



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Cox PM C 8-4/05-123-14172
DECLINATION: 8.21 Degrees
TD AS DRILLED: 7165 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.33271, Longitude: -104.58120
Grid North = True North -0.59 degs (NAD 27)
Grid Correction Applied = -0.59 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4785 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/5/2016 / 13:38

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Cox PM C 8-4

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	0.264	348.605	100.000	0.226	-0.046	0.226	0.231	348.605	0.264
200.000	0.171	266.818	199.999	0.444	-0.240	0.444	0.505	331.631	0.294
300.000	0.163	319.470	299.999	0.544	-0.481	0.544	0.726	318.521	0.148
400.000	0.506	96.399	399.998	0.603	-0.134	0.603	0.618	347.432	0.635
500.000	0.464	89.393	499.994	0.558	0.710	0.558	0.903	51.822	0.073
600.000	0.402	74.356	599.991	0.657	1.453	0.657	1.595	65.667	0.129
700.000	0.462	108.653	699.989	0.623	2.173	0.623	2.260	74.003	0.261
800.000	0.600	106.757	799.984	0.343	3.056	0.343	3.075	83.596	0.140
900.000	0.456	114.025	899.980	0.030	3.921	0.030	3.922	89.563	0.159
1000.000	0.206	92.141	999.978	-0.139	4.465	-0.139	4.467	91.783	0.276
1100.000	0.271	103.261	1099.977	-0.200	4.875	-0.200	4.879	92.349	0.080
1200.000	0.352	101.933	1199.976	-0.318	5.405	-0.318	5.415	93.364	0.081
1300.000	0.433	66.398	1299.974	-0.230	6.052	-0.230	6.056	92.174	0.252
1400.000	0.262	61.918	1399.972	0.029	6.600	0.029	6.600	89.748	0.174
1500.000	0.188	60.306	1499.971	0.218	6.943	0.218	6.947	88.205	0.074
1600.000	0.284	49.177	1599.970	0.461	7.273	0.461	7.288	86.373	0.107
1700.000	0.071	19.825	1699.970	0.682	7.482	0.682	7.513	84.792	0.225
1800.000	0.318	24.950	1799.969	0.992	7.621	0.992	7.685	82.583	0.247

