

Noble Energy

Garfield County, CO (NAD 83)
Sec. 8-T8S-R95W (SGV 8D PAD)
SGV Federal 8-11D - B11

Plan #2

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

03 March, 2011

Well Coordinates: 1,573,849.36 N, 2,286,063.38 E (39° 22' 54.20" N, 108° 01' 34.02" W)
Ground Level: 6,341.70 ft

Local Coordinate Origin:	Centered on Well SGV Federal 8-11D - Slot B11
Viewing Datum:	RKB 24' @ 6365.70ft (H&P 322)
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 SGV Federal 8-11D - 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
155.00	2.04	58.25	154.97	1.45	2.35	2.58	1.32
First Sperry MWD Survey							
248.00	2.63	88.63	247.89	2.37	5.89	6.23	1.45
339.00	3.35	91.41	338.77	2.36	10.63	10.89	0.81
434.00	2.14	71.95	433.66	2.84	15.09	15.36	1.59
525.00	2.33	70.48	524.59	3.98	18.45	18.87	0.22
616.00	2.09	87.01	615.52	4.69	21.85	22.35	0.75
708.00	3.51	85.79	707.41	4.98	26.34	26.80	1.54
799.00	4.74	84.80	798.17	5.53	32.86	33.31	1.35
894.00	4.67	95.77	892.86	5.50	40.62	40.92	0.95
988.00	4.52	84.61	986.56	5.46	48.11	48.26	0.96
1,082.00	5.57	79.53	1,080.19	6.64	56.29	56.51	1.21
1,177.00	5.22	78.59	1,174.77	8.33	65.06	65.44	0.38
1,271.00	5.08	86.56	1,268.39	9.42	73.40	73.84	0.77
1,365.00	5.34	74.74	1,362.01	10.83	81.78	82.33	1.17
1,460.00	5.80	69.22	1,456.56	13.69	90.53	91.47	0.74
1,556.00	6.01	66.43	1,552.05	17.42	99.67	101.16	0.37
1,650.00	6.03	67.09	1,645.53	21.31	108.73	110.80	0.08
1,744.00	6.52	73.75	1,738.97	24.73	118.40	120.95	0.93
1,839.00	6.11	73.49	1,833.39	27.67	128.43	131.35	0.43
1,933.00	5.56	72.24	1,926.90	30.48	137.56	140.85	0.60
2,028.00	6.88	76.94	2,021.34	33.17	147.49	151.11	1.49
2,122.00	6.53	75.56	2,114.70	35.78	158.15	162.07	0.41
2,216.00	5.97	76.22	2,208.14	38.28	168.07	172.29	0.60
2,311.00	5.99	76.56	2,302.62	40.61	177.69	182.18	0.04
2,405.00	5.74	79.10	2,396.13	42.63	187.08	191.78	0.38
2,499.00	5.54	73.97	2,489.68	44.78	196.05	201.00	0.58
2,594.00	5.90	68.56	2,584.21	47.83	205.00	210.38	0.68
2,688.00	6.15	70.71	2,677.69	51.26	214.25	220.11	0.36
2,782.00	5.77	68.40	2,771.18	54.66	223.40	229.74	0.48
2,877.00	6.62	76.72	2,865.62	57.68	233.17	239.91	1.30
2,971.00	6.75	77.11	2,958.98	60.15	243.83	250.85	0.15
3,065.00	6.46	77.28	3,052.36	62.55	254.37	261.65	0.31
3,159.00	6.36	75.30	3,145.77	65.03	264.57	272.14	0.26
3,254.00	6.01	73.18	3,240.22	67.81	274.42	282.34	0.44
3,348.00	5.62	75.12	3,333.74	70.41	283.57	291.82	0.46
3,442.00	6.51	76.73	3,427.21	72.82	293.21	301.74	0.96
3,537.00	6.14	75.74	3,521.63	75.31	303.38	312.20	0.41
3,631.00	5.52	83.14	3,615.15	77.09	312.74	321.72	1.04
3,725.00	5.56	72.18	3,708.71	79.02	321.56	330.76	1.12
3,820.00	6.07	67.15	3,803.22	82.38	330.57	340.24	0.76
3,914.00	5.53	67.96	3,896.74	86.01	339.35	349.56	0.58
4,008.00	4.90	69.70	3,990.35	89.10	347.31	357.97	0.69
4,102.00	4.60	71.16	4,084.03	91.71	354.65	365.66	0.34
4,197.00	3.94	74.62	4,178.76	93.81	361.40	372.69	0.75
4,291.00	3.73	79.17	4,272.55	95.24	367.51	378.97	0.39
4,385.00	3.34	76.68	4,366.37	96.44	373.18	384.77	0.45
4,480.00	3.09	86.43	4,461.22	97.24	378.43	390.07	0.63
4,574.00	3.13	93.27	4,555.09	97.25	383.52	395.07	0.40

