



Gyroscopic Survey Report  
for  
KP KAUFFMAN

Well Location	WELD COUNTY, CO
Well Name	180208 THE GEORGE W KIEFER B #4
Rig Number	NABORS
Survey Date	8/5/2014
Latitude	40.0456400°N
Longitude	104.8457800°W
North Reference	True North
Grid Correction	None
Depth Reference	GL (0.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 283.47Azim (deg)
Definitive Survey	GEORGE W KIEFER B-4
Operator(s)	C KIRBY, P HOLBROOK

**Well Notes**

# Survey Report

**Well Name:** 180208 THE GEORGE W KIEFER B #4  
**Survey:** GEORGE W KIEFER B-4  
**Survey Date:** 8/5/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	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
90.00	0.60	42.23	90.00	-0.23	0.35	0.32	0.67	0.47	42.23
115.14	0.49	34.35	115.14	-0.33	0.53	0.47	0.52	0.71	41.04
140.80	0.59	27.80	140.80	-0.40	0.74	0.59	0.45	0.95	38.43
165.41	0.62	35.37	165.41	-0.48	0.96	0.72	0.34	1.21	36.98
192.17	0.67	35.71	192.16	-0.59	1.21	0.90	0.21	1.51	36.69
215.95	0.71	32.78	215.94	-0.70	1.45	1.06	0.23	1.79	36.29
242.07	0.69	36.37	242.06	-0.81	1.71	1.24	0.19	2.11	36.03
265.56	0.65	29.46	265.55	-0.90	1.94	1.39	0.38	2.39	35.68
292.22	0.82	38.12	292.21	-1.02	2.22	1.58	0.77	2.73	35.51
317.05	0.63	28.44	317.03	-1.13	2.48	1.76	0.92	3.04	35.35
341.56	0.64	38.27	341.54	-1.23	2.71	1.91	0.45	3.31	35.19
366.08	0.78	24.34	366.06	-1.31	2.97	2.06	0.89	3.61	34.81
390.62	0.75	28.44	390.59	-1.39	3.26	2.21	0.24	3.94	34.11
415.56	0.63	30.38	415.54	-1.47	3.52	2.35	0.49	4.24	33.77
442.15	0.73	30.50	442.12	-1.56	3.79	2.52	0.39	4.55	33.54
466.48	0.57	27.66	466.45	-1.64	4.04	2.65	0.67	4.83	33.29
490.83	0.71	31.84	490.80	-1.72	4.27	2.79	0.58	5.10	33.12
515.02	0.42	48.41	514.99	-1.81	4.46	2.93	1.35	5.34	33.33
541.65	0.38	32.05	541.62	-1.90	4.60	3.05	0.46	5.52	33.58
566.03	0.31	25.26	566.00	-1.94	4.73	3.12	0.33	5.67	33.46
592.12	0.38	49.10	592.09	-2.00	4.85	3.22	0.62	5.82	33.59
615.17	0.36	33.57	615.14	-2.07	4.96	3.32	0.45	5.97	33.79
641.17	0.41	35.76	641.14	-2.14	5.10	3.42	0.20	6.14	33.82
667.30	0.43	43.67	667.26	-2.22	5.25	3.54	0.23	6.33	34.00
693.00	0.21	53.66	692.96	-2.30	5.35	3.64	0.85	6.47	34.28
715.97	0.29	24.23	715.93	-2.34	5.42	3.70	0.64	6.57	34.32
741.98	0.35	63.87	741.95	-2.41	5.52	3.80	0.87	6.70	34.56
768.17	0.31	69.32	768.14	-2.53	5.58	3.94	0.22	6.83	35.22
791.10	0.22	72.21	791.07	-2.62	5.61	4.04	0.37	6.92	35.73
817.38	0.23	80.00	817.35	-2.71	5.64	4.14	0.12	6.99	36.27
840.35	0.29	104.58	840.32	-2.81	5.63	4.24	0.55	7.05	36.97
866.12	0.24	47.79	866.09	-2.91	5.65	4.34	0.99	7.13	37.53
892.43	0.05	47.06	892.39	-2.94	5.70	4.39	0.73	7.19	37.63
915.39	0.32	122.19	915.35	-3.01	5.67	4.45	1.35	7.21	38.15
941.58	0.23	106.40	941.55	-3.13	5.62	4.57	0.45	7.24	39.11

