

Noble Energy

Weld County, CO (NAD 83)

Sec. 36-T6N-R65W (Bill Mansfield 36 PAD)

Bill E36-67HN - A1

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

30 October, 2012

Well Coordinates: 1,405,466.40 N, 3,244,962.78 E (40° 26' 35.05" N, 104° 37' 11.57" W)

Ground Level: 4,654.00 ft

Local Coordinate Origin:

Centered on Well Bill E36-67HN - Slot A1

Viewing Datum:

KB @ 4678.00ft (H&P 343)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Design Report for Bill E36-67HN - 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
662.00	0.00	0.00	662.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 662.00ft							
726.00	0.37	233.06	726.00	-0.12	-0.17	-0.19	0.58
First MWD Survey							
821.00	0.28	245.50	821.00	-0.40	-0.62	-0.70	0.12
1,010.00	0.69	201.63	1,009.99	-1.65	-1.46	-1.82	0.28
1,194.00	1.16	222.06	1,193.97	-4.07	-3.12	-4.01	0.31
1,287.00	1.25	212.32	1,286.95	-5.62	-4.29	-5.52	0.24
1,471.00	1.24	216.78	1,470.90	-8.91	-6.56	-8.51	0.05
1,563.00	2.99	338.74	1,562.86	-7.47	-8.02	-9.59	4.12
1,655.00	3.43	351.33	1,654.72	-2.52	-9.31	-9.64	0.90
1,747.00	5.90	350.26	1,746.41	4.86	-10.52	-9.04	2.69
1,839.00	8.74	355.03	1,837.65	16.49	-11.93	-7.59	3.15
1,932.00	11.46	352.49	1,929.20	32.69	-13.75	-5.45	2.96
2,031.00	13.31	345.22	2,025.90	53.47	-17.94	-4.50	2.44
2,126.00	14.67	349.83	2,118.08	75.88	-22.86	-3.86	1.85
2,222.00	15.71	347.26	2,210.73	100.52	-27.87	-2.78	1.29
2,317.00	15.34	346.34	2,302.26	125.28	-33.67	-2.44	0.47
2,413.00	14.33	348.27	2,395.06	149.25	-39.09	-1.90	1.17
2,508.00	17.02	349.00	2,486.52	174.42	-44.13	-0.72	2.84
2,604.00	16.24	346.45	2,578.50	201.26	-49.96	0.10	1.11
2,699.00	16.24	346.10	2,669.71	227.07	-56.26	0.21	0.10
2,795.00	17.11	344.76	2,761.68	253.72	-63.20	-0.08	0.99
2,890.00	17.26	344.64	2,852.43	280.80	-70.60	-0.74	0.16
2,985.00	17.53	345.74	2,943.09	308.25	-77.86	-1.15	0.45
3,081.00	15.96	345.85	3,035.02	335.07	-84.65	-1.27	1.64
3,176.00	15.08	344.70	3,126.55	359.65	-91.10	-1.60	0.98
3,272.00	14.35	345.73	3,219.40	383.23	-97.33	-1.95	0.81
3,367.00	12.93	344.82	3,311.72	404.89	-103.02	-2.24	1.51
3,463.00	13.25	347.81	3,405.23	426.01	-108.15	-2.12	0.78
3,558.00	14.12	347.54	3,497.53	447.97	-112.95	-1.48	0.92
3,653.00	17.18	348.03	3,589.00	473.02	-118.36	-0.68	3.22
3,749.00	18.76	349.34	3,680.31	502.06	-124.16	0.70	1.70
3,844.00	18.22	345.54	3,770.41	531.45	-130.69	1.46	1.39
3,940.00	14.99	345.26	3,862.40	558.00	-137.60	1.16	3.37
4,035.00	14.70	345.29	3,954.22	581.54	-143.79	0.84	0.31
4,131.00	14.01	344.14	4,047.23	604.50	-150.06	0.30	0.78
4,226.00	13.72	343.31	4,139.46	626.35	-156.43	-0.62	0.37
4,322.00	11.33	337.69	4,233.17	645.99	-163.29	-2.53	2.79
4,417.00	7.67	342.62	4,326.85	660.67	-168.72	-4.26	3.94
4,512.00	6.81	343.24	4,421.09	672.12	-172.24	-4.91	0.91
4,608.00	5.74	343.46	4,516.52	682.17	-175.25	-5.40	1.11
4,799.00	4.39	347.78	4,706.77	698.47	-179.52	-5.61	0.73
4,894.00	3.46	346.90	4,801.54	704.82	-180.94	-5.45	0.98
5,085.00	1.63	17.19	4,992.36	713.03	-181.44	-3.96	1.16
5,180.00	1.04	22.07	5,087.33	715.12	-180.72	-2.76	0.63
5,371.00	0.43	66.09	5,278.31	717.01	-179.41	-1.03	0.41
5,466.00	0.32	64.11	5,373.31	717.27	-178.84	-0.42	0.12
5,752.00	0.59	135.20	5,659.30	716.58	-177.09	1.12	0.20

