



Gyroscopic Survey Report
for
K.P. KAUFFMAN
1675 BROADWAY SUITE 2800
DENVER, CO 80202

Well Location	WELD COUNTY, CO
Well Name	MARTIN T. HART D UNIT #1
Rig Number	FMC 134
Survey Date	6/19/2014
Latitude	40.1145590°N
Longitude	104.8619620°W
North Reference	True North
Grid Correction	None
Depth Reference	GROUND LEVEL (4945.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 302.03Azim (deg)
Definitive Survey	MARTIN T. HART D UNIT #1
Operator(s)	C JAQUES

Well Notes

Survey Report

Well Name:		MARTIN T. HART D UNIT #1							
Survey:		MARTIN T. HART D UNIT #1							
Survey Date:		6/19/2014							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
100.11	1.29	347.38	100.10	0.79	1.10	-0.25	1.29	1.13	347.38
124.12	1.17	343.49	124.10	1.17	1.60	-0.38	0.59	1.64	346.80
149.50	1.07	339.46	149.48	1.55	2.07	-0.53	0.52	2.14	345.58
174.89	0.95	327.44	174.87	1.93	2.47	-0.73	0.96	2.57	343.56
199.61	0.82	324.68	199.59	2.27	2.78	-0.94	0.56	2.94	341.35
224.21	0.84	316.87	224.18	2.61	3.06	-1.16	0.47	3.27	339.16
249.89	0.77	311.55	249.86	2.96	3.31	-1.42	0.39	3.60	336.75
274.14	0.55	299.24	274.11	3.24	3.48	-1.65	1.07	3.85	334.66
299.37	0.51	288.46	299.34	3.47	3.57	-1.86	0.43	4.03	332.50
324.52	0.51	284.76	324.49	3.69	3.63	-2.07	0.13	4.18	330.29
349.27	0.53	287.03	349.23	3.90	3.70	-2.29	0.10	4.35	328.23
373.96	0.52	287.06	373.92	4.12	3.76	-2.50	0.01	4.52	326.35
399.65	0.51	304.62	399.61	4.34	3.86	-2.71	0.61	4.72	324.94
423.84	0.50	320.13	423.80	4.55	4.00	-2.87	0.56	4.92	324.40
449.83	0.48	324.94	449.79	4.76	4.18	-3.00	0.18	5.14	324.32
474.51	0.52	332.19	474.47	4.95	4.36	-3.11	0.30	5.36	324.50
499.17	0.48	334.45	499.13	5.14	4.55	-3.21	0.19	5.57	324.83
524.45	0.51	332.90	524.41	5.32	4.75	-3.31	0.14	5.79	325.16
548.65	0.58	335.30	548.61	5.52	4.96	-3.41	0.29	6.01	325.51
573.83	0.60	330.44	573.79	5.74	5.19	-3.52	0.22	6.27	325.81
598.93	0.50	321.97	598.88	5.95	5.39	-3.66	0.52	6.51	325.83
624.89	0.55	315.67	624.85	6.18	5.56	-3.81	0.31	6.74	325.58
648.80	0.49	314.03	648.76	6.39	5.72	-3.97	0.27	6.96	325.25
674.47	0.52	309.48	674.42	6.62	5.87	-4.13	0.19	7.18	324.83
698.30	0.38	306.58	698.25	6.80	5.98	-4.28	0.57	7.36	324.41
724.02	0.58	290.00	723.97	7.01	6.08	-4.47	0.91	7.55	323.66
749.74	0.45	290.32	749.69	7.24	6.16	-4.69	0.47	7.74	322.71
774.86	0.27	349.50	774.81	7.38	6.25	-4.79	1.56	7.88	322.52
799.20	0.64	274.96	799.15	7.54	6.32	-4.94	2.55	8.02	321.99
824.38	0.41	331.97	824.33	7.74	6.41	-5.12	2.13	8.20	321.39
848.72	0.46	331.97	848.67	7.90	6.57	-5.20	0.20	8.38	321.62
873.90	0.48	322.85	873.84	8.08	6.75	-5.32	0.32	8.59	321.76
899.50	0.48	296.63	899.45	8.29	6.88	-5.48	0.86	8.79	321.47
924.77	0.51	334.94	924.71	8.49	7.03	-5.62	1.29	9.00	321.35
949.02	0.61	335.87	948.97	8.69	7.24	-5.72	0.42	9.23	321.71

