

Company: NOBLE ENERGY

Well: WALCKER AB12-12

API: 05-123-31709

Rig Name: PRODUCTION/LIGHTNING

State/County: COLORADO/WELD

Latitude: 40.586, Longitude: -104.505

GRID North is 0.640 Degrees East of True North

VS-Azi: 0.000 Degrees

**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = 6 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/17/2012 / 13:40

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

866-835-8333

NICK KULA

DEPTH REFERENCE= 6 FEET

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	0.495	116.955	99.999	-0.196	0.385	-0.196	0.432	116.955	0.495
200.000	0.174	118.357	199.997	-0.464	0.903	-0.464	1.015	117.165	0.321
300.000	0.629	107.708	299.994	-0.703	1.560	-0.703	1.711	114.247	0.460
400.000	1.063	162.185	399.984	-1.753	2.367	-1.753	2.945	126.523	0.865
500.000	1.108	157.629	499.967	-3.530	3.019	-3.530	4.645	139.467	0.097
600.000	1.006	177.299	599.950	-5.301	3.428	-5.301	6.313	147.111	0.375
700.000	1.077	227.185	699.935	-6.817	2.780	-6.817	7.362	157.812	0.881
800.000	0.865	285.558	799.923	-7.253	1.364	-7.253	7.380	169.349	0.965
900.000	0.702	261.489	899.914	-7.141	0.031	-7.141	7.141	179.751	0.363
1000.000	0.620	257.771	999.907	-7.347	-1.104	-7.347	7.429	188.544	0.093
1100.000	0.897	248.808	1099.899	-7.744	-2.362	-7.744	8.096	196.962	0.300
1200.000	0.761	292.363	1199.889	-7.774	-3.706	-7.774	8.612	205.484	0.628
1300.000	0.981	250.876	1299.878	-7.802	-5.129	-7.802	9.337	213.318	0.651
1400.000	0.405	266.582	1399.871	-8.104	-6.290	-8.104	10.259	217.818	0.602
1500.000	0.409	260.468	1499.868	-8.184	-6.995	-8.184	10.766	220.519	0.044
1600.000	0.643	292.672	1599.864	-8.027	-7.864	-8.027	11.237	224.414	0.368
1700.000	0.493	262.282	1699.859	-7.868	-8.808	-7.868	11.811	228.226	0.331
1800.000	0.252	282.329	1799.857	-7.879	-9.450	-7.879	12.304	230.178	0.271
1900.000	0.203	202.349	1899.857	-7.996	-9.732	-7.996	12.595	230.591	0.295
2000.000	0.531	161.574	1999.855	-8.599	-9.653	-8.599	12.928	228.302	0.400
2100.000	0.796	158.471	2099.848	-9.685	-9.251	-9.685	13.394	223.687	0.268
2200.000	1.423	191.859	2199.829	-11.547	-9.252	-11.547	14.796	218.702	0.876
2300.000	1.488	170.588	2299.798	-14.043	-9.294	-14.043	16.841	213.498	0.541
2400.000	1.497	169.912	2399.764	-16.611	-8.853	-16.611	18.823	208.057	0.020
2500.000	1.998	159.803	2499.717	-19.533	-8.023	-19.533	21.116	202.329	0.586
2600.000	1.763	151.395	2599.664	-22.519	-6.684	-22.519	23.490	196.532	0.362
2700.000	1.803	152.672	2699.615	-25.267	-5.226	-25.267	25.802	191.685	0.057
2800.000	1.218	154.930	2799.580	-27.627	-4.053	-27.627	27.923	188.346	0.588
2900.000	0.457	181.302	2899.569	-28.989	-3.612	-28.989	29.213	187.102	0.833

