

Results of Directional Survey

API number:	30-005-29090		
OGRID:		Operator:	CIMAREX ENERGY CO OF COLORADO
		Property:	FRAKLIN 18 FEDERAL COM # 4H

surface	ULSTR:	P	18	T 15S	R 31E
				375 FSL	375 FEL

BH Loc	ULSTR:	A	18	T 15S	R 31E
13177	MD	8691.5	TVD	4935 FSL	387 FEL

Top Perf/OH	ULSTR:	P	18	T 15S	R 31E
8460	MD	8459.5	TVD	348 FSL	354 FEL

Bot Perf/OH	ULSTR:	A	18	T 15S	R 31E
13177	MD	8691.5	TVD	4935 FSL	387 FEL

	MD	N/S	E/W	VD
	8458	-27.48	21.39	8457.52
TOP PERFS/OH	8460	-27.35	21.39	8459.52
	8490	-25.44	21.41	8489.44
	13044	4426.85	-11.05	8693.39
BOT PERFS/OH	13177	4559.85	-12.08	8691.53
	13107	4489.85	-11.54	8692.51

NEXT TO LAST	13044	4426.85	-11.05	8693.39
LAST READING	13107	4489.85	-11.54	8692.51
TD	13177	4559.85	-12.08	8691.53

Surface Location	375	FS	375	FE
Projected BHL	4935	FS	387	FE
Location of				
Top Perfs/OH	348	FS	354	FE
Bottom Perfs/OH	4935	FS	387	FE

SUMMARY of Subsurface Locations

Surface Location	P-18-15S-31E	375	FS	375	FE	Vert. Depth
Top Perfs/OH	P-18-15S-31E	348	FS	354	FE	8459.52
Bottom Perfs/OH	A-18-15S-31E	4935	FS	387	FE	8691.53
Projected TD	A-18-15S-31E	4935	FS	387	FE	8691.53



Cimarex Energy Co.

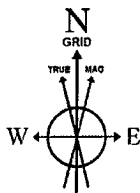
Location Chaves County, NM
Field (Franklin) Sec 18, T15S, R31E
Facility Franklin 18 Fed Com No. 4H

Slot: No 4H SHL
Well No 4H
Wellbore No. 4H PWB



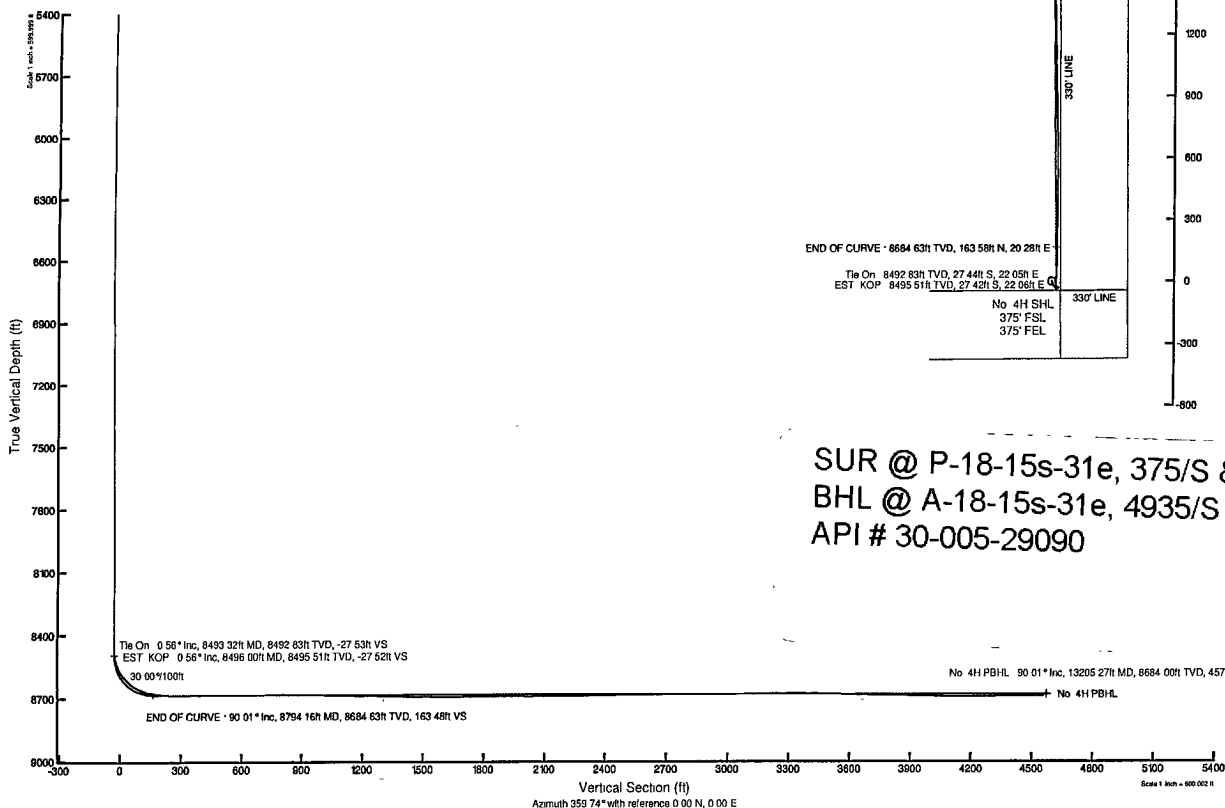
Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8493.32	0.560	77.909	8492.83	-27.44	22.05	0.00	-27.53
EST KOP	8496.00	0.560	359.000	8495.51	-27.42	22.06	26.56	-27.52
END OF CURVE	8794.16	90.008	359.472	8684.63	163.58	20.28	30.00	163.48
No 4H PBHL	13205.27	90.008	359.472	8684.00	4574.50	-20.37	0.00	4574.54



