



COMPANY/RIG: Noble Energy/Production/VES  
WELL/API: Stout 9-4/05-123-15765  
DECLINATION: 8.07 Degrees  
TD AS DRILLED: 7149 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.42703, Longitude: -104.66144  
Grid North = True North -0.54 degs (NAD 27)  
Grid Correction Applied = -0.54 degs



DEPTH REFERENCE : RKB = GL Elevation = 4627

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hgyrosurvey.ut  
Minimum Curvature Method  
Report Date/Time: 4/4/2018 / 09:47

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD  
NORTH REFERENCE: GRID  
HENDERSON, COLORADO  
303-853-4976

Surveyor:JUSTIN WILLIAMS/Stout 9-4/API 05-123-15765

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	0.365	143.385	99.999	-0.256	0.190	-0.256	0.318	143.385	0.365
200.000	0.180	183.727	199.998	-0.668	0.370	-0.668	0.764	151.038	0.256
300.000	0.283	76.827	299.998	-0.769	0.600	-0.769	0.975	142.041	0.377
400.000	0.412	130.828	399.996	-0.948	1.112	-0.948	1.461	130.438	0.336
500.000	0.366	219.509	499.995	-1.429	1.181	-1.429	1.854	140.424	0.545
600.000	0.319	344.862	599.994	-1.407	0.906	-1.407	1.673	147.230	0.608
700.000	0.601	118.009	699.992	-1.385	1.296	-1.385	1.897	136.901	0.851
800.000	0.850	160.619	799.985	-2.331	2.005	-2.331	3.075	139.302	0.576
900.000	0.249	166.674	899.980	-3.243	2.301	-3.243	3.976	144.639	0.603
1000.000	1.097	153.322	999.972	-4.310	2.781	-4.310	5.129	147.167	0.856
1100.000	0.960	139.701	1099.956	-5.804	3.753	-5.804	6.912	147.115	0.279
1200.000	0.597	177.966	1199.947	-6.964	4.313	-6.964	8.192	148.228	0.615
1300.000	0.659	168.162	1299.941	-8.048	4.450	-8.048	9.197	151.062	0.124
1400.000	1.020	184.649	1399.930	-9.499	4.496	-9.499	10.509	154.671	0.430
1500.000	0.995	186.010	1499.915	-11.249	4.333	-11.249	12.055	158.935	0.034
1600.000	0.787	184.982	1599.903	-12.797	4.182	-12.797	13.463	161.902	0.209
1700.000	0.908	184.078	1699.892	-14.272	4.066	-14.272	14.840	164.097	0.122
1800.000	0.965	187.421	1799.878	-15.897	3.901	-15.897	16.369	166.212	0.078

