



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Fuego C 1-19/05-123-23166  
DECLINATION: 8.13 Degrees  
TD AS DRILLED: 6854 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.34546, Longitude: -104.50361  
Grid North = True North -0.64 degs (NAD 27)  
Grid Correction Applied = -0.64 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4605 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 11/22/2016 / 09:11

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Fuego C 1-19

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	0.339	243.850	99.999	-0.130	-0.266	-0.130	0.296	243.850	0.339
200.000	0.227	263.567	199.998	-0.283	-0.728	-0.283	0.781	248.752	0.147
300.000	0.333	210.112	299.997	-0.557	-1.071	-0.557	1.207	242.532	0.269
400.000	0.342	277.458	399.996	-0.769	-1.513	-0.769	1.697	243.053	0.374
500.000	0.324	160.064	499.995	-0.996	-1.713	-0.996	1.981	239.831	0.569
600.000	0.303	135.186	599.993	-1.448	-1.430	-1.448	2.036	224.638	0.136
700.000	0.364	162.856	699.992	-1.940	-1.150	-1.940	2.255	210.668	0.170
800.000	0.370	133.165	799.990	-2.464	-0.821	-2.464	2.598	198.423	0.188
900.000	0.356	140.137	899.988	-2.924	-0.386	-2.924	2.949	187.524	0.046
1000.000	0.451	155.357	999.985	-3.520	-0.023	-3.520	3.520	180.373	0.142
1100.000	0.419	146.440	1099.983	-4.182	0.343	-4.182	4.196	175.310	0.075
1200.000	0.565	166.872	1199.979	-4.967	0.657	-4.967	5.010	172.464	0.226
1300.000	0.515	158.151	1299.974	-5.864	0.936	-5.864	5.938	170.928	0.096
1400.000	0.568	168.022	1399.970	-6.767	1.207	-6.767	6.873	169.889	0.107
1500.000	0.589	167.823	1499.965	-7.754	1.418	-7.754	7.883	169.637	0.021
1600.000	0.513	149.327	1599.960	-8.642	1.755	-8.642	8.818	168.522	0.193

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
1700.000	0.464	142.951	1699.957	-9.350	2.227	-9.350	9.611	166.603	0.073
1800.000	0.482	126.877	1799.953	-9.925	2.807	-9.925	10.314	164.208	0.133
1900.000	0.470	130.482	1899.950	-10.444	3.455	-10.444	11.000	161.693	0.032
2000.000	0.535	137.406	1999.946	-11.054	4.083	-11.054	11.784	159.726	0.089
2100.000	0.609	182.495	2099.942	-11.928	4.376	-11.928	12.705	159.853	0.444
2200.000	0.904	163.674	2199.933	-13.216	4.575	-13.216	13.985	160.906	0.383
2300.000	0.994	160.400	2299.919	-14.790	5.088	-14.790	15.641	161.017	0.105
2400.000	0.796	169.018	2399.907	-16.290	5.511	-16.290	17.197	161.309	0.239
2500.000	0.796	168.744	2499.897	-17.653	5.779	-17.653	18.575	161.873	0.004
2600.000	0.734	163.103	2599.888	-18.947	6.101	-18.947	19.905	162.152	0.097
2700.000	0.820	162.852	2699.879	-20.244	6.498	-20.244	21.262	162.204	0.086
2800.000	0.655	137.461	2799.871	-21.350	7.096	-21.350	22.498	161.615	0.362
2900.000	0.754	123.773	2899.864	-22.137	8.029	-22.137	23.548	160.064	0.194
3000.000	0.674	124.911	2999.856	-22.839	9.059	-22.839	24.570	158.365	0.081
3100.000	0.251	116.770	3099.852	-23.275	9.737	-23.275	25.229	157.298	0.427
3200.000	0.215	159.337	3199.852	-23.549	9.999	-23.549	25.584	156.994	0.173
3300.000	0.476	150.039	3299.850	-24.085	10.273	-24.085	26.184	156.901	0.266
3400.000	0.994	151.738	3399.841	-25.210	10.891	-25.210	27.462	156.635	0.518
3500.000	1.307	146.567	3499.821	-26.926	11.930	-26.926	29.451	156.102	0.329
3600.000	1.245	161.155	3599.796	-28.906	12.910	-28.906	31.658	155.934	0.330
3700.000	0.876	192.640	3699.780	-30.680	13.093	-30.680	33.357	156.888	0.676
3800.000	0.406	280.961	3799.775	-31.359	12.579	-31.359	33.787	158.143	0.955
3900.000	0.623	328.035	3899.771	-30.830	11.943	-30.830	33.063	158.824	0.457
4000.000	0.918	13.343	3999.763	-29.590	11.840	-29.590	31.871	158.191	0.653
4100.000	1.095	12.051	4099.748	-27.876	12.225	-27.876	30.438	156.321	0.179
4200.000	1.042	22.960	4199.730	-26.104	12.779	-26.104	29.064	153.916	0.210
4300.000	1.197	12.132	4299.711	-24.245	13.353	-24.245	27.679	151.155	0.261
4400.000	1.293	358.075	4399.688	-22.097	13.535	-22.097	25.913	148.511	0.319
4500.000	1.346	5.266	4499.661	-19.800	13.605	-19.800	24.023	145.506	0.174
4600.000	1.335	6.924	4599.634	-17.474	13.853	-17.474	22.299	141.593	0.040
4700.000	1.199	2.990	4699.610	-15.273	14.048	-15.273	20.751	137.392	0.162
4800.000	1.367	2.124	4799.585	-13.036	14.147	-13.036	19.237	132.660	0.170
4900.000	1.336	5.403	4899.557	-10.684	14.301	-10.684	17.851	126.762	0.084
5000.000	1.404	35.255	4999.529	-8.523	15.118	-8.523	17.355	119.415	0.708
5100.000	1.962	57.969	5099.487	-6.615	17.276	-6.615	18.499	110.952	0.860
5200.000	1.943	62.432	5199.429	-4.922	20.231	-4.922	20.821	103.675	0.153
5300.000	1.996	40.540	5299.371	-2.814	22.866	-2.814	23.038	97.015	0.750
5400.000	1.322	43.179	5399.329	-0.649	24.787	-0.649	24.796	91.499	0.679
5500.000	0.557	51.947	5499.315	0.492	25.960	0.492	25.965	88.914	0.776

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
5600.000	0.784	131.926	5599.310	0.335	26.852	0.335	26.854	89.285	0.879
5700.000	1.213	169.400	5699.295	-1.162	27.555	-1.162	27.580	92.415	0.759
5800.000	1.254	153.629	5799.272	-3.182	28.236	-3.182	28.415	96.430	0.341
5900.000	1.603	159.041	5899.241	-5.468	29.222	-5.468	29.729	100.599	0.374
6000.000	2.177	181.482	5999.188	-8.673	29.673	-8.673	30.915	106.293	0.926
6100.000	1.839	208.643	6099.128	-11.981	28.855	-11.981	31.243	112.549	0.998
6200.000	0.830	257.485	6199.103	-13.546	27.378	-13.546	30.546	116.325	1.436
6300.000	1.383	293.901	6299.085	-13.214	25.568	-13.214	28.781	117.331	0.869
6400.000	1.507	326.267	6399.054	-11.632	23.735	-11.632	26.432	116.108	0.814
6500.000	2.091	320.585	6499.005	-9.129	21.846	-9.129	23.677	112.679	0.611
6550.000	1.660	325.894	6548.978	-7.824	20.861	-7.824	22.280	110.560	0.930