



Company: Noble Energy
 Well: Shale USX AB11-12P
 API: 05-123-31318
 Rig Name: Production/Lightning Wireline
 State/County: Colorado/Weld
 Latitude: 40.586, Longitude: -104.524
 GRID North is 0.630 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_ed.ut
 Minimum Curvature Method
 Report Date/Time: 11/14/2012 / 14:41

Vaughn Energy Services
 Henderson, CO
 303-853-4976
 Levi Sheldon

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	0.061	51.800	100.000	0.033	0.042	0.033	0.053	51.800	0.061
200.000	0.066	52.428	200.000	0.101	0.130	0.101	0.165	52.020	0.005
300.000	0.102	34.820	300.000	0.210	0.226	0.210	0.308	47.204	0.044
400.000	0.330	284.004	399.999	0.352	-0.002	0.352	0.352	359.624	0.378
500.000	0.205	334.099	499.998	0.583	-0.360	0.583	0.685	328.307	0.253
600.000	0.265	347.392	599.997	0.969	-0.488	0.969	1.085	333.253	0.080
700.000	0.716	81.103	699.995	1.291	0.078	1.291	1.293	3.473	0.779
800.000	0.824	75.761	799.986	1.564	1.392	1.564	2.094	41.675	0.130
900.000	0.628	55.448	899.978	2.052	2.541	2.052	3.266	51.077	0.321
1000.000	1.215	59.125	999.964	2.907	3.902	2.907	4.865	53.317	0.589
1100.000	1.368	60.388	1099.939	4.040	5.849	4.040	7.109	55.366	0.156
1200.000	1.072	50.395	1199.916	5.227	7.608	5.227	9.230	55.512	0.363
1300.000	0.880	46.146	1299.902	6.355	8.883	6.355	10.922	54.418	0.205
1400.000	0.701	42.851	1399.892	7.336	9.852	7.336	12.283	53.330	0.185
1500.000	0.730	42.276	1499.884	8.256	10.697	8.256	13.513	52.340	0.030
1600.000	0.661	57.427	1599.877	9.038	11.612	9.038	14.715	52.106	0.196
1700.000	0.710	46.006	1699.870	9.779	12.544	9.779	15.906	52.061	0.145
1800.000	0.575	32.761	1799.864	10.632	13.262	10.632	16.997	51.282	0.200
1900.000	0.558	32.736	1899.859	11.463	13.797	11.463	17.938	50.277	0.017
2000.000	0.466	41.568	1999.855	12.178	14.330	12.178	18.806	49.642	0.121
2100.000	0.423	60.965	2099.852	12.662	14.924	12.662	19.571	49.687	0.156
2200.000	0.321	117.768	2199.850	12.711	15.494	12.711	20.041	50.637	0.365
2300.000	0.297	179.084	2299.849	12.321	15.746	12.321	19.994	51.957	0.316
2400.000	0.711	150.881	2399.845	11.520	16.052	11.520	19.759	54.334	0.471
2500.000	1.190	183.719	2499.831	9.942	16.287	9.942	19.082	58.598	0.707
2600.000	1.804	191.511	2599.797	7.364	15.906	7.364	17.528	65.157	0.645
2700.000	1.706	193.784	2699.750	4.376	15.237	4.376	15.853	73.977	0.120
2800.000	1.464	197.730	2799.712	1.713	14.493	1.713	14.594	83.258	0.266
2900.000	1.241	216.907	2899.684	-0.369	13.454	-0.369	13.459	91.573	0.501
3000.000	1.092	243.145	2999.664	-1.666	11.953	-1.666	12.069	97.934	0.549
3100.000	0.831	251.819	3099.650	-2.322	10.415	-2.322	10.670	102.571	0.298
3200.000	0.781	255.336	3199.640	-2.721	9.067	-2.721	9.466	106.706	0.070
3300.000	0.941	254.047	3299.629	-3.119	7.618	-3.119	8.232	112.267	0.161
3400.000	0.628	286.600	3399.620	-3.188	6.303	-3.188	7.064	116.832	0.532

