

EnCana Oil & Gas (USA) Inc.

Garfield County, CO

Sec. 8-T7S-R99W

KM DH5A-32 C08 799

Plan A Rev 3

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

03 August, 2012

Well Coordinates: 1,608,186.78 N, 2,162,632.67 E (39° 27' 56.55" N, 108° 27' 59.50" W)

Ground Level: 6,429.00 ft

Local Coordinate Origin:

Centered on Well KM DH5A-32 C08 799

Viewing Datum:

RKB 32 ft. @ 6461.00ft (Patterson 326)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Design Report for KM DH5A-32 C08 799 - Actual Field Surveys

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
187.00	1.60	190.60	186.98	-2.57	-0.48	-2.57	0.86
Fisrt Customer Supplied Survey							
246.00	1.70	192.80	245.95	-4.23	-0.83	-4.23	0.20
338.00	1.80	171.70	337.91	-6.99	-0.92	-7.00	0.70
430.00	2.40	137.60	429.85	-9.84	0.59	-9.84	1.48
522.00	3.30	146.50	521.74	-13.47	3.35	-13.45	1.09
615.00	4.10	148.10	614.54	-18.53	6.58	-18.49	0.87
709.00	5.10	147.90	708.24	-24.92	10.58	-24.85	1.06
804.00	6.10	153.00	802.78	-32.99	15.11	-32.90	1.17
899.00	6.50	165.70	897.21	-42.70	18.73	-42.58	1.52
994.00	7.20	161.60	991.54	-53.56	21.94	-53.42	0.90
1,088.00	7.00	172.90	1,084.82	-64.84	24.51	-64.68	1.50
1,183.00	6.30	170.00	1,179.18	-75.71	26.13	-75.55	0.82
1,230.00	6.50	172.30	1,225.89	-80.89	26.93	-80.72	0.69
1,278.00	6.70	169.70	1,273.57	-86.34	27.80	-86.16	0.75
1,373.00	7.60	158.40	1,367.83	-97.63	31.10	-97.43	1.75
1,468.00	6.60	151.40	1,462.11	-108.27	36.03	-108.04	1.39
1,563.00	7.40	182.40	1,556.43	-119.18	38.39	-118.93	4.01
1,658.00	7.10	175.40	1,650.67	-131.14	38.60	-130.89	0.98
1,752.00	7.30	177.40	1,743.93	-142.90	39.34	-142.65	0.34
