



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

Well Location	WELD COUNTY, CO
Well Name	MARIE GERHARDT B-1
Rig Number	NABORS 92-0438
Survey Date	7/9/2014
Latitude	40.1181010°N
Longitude	104.8557050°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), 312.23Azim (deg)
Definitive Survey	MARIE GERHARDT B-1
Operator(s)	C JAKUES

Well Notes

Survey Report

Well Name:		MARIE GERHARDT B-1							
Survey:		MARIE GERHARDT B-1							
Survey Date:		7/9/2014							
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
99.25	0.35	45.27	99.25	-0.02	0.22	0.22	0.36	0.31	45.27
123.79	0.25	53.16	123.79	-0.03	0.30	0.31	0.46	0.43	46.23
149.41	0.40	47.87	149.41	-0.05	0.39	0.42	0.59	0.58	47.14
174.62	0.34	44.96	174.61	-0.06	0.50	0.54	0.22	0.74	47.01
199.18	0.24	34.20	199.18	-0.06	0.60	0.62	0.47	0.86	46.08
224.57	0.31	356.75	224.57	0.00	0.71	0.65	0.75	0.96	42.29
249.44	0.47	320.22	249.44	0.15	0.86	0.58	1.16	1.03	33.95
274.12	0.64	312.24	274.11	0.39	1.03	0.41	0.73	1.11	21.78
298.80	0.71	310.13	298.80	0.68	1.22	0.19	0.32	1.23	8.97
324.27	0.71	310.07	324.27	0.99	1.42	-0.05	0.00	1.42	358.01
348.95	0.63	304.16	348.94	1.28	1.60	-0.28	0.42	1.62	350.07
374.98	0.61	303.32	374.97	1.56	1.75	-0.51	0.11	1.83	343.66
399.69	0.60	301.23	399.68	1.82	1.89	-0.73	0.09	2.03	338.80
423.96	0.54	295.33	423.94	2.05	2.01	-0.95	0.35	2.22	334.77
449.88	0.33	258.91	449.87	2.21	2.05	-1.13	1.29	2.34	331.07
474.55	0.31	258.52	474.53	2.30	2.02	-1.27	0.09	2.38	327.88
499.30	0.21	271.95	499.28	2.37	2.01	-1.38	0.48	2.43	325.50
523.49	0.22	15.45	523.47	2.42	2.05	-1.41	1.40	2.49	325.50
549.55	0.27	9.21	549.53	2.48	2.16	-1.39	0.22	2.57	327.30
574.27	0.17	20.89	574.26	2.53	2.25	-1.37	0.44	2.64	328.79
599.05	0.22	23.98	599.03	2.55	2.33	-1.33	0.21	2.69	330.24
624.95	0.23	26.90	624.94	2.58	2.42	-1.29	0.07	2.75	332.01
649.22	0.27	338.08	649.20	2.65	2.52	-1.29	0.87	2.83	332.95
673.90	0.26	341.87	673.88	2.75	2.63	-1.33	0.07	2.94	333.22
699.87	0.21	7.85	699.86	2.83	2.73	-1.34	0.46	3.04	333.89
724.51	0.17	8.31	724.50	2.87	2.81	-1.33	0.16	3.11	334.71
748.78	0.40	299.78	748.77	2.97	2.89	-1.40	1.54	3.21	334.19
773.80	0.34	335.85	773.78	3.13	3.00	-1.50	0.95	3.35	333.38
799.55	0.54	309.96	799.53	3.32	3.15	-1.63	1.09	3.54	332.65
824.95	0.55	290.67	824.93	3.55	3.27	-1.83	0.72	3.75	330.69
849.10	0.53	302.78	849.08	3.77	3.37	-2.04	0.48	3.94	328.84
874.11	0.46	311.71	874.09	3.99	3.50	-2.21	0.43	4.14	327.73
899.53	0.54	292.64	899.50	4.20	3.61	-2.39	0.74	4.33	326.44
924.99	0.76	283.57	924.96	4.46	3.70	-2.67	0.94	4.56	324.15
949.17	0.74	285.22	949.15	4.74	3.78	-2.98	0.11	4.81	321.73

