

**Cimarex Energy
Midway 17 Federal No. 4 A
Chaves County, NM
Patriot No. 4
API# 30-005-29065**

RECEIVED

**MAR 08 2010
HOBBSUCD**

**June 25, 2009 – July 11, 2009
MO-MJ-0006728497**

Sperry Drilling Services Survey Report

**SUR: D-17-15s-31e, 375/N & 375/W
BHL: A-17-15s-31e, 359/N & 4825/W
API # 30-005-29065**

**Submitted by James Ballin
6155 West Murphy
Odessa, TX 79763
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HALLIBURTON

**Drilling and Formation
Evaluation**



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MAR 08 2010

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DIRECTIONAL SURVEY REPORT

Cimarex Energy Company

Midway 17 Federal No. 4

Midway 17 Federal

Chaves County NM

USA

MO-MJ-006728497

SURVEYS CALCULATED USING LONG COLLAR METHOD. TIE ON SURVEYS PROVIDED BY A GYRODATA DIRECTIONAL SURVEY FROM 0'MD TO 8419'MD. SURVEYS FROM 8564' MD TO 13018' MD ARE PROVIDED BY SPERRY DRILLING SERVICES.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
86.70	0.93	293.81	86.70	0.28 N	0.64 W	-0.64	1.07
145.80	0.91	282.96	145.79	0.58 N	1.54 W	-1.54	0.30
236.00	0.70	272.59	235.98	0.77 N	2.79 W	-2.79	0.28
325.70	0.60	260.95	325.67	0.72 N	3.80 W	-3.80	0.18
415.30	0.88	276.60	415.27	0.72 N	4.95 W	-4.94	0.38
504.60	0.87	272.56	504.56	0.83 N	6.30 W	-6.30	0.07
594.50	0.74	250.21	594.45	0.67 N	7.53 W	-7.53	0.37
684.60	0.80	261.20	684.54	0.37 N	8.70 W	-8.70	0.18
805.60	0.81	260.29	805.53	0.10 N	10.38 W	-10.38	0.01
900.60	0.76	255.50	900.52	0.17 S	11.65 W	-11.65	0.09
995.50	0.64	256.21	995.41	0.45 S	12.78 W	-12.78	0.13
1090.30	0.57	233.18	1090.21	0.86 S	13.67 W	-13.67	0.26
1185.30	0.55	197.80	1185.20	1.58 S	14.18 W	-14.19	0.36
1280.30	0.89	191.61	1280.19	2.74 S	14.47 W	-14.48	0.37
1374.50	0.57	133.12	1374.39	3.77 S	14.28 W	-14.29	0.81
1468.50	0.16	147.60	1468.39	4.20 S	13.87 W	-13.88	0.44
1563.50	0.19	129.61	1563.39	4.42 S	13.67 W	-13.69	0.07
1657.60	0.25	119.15	1657.48	4.62 S	13.37 W	-13.39	0.08
1752.60	0.45	104.54	1752.48	4.81 S	12.83 W	-12.85	0.23
1847.50	0.95	90.87	1847.38	4.92 S	11.69 W	-11.70	0.55
1942.40	1.16	91.12	1942.26	4.95 S	9.94 W	-9.96	0.22
2037.30	1.40	93.98	2037.14	5.05 S	7.82 W	-7.84	0.26
2132.20	1.40	98.35	2132.01	5.30 S	5.52 W	-5.54	0.11
2227.30	1.22	83.37	2227.08	5.35 S	3.36 W	-3.38	0.41
2322.20	1.18	86.86	2321.96	5.18 S	1.38 W	-1.40	0.09
2417.20	0.87	76.27	2416.95	4.95 S	0.29 E	0.28	0.38
2512.20	0.66	82.20	2511.94	4.71 S	1.54 E	1.52	0.24
2607.20	0.60	68.40	2606.93	4.45 S	2.54 E	2.52	0.17
2702.20	0.49	59.95	2701.93	4.06 S	3.36 E	3.34	0.14
2797.30	0.43	59.22	2797.02	3.68 S	4.01 E	4.00	0.06
2892.30	0.50	77.47	2892.02	3.40 S	4.72 E	4.71	0.17
2987.30	0.49	49.04	2987.02	3.05 S	5.44 E	5.42	0.26
3081.40	0.34	24.22	3081.12	2.53 S	5.85 E	5.84	0.25
3176.50	0.40	37.01	3176.21	2.01 S	6.17 E	6.16	0.11
3270.40	0.35	37.94	3270.11	1.52 S	6.54 E	6.54	0.05
3365.80	0.41	15.70	3365.51	0.96 S	6.82 E	6.81	0.17
3460.70	0.08	286.15	3460.41	0.62 S	6.84 E	6.84	0.44
3650.70	0.06	244.75	3650.41	0.62 S	6.63 E	6.62	0.03
3745.80	0.15	96.08	3745.51	0.66 S	6.71 E	6.70	0.21
3840.90	0.31	313.32	3840.61	0.49 S	6.64 E	6.64	0.46
3935.90	0.13	321.67	3935.61	0.23 S	6.39 E	6.39	0.19
4030.90	0.41	330.69	4030.61	0.15 N	6.15 E	6.16	0.30
4125.80	0.29	11.74	4125.50	0.68 N	6.04 E	6.04	0.28
4220.80	0.36	2.58	4220.50	1.21 N	6.10 E	6.10	0.09
4315.70	0.16	299.72	4315.40	1.58 N	6.00 E	6.00	0.34
4410.90	0.14	311.46	4410.60	1.72 N	5.80 E	5.80	0.04
4505.90	0.39	344.61	4505.60	2.11 N	5.62 E	5.63	0.30
4599.10	0.32	1.67	4598.80	2.68 N	5.55 E	5.56	0.14
4694.10	0.28	32.12	4693.80	3.14 N	5.68 E	5.69	0.17
4789.00	0.22	50.02	4788.70	3.45 N	5.94 E	5.95	0.10