1,847.00	7.40	163.00	1,838.16	-154.78	41.40	-154.51	1.94
1,942.00	7.50	168.20	1,932.36	-166.70	44.46	-166.41	0.72
2,037.00	6.50	155.90	2,026.65	-177.68	47.92	-177.37	1.89
2,132.00	6.20	156.90	2,121.07	-187.30	52.13	-186.97	0.34
2,226.00	5.90	156.40	2,214.55	-196.40	56.06	-196.04	0.32
2,321.00	6.00	165.70	2,309.04	-205.69	59.24	-205.31	1.02
2,416.00	5.90	149.50	2,403.53	-214.70	62.94	-214.30	1.76
2,511.00	5.70	154.40	2,498.05	-223.17	67.46	-222.73	0.56
2,605.00	5.50	154.70	2,591.60	-231.45	71.40	-230.99	0.22
2,700.00	5.40	153.30	2,686.17	-239.56	75.35	-239.08	0.18
2,794.00	5.10	148.50	2,779.78	-247.07	79.52	-246.56	0.57
2,889.00	5.40	160.00	2,874.38	-254.87	83.26	-254.34	1.15
2,984.00	4.80	152.20	2,969.00	-262.59	86.64	-262.03	0.96
3,079.00	4.40	148.30	3,063.70	-269.21	90.41	-268.63	0.53
3,173.00	3.60	152.90	3,157.47	-274.90	93.65	-274.30	0.92
3,268.00	2.80	144.70	3,252.32	-279.45	96.35	-278.83	0.97
3,363.00	2.70	156.60	3,347.21	-283.40	98.58	-282.77	0.61
3,458.00	1.80	142.00	3,442.14	-286.63	100.39	-285.98	1.12
3,553.00	1.10	138.40	3,537.11	-288.48	101.91	-287.83	0.74
3,647.00	0.50	189.50	3,631.10	-289.56	102.44	-288.91	0.93
3,742.00	0.70	208.10	3,726.09	-290.48	102.10	-289.83	0.29
3,837.00	0.50	157.00	3,821.09	-291.38	101.99	-290.73	0.58
3,932.00	0.70	209.40	3,916.08	-292.27	101.87	-291.61	0.59
4,027.00	0.30	147.80	4,011.08	-292.98	101.71	-292.33	0.65
4,121.00	0.40	172.60	4,105.08	-293.52	101.89	-292.86	0.19
4,216.00	0.70	69.10	4,200.08	-293.64	102.47	-292.98	0.93
4,311.00	0.40	29.60	4,295.07	-293.14	103.18	-292.48	0.49
4,406.00	0.50	219.40	4,390.07	-293.17	103.08	-292.51	0.94
4,500.00	0.50	2.70	4,484.07	-293.08	102.84	-292.42	1.01

