



Company: Encana
 Well: Miller 33-20
 API: 05-123-20308
 Rig Name: Production / Coretech
 State/County: Colorado/Weld County
 VS-Azi: 0.000 Degrees
 Latitude: 40.20885, Longitude: -104.79957
 All Azimuths referenced to True North
 No Grid Correction Applied



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 11/13/2015 / 12:31

VES Survey International
 Henderson, CO
 303-853-4976
 Geof 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	0.427	42.820	99.999	0.274	0.253	0.274	0.373	42.820	0.427
200.000	0.296	67.638	199.997	0.645	0.746	0.645	0.986	49.133	0.201
300.000	0.134	4.026	299.996	0.861	0.993	0.861	1.314	49.090	0.265
400.000	0.117	85.905	399.996	0.985	1.103	0.985	1.479	48.247	0.165
500.000	0.213	33.555	499.996	1.147	1.308	1.147	1.739	48.752	0.169
600.000	0.099	83.291	599.996	1.311	1.496	1.311	1.989	48.758	0.167
700.000	0.567	28.266	699.994	1.757	1.815	1.757	2.526	45.938	0.517
800.000	0.609	16.382	799.989	2.702	2.199	2.702	3.484	39.143	0.129
900.000	0.653	342.505	899.983	3.756	2.178	3.756	4.342	30.107	0.370
1000.000	0.449	344.952	999.978	4.678	1.905	4.678	5.051	22.157	0.206
1100.000	0.538	331.500	1099.974	5.469	1.579	5.469	5.692	16.106	0.146
1200.000	0.656	309.475	1199.969	6.245	0.913	6.245	6.312	8.320	0.255
1300.000	0.680	333.279	1299.963	7.139	0.205	7.139	7.142	1.644	0.276
1400.000	0.676	300.960	1399.956	7.973	-0.568	7.973	7.993	355.924	0.378
1500.000	0.471	312.796	1499.951	8.555	-1.376	8.555	8.665	350.865	0.236
1600.000	0.790	315.140	1599.945	9.323	-2.163	9.323	9.571	346.935	0.321
1700.000	0.448	308.001	1699.939	10.053	-2.958	10.053	10.479	343.603	0.350
1800.000	0.595	276.886	1799.935	10.356	-3.781	10.356	11.024	339.940	0.313
1900.000	0.656	305.226	1899.929	10.748	-4.765	10.748	11.757	336.093	0.312
2000.000	0.824	282.178	1999.921	11.230	-5.935	11.230	12.702	332.143	0.338
2100.000	0.818	290.095	2099.911	11.627	-7.309	11.627	13.734	327.847	0.114
2200.000	0.693	297.304	2199.902	12.150	-8.517	12.150	14.838	324.970	0.157
2300.000	0.686	273.379	2299.895	12.463	-9.652	12.463	15.764	322.244	0.286
2400.000	0.636	285.306	2399.888	12.645	-10.784	12.645	16.619	319.540	0.146
2500.000	0.730	289.128	2499.881	13.000	-11.921	13.000	17.638	317.479	0.104
2600.000	0.656	253.342	2599.874	13.044	-13.071	13.044	18.467	314.941	0.432
2700.000	0.546	285.954	2699.869	13.011	-14.078	13.011	19.170	312.744	0.354
2800.000	0.522	259.872	2799.865	13.062	-14.985	13.062	19.878	311.078	0.242
2900.000	0.415	261.184	2899.862	12.926	-15.791	12.926	20.407	309.304	0.107
3000.000	0.548	316.581	2999.858	13.218	-16.478	13.218	21.124	308.736	0.463
3100.000	0.611	299.117	3099.853	13.825	-17.272	13.825	22.124	308.674	0.187
3200.000	0.453	326.098	3199.849	14.413	-17.959	14.413	23.027	308.748	0.292
3300.000	0.444	326.330	3299.846	15.063	-18.394	15.063	23.774	309.314	0.009
3400.000	0.603	296.193	3399.842	15.617	-19.081	15.617	24.657	309.300	0.313

