



Company/Rig: Noble Energy/ VES

WELL/API#: Loloff 35-6/05-123-21927

DECLINATION: 8.16 Degrees

TD AS DRILLED: 6882 Feet

COUNTY/STATE: Weld/Colorado

VS-Azi: 0.000 Degrees

Latitude: 40.35722, Longitude: -104.51904

Grid North = True North -0.63 degs (NAD 27)

Grid Correction Applied = -0.63 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4611 Feet

DRILLOG GYRO SURVEY CALCULATIONS

Filename: gyro-de\_01.ut

Minimum Curvature Method

Report Date/Time: 8/18/2016 / 09:29

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Loloff 35-6

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	0.301	29.179	100.000	0.229	0.128	0.229	0.263	29.179	0.301
200.000	0.406	131.032	199.998	0.226	0.524	0.226	0.570	66.686	0.553
300.000	0.371	304.521	299.998	0.176	0.524	0.176	0.553	71.433	0.776
400.000	0.584	328.159	399.994	0.793	-0.011	0.793	0.793	359.190	0.286
500.000	0.204	85.773	499.992	1.239	-0.103	1.239	1.244	355.270	0.703
600.000	0.115	47.889	599.992	1.320	0.150	1.320	1.329	6.482	0.133
700.000	0.703	201.364	699.990	0.817	0.001	0.817	0.817	0.098	0.808
800.000	0.641	202.158	799.983	-0.272	-0.433	-0.272	0.511	237.829	0.062
900.000	0.082	144.257	899.981	-0.848	-0.602	-0.848	1.040	215.373	0.602
1000.000	0.563	202.166	999.979	-1.361	-0.746	-1.361	1.552	208.722	0.524
1100.000	0.645	313.450	1099.976	-1.429	-1.340	-1.429	1.959	223.161	0.999
1200.000	0.444	219.254	1199.973	-1.342	-1.994	-1.342	2.404	236.066	0.810
1300.000	0.654	271.783	1299.969	-1.624	-2.810	-1.624	3.246	239.976	0.521
1400.000	0.576	182.916	1399.965	-2.108	-3.406	-2.108	4.006	238.248	0.863
1500.000	0.451	230.968	1499.961	-2.858	-3.738	-2.858	4.705	232.597	0.433
1600.000	0.283	256.171	1599.959	-3.165	-4.284	-3.165	5.327	233.541	0.229

