Noble Energy

Weld County, CO (NAD 83)
Sec. 25-T6N-R63W (Wells Ranch USX AA25 SOUTH PAD)
Wells Ranch USX AA25-63-1HN - A1

Design: Drillog Gyro and Sperry MWD Survey

Sperry Drilling Services

Final Survey Report

10 January, 2012

Well Coordinates: 1,410,767.23 N, 3,307,743.61 E (40° 27' 20.48" N, 104° 23' 38.76" W)
Ground Level: 4,790.00 ft

Local Coordinate Origin:	Centered on Well Wells Ranch USX AA25-63-1HN -
Viewing Datum:	KB @ 4814.00ft (Rig KB)
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 AA25-63-1HN - Drillog Gyro and Sperry 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
100.00	0.23	248.79	100.00	-0.07	-0.19	-0.17	0.23
Surveys from 100.00ft to 620.00ft are Drillog Gyro Surveys							
200.00	0.23	334.89	200.00	0.04	-0.46	-0.46	0.31
300.00	0.24	23.53	300.00	0.41	-0.46	-0.53	0.19
400.00	0.29	32.72	400.00	0.82	-0.24	-0.39	0.07
500.00	0.13	93.85	500.00	1.02	0.01	-0.19	0.25
600.00	0.26	331.97	600.00	1.21	0.02	-0.22	0.35
620.00	0.26	344.59	620.00	1.30	-0.02	-0.27	0.29
Tie-On to Drillog Gyro Survey							
701.00	0.57	305.93	700.99	1.71	-0.39	-0.72	0.50
First Sperry MWD Survey							
792.00	0.59	313.32	791.99	2.30	-1.10	-1.53	0.09
882.00	1.33	174.58	881.98	1.58	-1.34	-1.62	2.02
974.00	1.12	167.59	973.96	-0.37	-1.04	-0.95	0.28
1,257.00	1.70	197.29	1,256.88	-7.07	-1.70	-0.29	0.32
1,446.00	1.35	187.03	1,445.81	-11.96	-2.80	-0.43	0.23
1,540.00	4.54	189.52	1,539.68	-16.73	-3.55	-0.24	3.40
1,635.00	6.71	180.70	1,634.21	-25.99	-4.24	0.89	2.45
1,729.00	8.36	176.54	1,727.40	-38.30	-3.90	3.62	1.85
1,824.00	8.96	175.77	1,821.32	-52.57	-2.94	7.34	0.64
1,918.00	10.81	173.15	1,913.92	-68.63	-1.34	12.02	2.02
2,013.00	12.19	175.83	2,007.01	-87.48	0.45	17.44	1.56
2,110.00	12.75	183.87	2,101.73	-108.37	0.47	21.52	1.88
2,206.00	13.74	181.07	2,195.17	-130.34	-0.46	24.88	1.23
2,302.00	15.42	177.53	2,288.08	-154.49	-0.12	29.90	1.98
2,397.00	15.15	178.77	2,379.72	-179.52	0.69	35.56	0.45
2,492.00	14.52	178.78	2,471.55	-203.84	1.21	40.79	0.66
2,587.00	15.90	176.73	2,563.22	-228.74	2.21	46.61	1.56
2,683.00	14.83	177.23	2,655.79	-254.14	3.55	52.86	1.12
2,779.00	15.65	175.52	2,748.41	-279.32	5.15	59.33	0.97
2,874.00	16.11	178.29	2,839.79	-305.27	6.55	65.74	0.93
2,970.00	17.20	179.53	2,931.76	-332.78	7.06	71.59	1.19
3,065.00	16.38	177.92	3,022.71	-360.21	7.66	77.51	0.99
3,161.00	13.71	177.80	3,115.41	-385.11	8.59	83.26	2.78
3,257.00	15.26	180.27	3,208.36	-409.11	8.97	88.29	1.74
3,352.00	14.00	181.87	3,300.28	-433.10	8.54	92.53	1.39
3,448.00	13.63	181.29	3,393.50	-456.02	7.90	96.36	0.41
3,544.00	13.78	183.31	3,486.77	-478.74	6.99	99.87	0.52
3,639.00	15.60	186.50	3,578.66	-502.73	4.89	102.48	2.10
3,735.00	17.27	182.68	3,670.74	-529.79	2.76	105.65	2.07
3,831.00	18.05	182.48	3,762.21	-558.89	1.45	110.02	0.81
3,925.00	18.24	180.58	3,851.54	-588.14	0.67	114.94	0.66
4,021.00	18.53	183.27	3,942.64	-618.40	-0.35	119.81	0.93
4,116.00	16.34	182.48	4,033.27	-646.82	-1.79	123.92	2.32
4,212.00	14.01	180.30	4,125.92	-671.94	-2.44	128.17	2.50
4,307.00	12.84	173.63	4,218.32	-693.93	-1.32	133.53	2.04
4,402.00	12.89	178.81	4,310.94	-715.02	0.07	138.99	1.21
4,498.00	14.52	179.95	4,404.21	-737.76	0.30	143.64	1.72
4,593.00	15.45	180.73	4,495.98	-762.32	0.15	148.27	1.00