BGGM (1945.0 to 2011.0) Dip: 60.91° Field 49231.4 nT
Magnetic North is 7.96 degrees East of True North (at 4/18/2010)
Grid North is 0.26 degrees East of True North
To correct azimuth from True to Grid subtract 0.26 degrees
To correct azimuth from Magnetic to Grid add 7.70 degrees
For example if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.70 = 97.70

Plot reference wellpath is Plan #1 vs. Actual <FINAL>	
True vertical depths are referenced to Rig on No. 4H SHL (RT)	Grid System: NAD83 / TM New Mexico State Planes, Eastern Zone (2001), US feet
Measured depths are referenced to Rig on No. 4H SHL (RT)	North Reference: Grid north
Rig on No. 4H SHL (RT) to Mean Sea Level: 4452 feet	Scale: True distance
Mean Sea Level to Mud line (Facility: Franklin 18 Fed Com No. 4H) -4431 feet	Depths are in feet
Coordinates are in feet referenced to Surface Location	Created by: Victor Hernandez on 5/3/2010





Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWB
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet	Software System	WellArchitect® 2.0
North Reference	Grid	User	Victor Hernandez
Scale	0.999934	Report Generated	5/3/2010 at 3:16:23 PM
Convergence at slot	0.26° East	Database/Source file	WA_Midland/No._4H_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[USft]	Northing[USft]	Latitude	Longitude
Slot Location	0.00	0.00	688302.00	731387.60	33°00'34.792"N	103°51'14.077"W
Facility Reference Pt			688302.00	731387.60	33°00'34.792"N	103°51'14.077"W
Field Reference Pt			688326.60	735962.00	33°01'20.052"N	103°51'13.544"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 4H SHL (KB) to GL	21.00ft
Horizontal Reference Pt	Surface Location	Rig on No. 4H SHL (KB) to Mean Sea Level	4452.00ft
Vertical Reference Pt	Rig on No. 4H SHL (KB)	GL to Mud Line (Facility)	0.00ft
MD Reference Pt	Rig on No. 4H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	359.74°

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Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