4883.90	0.26	23.16	4883.60	3.77 N	6.16 E	6.18	0.12
4979.00	0.37	332.69	4978.70	4.24 N	6.11 E	6.12	0.30
5071.90	0.47	283.55	5071.59	4.59 N	5.60 E	5.62	0.39
5166.90	0.38	269.82	5166.59	4.68 N	4.91 E	4.92	0.14
5261.80	0.28	288.43	5261.49	4.76 N	4.37 E	4.39	0.15
5356.80	0.36	307.57	5356.49	5.01 N	3.92 E	3.93	0.14
5451.60	0.53	308.26	5451.28	5.46 N	3.33 E	3.36	0.18
5546.60	0.60	310.97	5546.28	6.06 N	2.61 E	2.64	0.08
5641.60	0.73	298.00	5641.27	6.67 N	1.70 E	1.73	0.21
5736.60	0.56	279.66	5736.27	7.03 N	0.71 E	0.74	0.28
5831.50	0.39	292.49	5831.16	7.24 N	0.04 W	-0.02	0.21
5925.80	0.53	304.79	5925.46	7.61 N	0.70 W	-0.67	0.18
6020.80	0.65	318.67	6020.46	8.26 N	1.41 W	-1.38	0.20
6116.00	0.89	304.69	6115.65	9.09 N	2.38 W	-2.34	0.32
6211.00	0.61	302.44	6210.64	9.78 N	3.41 W	-3.38	0.30
6306.00	0.89	309.05	6305.63	10.52 N	4.41 W	-4.37	0.31
6401.20	0.98	304.26	6400.82	11.44 N	5.66 W	-5.62	0.13
6496.20	0.87	309.49	6495.81	12.36 N	6.89 W	-6.84	0.15
6591.30	0.83	306.42	6590.90	13.22 N	8.00 W	-7.95	0.06
6685.20	0.70	306.34	6684.79	13.97 N	9.01 W	-8.95	0.14
6780.20	0.73	297.43	6779.78	14.59 N	10.01 W	-9.96	0.12
6875.40	0.93	287.60	6874.97	15.10 N	11.29 W	-11.23	0.26
6970.40	0.74	302.72	6969.96	15.67 N	12.54 W	-12.48	0.30
7065.40	0.99	303.58	7064.95	16.45 N	13.74 W	-13.68	0.26
7160.40	0.71	297.17	7159.94	17.18 N	14.95 W	-14.88	0.31
7255.20	0.62	305.26	7254.73	17.74 N	15.89 W	-15.82	0.14
7350.30	0.63	333.74	7349.83	18.51 N	16.54 W	-16.47	0.32
7445.40	0.58	331.77	7444.92	19.40 N	17.00 W	-16.92	0.06
7540.40	0.52	347.92	7539.92	20.25 N	17.32 W	-17.24	0.17
7635.60	0.52	9.85	7635.11	21.09 N	17.33 W	-17.25	0.21
7730.70	0.54	15.48	7730.21	21.95 N	17.14 W	-17.05	0.06
7825.80	0.55	29.54	7825.31	22.78 N	16.79 W	-16.71	0.14
7920.70	0.67	40.44	7920.20	23.60 N	16.21 W	-16.12	0.18
8015.60	0.74	41.19	8015.09	24.48 N	15.45 W	-15.35	0.07
8110.80	0.83	48.02	8110.28	25.41 N	14.53 W	-14.43	0.14
8205.90	1.07	60.29	8205.37	26.31 N	13.25 W	-13.14	0.33
8301.00	1.19	65.34	8300.45	27.16 N	11.58 W	-11.47	0.16