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
1900.000	0.242	247.421	1899.968	1.162	7.542	1.162	7.631	81.239	0.523
2000.000	0.313	261.610	1999.967	1.041	7.077	1.041	7.153	81.629	0.098
2100.000	0.608	237.506	2099.964	0.717	6.359	0.717	6.399	83.571	0.346
2200.000	0.751	241.427	2199.957	0.118	5.336	0.118	5.337	88.734	0.151
2300.000	1.014	239.283	2299.945	-0.648	3.999	-0.648	4.051	99.202	0.265
2400.000	0.757	231.502	2399.933	-1.511	2.721	-1.511	3.112	119.046	0.284
2500.000	0.910	225.726	2499.922	-2.476	1.636	-2.476	2.968	146.554	0.174
2600.000	0.483	240.664	2599.915	-3.237	0.700	-3.237	3.312	167.796	0.460
2700.000	0.638	247.238	2699.910	-3.659	-0.180	-3.659	3.663	182.824	0.167
2800.000	0.668	246.746	2799.904	-4.104	-1.229	-4.104	4.284	196.671	0.031
2900.000	0.712	246.622	2899.896	-4.581	-2.335	-4.581	5.142	207.009	0.044
3000.000	0.640	246.566	2999.889	-5.050	-3.418	-5.050	6.097	214.093	0.072
3100.000	0.824	218.899	3099.881	-5.831	-4.382	-5.831	7.294	216.922	0.393
3200.000	0.830	217.623	3199.871	-6.964	-5.275	-6.964	8.737	217.143	0.020
3300.000	1.018	187.418	3299.859	-8.419	-5.832	-8.419	10.242	214.713	0.514
3400.000	1.145	185.031	3399.841	-10.295	-6.035	-10.295	11.933	210.378	0.135
3500.000	1.495	173.306	3499.814	-12.586	-5.970	-12.586	13.930	205.378	0.440
3600.000	1.744	162.866	3599.774	-15.335	-5.370	-15.335	16.248	199.299	0.385
3700.000	1.782	161.413	3699.727	-18.262	-4.426	-18.262	18.791	193.624	0.059
3800.000	1.695	160.305	3799.681	-21.128	-3.432	-21.128	21.405	189.228	0.093
3900.000	1.741	160.618	3899.636	-23.953	-2.430	-23.953	24.076	185.792	0.048
4000.000	1.722	161.724	3999.591	-26.813	-1.454	-26.813	26.853	183.105	0.039
4100.000	1.959	163.239	4099.539	-29.877	-0.490	-29.877	29.881	180.940	0.242
4200.000	1.934	159.453	4199.481	-33.094	0.595	-33.094	33.099	178.970	0.131
4300.000	1.629	158.510	4299.433	-35.997	1.708	-35.997	36.037	177.283	0.307
4400.000	1.565	165.309	4399.394	-38.640	2.575	-38.640	38.726	176.187	0.200
4500.000	1.115	177.393	4499.367	-40.932	2.965	-40.932	41.040	175.856	0.529
4600.000	0.639	186.250	4599.355	-42.458	2.949	-42.458	42.561	176.027	0.493
4700.000	0.682	176.804	4699.348	-43.607	2.921	-43.607	43.705	176.167	0.117
4800.000	0.369	226.936	4799.344	-44.422	2.719	-44.422	44.505	176.497	0.528
4900.000	0.542	217.952	4899.341	-45.015	2.193	-45.015	45.068	177.211	0.186
5000.000	0.530	183.560	4999.337	-45.849	1.873	-45.849	45.887	177.661	0.317
5100.000	0.568	162.243	5099.332	-46.783	1.996	-46.783	46.825	177.557	0.207
5200.000	0.279	134.464	5199.330	-47.425	2.321	-47.425	47.482	177.198	0.346
5300.000	0.438	20.927	5299.328	-47.239	2.631	-47.239	47.313	176.812	0.606
5400.000	1.120	55.364	5399.319	-46.327	3.572	-46.327	46.465	175.591	0.798
5500.000	1.591	77.679	5499.291	-45.476	5.732	-45.476	45.835	172.817	0.699
5600.000	2.489	85.186	5599.227	-44.997	9.251	-44.997	45.938	168.382	0.935
5700.000	2.096	99.014	5699.148	-45.102	13.221	-45.102	46.999	163.662	0.676
5800.000	1.746	96.443	5799.091	-45.559	16.541	-45.559	48.469	160.046	0.361

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
5900.000	1.654	127.027	5899.050	-46.599	19.207	-46.599	50.402	157.600	0.901
6000.000	1.560	139.470	5999.010	-48.503	21.244	-48.503	52.951	156.347	0.361
6100.000	1.804	151.355	6098.968	-50.920	22.883	-50.920	55.825	155.801	0.425
6200.000	1.911	143.794	6198.915	-53.647	24.623	-53.647	59.028	155.346	0.267
6300.000	2.174	156.564	6298.852	-56.733	26.362	-56.733	62.559	155.077	0.524
6400.000	2.313	155.800	6398.775	-60.314	27.944	-60.314	66.473	155.141	0.142
6500.000	2.657	139.421	6498.682	-63.916	30.279	-63.916	70.725	154.651	0.785
6600.000	2.612	155.671	6598.578	-67.752	32.726	-67.752	75.242	154.218	0.746
6700.000	3.042	163.246	6698.457	-72.369	34.429	-72.369	80.142	154.557	0.569
6800.000	3.329	167.642	6798.302	-77.747	35.816	-77.747	85.600	155.266	0.377
6900.000	3.909	165.242	6898.102	-83.879	37.305	-83.879	91.801	156.023	0.599