



Company/Rig: Noble Energy/CoreTech
WELL/API#: Karakakes H 13-32/05-123-25084
DECLINATION: 8.32
TD AS DRILLED: 7407'
COUNTY/STATE: Weld/Colorado
Latitude: 40.225, Longitude: -104.618
GRID North is 0.570 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=Surface Elevation=4837'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/28/2014 / 09:35

Lat & Long Obtained By Handheld GPS At Wellhead

North Reference: Grid

Henderson, Co.

303-853-4976

Surveyor: Mark Simmons

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.663	284.977	99.998	0.150	-0.559	0.150	0.579	284.977	0.663
200.000	0.413	287.635	199.993	0.408	-1.462	0.408	1.518	285.607	0.252
300.000	0.538	288.740	299.990	0.668	-2.250	0.668	2.347	286.545	0.126
400.000	0.490	292.365	399.986	0.982	-3.089	0.982	3.241	287.628	0.058
500.000	0.517	305.349	499.982	1.405	-3.852	1.405	4.101	290.041	0.117
600.000	0.442	319.311	599.978	1.959	-4.472	1.959	4.882	293.654	0.138
700.000	1.014	330.666	699.970	3.022	-5.156	3.022	5.977	300.375	0.587
800.000	0.980	333.486	799.955	4.559	-5.972	4.559	7.513	307.359	0.059
900.000	1.002	311.275	899.940	5.901	-7.011	5.901	9.164	310.089	0.382
1000.000	0.970	300.917	999.926	6.913	-8.394	6.913	10.874	309.474	0.181
1100.000	0.995	285.731	1099.911	7.583	-9.955	7.583	12.514	307.297	0.261
1200.000	1.100	268.385	1199.895	7.791	-11.750	7.791	14.098	303.547	0.332
1300.000	1.029	263.641	1299.877	7.665	-13.602	7.665	15.612	299.402	0.113
1400.000	1.129	259.364	1399.860	7.383	-15.462	7.383	17.134	295.526	0.128
1500.000	1.779	299.021	1499.829	7.955	-17.787	7.955	19.485	294.095	1.160
1600.000	2.969	294.240	1599.742	9.771	-21.506	9.771	23.621	294.434	1.205
1700.000	4.027	289.859	1699.554	12.027	-27.170	12.027	29.713	293.877	1.091
1800.000	5.582	289.397	1799.200	14.835	-35.060	14.835	38.069	292.935	1.555
1900.000	6.631	281.727	1898.633	17.624	-45.301	17.624	48.608	291.258	1.327

