

Bill Barrett Corp

Weld County, CO (NAD 1983)

Sec. 34-T6N-R62W

Dutch Lake 22-34H

Plan B

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

30 October, 2012

Well Coordinates: 1,404,692.38 N, 3,333,514.26 E (40° 26' 17.15" N, 104° 18' 06.47" W)

Ground Level: 4,648.00 ft

Local Coordinate Origin:

Centered on Well Dutch Lake 22-34H

Viewing Datum:

KB=22' @ 4670.00ft (H&P 278)

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 Dutch Lake 22-34H - 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
880.00	0.00	0.00	880.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 880.00ft							
993.00	0.97	56.79	992.99	0.52	0.80	-0.80	0.86
First MWD Survey							
1,088.00	0.83	32.03	1,087.98	1.55	1.84	-1.83	0.43
1,183.00	2.32	69.67	1,182.95	2.80	4.01	-4.00	1.83
1,277.00	3.88	68.91	1,276.81	4.60	8.76	-8.74	1.66
1,372.00	5.17	66.58	1,371.51	7.46	15.68	-15.66	1.37
1,468.00	5.01	76.81	1,467.13	10.14	23.74	-23.70	0.96
1,564.00	5.72	74.42	1,562.71	12.38	32.42	-32.38	0.78
1,659.00	6.92	72.03	1,657.13	15.42	42.43	-42.38	1.29
1,754.00	5.29	74.91	1,751.59	18.32	52.10	-52.04	1.75
1,849.00	6.36	71.38	1,846.10	21.14	61.32	-61.25	1.19
1,944.00	6.70	69.51	1,940.48	24.76	71.49	-71.41	0.42
2,040.00	7.19	68.72	2,035.78	28.90	82.34	-82.24	0.52
2,136.00	7.60	71.92	2,130.98	33.05	93.97	-93.86	0.61
2,230.00	8.13	65.31	2,224.10	37.76	105.92	-105.79	1.11
2,325.00	7.98	66.28	2,318.16	43.22	118.06	-117.91	0.21
2,421.00	7.85	76.75	2,413.25	47.40	130.54	-130.38	1.51
2,517.00	8.13	72.30	2,508.32	50.97	143.39	-143.22	0.71
2,612.00	8.62	72.69	2,602.30	55.13	156.59	-156.40	0.52
2,707.00	8.45	66.86	2,696.25	59.99	169.80	-169.60	0.93
2,803.00	8.94	71.23	2,791.15	65.16	183.35	-183.13	0.86
2,899.00	9.42	71.83	2,885.92	70.01	197.88	-197.64	0.51
2,995.00	7.57	61.46	2,980.87	75.48	210.90	-210.64	2.49
3,092.00	7.55	65.32	3,077.03	81.20	222.30	-222.03	0.52
3,187.00	7.52	62.67	3,171.21	86.66	233.50	-233.20	0.37
3,283.00	6.97	65.48	3,266.44	91.96	244.38	-244.07	0.68
3,377.00	6.96	63.77	3,359.75	96.84	254.68	-254.35	0.22
3,472.00	8.19	72.80	3,453.92	101.39	266.30	-265.96	1.80
3,567.00	9.78	72.00	3,547.75	105.88	280.44	-280.08	1.68
3,662.00	11.10	71.56	3,641.18	111.27	296.79	-296.41	1.39
3,757.00	10.16	70.40	3,734.55	116.97	313.36	-312.96	1.01
3,851.00	7.99	68.95	3,827.36	122.10	327.27	-326.86	2.32
3,946.00	7.65	72.39	3,921.48	126.39	339.46	-339.03	0.61
4,041.00	6.80	76.65	4,015.73	129.60	350.96	-350.52	1.06
4,137.00	7.28	75.78	4,111.00	132.40	362.38	-361.94	0.51
4,233.00	7.67	74.33	4,206.19	135.63	374.45	-373.99	0.45
4,328.00	7.24	65.83	4,300.39	139.79	386.02	-385.54	1.24
4,424.00	6.11	61.59	4,395.73	144.70	396.03	-395.54	1.28
4,519.00	4.57	68.84	4,490.32	148.47	404.01	-403.50	1.77
4,613.00	4.66	51.18	4,584.02	152.22	410.47	-409.96	1.51
4,709.00	2.32	45.81	4,679.84	156.02	414.90	-414.38	2.46
4,805.00	1.96	47.84	4,775.77	158.47	417.52	-416.98	0.38
4,900.00	1.15	71.48	4,870.73	159.87	419.62	-419.08	1.07
4,995.00	0.86	117.08	4,965.72	159.84	421.16	-420.62	0.87
5,090.00	0.34	246.52	5,060.72	159.41	421.54	-421.00	1.17
5,185.00	1.77	156.47	5,155.70	157.95	421.87	-421.33	1.90
5,281.00	0.20	17.67	5,251.69	156.75	422.51	-421.98	2.01