Survey Report

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Survey Date:		7/9/2014							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
973.80	0.76	289.12	973.77	5.04	3.87	-3.29	0.22	5.08	319.66
999.12	0.70	287.15	999.09	5.33	3.97	-3.59	0.26	5.36	317.86
1024.51	0.76	286.36	1024.48	5.62	4.06	-3.90	0.23	5.63	316.16
1049.92	0.82	279.81	1049.89	5.93	4.14	-4.24	0.44	5.93	314.31
1074.15	0.94	275.13	1074.11	6.23	4.19	-4.61	0.58	6.23	312.24
1099.46	0.96	277.52	1099.42	6.57	4.24	-5.03	0.17	6.58	310.09
1124.46	1.01	287.93	1124.42	6.95	4.33	-5.45	0.74	6.96	308.48
1149.83	0.96	283.49	1149.78	7.34	4.45	-5.87	0.37	7.37	307.17
1173.97	1.06	281.14	1173.92	7.70	4.54	-6.28	0.45	7.75	305.85
1199.37	1.01	290.50	1199.31	8.11	4.66	-6.72	0.69	8.18	304.75
1224.66	1.00	291.31	1224.60	8.53	4.82	-7.14	0.06	8.61	304.05
1248.93	1.07	286.77	1248.87	8.93	4.96	-7.55	0.43	9.04	303.32
1274.18	1.08	282.07	1274.11	9.35	5.08	-8.01	0.35	9.48	302.40
1299.49	1.40	260.44	1299.41	9.74	5.08	-8.55	2.21	9.94	300.73
1323.38	1.04	280.54	1323.30	10.11	5.07	-9.05	2.32	10.37	299.28
1349.78	1.03	287.70	1349.70	10.53	5.19	-9.51	0.49	10.83	298.62
1374.22	1.03	286.74	1374.13	10.93	5.32	-9.93	0.07	11.26	298.18
1399.39	1.06	284.84	1399.30	11.34	5.44	-10.37	0.18	11.71	297.70
1424.65	1.02	287.68	1424.56	11.75	5.57	-10.81	0.26	12.16	297.27
1449.87	1.10	281.92	1449.77	12.16	5.69	-11.26	0.53	12.61	296.81
1474.59	1.08	284.85	1474.48	12.57	5.80	-11.71	0.23	13.07	296.33
1499.01	0.93	291.17	1498.90	12.96	5.93	-12.12	0.76	13.49	296.06
1524.55	0.97	288.28	1524.44	13.35	6.07	-12.52	0.23	13.92	295.87
1549.21	0.93	280.83	1549.09	13.71	6.17	-12.92	0.52	14.32	295.55
1574.28	0.81	294.61	1574.16	14.06	6.29	-13.28	0.97	14.69	295.33
1598.52	0.89	281.32	1598.40	14.38	6.39	-13.62	0.88	15.05	295.15
1624.97	0.85	286.32	1624.85	14.74	6.49	-14.01	0.32	15.44	294.86
1648.80	0.84	292.10	1648.67	15.06	6.61	-14.34	0.37	15.79	294.73
1673.90	0.80	286.44	1673.77	15.39	6.72	-14.68	0.35	16.15	294.61
1699.45	0.74	298.74	1699.31	15.71	6.85	-15.00	0.69	16.49	294.56
1724.10	0.75	289.75	1723.97	16.01	6.99	-15.29	0.48	16.81	294.56
1749.27	0.54	299.66	1749.14	16.28	7.10	-15.54	0.96	17.09	294.55
1773.53	0.43	298.65	1773.40	16.48	7.20	-15.72	0.43	17.29	294.60
1799.81	0.44	299.30	1799.67	16.68	7.30	-15.90	0.04	17.49	294.65
1823.81	0.47	296.53	1823.67	16.86	7.39	-16.07	0.16	17.69	294.69
1848.93	0.51	290.82	1848.79	17.07	7.47	-16.27	0.24	17.90	294.67

