



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Wells Ranch USX BB 3-25/05-123-25218
DECLINATION: 8.12 Degrees
TD AS DRILLED: 6873 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.42490, Longitude: -104.42759
Grid North = True North -0.69 degs (NAD 27)
Grid Correction Applied = -0.69 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4714 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/11/2016 / 09:38

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Wells Ranch USX BB 3-25

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	0.112	13.120	100.000	0.095	0.022	0.095	0.098	13.120	0.112
200.000	0.388	92.574	199.999	0.176	0.383	0.176	0.421	65.349	0.384
300.000	0.527	97.855	299.996	0.098	1.176	0.098	1.180	85.259	0.145
400.000	0.405	66.994	399.993	0.173	1.957	0.173	1.965	84.953	0.274
500.000	0.587	132.086	499.990	-0.032	2.662	-0.032	2.662	90.692	0.555
600.000	0.554	148.053	599.985	-0.785	3.298	-0.785	3.390	103.396	0.162
700.000	0.574	119.106	699.980	-1.439	3.992	-1.439	4.243	109.829	0.283
800.000	0.493	158.670	799.976	-2.084	4.586	-2.084	5.038	114.438	0.369
900.000	0.328	125.127	899.974	-2.650	4.977	-2.650	5.638	118.030	0.285
1000.000	0.571	161.160	999.971	-3.286	5.372	-3.286	6.298	121.455	0.362
1100.000	0.511	170.773	1099.966	-4.198	5.605	-4.198	7.003	126.837	0.109
1200.000	0.528	140.714	1199.962	-4.996	5.968	-4.996	7.783	129.931	0.270
1300.000	0.553	215.401	1299.959	-5.746	5.980	-5.746	8.293	133.855	0.656
1400.000	0.631	205.388	1399.954	-6.637	5.464	-6.637	8.597	140.534	0.129
1500.000	0.466	275.403	1499.950	-7.096	4.823	-7.096	8.580	145.796	0.644
1600.000	2.545	2.791	1599.916	-4.840	4.526	-4.840	6.626	136.917	2.567

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	2.476	5.856	1699.820	-0.473	4.855	-0.473	4.878	95.569	0.151
1800.000	2.149	10.555	1799.738	3.518	5.419	3.518	6.461	57.004	0.377
1900.000	0.476	52.550	1899.710	5.614	6.092	5.614	8.284	47.336	1.823
2000.000	0.429	152.470	1999.708	5.535	6.595	5.535	8.609	49.995	0.694
2100.000	0.237	203.496	2099.706	5.013	6.685	5.013	8.356	53.137	0.335
2200.000	0.265	218.011	2199.705	4.641	6.460	4.641	7.954	54.309	0.069
2300.000	0.170	257.226	2299.705	4.426	6.173	4.426	7.596	54.363	0.172
2400.000	0.118	128.133	2399.705	4.329	6.109	4.329	7.488	54.678	0.261
2500.000	0.198	213.344	2499.704	4.121	6.095	4.121	7.358	55.935	0.222
2600.000	0.343	47.181	2599.704	4.180	6.220	4.180	7.494	56.095	0.537
2700.000	0.629	38.367	2699.700	4.813	6.779	4.813	8.314	54.624	0.295
2800.000	0.655	48.384	2799.694	5.623	7.547	5.623	9.411	53.311	0.115
2900.000	0.609	57.610	2899.688	6.287	8.423	6.287	10.511	53.261	0.111
3000.000	0.237	104.855	2999.685	6.519	9.071	6.519	11.171	54.298	0.481
3100.000	0.438	146.038	3099.684	6.149	9.485	6.149	11.303	57.044	0.303
3200.000	0.724	221.763	3199.679	5.361	9.277	5.361	10.715	59.977	0.748
3300.000	1.234	214.915	3299.665	4.007	8.240	4.007	9.163	64.068	0.523
3400.000	1.468	203.416	3399.637	1.948	7.115	1.948	7.377	74.685	0.357
3500.000	1.398	188.324	3499.606	-0.434	6.429	-0.434	6.444	93.860	0.383
3600.000	1.524	198.367	3599.574	-2.902	5.834	-2.902	6.516	116.451	0.285
3700.000	1.348	195.806	3699.542	-5.296	5.094	-5.296	7.349	136.112	0.187
3800.000	1.507	194.622	3799.511	-7.700	4.442	-7.700	8.889	150.020	0.161
3900.000	1.247	190.421	3899.482	-10.042	3.913	-10.042	10.778	158.710	0.278
4000.000	1.186	163.138	3999.460	-12.103	4.017	-12.103	12.752	161.640	0.577
4100.000	1.652	157.177	4099.430	-14.422	4.876	-14.422	15.224	161.320	0.488
4200.000	2.280	158.398	4199.370	-17.600	6.167	-17.600	18.649	160.688	0.630
4300.000	2.550	152.213	4299.282	-21.417	7.937	-21.417	22.840	159.667	0.375
4400.000	2.790	140.970	4399.174	-25.276	10.506	-25.276	27.372	157.429	0.575
4500.000	2.656	120.802	4499.063	-28.353	14.029	-28.353	31.634	153.674	0.962
4600.000	2.667	126.071	4598.955	-30.909	17.900	-30.909	35.718	149.924	0.245
4700.000	2.746	121.076	4698.844	-33.515	21.832	-33.515	39.999	146.920	0.248
4800.000	2.375	123.645	4798.744	-35.900	25.609	-35.900	44.098	144.498	0.387
4900.000	2.312	116.894	4898.660	-37.961	29.133	-37.961	47.851	142.495	0.283
5000.000	2.284	133.206	4998.581	-40.237	32.385	-40.237	51.651	141.172	0.653
5100.000	2.334	130.040	5098.500	-42.911	35.396	-42.911	55.626	140.482	0.137
5200.000	1.819	126.922	5198.434	-45.174	38.223	-45.174	59.175	139.765	0.527
5300.000	1.627	136.511	5298.389	-47.158	40.469	-47.158	62.142	139.365	0.345
5400.000	1.253	115.268	5398.358	-48.655	42.435	-48.655	64.560	138.906	0.646
5500.000	1.340	145.446	5498.333	-50.085	44.087	-50.085	66.724	138.644	0.680

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	1.468	124.197	5598.304	-51.768	45.810	-51.768	69.126	138.494	0.533
5700.000	1.854	135.466	5698.262	-53.641	48.004	-53.641	71.984	138.174	0.503
5800.000	1.918	140.356	5798.208	-56.082	50.206	-56.082	75.272	138.165	0.173
5900.000	1.613	129.302	5898.161	-58.262	52.363	-58.262	78.335	138.053	0.456
6000.000	1.716	125.473	5998.118	-60.023	54.671	-60.023	81.189	137.672	0.151
6100.000	1.557	134.906	6098.078	-61.851	56.852	-61.851	84.010	137.411	0.312
6200.000	2.046	123.724	6198.028	-63.801	59.300	-63.801	87.104	137.094	0.600
6300.000	2.305	137.576	6297.957	-66.277	62.142	-66.277	90.853	136.844	0.584
6400.000	2.882	137.659	6397.854	-69.620	65.192	-69.620	95.378	136.881	0.576
6500.000	3.344	141.425	6497.706	-73.758	68.704	-73.758	100.799	137.032	0.505
6600.000	3.699	133.729	6597.518	-78.268	72.853	-78.268	106.928	137.052	0.590