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	0.623	170.367	1699.957	-3.761	-4.433	-3.761	5.813	229.694	0.665
1800.000	0.601	153.806	1799.951	-4.767	-4.111	-4.767	6.295	220.774	0.178
1900.000	0.312	160.595	1899.948	-5.494	-3.789	-5.494	6.674	214.594	0.294
2000.000	0.632	174.176	1999.945	-6.299	-3.643	-6.299	7.276	210.042	0.337
2100.000	0.439	266.452	2099.942	-6.871	-3.970	-6.871	7.935	210.017	0.784
2200.000	0.616	203.212	2199.938	-7.389	-4.564	-7.389	8.685	211.705	0.574
2300.000	0.400	255.481	2299.935	-7.971	-5.114	-7.971	9.470	212.686	0.488
2400.000	0.749	202.897	2399.930	-8.660	-5.707	-8.660	10.371	213.382	0.598
2500.000	0.551	235.597	2499.924	-9.534	-6.357	-9.534	11.459	213.695	0.412
2600.000	0.638	148.397	2599.920	-10.280	-6.462	-10.280	12.142	212.155	0.822
2700.000	0.140	199.736	2699.918	-10.868	-6.212	-10.868	12.518	209.750	0.561
2800.000	0.536	102.103	2799.916	-11.081	-5.796	-11.081	12.505	207.612	0.571
2900.000	0.208	204.320	2899.915	-11.344	-5.414	-11.344	12.570	205.511	0.614
3000.000	0.536	179.609	2999.912	-11.978	-5.485	-11.978	13.174	204.605	0.358
3100.000	0.095	311.194	3099.911	-12.391	-5.544	-12.391	13.575	204.106	0.604
3200.000	0.497	159.082	3199.910	-12.742	-5.452	-12.742	13.859	203.164	0.583
3300.000	0.418	168.593	3299.907	-13.505	-5.225	-13.505	14.480	201.149	0.109
3400.000	0.309	118.053	3399.905	-13.990	-4.915	-13.990	14.828	199.356	0.326
3500.000	0.330	150.264	3499.904	-14.366	-4.534	-14.366	15.065	197.516	0.178
3600.000	0.468	220.511	3599.902	-14.927	-4.656	-14.927	15.636	197.325	0.472
3700.000	0.713	180.795	3699.897	-15.859	-4.930	-15.859	16.608	197.269	0.463
3800.000	0.356	148.505	3799.892	-16.746	-4.777	-16.746	17.414	195.920	0.454
3900.000	0.972	119.513	3899.885	-17.429	-3.876	-17.429	17.855	192.538	0.683
4000.000	1.068	142.167	3999.870	-18.583	-2.566	-18.583	18.760	187.861	0.412
4100.000	1.177	134.548	4099.851	-20.040	-1.262	-20.040	20.080	183.604	0.184
4200.000	1.190	158.575	4199.830	-21.727	-0.151	-21.727	21.727	180.398	0.493
4300.000	1.843	143.823	4299.795	-23.991	1.178	-23.991	24.020	177.190	0.756
4400.000	2.388	131.120	4399.727	-26.660	3.696	-26.660	26.915	172.106	0.716
4500.000	2.489	136.785	4499.636	-29.612	6.753	-29.612	30.372	167.154	0.261
4600.000	2.058	153.395	4599.559	-32.800	9.044	-32.800	34.024	164.586	0.783
4700.000	1.609	163.819	4699.507	-35.754	10.239	-35.754	37.191	164.020	0.558
4800.000	1.431	173.746	4799.472	-38.344	10.766	-38.344	39.826	164.316	0.317
4900.000	1.789	165.621	4899.433	-41.098	11.290	-41.098	42.620	164.639	0.424
5000.000	0.927	145.395	4999.404	-43.276	12.137	-43.276	44.946	164.333	0.974
5100.000	1.159	173.226	5099.388	-44.946	12.716	-44.946	46.710	164.203	0.550
5200.000	0.733	171.153	5199.374	-46.583	12.934	-46.583	48.345	164.483	0.427
5300.000	1.315	144.924	5299.358	-48.154	13.691	-48.154	50.062	164.128	0.733
5400.000	1.123	173.448	5399.337	-50.066	14.463	-50.066	52.113	163.888	0.629
5500.000	0.575	153.120	5499.326	-51.487	14.801	-51.487	53.572	163.961	0.617

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	0.388	188.495	5599.322	-52.269	14.978	-52.269	54.373	164.010	0.342
5700.000	0.931	148.918	5699.316	-53.299	15.347	-53.299	55.465	163.937	0.678
5800.000	0.271	231.100	5799.311	-54.143	15.582	-54.143	56.341	163.944	0.933
5900.000	0.493	301.277	5899.309	-54.069	15.031	-54.069	56.119	164.464	0.475
6000.000	0.493	326.977	5999.305	-53.484	14.429	-53.484	55.397	164.902	0.219
6100.000	0.350	342.151	6099.303	-52.833	14.101	-52.833	54.682	165.057	0.180
6200.000	0.895	353.591	6199.296	-51.765	13.920	-51.765	53.604	164.949	0.556
6300.000	0.986	5.003	6299.283	-50.132	13.908	-50.132	52.026	164.495	0.208
6400.000	1.010	17.959	6399.268	-48.438	14.254	-48.438	50.491	163.602	0.226
6500.000	0.718	351.451	6499.257	-46.980	14.433	-46.980	49.147	162.923	0.487
6600.000	0.903	8.235	6599.247	-45.580	14.453	-45.580	47.817	162.407	0.299