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
967.85	0.23	114.68	967.82	-3.24	5.58	4.66	0.13	7.27	39.89
990.91	0.10	190.49	990.88	-3.28	5.54	4.70	0.99	7.27	40.32
1017.19	0.29	47.93	1017.15	-3.32	5.56	4.75	1.43	7.31	40.47
1043.04	0.36	156.67	1043.00	-3.41	5.53	4.83	2.06	7.34	41.11
1066.15	0.33	161.60	1066.11	-3.49	5.40	4.88	0.19	7.28	42.08
1092.45	0.39	173.88	1092.41	-3.56	5.24	4.91	0.37	7.18	43.14
1115.55	0.39	185.76	1115.51	-3.59	5.08	4.91	0.35	7.07	44.02
1141.87	0.37	201.89	1141.83	-3.59	4.91	4.87	0.42	6.92	44.75
1168.39	0.30	222.12	1168.35	-3.55	4.78	4.79	0.51	6.77	45.05
1190.80	0.62	183.67	1190.76	-3.54	4.62	4.75	1.89	6.62	45.77
1217.15	0.68	184.49	1217.11	-3.59	4.32	4.72	0.26	6.40	47.55
1240.32	0.30	170.70	1240.28	-3.63	4.12	4.72	1.73	6.27	48.87
1266.64	0.28	222.79	1266.60	-3.63	4.01	4.69	0.97	6.17	49.48
1291.14	0.57	221.51	1291.10	-3.54	3.87	4.57	1.18	5.99	49.71
1318.19	0.52	201.36	1318.14	-3.46	3.66	4.44	0.73	5.75	50.47
1342.91	0.52	202.09	1342.87	-3.43	3.45	4.35	0.04	5.56	51.58
1368.37	0.46	183.89	1368.32	-3.43	3.24	4.30	0.66	5.39	52.99
1393.21	0.45	201.44	1393.16	-3.43	3.05	4.26	0.56	5.24	54.37
1415.10	0.32	206.96	1415.05	-3.41	2.92	4.20	0.64	5.11	55.21
1440.53	0.39	197.47	1440.48	-3.38	2.77	4.14	0.36	4.99	56.19
1465.32	0.42	192.34	1465.27	-3.38	2.60	4.10	0.20	4.86	57.56
1490.82	0.26	232.84	1490.77	-3.34	2.48	4.03	1.10	4.73	58.43
1516.40	0.08	244.32	1516.35	-3.29	2.43	3.97	0.71	4.66	58.47
1541.11	0.38	163.78	1541.06	-3.32	2.35	3.98	1.54	4.62	59.44
1565.99	0.67	199.21	1565.94	-3.35	2.13	3.95	1.69	4.49	61.68
1591.57	0.54	222.82	1591.52	-3.27	1.90	3.82	1.10	4.27	63.55
1616.96	0.16	208.24	1616.91	-3.21	1.78	3.72	1.50	4.13	64.42
1642.73	0.24	193.41	1642.67	-3.20	1.70	3.69	0.38	4.06	65.33
1668.09	0.56	207.29	1668.04	-3.17	1.53	3.62	1.28	3.94	67.05
1692.45	0.32	175.74	1692.39	-3.16	1.36	3.58	1.35	3.83	69.17
1718.05	0.40	168.60	1718.00	-3.22	1.20	3.60	0.36	3.79	71.57
1743.70	0.33	237.04	1743.65	-3.21	1.07	3.55	1.63	3.71	73.24
1765.06	0.28	212.13	1765.01	-3.15	0.99	3.48	0.66	3.61	74.06
1790.79	0.29	204.45	1790.74	-3.12	0.88	3.41	0.16	3.53	75.57
1816.41	0.20	197.10	1816.35	-3.10	0.78	3.37	0.41	3.46	77.03
1841.91	0.24	214.82	1841.85	-3.08	0.69	3.33	0.32	3.40	78.27