Design Report for Dutch Lake 22-34H - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,377.00	0.31	104.18	5,347.69	156.85	422.81	-422.28	0.37
5,473.00	0.73	103.56	5,443.68	156.64	423.66	-423.13	0.44
5,567.00	0.81	119.50	5,537.67	156.17	424.82	-424.29	0.24
5,647.00	0.82	146.65	5,617.67	155.42	425.62	-425.10	0.48
5,711.00	1.00	214.22	5,681.66	154.57	425.56	-425.04	1.60
5,759.00	4.45	270.65	5,729.60	154.25	423.46	-422.94	8.30
5,806.00	8.62	281.49	5,776.29	154.97	418.19	-417.66	9.21
5,854.00	12.88	279.58	5,823.44	156.58	409.38	-408.85	8.90
5,902.00	17.98	278.63	5,869.69	158.58	396.77	-396.24	10.64
5,949.00	23.07	275.84	5,913.69	160.61	380.43	-379.89	11.03
5,996.00	27.58	273.14	5,956.17	162.14	360.39	-359.85	9.90
6,044.00	32.67	271.03	5,997.67	162.98	336.33	-335.78	10.83
6,091.00	38.09	268.70	6,035.98	162.88	309.13	-308.58	11.88
6,139.00	43.33	268.15	6,072.35	162.01	277.85	-277.30	10.94
6,186.00	48.59	267.47	6,105.01	160.71	244.10	-243.56	11.24
6,234.00	54.20	266.20	6,134.95	158.63	206.66	-206.13	11.87
6,282.00	59.43	265.99	6,161.21	155.89	166.60	-166.07	10.90
6,330.00	63.47	265.44	6,184.15	152.74	124.56	-124.05	8.48
6,378.00	65.66	267.20	6,204.77	149.96	81.31	-80.80	5.64
6,426.00	66.05	269.17	6,224.40	148.57	37.53	-37.03	3.83
6,474.00	68.47	268.94	6,242.95	147.84	-6.73	7.23	5.06
6,519.00	74.25	268.71	6,257.33	146.97	-49.34	49.83	12.85
6,566.00	82.62	268.41	6,266.75	145.81	-95.33	95.82	17.82
6,614.00	90.71	269.76	6,269.54	145.05	-143.20	143.69	17.09
6,621.00	92.28	270.03	6,269.35	145.04	-150.20	150.69	22.76
6,670.00	96.11	270.03	6,265.77	145.06	-199.06	199.55	7.82
6,690.00	95.27	271.58	6,263.79	145.34	-218.96	219.45	8.78
6,786.00	94.85	269.60	6,255.32	146.32	-314.57	315.06	2.10
6,882.00	91.98	270.20	6,249.60	146.16	-410.39	410.88	3.05
6,978.00	92.71	270.47	6,245.67	146.72	-506.31	506.80	0.81
7,074.00	90.86	269.77	6,242.68	146.92	-602.26	602.75	2.06
7,169.00	89.23	268.70	6,242.61	145.65	-697.24	697.73	2.05
7,265.00	87.97	266.37	6,244.95	141.52	-793.12	793.59	2.76
7,359.00	88.58	266.45	6,247.78	135.64	-886.89	887.34	0.65
7,454.00	88.83	266.46	6,249.93	129.77	-981.68	982.12	0.26
7,549.00	90.68	265.37	6,250.34	123.00	-1,076.44	1,076.85	2.26
7,644.00	88.74	265.35	6,250.82	115.32	-1,171.12	1,171.50	2.04
7,740.00	85.68	264.59	6,255.49	106.91	-1,266.62	1,266.98	3.28
7,834.00	86.39	265.05	6,261.99	98.45	-1,360.02	1,360.34	0.90
7,929.00	86.70	265.72	6,267.71	90.82	-1,454.53	1,454.83	0.78
8,024.00	86.49	265.40	6,273.36	83.47	-1,549.08	1,549.36	0.40
8,120.00	86.05	265.60	6,279.60	75.96	-1,644.58	1,644.83	0.50
8,215.00	88.30	267.23	6,284.28	70.03	-1,739.27	1,739.50	2.92
8,310.00	89.26	268.00	6,286.31	66.08	-1,834.17	1,834.38	1.30
8,406.00	88.00	267.17	6,288.60	62.03	-1,930.05	1,930.25	1.57
8,501.00	90.09	268.72	6,290.19	58.63	-2,024.97	2,025.16	2.74
8,596.00	90.37	268.90	6,289.80	56.65	-2,119.95	2,120.13	0.35
8,691.00	89.23	269.11	6,290.14	55.00	-2,214.93	2,215.10	1.22
8,787.00	89.23	269.29	6,291.43	53.66	-2,310.91	2,311.08	0.19
8,883.00	89.23	270.19	6,292.72	53.23	-2,406.90	2,407.07	0.94
8,978.00	89.91	269.37	6,293.43	52.86	-2,501.90	2,502.06	1.12