WELLPATH DATA (178 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
0.00	0.000	174.410	0.00	0.00	0.00	0.00	688302.00	731387.60	33°00'34.792"N	103°51'14.077"W	0.00
100.00	0.400	174.410	100.00	-0.35	-0.35	0.03	688302.03	731387.25	33°00'34.788"N	103°51'14.077"W	0.40
200.00	0.290	133.790	200.00	-0.87	-0.87	0.25	688302.25	731386.73	33°00'34.783"N	103°51'14.075"W	0.26
300.00	0.360	180.850	300.00	-1.36	-1.36	0.43	688302.43	731386.24	33°00'34.778"N	103°51'14.073"W	0.27
400.00	0.490	122.600	399.99	-1.91	-1.90	0.78	688302.78	731385.70	33°00'34.773"N	103°51'14.068"W	0.43
500.00	0.450	119.700	499.99	-2.34	-2.33	1.49	688303.49	731385.27	33°00'34.769"N	103°51'14.060"W	0.05
600.00	0.640	156.960	599.99	-3.05	-3.04	2.05	688304.05	731384.56	33°00'34.762"N	103°51'14.054"W	0.39
700.00	0.550	141.800	699.98	-3.94	-3.93	2.56	688304.56	731383.67	33°00'34.753"N	103°51'14.048"W	0.18
785.00	0.620	142.890	784.98	-4.63	-4.62	3.09	688305.09	731382.98	33°00'34.746"N	103°51'14.041"W	0.08
880.40	0.650	145.770	880.37	-5.49	-5.47	3.71	688305.71	731382.13	33°00'34.738"N	103°51'14.034"W	0.05
975.90	0.570	152.650	975.87	-6.36	-6.34	4.23	688306.23	731381.26	33°00'34.729"N	103°51'14.028"W	0.11
1071.30	0.580	152.640	1071.26	-7.22	-7.19	4.67	688306.67	731380.41	33°00'34.720"N	103°51'14.023"W	0.01
1166.70	0.640	147.030	1166.65	-8.09	-8.07	5.18	688307.18	731379.53	33°00'34.712"N	103°51'14.017"W	0.09
1262.10	0.570	164.520	1262.05	-9.00	-8.97	5.60	688307.60	731378.63	33°00'34.703"N	103°51'14.012"W	0.21
1357.40	0.760	183.380	1357.34	-10.09	-10.06	5.69	688307.69	731377.54	33°00'34.692"N	103°51'14.011"W	0.30
1452.90	0.930	190.840	1452.83	-11.48	-11.46	5.50	688307.50	731376.14	33°00'34.678"N	103°51'14.013"W	0.21
1548.40	0.890	198.550	1548.32	-12.94	-12.92	5.12	688307.12	731374.68	33°00'34.664"N	103°51'14.018"W	0.13
1643.90	0.880	187.270	1643.81	-14.37	-14.35	4.79	688306.79	731373.25	33°00'34.650"N	103°51'14.022"W	0.18
1739.50	0.910	162.520	1739.40	-15.83	-15.80	4.93	688306.93	731371.80	33°00'34.635"N	103°51'14.020"W	0.40
1835.10	1.080	147.190	1834.98	-17.31	-17.28	5.64	688307.64	731370.32	33°00'34.621"N	103°51'14.012"W	0.33
1930.50	1.240	142.100	1930.36	-18.88	-18.85	6.77	688308.77	731368.75	33°00'34.605"N	103°51'13.999"W	0.20
2026.00	1.210	122.910	2025.84	-20.25	-20.22	8.25	688310.25	731367.38	33°00'34.591"N	103°51'13.982"W	0.43
2121.50	1.450	105.820	2121.32	-21.14	-21.10	10.26	688312.26	731366.51	33°00'34.583"N	103°51'13.958"W	0.48
2216.90	1.420	104.920	2216.69	-21.78	-21.73	12.56	688314.56	731365.87	33°00'34.576"N	103°51'13.931"W	0.04
2312.30	1.430	102.010	2312.06	-22.35	-22.28	14.87	688316.87	731365.32	33°00'34.571"N	103°51'13.904"W	0.08
2407.50	1.300	104.080	2407.23	-22.87	-22.79	17.08	688319.07	731364.81	33°00'34.566"N	103°51'13.878"W	0.15
2502.80	1.120	105.370	2502.51	-23.39	-23.30	19.02	688321.02	731364.30	33°00'34.560"N	103°51'13.855"W	0.19
2598.30	0.950	112.130	2597.99	-23.94	-23.85	20.66	688322.65	731363.76	33°00'34.555"N	103°51'13.836"W	0.22
2693.30	0.880	112.270	2692.98	-24.52	-24.42	22.06	688324.06	731363.18	33°00'34.549"N	103°51'13.820"W	0.07
2788.40	0.720	106.480	2788.07	-24.97	-24.87	23.31	688325.31	731362.74	33°00'34.545"N	103°51'13.805"W	0.19

Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWB
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

WELLPATH DATA (178 stations)