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	0.556	287.407	3499.837	15.995	-20.016	15.995	25.622	308.628	0.101
3600.000	0.393	332.734	3599.834	16.445	-20.636	16.445	26.387	308.551	0.395
3700.000	0.369	14.194	3699.832	17.061	-20.714	17.061	26.836	309.477	0.271
3800.000	0.385	345.000	3799.830	17.698	-20.722	17.698	27.251	310.499	0.191
3900.000	1.331	320.877	3899.818	18.923	-21.542	18.923	28.673	311.297	0.992
4000.000	1.301	343.462	3999.792	20.912	-22.598	20.912	30.789	312.782	0.516
4100.000	1.264	346.086	4099.767	23.072	-23.186	23.072	32.709	314.858	0.069
4200.000	1.119	349.111	4199.745	25.102	-23.636	25.102	34.478	316.723	0.158
4300.000	1.168	2.562	4299.726	27.079	-23.775	27.079	36.035	318.717	0.272
4400.000	1.155	359.411	4399.705	29.105	-23.739	29.105	37.559	320.798	0.065
4500.000	0.888	335.003	4499.689	30.815	-24.077	30.815	39.106	321.998	0.505
4600.000	1.061	339.016	4599.675	32.381	-24.736	32.381	40.748	322.624	0.186
4700.000	1.206	339.125	4699.655	34.228	-25.442	34.228	42.648	323.376	0.145
4800.000	1.050	329.530	4799.636	36.001	-26.282	36.001	44.574	323.870	0.244
4900.000	1.189	344.464	4899.617	37.791	-27.024	37.791	46.459	324.431	0.322
5000.000	1.272	342.609	4999.594	39.850	-27.634	39.850	48.494	325.261	0.092
5100.000	1.524	349.651	5099.564	42.218	-28.205	42.218	50.773	326.254	0.304
5200.000	1.624	334.186	5199.527	44.802	-29.061	44.802	53.402	327.031	0.435
5300.000	2.066	320.267	5299.475	47.464	-30.830	47.464	56.598	326.994	0.627
5400.000	2.222	320.976	5399.405	50.356	-33.203	50.356	60.318	326.601	0.158
5500.000	2.020	324.629	5499.337	53.299	-35.444	53.299	64.009	326.376	0.243
5600.000	1.668	317.293	5599.285	55.806	-37.451	55.806	67.207	326.135	0.423
5700.000	1.089	318.894	5699.256	57.591	-39.062	57.591	69.589	325.852	0.580
5800.000	1.133	318.378	5799.237	59.046	-40.344	59.046	71.512	325.657	0.046
5900.000	1.601	306.615	5899.208	60.618	-42.122	60.618	73.816	325.206	0.543
6000.000	1.407	306.517	5999.174	62.182	-44.230	62.182	76.307	324.576	0.194
6100.000	1.049	301.846	6099.151	63.395	-45.994	63.395	78.322	324.039	0.371
6200.000	0.796	296.806	6199.138	64.191	-47.391	64.191	79.790	323.562	0.266
6300.000	0.781	305.685	6299.128	64.902	-48.565	64.902	81.060	323.193	0.123
6400.000	0.541	301.195	6399.122	65.544	-49.522	65.544	82.149	322.927	0.245
6500.000	0.250	270.495	6499.119	65.791	-50.144	65.791	82.722	322.686	0.350
6600.000	0.396	310.203	6599.118	66.015	-50.626	66.015	83.193	322.516	0.258
6700.000	0.287	277.796	6699.116	66.272	-51.138	66.272	83.709	322.345	0.217
6800.000	0.503	295.774	6799.114	66.497	-51.782	66.497	84.281	322.092	0.246
6900.000	0.581	286.616	6899.109	66.833	-52.663	66.833	85.089	321.762	0.116
7000.000	0.619	238.134	6999.104	66.693	-53.608	66.693	85.567	321.208	0.494
7100.000	1.064	243.542	7099.093	65.994	-54.898	65.994	85.843	320.244	0.451
7200.000	0.634	264.431	7199.082	65.527	-56.280	65.527	86.378	319.341	0.523
7300.000	0.961	293.653	7299.073	65.809	-57.599	65.809	87.456	318.806	0.512
7400.000	1.048	291.375	7399.058	66.479	-59.219	66.479	89.030	318.306	0.096
7500.000	0.539	306.243	7499.048	67.091	-60.450	67.091	90.307	317.981	0.545
7600.000	0.735	299.331	7599.041	67.683	-61.388	67.683	91.375	317.792	0.210
7700.000	0.652	271.754	7699.034	68.014	-62.515	68.014	92.380	317.412	0.340
7800.000	0.272	273.550	7799.031	68.046	-63.320	68.046	92.950	317.060	0.381

HORIZONTAL DISPLACEMENT IS
92.950 FEET AT 317.060 DEGREES