

Results of Directional Survey

API number:	30-025-40135		
OGRID:		Operator:	CIMAREX ENERGY CO. OF COLORADO
		Property:	MALLON 34 FEDERAL # 20H

surface	ULSTR:	A	34	T 19S	R 34E
				380 FNL	330 FEL

BH Loc	ULSTR:	D	34	T 19S	R 34E
15352 MD		10870.1	TVD	760 FNL	355 FWL
					4925 FEL

Top Perf/OH	ULSTR:	A	34	T 19S	R 34E
10702 MD		10694.8	TVD	398 FNL	356 FEL

Bot Perf/OH	ULSTR:	D	34	T 19S	R 34E
15261 MD		10869.6	TVD	753 FNL	446 FWL
					4834 FEL

	MD	N/S	E/W	VD
	10684	-16.45	-17.41	10678.87
TOP PERFS/OH	10702	-18.14	-25.58	10694.81
	10717	-19.54	-32.39	10708.09
	15250	-371.86	-4493.05	10869.48
BOT PERFS/OH	15261	-372.77	-4504.01	10869.56
	15301	-376.08	-4543.87	10869.83

NEXT TO LAST	15301	-376.08	-4543.87	10869.83
LAST READING	15352	-380.26	-4594.70	10870.10
TD	15352	-380.26	-4594.70	10870.10

Surface Location	380 FN	330 FE
Projected BHL	760 FN	4925 FE
Location of		
Top Perfs/OH	398 FN	356 FE
Bottom Perfs/OH	753 FN	4834 FE

SUMMARY of Subsurface Locations

Surface Location	A-34-19S-34E	380 FN	330 FE	Vert. Depth
Top Perfs/OH	A-34-19S-34E	398 FN	356 FE	10694.81
Bottom Perfs/OH	D-34-19S-34E	753 FN	4834 FE	10869.56
Projected TD	D-34-19S-34E	760 FN	4925 FE	10870.10

MAR 27 2012



Cimarex Energy Co.

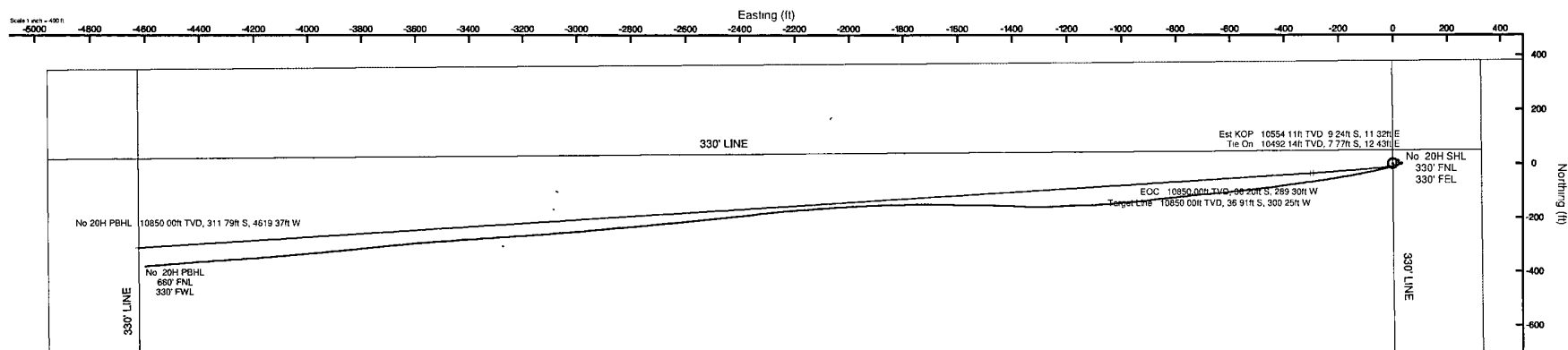
Location Lea County, NM
Field (Mallon) Sec 34, T19S, R34E
Facility Mallon 34 Fed No. 20H

Slot No 20H SHL
Well No 20H
Wellbore No. 20H PIWB

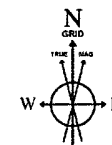


Well Profile Data

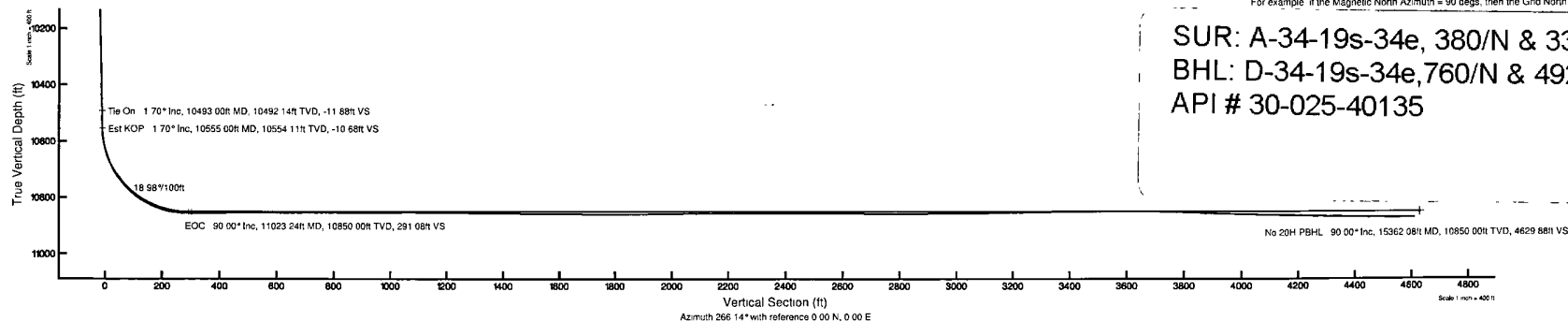
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	10493.00	1.700	216.870	10492.14	-7.77	12.43	0.00	-11.88
Est KOP	10555.00	1.700	216.870	10554.11	-9.24	11.32	0.00	-10.68
EOC	11023.24	90.000	266.139	10850.00	-36.20	-289.30	18.98	291.08
Target Line	11034.21	90.000	266.359	10850.00	-36.91	-300.25	2.00	302.05
No.20H PBHL	15362.08	90.000	266.359	10850.00	-311.79	-4619.37	0.00	4629.88



Plot reference wellpath is Plan #1	
True vertical depths are referenced to Rig on No. 20H SHL (KB)	Grid System NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No. 20H SHL (KB)	North Reference Grid north
Rig on No. 20H SHL (KB) to Mean Sea Level: 3734 feet	Scale True distance
Mean Sea Level to Mud line (At Slot No. 20H SHL) -3715 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by gentbry on 9/22/2011



BGGM (1945 0 to 2012 0) Dip 60.56° Field 48869.6 nT
Magnetic North is 7.63 degrees East of True North (at 8/26/2011)
Grid North is 0.43 degrees East of True North
To correct azimuth from True to Grid subtract 0.43 degrees
To correct azimuth from Magnetic to Grid add 7.20 degrees
For example if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.20 = 97.20



SUR: A-34-19s-34e, 380/N & 330/E
BHL: D-34-19s-34e, 760/N & 4925/E
API # 30-025-40135