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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
1866.95	0.35	220.21	1866.89	-3.02	0.59	3.25	0.43	3.30	79.71
1892.58	0.27	216.86	1892.52	-2.97	0.48	3.17	0.31	3.20	81.31
1918.20	0.34	214.41	1918.14	-2.92	0.37	3.09	0.29	3.11	83.10
1943.40	0.30	220.66	1943.34	-2.86	0.26	3.00	0.22	3.01	85.01
1968.43	0.19	201.14	1968.37	-2.82	0.18	2.95	0.55	2.95	86.59
1990.56	0.31	227.42	1990.51	-2.79	0.10	2.89	0.74	2.89	87.99
2015.80	0.34	209.37	2015.74	-2.73	-0.01	2.80	0.42	2.80	90.20
2040.39	0.40	219.13	2040.33	-2.67	-0.14	2.71	0.36	2.72	92.96
2065.63	0.26	241.20	2065.57	-2.59	-0.24	2.61	0.74	2.62	95.20
2090.84	0.41	228.23	2090.78	-2.49	-0.32	2.49	0.65	2.51	97.44
2116.03	0.33	239.77	2115.97	-2.39	-0.42	2.36	0.42	2.39	100.14
2141.24	0.52	229.04	2141.18	-2.27	-0.53	2.21	0.80	2.27	103.58
2165.83	0.54	226.21	2165.77	-2.14	-0.69	2.04	0.12	2.15	108.58
2191.05	0.14	160.14	2190.99	-2.10	-0.80	1.97	1.96	2.12	112.08
2216.26	0.62	284.64	2216.20	-1.98	-0.79	1.85	2.81	2.01	113.26
2241.47	0.79	251.01	2241.41	-1.70	-0.82	1.55	1.73	1.75	117.73
2266.66	0.63	227.20	2266.59	-1.48	-0.97	1.29	1.31	1.61	126.90
2291.36	0.66	215.68	2291.29	-1.35	-1.17	1.10	0.54	1.61	136.77
2316.60	0.56	217.86	2316.53	-1.24	-1.39	0.94	0.41	1.68	145.84
2341.73	0.49	285.16	2341.66	-1.08	-1.46	0.76	2.33	1.65	152.37
2366.97	0.82	264.72	2366.90	-0.80	-1.45	0.48	1.60	1.52	161.71
2391.82	0.86	197.01	2391.75	-0.62	-1.64	0.25	3.78	1.66	171.49
2416.51	0.24	193.35	2416.43	-0.61	-1.87	0.18	2.50	1.88	174.53
2440.51	0.72	278.45	2440.44	-0.46	-1.90	0.02	3.08	1.90	179.45
2465.80	0.86	231.26	2465.72	-0.19	-1.99	-0.29	2.54	2.01	188.17
2492.21	0.59	196.52	2492.13	-0.06	-2.25	-0.48	1.90	2.30	192.03
2517.50	0.41	275.98	2517.42	0.04	-2.36	-0.61	2.60	2.44	194.39
2542.76	1.03	266.33	2542.68	0.35	-2.37	-0.92	2.48	2.54	201.29
2568.31	0.81	243.36	2568.22	0.70	-2.46	-1.31	1.66	2.79	208.04
2593.32	0.11	137.70	2593.23	0.82	-2.56	-1.45	3.37	2.94	209.58
2615.75	0.73	240.22	2615.66	0.90	-2.65	-1.56	3.38	3.07	210.55
2640.65	0.81	272.04	2640.56	1.19	-2.72	-1.88	1.72	3.30	214.59
2665.84	0.53	306.68	2665.75	1.47	-2.64	-2.15	1.91	3.41	219.09
2691.15	0.03	233.71	2691.06	1.59	-2.58	-2.25	2.06	3.42	221.08
2716.46	0.76	223.00	2716.37	1.67	-2.71	-2.37	2.89	3.60	221.20
2741.23	0.95	269.63	2741.14	1.95	-2.83	-2.69	2.82	3.90	223.53