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
975.00	0.65	321.95	974.94	8.94	7.49	-5.87	0.60	9.51	321.92
998.93	0.66	320.33	998.87	9.20	7.70	-6.04	0.10	9.78	321.90
1024.43	0.63	316.30	1024.36	9.48	7.91	-6.23	0.21	10.07	321.80
1049.17	0.50	319.99	1049.11	9.71	8.09	-6.39	0.54	10.31	321.71
1074.39	0.42	335.24	1074.32	9.89	8.26	-6.50	0.57	10.51	321.81
1099.96	0.48	343.42	1099.89	10.05	8.45	-6.57	0.34	10.70	322.14
1123.71	0.51	344.04	1123.65	10.21	8.65	-6.63	0.14	10.90	322.54
1149.32	0.60	337.14	1149.25	10.40	8.88	-6.71	0.44	11.13	322.93
1173.89	0.66	340.25	1173.82	10.62	9.14	-6.81	0.27	11.40	323.30
1199.94	0.77	333.48	1199.87	10.89	9.43	-6.94	0.52	11.71	323.66
1224.59	0.65	333.16	1224.51	11.15	9.71	-7.08	0.46	12.01	323.91
1249.42	0.63	328.28	1249.35	11.39	9.95	-7.21	0.24	12.29	324.06
1274.27	0.58	320.01	1274.20	11.63	10.16	-7.36	0.41	12.55	324.07
1299.82	0.56	314.97	1299.74	11.88	10.35	-7.53	0.20	12.80	323.94
1324.37	0.42	315.77	1324.29	12.08	10.50	-7.68	0.60	13.01	323.80
1349.49	0.41	318.37	1349.41	12.26	10.63	-7.81	0.08	13.19	323.71
1373.96	0.61	303.82	1373.88	12.47	10.77	-7.97	0.97	13.40	323.48
1399.79	0.75	304.46	1399.71	12.78	10.94	-8.23	0.54	13.69	323.06
1424.05	0.41	320.45	1423.97	13.02	11.10	-8.41	1.56	13.93	322.83
1449.62	0.49	353.37	1449.54	13.17	11.28	-8.48	1.04	14.11	323.04
1473.92	0.66	333.30	1473.84	13.36	11.50	-8.56	1.06	14.34	323.35
1499.78	0.58	322.33	1499.69	13.61	11.74	-8.71	0.54	14.62	323.44
1524.35	0.66	320.97	1524.26	13.86	11.95	-8.87	0.31	14.88	323.41
1549.83	0.61	326.14	1549.74	14.12	12.17	-9.04	0.29	15.16	323.41
1573.67	0.67	315.60	1573.58	14.37	12.38	-9.21	0.55	15.43	323.36
1599.03	0.69	311.15	1598.93	14.67	12.59	-9.43	0.21	15.72	323.17
1624.03	0.55	313.84	1623.94	14.93	12.77	-9.63	0.53	15.99	322.99
1648.31	0.55	315.90	1648.22	15.16	12.93	-9.79	0.08	16.22	322.87
1673.79	0.44	314.59	1673.70	15.37	13.09	-9.95	0.44	16.44	322.77
1699.35	0.43	311.39	1699.25	15.56	13.22	-10.09	0.11	16.63	322.66
1723.97	0.41	313.98	1723.87	15.74	13.34	-10.22	0.10	16.81	322.55
1748.95	0.28	334.12	1748.85	15.88	13.46	-10.31	0.70	16.96	322.55
1774.44	0.26	341.15	1774.34	15.98	13.57	-10.36	0.15	17.07	322.65
1799.47	0.26	327.60	1799.37	16.07	13.67	-10.41	0.25	17.18	322.73
1824.53	0.21	318.22	1824.44	16.17	13.76	-10.47	0.26	17.29	322.73
1849.09	0.27	340.45	1848.99	16.26	13.85	-10.52	0.45	17.39	322.78