Actual Wellpath Report

No.20H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 20H SHL
Area	Lea County, NM	Well	No. 20H
Field	(Mallon) Sec 34, T19S, R34E	Wellbore	No.20H AWB
Facility	Mallon 34 Fed No. 20H		

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet	Software System	WellArchitect® 3.0.0
North Reference	Grid	User	Gentbry
Scale	0.999977	Report Generated	10/10/2011 at 8:01:47 AM
Convergence at slot	0.43° East	Database/Source file	WA Midland/No.20H_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	381.51	4618.83	785418.30	591279.00	32°37'22.705"N	103°32'25.977"W
Facility Reference Pt			780799.60	590897.50	32°37'19.268"N	103°33'20.011"W
Field Reference Pt			780804.80	586972.60	32°36'40.432"N	103°33'20.286"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 20H SHL (KB) to GL	19.00ft
Horizontal Reference Pt	Slot	Rig on No. 20H SHL (KB) to Mean Sea Level	3734.00ft
Vertical Reference Pt	Rig on No. 20H SHL (KB)	Rig on No. 20H SHL (KB) to Mud Line at Slot (No. 20H SHL)	19.00ft
MD Reference Pt	Rig on No. 20H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	266.14°



Actual Wellpath Report

No.20H AWP
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Area	Lea County, NM	Well	No. 20H
Field	(Mallon) Sec 34, T19S, R34E	Wellbore	No.20H AWB
Facility	Mallon 34 Fed No. 20H		

WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00†	0.000	261.620	0.00	0.00	0.00	0.00	785418.30	591279.00	32°37'22.705"N	103°32'25.977"W	0.00	
19.00	0.000	261.620	19.00	0.00	0.00	0.00	785418.30	591279.00	32°37'22.705"N	103°32'25.977"W	0.00	
100.00	0.460	261.620	100.00	0.32	-0.05	-0.32	785417.98	591278.95	32°37'22.704"N	103°32'25.980"W	0.57	
200.00	0.370	248.270	200.00	1.03	-0.23	-1.02	785417.28	591278.77	32°37'22.703"N	103°32'25.989"W	0.13	
300.00	0.280	245.500	299.99	1.57	-0.45	-1.54	785416.76	591278.55	32°37'22.701"N	103°32'25.995"W	0.09	
400.00	0.240	256.840	399.99	2.00	-0.60	-1.97	785416.33	591278.40	32°37'22.699"N	103°32'26.000"W	0.06	
500.00	0.170	218.360	499.99	2.31	-0.76	-2.26	785416.04	591278.24	32°37'22.698"N	103°32'26.003"W	0.15	
611.40	0.150	127.990	611.39	2.31	-0.98	-2.25	785416.05	591278.02	32°37'22.695"N	103°32'26.003"W	0.20	
706.60	0.170	118.930	706.59	2.10	-1.12	-2.03	785416.27	591277.88	32°37'22.694"N	103°32'26.001"W	0.03	
801.80	0.270	92.660	801.79	1.76	-1.20	-1.68	785416.62	591277.80	32°37'22.693"N	103°32'25.996"W	0.15	
897.00	0.400	100.330	896.99	1.21	-1.27	-1.13	785417.17	591277.73	32°37'22.692"N	103°32'25.990"W	0.14	
992.20	0.530	128.060	992.19	0.56	-1.60	-0.46	785417.84	591277.40	32°37'22.689"N	103°32'25.982"W	0.27	
1087.40	0.580	130.270	1087.38	-0.11	-2.19	0.26	785418.56	591276.81	32°37'22.683"N	103°32'25.974"W	0.06	
1182.60	0.580	119.590	1182.58	-0.86	-2.74	1.04	785419.34	591276.26	32°37'22.678"N	103°32'25.965"W	0.11	
1277.80	0.450	111.700	1277.77	-1.60	-3.11	1.81	785420.11	591275.89	32°37'22.674"N	103°32'25.956"W	0.16	
1373.00	0.270	111.150	1372.97	-2.14	-3.33	2.37	785420.67	591275.67	32°37'22.672"N	103°32'25.949"W	0.19	
1468.10	0.110	130.400	1468.07	-2.41	-3.47	2.65	785420.95	591275.53	32°37'22.670"N	103°32'25.946"W	0.18	
1563.30	0.120	180.190	1563.27	-2.46	-3.63	2.71	785421.01	591275.37	32°37'22.669"N	103°32'25.945"W	0.10	
1658.50	0.160	174.840	1658.47	-2.46	-3.86	2.73	785421.03	591275.14	32°37'22.666"N	103°32'25.945"W	0.04	
1753.70	0.280	145.290	1753.67	-2.58	-4.19	2.87	785421.17	591274.81	32°37'22.663"N	103°32'25.943"W	0.17	
1848.90	0.380	126.510	1848.87	-2.94	-4.56	3.26	785421.56	591274.44	32°37'22.659"N	103°32'25.939"W	0.15	
1944.10	0.600	100.960	1944.07	-3.66	-4.85	4.00	785422.30	591274.15	32°37'22.657"N	103°32'25.930"W	0.32	
2039.30	0.510	111.860	2039.26	-4.53	-5.10	4.88	785423.18	591273.90	32°37'22.654"N	103°32'25.920"W	0.15	
2134.50	0.480	113.360	2134.46	-5.26	-5.42	5.64	785423.94	591273.58	32°37'22.651"N	103°32'25.911"W	0.03	
2229.70	0.480	113.820	2229.65	-5.97	-5.73	6.37	785424.67	591273.27	32°37'22.648"N	103°32'25.903"W	0.00	
2324.80	0.530	114.840	2324.75	-6.71	-6.08	7.14	785425.44	591272.92	32°37'22.644"N	103°32'25.894"W	0.05	
2420.00	0.520	112.840	2419.95	-7.48	-6.43	7.93	785426.23	591272.57	32°37'22.641"N	103°32'25.884"W	0.02	
2515.20	0.350	105.520	2515.14	-8.14	-6.68	8.61	785426.91	591272.32	32°37'22.638"N	103°32'25.877"W	0.19	
2610.40	0.290	98.960	2610.34	-8.65	-6.79	9.13	785427.43	591272.21	32°37'22.637"N	103°32'25.871"W	0.07	
2705.60	0.310	85.470	2705.54	-9.14	-6.81	9.63	785427.93	591272.19	32°37'22.637"N	103°32'25.865"W	0.08	
2800.80	0.590	70.970	2800.74	-9.88	-6.63	10.35	785428.65	591272.37	32°37'22.639"N	103°32'25.856"W	0.32	
2896.00	1.120	69.500	2895.93	-11.24	-6.15	11.68	785429.98	591272.85	32°37'22.643"N	103°32'25.841"W	0.56	
2991.20	1.400	67.020	2991.10	-13.23	-5.37	13.62	785431.92	591273.63	32°37'22.651"N	103°32'25.818"W	0.30	
3086.40	1.460	68.630	3086.27	-15.49	-4.47	15.82	785434.12	591274.53	32°37'22.659"N	103°32'25.792"W	0.08	
3181.60	1.540	68.160	3181.44	-17.86	-3.55	18.14	785436.44	591275.45	32°37'22.668"N	103°32'25.765"W	0.09	
3276.80	1.590	67.300	3276.61	-20.33	-2.57	20.55	785438.84	591276.43	32°37'22.678"N	103°32'25.737"W	0.06	
3371.90	1.630	65.290	3371.67	-22.84	-1.49	22.99	785441.29	591277.51	32°37'22.688"N	103°32'25.708"W	0.07	
3467.10	1.380	58.650	3466.84	-25.12	-0.33	25.20	785443.50	591278.67	32°37'22.700"N	103°32'25.682"W	0.32	
3562.30	1.190	58.800	3562.01	-27.02	0.78	27.02	785445.32	591279.78	32°37'22.711"N	103°32'25.661"W	0.20	
3657.50	1.280	59.390	3657.19	-28.84	1.83	28.79	785447.08	591280.83	32°37'22.721"N	103°32'25.640"W	0.10	
3752.70	1.010	70.680	3752.37	-30.60	2.65	30.49	785448.79	591281.65	32°37'22.729"N	103°32'25.620"W	0.37	
3847.90	0.760	72.380	3847.56	-32.02	3.12	31.89	785450.19	591282.12	32°37'22.733"N	103°32'25.604"W	0.26	
3943.10	0.670	62.500	3942.75	-33.15	3.57	32.98	785451.28	591282.57	32°37'22.738"N	103°32'25.591"W	0.16	
4038.30	0.350	99.380	4037.95	-33.94	3.78	33.76	785452.06	591282.78	32°37'22.740"N	103°32'25.582"W	0.47	
4133.50	0.330	137.380	4133.15	-34.39	3.53	34.23	785452.53	591282.53	32°37'22.737"N	103°32'25.576"W	0.23	