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
2766.25	0.65	303.38	2766.15	2.29	-2.75	-3.01	2.18	4.08	227.59
2791.20	0.24	321.21	2791.10	2.46	-2.63	-3.16	1.72	4.11	230.22
2816.66	0.77	233.17	2816.56	2.61	-2.69	-3.33	3.14	4.29	231.04
2842.14	0.88	280.76	2842.04	2.92	-2.76	-3.66	2.64	4.59	232.98
2866.93	0.82	310.80	2866.83	3.26	-2.61	-3.98	1.79	4.76	236.75
2891.24	0.21	328.89	2891.14	3.45	-2.46	-4.14	2.56	4.81	239.26
2916.07	0.41	208.59	2915.96	3.50	-2.50	-4.20	2.21	4.89	239.25
2940.98	0.73	253.41	2940.87	3.67	-2.62	-4.40	2.11	5.12	239.18
2965.54	0.94	296.99	2965.43	4.00	-2.58	-4.73	2.65	5.38	241.40
2990.52	0.61	343.59	2990.41	4.26	-2.36	-4.95	2.74	5.48	244.54
3015.70	0.51	242.80	3015.59	4.42	-2.28	-5.09	3.46	5.57	245.87
3041.67	1.20	248.75	3041.55	4.73	-2.43	-5.44	2.66	5.96	245.94
3065.20	1.42	283.09	3065.08	5.22	-2.45	-5.96	3.41	6.44	247.62
3091.44	0.48	269.83	3091.32	5.65	-2.38	-6.38	3.65	6.81	249.56
3117.50	1.03	241.53	3117.37	5.93	-2.49	-6.70	2.48	7.15	249.60
3140.87	1.65	271.20	3140.74	6.42	-2.58	-7.22	3.88	7.67	250.30
3165.51	1.97	248.25	3165.36	7.11	-2.73	-7.97	3.19	8.42	251.06
3190.67	1.25	242.01	3190.52	7.67	-3.02	-8.61	2.93	9.12	250.65
3216.44	0.72	253.68	3216.28	8.02	-3.20	-9.01	2.20	9.56	250.45
3242.24	0.63	235.20	3242.08	8.26	-3.33	-9.29	0.90	9.86	250.29
3267.96	0.96	178.05	3267.80	8.29	-3.62	-9.40	3.17	10.07	248.91
3290.14	0.15	186.59	3289.97	8.24	-3.84	-9.39	3.65	10.15	247.77
3315.36	0.81	276.37	3315.19	8.41	-3.85	-9.57	3.26	10.32	248.08
3341.18	1.02	234.61	3341.02	8.74	-3.97	-9.94	2.63	10.70	248.25
3367.02	0.45	209.71	3366.85	8.92	-4.19	-10.18	2.45	11.01	247.64
3392.88	0.51	305.90	3392.71	9.06	-4.21	-10.32	2.79	11.15	247.82
3418.33	1.05	291.94	3418.16	9.39	-4.05	-10.63	2.21	11.38	249.12
3440.52	0.90	257.66	3440.34	9.75	-4.02	-10.99	2.66	11.70	249.92
3466.29	0.20	54.17	3466.11	9.90	-4.03	-11.15	4.22	11.86	250.11
3492.08	0.70	323.13	3491.90	10.00	-3.88	-11.21	2.83	11.86	250.90
3516.27	0.89	270.53	3516.09	10.29	-3.76	-11.48	2.99	12.08	251.87
3541.55	1.00	339.15	3541.37	10.61	-3.55	-11.76	4.23	12.28	253.19
3566.90	0.24	15.68	3566.72	10.73	-3.30	-11.82	3.25	12.27	254.43
3592.40	0.58	280.62	3592.21	10.86	-3.22	-11.94	2.54	12.36	254.90
3617.02	1.09	315.90	3616.84	11.18	-3.03	-12.22	2.85	12.59	256.08
3642.46	0.78	4.36	3642.27	11.41	-2.68	-12.38	3.22	12.67	257.78