8419.00	1.28	67.12	8418.42	28.18 N	9.25 W	-9.14	0.08
8564.00	13.28	70.98	8561.99	34.26 N	8.05 E	8.18	8.28
8596.00	19.70	64.34	8592.66	37.80 N	16.40 E	16.54	20.88
8627.00	26.31	62.80	8621.18	43.21 N	27.23 E	27.39	21.40
8659.00	34.56	68.31	8648.76	49.81 N	41.99 E	42.19	27.20
8691.00	42.70	71.44	8673.74	56.63 N	60.75 E	60.97	26.17
8722.00	50.64	74.22	8694.99	63.25 N	82.28 E	82.53	26.43
8754.00	60.30	76.11	8713.11	69.97 N	107.74 E	108.01	30.55
8785.00	68.76	80.48	8726.43	75.60 N	135.12 E	135.41	30.13
8817.00	77.78	88.62	8735.65	78.46 N	165.57 E	165.87	37.23
8848.00	85.18	95.02	8740.24	77.47 N	196.18 E	196.47	31.40
8880.00	90.49	95.27	8741.45	74.60 N	228.01 E	228.30	16.62
8911.00	94.76	93.83	8740.03	72.15 N	258.87 E	259.15	14.53
8943.00	95.38	93.39	8737.20	70.14 N	290.69 E	290.95	2.38
8974.00	93.92	93.11	8734.68	68.39 N	321.53 E	321.79	4.80
9006.00	92.30	92.99	8732.95	66.69 N	353.44 E	353.69	5.08
9038.00	91.94	93.16	8731.76	64.98 N	385.37 E	385.62	1.24
9069.00	92.13	93.01	8730.66	63.31 N	416.31 E	416.55	0.76
9100.00	93.02	93.05	8729.27	61.67 N	447.23 E	447.47	2.90
9132.00	93.20	92.81	8727.53	60.04 N	479.14 E	479.37	0.93
9164.00	93.28	92.64	8725.72	58.52 N	511.06 E	511.28	0.59
9195.00	93.63	92.85	8723.86	57.03 N	541.96 E	542.18	1.32
9227.00	93.57	92.73	8721.85	55.48 N	573.86 E	574.07	0.42
9259.00	93.08	92.27	8719.99	54.08 N	605.78 E	605.98	2.10
9291.00	92.56	93.53	8718.41	52.47 N	637.70 E	637.89	4.28
9322.00	91.26	94.10	8717.38	50.40 N	668.61 E	668.80	4.56
9354.00	89.66	94.57	8717.12	47.98 N	700.52 E	700.70	5.22
9386.00	90.22	94.70	8717.16	45.40 N	732.41 E	732.58	1.78
9417.00	90.09	94.24	8717.07	42.98 N	763.32 E	763.48	1.55
9449.00	88.76	93.15	8717.39	40.92 N	795.25 E	795.40	5.37
9481.00	88.58	92.77	8718.14	39.27 N	827.20 E	827.34	1.31
9512.00	89.05	92.64	8718.78	37.80 N	858.16 E	858.29	1.56
9544.00	90.68	92.12	8718.85	36.48 N	890.13 E	890.26	5.35
9575.00	91.32	91.43	8718.31	35.52 N	921.11 E	921.24	3.05
9607.00	90.52	92.42	8717.70	35.58 N	952.10 E	952.22	0.72

