



**Scientific
Drilling**

Survey Certification

7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Operator	K.P. Kauffman
Well Name & No.	Harriet Lucke #2
County & State	Weld County, CO
SDI Job No.	410913K54023
Rig	Halliburton Truck 118527
Survey Date	11-Sep-2013

I, Steven F. Gottschalk, having personal knowledge of all the facts, hereby
certify that the attached directional survey run from a measured depth of 0 feet to a
measured depth of 4915.2 feet is true and correct as determined from all available records.


Signature

25-Sep-2013
Date

Steven F. Gottschalk
Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District

KP Kauffman Co, Inc.

Weld County, CO

Harriet Lucke

Harriet Lucke #2

OH

Design: OH

Standard Survey Report

25 September, 2013



Scientific Drilling International

Survey Report

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Harriet Lucke #2
Project:	Weld County, CO	TVD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Site:	Harriet Lucke	MD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Well:	Harriet Lucke #2	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Harriet Lucke			
Site Position:		Northing:	1,249,534.96 usft	Latitude:	40° 1' 0.516 N
From:	Lat/Long	Easting:	3,167,478.08 usft	Longitude:	104° 54' 7.344 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.39 °

Well	Harriet Lucke #2, 66' FSL, 760 FWL SEC 28 T0 R67W					
Well Position	+N/-S	0.00 ft	Northing:	1,249,534.95 usft	Latitude:	40° 1' 0.516 N
	+E/-W	0.00 ft	Easting:	3,167,478.08 usft	Longitude:	104° 54' 7.344 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	5,002.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	9/11/2013	8.64	66.63	52,606

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	314.92	

Survey Program	Date	9/25/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,915.20	Survey #1 Surface Gyros (OH)	SDI Standard Keeper 103	SDI Standard Wireline Keeper ver 1.0.3	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.39	356.43	100.00	0.34	-0.02	0.25	0.39	0.39	0.00
First SDI Gyro Survey									
124.10	0.62	353.07	124.10	0.55	-0.04	0.42	0.96	0.95	-13.94
149.14	0.28	347.60	149.14	0.75	-0.07	0.58	1.37	-1.36	-21.85
174.85	0.43	354.08	174.85	0.90	-0.09	0.70	0.60	0.58	25.20
199.18	0.34	353.03	199.18	1.07	-0.11	0.83	0.37	-0.37	-4.32
224.55	0.49	353.64	224.55	1.25	-0.13	0.98	0.59	0.59	2.40
249.90	0.45	356.44	249.89	1.45	-0.15	1.14	0.18	-0.16	11.05
274.77	0.36	351.35	274.76	1.63	-0.17	1.27	0.39	-0.36	-20.47
299.48	0.30	354.53	299.47	1.77	-0.19	1.38	0.25	-0.24	12.87

