



Company: Noble Energy  
Well: Brown USX AA 3-8  
API: 05-123-28146  
Rig Name: Production/Lightning Wireline  
State/County: Colorado/Weld  
Latitude: 40.518, Longitude: -104.415  
GRID North is 0.700 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: merged.ut

Minimum Curvature Method

Report Date/Time: 12/4/2012 / 16:23

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	0.435	36.448	99.999	0.305	0.225	0.305	0.380	36.448	0.435
200.000	0.495	57.886	199.996	0.840	0.817	0.840	1.171	44.187	0.183
300.000	0.725	34.074	299.990	1.594	1.537	1.594	2.214	43.956	0.338
400.000	0.739	20.374	399.982	2.722	2.116	2.722	3.448	37.853	0.175
500.000	1.125	355.997	499.969	4.306	2.272	4.306	4.869	27.812	0.546
600.000	1.064	20.284	599.951	6.157	2.525	6.157	6.655	22.299	0.464
700.000	0.963	8.366	699.936	7.860	2.969	7.860	8.402	20.696	0.233
800.000	0.802	328.275	799.925	9.287	2.723	9.287	9.678	16.344	0.624
900.000	0.950	338.490	899.913	10.654	2.051	10.654	10.850	10.898	0.215
1000.000	1.100	321.868	999.897	12.181	1.154	12.181	12.235	5.413	0.332
1100.000	0.860	329.639	1099.883	13.583	0.182	13.583	13.585	0.768	0.274
1200.000	1.230	353.329	1199.866	15.297	-0.322	15.297	15.300	358.795	0.562
1300.000	1.183	342.398	1299.844	17.347	-0.758	17.347	17.363	357.496	0.235
1400.000	1.245	350.343	1399.822	19.402	-1.253	19.402	19.442	356.305	0.179
1500.000	0.731	13.691	1499.807	21.093	-1.284	21.093	21.132	356.516	0.643
1600.000	0.778	5.327	1599.798	22.389	-1.070	22.389	22.414	357.263	0.120
1700.000	0.746	327.055	1699.790	23.611	-1.361	23.611	23.650	356.701	0.501
1800.000	0.696	312.791	1799.782	24.570	-2.160	24.570	24.664	354.975	0.186
1900.000	0.816	288.707	1899.774	25.210	-3.280	25.210	25.423	352.587	0.337
2000.000	0.957	288.610	1999.762	25.705	-4.746	25.705	26.140	349.539	0.140
2100.000	1.357	294.779	2099.741	26.468	-6.612	26.468	27.281	345.974	0.419
2200.000	1.044	283.143	2199.719	27.171	-8.574	27.171	28.492	342.486	0.395
2300.000	1.481	296.665	2299.695	27.958	-10.616	27.958	29.906	339.207	0.526
2400.000	0.976	270.195	2399.673	28.541	-12.623	28.541	31.208	336.142	0.747
2500.000	0.791	254.732	2499.661	28.362	-14.141	28.362	31.692	333.500	0.300
2600.000	0.626	262.034	2599.653	28.105	-15.348	28.105	32.022	331.361	0.188
2700.000	0.828	281.238	2699.645	28.170	-16.598	28.170	32.696	329.493	0.314
2800.000	0.676	311.852	2799.637	28.704	-17.746	28.704	33.747	328.274	0.423
2900.000	0.496	278.275	2899.632	29.160	-18.613	29.160	34.594	327.449	0.380
3000.000	0.523	263.550	2999.628	29.171	-19.495	29.171	35.085	326.245	0.133
3100.000	0.773	308.709	3099.622	29.541	-20.474	29.541	35.943	325.275	0.549
3200.000	0.804	317.961	3199.613	30.484	-21.471	30.484	37.286	324.842	0.131
3300.000	0.416	358.310	3299.607	31.368	-21.951	31.368	38.286	325.016	0.557
3400.000	0.321	316.196	3399.605	31.934	-22.156	31.934	38.867	325.247	0.279

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	0.506	227.524	3499.604	31.837	-22.675	31.837	39.087	324.541	0.593
3600.000	0.506	210.571	3599.600	31.159	-23.226	31.159	38.863	323.299	0.149
3700.000	0.302	143.953	3699.598	30.565	-23.295	30.565	38.431	322.687	0.475
3800.000	0.441	143.246	3799.596	30.044	-22.910	30.044	37.782	322.673	0.139
3900.000	0.842	171.237	3899.589	29.008	-22.567	29.008	36.753	322.119	0.498
4000.000	0.766	207.806	3999.580	27.691	-22.767	27.691	35.848	320.574	0.510
4100.000	1.033	237.697	4099.568	26.618	-23.841	26.618	35.734	318.150	0.531
4200.000	1.044	285.307	4199.554	26.376	-25.481	26.376	36.674	315.989	0.838
4300.000	1.344	312.032	4299.532	27.402	-27.231	27.402	38.632	315.180	0.624
4400.000	1.776	325.408	4399.496	29.463	-28.982	29.463	41.328	315.472	0.562
4500.000	1.513	330.159	4499.454	31.884	-30.518	31.884	44.136	316.253	0.297
4600.000	1.357	307.162	4599.424	33.744	-32.119	33.744	46.586	316.413	0.592
4700.000	1.561	296.340	4699.391	35.064	-34.284	35.064	49.039	315.645	0.342
4800.000	0.655	300.873	4799.372	35.962	-35.995	35.962	50.881	314.973	0.909
4900.000	0.553	42.173	4899.368	36.613	-36.161	36.613	51.460	315.355	0.936
5000.000	0.271	274.011	4999.367	36.987	-36.073	36.987	51.665	315.717	0.751
5100.000	0.875	251.967	5099.362	36.767	-37.034	36.767	52.186	314.792	0.632
5200.000	0.908	242.360	5199.349	36.163	-38.462	36.163	52.793	313.236	0.153
5300.000	0.772	273.193	5299.339	35.833	-39.836	35.833	53.581	311.972	0.465
5400.000	0.692	281.860	5399.331	35.995	-41.100	35.995	54.634	311.211	0.137
5500.000	0.771	256.851	5499.323	35.966	-42.346	35.966	55.559	310.342	0.326
5600.000	0.091	308.920	5599.320	35.863	-43.063	35.863	56.041	309.787	0.719
5700.000	0.083	97.692	5699.320	35.903	-43.053	35.903	56.058	309.826	0.168
5800.000	0.243	120.726	5799.319	35.785	-42.798	35.785	55.788	309.900	0.169
5900.000	0.239	140.428	5899.319	35.515	-42.483	35.515	55.373	309.895	0.083
6000.000	0.387	89.041	5999.317	35.360	-42.013	35.360	54.913	310.086	0.302
6100.000	0.167	99.222	6099.316	35.342	-41.532	35.342	54.534	310.397	0.225
6200.000	0.369	113.114	6199.315	35.193	-41.092	35.193	54.103	310.578	0.211
6300.000	0.582	110.973	6299.311	34.885	-40.322	34.885	53.318	310.864	0.213
6400.000	0.608	121.485	6399.306	34.426	-39.396	34.426	52.318	311.148	0.112
6500.000	0.626	93.251	6499.300	34.118	-38.399	34.118	51.367	311.622	0.301
6600.000	0.623	88.945	6599.295	34.097	-37.311	34.097	50.544	312.423	0.047
6700.000	0.428	72.507	6699.290	34.219	-36.412	34.219	49.968	313.222	0.245
HORIZONTAL DISPLACEMENT IS 49.968 FEET AT 313.222 DEGREES									