MD [ft]	Incl nation [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
2883.40	0.510	111.770	2883.07	-25.30	-25.19	24.27	688326.27	731362.41	33°00'34.542"N	103°51'13.794"W	0.23
2978.50	0.500	110.430	2978.16	-25.60	-25.49	25.06	688327.05	731362.11	33°00'34.538"N	103°51'13.785"W	0.02
3073.70	0.500	101.670	3073.36	-25.84	-25.72	25.85	688327.85	731361.88	33°00'34.536"N	103°51'13.775"W	0.08
3168.70	0.310	108.100	3168.36	-26.00	-25.89	26.50	688328.50	731361.72	33°00'34.535"N	103°51'13.768"W	0.21
3263.70	0.250	141.810	3263.36	-26.25	-26.13	26.87	688328.87	731361.47	33°00'34.532"N	103°51'13.763"W	0.18
3359.00	0.190	140.700	3358.66	-26.54	-26.41	27.10	688329.10	731361.19	33°00'34.529"N	103°51'13.761"W	0.06
3454.10	0.220	121.040	3453.76	-26.75	-26.63	27.36	688329.36	731360.97	33°00'34.527"N	103°51'13.758"W	0.08
3549.30	0.170	141.650	3548.95	-26.96	-26.84	27.60	688329.60	731360.77	33°00'34.525"N	103°51'13.755"W	0.09
3644.50	0.110	179.120	3644.15	-27.16	-27.04	27.69	688329.69	731360.56	33°00'34.523"N	103°51'13.754"W	0.11
3739.80	0.090	185.850	3739.45	-27.33	-27.20	27.69	688329.68	731360.40	33°00'34.521"N	103°51'13.754"W	0.02
3834.90	0.100	137.600	3834.55	-27.46	-27.34	27.74	688329.73	731360.26	33°00'34.520"N	103°51'13.753"W	0.08
3930.10	0.170	112.710	3929.75	-27.58	-27.46	27.92	688329.92	731360.15	33°00'34.519"N	103°51'13.751"W	0.09
4025.40	0.250	112.580	4025.05	-27.72	-27.59	28.24	688330.24	731360.01	33°00'34.518"N	103°51'13.747"W	0.08
4120.50	0.200	109.220	4120.15	-27.85	-27.72	28.59	688330.59	731359.88	33°00'34.516"N	103°51'13.743"W	0.05
4215.60	0.190	129.820	4215.25	-28.01	-27.88	28.87	688330.87	731359.72	33°00'34.515"N	103°51'13.740"W	0.07
4310.70	0.160	138.350	4310.35	-28.21	-28.08	29.08	688331.08	731359.52	33°00'34.513"N	103°51'13.738"W	0.04
4406.00	0.210	119.200	4405.65	-28.39	-28.26	29.32	688331.32	731359.34	33°00'34.511"N	103°51'13.735"W	0.08
4500.90	0.210	125.080	4500.55	-28.58	-28.45	29.61	688331.61	731359.15	33°00'34.509"N	103°51'13.731"W	0.02
4596.00	0.280	135.100	4595.65	-28.85	-28.71	29.92	688331.92	731358.89	33°00'34.506"N	103°51'13.728"W	0.09
4691.20	0.230	133.550	4690.85	-29.14	-29.01	30.22	688332.22	731358.59	33°00'34.503"N	103°51'13.724"W	0.05
4786.50	0.190	119.560	4786.15	-29.36	-29.22	30.50	688332.50	731358.38	33°00'34.501"N	103°51'13.721"W	0.07
4881.60	0.270	106.790	4881.25	-29.50	-29.36	30.85	688332.85	731358.24	33°00'34.500"N	103°51'13.717"W	0.10
4976.80	0.260	99.330	4976.45	-29.60	-29.46	31.28	688333.28	731358.14	33°00'34.499"N	103°51'13.712"W	0.04
5072.20	0.280	96.570	5071.85	-29.67	-29.52	31.72	688333.72	731358.08	33°00'34.498"N	103°51'13.707"W	0.03
5167.50	0.330	107.470	5167.14	-29.78	-29.63	32.22	688334.22	731357.97	33°00'34.497"N	103°51'13.701"W	0.08
5262.60	0.370	119.390	5262.24	-30.01	-29.87	32.75	688334.74	731357.74	33°00'34.495"N	103°51'13.695"W	0.09
5357.60	0.400	126.100	5357.24	-30.36	-30.21	33.28	688335.28	731357.39	33°00'34.491"N	103°51'13.688"W	0.06
5452.50	0.300	144.710	5452.14	-30.76	-30.61	33.69	688335.69	731356.99	33°00'34.487"N	103°51'13.683"W	0.16
5547.40	0.260	144.060	5547.04	-31.14	-30.99	33.96	688335.96	731356.61	33°00'34.484"N	103°51'13.680"W	0.04
5642.40	0.210	150.420	5642.04	-31.47	-31.31	34.18	688336.17	731356.29	33°00'34.481"N	103°51'13.678"W	0.06



Actual Wellpath Report

No. 4H AWP

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Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWB
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