Actual Wellpath Report

No.20H AWP

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BAKER HUGHES

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 20H SHL
Area	Lea County, NM	Well	No. 20H
Field	(Mallon) Sec 34, T19S, R34E	Wellbore	No.20H AWB
Facility	Mallon 34 Fed No. 20H		

WELLPATH DATA (203 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4228.60	0.300	145.760	4228.25	-34.69	3.12	34.56	785452.86	591282.12	32°37'22.733"N	103°32'25.572"W	0.06	
4323.80	0.280	155.550	4323.44	-34.90	2.70	34.80	785453.10	591281.70	32°37'22.729"N	103°32'25.570"W	0.06	
4419.00	0.410	166.680	4418.64	-35.04	2.16	34.97	785453.27	591281.16	32°37'22.724"N	103°32'25.568"W	0.15	
4514.20	0.370	207.540	4513.84	-34.93	1.56	34.91	785453.21	591280.56	32°37'22.718"N	103°32'25.568"W	0.29	
4609.40	0.320	242.900	4609.04	-34.61	1.06	34.62	785452.92	591280.06	32°37'22.713"N	103°32'25.572"W	0.06	
4704.60	0.210	233.350	4704.24	-34.31	0.73	34.34	785452.64	591279.73	32°37'22.710"N	103°32'25.575"W	0.15	
4799.80	0.140	214.860	4799.44	-34.09	0.53	34.13	785452.43	591279.53	32°37'22.708"N	103°32'25.578"W	0.09	
4895.00	0.070	226.640	4894.64	-33.97	0.40	34.02	785452.32	591279.40	32°37'22.706"N	103°32'25.579"W	0.08	
4990.20	0.110	200.720	4989.84	-33.89	0.27	33.95	785452.25	591279.27	32°37'22.705"N	103°32'25.580"W	0.06	
5085.40	0.180	222.570	5085.04	-33.74	0.08	33.81	785452.11	591279.08	32°37'22.703"N	103°32'25.581"W	0.09	
5180.60	0.320	223.270	5180.24	-33.44	-0.23	33.53	785451.83	591278.77	32°37'22.700"N	103°32'25.585"W	0.15	
5275.70	0.440	234.010	5275.33	-32.93	-0.63	33.05	785451.35	591278.37	32°37'22.696"N	103°32'25.590"W	0.15	
5370.90	0.080	219.270	5370.53	-32.58	-0.90	32.71	785451.01	591278.10	32°37'22.694"N	103°32'25.594"W	0.38	
5466.10	0.370	21.590	5465.73	-32.67	-0.67	32.79	785451.08	591278.33	32°37'22.696"N	103°32'25.593"W	0.47	
5561.30	0.230	55.380	5560.93	-32.96	-0.27	33.06	785451.36	591278.73	32°37'22.700"N	103°32'25.590"W	0.23	
5656.50	0.100	53.430	5656.13	-33.20	-0.11	33.28	785451.58	591278.89	32°37'22.701"N	103°32'25.588"W	0.14	
5751.70	0.110	262.580	5751.33	-33.18	-0.08	33.26	785451.56	591278.92	32°37'22.702"N	103°32'25.588"W	0.21	
5846.90	0.250	266.200	5846.53	-32.88	-0.10	32.96	785451.26	591278.90	32°37'22.701"N	103°32'25.591"W	0.15	
5942.10	0.320	231.730	5941.73	-32.45	-0.28	32.54	785450.84	591278.72	32°37'22.700"N	103°32'25.596"W	0.19	
6037.30	0.380	203.400	6036.93	-32.09	-0.73	32.21	785450.51	591278.27	32°37'22.695"N	103°32'25.600"W	0.19	
6132.40	0.440	213.410	6132.02	-31.72	-1.33	31.88	785450.18	591277.67	32°37'22.689"N	103°32'25.604"W	0.10	
6227.60	0.440	221.990	6227.22	-31.24	-1.91	31.44	785449.74	591277.10	32°37'22.684"N	103°32'25.609"W	0.07	
6322.80	0.400	260.330	6322.42	-30.64	-2.23	30.86	785449.16	591276.77	32°37'22.681"N	103°32'25.616"W	0.29	
6418.00	0.410	260.310	6417.62	-29.97	-2.35	30.20	785448.50	591276.65	32°37'22.679"N	103°32'25.624"W	0.01	
6513.20	0.450	247.420	6512.81	-29.28	-2.55	29.52	785447.82	591276.45	32°37'22.678"N	103°32'25.632"W	0.11	
6608.40	0.480	253.950	6608.01	-28.54	-2.80	28.79	785447.09	591276.20	32°37'22.675"N	103°32'25.640"W	0.06	
6703.60	0.340	268.050	6703.21	-27.87	-2.92	28.13	785446.43	591276.08	32°37'22.674"N	103°32'25.648"W	0.18	
6798.80	0.440	310.040	6798.41	-27.32	-2.69	27.56	785445.86	591276.31	32°37'22.676"N	103°32'25.655"W	0.31	
6894.00	0.480	302.310	6893.60	-26.73	-2.25	26.95	785445.25	591276.75	32°37'22.681"N	103°32'25.662"W	0.08	
6989.20	0.460	299.630	6988.80	-26.09	-1.84	26.28	785444.58	591277.16	32°37'22.685"N	103°32'25.670"W	0.03	
7084.40	0.460	295.650	7084.00	-25.44	-1.49	25.60	785443.90	591277.51	32°37'22.688"N	103°32'25.678"W	0.03	
7179.50	0.490	287.980	7179.09	-24.73	-1.20	24.87	785443.17	591277.80	32°37'22.691"N	103°32'25.686"W	0.07	
7274.70	0.510	292.350	7274.29	-23.97	-0.91	24.09	785442.39	591278.09	32°37'22.694"N	103°32'25.695"W	0.05	
7369.90	0.480	296.340	7369.49	-23.25	-0.57	23.34	785441.64	591278.43	32°37'22.697"N	103°32'25.704"W	0.05	
7465.10	0.560	285.070	7464.68	-22.47	-0.28	22.54	785440.83	591278.72	32°37'22.700"N	103°32'25.713"W	0.14	
7560.30	0.580	285.180	7559.88	-21.57	-0.03	21.62	785439.92	591278.97	32°37'22.703"N	103°32'25.724"W	0.02	
7655.50	0.590	290.390	7655.07	-20.67	0.27	20.70	785439.00	591279.27	32°37'22.706"N	103°32'25.735"W	0.06	
7750.70	0.530	299.660	7750.27	-19.85	0.66	19.85	785438.15	591279.66	32°37'22.710"N	103°32'25.745"W	0.11	
7845.90	0.560	297.610	7845.46	-19.09	1.09	19.06	785437.36	591280.09	32°37'22.714"N	103°32'25.754"W	0.04	
7941.10	0.540	288.970	7940.66	-18.28	1.45	18.22	785436.52	591280.45	32°37'22.718"N	103°32'25.764"W	0.09	
8036.30	0.600	279.010	8035.86	-17.38	1.68	17.31	785435.61	591280.68	32°37'22.720"N	103°32'25.774"W	0.12	
8131.40	0.610	277.290	8130.95	-16.40	1.82	16.31	785434.61	591280.82	32°37'22.722"N	103°32'25.786"W	0.02	
8226.60	0.700	281.040	8226.14	-15.34	1.99	15.24	785433.54	591280.99	32°37'22.723"N	103°32'25.798"W	0.10	
8321.80	0.720	309.530	8321.34	-14.34	2.49	14.21	785432.51	591281.49	32°37'22.728"N	103°32'25.810"W	0.37	
8417.00	0.660	317.090	8416.53	-13.56	3.27	13.37	785431.67	591282.27	32°37'22.736"N	103°32'25.820"W	0.11	