Design Report for Dutch Lake 22-34H - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,073.00	88.80	268.21	6,294.50	50.86	-2,596.87	2,597.02	1.69
9,167.00	89.82	269.21	6,295.63	48.74	-2,690.83	2,690.98	1.52
9,263.00	89.72	269.63	6,296.02	47.77	-2,786.83	2,786.97	0.45
9,359.00	90.00	270.66	6,296.25	48.01	-2,882.83	2,882.97	1.11
9,455.00	89.91	271.37	6,296.33	49.71	-2,978.81	2,978.96	0.75
9,550.00	89.66	271.81	6,296.68	52.35	-3,073.77	3,073.93	0.53
9,646.00	89.29	271.07	6,297.56	54.76	-3,169.74	3,169.90	0.86
9,740.00	89.45	272.18	6,298.60	57.43	-3,263.69	3,263.87	1.19
9,836.00	89.48	272.78	6,299.49	61.58	-3,359.60	3,359.79	0.63
9,931.00	89.41	273.65	6,300.41	66.91	-3,454.44	3,454.65	0.92
10,026.00	89.63	274.68	6,301.21	73.81	-3,549.19	3,549.42	1.11
10,121.00	89.88	275.20	6,301.61	81.99	-3,643.83	3,644.09	0.61
10,216.00	89.72	274.57	6,301.95	90.08	-3,738.49	3,738.77	0.68
10,312.00	89.69	275.47	6,302.44	98.48	-3,834.12	3,834.43	0.94
10,343.00	89.72	275.90	6,302.60	101.55	-3,864.96	3,865.29	1.39
Final MWD Survey							
10,400.00	89.72	275.90	6,302.88	107.41	-3,921.66	3,922.00	0.00
Survey Projection to TD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
880.00	880.00	0.00	0.00	Surface Casing Assumed Vertical at 880.00ft
993.00	992.99	0.52	0.80	First MWD Survey
10,343.00	6,302.60	101.55	-3,864.96	Final MWD Survey
10,400.00	6,302.88	107.41	-3,921.66	Survey Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Dutch Lake 22-34H_PlanB - Rev0_BHL	270.19	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
880.00	10,400.00	Sperry MWD Surveys	MWD