Design Report for KM DH5A-32 C08 799 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,595.00	1.00	16.80	4,579.06	-291.87	103.10	-291.21	0.56
4,690.00	1.00	23.90	4,674.05	-290.32	103.67	-289.66	0.13
4,785.00	0.40	350.40	4,769.04	-289.24	103.95	-288.57	0.74
4,880.00	0.70	295.10	4,864.04	-288.66	103.37	-288.00	0.61
4,974.00	0.60	112.90	4,958.03	-288.61	103.31	-287.95	1.38
5,069.00	0.20	178.80	5,053.03	-288.97	103.77	-288.31	0.58
5,163.00	0.00	280.50	5,147.03	-289.13	103.77	-288.47	0.21
5,258.00	0.20	239.90	5,242.03	-289.22	103.63	-288.55	0.21
5,353.00	0.40	247.90	5,337.03	-289.43	103.18	-288.77	0.21
5,448.00	0.60	214.60	5,432.03	-289.96	102.59	-289.30	0.36
5,542.00	0.80	234.20	5,526.02	-290.75	101.77	-290.10	0.33
5,637.00	0.20	232.30	5,621.02	-291.24	101.11	-290.59	0.63
5,732.00	0.10	44.30	5,716.02	-291.28	101.03	-290.63	0.32
5,826.00	0.60	49.90	5,810.01	-290.90	101.47	-290.26	0.53
5,921.00	0.30	315.50	5,905.01	-290.41	101.67	-289.76	0.73
6,016.00	0.60	313.10	6,000.01	-289.89	101.14	-289.24	0.32
6,110.00	0.30	149.60	6,094.01	-289.77	100.90	-289.12	0.95
6,205.00	0.40	231.20	6,189.01	-290.19	100.77	-289.54	0.49
6,305.00	1.00	245.40	6,289.00	-290.77	99.70	-290.13	0.62
Final Customer Supplied Survey - Tie On to Customer Supplied Surveys							
6,366.00	1.25	234.65	6,349.99	-291.38	98.68	-290.74	0.53
First Sperry MWD Survey							
6,461.00	1.76	238.25	6,444.95	-292.74	96.59	-292.12	0.55
6,556.00	2.23	233.85	6,539.90	-294.60	93.86	-294.00	0.52
6,588.00	2.56	244.72	6,571.87	-295.27	92.71	-294.68	1.75
6,619.00	3.88	265.72	6,602.82	-295.65	91.04	-295.06	5.64
6,651.00	5.18	282.51	6,634.72	-295.42	88.55	-294.85	5.76
6,683.00	6.79	290.42	6,666.54	-294.44	85.36	-293.90	5.64
6,714.00	8.52	295.64	6,697.27	-292.81	81.57	-292.29	6.01
6,746.00	10.06	301.90	6,728.85	-290.31	77.06	-289.81	5.75
6,778.00	11.46	311.91	6,760.29	-286.71	72.32	-286.24	7.28
6,809.00	13.11	320.20	6,790.58	-281.95	67.78	-281.51	7.78
6,841.00	14.37	326.16	6,821.66	-275.86	63.25	-275.45	5.92
6,873.00	16.10	330.33	6,852.54	-268.71	58.84	-268.33	6.40
6,904.00	17.19	334.99	6,882.24	-260.82	54.77	-260.47	5.56
6,936.00	17.95	339.89	6,912.75	-251.90	51.08	-251.57	5.19
6,967.00	19.54	344.13	6,942.11	-242.43	48.02	-242.12	6.75
6,999.00	21.51	348.45	6,972.07	-231.53	45.38	-231.24	7.76
7,031.00	23.09	352.24	7,001.68	-219.57	43.36	-219.29	6.67
7,062.00	24.06	357.26	7,030.10	-207.23	42.24	-206.96	7.19
7,094.00	25.18	1.24	7,059.19	-193.91	42.07	-193.64	6.25
7,126.00	26.88	2.86	7,087.94	-179.87	42.58	-179.60	5.76
7,157.00	28.61	3.49	7,115.38	-165.47	43.38	-165.19	5.66
7,189.00	29.92	2.64	7,143.29	-149.85	44.21	-149.56	4.29
7,220.00	30.55	1.30	7,170.08	-134.25	44.75	-133.96	2.98
7,252.00	31.64	0.64	7,197.48	-117.72	45.03	-117.43	3.57
7,284.00	32.74	1.04	7,224.56	-100.68	45.28	-100.39	3.50
7,315.00	33.75	2.05	7,250.48	-83.69	45.74	-83.40	3.72
7,347.00	34.95	2.57	7,276.90	-65.65	46.47	-65.35	3.86
7,379.00	36.59	2.39	7,302.87	-46.96	47.28	-46.66	5.14
7,410.00	38.29	1.40	7,327.48	-28.13	47.90	-27.82	5.82

