



Company/Rig: Noble Energy/Production

WELL/API#: Hall 01/05-123-11379

DECLINATION: 8.19 Degrees

TD AS DRILLED: 7763 Feet

COUNTY/STATE: Weld/Colorado

VS-Azi: 0.000 Degrees

Latitude: 40.47496, Longitude: -104.81393

Grid North = True North -0.44 degs (NAD 27)

Grid Correction Applied = -0.44 degs



DEPTH REFERENCE : RKB=GL Elevation= 4792 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: run1-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/13/2017 / 14:03

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Geof Davis / Hall 01

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	0.257	281.350	100.000	0.044	-0.220	0.044	0.224	281.350	0.257
200.000	0.203	261.242	199.999	0.061	-0.615	0.061	0.618	275.688	0.096
300.000	0.057	269.931	299.999	0.034	-0.839	0.034	0.840	272.331	0.147
400.000	0.100	255.772	399.998	0.013	-0.973	0.013	0.973	270.750	0.047
500.000	0.119	240.923	499.998	-0.059	-1.148	-0.059	1.149	267.061	0.034
600.000	0.415	277.184	599.997	-0.064	-1.598	-0.064	1.599	267.708	0.327
700.000	0.255	313.282	699.996	0.134	-2.119	0.134	2.123	273.610	0.258
800.000	0.166	313.889	799.995	0.386	-2.385	0.386	2.416	279.198	0.089
900.000	0.475	243.617	899.993	0.302	-2.860	0.302	2.876	276.029	0.447
1000.000	0.156	293.928	999.992	0.173	-3.356	0.173	3.361	272.954	0.394
1100.000	0.332	248.045	1099.991	0.120	-3.750	0.120	3.752	271.836	0.250
1200.000	0.433	237.790	1199.989	-0.189	-4.338	-0.189	4.342	267.500	0.121
1300.000	0.117	225.848	1299.988	-0.462	-4.731	-0.462	4.753	264.425	0.319
1400.000	0.496	223.422	1399.986	-0.847	-5.101	-0.847	5.171	260.572	0.379
1500.000	0.208	236.861	1499.984	-1.260	-5.551	-1.260	5.692	257.206	0.297
1600.000	0.428	243.922	1599.982	-1.524	-6.038	-1.524	6.228	255.835	0.223
1700.000	0.949	243.044	1699.975	-2.064	-7.113	-2.064	7.406	253.819	0.521
1800.000	0.999	228.312	1799.960	-3.019	-8.502	-3.019	9.022	250.448	0.255