Design Report for Dutch Lake 22-34H - 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
Dutch Lake	0.00	0.00	0.00	0.00	0.00	1,404,692.38	3,333,514.26	40° 26' 17.149 N	104° 18' 6.469 W
- actual wellpath hits target center									
- Polygon									
Point 1			495.00	-487.00		1,404,205.40	3,334,009.24		
Point 2			-2,149.00	-559.00		1,404,133.40	3,331,365.34		
Point 3			-4,535.00	-615.00		1,404,077.40	3,328,979.43		
Point 4			-4,668.00	4,633.00		1,409,325.20	3,328,846.44		
Point 5			557.00	4,795.00		1,409,487.20	3,334,071.24		
Point 6			495.00	-487.00		1,404,205.40	3,334,009.24		
Dutch Lake	0.00	0.00	6,330.00	13.24	-3,923.24	1,404,705.62	3,329,591.17	40° 26' 17.801 N	104° 18' 57.200 W
- actual wellpath misses target center by 97.68ft at 10392.02ft MD (6302.84 TVD, 106.59 N, -3913.72 E)									
- Point									
Dutch Lake	0.00	0.00	0.00	0.00	0.00	1,404,692.38	3,333,514.26	40° 26' 17.149 N	104° 18' 6.469 W
- actual wellpath hits target center									
- Polygon									
Point 1			-105.00	113.00		1,404,805.38	3,333,409.27		
Point 2			-2,149.00	41.00		1,404,733.38	3,331,365.34		
Point 3			-3,935.00	-15.00		1,404,677.38	3,329,579.41		
Point 4			-4,068.00	4,033.00		1,408,725.23	3,329,446.42		
Point 5			-43.00	4,195.00		1,408,887.22	3,333,471.26		
Point 6			-105.00	113.00		1,404,805.38	3,333,409.27		

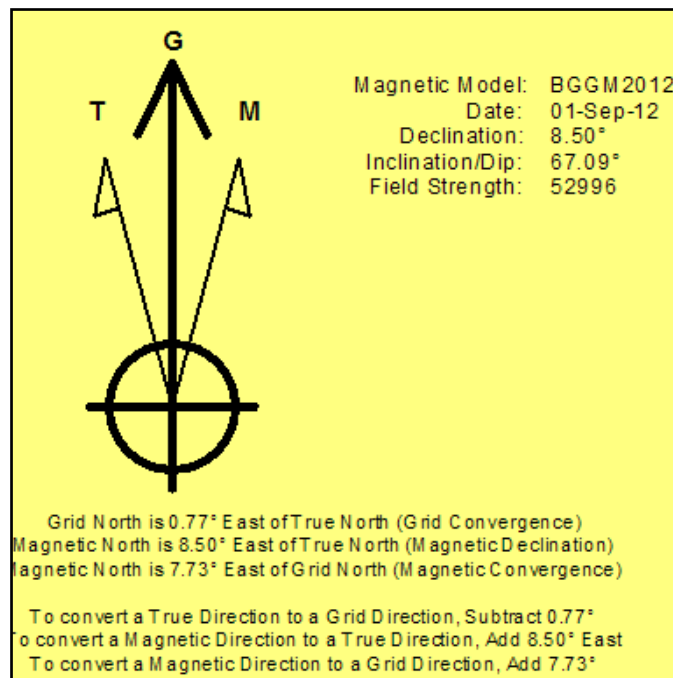
North Reference Sheet for Sec. 34-T6N-R62W - Dutch Lake 22-34H - Plan B

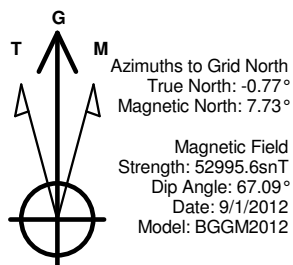
All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
Vertical Depths are relative to KB=22' @ 4670.00ft (H&P 278). Northing and Easting are relative to Dutch Lake 22-34H
Coordinate System is US State Plane 1983, Colorado Northern Zone using 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: 0.99996218

Grid Coordinates of Well: 1,404,692.38 ft N, 3,333,514.26 ft E
Geographical Coordinates of Well: 40° 26' 17.15" N, 104° 18' 06.47" W
Grid Convergence at Surface is: 0.77°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,400.00ft
the Bottom Hole Displacement is 3,923.13ft in the Direction of 271.57° (Grid).

