

Noble Energy

Weld County, CO

Sec. 9-T7N-R64W

Dillard USX AB09-99HZ

Plan #2

Survey: Sperry MWD Survey

Sperry Drilling Services

Standard Report

11 May, 2010

Well Coordinates: 1,460,695.33 N, 3,260,661.58 E (40° 35' 39.19" N, 104° 33' 40.97" W)

Ground Level: 4,918.00 ft

Local Coordinate Origin:

Centered on Well Dillard USX AB09-99HZ

Viewing Datum:

RKB - 16' (Cade 22) @ 4934.00ft

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Survey Report for Dillard USX AB09-99HZ - 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
884.00	0.21	226.63	884.00	-1.11	-1.18	-0.10	0.02
977.00	0.52	247.00	977.00	-1.39	-1.69	-0.28	0.36
1,073.00	0.34	281.45	1,072.99	-1.51	-2.37	-0.69	0.32
1,167.00	0.31	268.29	1,166.99	-1.46	-2.90	-1.11	0.09
1,261.00	0.18	346.35	1,260.99	-1.32	-3.19	-1.42	0.35
1,384.00	0.14	326.56	1,383.99	-1.01	-3.32	-1.72	0.06
1,476.00	0.20	327.74	1,475.99	-0.78	-3.46	-1.99	0.07
1,570.00	0.33	308.11	1,569.99	-0.48	-3.76	-2.42	0.17
1,663.00	0.23	332.96	1,662.99	-0.14	-4.06	-2.86	0.17
1,757.00	0.37	316.95	1,756.99	0.25	-4.35	-3.34	0.17
1,851.00	0.27	321.70	1,850.99	0.64	-4.70	-3.86	0.11
1,944.00	0.17	51.04	1,943.99	0.90	-4.72	-4.06	0.34
2,041.00	0.47	86.27	2,040.98	1.02	-4.22	-3.77	0.36
2,137.00	0.40	122.79	2,136.98	0.86	-3.54	-3.17	0.29
2,232.00	0.31	137.40	2,231.98	0.49	-3.09	-2.59	0.13
2,327.00	0.27	128.94	2,326.98	0.16	-2.74	-2.11	0.06
2,421.00	0.53	157.93	2,420.98	-0.38	-2.40	-1.49	0.34
2,516.00	0.44	157.19	2,515.97	-1.12	-2.10	-0.76	0.09
2,611.00	0.74	152.60	2,610.97	-2.00	-1.67	0.15	0.32
2,706.00	0.62	156.18	2,705.96	-3.02	-1.18	1.20	0.13
2,801.00	0.74	135.72	2,800.95	-3.93	-0.55	2.29	0.28
2,926.00	0.61	112.21	2,925.95	-4.76	0.63	3.72	0.24
3,021.00	0.53	126.84	3,020.94	-5.21	1.45	4.63	0.17
3,116.00	0.29	147.05	3,115.94	-5.68	1.93	5.30	0.29
3,211.00	0.17	157.06	3,210.94	-6.01	2.12	5.66	0.13
3,306.00	0.26	359.00	3,305.94	-5.92	2.17	5.64	0.44
3,433.00	0.19	358.78	3,432.94	-5.43	2.16	5.29	0.06
3,529.00	0.41	278.68	3,528.94	-5.21	1.82	4.89	0.44
3,624.00	0.45	235.93	3,623.93	-5.37	1.17	4.53	0.33
3,719.00	0.54	232.30	3,718.93	-5.85	0.51	4.38	0.10
3,814.00	1.13	209.14	3,813.92	-6.95	-0.30	4.54	0.70
3,909.00	1.28	217.72	3,908.90	-8.60	-1.41	4.87	0.25
4,052.00	1.94	214.93	4,051.84	-11.85	-3.77	5.37	0.46
4,162.00	1.31	223.49	4,161.80	-14.29	-5.70	5.63	0.61
4,305.00	0.97	216.80	4,304.77	-16.45	-7.55	5.76	0.25
4,415.00	1.10	231.62	4,414.75	-17.85	-8.94	5.71	0.27
4,510.00	1.04	234.89	4,509.73	-18.91	-10.36	5.40	0.09
4,605.00	1.65	236.06	4,604.71	-20.17	-12.20	4.92	0.64
4,701.00	1.68	239.38	4,700.67	-21.66	-14.55	4.22	0.11
4,828.00	2.02	240.12	4,827.60	-23.72	-18.10	3.05	0.27
4,922.00	2.05	237.91	4,921.54	-25.44	-20.96	2.14	0.09
5,017.00	2.00	237.39	5,016.48	-27.23	-23.79	1.31	0.06
5,111.00	2.28	225.71	5,110.42	-29.42	-26.51	0.82	0.55
5,207.00	1.90	217.44	5,206.35	-32.02	-28.85	0.90	0.50
5,302.00	1.29	228.13	5,301.32	-33.99	-30.60	0.97	0.71
5,397.00	0.62	248.18	5,396.30	-34.89	-31.88	0.66	0.78
5,492.00	0.24	277.90	5,491.30	-35.05	-32.55	0.28	0.45
5,587.00	0.27	3.72	5,586.30	-34.80	-32.73	-0.03	0.37
5,714.00	1.27	50.79	5,713.29	-33.62	-31.62	-0.03	0.87