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
1874.11	0.30	317.94	1874.01	16.37	13.95	-10.58	0.46	17.51	322.82
1897.97	0.26	321.48	1897.87	16.48	14.04	-10.66	0.18	17.63	322.80
1923.85	0.31	300.63	1923.75	16.60	14.12	-10.75	0.44	17.75	322.71
1948.95	0.18	306.19	1948.85	16.71	14.18	-10.84	0.52	17.85	322.59
1973.62	0.31	269.52	1973.52	16.81	14.20	-10.94	0.80	17.93	322.39
1999.94	0.19	265.11	1999.84	16.90	14.20	-11.06	0.45	17.99	322.09
2023.76	0.17	262.55	2023.66	16.96	14.19	-11.13	0.11	18.03	321.88
2048.90	0.17	274.85	2048.80	17.02	14.19	-11.21	0.14	18.08	321.69
2074.70	0.15	234.26	2074.60	17.07	14.17	-11.27	0.43	18.11	321.50
2099.87	0.20	277.01	2099.76	17.12	14.16	-11.34	0.53	18.14	321.30
2124.90	0.05	223.68	2124.80	17.16	14.15	-11.39	0.68	18.17	321.17
2148.38	0.05	59.98	2148.27	17.16	14.15	-11.39	0.44	18.16	321.17
2174.65	0.05	149.56	2174.55	17.14	14.15	-11.37	0.28	18.15	321.21
2199.67	0.22	348.89	2199.57	17.17	14.18	-11.38	1.07	18.18	321.27
2224.83	0.07	277.14	2224.72	17.21	14.23	-11.40	0.83	18.24	321.31
2249.41	0.35	254.54	2249.31	17.28	14.22	-11.49	1.15	18.28	321.06
2274.44	0.27	305.26	2274.34	17.39	14.23	-11.61	1.09	18.36	320.79
2299.59	0.13	315.64	2299.49	17.47	14.28	-11.68	0.59	18.45	320.74
2324.61	0.25	313.88	2324.50	17.55	14.34	-11.73	0.49	18.53	320.71
2349.18	0.30	279.93	2349.08	17.67	14.39	-11.84	0.69	18.63	320.56
2374.30	0.22	244.52	2374.20	17.75	14.38	-11.94	0.71	18.69	320.28
2399.31	0.08	5.99	2399.21	17.79	14.38	-11.99	1.06	18.72	320.18
2423.86	0.15	165.92	2423.76	17.77	14.36	-11.98	0.90	18.70	320.18
2449.36	0.19	240.93	2449.25	17.77	14.31	-12.00	0.81	18.68	320.01
2474.39	0.20	216.50	2474.28	17.79	14.25	-12.07	0.33	18.68	319.75
2499.27	0.22	173.47	2499.17	17.76	14.17	-12.09	0.62	18.63	319.54
2523.84	0.10	80.29	2523.74	17.72	14.13	-12.06	1.02	18.58	319.52
2549.23	0.27	115.12	2549.12	17.64	14.11	-11.98	0.77	18.51	319.66
2573.88	0.28	72.35	2573.78	17.54	14.10	-11.87	0.82	18.43	319.91
2599.78	0.34	223.82	2599.67	17.52	14.07	-11.86	2.35	18.40	319.85
2624.44	0.30	294.61	2624.33	17.60	14.04	-11.97	1.53	18.45	319.54
2648.58	0.49	13.06	2648.48	17.69	14.17	-12.01	2.16	18.57	319.71
2674.46	0.48	63.34	2674.36	17.67	14.32	-11.89	1.59	18.61	320.31
2699.11	0.30	252.47	2699.00	17.66	14.35	-11.86	3.13	18.61	320.43
2724.92	0.57	247.42	2724.81	17.78	14.28	-12.04	1.08	18.68	319.87
2749.96	0.39	127.57	2749.85	17.77	14.18	-12.09	3.35	18.63	319.56