Design Report for Bill E36-67HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,847.00	0.31	115.86	5,754.30	716.12	-176.51	1.57	0.33
5,942.00	0.43	122.28	5,849.30	715.82	-175.98	2.01	0.13
6,133.00	0.46	136.24	6,040.29	714.88	-174.84	2.89	0.06
6,228.00	3.11	82.90	6,135.24	714.92	-172.02	5.63	3.01
6,276.00	7.68	78.45	6,183.02	715.73	-167.59	10.13	9.55
6,323.00	11.75	77.37	6,229.33	717.40	-159.84	18.06	8.67
6,371.00	15.48	78.49	6,275.98	719.75	-148.79	29.35	7.79
6,419.00	19.21	79.36	6,321.79	722.49	-134.74	43.64	7.79
6,467.00	23.17	80.78	6,366.53	725.46	-117.65	60.94	8.32
6,514.00	26.23	82.84	6,409.23	728.24	-98.22	80.47	6.76
6,562.00	29.27	87.49	6,451.71	730.07	-75.96	102.51	7.77
6,610.00	30.78	89.98	6,493.27	730.59	-51.95	125.93	4.08
6,658.00	34.00	86.66	6,533.80	731.38	-26.27	151.05	7.66
6,705.00	38.31	84.84	6,571.74	733.45	1.38	178.38	9.45
6,753.00	41.77	83.97	6,608.48	736.47	32.10	208.93	7.30
6,801.00	45.53	85.56	6,643.21	739.48	65.09	241.66	8.16
6,849.00	49.39	84.97	6,675.65	742.40	100.33	276.56	8.09
6,896.00	54.67	84.39	6,704.56	745.84	137.21	313.18	11.28
6,944.00	60.22	84.32	6,730.38	749.82	177.45	353.20	11.56
6,991.00	64.19	85.56	6,752.29	753.48	218.86	394.26	8.76
7,039.00	67.43	86.20	6,771.96	756.62	262.52	437.40	6.86
7,087.00	70.77	86.68	6,789.08	759.41	307.27	481.50	7.02
7,135.00	74.26	86.93	6,803.50	761.96	352.98	526.46	7.29
7,182.00	76.86	87.27	6,815.22	764.26	398.43	571.13	5.58
7,216.00	80.50	85.61	6,821.89	766.33	431.70	603.91	11.73
7,309.00	85.37	84.10	6,833.33	774.61	523.59	695.08	5.48
7,404.00	85.75	83.73	6,840.68	784.65	617.77	788.90	0.56
7,500.00	86.05	83.56	6,847.55	795.25	712.94	883.81	0.36
7,595.00	88.58	84.79	6,852.00	804.88	807.33	977.74	2.96
7,690.00	90.37	85.91	6,852.87	812.58	902.01	1,071.48	2.22
7,786.00	91.42	86.35	6,851.37	819.06	997.78	1,165.98	1.19
7,881.00	90.77	85.77	6,849.55	825.58	1,092.54	1,259.51	0.92
7,977.00	91.51	86.33	6,847.64	832.20	1,188.29	1,354.03	0.97
8,072.00	92.40	87.02	6,844.40	837.70	1,283.07	1,447.34	1.19
8,167.00	92.59	87.33	6,840.26	842.38	1,377.86	1,540.46	0.38
8,263.00	93.02	87.50	6,835.57	846.71	1,473.65	1,634.46	0.48
8,358.00	92.16	85.91	6,831.27	852.16	1,568.39	1,727.71	1.90
8,454.00	91.94	84.87	6,827.84	859.87	1,664.02	1,822.37	1.11
8,549.00	90.62	84.85	6,825.72	868.38	1,758.61	1,916.22	1.39
8,645.00	90.80	83.94	6,824.53	877.76	1,854.15	2,011.19	0.97
8,740.00	89.94	84.40	6,823.91	887.40	1,948.65	2,105.23	1.03
8,836.00	90.68	84.57	6,823.39	896.63	2,044.20	2,200.19	0.79
8,931.00	91.48	84.66	6,821.60	905.54	2,138.77	2,294.11	0.85
9,027.00	90.40	85.29	6,820.03	913.95	2,234.38	2,388.93	1.30
9,122.00	90.46	84.56	6,819.32	922.36	2,329.01	2,482.78	0.77
9,217.00	89.82	83.42	6,819.08	932.30	2,423.48	2,576.86	1.38
9,313.00	90.71	83.61	6,818.64	943.14	2,518.87	2,672.04	0.95
9,408.00	91.60	84.06	6,816.73	953.34	2,613.30	2,766.14	1.05
9,504.00	92.16	84.79	6,813.58	962.67	2,708.79	2,861.06	0.96
9,599.00	93.27	84.56	6,809.08	971.47	2,803.27	2,954.88	1.19
9,695.00	92.16	84.81	6,804.53	980.35	2,898.75	3,049.68	1.19