Survey Report for Dillard USX AB09-99HZ - Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,809.00	0.94	42.80	5,808.27	-32.38	-30.28	0.10	0.38
5,904.00	0.54	74.78	5,903.26	-31.69	-29.32	0.33	0.59
5,999.00	0.67	83.50	5,998.25	-31.51	-28.33	0.92	0.17
6,174.00	0.31	87.38	6,173.25	-31.37	-26.84	1.92	0.21
6,236.00	0.54	97.68	6,235.25	-31.40	-26.39	2.27	0.39
6,268.00	1.24	115.59	6,267.24	-31.57	-25.92	2.72	2.33
6,299.00	5.29	131.70	6,298.19	-32.67	-24.55	4.47	13.27
6,331.00	9.10	131.27	6,329.93	-35.32	-21.55	8.48	11.91
6,363.00	11.60	130.95	6,361.41	-39.10	-17.22	14.22	7.81
6,394.00	13.48	130.01	6,391.66	-43.46	-12.09	20.94	6.10
6,426.00	16.14	128.48	6,422.60	-48.63	-5.76	29.10	8.40
6,457.00	18.66	127.25	6,452.18	-54.31	1.57	38.33	8.21
6,489.00	21.36	129.28	6,482.24	-61.10	10.15	49.24	8.71
6,521.00	23.63	130.33	6,511.81	-68.94	19.56	61.46	7.20
6,552.00	25.97	132.20	6,539.95	-77.53	29.32	74.45	7.96
6,584.00	27.85	134.10	6,568.48	-87.44	39.88	88.93	6.46
6,613.00	28.90	134.32	6,594.00	-97.05	49.76	102.71	3.64
6,646.00	29.47	133.90	6,622.81	-108.25	61.31	118.80	1.84
6,676.00	30.44	135.49	6,648.80	-118.78	71.96	133.78	4.18
6,707.00	32.05	137.06	6,675.30	-130.40	83.07	149.83	5.82
6,739.00	34.62	138.57	6,702.04	-143.44	94.87	167.36	8.44
6,771.00	37.14	140.18	6,727.96	-157.68	107.07	186.00	8.41
6,803.00	39.30	141.88	6,753.10	-173.07	119.52	205.61	7.51
6,835.00	41.95	142.20	6,777.39	-189.50	132.33	226.19	8.31
6,866.00	43.93	142.34	6,800.08	-206.20	145.25	247.05	6.39
6,898.00	46.61	142.89	6,822.60	-224.26	159.05	269.47	8.46
6,930.00	49.26	143.94	6,844.04	-243.34	173.21	292.85	8.63
6,962.00	53.67	140.05	6,863.97	-263.03	188.63	317.58	16.74
6,993.00	56.15	138.25	6,881.79	-282.22	205.22	342.80	9.30
7,025.00	58.84	135.77	6,898.99	-301.95	223.63	369.73	10.65
7,057.00	62.01	134.14	6,914.78	-321.60	243.32	397.54	10.85
7,089.00	64.56	132.98	6,929.17	-341.29	264.04	426.12	8.60
7,121.00	66.58	132.36	6,942.40	-361.04	285.46	455.25	6.55
7,153.00	69.17	132.08	6,954.45	-380.96	307.41	484.89	8.13
7,185.00	71.01	131.55	6,965.35	-401.02	329.83	514.97	5.96
7,217.00	74.24	131.01	6,974.90	-421.16	352.78	545.48	10.22
7,248.00	77.23	130.83	6,982.54	-440.84	375.48	575.50	9.66
7,303.00	84.69	130.18	6,991.18	-476.09	416.75	629.72	13.61
7,365.00	87.41	130.34	6,995.45	-516.06	463.95	691.48	4.39
7,428.00	88.52	129.55	6,997.68	-556.48	512.22	754.34	2.16
7,460.00	89.20	129.98	6,998.32	-576.95	536.81	786.28	2.51
7,524.00	88.09	130.93	6,999.83	-618.46	585.49	850.18	2.28
7,587.00	88.77	130.71	7,001.56	-659.63	633.15	913.10	1.13
7,651.00	89.51	131.01	7,002.52	-701.49	681.55	977.04	1.25
7,715.00	90.00	130.96	7,002.80	-743.46	729.86	1,040.99	0.77
7,779.00	91.36	130.25	7,002.04	-785.11	778.45	1,104.92	2.40
7,843.00	92.78	129.99	6,999.72	-826.33	827.35	1,168.78	2.26
7,907.00	92.35	130.60	6,996.86	-867.68	876.12	1,232.64	1.17
7,970.00	89.07	131.54	6,996.08	-909.06	923.61	1,295.58	5.42
8,033.00	88.27	131.61	6,997.54	-950.85	970.72	1,358.53	1.27