WELLPATH DATA (178 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
5737.50	0.210	182.120	5737.14	-31.79	-31.64	34.25	688336.25	731355.96	33°00'34.477"N	103°51'13.677"W	0.12
5832.50	0.250	213.620	5832.13	-32.14	-31.99	34.13	688336.13	731355.62	33°00'34.474"N	103°51'13.678"W	0.14
5927.50	0.240	232.050	5927.13	-32.43	-32.28	33.86	688335.86	731355.32	33°00'34.471"N	103°51'13.682"W	0.08
6022.10	0.320	251.310	6021.73	-32.64	-32.49	33.46	688335.45	731355.12	33°00'34.469"N	103°51'13.686"W	0.13
6117.00	0.420	253.760	6116.63	-32.82	-32.67	32.87	688334.87	731354.93	33°00'34.467"N	103°51'13.693"W	0.11
6211.20	0.580	258.610	6210.83	-33.00	-32.86	32.07	688334.07	731354.74	33°00'34.465"N	103°51'13.703"W	0.18
6305.30	0.540	258.680	6304.92	-33.18	-33.04	31.17	688333.17	731354.56	33°00'34.464"N	103°51'13.713"W	0.04
6400.40	0.530	262.650	6400.02	-33.32	-33.19	30.29	688332.29	731354.42	33°00'34.462"N	103°51'13.724"W	0.04
6495.50	0.610	268.640	6495.11	-33.38	-33.25	29.35	688331.35	731354.35	33°00'34.462"N	103°51'13.735"W	0.10
6590.90	0.650	268.360	6590.51	-33.41	-33.28	28.30	688330.30	731354.32	33°00'34.461"N	103°51'13.747"W	0.04
6686.10	0.700	274.670	6685.70	-33.37	-33.25	27.18	688329.18	731354.35	33°00'34.462"N	103°51'13.760"W	0.09
6781.10	0.760	278.340	6780.69	-33.23	-33.11	25.98	688327.98	731354.49	33°00'34.463"N	103°51'13.774"W	0.08
6876.10	0.820	285.750	6875.68	-32.94	-32.83	24.70	688326.70	731354.77	33°00'34.466"N	103°51'13.789"W	0.12
6971.50	0.770	287.750	6971.08	-32.56	-32.45	23.44	688325.44	731355.15	33°00'34.470"N	103°51'13.804"W	0.06
7066.60	0.740	288.910	7066.17	-32.16	-32.06	22.25	688324.25	731355.54	33°00'34.474"N	103°51'13.818"W	0.04
7161.90	0.720	288.080	7161.46	-31.77	-31.67	21.10	688323.09	731355.93	33°00'34.478"N	103°51'13.831"W	0.02
7257.20	0.680	287.490	7256.75	-31.41	-31.32	19.99	688321.99	731356.28	33°00'34.481"N	103°51'13.844"W	0.04
7352.40	0.580	288.560	7351.95	-31.08	-31.00	18.99	688320.99	731356.61	33°00'34.484"N	103°51'13.856"W	0.11
7447.50	0.430	298.780	7447.04	-30.75	-30.67	18.22	688320.22	731356.93	33°00'34.488"N	103°51'13.865"W	0.18
7542.40	0.330	302.240	7541.94	-30.43	-30.35	17.68	688319.68	731357.25	33°00'34.491"N	103°51'13.872"W	0.11
7637.30	0.220	321.050	7636.84	-30.14	-30.07	17.33	688319.33	731357.54	33°00'34.494"N	103°51'13.876"W	0.15
7732.60	0.250	355.370	7732.14	-29.79	-29.72	17.20	688319.20	731357.89	33°00'34.497"N	103°51'13.877"W	0.15
7827.60	0.220	10.230	7827.14	-29.41	-29.33	17.22	688319.22	731358.27	33°00'34.501"N	103°51'13.877"W	0.07
7922.80	0.290	58.170	7922.34	-29.10	-29.02	17.45	688319.45	731358.58	33°00'34.504"N	103°51'13.874"W	0.23
8018.20	0.320	57.830	8017.74	-28.83	-28.75	17.89	688319.88	731358.85	33°00'34.507"N	103°51'13.869"W	0.03
8113.00	0.380	61.820	8112.53	-28.55	-28.47	18.39	688320.39	731359.14	33°00'34.509"N	103°51'13.863"W	0.07
8208.20	0.520	70.180	8207.73	-28.25	-28.17	19.07	688321.07	731359.43	33°00'34.512"N	103°51'13.855"W	0.16
8303.40	0.660	74.790	8302.93	-27.97	-27.88	20.01	688322.01	731359.72	33°00'34.515"N	103°51'13.844"W	0.16
8398.41	0.650	79.170	8397.93	-27.73	-27.63	21.06	688323.06	731359.97	33°00'34.517"N	103°51'13.832"W	0.05
8429.00	0.300	119.100	8428.52	-27.74	-27.64	21.30	688323.30	731359.96	33°00'34.517"N	103°51'13.829"W	1.51



Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWB
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