Actual Wellpath Report

No.20H AWP
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 20H SHL
Area	Lea County, NM	Well	No. 20H
Field	(Mallon) Sec 34, T19S, R34E	Wellbore	No.20H AWB
Facility	Mallon 34 Fed No. 20H		

WELLPATH DATA (203 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8512.20	0.620	339.030	8511.72	-13.07	4.15	12.81	785431.11	591283.15	32°37'22.745"N	103°32'25.827"W	0.26	
8607.40	0.970	14.550	8606.92	-13.17	5.41	12.83	785431.13	591284.41	32°37'22.757"N	103°32'25.826"W	0.62	
8702.60	1.340	28.950	8702.10	-14.03	7.16	13.57	785431.87	591286.16	32°37'22.775"N	103°32'25.817"W	0.49	
8797.80	1.500	23.510	8797.27	-15.20	9.28	14.61	785432.91	591288.28	32°37'22.796"N	103°32'25.805"W	0.22	
8893.00	0.940	37.840	8892.44	-16.29	11.04	15.59	785433.89	591290.04	32°37'22.813"N	103°32'25.794"W	0.67	
8988.10	1.010	60.880	8987.53	-17.57	12.06	16.80	785435.10	591291.06	32°37'22.823"N	103°32'25.779"W	0.42	
9083.30	0.970	91.270	9082.72	-19.13	12.46	18.34	785436.63	591291.45	32°37'22.827"N	103°32'25.761"W	0.55	
9178.50	0.820	116.070	9177.91	-20.53	12.14	19.75	785438.05	591291.14	32°37'22.824"N	103°32'25.745"W	0.43	
9273.70	0.770	125.350	9273.10	-21.61	11.47	20.89	785439.19	591290.47	32°37'22.817"N	103°32'25.731"W	0.14	
9368.90	0.800	116.650	9368.29	-22.68	10.80	22.00	785440.30	591289.80	32°37'22.810"N	103°32'25.719"W	0.13	
9464.10	0.620	152.140	9463.48	-23.46	10.05	22.84	785441.14	591289.05	32°37'22.803"N	103°32'25.709"W	0.49	
9559.30	0.520	188.550	9558.68	-23.58	9.16	23.01	785441.31	591288.16	32°37'22.794"N	103°32'25.707"W	0.39	
9654.50	0.500	193.500	9653.87	-23.36	8.33	22.85	785441.15	591287.33	32°37'22.786"N	103°32'25.709"W	0.05	
9749.70	0.930	207.070	9749.07	-22.84	7.24	22.40	785440.70	591286.24	32°37'22.775"N	103°32'25.714"W	0.48	
9844.90	1.330	201.080	9844.25	-21.98	5.52	21.65	785439.95	591284.52	32°37'22.758"N	103°32'25.723"W	0.44	
9940.00	1.160	198.340	9939.32	-21.15	3.58	20.95	785439.25	591282.58	32°37'22.739"N	103°32'25.731"W	0.19	
10035.20	1.120	207.000	10034.51	-20.31	1.84	20.23	785438.53	591280.84	32°37'22.722"N	103°32'25.740"W	0.19	
10130.40	1.560	221.530	10129.68	-18.91	0.04	18.95	785437.25	591279.04	32°37'22.704"N	103°32'25.755"W	0.58	
10225.60	1.470	226.060	10224.85	-17.05	-1.78	17.21	785435.51	591277.22	32°37'22.686"N	103°32'25.776"W	0.16	
10320.80	1.660	221.730	10320.01	-15.13	-3.66	15.41	785433.71	591275.34	32°37'22.668"N	103°32'25.797"W	0.23	
10416.00	1.710	212.540	10415.17	-13.30	-5.88	13.73	785432.03	591273.12	32°37'22.646"N	103°32'25.817"W	0.29	
10493.00	1.700	216.870	10492.14	-11.88	-7.77	12.43	785430.73	591271.23	32°37'22.627"N	103°32'25.832"W	0.17	
10558.00	2.700	231.100	10557.09	-9.99	-9.50	10.66	785428.96	591269.50	32°37'22.610"N	103°32'25.853"W	1.74	
10588.00	7.200	248.100	10586.97	-7.63	-10.64	8.36	785426.66	591268.36	32°37'22.599"N	103°32'25.880"W	15.62	
10622.00	13.600	257.800	10620.40	-1.64	-12.29	2.47	785420.77	591266.71	32°37'22.583"N	103°32'25.949"W	19.45	
10654.00	19.300	257.000	10651.07	7.31	-14.27	-6.37	785411.93	591264.73	32°37'22.564"N	103°32'26.052"W	17.83	
10684.00	24.800	260.300	10678.87	18.48	-16.45	-17.41	785400.89	591262.55	32°37'22.543"N	103°32'26.182"W	18.79	
10717.00	30.500	256.700	10708.09	33.64	-19.54	-32.39	785385.91	591259.46	32°37'22.514"N	103°32'26.357"W	17.99	
10749.00	36.500	257.400	10734.76	51.07	-23.49	-49.60	785368.70	591255.51	32°37'22.476"N	103°32'26.559"W	18.79	
10780.00	42.300	257.900	10758.71	70.52	-27.69	-68.81	785349.49	591251.31	32°37'22.436"N	103°32'26.784"W	18.74	
10812.00	48.600	258.000	10781.15	93.08	-32.45	-91.10	785327.20	591246.55	32°37'22.391"N	103°32'27.045"W	19.69	
10845.00	54.800	258.500	10801.59	118.72	-37.72	-116.45	785301.85	591241.28	32°37'22.340"N	103°32'27.341"W	18.83	
10874.00	60.200	259.500	10817.16	142.98	-42.38	-140.45	785277.85	591236.62	32°37'22.296"N	103°32'27.622"W	18.85	
10909.00	66.900	259.900	10832.75	174.10	-47.97	-171.26	785247.04	591231.03	32°37'22.243"N	103°32'27.983"W	19.17	
10940.00	73.100	261.000	10843.34	203.08	-52.80	-199.98	785218.33	591226.20	32°37'22.197"N	103°32'28.319"W	20.28	
10970.00	80.200	260.800	10850.27	232.13	-57.41	-228.78	785189.53	591221.59	32°37'22.154"N	103°32'28.657"W	23.68	
11004.00	87.000	261.200	10854.05	265.76	-62.69	-262.13	785156.17	591216.31	32°37'22.104"N	103°32'29.047"W	20.03	
11035.00	89.600	262.300	10854.97	296.65	-67.14	-292.79	785125.51	591211.86	32°37'22.062"N	103°32'29.406"W	9.11	
11068.00	90.100	262.600	10855.06	329.58	-71.48	-325.51	785092.80	591207.53	32°37'22.022"N	103°32'29.789"W	1.77	
11099.00	90.400	262.500	10854.92	360.52	-75.50	-356.25	785062.06	591203.51	32°37'21.984"N	103°32'30.148"W	1.02	
11131.00	90.800	261.500	10854.59	392.44	-79.95	-387.93	785030.38	591199.05	32°37'21.942"N	103°32'30.519"W	3.37	
11163.00	91.300	262.500	10854.00	424.35	-84.40	-419.62	784998.69	591194.60	32°37'21.901"N	103°32'30.890"W	3.49	
11195.00	90.700	263.200	10853.44	456.29	-88.38	-451.36	784966.95	591190.62	32°37'21.864"N	103°32'31.262"W	2.88	
11227.00	89.700	263.100	10853.33	488.24	-92.20	-483.13	784935.18	591186.80	32°37'21.828"N	103°32'31.633"W	3.14	
11259.00	89.600	264.000	10853.53	520.21	-95.80	-514.93	784903.38	591183.21	32°37'21.795"N	103°32'32.005"W	2.83	