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Site:	Harriet Lucke	MD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Well:	Harriet Lucke #2	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
324.14	0.33	351.32	324.13	1.90	-0.21	1.49	0.14	0.12	-13.02
349.77	0.49	353.76	349.76	2.09	-0.23	1.64	0.63	0.62	9.52
374.39	0.45	350.51	374.38	2.29	-0.26	1.80	0.20	-0.16	-13.20
399.07	0.33	330.57	399.06	2.44	-0.31	1.94	0.73	-0.49	-80.79
424.46	0.41	313.25	424.45	2.57	-0.41	2.10	0.54	0.32	-68.22
449.11	0.47	305.39	449.10	2.69	-0.56	2.29	0.34	0.24	-31.89
474.79	0.50	284.37	474.78	2.78	-0.75	2.49	0.70	0.12	-81.85
498.67	0.53	287.43	498.66	2.84	-0.96	2.68	0.17	0.13	12.81
524.33	0.56	267.70	524.32	2.87	-1.19	2.87	0.74	0.12	-76.89
549.97	0.61	262.67	549.96	2.85	-1.45	3.04	0.28	0.20	-19.62
573.80	0.73	255.06	573.78	2.79	-1.73	3.19	0.63	0.50	-31.93
599.30	0.76	253.92	599.28	2.70	-2.05	3.36	0.13	0.12	-4.47
624.77	0.76	254.18	624.75	2.61	-2.37	3.52	0.01	0.00	1.02
648.77	0.78	254.29	648.75	2.52	-2.68	3.68	0.08	0.08	0.46
674.33	0.83	229.75	674.31	2.35	-2.99	3.78	1.35	0.20	-96.01
699.91	1.06	214.23	699.88	2.04	-3.27	3.75	1.34	0.90	-60.67
724.65	1.07	215.07	724.62	1.66	-3.53	3.67	0.07	0.04	3.40
748.87	1.02	211.73	748.83	1.29	-3.77	3.58	0.33	-0.21	-13.79
774.02	1.07	208.13	773.98	0.89	-4.00	3.46	0.33	0.20	-14.31
799.60	1.10	209.30	799.55	0.47	-4.23	3.33	0.15	0.12	4.57
823.76	1.09	208.87	823.71	0.07	-4.46	3.20	0.05	-0.04	-1.78
850.97	1.04	207.41	850.92	-0.38	-4.69	3.06	0.21	-0.18	-5.37
875.32	1.09	209.17	875.26	-0.78	-4.91	2.93	0.25	0.21	7.23
900.86	0.97	211.93	900.80	-1.17	-5.14	2.81	0.51	-0.47	10.81
925.16	1.05	207.29	925.09	-1.55	-5.35	2.70	0.47	0.33	-19.09
951.08	1.13	207.03	951.01	-1.98	-5.58	2.55	0.31	0.31	-1.00
975.55	1.15	204.13	975.47	-2.42	-5.79	2.39	0.25	0.08	-11.85
1,000.67	1.52	209.13	1,000.59	-2.94	-6.05	2.21	1.54	1.47	19.90
1,025.02	1.45	209.44	1,024.93	-3.50	-6.36	2.04	0.29	-0.29	1.27
1,050.55	0.86	212.46	1,050.45	-3.94	-6.62	1.91	2.32	-2.31	11.83
1,076.14	0.79	205.84	1,076.04	-4.26	-6.80	1.81	0.46	-0.27	-25.87
1,100.47	0.67	215.46	1,100.37	-4.53	-6.96	1.73	0.70	-0.49	39.54
1,126.18	0.72	235.16	1,126.08	-4.74	-7.18	1.74	0.94	0.19	76.62
1,150.18	1.71	217.68	1,150.07	-5.11	-7.52	1.72	4.36	4.13	-72.83
1,175.35	1.30	222.75	1,175.23	-5.62	-7.94	1.66	1.71	-1.63	20.14
1,200.89	1.01	224.61	1,200.77	-5.99	-8.30	1.65	1.14	-1.14	7.28
1,225.47	1.32	221.97	1,225.34	-6.35	-8.64	1.63	1.28	1.26	-10.74
1,250.04	1.71	219.15	1,249.90	-6.85	-9.06	1.58	1.62	1.59	-11.48
1,275.62	1.45	220.40	1,275.47	-7.39	-9.51	1.52	1.03	-1.02	4.89
1,300.11	1.38	224.55	1,299.96	-7.84	-9.92	1.49	0.51	-0.29	16.95
1,325.29	1.23	227.42	1,325.13	-8.24	-10.33	1.50	0.65	-0.60	11.40
1,350.94	1.38	225.10	1,350.77	-8.64	-10.75	1.51	0.62	0.58	-9.04
1,375.85	1.22	231.77	1,375.68	-9.02	-11.17	1.54	0.88	-0.64	26.78