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
3000.000	0.320	140.849	2999.567	-29.604	-3.445	-29.604	29.804	186.637	0.298
3100.000	0.280	43.690	3099.566	-29.644	-3.099	-29.644	29.806	185.969	0.451
3200.000	0.502	62.769	3199.564	-29.267	-2.541	-29.267	29.377	184.963	0.254
3300.000	0.482	28.392	3299.560	-28.697	-1.952	-28.697	28.763	183.891	0.291
3400.000	0.609	57.312	3399.556	-28.040	-1.305	-28.040	28.070	182.664	0.299
3500.000	0.076	125.461	3499.554	-27.792	-0.803	-27.792	27.803	181.655	0.585
3600.000	0.639	208.087	3599.552	-28.322	-1.011	-28.322	28.340	182.044	0.633
3700.000	1.614	218.588	3699.531	-29.915	-2.152	-29.915	29.992	184.114	0.993
3800.000	2.065	232.839	3799.480	-32.104	-4.466	-32.104	32.413	187.920	0.639
3900.000	2.235	223.473	3899.410	-34.607	-7.244	-34.607	35.357	191.822	0.390
4000.000	3.006	226.468	3999.305	-37.828	-10.486	-37.828	39.255	195.494	0.782
4100.000	2.543	231.717	4099.187	-41.009	-14.129	-41.009	43.375	199.010	0.527
4200.000	1.972	251.330	4199.111	-42.935	-17.501	-42.935	46.364	202.177	0.953
4300.000	1.401	272.389	4299.068	-43.435	-20.353	-43.435	47.967	205.107	0.834
4400.000	1.141	300.040	4399.044	-42.885	-22.436	-42.885	48.400	207.617	0.658
4500.000	0.648	319.905	4499.032	-41.954	-23.662	-41.954	48.167	209.423	0.576
4600.000	0.934	321.653	4599.022	-40.883	-24.532	-40.883	47.678	210.966	0.287
4700.000	0.782	355.410	4699.012	-39.564	-25.092	-39.564	46.850	212.383	0.519
4800.000	0.840	314.291	4799.002	-38.371	-25.671	-38.371	46.167	213.783	0.572
4900.000	0.691	26.317	4898.995	-37.319	-25.929	-37.319	45.442	214.791	0.908
5000.000	1.069	61.729	4998.984	-36.337	-24.840	-36.337	44.016	214.357	0.645
5100.000	1.284	65.705	5098.963	-35.434	-22.997	-35.434	42.243	212.984	0.230
5200.000	1.015	65.227	5198.943	-34.602	-21.172	-34.602	40.565	211.461	0.270
5300.000	1.091	77.507	5298.926	-34.025	-19.439	-34.025	39.186	209.739	0.237
5400.000	0.964	103.046	5398.910	-34.009	-17.690	-34.009	38.335	207.482	0.471
5500.000	0.773	131.781	5498.899	-34.648	-16.369	-34.648	38.320	205.287	0.469
5600.000	0.589	154.509	5598.892	-35.561	-15.645	-35.561	38.851	203.746	0.323
5700.000	1.000	84.800	5698.885	-35.946	-14.554	-35.946	38.781	202.042	0.969
5800.000	1.448	64.522	5798.862	-35.324	-12.544	-35.324	37.485	199.551	0.617
5900.000	1.369	55.783	5898.832	-34.108	-10.415	-34.108	35.663	196.981	0.229
6000.000	1.298	86.009	5998.806	-33.357	-8.297	-33.357	34.373	193.968	0.699
6100.000	1.237	91.124	6098.782	-33.299	-6.088	-33.299	33.851	190.360	0.129
6200.000	0.763	82.252	6198.766	-33.231	-4.350	-33.231	33.514	187.457	0.497
6300.000	0.759	36.716	6298.758	-32.611	-3.294	-32.611	32.777	185.769	0.589
6400.000	0.781	358.816	6398.750	-31.399	-2.913	-31.399	31.534	185.300	0.500
6500.000	0.515	41.072	6498.744	-30.378	-2.631	-30.378	30.492	184.951	0.529
6600.000	0.820	11.793	6598.737	-29.339	-2.190	-29.339	29.421	184.268	0.448
6700.000	0.691	56.225	6698.729	-28.303	-1.542	-28.303	28.345	183.119	0.584
6800.000	0.575	147.963	6798.725	-28.394	-0.774	-28.394	28.404	181.562	0.913
6900.000	0.449	247.946	6898.723	-28.966	-0.871	-28.966	28.980	181.722	0.789
7000.000	0.181	236.154	6998.721	-29.202	-1.366	-29.202	29.234	182.678	0.274
7076.000	0.376	253.860	7074.720	-29.338	-1.705	-29.338	29.387	183.326	0.277
HORIZONTAL DISPLACEMENT IS 29.387 FEET AT 183.326 DEGREES									