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7,442.00	40.15	1.80	7,352.27	-7.90	48.46	-7.59	5.87
7,473.00	41.48	1.95	7,375.73	12.35	49.13	12.66	4.30
7,505.00	42.36	3.03	7,399.54	33.71	50.06	34.02	3.56
7,537.00	43.93	3.13	7,422.89	55.56	51.23	55.88	4.91
7,568.00	45.62	2.68	7,444.89	77.36	52.34	77.69	5.55
7,600.00	47.41	3.14	7,466.91	100.55	53.52	100.89	5.69
7,632.00	49.30	2.79	7,488.18	124.43	54.75	124.77	5.96
7,663.00	50.80	2.99	7,508.08	148.16	55.95	148.51	4.86
7,695.00	52.49	3.24	7,527.94	173.22	57.32	173.58	5.32
7,726.00	54.35	2.46	7,546.41	198.08	58.55	198.45	6.33
7,758.00	55.80	2.38	7,564.73	224.29	59.66	224.67	4.54
7,790.00	56.85	2.61	7,582.48	250.90	60.82	251.28	3.34
7,821.00	58.18	2.83	7,599.13	277.02	62.06	277.40	4.33
7,853.00	60.22	2.76	7,615.51	304.47	63.40	304.87	6.38
7,885.00	62.37	2.47	7,630.88	332.51	64.68	332.91	6.77
7,916.00	64.00	2.34	7,644.86	360.15	65.84	360.56	5.27
7,948.00	65.58	2.67	7,658.49	389.07	67.11	389.49	5.02
7,979.00	66.87	2.67	7,670.99	417.41	68.43	417.83	4.16
8,011.00	67.53	3.68	7,683.39	446.86	70.06	447.30	3.57
8,043.00	69.26	4.31	7,695.17	476.54	72.14	476.99	5.71
8,074.00	70.65	4.99	7,705.80	505.57	74.50	506.03	4.93
8,106.00	72.46	4.85	7,715.92	535.81	77.10	536.29	5.67
8,138.00	74.51	4.01	7,725.02	566.39	79.47	566.89	6.88
8,169.00	76.12	3.53	7,732.88	596.32	81.44	596.82	5.41
8,201.00	78.05	3.32	7,740.03	627.45	83.30	627.97	6.07
8,232.00	79.96	3.19	7,745.94	657.83	85.03	658.36	6.18
8,264.00	81.62	3.50	7,751.06	689.36	86.88	689.90	5.27
8,296.00	83.88	2.28	7,755.10	721.06	88.47	721.61	8.01
8,327.00	85.62	3.16	7,757.94	751.90	89.94	752.45	6.28
8,359.00	87.04	3.66	7,759.99	783.77	91.84	784.34	4.70
8,391.00	87.78	3.65	7,761.43	815.68	93.88	816.26	2.31
8,454.00	89.32	4.66	7,763.03	878.49	98.44	879.09	2.92
8,517.00	90.40	5.15	7,763.18	941.26	103.83	941.90	1.88
8,580.00	90.00	5.69	7,762.96	1,003.97	109.78	1,004.65	1.07
8,612.00	90.31	5.94	7,762.87	1,035.81	113.02	1,036.50	1.24
8,643.00	90.65	6.10	7,762.61	1,066.64	116.27	1,067.35	1.21
8,707.00	89.54	5.54	7,762.51	1,130.31	122.76	1,131.06	1.94
8,738.00	89.88	5.43	7,762.66	1,161.16	125.72	1,161.94	1.15
8,802.00	90.59	5.60	7,762.40	1,224.87	131.87	1,225.68	1.14
8,864.00	89.66	4.81	7,762.27	1,286.61	137.50	1,287.46	1.97
8,926.00	89.88	4.99	7,762.51	1,348.38	142.79	1,349.26	0.46
8,987.00	90.46	4.78	7,762.33	1,409.16	147.99	1,410.07	1.01
9,018.00	90.68	4.45	7,762.03	1,440.06	150.48	1,440.98	1.28
9,048.00	90.46	4.23	7,761.73	1,469.97	152.75	1,470.91	1.04
9,079.00	90.77	3.97	7,761.39	1,500.89	154.97	1,501.84	1.31
9,110.00	91.02	4.21	7,760.91	1,531.81	157.18	1,532.77	1.12
9,141.00	90.46	3.85	7,760.51	1,562.73	159.36	1,563.71	2.15
9,202.00	90.19	4.02	7,760.16	1,623.58	163.55	1,624.59	0.52
9,232.00	90.46	3.73	7,759.99	1,653.51	165.57	1,654.53	1.32
9,294.00	90.62	3.58	7,759.41	1,715.38	169.52	1,716.42	0.35
9,345.00	90.19	3.33	7,759.05	1,766.29	172.60	1,767.35	0.98