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	0.893	231.047	3499.612	-3.522	5.172	-3.522	6.257	124.251	0.747
3600.000	0.533	217.679	3599.604	-4.380	4.282	-4.380	6.125	135.648	0.394
3700.000	0.166	108.964	3699.603	-4.795	4.135	-4.795	6.331	139.230	0.607
3800.000	0.328	101.130	3799.602	-4.898	4.553	-4.898	6.687	137.087	0.165
3900.000	0.450	143.276	3899.600	-5.267	5.069	-5.267	7.310	136.100	0.302
4000.000	0.332	160.091	3999.598	-5.854	5.402	-5.854	7.966	137.300	0.163
4100.000	0.158	186.927	4099.597	-6.264	5.484	-6.264	8.325	138.796	0.204
4200.000	0.198	156.519	4199.596	-6.559	5.536	-6.559	8.583	139.833	0.101
4300.000	0.056	111.338	4299.596	-6.735	5.651	-6.735	8.791	140.003	0.163
4400.000	0.114	346.793	4399.596	-6.656	5.673	-6.656	8.746	139.556	0.153
4500.000	0.583	331.816	4499.594	-6.110	5.410	-6.110	8.161	138.478	0.474
4600.000	1.277	322.615	4599.580	-4.776	4.493	-4.776	6.557	136.749	0.707
4700.000	1.501	319.490	4699.551	-2.895	2.966	-2.895	4.145	134.308	0.236
4800.000	1.527	319.503	4799.516	-0.886	1.250	-0.886	1.532	125.336	0.027
4900.000	1.420	319.819	4899.483	1.074	-0.415	1.074	1.152	338.865	0.107
5000.000	1.224	319.133	4999.456	2.829	-1.914	2.829	3.415	325.921	0.197
5100.000	1.100	319.964	5099.435	4.371	-3.230	4.371	5.435	323.539	0.125
5200.000	1.153	325.252	5199.416	5.933	-4.421	5.933	7.399	323.309	0.117
5300.000	1.197	334.134	5299.395	7.699	-5.450	7.699	9.433	324.707	0.187
5400.000	0.969	334.557	5399.377	9.402	-6.269	9.402	11.301	326.308	0.228
5500.000	0.868	338.750	5499.364	10.871	-6.906	10.871	12.880	327.573	0.121
5600.000	0.763	343.841	5599.354	12.217	-7.366	12.217	14.266	328.912	0.127
5700.000	1.346	351.937	5699.337	14.019	-7.716	14.019	16.003	331.172	0.600
5800.000	2.095	1.798	5799.291	17.009	-7.824	17.009	18.722	335.299	0.803
5900.000	2.649	8.929	5899.205	21.119	-7.408	21.119	22.381	340.671	0.627
6000.000	3.318	15.255	5999.070	26.194	-6.287	26.194	26.938	346.503	0.745
6100.000	3.701	20.647	6098.882	32.007	-4.388	32.007	32.306	352.194	0.505
6200.000	2.815	12.871	6198.720	37.421	-2.703	37.421	37.519	355.869	0.989
6300.000	1.589	1.754	6298.645	41.201	-2.113	41.201	41.255	357.064	1.293
6400.000	1.376	330.331	6398.613	43.630	-2.665	43.630	43.711	356.504	0.828
6500.000	1.674	294.749	6498.579	45.285	-4.586	45.285	45.516	354.217	0.974
6600.000	1.527	280.016	6598.541	46.128	-7.225	46.128	46.690	351.098	0.436
6700.000	1.706	275.129	6698.501	46.493	-10.019	46.493	47.560	347.839	0.226
6800.000	1.764	277.278	6798.455	46.821	-13.028	46.821	48.599	344.451	0.087
6900.000	2.040	286.538	6898.400	47.522	-16.260	47.522	50.227	341.111	0.413
7000.000	2.785	298.474	6998.311	49.187	-20.103	49.187	53.137	337.770	0.895
7100.000	2.230	303.229	7098.215	51.412	-23.866	51.412	56.681	335.099	0.593
7148.000	2.085	307.148	7146.181	52.451	-25.343	52.451	58.253	334.211	0.430

HORIZONTAL DISPLACEMENT IS
58.253 FEET AT 334.211 DEGREES