

Results of Directional Survey

API number:	30-025-40066		
OGRID:		Operator:	CIMAREX ENERGY CO of COLORADO
		Property:	WEST SHINNERY 15 FEDERAL COM # 3H

surface	ULSTR:	H	15	T	18S	R	32E
				1980	FNL	330	FEL

BH Loc	ULSTR:	E	15	T	18S	R	32E
13727	MD	9102.5	TVD	2016	FNL	339	FWL
						4941	FEL

Top Perf/OH	ULSTR:	H	15	T	18S	R	32E
9302	MD	9081.5	TVD	2175	FNL	524	FEL

Bot Perf/OH	ULSTR:	E	15	T	18S	R	32E
13589	MD	9101.1	TVD	2021	FNL	477	FWL
						4803	FEL

	MD	N/S	E/W	VD
	9273	-196.08	-165.30	9076.99
TOP PERFS/OH	9302	-194.68	-193.92	9081.45
	9305	-194.54	-196.88	9081.91
	13528	-42.07	-4411.87	9099.97
BOT PERFS/OH	13589	-40.75	-4472.84	9101.09
	13592	-40.68	-4475.84	9101.15

NEXT TO LAST	13655	-38.86	-4538.81	9101.92
LAST READING	13727	-36.35	-4610.77	9102.54
TD	13727	-36.35	-4610.77	9102.54

Surface Location	1980	FN	330	FE
Projected BHL	2016	FN	4941	FE
Location of				
Top Perfs/OH	2175	FN	524	FE
Bottom Perfs/OH	2021	FN	4803	FE

SUMMARY of Subsurface Locations

Surface Location	H-15-18S-32E	1980	FN	330	FE	Vert. Depth
Top Perfs/OH	H-15-18S-32E	2175	FN	524	FE	9081.45
Bottom Perfs/OH	E-15-18S-32E	2021	FN	4803	FE	9101.09
Projected TD	E-15-18S-32E	2016	FN	4941	FE	9102.54



Cimarex Energy Co.

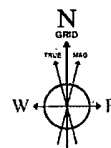
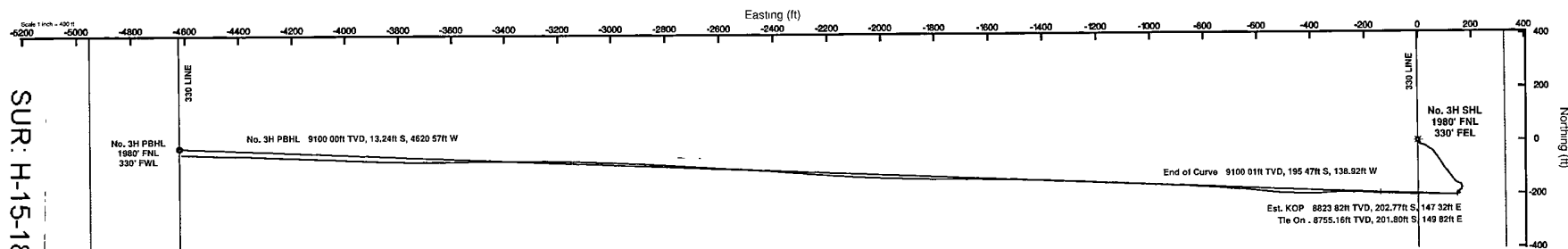
Location: Lea County, NM
Field: (West Shinnery) Sec 15, T18S, R32E
Facility: West Shinnery 15 Fed Com