Design Report for Wells Ranch USX AA25-63-1HN - Drillog Gyro and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,688.00	11.39	176.67	4,588.36	-784.35	0.53	152.92	4.38
4,784.00	12.10	184.06	4,682.36	-803.85	0.37	156.55	1.73
4,879.00	12.99	186.10	4,775.09	-824.40	-1.47	158.74	1.05
4,975.00	11.15	187.61	4,868.96	-844.33	-3.85	160.28	1.94
5,070.00	10.69	187.04	4,962.24	-862.18	-6.14	161.50	0.50
5,166.00	8.15	188.95	5,056.94	-877.74	-8.29	162.41	2.67
5,262.00	5.84	184.77	5,152.22	-889.33	-9.76	163.23	2.46
5,356.00	4.66	166.74	5,245.83	-897.81	-9.28	165.35	2.14
5,452.00	4.01	165.28	5,341.56	-904.86	-7.53	168.43	0.69
5,548.00	3.68	161.82	5,437.34	-911.03	-5.72	171.41	0.42
5,643.00	2.55	136.57	5,532.20	-915.46	-3.31	174.63	1.84
5,739.00	1.99	125.36	5,628.13	-917.98	-0.49	177.89	0.74
5,835.00	1.70	106.80	5,724.08	-919.35	2.24	180.83	0.69
5,880.00	1.03	103.06	5,769.07	-919.64	3.27	181.90	1.50
5,942.00	1.24	106.07	5,831.05	-919.95	4.46	183.12	0.35
6,026.00	5.27	95.47	5,914.90	-920.57	9.17	187.87	4.83
6,074.00	10.73	101.07	5,962.42	-921.64	15.76	194.53	11.48
6,121.00	15.11	103.25	6,008.22	-923.88	26.02	205.04	9.38
6,169.00	16.67	101.06	6,054.38	-926.64	38.87	218.17	3.48
6,217.00	20.74	98.93	6,099.84	-929.28	54.03	233.56	8.60
6,265.00	24.00	99.51	6,144.22	-932.21	72.05	251.81	6.81
6,313.00	28.04	96.75	6,187.35	-935.15	92.90	272.83	8.78
6,361.00	33.25	95.11	6,228.63	-937.65	117.22	297.18	10.99
6,409.00	37.56	96.51	6,267.74	-940.48	144.88	324.86	9.14
6,457.00	40.31	95.95	6,305.08	-943.75	174.86	354.90	5.78
6,504.00	44.18	96.61	6,339.86	-947.21	206.27	386.38	8.29
6,552.00	47.43	95.98	6,373.32	-950.98	240.47	420.66	6.84
6,599.00	49.74	94.79	6,404.41	-954.28	275.56	455.72	5.27
6,647.00	53.73	93.79	6,434.13	-957.09	313.13	493.13	8.47
6,695.00	57.43	92.60	6,461.26	-959.29	352.66	532.33	7.97
6,743.00	60.88	89.54	6,485.87	-960.04	393.85	572.88	9.03
6,791.00	65.28	87.83	6,507.60	-959.04	436.62	614.65	9.70
6,839.00	69.89	88.99	6,525.90	-957.82	480.97	657.91	9.86
6,887.00	73.39	89.67	6,541.01	-957.29	526.51	702.48	7.41
6,935.00	75.59	89.48	6,553.85	-956.95	572.76	747.78	4.60
6,981.00	77.90	89.51	6,564.39	-956.55	617.53	791.62	5.02
7,061.00	80.60	89.36	6,579.32	-955.78	696.11	868.56	3.38
7,132.00	86.64	88.99	6,587.20	-954.76	766.63	937.54	8.52
7,196.00	88.98	89.64	6,589.65	-954.00	830.58	1,000.11	3.79
7,291.00	90.71	89.52	6,589.90	-953.30	925.57	1,093.16	1.83
7,387.00	90.12	89.16	6,589.21	-952.19	1,021.56	1,187.11	0.72
7,482.00	91.20	88.83	6,588.11	-950.53	1,116.54	1,279.95	1.19
7,578.00	89.26	88.29	6,587.73	-948.12	1,212.50	1,373.62	2.10
7,673.00	90.71	88.68	6,587.75	-945.60	1,307.47	1,466.28	1.58
7,769.00	90.77	89.48	6,586.51	-944.06	1,403.45	1,560.13	0.84
7,865.00	89.91	90.11	6,585.94	-943.72	1,499.44	1,654.23	1.11
7,960.00	91.14	89.78	6,585.07	-943.63	1,594.44	1,747.40	1.34
8,056.00	89.91	89.64	6,584.19	-943.14	1,690.43	1,841.47	1.29
8,152.00	91.48	89.56	6,583.03	-942.47	1,786.42	1,935.50	1.64
8,247.00	91.23	89.67	6,580.78	-941.83	1,881.39	2,028.53	0.29
8,343.00	88.61	88.20	6,580.92	-940.05	1,977.36	2,122.33	3.13

