00	90.12	124.27	6,704.49	-1,853.79	2,090.10	2,793.26	3.26
9,309.00	89.63	125.77	6,704.63	-1,890.51	2,142.51	2,856.70	2.47
9,373.00	90.93	125.31	6,704.32	-1,927.71	2,194.58	2,920.21	2.15
9,437.00	91.05	125.98	6,703.22	-1,965.00	2,246.58	2,983.72	1.06
9,501.00	90.80	124.95	6,702.18	-2,002.13	2,298.70	3,047.21	1.66
9,565.00	91.30	124.39	6,701.01	-2,038.53	2,351.33	3,110.58	1.17
9,628.00	93.71	124.58	6,698.26	-2,074.16	2,403.21	3,172.88	3.84
9,692.00	93.96	123.94	6,693.98	-2,110.11	2,455.98	3,236.05	1.07
9,756.00	92.72	124.93	6,690.25	-2,146.24	2,508.68	3,299.29	2.48
9,819.00	89.51	125.91	6,689.02	-2,182.74	2,560.00	3,361.77	5.33
9,882.00	90.62	127.01	6,688.95	-2,220.18	2,610.67	3,424.40	2.48
9,946.00	91.48	128.46	6,687.78	-2,259.34	2,661.27	3,488.16	2.63
10,010.00	92.16	129.11	6,685.74	-2,299.41	2,711.13	3,551.98	1.47
10,074.00	90.86	130.15	6,684.06	-2,340.21	2,760.41	3,615.87	2.60
10,138.00	89.57	128.94	6,683.82	-2,380.96	2,809.76	3,679.77	2.76
10,201.00	90.74	129.14	6,683.65	-2,420.64	2,858.69	3,742.64	1.88
10,265.00	90.19	129.28	6,683.13	-2,461.10	2,908.27	3,806.53	0.89
10,328.00	88.89	130.25	6,683.63	-2,501.39	2,956.70	3,869.44	2.57
10,391.00	89.20	130.15	6,684.68	-2,542.05	3,004.81	3,932.38	0.52
10,455.00	88.08	130.73	6,686.20	-2,583.55	3,053.50	3,996.31	1.97
10,519.00	88.51	129.94	6,688.11	-2,624.96	3,102.27	4,060.23	1.40
10,565.00	88.33	129.15	6,689.38	-2,654.23	3,137.73	4,106.15	1.76
<b>Final Sperry MWD Survey</b>							
10,600.00	88.33	129.15	6,690.40	-2,676.32	3,164.86	4,141.07	0.00
<b>Survey Projection to TD - Estimated BHL: 1601' FSL, 674' FEL</b>							

## Design Report for Wells Ranch USX AE07-99HZ - MWD Survey

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
794.00	793.91	-0.76	-10.36	First Sperry MWD Survey
10,565.00	6,689.38	-2,654.23	3,137.73	Final Sperry MWD Survey
10,600.00	6,690.40	-2,676.32	3,164.86	Survey Projection to TD
10,600.00	6,690.40	-2,676.32	3,164.86	Estimated BHL: 1601' FSL, 674' FEL

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	Wells Ranch USX AE07-99HZ Plan #3 BH Tgt	132.64	Slot	0.00	0.00	0.00

### Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
794.00	10,600.00	Sperry MWD Surveys	MWD

