



Company: Noble Energy
Well: Buckcherry USX AA 3-12
API: 05-123-29040
Rig Name: Production/Lightning Wireline
State/County: Colorado/ Weld
Latitude: 40.514, Longitude: -104.429
GRID North is 0.690 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/4/2012 / 14:06

Vaughn Energy Services
Henderson, Colorado
866-835-8333
Jason Kinchelow

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	0.473	187.696	99.999	-0.409	-0.055	-0.409	0.413	187.696	0.473
200.000	0.126	191.559	199.997	-0.926	-0.133	-0.926	0.935	188.150	0.347
300.000	0.207	151.382	299.997	-1.192	-0.068	-1.192	1.194	183.261	0.138
400.000	0.245	228.364	399.996	-1.493	-0.141	-1.493	1.500	185.400	0.283
500.000	0.485	243.954	499.994	-1.821	-0.681	-1.821	1.945	200.508	0.257
600.000	0.566	251.283	599.990	-2.166	-1.529	-2.166	2.651	215.226	0.105
700.000	0.593	251.534	699.985	-2.488	-2.488	-2.488	3.518	224.996	0.027
800.000	0.607	245.155	799.979	-2.875	-3.459	-2.875	4.498	230.275	0.068
900.000	0.657	231.839	899.973	-3.451	-4.391	-3.451	5.585	231.832	0.155
1000.000	0.798	220.008	999.965	-4.339	-5.290	-4.339	6.842	230.637	0.206
1100.000	1.006	235.335	1099.953	-5.372	-6.460	-5.372	8.402	230.251	0.317
1200.000	0.971	231.021	1199.938	-6.405	-7.841	-6.405	10.124	230.756	0.082
1300.000	1.084	238.915	1299.922	-7.426	-9.310	-7.426	11.909	231.421	0.181
1400.000	0.881	250.529	1399.908	-8.171	-10.845	-8.171	13.578	233.004	0.283
1500.000	0.826	251.030	1499.896	-8.662	-12.252	-8.662	15.004	234.740	0.056
1600.000	0.678	249.047	1599.888	-9.107	-13.486	-9.107	16.273	235.967	0.151
1700.000	0.827	244.586	1699.879	-9.629	-14.690	-9.629	17.564	236.756	0.160
1800.000	0.673	263.970	1799.871	-10.000	-15.926	-10.000	18.805	237.875	0.295
1900.000	0.672	291.922	1899.864	-9.843	-17.054	-9.843	19.690	240.007	0.325
2000.000	0.950	288.040	1999.854	-9.368	-18.385	-9.368	20.634	243.001	0.284
2100.000	0.817	284.470	2099.842	-8.933	-19.863	-8.933	21.780	245.786	0.144
2200.000	1.000	306.677	2199.830	-8.233	-21.253	-8.233	22.792	248.824	0.394
2300.000	1.296	303.630	2299.810	-7.086	-22.895	-7.086	23.966	252.803	0.302
2400.000	1.456	300.835	2399.781	-5.808	-24.927	-5.808	25.595	256.883	0.174
2500.000	1.472	303.431	2499.748	-4.449	-27.090	-4.449	27.453	260.673	0.068
2600.000	1.380	293.878	2599.717	-3.254	-29.263	-3.254	29.444	263.654	0.255
2700.000	1.327	294.318	2699.689	-2.290	-31.419	-2.290	31.503	265.831	0.055
2800.000	1.389	297.136	2799.661	-1.261	-33.552	-1.261	33.576	267.848	0.091
2900.000	1.376	296.877	2899.632	-0.166	-35.701	-0.166	35.702	269.734	0.014
3000.000	1.373	289.832	2999.604	0.784	-37.899	0.784	37.907	271.184	0.169
3100.000	1.319	297.550	3099.576	1.723	-40.047	1.723	40.084	272.463	0.189
3200.000	1.324	291.152	3199.549	2.672	-42.145	2.672	42.230	273.628	0.148
3300.000	1.057	310.828	3299.528	3.692	-43.921	3.692	44.075	274.805	0.484
3400.000	1.328	301.701	3399.507	4.904	-45.604	4.904	45.867	276.137	0.330