WELLPATH DATA (178 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
8458.00	0.800	5.500	8457.52	-27.57	-27.48	21.39	688323.39	731360.13	33°00'34.519"N	103°51'13.828"W	3.31
8490.00	6.500	0.100	8489.44	-25.54	-25.44	21.41	688323.41	731362.16	33°00'34.539"N	103°51'13.827"W	17.83
8505.00	10.600	3.200	8504.27	-23.31	-23.21	21.49	688323.49	731364.39	33°00'34.561"N	103°51'13.826"W	27.50
8521.00	15.200	2.700	8519.86	-19.74	-19.65	21.67	688323.67	731367.95	33°00'34.596"N	103°51'13.824"W	28.76
8553.00	23.300	3.300	8550.05	-9.22	-9.12	22.24	688324.24	731378.48	33°00'34.701"N	103°51'13.817"W	25.32
8568.00	27.200	2.900	8563.61	-2.83	-2.73	22.58	688324.58	731384.87	33°00'34.764"N	103°51'13.812"W	26.02
8585.00	31.900	2.100	8578.40	5.54	5.64	22.94	688324.94	731393.24	33°00'34.847"N	103°51'13.808"W	27.74
8616.00	40.200	1.100	8603.44	23.76	23.86	23.44	688325.43	731411.46	33°00'35.027"N	103°51'13.801"W	26.84
8648.00	48.600	1.100	8626.28	46.12	46.23	23.87	688325.86	731433.82	33°00'35.248"N	103°51'13.795"W	26.25
8680.00	57.200	0.600	8645.57	71.61	71.72	24.24	688326.24	731459.32	33°00'35.500"N	103°51'13.789"W	26.90
8712.00	65.000	1.200	8661.02	99.60	99.71	24.68	688326.68	731487.30	33°00'35.777"N	103°51'13.782"W	24.43
8727.00	69.100	1.000	8666.87	113.41	113.52	24.95	688326.95	731501.11	33°00'35.914"N	103°51'13.778"W	27.36
8741.00	73.000	1.200	8671.41	126.64	126.75	25.20	688327.20	731514.35	33°00'36.045"N	103°51'13.775"W	27.89
8772.00	81.100	0.900	8678.35	156.82	156.94	25.75	688327.75	731544.53	33°00'36.343"N	103°51'13.767"W	26.15
8804.00	84.100	0.200	8682.47	188.55	188.66	26.06	688328.06	731576.25	33°00'36.657"N	103°51'13.761"W	9.62
8836.00	86.000	359.900	8685.24	220.43	220.54	26.09	688328.08	731608.13	33°00'36.973"N	103°51'13.759"W	6.01
8867.00	88.100	0.100	8686.83	251.38	251.50	26.09	688328.08	731639.08	33°00'37.279"N	103°51'13.758"W	6.80
8899.00	89.800	359.900	8687.42	283.38	283.49	26.09	688328.08	731671.07	33°00'37.596"N	103°51'13.756"W	5.35
8930.00	90.100	0.600	8687.44	314.37	314.49	26.22	688328.22	731702.07	33°00'37.902"N	103°51'13.753"W	2.46
8962.00	90.400	0.500	8687.31	346.37	346.49	26.53	688328.53	731734.07	33°00'38.219"N	103°51'13.747"W	0.99
9025.00	91.200	1.000	8686.43	409.35	409.48	27.35	688329.35	731797.05	33°00'38.842"N	103°51'13.734"W	1.50
9057.00	91.200	1.300	8685.76	441.34	441.47	27.99	688329.99	731829.04	33°00'39.158"N	103°51'13.725"W	0.94
9088.00	91.200	1.100	8685.11	472.32	472.45	28.64	688330.64	731860.02	33°00'39.465"N	103°51'13.716"W	0.65
9120.00	90.200	1.100	8684.72	504.31	504.44	29.26	688331.26	731892.01	33°00'39.781"N	103°51'13.707"W	3.12
9152.00	89.800	359.200	8684.72	536.31	536.44	29.34	688331.34	731924.01	33°00'40.098"N	103°51'13.704"W	-6.07
9247.00	89.800	359.300	8685.05	631.30	631.43	28.10	688330.10	732018.99	33°00'41.038"N	103°51'13.714"W	0.11
9279.00	90.200	359.700	8685.05	663.30	663.43	27.82	688329.82	732050.99	33°00'41.354"N	103°51'13.715"W	1.77
9342.00	90.600	359.100	8684.61	726.30	726.43	27.16	688329.16	732113.98	33°00'41.978"N	103°51'13.720"W	1.14
9374.00	91.200	358.900	8684.10	758.29	758.42	26.60	688328.60	732145.97	33°00'42.294"N	103°51'13.725"W	1.98
9405.00	90.800	359.300	8683.56	789.28	789.41	26.11	688328.11	732176.96	33°00'42.601"N	103°51'13.729"W	1.82



Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWB
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