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
2000.000	8.317	275.506	1997.781	19.491	-58.154	19.491	61.334	288.529	1.868
2100.000	10.322	275.464	2096.456	21.039	-74.274	21.039	77.196	285.815	2.005
2200.000	11.449	278.335	2194.656	23.330	-93.012	23.330	95.894	284.081	1.250
2300.000	13.447	282.695	2292.302	27.325	-114.178	27.325	117.402	283.459	2.207
2400.000	14.138	282.918	2389.418	32.611	-137.425	32.611	141.241	283.349	0.693
2500.000	14.264	281.904	2486.363	37.882	-161.383	37.882	165.770	283.210	0.279
2600.000	14.592	282.710	2583.209	43.195	-185.726	43.195	190.682	283.093	0.385
2700.000	15.008	281.963	2679.891	48.650	-210.680	48.650	216.224	283.003	0.458
2800.000	15.596	281.492	2776.345	54.012	-236.520	54.012	242.609	282.864	0.601
2900.000	15.930	280.969	2872.585	59.301	-263.166	59.301	269.765	282.699	0.362
3000.000	15.982	282.723	2968.733	64.945	-290.067	64.945	297.248	282.620	0.485
3100.000	15.833	280.507	3064.904	70.464	-316.908	70.464	324.648	282.536	0.625
3200.000	15.148	280.132	3161.271	75.250	-343.183	75.250	351.337	282.368	0.692
3300.000	14.642	281.330	3257.911	80.032	-368.438	80.032	377.030	282.255	0.592
3400.000	14.135	282.019	3354.774	85.058	-392.774	85.058	401.878	282.219	0.535
3500.000	13.957	284.259	3451.785	90.571	-416.405	90.571	426.141	282.271	0.572
3600.000	14.131	284.270	3548.796	96.550	-439.924	96.550	450.395	282.378	0.174
3700.000	13.415	282.894	3645.920	102.148	-463.063	102.148	474.195	282.440	0.788
3800.000	13.256	280.648	3743.224	106.855	-485.638	106.855	497.255	282.409	0.542
3900.000	14.236	281.111	3840.359	111.343	-508.972	111.343	521.008	282.340	0.986
4000.000	14.374	284.752	3937.260	116.873	-533.041	116.873	545.703	282.367	0.910
4100.000	14.881	283.281	4034.019	122.984	-557.542	122.984	570.945	282.439	0.629
4200.000	14.881	283.366	4130.665	128.902	-582.532	128.902	596.624	282.477	0.022
4300.000	15.007	280.960	4227.284	134.332	-607.736	134.332	622.405	282.464	0.633
4400.000	14.564	278.153	4323.974	138.577	-632.893	138.577	647.887	282.350	0.842
4500.000	15.077	280.060	4420.647	142.631	-658.145	142.631	673.423	282.228	0.708
4600.000	14.772	282.314	4517.275	147.622	-683.406	147.622	699.168	282.189	0.655
4700.000	14.469	282.321	4614.036	153.007	-708.067	153.007	724.410	282.194	0.304
4800.000	13.313	283.685	4711.111	158.396	-731.458	158.396	748.412	282.219	1.201
4900.000	13.641	280.828	4808.358	163.336	-754.227	163.336	771.711	282.219	0.743
5000.000	13.403	279.205	4905.586	167.405	-777.250	167.405	795.074	282.155	0.448
5100.000	12.593	278.391	5003.023	170.850	-799.476	170.850	817.527	282.063	0.831
5200.000	11.078	280.033	5100.895	174.115	-819.721	174.115	838.009	281.992	1.552
5300.000	8.938	282.681	5199.368	177.494	-836.762	177.494	855.380	281.976	2.188
5400.000	7.305	283.178	5298.362	180.649	-850.531	180.649	869.504	281.991	1.635
5500.000	5.337	288.442	5397.750	183.570	-861.134	183.570	880.483	282.034	2.049
5600.000	3.380	292.659	5497.456	186.177	-868.267	186.177	888.003	282.102	1.982
5700.000	1.635	296.373	5597.357	187.946	-872.265	187.946	892.284	282.160	1.751
5800.000	0.185	350.168	5697.342	188.739	-873.571	188.739	893.727	282.192	1.533
5900.000	0.507	94.502	5797.341	188.863	-873.157	188.863	893.349	282.205	0.582
6000.000	0.659	90.987	5897.335	188.819	-872.141	188.819	892.346	282.216	0.156

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
6100.000	0.495	35.962	5997.331	189.159	-871.312	189.159	891.609	282.249	0.552
6200.000	0.276	28.475	6097.329	189.720	-870.944	189.720	891.368	282.289	0.224
6300.000	0.308	354.635	6197.327	190.200	-870.854	190.200	891.382	282.320	0.173
6400.000	0.552	331.375	6297.325	190.891	-871.110	190.891	891.780	282.360	0.295
6500.000	0.338	327.902	6397.322	191.564	-871.498	191.564	892.303	282.397	0.216
6600.000	0.361	318.298	6497.320	192.049	-871.864	192.049	892.765	282.422	0.063
6700.000	0.619	289.477	6597.316	192.464	-872.583	192.464	893.556	282.438	0.349
6800.000	0.675	290.255	6697.310	192.848	-873.644	192.848	894.676	282.448	0.057
6900.000	0.651	286.408	6797.303	193.213	-874.742	193.213	895.826	282.455	0.051
7000.000	0.532	288.820	6897.298	193.523	-875.726	193.523	896.854	282.461	0.121
7100.000	0.632	287.562	6997.293	193.839	-876.692	193.839	897.866	282.468	0.101