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	1.364	285.652	3499.479	5.833	-47.736	5.833	48.091	276.967	0.377
3600.000	1.542	269.095	3599.448	6.133	-50.227	6.133	50.600	276.962	0.454
3700.000	1.612	270.237	3699.410	6.118	-52.978	6.118	53.331	276.587	0.077
3800.000	1.702	273.921	3799.368	6.225	-55.866	6.225	56.212	276.358	0.139
3900.000	1.624	275.745	3899.326	6.469	-58.757	6.469	59.112	276.282	0.094
4000.000	1.782	271.399	3999.282	6.648	-61.722	6.648	62.079	276.148	0.204
4100.000	1.814	272.206	4099.232	6.747	-64.858	6.747	65.208	275.939	0.041
4200.000	2.022	272.166	4199.176	6.875	-68.203	6.875	68.548	275.756	0.207
4300.000	2.064	271.549	4299.113	6.990	-71.765	6.990	72.104	275.563	0.048
4400.000	1.726	272.517	4399.058	7.105	-75.069	7.105	75.405	275.407	0.339
4500.000	1.470	292.270	4499.020	7.657	-77.761	7.657	78.137	275.624	0.604
4600.000	1.152	286.836	4598.993	8.434	-79.910	8.434	80.354	276.025	0.341
4700.000	1.202	279.283	4698.972	8.895	-81.908	8.895	82.389	276.198	0.163
4800.000	1.213	290.803	4798.950	9.440	-83.933	9.440	84.462	276.417	0.243
4900.000	0.873	326.021	4898.935	10.448	-85.348	10.448	85.985	276.979	0.709
5000.000	1.081	337.088	4998.920	11.948	-86.141	11.948	86.966	277.897	0.280
5100.000	1.228	322.302	5098.900	13.665	-87.163	13.665	88.228	278.910	0.331
5200.000	1.256	331.609	5198.877	15.476	-88.339	15.476	89.685	279.937	0.203
5300.000	0.971	334.711	5298.858	17.207	-89.222	17.207	90.866	280.916	0.291
5400.000	1.175	345.413	5398.840	18.964	-89.842	18.964	91.822	281.919	0.285
5500.000	1.254	347.913	5498.818	21.026	-90.330	21.026	92.745	283.104	0.095
5600.000	1.372	354.703	5598.792	23.288	-90.669	23.288	93.612	284.405	0.195
5700.000	0.990	351.360	5698.770	25.335	-90.910	25.335	94.374	285.572	0.388
5800.000	0.896	2.329	5798.757	26.970	-91.008	26.970	94.920	286.507	0.203
5900.000	0.974	10.149	5898.743	28.588	-90.826	28.588	95.219	287.471	0.149
6000.000	0.872	32.725	5998.731	30.065	-90.265	30.065	95.140	288.422	0.375
6100.000	1.083	31.002	6098.716	31.516	-89.366	31.516	94.760	289.426	0.213
6200.000	1.400	42.471	6198.693	33.227	-88.055	33.227	94.115	290.674	0.401
6300.000	1.422	54.343	6298.663	34.851	-86.221	34.851	92.999	292.009	0.293
6400.000	1.617	53.376	6398.627	36.416	-84.081	36.416	91.628	293.418	0.196
6500.000	1.621	55.174	6498.587	38.066	-81.787	38.066	90.212	294.958	0.051
6600.000	1.216	65.845	6598.557	39.308	-79.658	39.308	88.829	296.264	0.482
6700.000	1.193	66.564	6698.535	40.156	-77.735	40.156	87.494	297.320	0.028
HORIZONTAL DISPLACEMENT IS 87.494 FEET AT 297.320 DEGREES									