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9,392.00	90.19	2.85	7,758.89	1,813.22	175.13	1,814.30	1.02
9,484.00	90.00	1.59	7,758.74	1,905.15	178.70	1,906.25	1.39
9,576.00	90.25	1.18	7,758.54	1,997.12	180.92	1,998.23	0.52
9,668.00	90.80	0.03	7,757.70	2,089.11	181.89	2,090.22	1.39
9,760.00	90.49	358.74	7,756.66	2,181.10	180.90	2,182.20	1.44
9,855.00	89.94	358.52	7,756.30	2,276.07	178.63	2,277.16	0.62
9,950.00	89.88	358.89	7,756.45	2,371.05	176.48	2,372.12	0.39
10,045.00	89.69	358.50	7,756.81	2,466.02	174.32	2,467.08	0.46
10,140.00	89.63	358.14	7,757.37	2,560.98	171.54	2,562.01	0.38
10,235.00	90.49	358.64	7,757.27	2,655.94	168.87	2,656.96	1.05
10,330.00	90.06	358.88	7,756.82	2,750.91	166.81	2,751.92	0.52
10,425.00	89.44	358.53	7,757.23	2,845.89	164.66	2,846.88	0.75
10,483.00	89.57	358.32	7,757.73	2,903.86	163.07	2,904.84	0.43
10,514.00	89.29	358.16	7,758.04	2,934.85	162.12	2,935.82	1.04
10,575.00	89.04	358.08	7,758.93	2,995.81	160.12	2,996.76	0.43
10,637.00	89.66	358.03	7,759.63	3,057.77	158.01	3,058.71	1.00
10,698.00	90.22	358.47	7,759.70	3,118.74	156.15	3,119.67	1.17
10,760.00	89.10	357.80	7,760.07	3,180.70	154.13	3,181.62	2.10
10,823.00	89.66	358.26	7,760.75	3,243.66	151.97	3,244.56	1.15
10,887.00	90.03	358.22	7,760.92	3,307.63	150.00	3,308.52	0.58
10,918.00	90.28	358.66	7,760.84	3,338.62	149.16	3,339.50	1.63
10,982.00	89.88	358.64	7,760.75	3,402.60	147.65	3,403.47	0.63
11,013.00	89.85	358.27	7,760.82	3,433.59	146.81	3,434.45	1.20
11,076.00	89.41	358.81	7,761.23	3,496.57	145.21	3,497.42	1.11
11,140.00	89.78	358.87	7,761.68	3,560.55	143.91	3,561.40	0.59
11,203.00	90.62	358.87	7,761.46	3,623.54	142.67	3,624.37	1.33
11,266.00	89.41	358.91	7,761.44	3,686.53	141.45	3,687.35	1.92
11,329.00	89.75	358.95	7,761.91	3,749.52	140.27	3,750.33	0.54
11,393.00	90.25	359.18	7,761.91	3,813.51	139.23	3,814.31	0.86
11,456.00	89.54	358.78	7,762.02	3,876.50	138.11	3,877.30	1.29
11,519.00	90.06	358.87	7,762.24	3,939.48	136.82	3,940.27	0.84
11,614.00	89.29	358.72	7,762.78	4,034.46	134.82	4,035.23	0.83
11,677.00	89.04	358.52	7,763.70	4,097.43	133.30	4,098.20	0.51
11,740.00	89.35	358.70	7,764.58	4,160.41	131.77	4,161.16	0.57
11,804.00	89.01	359.08	7,765.50	4,224.39	130.53	4,225.13	0.80
11,867.00	89.41	359.05	7,766.37	4,287.38	129.51	4,288.11	0.64
11,930.00	89.48	359.04	7,766.98	4,350.36	128.46	4,351.09	0.11
11,993.00	88.95	358.47	7,767.84	4,413.34	127.09	4,414.06	1.24
12,056.00	89.75	358.74	7,768.56	4,476.32	125.55	4,477.03	1.34
12,120.00	88.80	358.53	7,769.37	4,540.30	124.03	4,540.99	1.52
12,183.00	89.32	358.64	7,770.40	4,603.27	122.47	4,603.95	0.84
12,246.00	88.27	358.33	7,771.72	4,666.23	120.81	4,666.90	1.74
12,309.00	88.76	358.39	7,773.36	4,729.18	119.01	4,729.84	0.78
12,373.00	89.32	358.87	7,774.43	4,793.16	117.48	4,793.81	1.15
12,436.00	88.15	358.92	7,775.82	4,856.13	116.26	4,856.77	1.86
12,499.00	88.77	359.02	7,777.51	4,919.09	115.13	4,919.73	1.00
12,562.00	87.62	358.96	7,779.50	4,982.05	114.02	4,982.68	1.83
12,626.00	88.03	358.99	7,781.93	5,046.00	112.87	5,046.61	0.64
12,689.00	87.65	359.07	7,784.30	5,108.94	111.81	5,109.55	0.62
12,752.00	88.18	359.13	7,786.59	5,171.89	110.82	5,172.49	0.85
12,815.00	87.47	359.44	7,788.98	5,234.84	110.03	5,235.43	1.23