Slot: No. 3H SHL
Well: No. 3H
Wellbore: No. 3H PWB



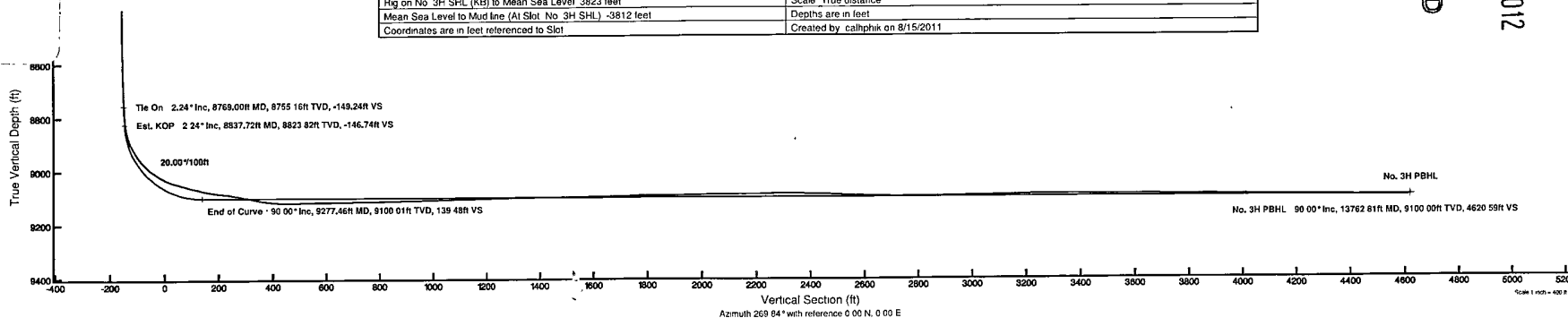
Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8769.00	2.240	248.710	8755.16	-201.80	149.82	0.00	-149.24
Est. KOP	8837.72	2.240	248.710	8823.82	-202.77	147.32	0.00	-146.74
End of Curve	9277.46	90.000	272.328	9100.01	-195.47	-138.92	20.00	139.48
No. 3H PBHL	13762.81	90.000	272.328	9100.00	-13.24	-4620.57	0.00	4620.59



BGGM (1945.0 to 2012.0) Dip 60.65° Field 48925.5 nT
Magnetic North is 7.73 degrees East of True North (at 8/15/2011)
Grid North is 0.32 degrees East of True North
To correct azimuth from True to Grid subtract 0.32 degrees
To correct azimuth from Magnetic to Grid add 7.42 degrees
For example: if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.42 = 97.42

Plot reference wellpath is Plan 1	
True vertical depths are referenced to Rig on No. 3H SHL (KB)	Grid System: NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No. 3H SHL (KB)	North Reference: Grid north
Rig on No. 3H SHL (KB) to Mean Sea Level 3823 feet	Scale: True distance
Mean Sea Level to Mud Line (At Slot No. 3H SHL) -3812 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: calphik on 8/15/2011



SUR: H-15-18s-32e, 1980/N & 330/E
BHL: E-15-18s-32e, 2016/N & 4941/E
API # 30-025-40066

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Actual Wellpath Report

No. 3H AWP

Page 1 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWB
Facility	West Shinnery 15 Fed Com		

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	0.999946	Report Generated	9/8/2011 at 7:23:19 AM
Convergence at slot	0.32° East	Database/Source file	WA Midland/No. 3H_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	721695.29	636812.94	32°44'57.345"N	103°44'48.103"W
Facility Reference Pt			721695.29	636812.94	32°44'57.345"N	103°44'48.103"W
Field Reference Pt			721695.29	636812.94	32°44'57.345"N	103°44'48.103"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 3H SHL (KB) to GL	11.00ft
Horizontal Reference Pt	Slot	Rig on No. 3H SHL (KB) to Mean Sea Level	3823.00ft
Vertical Reference Pt	Rig on No. 3H SHL (KB)	Rig on No. 3H SHL (KB) to Mud Line at Slot (No. 3H SHL)	11.00ft
MD Reference Pt	Rig on No. 3H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	269.84°



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No. 3H AWP

Page 2 of 7



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Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWP
Facility	West Shinnery 15 Fed Com		