Survey Report for Dillard USX AB09-99HZ - Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,065.00	88.46	131.95	6,998.45	-972.16	994.57	1,390.51	1.22
8,128.00	89.32	132.72	6,999.67	-1,014.58	1,041.14	1,453.49	1.83
8,192.00	89.75	132.78	7,000.19	-1,058.02	1,088.13	1,517.49	0.68
8,256.00	90.31	132.66	7,000.16	-1,101.44	1,135.15	1,581.48	0.89
8,319.00	90.62	132.55	6,999.65	-1,144.09	1,181.52	1,644.48	0.52
8,383.00	90.99	131.94	6,998.75	-1,187.11	1,228.89	1,708.46	1.11
8,447.00	89.69	132.79	6,998.37	-1,230.24	1,276.18	1,772.45	2.43
8,511.00	90.12	132.69	6,998.48	-1,273.67	1,323.18	1,836.45	0.69
8,575.00	91.23	132.54	6,997.72	-1,317.00	1,370.28	1,900.44	1.75
8,638.00	89.26	132.65	6,997.45	-1,359.64	1,416.65	1,963.43	3.13
8,702.00	89.63	132.10	6,998.07	-1,402.77	1,463.93	2,027.42	1.04
8,765.00	90.49	132.18	6,998.01	-1,445.04	1,510.64	2,090.41	1.37
8,829.00	91.05	131.85	6,997.15	-1,487.87	1,558.19	2,154.39	1.02
8,893.00	91.05	131.95	6,995.97	-1,530.60	1,605.82	2,218.36	0.16
8,956.00	89.75	132.55	6,995.53	-1,572.96	1,652.45	2,281.35	2.27
9,020.00	89.44	131.84	6,995.99	-1,615.95	1,699.86	2,345.34	1.21
9,084.00	90.68	131.34	6,995.92	-1,658.43	1,747.73	2,409.31	2.09
9,148.00	89.81	130.74	6,995.65	-1,700.45	1,796.00	2,473.27	1.65
9,212.00	89.32	131.99	6,996.13	-1,742.74	1,844.03	2,537.23	2.10
9,276.00	89.75	131.95	6,996.65	-1,785.54	1,891.61	2,601.21	0.67
9,340.00	90.12	131.67	6,996.72	-1,828.21	1,939.31	2,665.19	0.73
9,403.00	90.93	132.22	6,996.15	-1,870.31	1,986.17	2,728.17	1.55
9,466.00	90.00	130.84	6,995.64	-1,912.08	2,033.33	2,791.14	2.64
9,530.00	90.25	132.47	6,995.50	-1,954.62	2,081.14	2,855.12	2.58
9,594.00	90.49	135.57	6,995.08	-1,999.08	2,127.16	2,919.10	4.86
9,658.00	90.25	141.69	6,994.67	-2,047.09	2,169.44	2,982.78	9.57
9,721.00	90.31	150.03	6,994.36	-2,099.19	2,204.76	3,044.20	13.24
9,785.00	89.94	151.93	6,994.22	-2,155.15	2,235.81	3,105.14	3.02
9,817.00	90.19	151.14	6,994.18	-2,183.28	2,251.06	3,135.52	2.59
9,848.00	89.94	149.61	6,994.15	-2,210.23	2,266.38	3,165.14	5.00
9,880.00	89.94	148.46	6,994.18	-2,237.66	2,282.85	3,195.93	3.59
9,912.00	89.88	146.15	6,994.23	-2,264.59	2,300.13	3,226.96	7.22
9,944.00	90.74	143.55	6,994.06	-2,290.75	2,318.55	3,258.30	8.56
9,976.00	90.99	140.26	6,993.58	-2,315.93	2,338.29	3,289.92	10.31
10,008.00	90.80	137.25	6,993.08	-2,339.99	2,359.38	3,321.77	9.42
10,039.00	90.19	134.86	6,992.81	-2,362.30	2,380.89	3,352.73	7.96
10,071.00	89.63	133.12	6,992.86	-2,384.53	2,403.92	3,384.72	5.71
10,103.00	90.56	133.47	6,992.81	-2,406.47	2,427.21	3,416.72	3.11
10,135.00	91.36	133.79	6,992.27	-2,428.55	2,450.36	3,448.71	2.69
10,199.00	89.69	133.73	6,991.68	-2,472.81	2,496.58	3,512.71	2.61
10,262.00	89.88	133.15	6,991.92	-2,516.13	2,542.33	3,575.71	0.97
10,326.00	90.93	133.95	6,991.47	-2,560.22	2,588.71	3,639.70	2.06
10,389.00	90.00	133.56	6,990.96	-2,603.79	2,634.21	3,702.70	1.60
10,453.00	90.62	133.68	6,990.61	-2,647.94	2,680.54	3,766.69	0.99
10,517.00	90.19	134.44	6,990.16	-2,692.44	2,726.53	3,830.68	1.36
10,581.00	91.30	135.47	6,989.33	-2,737.66	2,771.82	3,894.65	2.37
10,645.00	90.56	135.53	6,988.29	-2,783.30	2,816.67	3,958.59	1.16
10,709.00	90.87	135.48	6,987.49	-2,828.95	2,861.52	4,022.53	0.49
10,772.00	91.92	135.82	6,985.95	-2,873.98	2,905.55	4,085.45	1.75
10,836.00	90.06	134.99	6,984.85	-2,919.55	2,950.47	4,149.39	3.18
10,895.00	90.74	135.39	6,984.44	-2,961.41	2,992.05	4,208.36	1.34