Design Report for KM DH5A-32 C08 799 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
12,878.00	87.81	359.74	7,791.58	5,297.79	109.58	5,298.38	0.72
12,942.00	87.78	359.57	7,794.04	5,361.74	109.20	5,362.32	0.27
12,973.00	88.70	0.49	7,794.99	5,392.72	109.22	5,393.31	4.20
13,005.00	89.57	1.38	7,795.48	5,424.71	109.74	5,425.30	3.89
13,036.00	88.24	0.69	7,796.07	5,455.70	110.30	5,456.29	4.83
13,068.00	88.77	2.09	7,796.90	5,487.68	111.07	5,488.28	4.68
13,131.00	88.52	2.48	7,798.39	5,550.61	113.58	5,551.22	0.74
13,194.00	88.00	2.47	7,800.31	5,613.53	116.30	5,614.15	0.83
13,256.00	86.24	1.93	7,803.42	5,675.40	118.68	5,676.04	2.97
13,318.00	87.07	1.31	7,807.04	5,737.27	120.43	5,737.92	1.67
13,381.00	87.47	1.31	7,810.04	5,800.18	121.87	5,800.84	0.63
13,444.00	88.00	1.39	7,812.53	5,863.11	123.35	5,863.78	0.85
13,508.00	87.32	0.70	7,815.14	5,927.05	124.52	5,927.72	1.51
13,571.00	87.78	0.79	7,817.83	5,989.98	125.34	5,990.66	0.74
13,634.00	87.81	0.60	7,820.26	6,052.93	126.10	6,053.61	0.31
13,697.00	88.00	359.86	7,822.56	6,115.89	126.35	6,116.57	1.21
13,761.00	87.38	359.92	7,825.14	6,179.84	126.23	6,180.51	0.97
13,824.00	88.09	359.48	7,827.63	6,242.79	125.90	6,243.46	1.33
13,887.00	86.98	359.76	7,830.34	6,305.73	125.48	6,306.40	1.82
13,950.00	87.69	359.75	7,833.27	6,368.66	125.21	6,369.32	1.13
13,982.00	88.03	359.44	7,834.46	6,400.63	124.99	6,401.30	1.44
14,045.00	87.56	358.99	7,836.89	6,463.58	124.13	6,464.24	1.03
14,108.00	88.30	359.59	7,839.16	6,526.53	123.35	6,527.19	1.51
14,172.00	88.70	359.14	7,840.84	6,590.51	122.64	6,591.15	0.94
14,235.00	87.63	358.58	7,842.86	6,653.46	121.38	6,654.10	1.92
14,298.00	87.99	359.01	7,845.26	6,716.40	120.06	6,717.03	0.89
14,361.00	88.92	358.76	7,846.96	6,779.37	118.83	6,779.98	1.53
14,424.00	87.50	359.15	7,848.93	6,842.32	117.69	6,842.93	2.34
14,488.00	87.96	359.07	7,851.47	6,906.27	116.69	6,906.87	0.73
14,519.00	88.33	359.10	7,852.47	6,937.25	116.20	6,937.84	1.20
14,583.00	87.22	359.01	7,854.95	7,001.19	115.14	7,001.78	1.74
14,646.00	87.96	358.60	7,857.60	7,064.12	113.83	7,064.70	1.34
14,709.00	88.61	358.51	7,859.49	7,127.07	112.24	7,127.64	1.04
14,772.00	87.23	358.78	7,861.78	7,190.01	110.75	7,190.57	2.23
14,835.00	87.44	359.05	7,864.70	7,252.93	109.56	7,253.48	0.54
14,899.00	88.06	358.36	7,867.22	7,316.86	108.12	7,317.40	1.45
14,962.00	88.42	358.48	7,869.15	7,379.81	106.38	7,380.34	0.60
15,025.00	87.10	359.08	7,871.61	7,442.74	105.04	7,443.26	2.30
15,088.00	87.50	359.15	7,874.58	7,505.67	104.07	7,506.18	0.64
15,183.00	88.30	358.97	7,878.06	7,600.59	102.51	7,601.09	0.86
15,278.00	87.34	358.94	7,881.68	7,695.50	100.78	7,695.99	1.01
15,373.00	88.27	359.47	7,885.32	7,790.42	99.46	7,790.90	1.13
15,436.00	87.16	359.38	7,887.83	7,853.37	98.83	7,853.84	1.77
15,499.00	85.80	359.92	7,891.70	7,916.25	98.45	7,916.71	2.32
15,562.00	85.95	359.98	7,896.23	7,979.08	98.39	7,979.55	0.26
15,657.00	86.67	359.60	7,902.34	8,073.89	98.04	8,074.35	0.86
15,752.00	87.26	0.18	7,907.37	8,168.75	97.86	8,169.21	0.87
15,847.00	86.20	359.60	7,912.79	8,263.60	97.68	8,264.05	1.27
15,942.00	87.16	359.30	7,918.29	8,358.43	96.77	8,358.88	1.06
16,037.00	86.48	359.11	7,923.56	8,453.27	95.45	8,453.71	0.74