WELLPATH DATA (178 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
9437.00	89.900	359.000	8683.37	821.28	821.40	25.64	688327.64	732208.95	33°00'42.918"N	103°51'13.732"W	2.96
9500.00	89.100	358.300	8683.92	884.27	884.38	24.15	688326.15	732271.92	33°00'43.541"N	103°51'13.747"W	1.69
9532.00	89.100	359.000	8684.42	916.26	916.37	23.40	688325.40	732303.91	33°00'43.857"N	103°51'13.754"W	2.19
9563.00	88.300	358.500	8685.12	947.24	947.36	22.73	688324.72	732334.89	33°00'44.164"N	103°51'13.760"W	3.04
9627.00	88.200	358.700	8687.08	1011.20	1011.31	21.16	688323.16	732398.84	33°00'44.797"N	103°51'13.775"W	0.35
9690.00	89.300	358.900	8688.45	1074.18	1074.28	19.84	688321.84	732461.80	33°00'45.420"N	103°51'13.787"W	1.77
9785.00	89.100	358.200	8689.78	1169.15	1169.24	17.44	688319.44	732556.76	33°00'46.359"N	103°51'13.810"W	0.77
9880.00	88.900	358.700	8691.44	1264.11	1264.19	14.87	688316.87	732651.70	33°00'47.299"N	103°51'13.835"W	0.57
9975.00	88.500	359.100	8693.59	1359.07	1359.14	13.05	688315.05	732746.65	33°00'48.238"N	103°51'13.852"W	0.60
10006.00	88.600	358.900	8694.38	1390.06	1390.13	12.51	688314.51	732777.63	33°00'48.545"N	103°51'13.856"W	0.72
10070.00	90.100	357.600	8695.10	1454.03	1454.09	10.55	688312.55	732841.59	33°00'49.178"N	103°51'13.876"W	3.10
10165.00	89.400	358.100	8695.52	1548.98	1549.02	6.99	688308.99	732936.52	33°00'50.117"N	103°51'13.913"W	0.91
10197.00	89.200	358.000	8695.91	1580.96	1581.00	5.90	688307.90	732968.49	33°00'50.434"N	103°51'13.924"W	0.70
10228.00	90.500	357.900	8695.99	1611.94	1611.98	4.79	688306.79	732999.47	33°00'50.740"N	103°51'13.935"W	4.21
10291.00	90.300	358.200	8695.55	1674.92	1674.94	2.65	688304.65	733062.43	33°00'51.363"N	103°51'13.957"W	0.57
10323.00	90.300	357.900	8695.38	1706.90	1706.92	1.56	688303.56	733094.41	33°00'51.680"N	103°51'13.968"W	0.94
10355.00	90.200	358.000	8695.24	1738.88	1738.90	0.41	688302.41	733126.39	33°00'51.996"N	103°51'13.980"W	0.44
10418.00	90.700	357.900	8694.75	1801.85	1801.86	-1.84	688300.16	733189.34	33°00'52.619"N	103°51'14.003"W	0.81
10481.00	90.300	357.100	8694.20	1864.80	1864.80	-4.59	688297.41	733252.27	33°00'53.242"N	103°51'14.032"W	1.42
10544.00	89.900	356.900	8694.09	1927.73	1927.71	-7.89	688294.11	733315.18	33°00'53.865"N	103°51'14.067"W	0.71
10608.00	89.500	359.300	8694.42	1991.70	1991.67	-10.01	688291.99	733379.14	33°00'54.497"N	103°51'14.088"W	3.80
10671.00	90.500	358.900	8694.42	2054.69	2054.66	-11.00	688291.00	733442.12	33°00'55.121"N	103°51'14.097"W	1.71
10766.00	90.500	358.700	8693.59	2149.67	2149.64	-12.99	688289.01	733537.09	33°00'56.061"N	103°51'14.115"W	0.21
10861.00	90.600	358.900	8692.68	2244.66	2244.61	-14.98	688287.03	733632.06	33°00'57.000"N	103°51'14.133"W	0.24
10924.00	90.800	0.000	8691.91	2307.65	2307.60	-15.58	688286.42	733695.05	33°00'57.624"N	103°51'14.137"W	1.77
11019.00	91.000	1.100	8690.42	2402.63	2402.59	-14.67	688287.33	733790.02	33°00'58.563"N	103°51'14.121"W	1.18
11114.00	91.400	0.400	8688.43	2497.59	2497.56	-13.43	688288.58	733884.99	33°00'59.503"N	103°51'14.101"W	0.85
11178.00	89.400	358.300	8687.98	2561.58	2561.54	-14.15	688287.85	733948.97	33°01'00.136"N	103°51'14.107"W	4.53
11241.00	91.200	357.400	8687.65	2624.54	2624.50	-16.52	688285.49	734011.92	33°01'00.759"N	103°51'14.131"W	3.19
11304.00	90.700	357.000	8686.61	2687.47	2687.41	-19.59	688282.41	734074.83	33°01'01.381"N	103°51'14.164"W	1.02



Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWP
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWP at 8398.41 MD