Survey Report for Dillard USX AB09-99HZ - Sperry MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,959.00	89.51	135.02	6,984.30	-3,006.82	3,037.14	4,272.32	2.01
10,991.00	89.32	134.98	6,984.62	-3,029.45	3,059.77	4,304.30	0.61
11,022.00	88.83	134.97	6,985.12	-3,051.35	3,081.70	4,335.28	1.58
11,054.00	88.40	134.62	6,985.90	-3,073.89	3,104.40	4,367.26	1.73
11,086.00	88.83	135.27	6,986.67	-3,096.49	3,127.04	4,399.23	2.43
11,118.00	89.20	135.32	6,987.22	-3,119.23	3,149.55	4,431.21	1.17
11,150.00	89.01	135.22	6,987.72	-3,141.96	3,172.07	4,463.18	0.67
11,181.00	89.20	135.15	6,988.21	-3,163.95	3,193.91	4,494.16	0.65
11,213.00	89.57	134.99	6,988.55	-3,186.61	3,216.51	4,526.14	1.26
11,245.00	89.69	135.32	6,988.76	-3,209.29	3,239.08	4,558.12	1.10
11,277.00	90.00	134.88	6,988.84	-3,231.96	3,261.66	4,590.11	1.68
11,309.00	90.37	134.39	6,988.74	-3,254.44	3,284.44	4,622.10	1.92
11,341.00	90.99	134.48	6,988.36	-3,276.85	3,307.28	4,654.09	1.96
11,372.00	91.61	134.52	6,987.66	-3,298.57	3,329.39	4,685.07	2.00
11,404.00	92.35	134.60	6,986.55	-3,321.01	3,352.17	4,717.04	2.33
11,436.00	93.40	134.99	6,984.95	-3,343.52	3,374.85	4,748.99	3.50
11,468.00	94.09	134.65	6,982.85	-3,366.03	3,397.50	4,780.91	2.40
11,500.00	95.08	134.94	6,980.30	-3,388.51	3,420.14	4,812.79	3.22
11,532.00	95.08	134.75	6,977.46	-3,410.98	3,442.74	4,844.65	0.59
11,564.00	95.33	135.19	6,974.56	-3,433.51	3,465.28	4,876.51	1.58
11,596.00	95.07	135.07	6,971.66	-3,456.09	3,487.77	4,908.36	0.89
11,628.00	94.95	134.35	6,968.87	-3,478.52	3,510.42	4,940.22	2.27
11,664.00	94.83	134.04	6,965.80	-3,503.52	3,536.14	4,976.09	0.92
11,692.00	95.13	134.35	6,963.37	-3,522.97	3,556.14	5,003.98	1.54
11,723.00	95.07	134.05	6,960.61	-3,544.49	3,578.27	5,034.85	0.98
11,755.00	95.57	134.27	6,957.64	-3,566.69	3,601.13	5,066.71	1.71
11,794.00	95.57	134.27	6,953.86	-3,593.79	3,628.93	5,105.52	0.00