## Design Report for Wells Ranch USX AE07-99HZ - MWD Survey

**Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				-1,482.00	950.00	1,430,056.97	3,312,849.09		
Point 2				3,839.00	950.00	1,430,056.97	3,318,169.91		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				-1,482.00	950.00	1,430,056.97	3,312,849.09		
Point 2				-1,482.00	-4,278.00	1,424,829.14	3,312,849.09		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				-882.00	-3,678.00	1,425,429.12	3,313,449.07		
Point 2				3,239.00	-3,678.00	1,425,429.12	3,317,569.93		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				-1,482.00	-4,278.00	1,424,829.14	3,312,849.09		
Point 2				3,839.00	-4,278.00	1,424,829.14	3,318,169.91		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				3,239.00	350.00	1,429,456.99	3,317,569.93		
Point 2				3,239.00	-3,678.00	1,425,429.12	3,317,569.93		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				-882.00	350.00	1,429,456.99	3,313,449.07		
Point 2				-882.00	-3,678.00	1,425,429.12	3,313,449.07		
Wells Ranch USX	0.00	0.00	6,705.60	-2,917.88	3,169.07	1,426,189.21	3,317,500.00	40° 29' 51.648 N	104° 21' 29.988 W
- actual wellpath misses target center by 242.07ft at 10600.00ft MD (6690.40 TVD, -2676.32 N, 3164.86 E)									
- Point									
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				-882.00	350.00	1,429,456.99	3,313,449.07		
Point 2				3,239.00	350.00	1,429,456.99	3,317,569.93		
Wells Ranch USX	0.00	0.00	0.00	0.00	0.00	1,429,107.00	3,314,331.04	40° 30' 20.880 N	104° 22' 10.524 W
- actual wellpath hits target center									
- Polygon									
Point 1				3,839.00	950.00	1,430,056.97	3,318,169.91		
Point 2				3,839.00	-4,278.00	1,424,829.14	3,318,169.91		

## North Reference Sheet for Sec. 7-T6N-R62W - Wells Ranch USX AE07-99HZ - Plan #3

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

Vertical Depths are relative to RKB - 16' @ 4920.00ft. Northing and Easting are relative to Wells Ranch USX AE07-99HZ

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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996673

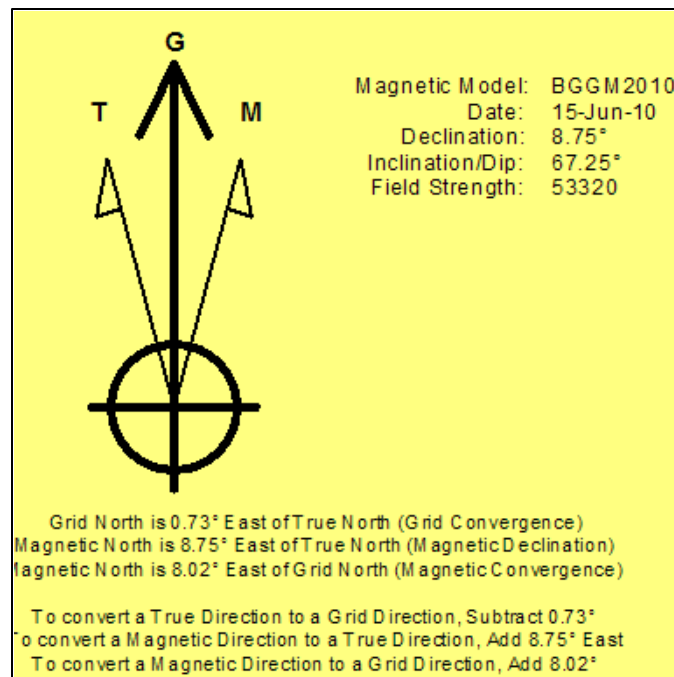
Grid Coordinates of Well: 1,429,107.00 ft N, 3,314,331.04 ft E

Geographical Coordinates of Well: 40° 30' 20.88" N, 104° 22' 10.52" W

Grid Convergence at Surface is: 0.73°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,600.00ft  
the Bottom Hole Displacement is 4,144.76ft in the Direction of 130.22° (Grid).

Magnetic Convergence at surface is: -8.02° (15 June 2010, , BGGM2010)



Project: Weld County, CO  
Site: Sec. 7-T6N-R62W  
Well: Wells Ranch USX AE07-99HZ

