COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Dejong 3-24/05-123-20685
DECLINATION: 8.24 Degrees
TD AS DRILLED: 7073 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.38961, Longitude: -104.61324
Grid North = True North -0.57 degs (NAD 27)
Grid Correction Applied = -0.57 degs

DEPTH REFERENCE : RKB = GL Elevation = 4631

DRILLOG MS GYRO SURVEY CALCULATIONS
Filename: msgyrosurvey.ut
Minimum Curvature Method
Report Date/Time: 5/25/2016 / 15:02

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD
NORTH REFERENCE: GRID
HENDERSON, COLORADO
303-853-4976
Surveyor: JUSTIN WILLIAMS / Dejong 3-24

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	0.363	58.851	99.999	0.164	0.271	0.164	0.317	58.851	0.363
200.000	0.141	43.436	199.998	0.417	0.627	0.417	0.753	56.367	0.231
300.000	0.276	10.442	299.998	0.743	0.755	0.743	1.060	45.450	0.176
400.000	0.524	313.690	399.995	1.296	0.468	1.296	1.378	19.863	0.438
500.000	0.818	320.766	499.989	2.165	-0.314	2.165	2.187	351.755	0.305
600.000	1.306	0.198	599.972	3.857	-0.761	3.857	3.931	348.838	0.851
700.000	1.533	19.306	699.942	6.259	-0.315	6.259	6.267	357.121	0.522
800.000	1.536	20.813	799.906	8.775	0.604	8.775	8.796	3.936	0.040
900.000	1.712	26.187	899.866	11.368	1.739	11.368	11.500	8.698	0.233
1000.000	1.638	16.120	999.824	14.081	2.795	14.081	14.356	11.227	0.303
1100.000	1.659	29.044	1099.783	16.719	3.894	16.719	17.167	13.112	0.372
1200.000	1.576	24.707	1199.743	19.233	5.172	19.233	19.917	15.050	0.148
1300.000	1.553	26.505	1299.705	21.695	6.351	21.695	22.606	16.317	0.054
1400.000	1.501	33.234	1399.670	24.004	7.674	24.004	25.200	17.729	0.186
1500.000	1.381	30.985	1499.638	26.132	9.012	26.132	27.643	19.028	0.133
1600.000	1.316	26.153	1599.611	28.196	10.138	28.196	29.963	19.777	0.131
1700.000	1.168	13.454	1699.587	30.217	10.881	30.217	32.117	19.805	0.312
1800.000	1.362	353.541	1799.563	32.389	10.985	32.389	34.201	18.734	0.478