WELLPATH DATA (178 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
11368.00	90.400	358.200	8685.99	2751.42	2751.35	-22.27	688279.73	734138.76	33°01'02.014"N	103°51'14.192"W	1.93
11399.00	90.500	358.500	8685.75	2782.41	2782.34	-23.16	688278.84	734169.75	33°01'02.321"N	103°51'14.201"W	1.02
11463.00	90.200	0.000	8685.36	2846.41	2846.33	-24.00	688278.00	734233.73	33°01'02.954"N	103°51'14.207"W	2.39
11558.00	90.200	359.300	8685.03	2941.41	2941.33	-24.58	688277.42	734328.73	33°01'03.894"N	103°51'14.209"W	0.74
11589.00	89.800	359.600	8685.03	2972.41	2972.32	-24.88	688277.12	734359.72	33°01'04.201"N	103°51'14.211"W	1.61
11653.00	91.000	2.400	8684.58	3036.38	3036.31	-23.76	688278.24	734423.70	33°01'04.834"N	103°51'14.194"W	4.76
11747.00	91.000	1.200	8682.94	3130.30	3130.24	-20.81	688281.19	734517.63	33°01'05.763"N	103°51'14.154"W	1.28
11842.00	90.900	1.200	8681.37	3225.26	3225.21	-18.82	688283.18	734612.59	33°01'06.702"N	103°51'14.126"W	0.11
11905.00	90.400	0.500	8680.65	3288.24	3288.20	-17.89	688284.11	734675.57	33°01'07.325"N	103°51'14.112"W	1.37
11937.00	90.200	0.600	8680.48	3320.24	3320.20	-17.58	688284.42	734707.57	33°01'07.642"N	103°51'14.106"W	0.70
12000.00	89.800	1.300	8680.48	3383.23	3383.19	-16.54	688285.47	734770.56	33°01'08.265"N	103°51'14.091"W	1.28
12064.00	88.400	1.400	8681.49	3447.19	3447.16	-15.03	688286.97	734834.52	33°01'08.898"N	103°51'14.069"W	2.19
12127.00	88.500	1.600	8683.19	3510.14	3510.11	-13.38	688288.62	734897.48	33°01'09.521"N	103°51'14.047"W	0.35
12222.00	88.600	1.100	8685.60	3605.07	3605.06	-11.14	688290.86	734992.41	33°01'10.460"N	103°51'14.015"W	0.54
12317.00	88.800	0.500	8687.75	3700.03	3700.02	-9.82	688292.18	735087.37	33°01'11.400"N	103°51'13.995"W	0.67
12412.00	88.900	1.200	8689.66	3794.99	3794.99	-8.41	688293.59	735182.33	33°01'12.339"N	103°51'13.973"W	0.74
12506.00	88.900	0.800	8691.46	3888.95	3888.96	-6.77	688295.23	735276.30	33°01'13.269"N	103°51'13.949"W	0.43
12601.00	88.600	358.800	8693.54	3983.93	3983.93	-7.10	688294.90	735371.26	33°01'14.208"N	103°51'13.948"W	2.13
12633.00	88.100	358.800	8694.46	4015.91	4015.91	-7.77	688294.23	735403.24	33°01'14.525"N	103°51'13.954"W	1.56
12664.00	88.200	358.700	8695.46	4046.89	4046.89	-8.44	688293.56	735434.21	33°01'14.831"N	103°51'13.960"W	0.46
12696.00	89.000	0.100	8696.24	4078.88	4078.88	-8.78	688293.22	735466.20	33°01'15.148"N	103°51'13.962"W	5.04
12727.00	90.300	359.600	8696.43	4109.87	4109.88	-8.86	688293.14	735497.20	33°01'15.455"N	103°51'13.961"W	4.49
12822.00	90.700	359.500	8695.60	4204.87	4204.87	-9.61	688292.39	735592.18	33°01'16.394"N	103°51'13.965"W	0.43
12885.00	90.400	359.800	8695.00	4267.87	4267.86	-9.99	688292.01	735655.17	33°01'17.018"N	103°51'13.966"W	0.67
12980.00	90.600	359.600	8694.17	4362.86	4362.86	-10.49	688291.51	735750.16	33°01'17.958"N	103°51'13.967"W	0.30
13044.00	90.800	359.400	8693.39	4426.86	4426.85	-11.05	688290.95	735814.15	33°01'18.591"N	103°51'13.970"W	0.44
13107.00	90.800	359.700	8692.51	4489.85	4489.84	-11.54	688290.46	735877.14	33°01'19.214"N	103°51'13.973"W	0.48
13177.00	90.800	359.700	8691.53	4559.84	4559.84	-11.91	688290.09	735947.13	33°01'19.906"N	103°51'13.973"W	0.00



Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Franklin) Sec 18, T15S, R31E	Wellbore	No. 4H AWB
Facility	Franklin 18 Fed Com No. 4H	Sidetrack from	No. 4 AWB at 8398.41 MD

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	Shape
No. 4H PBHL		8618.00	4574.50	-20.37	688281.63	735961.79	33°01'20.052"N	103°51'14.072"W	point

WELLPATH COMPOSITION					Ref Wellbore: No. 4H AWB	Ref Wellpath: No. 4H AWP
Start MD [ft]	End MD [ft]	Positional Uncertainty Model			Log Name/Comment	Wellbore
0.00	8398.41	Gyrodatta relative depth - Drop gyro or Multi-shot			GYRO <100 - 8986>	No. 4 AWB
8398.41	13107.00	NaviTrak (Standard)			MWD <8429 - 13107>	No. 4H AWB
13107.00	13177.00	Blind Drilling (std)			Projection to bit	No. 4H AWB