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
2774.58	0.29	221.37	2774.47	17.69	14.08	-12.06	2.05	18.54	319.42
2799.20	0.63	268.62	2799.09	17.81	14.03	-12.24	1.95	18.62	318.91
2823.81	0.63	292.84	2823.70	18.06	14.08	-12.50	1.07	18.83	318.41
2849.19	0.41	237.39	2849.08	18.24	14.09	-12.70	2.06	18.97	317.96
2873.75	0.30	234.22	2873.64	18.30	14.00	-12.83	0.46	18.99	317.50
2899.61	0.22	309.27	2899.50	18.38	13.99	-12.92	1.26	19.05	317.28
2924.23	0.64	242.42	2924.11	18.49	13.96	-13.08	2.41	19.13	316.86
2948.43	0.98	231.53	2948.31	18.63	13.77	-13.36	1.53	19.19	315.85
2974.23	0.39	240.82	2974.12	18.75	13.59	-13.61	2.35	19.23	314.94
2998.82	0.34	219.47	2998.71	18.80	13.49	-13.73	0.57	19.25	314.48
3024.59	0.46	216.50	3024.47	18.81	13.35	-13.84	0.45	19.23	313.95
3049.19	0.53	195.17	3049.07	18.79	13.16	-13.93	0.79	19.16	313.36
3074.53	0.42	255.06	3074.41	18.82	13.02	-14.05	1.89	19.16	312.82
3099.09	0.95	263.35	3098.97	19.04	12.97	-14.34	2.19	19.34	312.14
3124.53	0.85	238.00	3124.41	19.29	12.85	-14.71	1.60	19.53	311.14
3149.97	0.28	159.35	3149.85	19.32	12.69	-14.85	3.31	19.53	310.52
3174.24	0.49	287.41	3174.12	19.37	12.67	-14.93	2.90	19.58	310.32
3199.22	1.10	259.25	3199.09	19.65	12.65	-15.26	2.81	19.83	309.66
3224.61	0.72	226.58	3224.48	19.87	12.50	-15.62	2.47	20.00	308.67
3249.99	0.31	332.43	3249.86	19.97	12.45	-15.77	3.38	20.09	308.30
3274.22	1.05	297.11	3274.09	20.25	12.61	-15.99	3.36	20.37	308.26
3299.67	1.44	262.29	3299.53	20.73	12.68	-16.52	3.27	20.82	307.50
3324.72	0.94	237.73	3324.58	21.06	12.52	-17.00	2.80	21.12	306.37
3348.79	0.40	296.32	3348.64	21.23	12.46	-17.25	3.37	21.27	305.84
3374.25	0.87	287.40	3374.11	21.50	12.55	-17.51	1.87	21.54	305.63
3399.68	0.97	237.08	3399.53	21.78	12.49	-17.87	3.09	21.81	304.95
3423.81	1.39	238.02	3423.66	21.99	12.23	-18.29	1.72	22.00	303.76
3449.30	1.32	281.06	3449.14	22.40	12.12	-18.84	3.90	22.40	302.75
3474.11	0.57	282.88	3473.94	22.78	12.20	-19.24	3.02	22.79	302.38
3499.59	1.05	235.35	3499.43	23.00	12.10	-19.56	3.08	23.00	301.74
3524.99	1.61	270.12	3524.81	23.39	11.97	-20.11	3.78	23.40	300.76
3549.37	1.48	298.47	3549.19	24.00	12.12	-20.73	3.15	24.01	300.31
3574.73	0.70	311.04	3574.54	24.48	12.38	-21.13	3.20	24.49	300.36
3599.52	0.59	234.61	3599.33	24.68	12.40	-21.35	3.25	24.69	300.15
3624.63	1.26	254.66	3624.43	24.91	12.25	-21.72	2.91	24.94	299.42
3648.73	1.07	287.90	3648.53	25.31	12.25	-22.19	2.87	25.35	298.90