9639.00	90.22	87.99	8717.59	36.56 N	985.08 E	985.22	1.66
9671.00	89.22	87.91	8717.74	37.71 N	1017.06 E	1017.20	3.11
9702.00	89.10	86.92	8718.20	39.11 N	1048.03 E	1048.17	3.20
9734.00	89.23	88.17	8718.66	40.48 N	1079.99 E	1080.14	3.93
9765.00	89.97	88.73	8718.88	41.32 N	1110.98 E	1111.13	2.98
9794.00	89.48	88.95	8719.02	41.90 N	1139.97 E	1140.13	1.88
9826.00	88.55	88.70	8719.57	42.56 N	1171.96 E	1172.12	3.01
9858.00	89.07	88.53	8720.24	43.33 N	1203.95 E	1204.10	1.72
9889.00	89.72	88.66	8720.56	44.09 N	1234.93 E	1235.09	2.13
9921.00	90.71	89.45	8720.44	44.62 N	1266.93 E	1267.09	3.96
9952.00	90.80	89.40	8720.03	44.93 N	1297.92 E	1298.09	0.34
9984.00	90.74	89.33	8719.60	45.29 N	1329.92 E	1330.08	0.30
10015.00	90.52	89.13	8719.25	45.70 N	1360.91 E	1361.08	0.94
10047.00	90.09	89.10	8719.08	46.20 N	1392.91 E	1393.08	1.35
10079.00	90.56	89.27	8718.90	46.65 N	1424.91 E	1425.08	1.53
10110.00	89.81	89.04	8718.80	47.11 N	1455.90 E	1456.07	2.50
10142.00	89.94	89.61	8718.87	47.49 N	1487.90 E	1488.07	1.82
10174.00	90.59	89.43	8718.72	47.75 N	1519.90 E	1520.07	2.10
10206.00	90.86	88.98	8718.32	48.20 N	1551.89 E	1552.07	1.64
10237.00	90.96	89.32	8717.83	48.66 N	1582.89 E	1583.06	1.13
10269.00	90.65	90.02	8717.38	48.84 N	1614.88 E	1615.06	2.41
10300.00	89.78	89.87	8717.26	48.87 N	1645.88 E	1646.06	2.83
10332.00	89.57	89.65	8717.44	49.01 N	1677.88 E	1678.06	0.96
10364.00	89.69	90.27	8717.65	49.03 N	1709.88 E	1710.06	1.97
10395.00	89.97	90.40	8717.74	48.85 N	1740.88 E	1741.05	0.99
10427.00	87.96	91.00	8718.32	48.46 N	1772.87 E	1773.04	6.54
10459.00	87.93	91.96	8719.47	47.64 N	1804.84 E	1805.01	3.01
10490.00	89.05	92.30	8720.28	46.48 N	1835.81 E	1835.97	3.76
10522.00	89.01	91.82	8720.82	45.33 N	1867.78 E	1867.94	1.49
10553.00	87.96	90.81	8721.64	44.62 N	1898.76 E	1898.92	4.72
10585.00	87.37	90.18	8722.95	44.35 N	1930.73 E	1930.89	2.68
10617.00	88.39	90.71	8724.13	44.10 N	1962.71 E	1962.86	3.59
10648.00	88.64	90.46	8724.93	43.78 N	1993.70 E	1993.85	1.14
10680.00	88.36	90.40	8725.77	43.55 N	2025.68 E	2025.84	0.88
10712.00	88.36	89.84	8726.68	43.48 N	2057.67 E	2057.82	1.74
10744.00	88.08	89.81	8727.67	43.57 N	2089.66 E	2089.81	0.91