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Project:	Weld County, CO	TVD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Site:	Harriet Lucke	MD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Well:	Harriet Lucke #2	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,400.30	1.54	225.60	1,400.12	-9.41	-11.61	1.58	1.44	1.31	-25.24
1,425.81	1.59	226.72	1,425.62	-9.89	-12.12	1.60	0.23	0.20	4.39
1,450.02	0.60	260.15	1,449.83	-10.14	-12.49	1.68	4.70	-4.09	138.08
1,475.20	1.56	229.46	1,475.00	-10.39	-12.88	1.78	4.32	3.81	-121.88
1,500.41	1.30	230.00	1,500.20	-10.79	-13.36	1.83	1.03	-1.03	2.14
1,525.72	1.22	228.26	1,525.51	-11.16	-13.78	1.88	0.35	-0.32	-6.87
1,550.87	1.17	231.56	1,550.65	-11.50	-14.18	1.92	0.34	-0.20	13.12
1,575.17	1.26	229.36	1,574.95	-11.82	-14.57	1.97	0.42	0.37	-9.05
1,601.53	1.32	227.09	1,601.30	-12.22	-15.02	2.00	0.30	0.23	-8.61
1,625.04	1.28	228.83	1,624.80	-12.58	-15.41	2.03	0.24	-0.17	7.40
1,650.20	1.31	228.84	1,649.96	-12.95	-15.84	2.07	0.12	0.12	0.04
1,675.39	1.19	227.96	1,675.14	-13.32	-16.25	2.10	0.48	-0.48	-3.49
1,700.50	1.17	229.81	1,700.25	-13.66	-16.64	2.14	0.17	-0.08	7.37
1,725.89	1.15	228.25	1,725.63	-13.99	-17.03	2.18	0.15	-0.08	-6.14
1,749.11	1.06	243.75	1,748.85	-14.24	-17.40	2.26	1.34	-0.39	66.75
1,774.21	1.17	236.72	1,773.94	-14.49	-17.82	2.39	0.70	0.44	-28.01
1,798.84	1.10	238.87	1,798.57	-14.75	-18.23	2.50	0.33	-0.28	8.73
1,824.06	1.07	240.04	1,823.78	-14.99	-18.64	2.62	0.15	-0.12	4.64
1,849.35	1.08	238.34	1,849.07	-15.23	-19.05	2.73	0.13	0.04	-6.72
1,874.46	1.10	233.85	1,874.17	-15.50	-19.45	2.82	0.35	0.08	-17.88
1,899.59	1.02	240.05	1,899.30	-15.75	-19.83	2.92	0.56	-0.32	24.67
1,924.35	0.99	240.94	1,924.06	-15.97	-20.21	3.04	0.14	-0.12	3.59
1,949.50	0.78	250.78	1,949.20	-16.13	-20.56	3.17	1.03	-0.83	39.13
1,974.52	0.89	248.21	1,974.22	-16.26	-20.90	3.32	0.46	0.44	-10.27
1,998.83	0.89	252.56	1,998.53	-16.38	-21.26	3.49	0.28	0.00	17.89
2,024.85	0.87	243.70	2,024.54	-16.53	-21.63	3.64	0.53	-0.08	-34.05
2,049.92	0.94	235.06	2,049.61	-16.73	-21.97	3.74	0.61	0.28	-34.46
2,074.95	0.89	249.05	2,074.64	-16.92	-22.32	3.86	0.91	-0.20	55.89
2,098.42	0.92	237.89	2,098.10	-17.09	-22.65	3.97	0.76	0.13	-47.55
2,124.70	0.86	252.88	2,124.38	-17.26	-23.02	4.11	0.91	-0.23	57.04
2,149.82	0.89	256.47	2,149.50	-17.36	-23.39	4.30	0.25	0.12	14.29
2,174.74	0.84	258.42	2,174.42	-17.44	-23.75	4.50	0.23	-0.20	7.83
2,199.08	0.89	257.94	2,198.75	-17.52	-24.11	4.71	0.21	0.21	-1.97
2,224.95	0.90	266.40	2,224.62	-17.57	-24.51	4.95	0.51	0.04	32.70
2,249.17	0.98	261.61	2,248.84	-17.61	-24.91	5.20	0.46	0.33	-19.78
2,274.99	0.91	274.98	2,274.65	-17.63	-25.33	5.49	0.89	-0.27	51.78
2,299.21	0.87	278.65	2,298.87	-17.58	-25.70	5.78	0.29	-0.17	15.15
2,323.86	0.91	274.72	2,323.52	-17.54	-26.08	6.09	0.30	0.16	-15.94
2,348.84	0.91	293.06	2,348.49	-17.44	-26.46	6.42	1.16	0.00	73.42
2,374.65	0.88	291.30	2,374.30	-17.29	-26.84	6.79	0.16	-0.12	-6.82
2,399.28	0.83	302.46	2,398.93	-17.13	-27.16	7.14	0.70	-0.20	45.31
2,424.85	0.80	306.78	2,424.50	-16.92	-27.46	7.50	0.27	-0.12	16.89
2,448.99	0.84	310.69	2,448.63	-16.70	-27.73	7.84	0.28	0.17	16.20