Design Report for SGV Federal 8-11D - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,668.00	0.91	106.23	4,649.02	96.90	386.80	398.22	2.40
4,762.00	0.72	201.81	4,743.02	96.14	387.30	398.56	1.29
4,856.00	1.22	203.81	4,837.00	94.67	386.67	397.67	0.53
4,951.00	1.07	208.68	4,931.98	92.97	385.84	396.52	0.19
5,045.00	1.23	212.10	5,025.96	91.35	384.88	395.27	0.19
5,139.00	1.94	203.57	5,119.93	89.03	383.71	393.67	0.79
5,234.00	1.94	214.82	5,214.87	86.24	382.15	391.60	0.40
5,328.00	1.75	202.67	5,308.83	83.61	380.69	389.66	0.46
5,422.00	2.02	204.01	5,402.77	80.77	379.46	387.91	0.29
5,516.00	1.83	207.51	5,496.72	77.93	378.09	386.02	0.24
5,611.00	1.85	210.87	5,591.67	75.27	376.61	384.05	0.12
5,705.00	1.85	223.52	5,685.62	72.86	374.78	381.80	0.43
5,800.00	2.55	218.98	5,780.55	70.11	372.40	378.93	0.76
5,894.00	2.06	258.29	5,874.48	68.14	369.43	375.64	1.72
5,988.00	1.22	255.17	5,968.44	67.54	366.81	372.95	0.90
6,083.00	0.90	277.28	6,063.43	67.38	365.09	371.23	0.54
6,177.00	1.37	317.62	6,157.41	68.30	363.60	369.95	0.96
6,271.00	2.20	354.20	6,251.37	70.92	362.66	369.53	1.46
6,365.00	1.68	302.50	6,345.32	73.46	361.31	368.70	1.87
6,459.00	1.84	289.14	6,439.28	74.70	358.73	366.40	0.47
6,553.00	1.94	263.58	6,533.23	75.01	355.72	363.51	0.90
6,647.00	1.21	295.07	6,627.19	75.26	353.24	361.12	1.18
6,742.00	1.32	298.22	6,722.17	76.20	351.37	359.46	0.14
Final Sperry MWD Survey							
6,812.00	1.32	298.22	6,792.15	76.96	349.95	358.21	0.00
Survey Projection to TD - Estimated BHL: 1139' FNL, 708' FWL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
155.00	154.97	1.45	2.35	First Sperry MWD Survey
6,742.00	6,722.17	76.20	351.37	Final Sperry MWD Survey
6,812.00	6,792.15	76.96	349.95	Survey Projection to TD
6,812.00	6,792.15	76.96	349.95	Estimated BHL: 1139' FNL, 708' FWL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	SGV Federal 8-11D Plan #2 BH Tgt	78.91	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
155.00	6,812.00	Sperry MWD Surveys	MWD