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
3674.81	1.16	325.87	3674.61	25.79	12.55	-22.58	2.81	25.83	299.06
3699.72	0.85	322.96	3699.52	26.20	12.90	-22.83	1.27	26.22	299.48
3724.70	0.78	262.78	3724.49	26.50	13.03	-23.11	3.29	26.53	299.42
3749.54	0.82	326.24	3749.33	26.80	13.16	-23.38	3.39	26.82	299.37
3773.98	1.04	355.44	3773.76	27.09	13.52	-23.49	2.11	27.10	299.92
3798.82	0.50	300.10	3798.61	27.33	13.80	-23.60	3.46	27.34	300.31
3824.84	1.03	268.47	3824.62	27.64	13.85	-23.93	2.54	27.65	300.06
3849.66	1.00	301.67	3849.44	28.04	13.96	-24.34	2.34	28.06	299.83
3874.06	0.80	292.16	3873.83	28.42	14.13	-24.68	1.02	28.44	299.80
3898.80	0.85	296.01	3898.57	28.77	14.28	-25.00	0.31	28.79	299.73
3924.78	0.82	296.23	3924.55	29.15	14.45	-25.34	0.12	29.17	299.68
3949.57	0.90	298.68	3949.34	29.52	14.62	-25.67	0.38	29.54	299.66
3973.93	0.96	304.22	3973.69	29.91	14.82	-26.01	0.43	29.94	299.68
3999.85	0.83	310.58	3999.62	30.31	15.07	-26.33	0.61	30.34	299.78
4024.61	0.87	317.28	4024.37	30.67	15.32	-26.59	0.42	30.69	299.95
4049.36	0.83	322.18	4049.12	31.02	15.60	-26.83	0.34	31.04	300.18
4074.86	0.75	332.70	4074.61	31.34	15.89	-27.02	0.64	31.35	300.47
4099.58	0.55	336.04	4099.33	31.57	16.15	-27.14	0.82	31.58	300.75
4124.29	0.58	332.82	4124.04	31.78	16.37	-27.25	0.19	31.79	300.99
4148.99	0.47	332.50	4148.74	31.98	16.57	-27.35	0.48	31.98	301.20
4174.45	0.38	320.66	4174.20	32.14	16.73	-27.45	0.47	32.15	301.35
4199.06	0.33	313.06	4198.81	32.29	16.84	-27.56	0.29	32.29	301.42
4223.71	0.29	348.42	4223.46	32.40	16.95	-27.62	0.77	32.41	301.53
4248.80	0.30	342.96	4248.55	32.50	17.07	-27.65	0.11	32.50	301.69
4274.52	0.31	336.80	4274.27	32.61	17.20	-27.70	0.14	32.61	301.84
4298.39	0.31	356.17	4298.13	32.70	17.32	-27.73	0.44	32.70	301.99
4323.96	0.22	21.00	4323.71	32.75	17.44	-27.72	0.58	32.75	302.18
4349.00	0.36	54.68	4348.74	32.73	17.53	-27.64	0.86	32.73	302.38
4374.34	0.20	60.46	4374.09	32.67	17.60	-27.53	0.65	32.68	302.58
4399.77	0.23	94.09	4399.52	32.61	17.61	-27.45	0.50	32.61	302.69
4424.63	0.23	103.80	4424.38	32.52	17.60	-27.35	0.16	32.52	302.76
4448.84	0.13	107.95	4448.59	32.44	17.58	-27.27	0.42	32.45	302.80
4474.23	0.30	137.15	4473.98	32.35	17.52	-27.20	0.75	32.35	302.79
4499.45	0.20	153.49	4499.19	32.25	17.43	-27.14	0.47	32.25	302.72
4524.81	0.18	115.50	4524.56	32.17	17.38	-27.08	0.49	32.18	302.69
4548.41	0.25	101.86	4548.16	32.09	17.35	-27.00	0.38	32.09	302.73



Well Name: MARTIN T. HART D UNIT #1
Survey: MARTIN T. HART D UNIT #1
Survey Date: 6/19/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
4574.88	0.10	239.35	4574.63	32.04	17.33	-26.96	1.26	32.05	302.73
4599.25	0.04	90.29	4599.00	32.05	17.32	-26.97	0.55	32.05	302.70
4624.39	0.17	241.46	4624.14	32.06	17.30	-26.99	0.80	32.06	302.66
4649.28	0.30	280.89	4649.03	32.14	17.29	-27.09	0.82	32.14	302.56
4674.60	0.25	261.63	4674.34	32.24	17.30	-27.21	0.43	32.24	302.45
4699.66	0.48	263.30	4699.40	32.36	17.28	-27.37	0.95	32.36	302.27
4723.39	0.41	243.23	4723.13	32.49	17.23	-27.54	0.72	32.49	302.03