Actual Wellpath Report

No.20H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 20H SHL
Area	Lea County, NM	Well	No. 20H
Field	(Mallon) Sec 34, T19S, R34E	Wellbore	No.20H AWB
Facility	Mallon 34 Fed No. 20H		

WELLPATH DATA (203 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11322.00	90.300	263.000	10853.58	583.14	-102.93	-577.52	784840.79	591176.08	32°37'21.729"N	103°32'32.738"W	1.94	
11386.00	90.300	265.100	10853.25	647.10	-109.56	-641.17	784777.14	591169.44	32°37'21.668"N	103°32'33.483"W	3.28	
11450.00	90.000	264.600	10853.08	711.08	-115.31	-704.91	784713.40	591163.70	32°37'21.616"N	103°32'34.228"W	0.91	
11513.00	90.200	263.300	10852.97	774.03	-121.95	-767.56	784650.76	591157.06	32°37'21.555"N	103°32'34.961"W	2.09	
11577.00	89.900	264.500	10852.91	837.98	-128.75	-831.20	784587.12	591150.26	32°37'21.492"N	103°32'35.706"W	1.93	
11640.00	89.700	263.400	10853.13	900.93	-135.39	-893.85	784524.48	591143.62	32°37'21.431"N	103°32'36.439"W	1.77	
11704.00	90.300	264.300	10853.13	964.88	-142.24	-957.48	784460.85	591136.76	32°37'21.368"N	103°32'37.184"W	1.69	
11768.00	90.300	265.400	10852.80	1028.86	-147.99	-1021.22	784397.11	591131.02	32°37'21.316"N	103°32'37.929"W	1.72	
11831.00	89.800	267.100	10852.74	1091.86	-152.11	-1084.08	784334.25	591126.90	32°37'21.280"N	103°32'38.665"W	2.81	
11895.00	89.200	268.200	10853.30	1155.84	-154.73	-1148.02	784270.31	591124.27	32°37'21.258"N	103°32'39.412"W	1.96	
11959.00	89.200	266.700	10854.20	1219.81	-157.58	-1211.95	784206.38	591121.43	32°37'21.235"N	103°32'40.160"W	2.34	
12023.00	89.400	268.400	10854.98	1283.78	-160.31	-1275.88	784142.45	591118.69	32°37'21.213"N	103°32'40.908"W	2.67	
12087.00	89.600	272.600	10855.54	1347.58	-159.76	-1339.87	784078.47	591119.25	32°37'21.223"N	103°32'41.656"W	6.57	
12119.00	89.800	272.700	10855.70	1379.38	-158.28	-1371.83	784046.50	591120.73	32°37'21.240"N	103°32'42.029"W	0.70	
12151.00	89.700	272.000	10855.84	1411.19	-156.96	-1403.80	784014.53	591122.04	32°37'21.255"N	103°32'42.403"W	2.21	
12182.00	89.700	271.800	10856.01	1442.03	-155.94	-1434.79	783983.55	591123.07	32°37'21.268"N	103°32'42.765"W	0.65	
12214.00	89.700	271.200	10856.17	1473.89	-155.10	-1466.77	783951.56	591123.91	32°37'21.278"N	103°32'43.139"W	1.87	
12246.00	89.700	271.300	10856.34	1505.76	-154.40	-1498.77	783919.57	591124.60	32°37'21.287"N	103°32'43.513"W	0.31	
12310.00	89.300	270.800	10856.90	1569.52	-153.23	-1562.75	783855.59	591125.78	32°37'21.304"N	103°32'44.261"W	1.00	
12373.00	89.300	271.000	10857.67	1632.30	-152.24	-1625.74	783792.60	591126.77	32°37'21.318"N	103°32'44.998"W	0.32	
12437.00	89.400	270.400	10858.40	1696.09	-151.46	-1689.73	783728.61	591127.55	32°37'21.331"N	103°32'45.746"W	0.95	
12499.00	89.500	268.900	10858.99	1757.97	-151.83	-1751.73	783666.62	591127.17	32°37'21.331"N	103°32'46.470"W	2.42	
12563.00	90.500	268.600	10858.99	1821.91	-153.23	-1815.71	783602.64	591125.77	32°37'21.322"N	103°32'47.219"W	1.63	
12626.00	90.500	267.600	10858.44	1884.87	-155.32	-1878.67	783539.67	591123.68	32°37'21.306"N	103°32'47.955"W	1.59	
12690.00	90.300	267.400	10857.99	1948.85	-158.11	-1942.61	783475.74	591120.89	32°37'21.283"N	103°32'48.703"W	0.44	
12755.00	90.400	266.700	10857.60	2013.84	-161.46	-2007.52	783410.83	591117.55	32°37'21.255"N	103°32'49.462"W	1.09	
12819.00	90.200	266.300	10857.26	2077.83	-165.36	-2071.40	783346.95	591113.64	32°37'21.221"N	103°32'50.209"W	0.70	
12882.00	90.200	265.400	10857.04	2140.83	-169.92	-2134.23	783284.12	591109.08	32°37'21.180"N	103°32'50.944"W	1.43	
12946.00	90.200	265.600	10856.82	2204.83	-174.94	-2198.04	783220.32	591104.06	32°37'21.135"N	103°32'51.691"W	0.31	
13009.00	90.100	264.800	10856.65	2267.82	-180.22	-2260.82	783157.54	591098.79	32°37'21.088"N	103°32'52.425"W	1.28	
13073.00	89.900	263.300	10856.65	2331.77	-186.85	-2324.47	783093.89	591092.15	32°37'21.027"N	103°32'53.170"W	2.36	
13137.00	89.900	263.600	10856.77	2395.70	-194.15	-2388.05	783030.31	591084.85	32°37'20.959"N	103°32'53.914"W	0.47	
13201.00	89.900	264.200	10856.88	2459.65	-200.95	-2451.69	782966.67	591078.05	32°37'20.897"N	103°32'54.658"W	0.94	
13265.00	89.800	263.900	10857.04	2523.61	-207.59	-2515.34	782903.02	591071.42	32°37'20.836"N	103°32'55.403"W	0.49	
13329.00	89.800	264.200	10857.27	2587.57	-214.22	-2579.00	782839.37	591064.79	32°37'20.775"N	103°32'56.148"W	0.47	
13361.00	90.000	264.200	10857.32	2619.55	-217.45	-2610.83	782807.53	591061.55	32°37'20.745"N	103°32'56.521"W	0.62	
13436.00	89.700	264.600	10857.52	2694.52	-224.77	-2685.48	782732.89	591054.23	32°37'20.678"N	103°32'57.394"W	0.67	
13500.00	89.800	264.400	10857.80	2758.49	-230.91	-2749.18	782669.19	591048.10	32°37'20.622"N	103°32'58.139"W	0.35	
13564.00	90.200	265.300	10857.80	2822.47	-236.65	-2812.92	782605.45	591042.36	32°37'20.570"N	103°32'58.885"W	1.54	
13627.00	90.300	265.100	10857.52	2885.46	-241.92	-2875.70	782542.67	591037.08	32°37'20.522"N	103°32'59.619"W	0.35	
13689.00	90.700	264.700	10856.98	2947.45	-247.43	-2937.45	782480.92	591031.57	32°37'20.472"N	103°33'00.342"W	0.91	
13753.00	90.700	265.100	10856.20	3011.43	-253.12	-3001.19	782417.18	591025.88	32°37'20.421"N	103°33'01.088"W	0.62	
13816.00	90.600	265.600	10855.49	3074.42	-258.23	-3063.98	782354.39	591020.78	32°37'20.375"N	103°33'01.822"W	0.81	
13881.00	91.100	265.900	10854.52	3139.41	-263.05	-3128.80	782289.58	591015.96	32°37'20.332"N	103°33'02.580"W	0.90	
13945.00	91.000	266.400	10853.35	3203.40	-267.34	-3192.64	782225.74	591011.66	32°37'20.294"N	103°33'03.327"W	0.80	