# Noble Energy

**HALLIBURTON**

Sperry Drilling



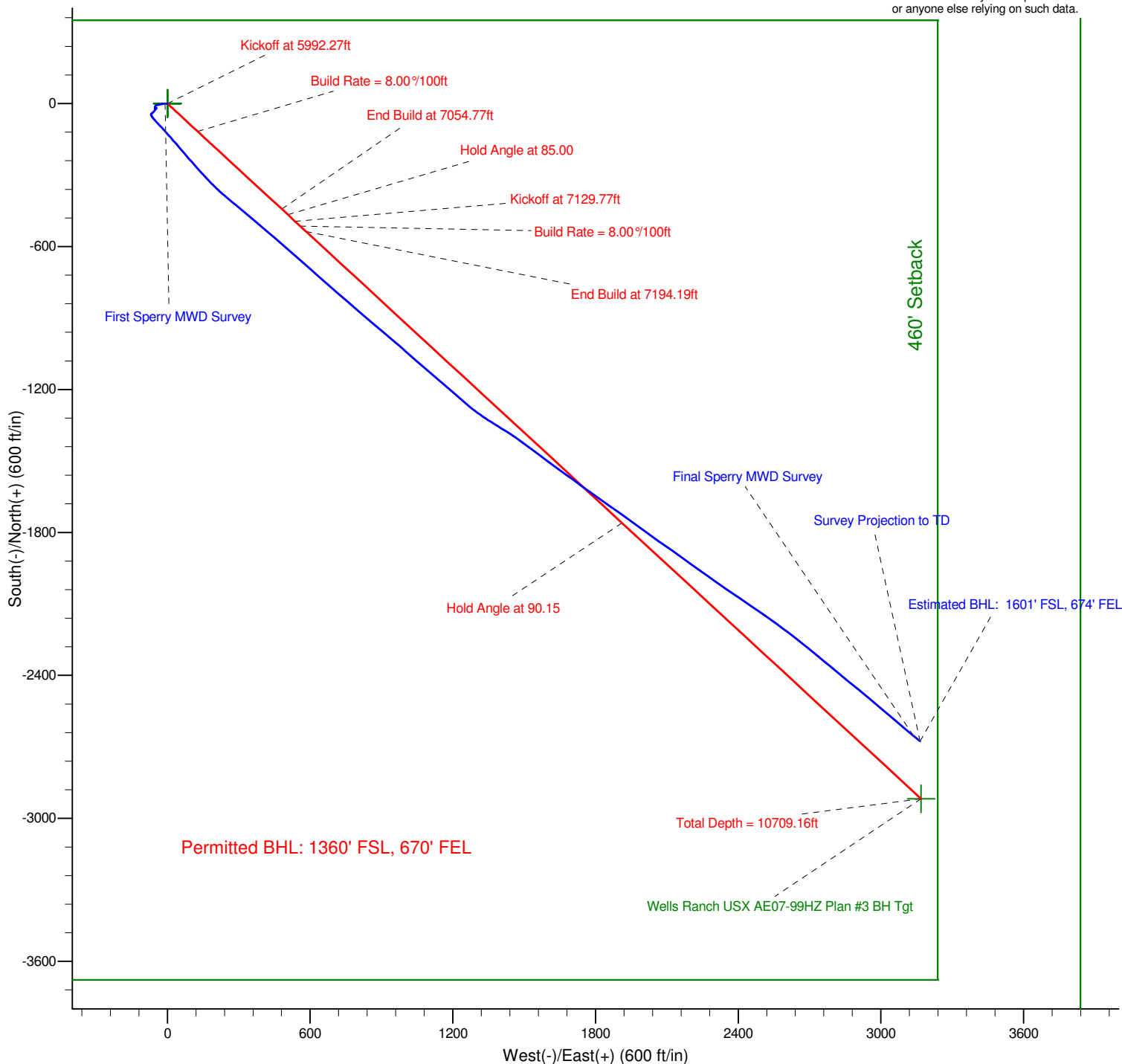
Azimuths to Grid North  
True North: -0.73°  
Magnetic North: 8.02°

Magnetic Field  
Strength: 53319.6snT  
Dip Angle: 67.25°  
Date: 6/15/2010  
Model: BGGM2010

## LEGEND

- Wells Ranch USX AE07-99HZ, Plan #3, Plan #3 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX AE07-99HZ well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.



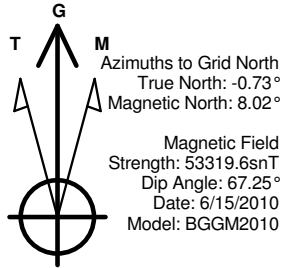


Project: Weld County, CO  
Site: Sec. 7-T6N-R62W  
Well: Wells Ranch USX AE07-99HZ

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Sperry Drilling



## LEGEND

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