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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2,474.42	0.74	322.17	2,474.06	-16.45	-27.97	8.19	0.73	-0.39		45.14
2,499.46	0.76	325.16	2,499.10	-16.19	-28.17	8.51	0.18	0.08		11.94
2,524.77	0.79	325.12	2,524.41	-15.91	-28.36	8.85	0.12	0.12		-0.16
2,548.86	0.69	332.47	2,548.49	-15.64	-28.53	9.15	0.57	-0.42		30.51
2,574.01	0.62	330.68	2,573.64	-15.39	-28.66	9.43	0.29	-0.28		-7.12
2,599.01	0.50	338.77	2,598.64	-15.17	-28.77	9.66	0.57	-0.48		32.36
2,624.72	0.54	339.21	2,624.35	-14.95	-28.85	9.87	0.16	0.16		1.71
2,649.02	0.54	343.92	2,648.65	-14.74	-28.92	10.08	0.18	0.00		19.38
2,673.88	0.53	343.21	2,673.51	-14.51	-28.99	10.28	0.05	-0.04		-2.86
2,699.22	0.51	341.11	2,698.85	-14.29	-29.06	10.48	0.11	-0.08		-8.29
2,724.22	0.61	349.90	2,723.85	-14.06	-29.12	10.69	0.53	0.40		35.16
2,749.07	0.45	344.93	2,748.69	-13.83	-29.17	10.89	0.67	-0.64		-20.00
2,774.00	0.61	343.22	2,773.62	-13.61	-29.23	11.09	0.64	0.64		-6.86
2,799.76	0.64	344.25	2,799.38	-13.34	-29.31	11.33	0.12	0.12		4.00
2,824.74	0.55	345.69	2,824.36	-13.09	-29.38	11.56	0.37	-0.36		5.76
2,849.62	0.59	348.10	2,849.24	-12.85	-29.43	11.77	0.19	0.16		9.69
2,874.53	0.81	342.82	2,874.15	-12.56	-29.51	12.03	0.92	0.88		-21.20
2,899.10	0.94	341.79	2,898.71	-12.20	-29.63	12.36	0.53	0.53		-4.19
2,924.07	1.10	341.75	2,923.68	-11.78	-29.77	12.76	0.64	0.64		-0.16
2,949.45	1.12	342.77	2,949.06	-11.31	-29.92	13.20	0.11	0.08		4.02
2,974.83	1.07	343.13	2,974.43	-10.85	-30.06	13.62	0.20	-0.20		1.42
2,999.69	1.12	343.38	2,999.29	-10.39	-30.19	14.04	0.20	0.20		1.01
3,024.11	1.28	341.59	3,023.70	-9.90	-30.35	14.50	0.67	0.66		-7.33
3,049.55	1.03	338.10	3,049.14	-9.42	-30.52	14.96	1.02	-0.98		-13.72
3,074.51	1.15	341.06	3,074.09	-8.98	-30.69	15.39	0.53	0.48		11.86
3,099.82	0.98	336.47	3,099.40	-8.54	-30.86	15.82	0.75	-0.67		-18.14
3,123.92	1.44	343.15	3,123.49	-8.06	-31.03	16.28	1.99	1.91		27.72
3,148.93	0.77	335.04	3,148.50	-7.61	-31.19	16.71	2.74	-2.68		-32.43
3,174.09	0.75	334.02	3,173.65	-7.30	-31.33	17.03	0.10	-0.08		-4.05
3,199.51	1.56	345.63	3,199.07	-6.82	-31.49	17.48	3.30	3.19		45.67
3,224.56	0.86	329.91	3,224.11	-6.33	-31.67	17.96	3.07	-2.79		-62.75
3,249.92	1.14	337.40	3,249.47	-5.93	-31.86	18.38	1.22	1.10		29.53
3,273.98	1.15	336.70	3,273.53	-5.49	-32.05	18.82	0.07	0.04		-2.91
3,299.01	0.87	325.52	3,298.55	-5.10	-32.26	19.24	1.36	-1.12		-44.67
3,324.38	0.84	322.93	3,323.92	-4.79	-32.48	19.61	0.19	-0.12		-10.21
3,349.69	0.88	326.71	3,349.23	-4.48	-32.70	19.99	0.27	0.16		14.93
3,373.32	1.09	331.95	3,372.85	-4.13	-32.90	20.38	0.97	0.89		22.18
3,399.57	0.90	325.76	3,399.10	-3.74	-33.14	20.82	0.83	-0.72		-23.58
3,424.97	0.79	321.10	3,424.50	-3.44	-33.36	21.19	0.51	-0.43		-18.35
3,449.85	0.85	324.65	3,449.37	-3.16	-33.57	21.54	0.32	0.24		14.27
3,473.93	0.91	323.28	3,473.45	-2.86	-33.79	21.91	0.26	0.25		-5.69
3,499.14	0.90	324.44	3,498.66	-2.54	-34.02	22.30	0.08	-0.04		4.60
3,524.08	0.91	325.99	3,523.59	-2.21	-34.25	22.69	0.11	0.04		6.21
3,549.48	0.87	329.07	3,548.99	-1.88	-34.46	23.08	0.25	-0.16		12.13