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Dillard USX AB09-99HZ Plan #2 BH Tgt	133.21	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
884.00	11,794.00	Sperry MWD Survey	MWD

Survey Report for Dillard USX AB09-99HZ - Sperry MWD Survey

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	TVDSS (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	7,013.00	2,079.00	Nio B Tgt Base		0.35	359.65
3,014.03	3,014.00	-1,920.00	Pierre Silt		0.35	359.65
3,816.04	3,816.00	-1,118.00	Parkman		0.35	359.65
4,623.18	4,623.00	-311.00	Sussex		0.35	359.65
5,208.45	5,208.00	274.00	Shannon		0.35	359.65
6,188.56	6,188.00	1,254.00	Teepee Buttes		0.35	359.65
6,951.15	6,859.00	1,925.00	Niobrara		0.35	359.65
6,976.31	6,874.00	1,940.00	Niobrara A		0.35	359.65
7,012.08	6,894.00	1,960.00	Niobrara A Base		0.35	359.65
7,222.57	6,979.00	2,045.00	Niobrara B		0.35	359.65
7,372.98	6,999.00	2,065.00	Nio B Tgt top		0.35	359.65

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
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB09-99H - survey misses target center by 280.90ft at 11794.00ft MD (6953.86 TVD, -3593.79 N, 3628.93 E) - Point	0.00	0.00	6,978.18	-3,663.79	3,899.88	1,457,031.63	3,264,561.36	40° 35' 2.580 N	104° 32' 50.928 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB9-16 - survey misses target center by 2175.89ft at 11794.00ft MD (6953.86 TVD, -3593.79 N, 3628.93 E) - Circle (radius 100.00)	0.00	0.00	4,921.00	-4,323.32	3,893.08	1,456,372.12	3,264,554.56	40° 34' 56.064 N	104° 32' 51.108 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W
Dillard USX AB09-99H - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,460,695.33	3,260,661.58	40° 35' 39.192 N	104° 33' 40.968 W

North Reference Sheet for Sec. 9-T7N-R64W - Dillard USX AB09-99HZ - 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 - 16' (Cade 22) @ 4934.00ft. Northing and Easting are relative to Dillard USX AB09-99HZ

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: 0.99997478

Grid Coordinates of Well: 1,460,695.33 ft N, 3,260,661.58 ft E

Geographical Coordinates of Well: 40° 35' 39.19" N, 104° 33' 40.97" W

Grid Convergence at Surface is: 0.61°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,794.00ft
the Bottom Hole Displacement is 5,107.29ft in the Direction of 134.72° (Grid).

Magnetic Convergence at surface is: -8.26° (4 May 2010, , BGGM2009)