Design Report for KM DH5A-32 C08 799 - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
16,132.00	87.10	359.39	7,928.88	8,548.12	94.21	8,548.54	0.72
16,226.00	87.71	358.21	7,933.14	8,642.00	92.25	8,642.41	1.41
16,321.00	86.69	358.73	7,937.78	8,736.85	89.71	8,737.24	1.20
16,416.00	87.53	358.59	7,942.57	8,831.70	87.49	8,832.08	0.90
16,511.00	86.61	358.73	7,947.42	8,926.55	85.27	8,926.91	0.98
16,606.00	87.59	358.49	7,952.23	9,021.40	82.97	9,021.74	1.06
16,701.00	87.04	359.02	7,956.68	9,116.27	80.91	9,116.60	0.80
16,796.00	87.38	359.04	7,961.30	9,211.15	79.30	9,211.46	0.36
16,890.00	86.89	359.27	7,966.00	9,305.02	77.92	9,305.32	0.58
16,985.00	87.90	359.23	7,970.32	9,399.91	76.68	9,400.21	1.06
17,080.00	87.00	359.17	7,974.55	9,494.81	75.35	9,495.09	0.95
17,175.00	87.38	359.44	7,979.20	9,589.68	74.20	9,589.96	0.49
17,270.00	86.60	359.63	7,984.19	9,684.55	73.43	9,684.82	0.84
17,365.00	87.50	0.40	7,989.08	9,779.42	73.46	9,779.69	1.25
17,459.00	86.51	1.08	7,993.99	9,873.28	74.67	9,873.56	1.28
17,554.00	87.41	1.14	7,999.03	9,968.13	76.51	9,968.42	0.95
17,649.00	86.67	1.16	8,003.94	10,062.98	78.41	10,063.28	0.78
17,776.00	88.89	1.97	8,008.86	10,189.83	81.88	10,190.15	1.86
Final Sperry MWD Survey							
18,304.00	94.00	1.97	7,995.55	10,717.18	100.02	10,717.60	0.97
Projection to TD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
187.00	186.98	-2.57	-0.48	First Customer Supplied Survey
6,305.00	6,289.00	-290.77	99.70	Final Customer Supplied Survey
6,305.00	6,289.00	-290.77	99.70	Tie On to Customer Supplied Surveys
6,366.00	6,349.99	-291.38	98.68	First Sperry MWD Survey
17,776.00	8,008.86	10,189.83	81.88	Final Sperry MWD Survey
18,304.00	7,995.55	10,717.18	100.02	Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	KM DH5-32 C08 799 Plan A Rev 3 BHL	0.36	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
187.00	6,305.00	Company Supplied Surveys	MWD
6,366.00	18,304.00	Sperry MWD Surveys	MWD