Design Report for SGV Federal 8-11D - 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
SGV Federal 8-11D	0.00	0.00	0.00	0.00	0.00	1,573,849.36	2,286,063.38	39° 22' 54.197 N	108° 1' 34.019 W
- actual wellpath hits target center									
- Polygon									
Point 1				546.00	4.87	1,573,854.23	2,286,609.35		
Point 2				146.00	4.87	1,573,854.23	2,286,209.37		
SGV Federal 8-11D	0.00	0.00	4,917.00	67.87	346.12	1,573,917.22	2,286,409.48	39° 22' 54.962 N	108° 1' 29.636 W
- actual wellpath misses target center by 47.23ft at 4936.82ft MD (4917.80 TVD, 93.21 N, 385.97 E)									
- Rectangle (sides W100.00 H200.00 D2,600.00)									
SGV Federal 8-11D	0.00	360.00	4,917.00	92.87	396.12	1,573,942.23	2,286,459.48	39° 22' 55.223 N	108° 1' 29.009 W
- actual wellpath misses target center by 10.15ft at 4935.93ft MD (4916.92 TVD, 93.22 N, 385.98 E)									
- Rectangle (sides W25.00 H25.00 D0.00)									
SGV Federal 8-11D	0.00	0.00	7,517.00	67.87	346.12	1,573,917.22	2,286,409.48	39° 22' 54.962 N	108° 1' 29.636 W
- actual wellpath misses target center by 724.92ft at 6812.00ft MD (6792.15 TVD, 76.96 N, 349.95 E)									
- Point									

North Reference Sheet for Sec. 8-T8S-R95W (SGV 8D PAD) - SGV Federal 8-11D - Plan #2

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

Vertical Depths are relative to RKB 24' @ 6365.70ft (H&P 322). Northing and Easting are relative to SGV Federal 8-11D - Slot B11

Coordinate System is US State Plane 1983, Colorado Central 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:39° 45' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99994788

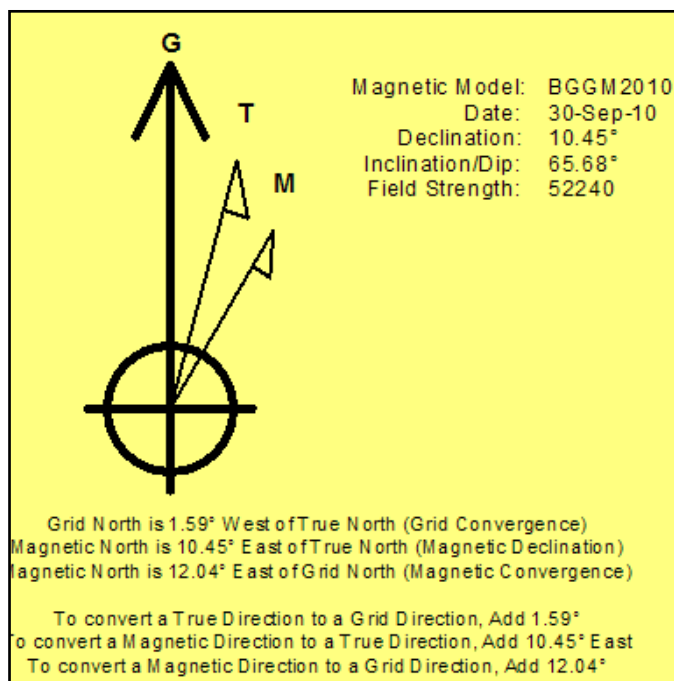
Grid Coordinates of Well: 1,573,849.36 ft N, 2,286,063.38 ft E

Geographical Coordinates of Well: 39° 22' 54.20" N, 108° 01' 34.02" W

Grid Convergence at Surface is: -1.59°

Based upon Minimum Curvature type calculations, at a Measured Depth of 6,812.00ft
the Bottom Hole Displacement is 358.31ft in the Direction of 77.60° (Grid).

Magnetic Convergence at surface is: -12.04° (30 September 2010, , BGGM2010)

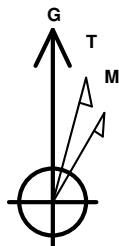


Project: Garfield County, CO (NAD 83)
 Site: Sec. 8-T8S-R95W (SGV 8D PAD)
 Well: SGV Federal 8-11D