Design Report for Wells Ranch USX AA25-63-1HN - Drillog Gyro and Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,439.00	90.03	88.07	6,582.06	-936.93	2,073.30	2,215.83	1.49
8,534.00	92.83	89.12	6,579.69	-934.60	2,168.23	2,308.50	3.15
8,630.00	90.83	89.99	6,576.62	-933.85	2,264.17	2,402.47	2.27
8,726.00	88.43	89.88	6,577.24	-933.74	2,360.17	2,496.61	2.50
8,822.00	89.54	90.73	6,578.94	-934.26	2,456.15	2,590.86	1.46
8,918.00	91.79	91.13	6,577.83	-935.81	2,552.12	2,685.31	2.38
9,013.00	89.01	90.25	6,577.16	-936.96	2,647.10	2,778.71	3.07
9,109.00	90.71	90.81	6,577.40	-937.84	2,743.09	2,873.04	1.86
9,204.00	90.74	90.02	6,576.20	-938.53	2,838.08	2,966.35	0.83
9,300.00	88.58	88.36	6,576.77	-937.18	2,934.06	3,060.24	2.84
9,396.00	90.37	88.63	6,577.65	-934.65	3,030.02	3,153.88	1.89
9,492.00	89.23	87.88	6,577.98	-931.73	3,125.97	3,247.44	1.42
9,588.00	88.83	88.91	6,579.61	-929.04	3,221.92	3,341.03	1.15
9,683.00	90.00	88.93	6,580.58	-927.25	3,316.90	3,433.85	1.23
9,779.00	89.17	90.20	6,581.27	-926.52	3,412.89	3,527.87	1.58
9,874.00	90.58	90.70	6,581.48	-927.27	3,507.88	3,621.20	1.57
9,969.00	88.68	90.43	6,582.09	-928.21	3,602.87	3,714.56	2.02
10,064.00	89.07	90.56	6,583.96	-929.03	3,697.85	3,807.89	0.43
10,160.00	90.31	90.35	6,584.48	-929.79	3,793.84	3,902.20	1.31
10,255.00	89.94	88.81	6,584.27	-929.09	3,888.84	3,995.25	1.67
10,350.00	91.60	89.22	6,582.99	-927.46	3,983.81	4,088.10	1.80
10,445.00	89.85	87.35	6,581.79	-924.62	4,078.75	4,180.68	2.70
10,541.00	89.78	87.67	6,582.10	-920.45	4,174.66	4,273.95	0.34
10,636.00	90.15	86.50	6,582.16	-915.62	4,269.54	4,366.07	1.29
10,732.00	90.15	85.32	6,581.91	-908.77	4,365.29	4,458.67	1.23
10,828.00	90.31	84.47	6,581.52	-900.23	4,460.91	4,550.81	0.90
10,908.00	90.18	82.93	6,581.18	-891.45	4,540.42	4,627.10	1.93
Final Sperry MWD Survey							
10,966.00	90.18	82.93	6,581.00	-884.31	4,597.98	4,682.18	0.00
Survey Projection to TD - Estimated BHL: 1077' FSL, 538' FEL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
100.00	100.00	-0.07	-0.19	Surveys from 100.00ft to 620.00ft are Drillog Gyro Surveys
620.00	620.00	1.30	-0.02	Tie-On to Drillog Gyro Survey
701.00	700.99	1.71	-0.39	First Sperry MWD Survey
10,908.00	6,581.18	-891.45	4,540.42	Final Sperry MWD Survey
10,966.00	6,581.00	-884.31	4,597.98	Survey Projection to TD
10,966.00	6,581.00	-884.31	4,597.98	Estimated BHL: 1077' FSL, 538' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Wells Ranch USX AA25-63-1HN_PlanA - Rev0_BHL Tgt	101.20	Slot	0.00	0.00	0.00