Design Report for Bill E36-67HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,790.00	90.43	85.32	6,802.38	988.52	2,993.37	3,143.47	1.90
9,885.00	90.89	85.25	6,801.29	996.33	3,088.04	3,237.23	0.49
9,981.00	89.78	85.09	6,800.73	1,004.42	3,183.70	3,332.01	1.17
10,076.00	90.52	85.20	6,800.48	1,012.46	3,278.36	3,425.81	0.79
10,172.00	89.57	85.12	6,800.40	1,020.56	3,374.01	3,520.59	0.99
10,267.00	89.23	85.34	6,801.40	1,028.45	3,468.68	3,614.36	0.43
10,363.00	91.23	85.50	6,801.01	1,036.12	3,564.37	3,709.07	2.09
10,458.00	89.97	86.55	6,800.02	1,042.70	3,659.13	3,802.62	1.73
10,554.00	89.51	86.49	6,800.45	1,048.53	3,754.95	3,897.02	0.48
10,649.00	89.69	86.48	6,801.12	1,054.36	3,849.77	3,990.44	0.19
10,745.00	89.94	85.45	6,801.43	1,061.11	3,945.53	4,085.00	1.10
10,840.00	89.66	84.19	6,801.76	1,069.69	4,040.14	4,178.88	1.36
10,936.00	90.49	84.50	6,801.63	1,079.15	4,135.67	4,273.87	0.92
11,031.00	90.49	83.00	6,800.82	1,089.49	4,230.10	4,368.00	1.58
11,127.00	90.96	82.55	6,799.60	1,101.56	4,325.33	4,463.33	0.68
11,222.00	91.30	82.08	6,797.73	1,114.26	4,419.46	4,557.74	0.61
Final MWD Survey							
11,279.00	91.30	82.08	6,796.44	1,122.12	4,475.90	4,614.41	0.00
Survey Projection to TD - Estimated BHL: 1314' FNL, 546' FEL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
662.00	662.00	0.00	0.00	Surface Casing Assumed Vertical at 662.00ft
726.00	726.00	-0.12	-0.17	First MWD Survey
11,222.00	6,797.73	1,114.26	4,419.46	Final MWD Survey
11,279.00	6,796.44	1,122.12	4,475.90	Survey Projection to TD
11,279.00	6,796.44	1,122.12	4,475.90	Estimated BHL: 1314' FNL, 546' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Bill E36-67HN_PlanA - Rev1_BHL	76.03	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
662.00	11,279.00	Sperry MWD Surveys	MWD