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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
1874.49	0.51	298.94	1874.35	17.29	7.57	-16.47	0.28	18.13	294.68
1899.24	0.54	300.40	1899.10	17.51	7.68	-16.67	0.11	18.36	294.74
1923.96	0.51	308.88	1923.82	17.73	7.81	-16.86	0.33	18.58	294.86
1948.66	0.56	294.18	1948.52	17.95	7.93	-17.05	0.60	18.80	294.93
1973.79	0.54	288.41	1973.65	18.18	8.01	-17.28	0.24	19.05	294.89
1999.07	0.55	304.03	1998.92	18.41	8.12	-17.49	0.58	19.28	294.90
2024.21	0.53	300.74	2024.06	18.64	8.25	-17.69	0.15	19.52	294.99
2049.84	0.64	287.97	2049.69	18.89	8.35	-17.93	0.68	19.77	294.98
2074.58	0.80	279.21	2074.43	19.16	8.42	-18.23	0.77	20.08	294.80
2099.41	0.59	296.84	2099.25	19.42	8.51	-18.51	1.19	20.37	294.68
2124.15	0.65	283.76	2124.00	19.67	8.60	-18.76	0.62	20.64	294.62
2149.76	0.71	295.46	2149.61	19.95	8.70	-19.05	0.59	20.94	294.55
2174.48	0.84	297.30	2174.33	20.27	8.85	-19.34	0.55	21.27	294.58
2199.71	0.69	292.77	2199.55	20.60	8.99	-19.65	0.64	21.61	294.59
2224.44	0.74	298.91	2224.28	20.89	9.13	-19.93	0.35	21.92	294.61
2249.54	0.67	294.98	2249.38	21.19	9.27	-20.20	0.31	22.23	294.64
2274.69	0.76	286.06	2274.52	21.48	9.38	-20.50	0.55	22.54	294.58
2299.24	0.73	284.81	2299.08	21.76	9.46	-20.80	0.12	22.85	294.45
2323.94	0.71	281.32	2323.77	22.03	9.53	-21.10	0.20	23.16	294.30
2349.83	0.76	283.08	2349.66	22.32	9.60	-21.43	0.22	23.48	294.13
2374.47	0.80	274.56	2374.30	22.60	9.65	-21.76	0.50	23.80	293.92
2398.71	0.80	280.70	2398.54	22.88	9.70	-22.09	0.35	24.13	293.70
2424.57	0.68	281.04	2424.39	23.16	9.76	-22.42	0.47	24.46	293.52
2449.38	0.94	272.77	2449.19	23.45	9.80	-22.77	1.15	24.79	293.28
2474.11	0.76	273.72	2473.93	23.73	9.82	-23.14	0.74	25.14	292.99
2498.32	0.89	277.00	2498.14	24.01	9.85	-23.48	0.58	25.47	292.76
2524.30	0.60	271.40	2524.11	24.28	9.88	-23.82	1.15	25.79	292.53
2548.96	0.84	282.30	2548.77	24.53	9.92	-24.13	1.13	26.09	292.35
2574.85	0.87	278.08	2574.65	24.86	9.99	-24.51	0.26	26.47	292.18
2599.57	0.93	270.02	2599.38	25.17	10.02	-24.89	0.58	26.83	291.92
2624.98	1.13	271.22	2624.78	25.51	10.02	-25.35	0.76	27.26	291.57
2649.66	1.40	262.31	2649.45	25.88	9.99	-25.89	1.36	27.75	291.09
2674.37	1.32	265.23	2674.16	26.27	9.92	-26.47	0.42	28.27	290.54
2699.02	1.39	267.64	2698.80	26.68	9.89	-27.06	0.35	28.81	290.07
2724.50	1.27	281.17	2724.27	27.14	9.93	-27.64	1.31	29.37	289.76
2749.14	1.38	275.55	2748.90	27.61	10.01	-28.20	0.69	29.93	289.54

