



Company: Noble Energy
Well: Cecil USX A 1-16
API#: 05-123-24339
Rig Name: Production / Lightning
Location: Weld County, Colorado
Latitude: 40.510, Longitude: -104.491
GRID North is 0.650 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: cecil usx a 1-16_ed.ut

Minimum Curvature Method

Report Date/Time: 1/14/2012 / 17:14

Vaughn Energy Services
Henderson, CO
303-853-4976
Robert Davis

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	0.274	53.742	100.000	0.141	0.193	0.141	0.239	53.742	0.274
200.000	0.233	98.562	199.999	0.253	0.587	0.253	0.639	66.718	0.197
300.000	0.108	121.779	299.998	0.173	0.869	0.173	0.886	78.771	0.140
400.000	0.218	140.644	399.998	-0.024	1.070	-0.024	1.070	91.290	0.120
500.000	0.252	69.422	499.997	-0.094	1.396	-0.094	1.399	93.839	0.275
600.000	0.277	58.083	599.996	0.111	1.807	0.111	1.810	86.473	0.058
700.000	0.070	350.388	699.996	0.300	2.002	0.300	2.024	81.487	0.259
800.000	0.314	39.485	799.995	0.572	2.166	0.572	2.240	75.210	0.274
900.000	0.329	23.421	899.994	1.047	2.454	1.047	2.668	66.903	0.091
1000.000	0.085	219.280	999.993	1.252	2.521	1.252	2.815	63.587	0.411
1100.000	0.155	121.294	1099.993	1.124	2.590	1.124	2.823	66.530	0.187
1200.000	0.286	348.306	1199.993	1.299	2.655	1.299	2.955	63.932	0.408
1300.000	0.120	316.892	1299.992	1.620	2.532	1.620	3.006	57.394	0.194
1400.000	0.195	351.011	1399.992	1.865	2.434	1.865	3.066	52.545	0.117
1500.000	0.128	61.767	1499.991	2.086	2.506	2.086	3.260	50.229	0.195
1600.000	0.127	48.625	1599.991	2.212	2.687	2.212	3.480	50.545	0.029
1700.000	0.366	300.712	1699.990	2.448	2.496	2.448	3.496	45.557	0.423
1800.000	0.488	285.425	1799.988	2.724	1.811	2.724	3.271	33.613	0.166
1900.000	0.370	299.920	1899.985	2.999	1.120	2.999	3.201	20.482	0.159
2000.000	0.287	288.534	1999.983	3.240	0.603	3.240	3.295	10.535	0.105
2100.000	0.607	269.393	2099.980	3.314	-0.165	3.314	3.318	357.158	0.348
2200.000	1.110	260.915	2199.968	3.155	-1.651	3.155	3.561	332.382	0.518
2300.000	1.282	250.728	2299.947	2.633	-3.663	2.633	4.511	305.707	0.272
2400.000	1.514	253.340	2399.917	1.885	-5.984	1.885	6.274	287.486	0.240
2500.000	1.509	248.432	2499.882	1.023	-8.474	1.023	8.535	276.882	0.129
2600.000	1.575	252.302	2599.846	0.121	-11.007	0.121	11.008	270.631	0.123
2700.000	1.633	237.696	2699.807	-1.058	-13.520	-1.058	13.561	265.526	0.412
2800.000	1.278	239.437	2799.775	-2.386	-15.685	-2.386	15.865	261.349	0.357
2900.000	1.480	233.293	2899.746	-3.726	-17.681	-3.726	18.069	258.101	0.250
3000.000	1.432	231.619	2999.714	-5.274	-19.696	-5.274	20.390	255.010	0.065
3100.000	1.309	224.525	3099.685	-6.863	-21.476	-6.863	22.546	252.277	0.209
3200.000	1.412	224.135	3199.657	-8.562	-23.134	-8.562	24.668	249.691	0.104
3300.000	1.422	187.746	3299.628	-10.675	-24.159	-10.675	26.413	246.162	0.885
3400.000	1.605	154.966	3399.595	-13.173	-23.734	-13.173	27.145	240.969	0.872