Actual Wellpath Report

No.20H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 20H SHL
Area	Lea County, NM	Well	No. 20H
Field	(Mallon) Sec 34, T19S, R34E	Wellbore	No.20H AWB
Facility	Mallon 34 Fed No. 20H		

WELLPATH DATA (203 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
14008.00	91.100	266.200	10852.20	3266.38	-271.41	-3255.50	782162.88	591007.60	32°37'20.258"N	103°33'04.062"W	0.35	
14072.00	91.200	265.900	10850.91	3330.37	-275.82	-3319.33	782099.05	591003.19	32°37'20.219"N	103°33'04.809"W	0.49	
14136.00	90.600	266.200	10849.91	3394.36	-280.22	-3383.17	782035.21	590998.78	32°37'20.180"N	103°33'05.556"W	1.05	
14200.00	90.500	265.900	10849.29	3458.36	-284.63	-3447.02	781971.37	590994.38	32°37'20.141"N	103°33'06.303"W	0.49	
14264.00	90.100	266.200	10848.96	3522.36	-289.04	-3510.86	781907.52	590989.97	32°37'20.102"N	103°33'07.050"W	0.78	
14328.00	90.000	265.800	10848.90	3586.36	-293.50	-3574.71	781843.68	590985.50	32°37'20.063"N	103°33'07.796"W	0.64	
14359.00	90.100	264.700	10848.87	3617.35	-296.07	-3605.60	781812.79	590982.94	32°37'20.040"N	103°33'08.158"W	3.56	
14422.00	88.800	264.600	10849.48	3680.33	-301.95	-3668.32	781750.07	590977.06	32°37'19.986"N	103°33'08.892"W	2.07	
14486.00	88.400	264.200	10851.04	3744.28	-308.19	-3732.00	781686.39	590970.82	32°37'19.929"N	103°33'09.637"W	0.88	
14550.00	88.300	264.300	10852.88	3808.22	-314.60	-3795.65	781622.74	590964.41	32°37'19.870"N	103°33'10.381"W	0.22	
14613.00	88.300	264.400	10854.75	3871.16	-320.80	-3858.32	781560.08	590958.21	32°37'19.813"N	103°33'11.115"W	0.16	
14678.00	87.800	264.800	10856.97	3936.10	-326.91	-3922.99	781495.41	590952.10	32°37'19.758"N	103°33'11.871"W	0.98	
14739.00	88.700	264.800	10858.83	3997.05	-332.44	-3983.71	781434.69	590946.57	32°37'19.707"N	103°33'12.582"W	1.48	
14803.00	88.700	265.000	10860.28	4061.02	-338.13	-4047.44	781370.96	590940.88	32°37'19.656"N	103°33'13.327"W	0.31	
14867.00	88.400	265.000	10861.90	4124.99	-343.70	-4111.18	781307.23	590935.31	32°37'19.605"N	103°33'14.073"W	0.47	
14931.00	88.300	265.800	10863.74	4188.96	-348.83	-4174.94	781243.46	590930.18	32°37'19.559"N	103°33'14.819"W	1.26	
14995.00	88.700	266.300	10865.42	4252.93	-353.24	-4238.77	781179.64	590925.77	32°37'19.520"N	103°33'15.565"W	1.00	
15059.00	88.600	266.200	10866.93	4316.92	-357.42	-4302.61	781115.79	590921.59	32°37'19.483"N	103°33'16.312"W	0.22	
15122.00	89.400	265.800	10868.03	4379.91	-361.82	-4365.45	781052.96	590917.19	32°37'19.444"N	103°33'17.047"W	1.42	
15186.00	89.300	265.500	10868.75	4443.90	-366.67	-4429.26	780989.15	590912.34	32°37'19.401"N	103°33'17.794"W	0.49	
15250.00	89.400	265.200	10869.48	4507.89	-371.86	-4493.05	780925.36	590907.15	32°37'19.354"N	103°33'18.540"W	0.49	
15301.00	89.800	265.300	10869.83	4558.88	-376.08	-4543.87	780874.54	590902.93	32°37'19.316"N	103°33'19.135"W	0.81	
15352.00	89.800	265.300	10870.01	4609.88	-380.26	-4594.70	780823.71	590898.75	32°37'19.278"N	103°33'19.729"W	0.00	Proj to Bit