Survey Report

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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
2773.85	1.38	274.70	2773.61	28.08	10.06	-28.79	0.08	30.50	289.26
2799.64	1.31	278.26	2799.39	28.57	10.13	-29.39	0.42	31.09	289.02
2823.92	1.34	284.11	2823.67	29.05	10.24	-29.94	0.57	31.65	288.88
2849.77	1.32	268.58	2849.51	29.54	10.31	-30.53	1.39	32.23	288.65
2874.47	1.34	279.21	2874.21	29.98	10.34	-31.10	1.00	32.78	288.40
2898.77	1.24	267.67	2898.49	30.41	10.38	-31.65	1.15	33.30	288.16
2924.21	1.16	274.18	2923.94	30.81	10.39	-32.18	0.62	33.81	287.89
2949.97	1.19	276.30	2949.68	31.23	10.44	-32.70	0.22	34.33	287.70
2973.79	1.20	274.40	2973.50	31.63	10.48	-33.20	0.17	34.81	287.52
2999.29	1.26	274.97	2998.99	32.06	10.53	-33.74	0.25	35.35	287.33
3024.70	1.22	278.58	3024.39	32.51	10.59	-34.29	0.35	35.89	287.16
3049.46	1.17	276.41	3049.15	32.93	10.66	-34.80	0.28	36.40	287.03
3074.31	1.24	266.16	3074.00	33.32	10.67	-35.32	0.92	36.90	286.81
3099.23	1.10	266.47	3098.91	33.68	10.64	-35.83	0.57	37.37	286.53
3124.45	1.16	264.57	3124.13	34.02	10.60	-36.33	0.28	37.84	286.26
3149.23	1.24	260.01	3148.90	34.35	10.53	-36.84	0.50	38.31	285.95
3174.24	1.35	267.18	3173.90	34.73	10.46	-37.40	0.78	38.84	285.63
3199.56	1.29	261.56	3199.22	35.12	10.41	-37.98	0.57	39.38	285.33
3223.95	1.34	259.39	3223.60	35.46	10.32	-38.53	0.29	39.89	284.99
3248.88	1.25	263.16	3248.53	35.82	10.23	-39.08	0.49	40.40	284.67
3275.00	1.40	263.40	3274.64	36.21	10.16	-39.68	0.57	40.96	284.36
3298.63	1.42	269.81	3298.26	36.62	10.13	-40.26	0.67	41.52	284.12
3323.93	1.35	276.57	3323.56	37.09	10.16	-40.87	0.71	42.12	283.96
3348.93	1.34	281.76	3348.54	37.58	10.25	-41.45	0.49	42.70	283.89
3373.82	1.31	284.24	3373.43	38.09	10.38	-42.01	0.26	43.27	283.88
3399.56	1.42	292.01	3399.16	38.64	10.57	-42.59	0.83	43.88	283.94
3424.46	1.41	290.56	3424.06	39.22	10.79	-43.16	0.14	44.49	284.04
3449.36	1.49	289.10	3448.94	39.80	11.01	-43.75	0.33	45.12	284.12
3474.34	1.30	289.36	3473.93	40.36	11.21	-44.33	0.73	45.72	284.19
3498.69	1.45	296.73	3498.27	40.91	11.44	-44.86	0.95	46.30	284.30
3524.99	1.37	300.72	3524.55	41.54	11.75	-45.43	0.48	46.93	284.50
3549.99	1.24	302.54	3549.55	42.10	12.05	-45.92	0.57	47.47	284.70
3574.99	1.26	310.97	3574.54	42.64	12.37	-46.35	0.74	47.98	284.95
3598.19	1.40	318.71	3597.74	43.18	12.75	-46.73	0.98	48.44	285.26
3624.86	1.48	321.78	3624.40	43.84	13.27	-47.16	0.42	48.99	285.72
3649.87	1.39	322.96	3649.40	44.46	13.77	-47.55	0.38	49.50	286.15