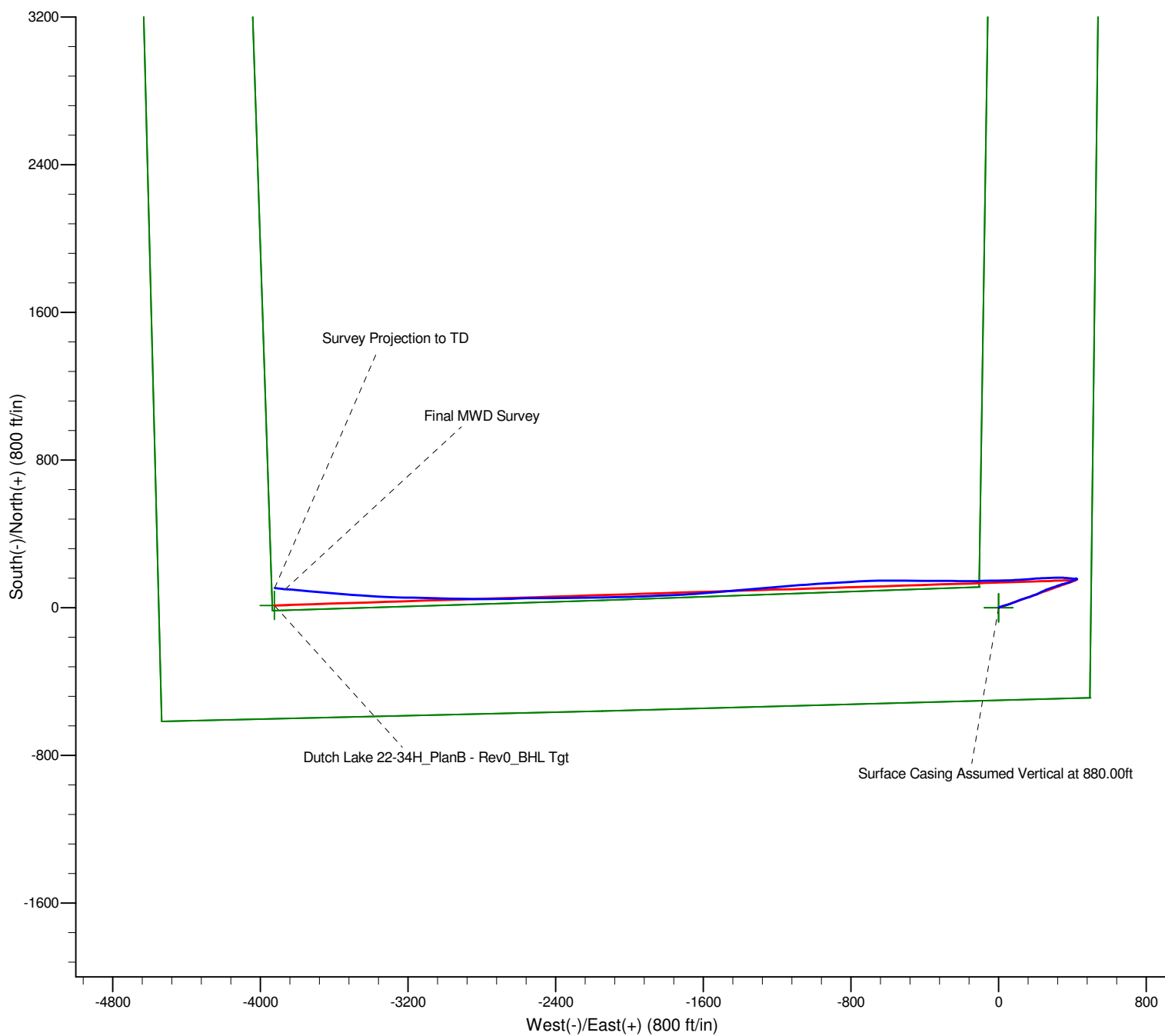
Magnetic Convergence at surface is: -7.73° (1 September 2012, , BGGM2012)





LEGEND

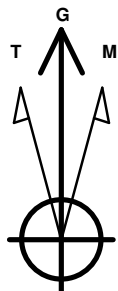
- Dutch Lake 22-34H, Plan A, Plan A - Rev 0 Proposal V0
- MWD Survey



Project: Weld County, CO (NAD 1983)
Site: Sec. 34-T6N-R62W
Well: Dutch Lake 22-34H

Bill Barrett Corp

HALLIBURTON
Sperry Drilling



Azimuths to Grid North
True North: -0.77°
Magnetic North: 7.73°

Magnetic Field
Strength: 52995.6snT
Dip Angle: 67.09°
Date: 9/1/2012
Model: BGGM2012

LEGEND

- Dutch Lake 22-34H, Plan A, Plan A - Rev 0 Proposal V0
- MWD Survey