Design Report for Bill E36-67HN - 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
Bill E36-67HN_Sec.	0.00	0.00	0.00	0.00	0.00	1,405,466.40	3,244,962.78	40° 26' 35.052 N	104° 37' 11.568 W
- actual wellpath hits target center									
- Polygon									
Point 1			197.00	1,949.00		1,407,415.33	3,245,159.78		
Point 2			4,540.00	1,980.00		1,407,446.33	3,249,502.61		
Point 3			4,624.00	-2,389.00		1,403,077.49	3,249,586.61		
Point 4			255.00	-2,431.00		1,403,035.49	3,245,217.77		
Point 5			197.00	1,949.00		1,407,415.33	3,245,159.78		
Bill E36-67HN_Sec.	0.00	0.00	0.00	0.00	0.00	1,405,466.40	3,244,962.78	40° 26' 35.052 N	104° 37' 11.568 W
- actual wellpath hits target center									
- Polygon									
Point 1			-263.00	2,409.00		1,407,875.31	3,244,699.79		
Point 2			5,000.00	2,440.00		1,407,906.31	3,249,962.59		
Point 3			5,084.00	-2,849.00		1,402,617.51	3,250,046.59		
Point 4			-205.00	-2,891.00		1,402,575.51	3,244,757.79		
Point 5			-263.00	2,409.00		1,407,875.31	3,244,699.79		
Bill	0.00	0.00	6,828.33	1,116.08	4,486.99	1,406,582.44	3,249,449.60	40° 26' 45.636 N	104° 36' 13.392 W
- actual wellpath misses target center by 34.30ft at 11279.00ft MD (6796.44 TVD, 1122.12 N, 4475.90 E)									
- Point									

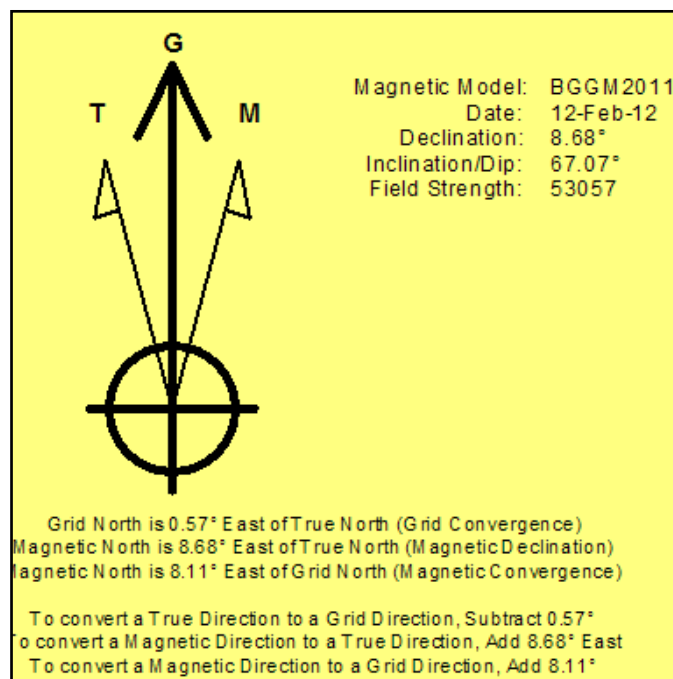
North Reference Sheet for Sec. 36-T6N-R65W (Bill Mansfield 36 PAD) - Bill E36-67HN

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
Vertical Depths are relative to KB @ 4678.00ft (H&P 343). Northing and Easting are relative to Bill E36-67HN - 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: 0.99996246

Grid Coordinates of Well: 1,405,466.40 ft N, 3,244,962.78 ft E
Geographical Coordinates of Well: 40° 26' 35.05" N, 104° 37' 11.57" W
Grid Convergence at Surface is: 0.57°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,279.00ft
the Bottom Hole Displacement is 4,614.42ft in the Direction of 75.93° (Grid).

Magnetic Convergence at surface is: -8.11° (12 February 2012, , BGGM2011)