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3667.82	0.46	265.95	3667.63	11.54	-2.52	-12.47	3.81	12.72	258.59
3692.02	0.29	14.45	3691.83	11.63	-2.46	-12.55	2.57	12.79	258.89
3717.39	0.84	356.21	3717.20	11.69	-2.22	-12.55	2.24	12.74	259.99
3742.78	0.62	339.86	3742.58	11.82	-1.90	-12.61	1.19	12.75	261.42
3766.99	0.09	326.06	3766.79	11.90	-1.76	-12.66	2.18	12.78	262.07
3792.58	0.76	325.22	3792.39	12.04	-1.61	-12.77	2.59	12.87	262.82
3817.77	0.52	329.89	3817.57	12.25	-1.37	-12.92	0.95	12.99	263.94
3843.20	0.54	329.50	3843.00	12.41	-1.17	-13.04	0.09	13.09	264.88
3865.12	0.61	349.70	3864.92	12.53	-0.96	-13.11	0.97	13.15	265.79
3893.43	0.66	327.92	3893.23	12.71	-0.68	-13.23	0.87	13.25	267.07
3915.24	0.53	337.15	3915.04	12.86	-0.48	-13.34	0.76	13.34	267.95
3940.66	0.54	320.71	3940.45	13.02	-0.28	-13.46	0.60	13.46	268.82
3966.03	0.53	309.41	3965.82	13.22	-0.11	-13.62	0.42	13.62	269.54
3990.96	0.46	320.74	3990.75	13.40	0.04	-13.77	0.47	13.77	270.17
4016.38	0.59	316.99	4016.17	13.59	0.21	-13.93	0.52	13.93	270.88
4041.80	0.55	314.76	4041.59	13.81	0.40	-14.10	0.17	14.11	271.61
4067.26	0.61	303.58	4067.05	14.04	0.56	-14.30	0.50	14.31	272.23
4092.00	0.61	302.88	4091.79	14.29	0.70	-14.52	0.03	14.54	272.76
4117.42	0.63	296.26	4117.21	14.55	0.84	-14.76	0.29	14.78	273.24
4142.97	0.64	299.53	4142.75	14.82	0.97	-15.01	0.16	15.04	273.69
4168.30	0.64	291.87	4168.09	15.10	1.09	-15.27	0.34	15.31	274.09
4190.28	0.65	294.21	4190.06	15.34	1.19	-15.49	0.13	15.54	274.39
4215.28	0.75	290.64	4215.06	15.65	1.30	-15.78	0.44	15.83	274.73
4240.03	0.76	285.86	4239.81	15.97	1.41	-16.09	0.26	16.15	275.00
4265.00	0.75	292.15	4264.78	16.30	1.51	-16.40	0.34	16.47	275.27
4290.01	0.69	302.17	4289.79	16.61	1.66	-16.68	0.55	16.76	275.67
4318.38	0.93	283.12	4318.15	17.00	1.80	-17.05	1.25	17.14	276.02
4342.76	0.92	284.55	4342.52	17.39	1.89	-17.43	0.10	17.53	276.20
4367.91	0.90	297.01	4367.68	17.78	2.03	-17.80	0.79	17.91	276.52
4392.65	0.94	293.90	4392.41	18.17	2.20	-18.16	0.26	18.29	276.92
4417.36	1.14	296.97	4417.12	18.61	2.40	-18.56	0.83	18.72	277.36
4440.02	1.05	301.78	4439.78	19.03	2.61	-18.94	0.54	19.12	277.84
4466.12	1.20	298.30	4465.87	19.52	2.86	-19.38	0.60	19.59	278.41
4490.64	1.19	299.93	4490.38	20.01	3.11	-19.83	0.14	20.07	278.92
4515.60	1.21	317.29	4515.34	20.48	3.44	-20.23	1.45	20.52	279.64
4540.97	1.22	307.56	4540.70	20.95	3.80	-20.63	0.82	20.98	280.43

**Well Name:** 180208 THE GEORGE W KIEFER B #4**Survey:** GEORGE W KIEFER B-4**Survey Date:** 8/5/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
4565.42	0.93	296.81	4565.15	21.38	4.05	-21.01	1.45	21.40	280.90
4590.99	0.89	284.72	4590.72	21.78	4.19	-21.39	0.77	21.80	281.08
4616.65	1.23	306.64	4616.37	22.23	4.41	-21.81	2.03	22.25	281.42
4640.84	1.05	306.74	4640.56	22.67	4.69	-22.19	0.74	22.68	281.94
4665.30	0.92	315.64	4665.01	23.05	4.97	-22.51	0.83	23.05	282.45
4690.44	1.30	296.83	4690.15	23.49	5.24	-22.90	2.08	23.49	282.89
4715.76	1.29	287.88	4715.46	24.06	5.46	-23.43	0.80	24.06	283.11
4741.14	1.32	295.53	4740.83	24.63	5.67	-23.97	0.69	24.63	283.31
4754.46	1.24	297.27	4754.15	24.92	5.80	-24.23	0.68	24.92	283.47