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	0.813	169.563	1899.866	-17.430	3.921	-17.430	17.865	167.322	0.314
2000.000	1.377	170.528	1999.848	-19.312	4.247	-19.312	19.774	167.597	0.564
2100.000	1.810	169.473	2099.809	-22.050	4.733	-22.050	22.552	167.884	0.434
2200.000	1.670	150.771	2199.764	-24.874	5.733	-24.874	25.526	167.020	0.582
2300.000	1.903	168.107	2299.716	-27.770	6.787	-27.770	28.587	166.266	0.585
2400.000	1.930	167.632	2399.660	-31.039	7.490	-31.039	31.930	166.434	0.032
2500.000	2.072	180.741	2499.599	-34.491	7.827	-34.491	35.368	167.215	0.478
2600.000	2.018	180.424	2599.536	-38.060	7.790	-38.060	38.849	168.432	0.055
2700.000	1.915	181.308	2699.477	-41.491	7.739	-41.491	42.207	169.434	0.108
2800.000	1.695	174.960	2799.427	-44.635	7.831	-44.635	45.317	170.049	0.297
2900.000	1.590	180.290	2899.386	-47.496	7.954	-47.496	48.157	170.493	0.185
3000.000	1.680	180.447	2999.345	-50.349	7.935	-50.349	50.970	171.043	0.089
3100.000	1.740	199.900	3099.302	-53.242	7.407	-53.242	53.754	172.080	0.581
3200.000	1.819	208.946	3199.254	-56.058	6.122	-56.058	56.391	173.767	0.291
3300.000	2.008	212.672	3299.198	-58.921	4.409	-58.921	59.086	175.721	0.226
3400.000	2.014	216.315	3399.136	-61.811	2.423	-61.811	61.859	177.756	0.128
3500.000	2.072	211.281	3499.073	-64.772	0.443	-64.772	64.773	179.608	0.188
3600.000	2.371	210.627	3598.998	-68.096	-1.549	-68.096	68.114	181.303	0.300
3700.000	2.230	213.891	3698.917	-71.491	-3.687	-71.491	71.586	182.953	0.192
3800.000	2.054	215.233	3798.847	-74.570	-5.806	-74.570	74.796	184.452	0.183
3900.000	2.257	228.459	3898.777	-77.340	-8.314	-77.340	77.786	186.136	0.536
4000.000	2.136	222.783	3998.704	-80.013	-11.053	-80.013	80.773	187.865	0.249
4100.000	1.451	227.877	4098.654	-82.230	-13.258	-82.230	83.292	189.159	0.702
4200.000	1.289	226.592	4198.625	-83.852	-15.014	-83.852	85.186	190.152	0.164
4300.000	1.181	230.109	4298.602	-85.286	-16.622	-85.286	86.891	191.029	0.133
4400.000	1.189	230.431	4398.581	-86.608	-18.212	-86.608	88.502	191.875	0.011
4500.000	1.418	244.987	4498.555	-87.792	-20.133	-87.792	90.070	192.916	0.401
4600.000	1.287	265.150	4598.528	-88.410	-22.373	-88.410	91.197	194.201	0.491
4700.000	1.144	285.208	4698.506	-88.243	-24.456	-88.243	91.569	195.490	0.446
4800.000	1.211	289.384	4798.485	-87.630	-26.417	-87.630	91.525	196.776	0.109
4900.000	1.087	294.878	4898.465	-86.880	-28.274	-86.880	91.365	198.027	0.166
5000.000	0.663	286.742	4998.453	-86.314	-29.688	-86.314	91.278	198.981	0.441
5100.000	0.832	294.640	5098.444	-85.845	-30.902	-85.845	91.238	199.798	0.198
5200.000	1.035	300.262	5198.431	-85.087	-32.342	-85.087	91.027	200.812	0.222
5300.000	0.820	305.612	5298.418	-84.216	-33.704	-84.216	90.710	201.812	0.232
5400.000	0.694	292.100	5398.409	-83.571	-34.847	-83.571	90.545	202.635	0.217
5500.000	1.266	314.610	5498.394	-82.567	-36.194	-82.567	90.152	203.671	0.679
5600.000	1.365	330.254	5598.368	-80.757	-37.572	-80.757	89.070	204.950	0.371
5700.000	1.230	333.868	5698.343	-78.760	-38.635	-78.760	87.726	206.130	0.158
5800.000	0.943	352.004	5798.325	-76.982	-39.222	-76.982	86.398	206.999	0.444

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	0.620	17.114	5898.316	-75.650	-39.178	-75.650	85.193	207.379	0.464
6000.000	0.888	27.403	5998.307	-74.446	-38.662	-74.446	83.886	207.444	0.299
6100.000	0.771	66.343	6098.297	-73.488	-37.689	-73.488	82.589	207.152	0.564
6200.000	1.494	84.707	6198.277	-73.098	-35.775	-73.098	81.383	206.078	0.801
6300.000	1.798	95.936	6298.236	-73.140	-32.916	-73.140	80.206	204.230	0.442
6400.000	1.160	68.367	6398.204	-72.929	-30.415	-72.929	79.017	202.638	0.939
6500.000	1.139	29.427	6498.185	-71.690	-28.985	-71.690	77.328	202.014	0.767
6600.000	2.022	16.621	6598.146	-69.134	-27.992	-69.134	74.586	202.043	0.945
6700.000	2.881	12.652	6698.054	-64.992	-26.937	-64.992	70.353	202.513	0.875
6800.000	3.337	11.884	6797.906	-59.691	-25.787	-59.691	65.023	203.365	0.459
6900.000	3.105	7.471	6897.749	-54.157	-24.836	-54.157	59.580	204.636	0.339