Design Report for KM DH5A-32 C08 799 - Actual Field Surveys**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
KM DH5-32 C08 799	0.00	0.00	7,805.40	10,919.90	69.30	1,619,098.11	2,163,058.44	39.495688	-108.466283
- actual wellpath misses target center by 279.63ft at 18304.00ft MD (7995.55 TVD, 10717.18 N, 100.02 E)									
- Point									
KM DH5-32 C08 799	0.00	0.00	7,805.40	849.50	102.20	1,609,032.45	2,162,762.55	39.468041	-108.466167
- actual wellpath misses target center by 43.29ft at 8426.44ft MD (7762.54 TVD, 851.02 N, 96.31 E)									
- Point									
KM C08 799 Sector	0.00	0.00	0.00	0.00	0.00	1,608,186.78	2,162,632.67	39.465709	-108.466529
- actual wellpath hits target center									
- Polygon									
Point 1			-2,502.62	873.24		1,609,141.22	2,160,160.01		
Point 2			149.82	866.19		1,609,047.58	2,162,810.68		
Point 3			1,471.10	868.06		1,609,006.31	2,164,131.26		
Point 4			2,801.42	860.15		1,608,954.97	2,165,460.56		
Point 5			2,799.87	-460.26		1,607,635.37	2,165,415.90		
Point 6			2,801.42	860.15		1,608,954.97	2,165,460.56		
Point 7			2,773.15	6,396.80		1,614,489.35	2,165,613.06		
Point 8			2,904.12	6,396.81		1,614,485.08	2,165,743.95		
Point 9			2,906.07	11,612.95		1,619,698.15	2,165,916.20		
Point 10			-2,405.95	11,574.54		1,619,833.19	2,160,605.99		
Point 11			-2,405.95	11,092.74		1,619,351.66	2,160,590.26		
Point 12			-2,391.43	6,420.08		1,614,681.23	2,160,452.22		
Point 13			-2,519.86	6,417.18		1,614,682.52	2,160,323.77		
Point 14			110.55	6,407.95		1,614,587.42	2,162,952.36		
Point 15			2,773.15	6,396.80		1,614,489.35	2,165,613.06		
Point 16			110.55	6,407.95		1,614,587.42	2,162,952.36		
Point 17			-2,519.86	6,417.18		1,614,682.52	2,160,323.77		
Point 18			-2,502.62	873.24		1,609,141.22	2,160,160.01		
Point 19			-2,507.27	-447.18		1,607,821.71	2,160,112.25		
Point 20			-2,502.62	873.24		1,609,141.22	2,160,160.01		
KM C08 799 Setbac	0.00	0.00	0.00	0.00	0.00	1,608,186.78	2,162,632.67	39.465709	-108.466529
- actual wellpath hits target center									
- Polygon									
Point 1			-2,507.02	-446.83		1,607,822.05	2,160,112.51		
Point 2			147.08	-453.65		1,607,728.59	2,162,764.86		
Point 3			1,473.54	-456.81		1,607,682.12	2,164,090.45		
Point 4			1,473.54	-456.81		1,607,682.12	2,164,090.45		
Point 5			147.08	-453.65		1,607,728.59	2,162,764.86		
Point 6			-2,507.02	-446.83		1,607,822.05	2,160,112.51		

North Reference Sheet for Sec. 8-T7S-R99W - KM DH5A-32 C08 799 - Plan A Rev 3

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

Vertical Depths are relative to RKB 32 ft. @ 6461.00ft (Patterson 326). Northing and Easting are relative to KM DH5A-32 C08 799

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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:39.750000°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995612

Grid Coordinates of Well: 1,608,186.78 ft N, 2,162,632.67 ft E

Geographical Coordinates of Well: 39° 27' 56.55" N, 108° 27' 59.50" W

Grid Convergence at Surface is: -1.87°

Based upon Minimum Curvature type calculations, at a Measured Depth of 18,304.00ft the Bottom Hole Displacement is 10,717.64ft in the Direction of 0.53° (True).

Magnetic Convergence at surface is: -12.37° (25 January 2012, , BGGM2011)