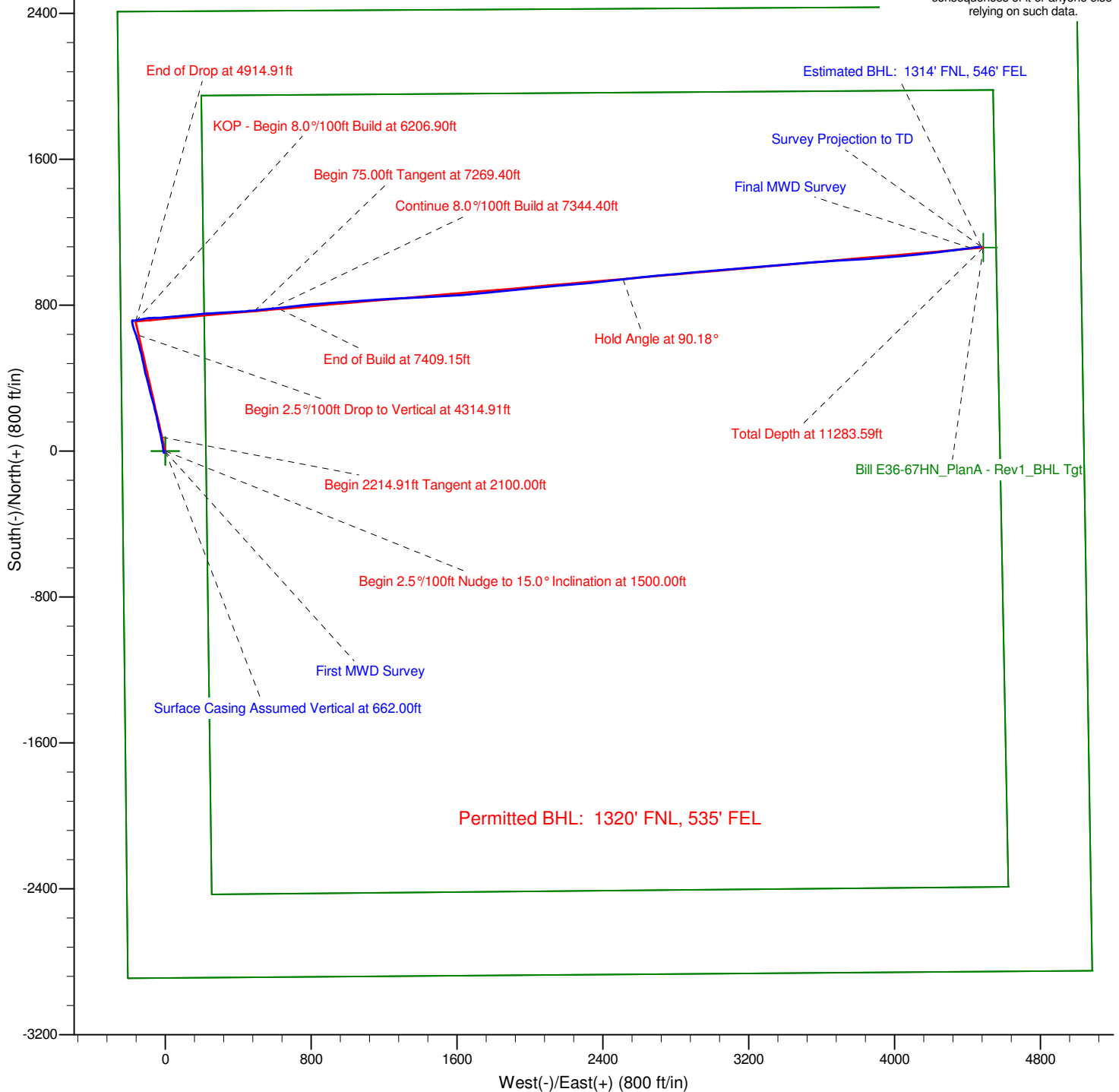
Azimuths to Grid North
 True North: -0.57°
 Magnetic North: 8.11°

Magnetic Field
 Strength: 53057.3snT
 Dip Angle: 67.07°
 Date: 2/12/2012
 Model: BGGM2011

LEGEND

- Bill E36-67HN, Plan A, Plan A - Rev 1 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Bill E36-67HN 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.

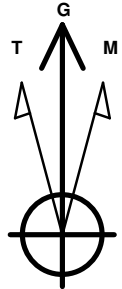


Project: Weld County, CO (NAD 83)
Site: Sec. 36-T6N-R65W (Bill Mansfield 36 PAD)
Well: Bill E36-67HN

Noble Energy

HALLIBURTON

Sperry Drilling



Azimuths to Grid North
True North: -0.57°
Magnetic North: 8.11°

Magnetic Field
Strength: 53057.3snT
Dip Angle: 67.07°
Date: 2/12/2012
Model: BGGM2011

LEGEND

- Bill E36-67HN, Plan A, Plan A - Rev 1 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Bill E36-67HNHN 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.