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	0.996	258.789	1899.946	-3.768	-10.006	-3.768	10.692	249.363	0.525
2000.000	0.672	270.904	1999.935	-3.928	-11.446	-3.928	12.101	251.058	0.367
2100.000	0.690	271.132	2099.928	-3.907	-12.634	-3.907	13.224	252.816	0.018
2200.000	0.341	280.155	2199.924	-3.843	-13.529	-3.843	14.064	254.143	0.357
2300.000	0.759	269.458	2299.919	-3.797	-14.484	-3.797	14.973	255.312	0.428
2400.000	0.463	288.150	2399.914	-3.677	-15.530	-3.677	15.959	256.680	0.353
2500.000	0.643	270.052	2499.909	-3.550	-16.475	-3.550	16.853	257.838	0.248
2600.000	0.935	251.172	2599.900	-3.813	-17.807	-3.813	18.211	257.914	0.387
2700.000	0.887	253.252	2699.887	-4.299	-19.320	-4.299	19.793	257.455	0.058
2800.000	0.788	235.829	2799.876	-4.908	-20.630	-4.908	21.206	256.617	0.272
2900.000	0.972	226.718	2899.865	-5.876	-21.816	-5.876	22.594	254.926	0.230
3000.000	0.905	243.085	2999.851	-6.815	-23.138	-6.815	24.120	253.589	0.275
3100.000	1.044	235.819	3099.837	-7.684	-24.596	-7.684	25.768	252.650	0.186
3200.000	1.144	234.088	3199.819	-8.782	-26.158	-8.782	27.593	251.442	0.105
3300.000	1.190	239.376	3299.798	-9.896	-27.860	-9.896	29.566	250.445	0.117
3400.000	1.306	258.414	3399.775	-10.654	-29.870	-10.654	31.713	250.370	0.428
3500.000	1.612	258.668	3499.742	-11.159	-32.366	-11.159	34.236	250.977	0.306
3600.000	1.680	267.952	3599.701	-11.488	-35.210	-11.488	37.037	251.930	0.275
3700.000	1.805	276.427	3699.655	-11.364	-38.240	-11.364	39.893	253.449	0.286
3800.000	1.617	263.705	3799.611	-11.343	-41.207	-11.343	42.740	254.610	0.423
3900.000	1.683	263.661	3899.569	-11.660	-44.070	-11.660	45.586	255.181	0.066
4000.000	1.972	270.397	3999.518	-11.810	-47.250	-11.810	48.704	255.967	0.359
4100.000	2.009	267.581	4099.458	-11.872	-50.722	-11.872	52.093	256.827	0.104
4200.000	2.061	258.886	4199.395	-12.292	-54.237	-12.292	55.612	257.230	0.313
4300.000	1.653	267.144	4299.343	-12.711	-57.441	-12.711	58.831	257.522	0.487
4400.000	1.876	272.987	4399.295	-12.697	-60.516	-12.697	61.834	258.150	0.286
4500.000	1.720	262.430	4499.246	-12.810	-63.638	-12.810	64.915	258.619	0.365
4600.000	1.641	260.811	4599.203	-13.236	-66.540	-13.236	67.843	258.749	0.093
4700.000	1.730	261.819	4699.160	-13.680	-69.447	-13.680	70.781	258.856	0.094
4800.000	1.952	263.458	4799.108	-14.089	-72.633	-14.089	73.987	259.023	0.229
4900.000	1.399	287.296	4899.066	-13.920	-75.491	-13.920	76.763	259.553	0.879
5000.000	1.679	280.105	4999.030	-13.300	-78.098	-13.300	79.223	260.336	0.340
5100.000	1.493	278.130	5098.992	-12.858	-80.831	-12.858	81.847	260.961	0.193
5200.000	0.952	291.331	5198.969	-12.372	-82.895	-12.372	83.813	261.511	0.607
5300.000	1.080	275.228	5298.953	-11.984	-84.608	-11.984	85.452	261.938	0.312
5400.000	1.095	288.683	5398.936	-11.592	-86.452	-11.592	87.226	262.363	0.255
5500.000	1.415	274.974	5498.912	-11.178	-88.587	-11.178	89.290	262.808	0.436
5600.000	1.408	274.421	5598.881	-10.977	-91.042	-10.977	91.701	263.125	0.015
5700.000	1.414	289.004	5698.851	-10.480	-93.434	-10.480	94.020	263.600	0.358

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
5800.000	0.990	280.711	5798.829	-9.918	-95.449	-9.918	95.963	264.068	0.458
5900.000	1.125	284.145	5898.812	-9.517	-97.250	-9.517	97.714	264.411	0.150
6000.000	1.307	302.683	5998.790	-8.661	-99.162	-8.661	99.539	265.008	0.431
6100.000	1.486	291.682	6098.760	-7.567	-101.327	-7.567	101.609	265.729	0.322
6200.000	1.376	282.476	6198.729	-6.828	-103.704	-6.828	103.928	266.233	0.255
6300.000	1.310	300.859	6298.702	-5.982	-105.857	-5.982	106.026	266.765	0.434
6400.000	1.529	300.436	6398.672	-4.720	-107.989	-4.720	108.092	267.497	0.219
6500.000	1.289	285.386	6498.642	-3.746	-110.224	-3.746	110.288	268.054	0.439
6600.000	0.985	293.041	6598.622	-3.111	-112.100	-3.111	112.143	268.410	0.340
6700.000	0.375	280.893	6698.614	-2.713	-113.212	-2.713	113.245	268.627	0.623
6800.000	0.330	312.991	6798.613	-2.454	-113.745	-2.454	113.771	268.764	0.200
6900.000	0.363	10.483	6898.611	-1.946	-113.898	-1.946	113.914	269.021	0.335
7000.000	0.353	41.263	6998.609	-1.403	-113.637	-1.403	113.645	269.293	0.190
7100.000	0.297	291.656	7098.608	-1.076	-113.674	-1.076	113.679	269.458	0.532