Design Report for Wells Ranch USX AA25-63-1HN - Drillog Gyro and Sperry MWD Survey

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
100.00	620.00	Drillog Gyro Surveys	NS-GYRO-MS
701.00	10,966.00	Sperry MWD Surveys	MWD

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 25	0.00	0.00	0.00	0.00	0.00	1,410,767.23	3,307,743.61	40° 27' 20.484 N	104° 23' 38.760 W
- actual wellpath hits target center									
- Polygon									
Point 1				-133.00	-2,020.00	1,408,747.31	3,307,610.61		
Point 2				-180.00	3,295.00	1,414,062.11	3,307,563.61		
Point 3				5,112.00	3,351.00	1,414,118.11	3,312,855.42		
Point 4				5,140.00	-1,954.00	1,408,813.31	3,312,883.42		
Point 5				-133.00	-2,020.00	1,408,747.31	3,307,610.61		
Wells Ranch USX	0.00	0.00	6,568.24	-911.34	4,600.94	1,409,855.93	3,312,344.37	40° 27' 10.908 N	104° 22' 39.396 W
- actual wellpath misses target center by 30.04ft at 10965.64ft MD (6581.00 TVD, -884.35 N, 4597.63 E)									
- Point									
Wells Ranch 25	0.00	0.00	0.00	0.00	0.00	1,410,767.23	3,307,743.61	40° 27' 20.484 N	104° 23' 38.760 W
- actual wellpath hits target center									
- Polygon									
Point 1				327.00	-1,560.00	1,409,207.29	3,308,070.60		
Point 2				280.00	2,835.00	1,413,602.13	3,308,023.60		
Point 3				4,652.00	2,891.00	1,413,658.13	3,312,395.44		
Point 4				4,680.00	-1,494.00	1,409,273.29	3,312,423.44		
Point 5				327.00	-1,560.00	1,409,207.29	3,308,070.60		