10775.00	86.73	88.99	8729.08	43.90 N	2120.62 E	2120.77	5.07
10807.00	86.58	89.16	8730.95	44.41 N	2152.56 E	2152.72	0.73
10839.00	86.79	89.65	8732.80	44.74 N	2184.51 E	2184.66	1.65
10870.00	86.80	90.08	8734.53	44.82 N	2215.46 E	2215.61	1.41
10902.00	86.84	89.78	8736.31	44.85 N	2247.41 E	2247.56	0.96
10934.00	86.98	90.29	8738.04	44.83 N	2279.36 E	2279.52	1.64
10966.00	87.81	90.15	8739.49	44.71 N	2311.33 E	2311.48	2.62
10997.00	88.92	90.70	8740.38	44.48 N	2342.31 E	2342.47	4.00
11029.00	89.23	90.27	8740.89	44.21 N	2374.31 E	2374.46	1.64
11060.00	88.55	89.79	8741.49	44.19 N	2405.30 E	2405.46	2.69
11092.00	87.65	89.77	8742.55	44.32 N	2437.29 E	2437.44	2.81
11123.00	87.37	88.94	8743.90	44.67 N	2468.25 E	2468.41	2.84
11155.00	89.23	89.37	8744.85	45.14 N	2500.23 E	2500.39	5.96
11186.00	90.18	90.11	8745.01	45.28 N	2531.23 E	2531.39	3.90
11218.00	90.28	90.16	8744.88	45.20 N	2563.23 E	2563.39	0.33
11250.00	90.09	89.92	8744.77	45.18 N	2595.23 E	2595.39	0.94
11281.00	90.19	90.29	8744.70	45.13 N	2626.23 E	2626.39	1.21
11313.00	90.43	91.05	8744.53	44.75 N	2658.23 E	2658.38	2.52
11345.00	90.84	91.19	8744.17	44.12 N	2690.22 E	2690.37	1.33
11376.00	89.38	91.46	8744.11	43.41 N	2721.21 E	2721.36	4.76
11407.00	87.73	91.86	8744.89	42.51 N	2752.19 E	2752.33	5.48
11439.00	87.72	91.99	8746.16	41.43 N	2784.15 E	2784.28	0.40
11470.00	87.89	92.27	8747.35	40.28 N	2815.10 E	2815.23	1.08
11502.00	88.21	91.83	8748.44	39.14 N	2847.06 E	2847.19	1.70
11534.00	88.52	91.74	8749.35	38.14 N	2879.03 E	2879.16	1.02
11565.00	87.82	92.01	8750.34	37.13 N	2910.00 E	2910.12	2.40
11597.00	87.81	92.33	8751.56	35.92 N	2941.95 E	2942.07	1.02
11628.00	88.33	92.62	8752.60	34.58 N	2972.91 E	2973.02	1.93
11660.00	88.86	92.33	8753.39	33.20 N	3004.87 E	3004.97	1.87
11692.00	89.29	92.79	8753.90	31.78 N	3036.83 E	3036.93	1.96
11723.00	88.46	92.39	8754.51	30.38 N	3067.79 E	3067.89	2.96
11755.00	87.78	91.75	8755.56	29.22 N	3099.76 E	3099.84	2.91
11786.00	87.99	91.93	8756.71	28.22 N	3130.72 E	3130.80	0.90
11818.00	88.76	91.43	8757.61	27.28 N	3162.69 E	3162.77	2.87
11850.00	88.61	91.49	8758.35	26.47 N	3194.67 E	3194.75	0.51

