

Company: Great Western Operating Co
 Well/API: Miller #1/05-123-11822
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/KLX Energy
 County/State: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.49628, Longitude: -104.85345
 All Azimuths referenced to True North
 No Grid Convergence Applied



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GLE=4848 Feet/RKB= 15 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Error Model: VESSI_GYROFLEX.IPM

Filename: gyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/9/2016 / 13:46

Lat/Long & Elevation Obtained by Handheld GPS at Wellhead

Handheld GPS Reference: NAD83/ Device Error: +- 9 Feet

VES Survey International- Denver, CO

Jason Kinchelow

303-853-4976

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	0.358	286.656	99.999	0.090	-0.299	0.090	0.312	286.656	0.358
200.000	0.059	224.521	199.999	0.143	-0.634	0.143	0.650	282.663	0.334
300.000	0.322	299.942	299.998	0.246	-0.914	0.246	0.946	285.084	0.312
400.000	0.483	261.718	399.996	0.326	-1.574	0.326	1.607	281.693	0.304
500.000	0.489	274.854	499.992	0.301	-2.416	0.301	2.435	277.105	0.111
600.000	0.598	268.413	599.988	0.323	-3.363	0.323	3.378	275.484	0.124
700.000	0.510	284.238	699.983	0.418	-4.315	0.418	4.336	275.531	0.175
800.000	0.515	266.902	799.979	0.503	-5.196	0.503	5.220	275.530	0.155
900.000	0.453	270.696	899.976	0.484	-6.040	0.484	6.060	274.577	0.070
1000.000	0.648	282.384	999.971	0.610	-6.988	0.610	7.014	274.985	0.223
1100.000	0.598	290.700	1099.965	0.915	-8.028	0.915	8.080	276.504	0.103
1200.000	0.592	295.453	1199.960	1.322	-8.983	1.322	9.079	278.371	0.050
1300.000	0.491	271.686	1299.955	1.556	-9.877	1.556	9.999	278.955	0.244
1400.000	0.719	254.041	1399.950	1.397	-10.909	1.397	10.998	277.296	0.291
1500.000	0.933	269.286	1499.939	1.214	-12.325	1.214	12.385	275.626	0.305
1600.000	0.912	271.830	1599.926	1.229	-13.934	1.229	13.989	275.042	0.046
1700.000	0.760	295.951	1699.916	1.545	-15.326	1.545	15.404	275.756	0.380
1800.000	0.620	289.979	1799.909	2.020	-16.431	2.020	16.554	277.009	0.157
1900.000	0.619	302.884	1899.903	2.498	-17.392	2.498	17.571	278.173	0.139
2000.000	0.558	321.293	1999.898	3.171	-18.151	3.171	18.426	279.911	0.198
2100.000	0.506	321.324	2099.894	3.896	-18.731	3.896	19.132	281.751	0.052
2200.000	0.377	321.578	2199.891	4.499	-19.212	4.499	19.731	283.179	0.129
2300.000	0.429	333.253	2299.888	5.091	-19.584	5.091	20.235	284.571	0.097
2400.000	0.382	308.728	2399.886	5.633	-20.013	5.633	20.791	285.722	0.178
2500.000	0.348	283.099	2499.884	5.911	-20.568	5.911	21.401	286.033	0.165
2600.000	0.264	277.763	2599.882	6.011	-21.092	6.011	21.932	285.906	0.088
2700.000	0.332	208.769	2699.881	5.788	-21.460	5.788	22.227	285.094	0.342
2800.000	0.384	176.004	2799.879	5.200	-21.576	5.200	22.194	283.549	0.208
2900.000	0.470	176.990	2899.877	4.455	-21.532	4.455	21.988	281.690	0.087
3000.000	0.579	176.882	2999.872	3.541	-21.483	3.541	21.772	279.360	0.109
3100.000	0.633	194.636	3099.867	2.502	-21.595	2.502	21.739	276.610	0.194
3200.000	0.978	194.733	3199.857	1.143	-21.951	1.143	21.981	272.981	0.345
3300.000	1.149	201.792	3299.840	-0.613	-22.540	-0.613	22.549	268.442	0.216