North Reference Sheet for Sec. 25-T6N-R63W (Wells Ranch USX AA25 SOUTH PAD) - Wells Ranch USX AA25-63-1HN

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

Vertical Depths are relative to KB @ 4814.00ft (Rig KB). Northing and Easting are relative to Wells Ranch USX AA25-63-1HN - Slot A1

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: 0.99996323

Grid Coordinates of Well: 1,410,767.23 ft N, 3,307,743.61 ft E

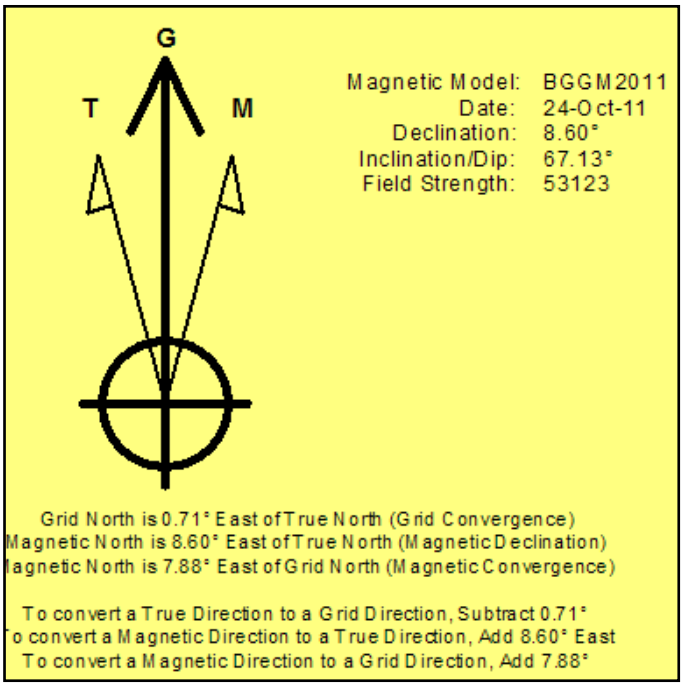
Geographical Coordinates of Well: 40° 27' 20.48" N, 104° 23' 38.76" W

Grid Convergence at Surface is: 0.71°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,966.00ft

the Bottom Hole Displacement is 4,682.25ft in the Direction of 100.89° (Grid).

Magnetic Convergence at surface is: -7.88° (24 October 2011, , BGGM2011)



Project: Weld County, CO (NAD 83)
Site: Sec. 25-T6N-R63W (Wells Ranch USX AA25 SOUTH PAD)
Well: Wells Ranch USX AA25-63-1HN