11882.00	88.70	91.19	8759.10	25.72 N	3226.66 E	3226.73	0.99
11913.00	89.57	91.03	8759.57	25.12 N	3257.65 E	3257.72	2.85
11945.00	90.31	91.11	8759.60	24.52 N	3289.64 E	3289.71	2.32
11976.00	90.89	90.80	8759.27	24.00 N	3320.63 E	3320.70	2.15
12008.00	90.49	91.18	8758.89	23.45 N	3352.63 E	3352.69	1.74
12040.00	89.44	91.32	8758.90	22.75 N	3384.62 E	3384.68	3.30
12072.00	89.63	90.93	8759.16	22.12 N	3416.61 E	3416.67	1.33
12103.00	89.78	90.74	8759.32	21.67 N	3447.61 E	3447.66	0.79
12135.00	89.04	90.05	8759.65	21.45 N	3479.60 E	3479.66	3.16
12166.00	88.95	89.97	8760.19	21.44 N	3510.60 E	3510.66	0.41
12198.00	89.26	89.41	8760.69	21.62 N	3542.59 E	3542.65	2.01
12230.00	89.35	89.27	8761.08	21.99 N	3574.59 E	3574.65	0.50
12261.00	89.51	89.23	8761.39	22.39 N	3605.59 E	3605.65	0.52
12293.00	89.78	88.29	8761.59	23.08 N	3637.58 E	3637.64	3.07
12324.00	90.15	87.49	8761.60	24.23 N	3668.56 E	3668.62	2.82
12356.00	90.00	87.66	8761.56	25.58 N	3700.53 E	3700.60	0.72
12387.00	90.03	88.11	8761.55	26.72 N	3731.51 E	3731.58	1.44
12419.00	89.69	89.11	8761.63	27.50 N	3763.50 E	3763.57	3.30
12451.00	88.40	89.15	8762.16	27.98 N	3795.49 E	3795.57	4.03
12482.00	88.28	88.42	8763.06	28.64 N	3826.47 E	3826.55	2.38
12514.00	88.64	88.21	8763.92	29.58 N	3858.44 E	3858.53	1.31
12545.00	89.26	89.54	8764.49	30.18 N	3889.43 E	3889.52	4.73
12577.00	89.72	89.85	8764.77	30.35 N	3921.43 E	3921.52	1.74
12608.00	89.20	90.37	8765.07	30.29 N	3952.43 E	3952.51	2.37
12640.00	88.86	90.51	8765.61	30.05 N	3984.42 E	3984.51	1.15
12671.00	88.58	90.77	8766.30	29.71 N	4015.41 E	4015.50	1.23
12703.00	88.49	91.10	8767.12	29.18 N	4047.40 E	4047.48	1.08
12735.00	88.76	91.28	8767.89	28.52 N	4079.38 E	4079.46	1.03
12766.00	89.01	91.67	8768.49	27.72 N	4110.36 E	4110.44	1.48
12798.00	88.64	92.35	8769.14	26.59 N	4142.34 E	4142.41	2.43
12829.00	88.74	92.81	8769.85	25.20 N	4173.30 E	4173.36	1.50
12860.00	89.32	92.73	8770.37	23.70 N	4204.26 E	4204.32	1.91
12892.00	89.85	92.72	8770.61	22.18 N	4236.22 E	4236.27	1.63
12924.00	89.04	92.54	8770.92	20.71 N	4268.18 E	4268.23	2.57
12955.00	88.91	91.97	8771.47	19.49 N	4299.16 E	4299.20	1.87
12987.00	89.45	91.19	8771.93	18.61 N	4331.14 E	4331.18	2.96
13018.00	89.66	91.81	8772.17	17.80 N	4362.13 E	4362.16	2.11
13106.00	89.66	91.81	8772.69	15.02 N	4450.08 E	4450.11	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

VERTICAL SECTION RELATIVE TO WELL HEAD

**VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 89.78 DEGREES (GRID)
A TOTAL CORRECTION OF 7.82 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT (CLOSURE) AT 13106.00 FEET
IS 4450.11 FEET ALONG 89.81 DEGREES (GRID)**

**SURVEY AT 13018' MD PROJECTED TO TD AT 13106' MD.
SPERRY ENGINEERS, JAMES BALLIN, DERRICK TORRES.**