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
No. 20H PBHL		10850.00	-311.79	-4619.37	780799.04	590967.22	32°37'19.958"N	103°33'20.012"W	point

WELLPATH COMPOSITION - Ref Wellbore: No.20H AWB Ref Wellpath: No.20H AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
19.00	10493.00	Generic gyro - northseeking (Standard)	GyroData Gyro <100-10493>	No.20H AWB
10493.00	15352.00	NaviTrak (Standard)	MWD NaviTrak (10493-XXXX)	No.20H AWB

A Gyrodata Directional Survey

for

CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE
Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

Run Date: 21 Sep 2011

Surveyor: Michael Hattar, Michael Robles

Calculation Method: MINIMUM CURVATURE

Survey surface coordinates obtained from: Well Plan/Plot

Survey Latitude: 32.622974 deg. N Longitude: 103.540549 deg. W

Azimuth Correction:

Gyro: -0.43000 deg to Grid North

Depth Reference: Rotary Table

Rotary Table Elevation: 19.00

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

RECEIVED

FEB 09 2012

HOBBBS OGD

SUR: A-34-19s-34e, 380/N & 330/E
BHL: D-34-19s-34e, 760/N & 4925/E
API # 30-025-40135

A Gyrodata Directional Survey

CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE

Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
0.00	0.00	0.00	0.00	0.00	0.0 0.0	0.00 N 0.00 E

0 - 10493 FT. RATE GYROSCOPIC MULTISHOT SURVEY RUN INSIDE 4 1/2" DRILLPIPE						
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO CACTUS #101 R.K.B. OF 19 FT.						

100.00	0.46	261.62	0.46	100.00	0.4 261.6	0.06 S 0.40 W
200.00	0.37	248.27	0.13	200.00	1.1 257.8	0.24 S 1.09 W
300.00	0.28	245.50	0.09	299.99	1.7 254.2	0.46 S 1.62 W
400.00	0.24	256.84	0.06	399.99	2.1 253.5	0.61 S 2.04 W
500.00	0.17	248.36	0.15	499.99	2.5 251.8	0.77 S 2.34 W
611.40	0.15	127.99	0.20	611.39	2.5 247.0	0.99 S 2.33 W
706.60	0.17	118.93	0.03	706.59	2.4 241.7	1.13 S 2.10 W
801.80	0.27	92.66	0.15	801.79	2.1 235.4	1.21 S 1.76 W
897.00	0.40	100.33	0.14	896.99	1.8 223.2	1.28 S 1.21 W
992.20	0.53	128.06	0.27	992.19	1.7 198.2	1.61 S 0.53 W
1087.40	0.58	130.27	0.06	1087.38	2.2 175.3	2.20 S 0.18 E
1182.60	0.58	119.59	0.11	1182.58	2.9 160.6	2.75 S 0.97 E
1277.80	0.45	111.70	0.16	1277.77	3.6 150.9	3.12 S 1.73 E
1373.00	0.27	111.15	0.19	1372.97	4.1 145.6	3.34 S 2.29 E
1468.10	0.11	130.40	0.18	1468.07	4.3 143.6	3.48 S 2.57 E
1563.30	0.12	180.19	0.10	1563.27	4.5 144.1	3.64 S 2.64 E
1658.50	0.16	174.84	0.04	1658.47	4.7 145.6	3.87 S 2.65 E

A Gyrodata Directional Survey

CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE

Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
1753.70	0.28	145.29	0.17	1753.67	5.0	146.3	4.20 S 2.80 E
1848.90	0.38	126.51	0.15	1848.87	5.6	145.2	4.58 S 3.18 E
1944.10	0.60	100.96	0.32	1944.07	6.2	141.1	4.86 S 3.92 E
2039.30	0.51	111.86	0.15	2039.26	7.0	136.8	5.11 S 4.81 E
2134.50	0.48	113.36	0.03	2134.46	7.8	134.3	5.43 S 5.57 E
2229.70	0.48	113.82	0.00	2229.65	8.5	132.4	5.75 S 6.30 E
2324.80	0.53	114.84	0.05	2324.75	9.3	130.8	6.09 S 7.06 E
2420.00	0.52	112.84	0.02	2419.95	10.2	129.4	6.44 S 7.86 E
2515.20	0.35	105.52	0.19	2515.14	10.8	128.1	6.69 S 8.54 E
2610.40	0.29	98.96	0.07	2610.34	11.3	126.9	6.81 S 9.06 E
2705.60	0.31	85.47	0.08	2705.54	11.7	125.5	6.82 S 9.55 E
2800.80	0.59	70.97	0.32	2800.74	12.2	122.9	6.64 S 10.27 E
2896.00	1.12	69.50	0.56	2895.93	13.1	117.9	6.16 S 11.60 E
2991.20	1.40	67.02	0.30	2991.10	14.6	111.6	5.38 S 13.55 E
3086.40	1.46	68.63	0.08	3086.27	16.4	105.9	4.48 S 15.75 E
3181.60	1.54	68.16	0.09	3181.44	18.4	101.2	3.56 S 18.06 E
3276.80	1.59	67.30	0.06	3276.61	20.6	97.2	2.58 S 20.47 E
3371.90	1.63	65.29	0.07	3371.67	23.0	93.8	1.50 S 22.92 E
3467.10	1.38	58.65	0.32	3466.84	25.1	90.8	0.34 S 25.12 E
3562.30	1.19	58.80	0.20	3562.01	27.0	88.4	0.77 N 26.95 E
3657.50	1.28	59.39	0.10	3657.19	28.8	86.4	1.82 N 28.71 E
3752.70	1.01	70.68	0.37	3752.37	30.5	85.0	2.64 N 30.42 E