Noble Energy

HALLIBURTON
Sperry Drilling

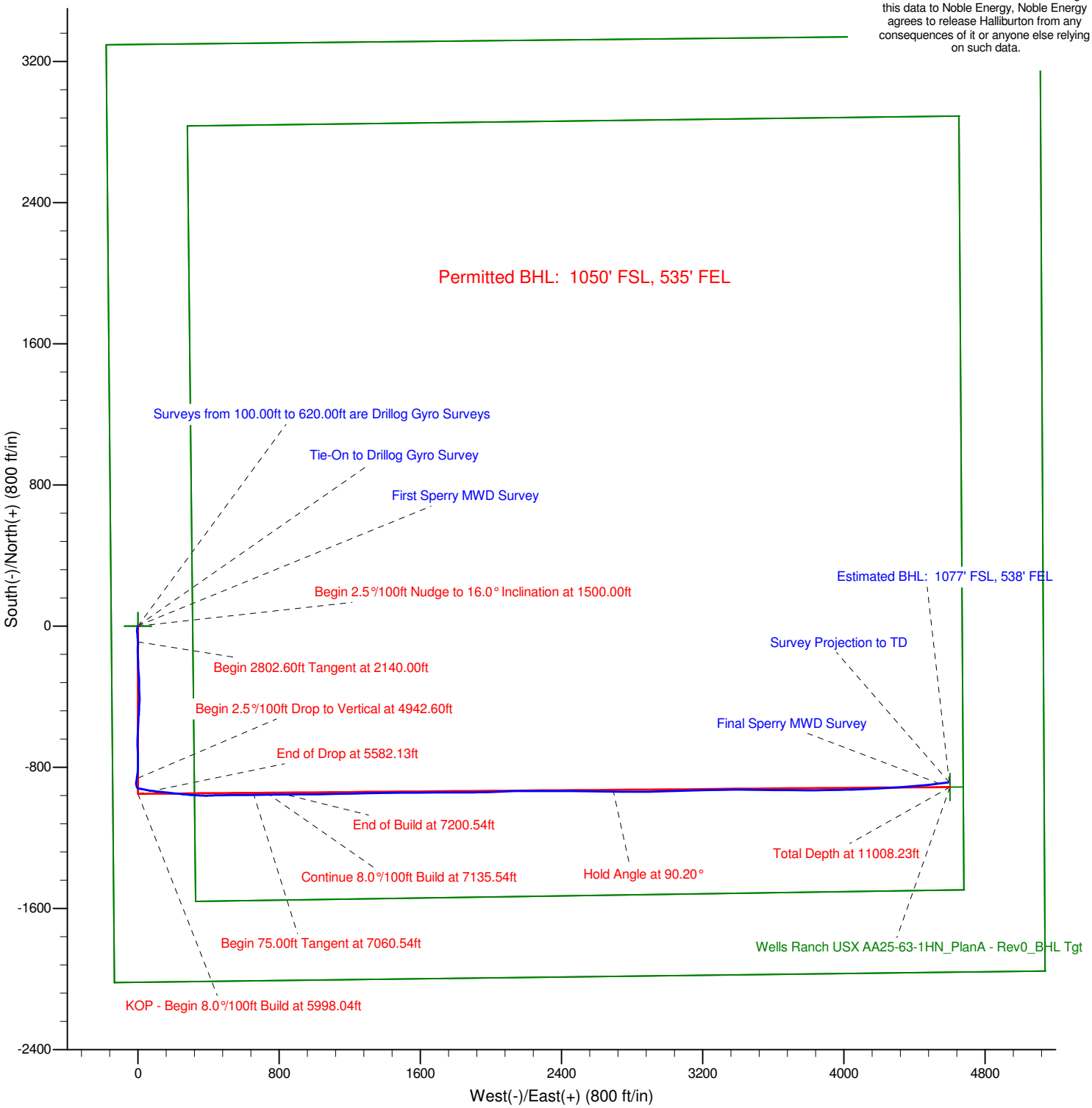
Azimuths to Grid North
True North: -0.71°
Magnetic North: 7.88°

Magnetic Field
Strength: 53123.1snT
Dip Angle: 67.13°
Date: 10/24/2011
Model: BGGM2011

LEGEND

Wells Ranch USX AA25-63-1HN, Plan A, Plan A - Rev 1 Proposa
Drillog Gyro and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX AA25-63-1HN 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 (NAD 83)
Site: Sec. 25-T6N-R63W (Wells Ranch USX AA25 SOUTH PAD)
Well: Wells Ranch USX AA25-63-1HN

Noble Energy

HALLIBURTON
Sperry Drilling

Azimuths to Grid North
True North: -0.71°
Magnetic North: 7.88°

Magnetic Field
Strength: 53123.1snT
Dip Angle: 67.13°
Date: 10/24/2011
Model: BGGM2011

LEGEND

Wells Ranch USX AA25-63-1HN, Plan A, Plan A - Rev 1 Proposal V0
Drillog Gyro and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch USX AA25-63-1HN 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.