WELLPATH DATA (231 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	327.530	0.00	0.00	0.00	0.00	721695.29	636812.94	32°44'57.345"N	103°44'48.103"W	0.00	
11.00	0.000	327.530	11.00	0.00	0.00	0.00	721695.29	636812.94	32°44'57.345"N	103°44'48.103"W	0.00	
57.00	0.220	327.530	57.00	0.05	0.07	-0.05	721695.24	636813.01	32°44'57.345"N	103°44'48.103"W	0.48	
127.00	0.280	303.620	127.00	0.26	0.28	-0.26	721695.03	636813.22	32°44'57.347"N	103°44'48.106"W	0.17	
184.00†	0.560	231.650	184.00	0.60	-0.19	-0.60	721694.69	636813.13	32°44'57.346"N	103°44'48.110"W	0.95	
252.00	0.420	185.960	252.00	0.88	-0.27	-0.88	721694.41	636812.67	32°44'57.342"N	103°44'48.113"W	0.59	
315.00	0.100	9.970	315.00	0.90	-0.44	-0.90	721694.39	636812.50	32°44'57.340"N	103°44'48.113"W	0.83	
378.00	0.340	252.770	377.99	1.07	-0.44	-1.07	721694.22	636812.50	32°44'57.340"N	103°44'48.115"W	0.63	
441.00	0.660	188.690	440.99	1.30	-0.86	-1.30	721693.99	636812.08	32°44'57.336"N	103°44'48.118"W	0.95	
504.00†	0.130	201.220	503.99	1.38	-1.28	-1.38	721693.91	636811.66	32°44'57.332"N	103°44'48.119"W	0.85	
567.00	0.740	188.480	566.99	1.47	-1.75	-1.47	721693.82	636811.19	32°44'57.327"N	103°44'48.120"W	0.97	
630.00	0.440	145.090	629.99	1.39	-2.35	-1.39	721693.90	636810.59	32°44'57.321"N	103°44'48.119"W	0.82	
693.00	0.370	240.860	692.98	1.43	-2.65	-1.43	721693.86	636810.29	32°44'57.318"N	103°44'48.120"W	0.96	
756.00	0.560	210.810	755.98	1.77	-3.01	-1.76	721693.53	636809.93	32°44'57.315"N	103°44'48.124"W	0.48	
819.00†	0.570	153.390	818.98	1.79	-3.56	-1.78	721693.51	636809.38	32°44'57.309"N	103°44'48.124"W	0.86	
882.00	0.150	225.560	881.98	1.71	-3.90	-1.70	721693.59	636809.04	32°44'57.306"N	103°44'48.123"W	0.86	
945.00	0.540	217.690	944.98	1.95	-4.19	-1.94	721693.35	636808.75	32°44'57.303"N	103°44'48.126"W	0.62	
1008.00	0.620	158.510	1007.98	2.01	-4.74	-2.00	721693.29	636808.20	32°44'57.298"N	103°44'48.126"W	0.92	
1071.00	0.440	157.090	1070.97	1.79	-5.28	-1.78	721693.51	636807.66	32°44'57.292"N	103°44'48.124"W	0.29	
1134.00†	0.230	151.990	1133.97	1.64	-5.62	-1.62	721693.67	636807.32	32°44'57.289"N	103°44'48.122"W	0.34	
1197.00	0.180	181.020	1196.97	1.58	-5.83	-1.57	721693.72	636807.11	32°44'57.287"N	103°44'48.121"W	0.18	
1260.00	0.150	189.360	1259.97	1.60	-6.01	-1.58	721693.71	636806.93	32°44'57.285"N	103°44'48.122"W	0.06	
1323.00	0.310	182.570	1322.97	1.62	-6.26	-1.60	721693.69	636806.68	32°44'57.283"N	103°44'48.122"W	0.26	
1386.00	0.410	178.900	1385.97	1.62	-6.65	-1.60	721693.69	636806.29	32°44'57.279"N	103°44'48.122"W	0.16	
1460.50†	0.620	171.450	1460.47	1.56	-7.32	-1.54	721693.75	636805.62	32°44'57.272"N	103°44'48.121"W	0.30	
1524.00	0.760	133.100	1523.96	1.20	-7.95	-1.18	721694.11	636804.99	32°44'57.266"N	103°44'48.117"W	0.74	