A Gyrodata Directional Survey

CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE

Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
3847.90	0.76	72.38	0.26	3847.56	32.0 84.4	3.11 N 31.81 E
3943.10	0.67	62.50	0.16	3942.75	33.1 83.8	3.56 N 32.91 E
4038.30	0.35	99.38	0.47	4037.95	33.9 83.6	3.77 N 33.69 E
4133.50	0.33	137.38	0.23	4133.15	34.3 84.1	3.52 N 34.16 E
4228.60	0.30	145.76	0.06	4228.24	34.6 84.8	3.11 N 34.48 E
4323.80	0.28	155.55	0.06	4323.44	34.8 85.6	2.69 N 34.72 E
4419.00	0.41	166.68	0.15	4418.64	35.0 86.5	2.15 N 34.90 E
4514.20	0.37	207.54	0.29	4513.84	34.9 87.5	1.55 N 34.83 E
4609.40	0.32	212.90	0.06	4609.04	34.6 88.3	1.05 N 34.55 E
4704.60	0.21	233.35	0.15	4704.24	34.3 88.8	0.72 N 34.26 E
4799.80	0.14	214.86	0.09	4799.44	34.1 89.1	0.52 N 34.05 E
4895.00	0.07	226.64	0.08	4894.64	33.9 89.3	0.39 N 33.95 E
4990.20	0.11	200.72	0.06	4989.84	33.9 89.6	0.26 N 33.87 E
5085.40	0.18	222.57	0.09	5085.04	33.7 89.9	0.07 N 33.74 E
5180.60	0.32	223.27	0.15	5180.24	33.5 90.4	0.24 S 33.45 E
5275.70	0.44	234.01	0.15	5275.33	33.0 91.1	0.64 S 32.98 E
5370.90	0.08	219.27	0.38	5370.53	32.7 91.6	0.91 S 32.64 E
5466.10	0.37	21.59	0.47	5465.73	32.7 91.2	0.68 S 32.71 E
5561.30	0.23	55.38	0.23	5560.93	33.0 90.5	0.28 S 32.98 E
5656.50	0.10	53.43	0.14	5656.13	33.2 90.2	0.12 S 33.20 E
5751.70	0.11	262.58	0.21	5751.33	33.2 90.1	0.09 S 33.18 E

A Gyrodata Directional Survey

CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE

Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
5846.90	0.25	266.20	0.15	5846.53	32.9 90.2	0.11 S 32.88 E
5942.10	0.32	231.73	0.19	5941.73	32.5 90.5	0.29 S 32.47 E
6037.30	0.38	203.40	0.19	6036.93	32.1 91.3	0.75 S 32.13 E
6132.40	0.44	213.41	0.10	6132.02	31.8 92.4	1.34 S 31.81 E
6227.60	0.44	221.99	0.07	6227.22	31.4 93.5	1.92 S 31.36 E
6322.80	0.40	260.33	0.29	6322.42	30.9 94.2	2.24 S 30.79 E
6418.00	0.41	260.31	0.01	6417.62	30.2 94.5	2.36 S 30.13 E
6513.20	0.45	247.42	0.11	6512.81	29.6 95.0	2.56 S 29.44 E
6608.40	0.48	253.95	0.06	6608.01	28.9 95.6	2.81 S 28.72 E
6703.60	0.34	268.05	0.18	6703.21	28.2 96.0	2.93 S 28.05 E
6798.80	0.44	310.04	0.31	6798.41	27.6 95.6	2.71 S 27.49 E
6894.00	0.48	302.31	0.08	6893.60	27.0 94.8	2.26 S 26.87 E
6989.20	0.46	299.63	0.03	6988.80	26.3 94.1	1.86 S 26.20 E
7084.40	0.46	295.65	0.03	7084.00	25.6 93.4	1.50 S 25.53 E
7179.50	0.49	287.98	0.07	7179.09	24.8 92.8	1.21 S 24.79 E
7274.70	0.51	292.35	0.05	7274.29	24.0 92.2	0.92 S 24.02 E
7369.90	0.48	296.34	0.05	7369.49	23.3 91.4	0.59 S 23.27 E
7465.10	0.56	285.07	0.14	7464.68	22.5 90.7	0.29 S 22.46 E
7560.30	0.58	285.18	0.02	7559.88	21.5 90.1	0.04 S 21.55 E
7655.50	0.59	290.39	0.06	7655.07	20.6 89.3	0.26 N 20.62 E
7750.70	0.53	299.66	0.11	7750.27	19.8 88.1	0.65 N 19.78 E
7845.90	0.56	297.61	0.04	7845.46	19.0 86.7	1.08 N 18.98 E

A Gyrodata Directional Survey

CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE

Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
7941.10	0.54	288.97	0.09	7940.66	18.2 85.5	1.44 N 18.15 E
8036.30	0.60	279.01	0.12	8035.85	17.3 84.5	1.66 N 17.23 E
8131.40	0.61	277.29	0.02	8130.95	16.3 83.7	1.81 N 16.24 E
8226.60	0.70	281.04	0.10	8226.14	15.3 82.6	1.98 N 15.16 E
8321.80	0.72	309.53	0.37	8321.34	14.3 80.1	2.47 N 14.13 E
8417.00	0.66	317.09	0.11	8416.53	13.7 76.2	3.26 N 13.30 E
8512.20	0.62	339.03	0.26	8511.72	13.4 72.0	4.14 N 12.74 E
8607.40	0.97	14.55	0.62	8606.91	13.9 67.1	5.40 N 12.76 E
8702.60	1.34	28.95	0.49	8702.10	15.3 62.1	7.15 N 13.50 E
8797.80	1.50	23.51	0.22	8797.27	17.2 57.5	9.27 N 14.53 E
8893.00	0.94	37.84	0.67	8892.44	19.0 54.6	11.03 N 15.51 E
8988.10	1.01	60.88	0.42	8987.53	20.6 54.2	12.05 N 16.72 E
9083.30	0.97	91.27	0.55	9082.72	22.1 55.7	12.44 N 18.26 E
9178.50	0.82	116.07	0.43	9177.91	23.1 58.4	12.13 N 19.68 E
9273.70	0.77	125.35	0.14	9273.10	23.8 61.2	11.46 N 20.81 E
9368.90	0.80	116.65	0.13	9368.29	24.4 63.8	10.79 N 21.93 E
9464.10	0.62	152.14	0.49	9463.48	24.9 66.2	10.04 N 22.76 E
9559.30	0.52	188.55	0.39	9558.68	24.7 68.2	9.15 N 22.94 E
9654.50	0.50	193.50	0.05	9653.87	24.2 69.9	8.32 N 22.78 E
9749.70	0.93	207.07	0.48	9749.07	23.5 72.1	7.23 N 22.33 E
9844.90	1.33	201.08	0.44	9844.25	22.3 75.7	5.51 N 21.58 E
9940.00	1.16	198.34	0.19	9939.32	21.2 80.3	3.57 N 20.88 E

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CIMAREX ENERGY

Lease: MALLON 34 FEDERAL Well: 20H, 4 1/2" DRILLPIPE

Location: CACTUS #101, LEA COUNTY, TEXAS

Job Number: MD0911GDM403

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
10035.20	1.12	207.00	0.19	10034.51	20.2 84.8	1.82 N 20.15 E
10130.40	1.56	221.53	0.58	10129.68	18.9 89.9	0.02 N 18.87 E
10225.60	1.47	226.06	0.16	10224.85	17.2 96.0	1.79 S 17.13 E
10320.80	1.66	221.73	0.23	10320.01	15.8 103.5	3.67 S 15.34 E
10416.00	1.71	212.54	0.29	10415.17	14.9 113.4	5.90 S 13.65 E
10493.00	1.70	216.87	0.17	10492.14	14.6 122.2	7.78 S 12.35 E

Final Station Closure: Distance: 14.60 ft Az: 122.20 deg.

gyrodata