



Company: Noble Energy
 Well: Henry 5-4
 API #: 05-123-13919
 Rig Name: Production/Lightning
 State/County: Colorado/Weld
 Latitude: 40.340, Longitude: -104.685
 GRID North is 0.530 Degrees East of True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: henry5-4-01_ed.ut
 Minimum Curvature Method
 Report Date/Time: 12/7/2011 / 14:12

Vaughn Energy Services
 Henderson, Colorado
 866-835-8333
 James Proulx

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	0.338	180.276	99.999	-0.295	-0.001	-0.295	0.295	180.276	0.338
200.000	0.289	153.508	199.998	-0.815	0.110	-0.815	0.822	172.348	0.153
300.000	0.133	197.518	299.997	-1.151	0.187	-1.151	1.166	170.776	0.214
400.000	0.305	222.610	399.997	-1.458	-0.028	-1.458	1.458	181.114	0.193
500.000	0.300	213.885	499.995	-1.871	-0.355	-1.871	1.905	190.734	0.046
600.000	0.162	188.075	599.994	-2.229	-0.521	-2.229	2.289	193.148	0.170
700.000	0.170	164.353	699.994	-2.513	-0.501	-2.513	2.562	191.267	0.069
800.000	0.153	243.138	799.994	-2.716	-0.579	-2.716	2.777	192.039	0.205
900.000	0.296	213.562	899.993	-2.991	-0.841	-2.991	3.107	195.702	0.180
1000.000	0.431	220.791	999.991	-3.492	-1.229	-3.492	3.702	199.398	0.141
1100.000	0.314	224.086	1099.989	-3.973	-1.666	-3.973	4.308	202.745	0.119
1200.000	0.538	205.931	1199.986	-4.592	-2.061	-4.592	5.033	204.177	0.259
1300.000	0.551	207.654	1299.981	-5.440	-2.490	-5.440	5.982	204.594	0.021
1400.000	0.635	206.828	1399.976	-6.360	-2.963	-6.360	7.016	204.980	0.085
1500.000	0.649	199.189	1499.970	-7.390	-3.399	-7.390	8.134	204.703	0.087
1600.000	0.648	210.821	1599.963	-8.410	-3.875	-8.410	9.260	204.740	0.131
1700.000	0.716	241.126	1699.957	-9.198	-4.713	-9.198	10.335	207.129	0.363
1800.000	0.961	271.101	1799.946	-9.484	-6.099	-9.484	11.275	212.745	0.494
1900.000	0.984	272.761	1899.932	-9.426	-7.795	-9.426	12.232	219.589	0.036
2000.000	1.089	273.693	1999.916	-9.324	-9.601	-9.324	13.383	225.839	0.107
2100.000	1.042	273.842	2099.898	-9.201	-11.457	-9.201	14.694	231.231	0.047
2200.000	1.057	280.636	2199.882	-8.970	-13.271	-8.970	16.018	235.944	0.125
2300.000	1.231	270.838	2299.862	-8.784	-15.251	-8.784	17.600	240.059	0.261
2400.000	1.255	276.106	2399.838	-8.652	-17.414	-8.652	19.445	243.579	0.117
2500.000	0.647	283.123	2499.824	-8.408	-19.052	-8.408	20.825	246.189	0.618
2600.000	0.898	276.134	2599.815	-8.196	-20.381	-8.196	21.967	248.094	0.268
2700.000	0.709	267.206	2699.805	-8.142	-21.778	-8.142	23.250	249.501	0.227
2800.000	0.785	289.434	2799.797	-7.944	-23.042	-7.944	24.373	250.977	0.298
2900.000	0.615	298.833	2899.789	-7.457	-24.158	-7.457	25.283	252.845	0.205
3000.000	1.063	286.447	2999.778	-6.936	-25.518	-6.936	26.444	254.794	0.481
3100.000	0.821	290.768	3099.765	-6.419	-27.077	-6.419	27.828	256.663	0.252
3200.000	1.124	273.170	3199.750	-6.111	-28.727	-6.111	29.370	257.991	0.422
3300.000	1.071	278.452	3299.732	-5.919	-30.632	-5.919	31.198	259.063	0.114
3400.000	0.853	294.225	3399.718	-5.476	-32.235	-5.476	32.697	260.358	0.341

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
3500.000	1.147	289.648	3499.703	-4.834	-33.857	-4.834	34.200	261.874	0.304
3600.000	1.015	311.483	3599.685	-3.911	-35.463	-3.911	35.678	263.706	0.430
3700.000	1.014	288.545	3699.670	-3.043	-36.966	-3.043	37.091	265.294	0.403
3800.000	1.038	291.502	3799.654	-2.429	-38.648	-2.429	38.724	266.403	0.058
3900.000	0.796	310.711	3899.641	-1.644	-40.017	-1.644	40.051	267.647	0.388
4000.000	0.896	299.207	3999.631	-0.809	-41.226	-0.809	41.234	268.875	0.196
4100.000	0.847	294.874	4099.619	-0.117	-42.579	-0.117	42.579	269.842	0.082
4200.000	0.417	267.896	4199.613	0.180	-43.612	0.180	43.613	270.236	0.511
4300.000	0.263	250.597	4299.611	0.090	-44.193	0.090	44.193	270.117	0.183
4400.000	0.167	229.608	4399.610	-0.081	-44.521	-0.081	44.521	269.896	0.123
4500.000	0.124	240.834	4499.610	-0.228	-44.727	-0.228	44.727	269.708	0.051
4600.000	0.501	343.806	4599.609	0.139	-44.943	0.139	44.944	270.177	0.543
4700.000	0.753	252.797	4699.605	0.365	-45.693	0.365	45.695	270.457	0.912
4800.000	0.903	296.789	4799.595	0.525	-47.024	0.525	47.027	270.640	0.635
4900.000	0.836	286.818	4899.584	1.091	-48.425	1.091	48.437	271.291	0.165
5000.000	0.711	313.122	4999.575	1.727	-49.576	1.727	49.606	271.995	0.372
5100.000	0.600	271.964	5099.569	2.169	-50.552	2.169	50.599	272.457	0.473
5200.000	0.206	289.193	5199.566	2.246	-51.245	2.246	51.295	272.510	0.408
5300.000	0.407	357.326	5299.565	2.660	-51.432	2.660	51.501	272.961	0.382
5400.000	0.466	353.436	5399.562	3.419	-51.495	3.419	51.608	273.799	0.066
5500.000	0.141	62.111	5499.561	3.881	-51.433	3.881	51.579	274.315	0.435
5600.000	0.307	340.776	5599.560	4.192	-51.413	4.192	51.583	274.661	0.318
5700.000	0.296	252.954	5699.559	4.369	-51.748	4.369	51.932	274.826	0.419
5800.000	0.323	334.162	5799.558	4.547	-52.118	4.547	52.316	274.986	0.403
5900.000	0.459	264.788	5899.556	4.764	-52.639	4.764	52.855	275.171	0.459
6000.000	0.578	294.761	5999.552	4.939	-53.496	4.939	53.724	275.275	0.292
6100.000	0.557	292.827	6099.548	5.339	-54.402	5.339	54.664	275.605	0.028
6200.000	0.595	312.417	6199.543	5.878	-55.234	5.878	55.546	276.074	0.200
6300.000	0.077	95.617	6299.541	6.222	-55.551	6.222	55.898	276.390	0.658
6360.000	0.150	308.451	6359.541	6.266	-55.573	6.266	55.925	276.434	0.363

HORIZONTAL DISPLACEMENT IS

55.925 FEET AT 276.434 DEGREES