Scientific Drilling International

Survey Report

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Harriet Lucke #2
Project:	Weld County, CO	TVD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Site:	Harriet Lucke	MD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Well:	Harriet Lucke #2	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,574.77	0.90	335.07	3,574.28	-1.53	-34.64	23.45	0.38	0.12	23.72
3,598.36	0.85	335.01	3,597.87	-1.21	-34.80	23.79	0.21	-0.21	-0.25
3,624.95	0.81	345.99	3,624.45	-0.85	-34.92	24.13	0.62	-0.15	41.29
3,648.98	0.86	355.57	3,648.48	-0.50	-34.98	24.41	0.62	0.21	39.87
3,674.17	0.98	351.19	3,673.67	-0.10	-35.03	24.73	0.55	0.48	-17.39
3,699.00	1.13	359.85	3,698.49	0.35	-35.06	25.08	0.88	0.60	34.88
3,724.29	1.01	357.08	3,723.78	0.83	-35.07	25.42	0.52	-0.47	-10.95
3,749.48	1.34	355.54	3,748.96	1.34	-35.11	25.81	1.32	1.31	-6.11
3,774.37	1.59	357.02	3,773.84	1.98	-35.15	26.28	1.02	1.00	5.95
3,799.60	1.75	355.87	3,799.06	2.71	-35.19	26.83	0.65	0.63	-4.56
3,824.70	1.72	357.38	3,824.15	3.47	-35.24	27.40	0.22	-0.12	6.02
3,849.73	1.77	355.71	3,849.17	4.23	-35.28	27.97	0.28	0.20	-6.67
3,874.08	2.21	357.22	3,873.51	5.07	-35.34	28.60	1.82	1.81	6.20
3,898.87	2.45	356.18	3,898.28	6.08	-35.39	29.35	0.98	0.97	-4.20
3,924.91	2.58	355.25	3,924.29	7.22	-35.48	30.22	0.52	0.50	-3.57
3,949.55	2.33	354.47	3,948.91	8.27	-35.57	31.03	1.02	-1.01	-3.17
3,973.83	2.81	356.67	3,973.16	9.36	-35.66	31.85	2.02	1.98	9.06
3,999.81	3.05	359.20	3,999.11	10.68	-35.70	32.82	1.05	0.92	9.74
4,024.48	2.82	359.36	4,023.75	11.95	-35.72	33.73	0.93	-0.93	0.65
4,049.13	3.17	0.61	4,048.36	13.23	-35.72	34.64	1.44	1.42	5.07
4,074.71	3.14	1.90	4,073.90	14.64	-35.69	35.61	0.30	-0.12	5.04
4,099.40	2.62	6.33	4,098.56	15.88	-35.60	36.42	2.29	-2.11	17.94
4,124.06	2.73	7.99	4,123.20	17.02	-35.46	37.13	0.55	0.45	6.73
4,149.15	2.33	10.16	4,148.26	18.11	-35.29	37.78	1.64	-1.59	8.65
4,173.83	2.48	10.84	4,172.92	19.13	-35.10	38.36	0.62	0.61	2.76
4,199.36	2.28	14.04	4,198.43	20.17	-34.87	38.93	0.94	-0.78	12.53
4,224.02	2.12	11.56	4,223.07	21.09	-34.66	39.43	0.75	-0.65	-10.06
4,249.02	2.15	15.90	4,248.05	21.99	-34.44	39.92	0.66	0.12	17.36
4,274.48	2.29	16.35	4,273.49	22.94	-34.16	40.39	0.55	0.55	1.77
4,298.83	1.93	14.77	4,297.83	23.80	-33.92	40.83	1.50	-1.48	-6.49
4,324.75	1.95	14.10	4,323.73	24.65	-33.70	41.27	0.12	0.08	-2.58
4,349.36	1.88	15.91	4,348.33	25.45	-33.49	41.68	0.38	-0.28	7.35
4,374.12	1.87	15.96	4,373.07	26.23	-33.27	42.08	0.04	-0.04	0.20
4,398.43	1.75	13.89	4,397.37	26.97	-33.07	42.46	0.56	-0.49	-8.52
4,424.24	1.73	13.24	4,423.17	27.73	-32.89	42.87	0.11	-0.08	-2.52
4,448.86	1.48	12.88	4,447.78	28.40	-32.73	43.23	1.02	-1.02	-1.46
4,474.77	1.52	4.08	4,473.68	29.07	-32.63	43.63	0.90	0.15	-33.96
4,499.40	1.45	359.69	4,498.30	29.71	-32.61	44.07	0.54	-0.28	-17.82
4,524.84	1.43	355.33	4,523.74	30.35	-32.64	44.54	0.44	-0.08	-17.14
4,548.92	1.31	345.93	4,547.81	30.91	-32.73	45.00	1.06	-0.50	-39.04
4,573.88	1.29	340.56	4,572.76	31.46	-32.89	45.50	0.49	-0.08	-21.51
4,599.58	1.34	328.80	4,598.46	31.98	-33.14	46.05	1.07	0.19	-45.76
4,623.67	1.55	326.30	4,622.54	32.50	-33.47	46.65	0.91	0.87	-10.38