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Sperry Drilling



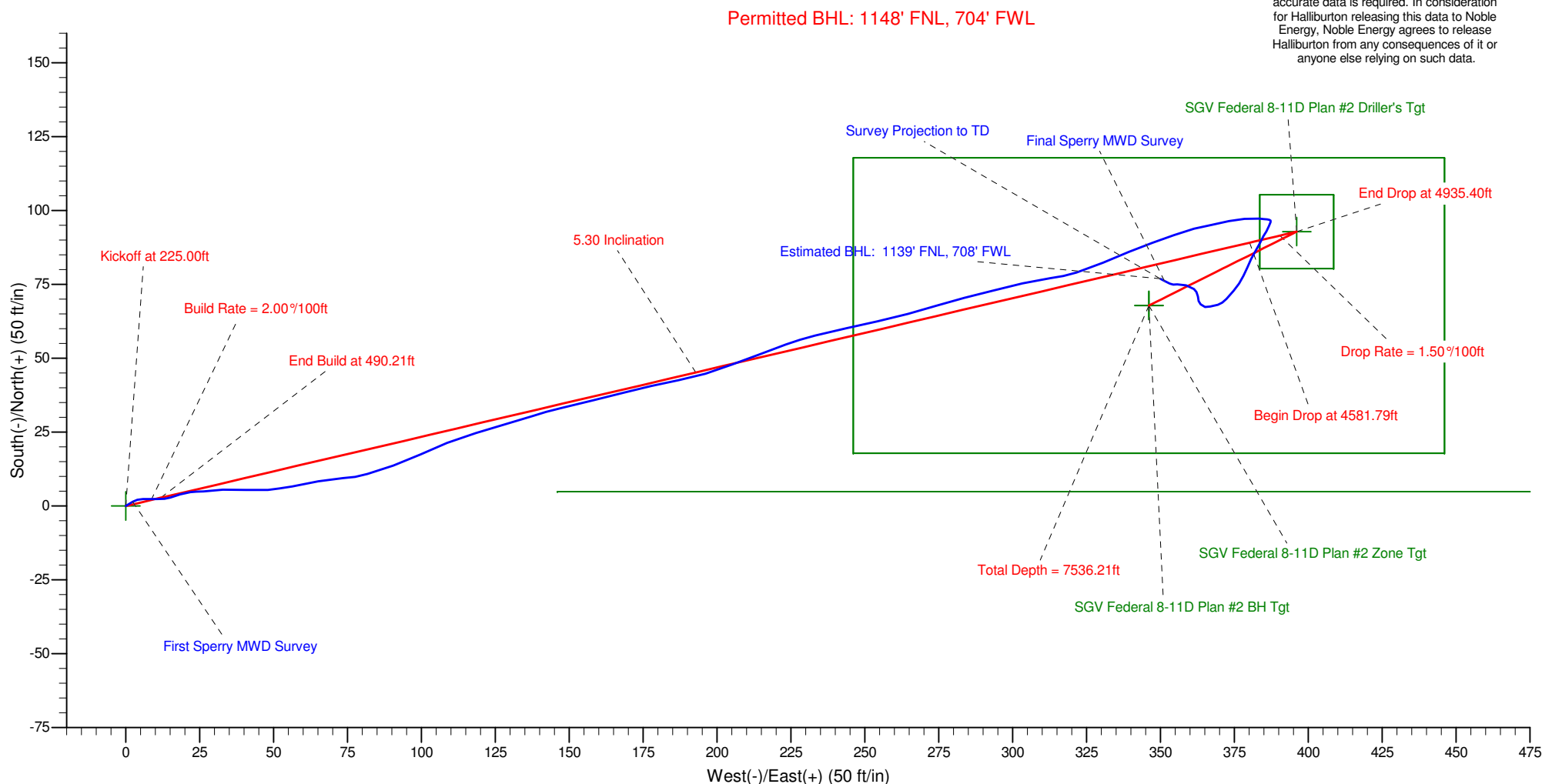
Azimuths to Grid North
 True North: 1.59°
 Magnetic North: 12.04°

Magnetic Field
 Strength: 52240.3nT
 Dip Angle: 65.68°
 Date: 9/30/2010
 Model: BGGM2010

LEGEND

- SGV Federal 8-11D, Plan #2, Plan #2 Proposal V0
- MWD Survey

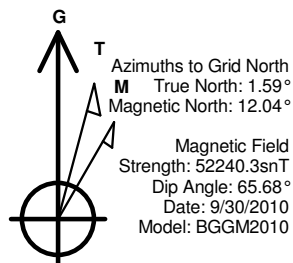
Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the SGV Federal 8-11D well located at Garfield County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide 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.



Noble Energy

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Sperry Drilling



LEGEND

SGV Federal 8-11D, Plan #2, Plan #2 Proposal V0

MWD Survey

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