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	1.629	144.871	3499.556	-15.604	-22.324	-15.604	27.237	235.048	0.285
3600.000	1.558	130.382	3599.517	-17.646	-20.471	-17.646	27.027	229.238	0.408
3700.000	1.698	130.214	3699.477	-19.483	-18.304	-19.483	26.733	223.213	0.140
3800.000	1.682	130.667	3799.434	-21.396	-16.060	-21.396	26.753	216.892	0.021
3900.000	1.798	119.449	3899.388	-23.124	-13.581	-23.124	26.817	210.427	0.359
4000.000	1.646	136.117	3999.343	-24.930	-11.219	-24.930	27.338	204.229	0.521
4100.000	1.195	120.215	4099.313	-26.490	-9.322	-26.490	28.083	199.388	0.595
4200.000	0.678	117.096	4199.299	-27.285	-7.894	-27.285	28.404	196.137	0.519
4300.000	0.266	100.562	4299.295	-27.597	-7.139	-27.597	28.505	194.503	0.430
4400.000	0.175	185.244	4399.295	-27.792	-6.924	-27.792	28.642	193.990	0.305
4500.000	0.491	273.359	4499.293	-27.919	-7.366	-27.919	28.875	194.780	0.516
4600.000	0.676	310.281	4599.288	-27.513	-8.245	-27.513	28.721	196.682	0.409
4700.000	0.842	312.766	4699.280	-26.632	-9.234	-26.632	28.188	199.123	0.169
4800.000	0.796	303.815	4799.269	-25.747	-10.351	-25.747	27.750	201.901	0.136
4900.000	0.476	267.167	4899.263	-25.381	-11.343	-25.381	27.800	204.081	0.502
5000.000	0.375	241.208	4999.261	-25.559	-12.045	-25.559	28.255	205.234	0.215
5100.000	0.588	248.596	5099.257	-25.904	-12.810	-25.904	28.899	206.314	0.222
5200.000	0.486	219.053	5199.253	-26.420	-13.556	-26.420	29.695	207.161	0.291
5300.000	0.630	185.620	5299.249	-27.297	-13.876	-27.297	30.622	206.946	0.350
5400.000	0.818	149.188	5399.241	-28.458	-13.564	-28.458	31.525	205.485	0.487
5500.000	1.066	57.488	5499.232	-28.571	-12.414	-28.571	31.151	203.485	1.363
5600.000	0.940	61.851	5599.217	-27.684	-10.906	-27.684	29.754	201.502	0.147
5700.000	0.725	69.448	5699.206	-27.075	-9.590	-27.075	28.723	199.505	0.242
5800.000	0.626	74.237	5799.199	-26.704	-8.473	-26.704	28.016	197.603	0.114
5900.000	0.547	80.014	5899.194	-26.473	-7.477	-26.473	27.509	195.772	0.098
6000.000	0.613	94.957	5999.189	-26.437	-6.474	-26.437	27.218	193.761	0.164
6100.000	0.579	65.834	6099.184	-26.276	-5.480	-26.276	26.841	191.781	0.301
6200.000	0.709	71.918	6199.177	-25.877	-4.431	-25.877	26.254	189.717	0.147
6300.000	0.601	83.856	6299.171	-25.629	-3.322	-25.629	25.843	187.385	0.174
6400.000	0.980	77.288	6399.161	-25.385	-1.966	-25.385	25.461	184.429	0.389
6500.000	1.097	69.172	6499.145	-24.856	-0.237	-24.856	24.857	180.546	0.188
6600.000	1.128	51.942	6599.126	-23.908	1.433	-23.908	23.951	176.569	0.335
6700.000	0.972	41.577	6699.109	-22.667	2.772	-22.667	22.836	173.029	0.245
6800.000	1.265	30.058	6799.090	-21.077	3.888	-21.077	21.432	169.549	0.368
HORIZONTAL DISPLACEMENT IS 21.432 FEET AT 169.549 DEGREES									