



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Wells Ranch USX BB 3-14/05-123-26320
DECLINATION: 8.12 Degrees
TD AS DRILLED: 6906 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.42271, Longitude: -104.42557
Grid North = True North -0.69 degs (NAD 27)
Grid Correction Applied = -0.69 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4710 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/11/2016 / 08:55

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Wells Ranch USX BB 3-14

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	0.486	25.365	99.999	0.383	0.182	0.383	0.424	25.365	0.486
200.000	0.651	42.729	199.994	1.184	0.749	1.184	1.400	32.316	0.237
300.000	0.597	49.959	299.988	1.936	1.533	1.936	2.469	38.371	0.095
400.000	0.456	90.426	399.984	2.268	2.329	2.268	3.251	45.771	0.387
500.000	0.529	13.249	499.981	2.714	2.834	2.714	3.924	46.233	0.617
600.000	0.769	20.162	599.975	3.794	3.171	3.794	4.945	39.888	0.252
700.000	0.546	7.989	699.968	4.896	3.469	4.896	6.000	35.314	0.262
800.000	0.725	355.874	799.962	5.999	3.489	5.999	6.940	30.183	0.222
900.000	0.749	22.191	899.954	7.235	3.691	7.235	8.122	27.025	0.336
1000.000	0.893	358.046	999.944	8.619	3.911	8.619	9.465	24.405	0.371
1100.000	0.630	347.758	1099.935	9.935	3.768	9.935	10.626	20.768	0.296
1200.000	0.775	346.740	1199.928	11.131	3.496	11.131	11.667	17.437	0.146
1300.000	0.654	6.387	1299.920	12.356	3.404	12.356	12.816	15.404	0.272
1400.000	0.639	352.448	1399.914	13.476	3.394	13.476	13.897	14.138	0.158
1500.000	0.806	355.577	1499.906	14.730	3.267	14.730	15.088	12.505	0.171
1600.000	0.526	17.986	1599.899	15.868	3.354	15.868	16.218	11.936	0.378

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	0.200	20.684	1699.897	16.467	3.558	16.467	16.847	12.191	0.326
1800.000	0.166	72.493	1799.897	16.674	3.757	16.674	17.092	12.699	0.163
1900.000	0.240	1.090	1899.896	16.927	3.900	16.927	17.371	12.973	0.245
2000.000	0.605	337.851	1999.893	17.626	3.705	17.626	18.011	11.870	0.396
2100.000	0.863	330.037	2099.885	18.767	3.129	18.767	19.026	9.467	0.277
2200.000	1.059	298.501	2199.871	19.861	1.941	19.861	19.955	5.583	0.555
2300.000	1.048	282.521	2299.855	20.500	0.237	20.500	20.501	0.662	0.293
2400.000	1.280	266.085	2399.834	20.622	-1.770	20.622	20.697	355.094	0.404
2500.000	2.012	246.737	2499.793	19.852	-4.497	19.852	20.355	347.235	0.910
2600.000	2.067	250.661	2599.730	18.561	-7.812	18.561	20.138	337.176	0.150
2700.000	1.995	245.873	2699.667	17.253	-11.102	17.253	20.516	327.240	0.184
2800.000	1.489	246.525	2799.621	16.024	-13.882	16.024	21.201	319.096	0.507
2900.000	0.850	259.011	2899.599	15.365	-15.802	15.365	22.040	314.196	0.684
3000.000	0.489	284.990	2999.593	15.334	-16.942	15.334	22.851	312.147	0.463
3100.000	0.683	288.681	3099.587	15.635	-17.918	15.635	23.780	311.106	0.198
3200.000	1.459	324.458	3199.570	16.862	-19.223	16.862	25.570	311.256	0.990
3300.000	1.661	292.510	3299.535	18.453	-21.303	18.453	28.184	310.900	0.880
3400.000	1.006	270.232	3399.508	19.012	-23.519	19.012	30.242	308.950	0.824
3500.000	1.029	276.371	3499.492	19.115	-25.289	19.115	31.700	307.084	0.111
3600.000	0.612	312.398	3599.482	19.575	-26.576	19.575	33.007	306.374	0.644
3700.000	0.488	319.707	3699.478	20.259	-27.246	20.259	33.953	306.634	0.143
3800.000	0.590	331.869	3799.473	21.038	-27.764	21.038	34.834	307.153	0.153
3900.000	0.178	302.783	3899.471	21.575	-28.136	21.575	35.456	307.481	0.443
4000.000	0.546	173.577	3999.469	21.186	-28.213	21.186	35.282	306.904	0.672
4100.000	0.832	154.971	4099.462	20.055	-27.853	20.055	34.322	305.755	0.360
4200.000	1.060	148.981	4199.449	18.604	-27.069	18.604	32.846	304.500	0.249
4300.000	1.044	168.673	4299.432	16.918	-26.413	16.918	31.367	302.639	0.360
4400.000	0.909	192.111	4399.418	15.248	-26.401	15.248	30.488	300.009	0.418
4500.000	0.956	220.920	4499.405	13.842	-27.114	13.842	30.443	297.045	0.466
4600.000	1.221	221.944	4599.387	12.419	-28.372	12.419	30.971	293.640	0.265
4700.000	1.537	203.963	4699.358	10.401	-29.629	10.401	31.401	289.344	0.532
4800.000	1.965	225.016	4799.312	7.964	-31.386	7.964	32.381	284.237	0.766
4900.000	1.605	235.587	4899.264	5.960	-33.754	5.960	34.276	280.014	0.486
5000.000	1.408	225.711	4999.230	4.311	-35.789	4.311	36.048	276.868	0.326
5100.000	0.685	254.110	5099.213	3.290	-37.243	3.290	37.388	275.048	0.868
5200.000	0.453	290.180	5199.208	3.262	-38.189	3.262	38.328	274.882	0.416
5300.000	0.399	324.180	5299.206	3.681	-38.764	3.681	38.938	275.425	0.254
5400.000	0.376	336.999	5399.203	4.266	-39.096	4.266	39.328	276.227	0.090
5500.000	0.373	38.507	5499.202	4.823	-39.022	4.823	39.319	277.045	0.383

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	0.334	5.220	5599.200	5.367	-38.793	5.367	39.162	277.878	0.206
5700.000	0.391	0.900	5699.198	5.999	-38.761	5.999	39.222	278.798	0.064
5800.000	0.421	351.307	5799.195	6.704	-38.811	6.704	39.386	279.800	0.074
5900.000	0.719	341.913	5899.190	7.664	-39.061	7.664	39.806	281.101	0.312
6000.000	0.965	334.086	5999.179	9.018	-39.624	9.018	40.637	282.821	0.271
6100.000	0.827	334.860	6099.167	10.429	-40.299	10.429	41.626	284.509	0.139
6200.000	0.867	358.623	6199.156	11.838	-40.623	11.838	42.313	286.247	0.351
6300.000	0.516	314.582	6299.150	12.911	-40.962	12.911	42.949	287.494	0.612
6400.000	0.836	230.147	6399.145	12.759	-41.844	12.759	43.746	286.958	0.939
6500.000	1.178	178.568	6499.131	11.264	-42.378	11.264	43.850	284.885	0.928
6600.000	1.963	165.957	6599.093	8.575	-41.937	8.575	42.805	281.556	0.854