



Company: Whiting Petroleum Corp.
 Well: Fregeau 2
 API: 05-123-07502
 Rig Name: Open Hole/Coretech
 State/County: Colorado/Weld
 Latitude: 40.849, Longitude: -103.864
 Directions are relative to 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: 5/27/2014 / 13:21

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	0.164	139.024	100.000	-0.108	0.094	-0.108	0.143	139.024	0.164
200.000	0.245	154.544	199.999	-0.410	0.280	-0.410	0.496	145.654	0.098
300.000	0.383	128.740	299.998	-0.812	0.633	-0.812	1.030	142.082	0.194
400.000	0.300	147.956	399.996	-1.244	1.033	-1.244	1.616	140.298	0.140
500.000	0.176	195.570	499.995	-1.613	1.130	-1.613	1.970	144.983	0.223
600.000	0.370	154.099	599.994	-2.052	1.230	-2.052	2.393	149.050	0.266
700.000	0.516	131.322	699.991	-2.640	1.710	-2.640	3.145	147.072	0.226
800.000	0.291	152.356	799.989	-3.162	2.165	-3.162	3.832	145.595	0.266
900.000	0.505	136.459	899.986	-3.706	2.586	-3.706	4.519	145.086	0.239
1000.000	0.429	162.801	999.983	-4.383	3.001	-4.383	5.311	145.601	0.225
1100.000	0.331	171.395	1099.981	-5.026	3.154	-5.026	5.934	147.884	0.113
1200.000	0.853	185.965	1199.975	-6.052	3.120	-6.052	6.809	152.724	0.539
1300.000	0.461	164.000	1299.969	-7.179	3.154	-7.179	7.841	156.283	0.459
1400.000	0.413	188.129	1399.966	-7.923	3.214	-7.923	8.550	157.920	0.189
1500.000	0.174	171.797	1499.964	-8.430	3.185	-8.430	9.012	159.305	0.251
1600.000	0.100	120.640	1599.964	-8.625	3.282	-8.625	9.228	159.169	0.136
1700.000	0.458	176.759	1699.963	-9.069	3.380	-9.069	9.678	159.562	0.410
1800.000	0.562	187.154	1799.959	-9.954	3.341	-9.954	10.500	161.446	0.139
1900.000	0.367	175.266	1899.956	-10.760	3.306	-10.760	11.256	162.918	0.216
2000.000	0.598	184.494	1999.952	-11.599	3.292	-11.599	12.057	164.156	0.243
2100.000	0.718	175.538	2099.945	-12.744	3.300	-12.744	13.164	165.484	0.157
2200.000	0.796	155.747	2199.937	-14.002	3.634	-14.002	14.466	165.452	0.271
2300.000	0.942	169.656	2299.925	-15.444	4.067	-15.444	15.970	165.248	0.256
2400.000	1.219	170.109	2399.908	-17.300	4.397	-17.300	17.850	165.740	0.277
2500.000	1.273	170.810	2499.884	-19.445	4.757	-19.445	20.018	166.253	0.057
2600.000	1.559	184.458	2599.854	-21.898	4.829	-21.898	22.424	167.564	0.440
2700.000	1.418	180.750	2699.820	-24.491	4.707	-24.491	24.939	169.121	0.171
2800.000	1.699	178.695	2799.783	-27.210	4.724	-27.210	27.617	170.150	0.286
2900.000	1.347	178.616	2899.747	-29.867	4.787	-29.867	30.248	170.895	0.352
3000.000	1.393	168.556	2999.719	-32.233	5.056	-32.233	32.627	171.085	0.245
3100.000	1.342	200.944	3099.692	-34.518	4.879	-34.518	34.861	171.955	0.764
3200.000	1.676	191.620	3199.657	-37.044	4.166	-37.044	37.278	173.584	0.414
3300.000	2.223	208.293	3299.600	-40.185	2.952	-40.185	40.293	175.799	0.782
3400.000	2.627	191.605	3399.511	-44.137	1.572	-44.137	44.165	177.961	0.809