VES Survey Date: 5/23/2016

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
1900.000	1.547	341.907	1899.531	34.853	10.432	34.853	36.381	16.663	0.347
2000.000	1.538	336.047	1999.495	37.363	9.468	37.363	38.543	14.220	0.158
2100.000	1.851	345.400	2099.452	40.152	8.516	40.152	41.045	11.975	0.416
2200.000	1.670	340.518	2199.404	43.088	7.623	43.088	43.757	10.033	0.235
2300.000	1.565	346.034	2299.365	45.787	6.807	45.787	46.290	8.457	0.188
2400.000	1.435	339.112	2399.330	48.282	6.032	48.282	48.657	7.121	0.223
2500.000	1.636	334.439	2499.295	50.739	4.969	50.739	50.982	5.594	0.237
2600.000	1.568	331.150	2599.255	53.225	3.693	53.225	53.353	3.969	0.115
2700.000	1.755	340.091	2699.214	55.864	2.512	55.864	55.920	2.574	0.319
2800.000	1.822	337.673	2799.165	58.775	1.386	58.775	58.791	1.351	0.101
2900.000	1.893	347.748	2899.112	61.860	0.431	61.860	61.861	0.400	0.334
3000.000	1.951	343.289	2999.056	65.104	-0.409	65.104	65.106	359.640	0.160
3100.000	1.953	355.461	3098.999	68.434	-1.033	68.434	68.441	359.135	0.414
3200.000	1.796	344.938	3198.945	71.646	-1.575	71.646	71.663	358.741	0.378
3300.000	1.628	341.289	3298.901	74.504	-2.438	74.504	74.544	358.126	0.200
3400.000	1.509	337.967	3398.863	77.071	-3.388	77.071	77.145	357.483	0.150
3500.000	1.252	330.344	3498.834	79.241	-4.422	79.241	79.364	356.806	0.316
3600.000	1.099	327.557	3598.813	80.999	-5.477	80.999	81.184	356.132	0.163
3700.000	1.114	323.055	3698.795	82.586	-6.576	82.586	82.847	355.447	0.088
3800.000	1.181	324.996	3798.775	84.207	-7.751	84.207	84.563	354.741	0.077
3900.000	1.247	323.451	3898.752	85.925	-8.990	85.925	86.394	354.027	0.073
4000.000	1.317	321.390	3998.727	87.697	-10.355	87.697	88.306	353.266	0.084
4100.000	1.278	340.880	4098.702	89.648	-11.437	89.648	90.375	352.729	0.441
4200.000	1.212	339.247	4198.678	91.691	-12.178	91.691	92.496	352.435	0.074
4300.000	1.338	336.119	4298.654	93.747	-13.025	93.747	94.648	352.090	0.143
4400.000	1.963	321.192	4398.612	96.149	-14.571	96.149	97.247	351.383	0.754
4500.000	2.525	317.976	4498.535	99.120	-17.119	99.120	100.588	350.201	0.576
4600.000	1.854	330.810	4598.462	102.169	-19.383	102.169	103.992	349.258	0.827
4700.000	1.070	352.974	4698.429	104.508	-20.286	104.508	106.459	349.015	0.953
4800.000	1.069	37.320	4798.414	106.177	-19.835	106.177	108.014	349.419	0.807
4900.000	1.226	71.601	4898.395	107.257	-18.254	107.257	108.799	350.341	0.693
5000.000	1.323	75.603	4998.370	107.881	-16.121	107.881	109.079	351.501	0.132
5100.000	1.077	89.098	5098.348	108.183	-14.063	108.183	109.093	352.593	0.373
5200.000	1.059	84.376	5198.331	108.288	-12.204	108.288	108.974	353.570	0.090
5300.000	1.232	75.946	5298.311	108.640	-10.241	108.640	109.122	354.615	0.240
5400.000	1.253	81.024	5398.287	109.072	-8.118	109.072	109.373	355.743	0.112
5500.000	1.453	81.011	5498.259	109.440	-5.786	109.440	109.593	356.974	0.200
5600.000	1.589	72.746	5598.224	110.050	-3.210	110.050	110.097	358.329	0.258
5700.000	1.632	74.782	5698.185	110.835	-0.511	110.835	110.836	359.736	0.071
5800.000	1.555	85.718	5798.146	111.310	2.216	111.310	111.332	1.140	0.313

VES Survey Date: 5/23/2016

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
5900.000	1.495	92.458	5898.111	111.355	4.873	111.355	111.462	2.505	0.189
6000.000	1.654	98.994	5998.073	111.074	7.602	111.074	111.333	3.915	0.240
6100.000	0.835	99.940	6098.049	110.722	9.746	110.722	111.150	5.030	0.819
6200.000	0.849	87.354	6198.038	110.630	11.204	110.630	111.196	5.783	0.185
6300.000	0.681	97.828	6298.029	110.584	12.533	110.584	111.292	6.466	0.218
6400.000	0.505	102.603	6398.024	110.407	13.552	110.407	111.235	6.998	0.182
6500.000	0.383	121.697	6498.021	110.135	14.267	110.135	111.055	7.381	0.190
6600.000	0.519	147.469	6598.018	109.578	14.794	109.578	110.572	7.689	0.241
6700.000	0.328	159.880	6698.015	108.927	15.136	108.927	109.974	7.911	0.210
6800.000	0.152	134.486	6798.014	108.566	15.329	108.566	109.642	8.037	0.202

VES Survey Date: 5/23/2016