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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
3674.79	1.58	323.67	3674.32	45.09	14.29	-47.93	0.74	50.01	286.60
3699.33	1.56	324.37	3698.84	45.75	14.83	-48.33	0.09	50.55	287.06
3724.27	1.49	322.25	3723.78	46.40	15.36	-48.72	0.37	51.09	287.50
3749.28	1.58	327.08	3748.78	47.06	15.91	-49.11	0.64	51.62	287.95
3774.23	1.61	332.37	3773.71	47.72	16.51	-49.46	0.60	52.14	288.46
3799.72	1.67	329.48	3799.19	48.41	17.15	-49.82	0.40	52.69	289.00
3824.23	1.69	329.37	3823.69	49.10	17.77	-50.18	0.07	53.24	289.50
3849.90	1.74	336.14	3849.35	49.82	18.45	-50.53	0.81	53.80	290.06
3874.39	1.77	340.08	3873.83	50.49	19.15	-50.81	0.51	54.30	290.65
3898.31	1.96	340.75	3897.74	51.18	19.88	-51.07	0.81	54.80	291.27
3924.12	1.95	341.15	3923.53	51.95	20.71	-51.36	0.07	55.38	291.96
3949.38	2.26	343.94	3948.77	52.75	21.60	-51.64	1.30	55.97	292.70
3973.80	2.21	346.78	3973.18	53.55	22.52	-51.88	0.50	56.55	293.46
3999.06	2.34	351.42	3998.42	54.35	23.50	-52.06	0.90	57.12	294.29
4024.72	2.49	354.70	4024.06	55.16	24.57	-52.19	0.79	57.69	295.21
4049.18	2.57	357.07	4048.50	55.94	25.65	-52.27	0.55	58.22	296.14
4074.91	2.62	359.33	4074.20	56.75	26.81	-52.31	0.45	58.78	297.14
4099.35	2.62	2.74	4098.61	57.49	27.93	-52.29	0.64	59.28	298.11
4124.60	2.61	3.49	4123.83	58.22	29.08	-52.22	0.15	59.78	299.11
4149.01	2.49	4.39	4148.22	58.89	30.16	-52.15	0.52	60.25	300.05
4174.67	2.48	5.71	4173.85	59.56	31.27	-52.05	0.23	60.72	301.00
4199.16	2.45	5.99	4198.33	60.18	32.32	-51.95	0.13	61.18	301.89
4224.85	2.58	5.33	4223.99	60.86	33.44	-51.83	0.53	61.68	302.83
4249.96	2.44	7.70	4249.07	61.50	34.53	-51.71	0.69	62.18	303.73
4274.44	2.33	7.13	4273.54	62.08	35.54	-51.58	0.48	62.64	304.57
4298.91	2.24	7.86	4297.99	62.64	36.51	-51.45	0.35	63.09	305.36
4324.56	2.19	7.91	4323.61	63.19	37.49	-51.32	0.22	63.55	306.15
4348.57	2.01	8.67	4347.61	63.69	38.36	-51.19	0.75	63.97	306.85
4374.24	1.98	6.32	4373.26	64.20	39.25	-51.07	0.34	64.41	307.54
4399.87	1.86	4.66	4398.88	64.71	40.10	-50.99	0.53	64.87	308.18
4423.96	1.70	6.52	4422.96	65.15	40.84	-50.92	0.70	65.28	308.74
4448.82	1.66	8.57	4447.81	65.57	41.57	-50.82	0.28	65.66	309.28
4474.09	1.72	10.64	4473.06	65.97	42.30	-50.70	0.34	66.03	309.84
4499.77	1.58	8.87	4498.74	66.37	43.03	-50.57	0.58	66.40	310.39
4523.92	1.39	13.82	4522.88	66.69	43.64	-50.45	0.94	66.71	310.86
4549.16	1.53	9.62	4548.10	67.02	44.27	-50.32	0.69	67.03	311.34



Well Name: MARIE GERHARDT B-1
Survey: MARIE GERHARDT B-1
Survey Date: 7/9/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
4574.17	1.57	2.95	4573.11	67.41	44.95	-50.25	0.74	67.42	311.81
4600.47	1.32	355.80	4599.40	67.86	45.61	-50.25	1.15	67.86	312.23