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	2.670	204.717	3499.405	-48.498	0.137	-48.498	48.498	179.839	0.606
3600.000	2.629	194.227	3599.299	-52.837	-1.401	-52.837	52.856	181.519	0.486
3700.000	2.284	215.603	3699.209	-56.681	-3.125	-56.681	56.767	183.156	0.972
3800.000	2.593	220.605	3799.118	-60.018	-5.757	-60.018	60.294	185.479	0.375
3900.000	3.301	230.114	3898.986	-63.582	-9.439	-63.582	64.278	188.444	0.859
4000.000	3.873	242.376	3998.791	-66.994	-14.640	-66.994	68.575	192.327	0.953
4100.000	4.076	253.331	4098.552	-69.579	-21.037	-69.579	72.690	196.823	0.785
4200.000	4.354	262.872	4198.283	-71.070	-28.208	-71.070	76.463	201.649	0.753
4300.000	4.618	273.934	4297.978	-71.265	-35.991	-71.265	79.837	206.795	0.903
4400.000	4.292	283.357	4397.677	-70.124	-43.647	-70.124	82.598	211.899	0.800
4500.000	3.962	292.277	4497.419	-67.950	-50.486	-67.950	84.652	216.612	0.721
4600.000	3.822	284.917	4597.189	-65.782	-56.903	-65.782	86.978	220.861	0.519
4700.000	3.896	298.548	4696.964	-63.300	-63.108	-63.300	89.384	224.913	0.918
4800.000	4.400	299.622	4796.702	-59.781	-69.427	-59.781	91.618	229.270	0.510
4900.000	4.459	308.707	4896.405	-55.453	-75.796	-55.453	93.915	233.810	0.703
5000.000	5.026	314.253	4996.062	-49.966	-81.967	-49.966	95.996	238.634	0.728
5100.000	5.441	320.180	5095.646	-43.268	-88.140	-43.268	98.188	243.854	0.681
5200.000	5.338	330.425	5195.206	-35.581	-93.472	-35.581	100.015	249.160	0.966
5300.000	5.232	340.540	5294.783	-27.237	-97.287	-27.237	101.028	254.359	0.936
5400.000	4.971	349.344	5394.389	-18.680	-99.607	-18.680	101.343	259.378	0.824
5500.000	4.573	350.232	5494.042	-10.493	-101.084	-10.493	101.628	264.073	0.405
5600.000	3.855	341.803	5593.772	-3.371	-102.811	-3.371	102.866	268.122	0.946
5700.000	3.468	340.111	5693.568	2.667	-104.889	2.667	104.923	271.457	0.402
5800.000	3.131	344.677	5793.402	8.145	-106.640	8.145	106.951	274.368	0.427
5900.000	2.709	331.403	5893.273	12.854	-108.493	12.854	109.252	276.757	0.794
6000.000	2.485	341.453	5993.171	16.985	-110.314	16.985	111.614	278.753	0.506
6100.000	2.512	346.119	6093.076	21.167	-111.529	21.167	113.520	280.747	0.205
6200.000	2.101	2.557	6192.996	25.126	-111.973	25.126	114.757	282.647	0.774
6300.000	1.560	357.174	6292.944	28.317	-111.958	28.317	115.484	284.194	0.567
6400.000	1.842	26.574	6392.902	31.115	-111.306	31.115	115.573	285.618	0.905
6500.000	1.530	57.879	6492.861	33.262	-109.457	33.262	114.399	286.903	0.958
6600.000	1.452	46.772	6592.827	34.840	-107.403	34.840	112.912	287.972	0.299
6700.000	1.872	77.257	6692.787	36.068	-104.886	36.068	110.914	288.977	0.964
HORIZONTAL DISPLACEMENT IS 110.914 FEET AT 288.977 DEGREES									