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
3400.000	1.443	212.403	3399.814	-2.608	-23.587	-2.608	23.731	263.692	0.378
3500.000	1.453	217.104	3499.782	-4.682	-25.027	-4.682	25.461	259.404	0.119
3600.000	1.447	223.601	3599.750	-6.607	-26.662	-6.607	27.469	256.082	0.164
3700.000	1.101	221.007	3699.725	-8.247	-28.164	-8.247	29.346	253.679	0.350
3800.000	1.230	233.661	3799.705	-9.608	-29.659	-9.608	31.177	252.050	0.287
3900.000	1.207	235.522	3899.682	-10.841	-31.392	-10.841	33.211	250.949	0.046
4000.000	0.732	208.125	3999.668	-12.001	-32.562	-12.001	34.703	249.769	0.651
4100.000	0.664	120.289	4099.663	-12.857	-32.363	-12.857	34.823	248.333	0.970
4200.000	0.236	166.571	4199.660	-13.350	-31.814	-13.350	34.502	247.236	0.529
4300.000	0.430	83.485	4299.659	-13.508	-31.393	-13.508	34.176	246.719	0.465
4400.000	0.345	112.814	4399.656	-13.582	-30.743	-13.582	33.610	246.165	0.213
4500.000	0.279	260.051	4499.656	-13.740	-30.706	-13.740	33.640	245.892	0.599
4600.000	0.240	346.268	4599.655	-13.579	-30.995	-13.579	33.839	246.341	0.355
4700.000	0.633	301.186	4699.652	-13.090	-31.517	-13.090	34.127	247.445	0.494
4800.000	0.612	275.651	4799.647	-12.751	-32.522	-12.751	34.932	248.590	0.276
4900.000	0.283	307.781	4899.643	-12.547	-33.249	-12.547	35.537	249.325	0.402
5000.000	0.475	275.591	4999.641	-12.355	-33.856	-12.355	36.040	249.951	0.279
5100.000	0.167	283.241	5099.640	-12.282	-34.411	-12.282	36.537	250.358	0.310
5200.000	0.520	307.653	5199.638	-11.971	-34.911	-11.971	36.907	251.073	0.374
5300.000	0.397	260.070	5299.635	-11.754	-35.612	-11.754	37.501	251.734	0.386
5400.000	0.782	280.006	5399.629	-11.695	-36.625	-11.695	38.447	252.291	0.431
5500.000	0.327	357.053	5499.626	-11.291	-37.312	-11.291	38.983	253.164	0.777
5600.000	0.689	254.527	5599.623	-11.166	-37.906	-11.166	39.516	253.587	0.824
5700.000	0.106	76.024	5699.621	-11.304	-38.396	-11.304	40.025	253.595	0.795
5800.000	0.778	206.634	5799.618	-11.889	-38.610	-11.889	40.399	252.886	0.851
5900.000	0.203	97.430	5899.615	-12.518	-38.739	-12.518	40.711	252.092	0.866
6000.000	0.352	333.896	5999.614	-12.265	-38.699	-12.265	40.596	252.415	0.494
6100.000	0.423	300.047	6099.612	-11.804	-39.154	-11.804	40.895	253.223	0.236
6200.000	0.209	37.469	6199.611	-11.475	-39.363	-11.475	41.001	253.748	0.496
6300.000	0.624	33.548	6299.608	-10.877	-38.951	-10.877	40.442	254.398	0.416
6400.000	0.559	134.777	6399.605	-10.767	-38.304	-10.767	39.789	254.300	0.915
6500.000	0.347	235.246	6499.603	-11.283	-38.207	-11.283	39.838	253.547	0.710
6600.000	0.212	129.796	6599.602	-11.574	-38.314	-11.574	40.024	253.191	0.452
6700.000	0.145	221.303	6699.602	-11.787	-38.255	-11.787	40.030	252.875	0.260
6800.000	0.104	135.213	6799.602	-11.947	-38.274	-11.947	40.096	252.665	0.172
6850.000	0.144	178.406	6849.602	-12.042	-38.241	-12.042	40.092	252.521	0.198

HORIZONTAL DISPLACEMENT IS
40.092 FEET AT 252.521 DEGREES