Scientific Drilling International

Survey Report

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Harriet Lucke #2
Project:	Weld County, CO	TVD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Site:	Harriet Lucke	MD Reference:	GL 5002' & 8' @ 5010.00ft (Halliburton 118527)
Well:	Harriet Lucke #2	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,649.17	1.68	323.50	4,648.03	33.08	-33.88	47.35	0.60	0.51	-10.98	
4,674.81	1.82	321.14	4,673.66	33.70	-34.36	48.13	0.61	0.55	-9.20	
4,699.71	1.83	316.98	4,698.54	34.30	-34.88	48.92	0.53	0.04	-16.71	
4,724.52	1.88	315.74	4,723.34	34.88	-35.44	49.72	0.26	0.20	-5.00	
4,749.09	2.12	320.84	4,747.90	35.52	-36.01	50.58	1.22	0.98	20.76	
4,774.48	2.05	318.43	4,773.27	36.23	-36.60	51.50	0.44	-0.28	-9.49	
4,799.44	1.90	315.04	4,798.21	36.85	-37.19	52.36	0.76	-0.60	-13.58	
4,824.31	2.10	309.61	4,823.07	37.44	-37.83	53.22	1.11	0.80	-21.83	
4,848.90	1.94	315.05	4,847.64	38.02	-38.48	54.09	1.01	-0.65	22.12	
4,873.71	1.93	321.07	4,872.44	38.64	-39.03	54.93	0.82	-0.04	24.26	
4,899.75	1.86	324.85	4,898.47	39.33	-39.55	55.78	0.55	-0.27	14.52	
4,915.20	1.72	323.41	4,913.91	39.72	-39.84	56.25	0.95	-0.91	-9.32	
Last SDI Gyro Survey										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
100.00	100.00	0.34	-0.02	First SDI Gyro Survey	
4,915.20	4,913.91	39.72	-39.84	Last SDI Gyro Survey	

Checked By: _____ Approved By: _____ Date: _____