1587.50	0.510	121.770	1587.46	0.66	-8.38	-0.63	721694.66	636804.56	32°44'57.262"N	103°44'48.111"W	0.44	
1651.00	0.440	143.430	1650.96	0.27	-8.73	-0.25	721695.04	636804.21	32°44'57.258"N	103°44'48.106"W	0.30	
1714.50	0.610	145.930	1714.45	-0.06	-9.20	0.09	721695.38	636803.74	32°44'57.254"N	103°44'48.102"W	0.27	
1778.00†	0.620	143.610	1777.95	-0.45	-9.76	0.48	721695.77	636803.18	32°44'57.248"N	103°44'48.098"W	0.04	
1841.50	0.610	135.900	1841.45	-0.89	-10.28	0.92	721696.21	636802.66	32°44'57.243"N	103°44'48.093"W	0.13	
1905.00	0.560	132.830	1904.94	-1.35	-10.73	1.38	721696.67	636802.21	32°44'57.238"N	103°44'48.087"W	0.09	
1968.50	0.470	136.040	1968.44	-1.76	-11.13	1.79	721697.08	636801.81	32°44'57.234"N	103°44'48.083"W	0.15	
2032.00	0.430	140.700	2031.94	-2.09	-11.50	2.12	721697.41	636801.44	32°44'57.231"N	103°44'48.079"W	0.09	
2095.50†	0.600	130.000	2095.44	-2.49	-11.90	2.53	721697.82	636801.04	32°44'57.227"N	103°44'48.074"W	0.31	
2159.00	0.610	110.170	2158.93	-3.06	-12.23	3.10	721698.39	636800.71	32°44'57.223"N	103°44'48.067"W	0.33	
2222.50	0.440	114.630	2222.43	-3.60	-12.45	3.64	721698.93	636800.49	32°44'57.221"N	103°44'48.061"W	0.28	
2286.00	0.460	113.390	2285.93	-4.06	-12.65	4.09	721699.38	636800.29	32°44'57.219"N	103°44'48.056"W	0.04	
2349.50	0.540	107.320	2349.42	-4.58	-12.84	4.61	721699.90	636800.10	32°44'57.217"N	103°44'48.050"W	0.15	
2413.00†	0.600	123.010	2412.92	-5.14	-13.11	5.18	721700.47	636799.83	32°44'57.215"N	103°44'48.043"W	0.26	
2476.50	0.660	123.870	2476.42	-5.72	-13.50	5.76	721701.05	636799.44	32°44'57.211"N	103°44'48.036"W	0.10	
2540.00	1.040	123.330	2539.91	-6.51	-14.02	6.55	721701.84	636798.92	32°44'57.206"N	103°44'48.027"W	0.60	
2603.50	1.210	110.010	2603.40	-7.62	-14.56	7.66	721702.95	636798.38	32°44'57.200"N	103°44'48.014"W	0.49	
2667.00	0.760	107.680	2666.89	-8.65	-14.92	8.69	721703.98	636798.02	32°44'57.196"N	103°44'48.002"W	0.71	
2730.50†	0.780	115.320	2730.38	-9.44	-15.23	9.48	721704.77	636797.71	32°44'57.193"N	103°44'47.993"W	0.16	



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Page 3 of 7



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Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWB
Facility	West Shinnery 15 Fed Com		

WELLPATH DATA (231 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
2794.00	0.870	123.190	2793.88	-10.23	-15.68	10.27	721705.56	636797.26	32°44'57.189"N	103°44'47.983"W	0.23	
2857.50	1.160	119.200	2857.37	-11.19	-16.26	11.24	721706.53	636796.68	32°44'57.183"N	103°44'47.972"W	0.47	
2921.00	1.090	115.080	2920.85	-12.30	-16.83	12.35	721707.64	636796.11	32°44'57.177"N	103°44'47.959"W	0.17	
2984.50	0.720	87.860	2984.35	-13.24	-17.07	13.29	721708.58	636795.87	32°44'57.175"N	103°44'47.948"W	0.88	
3048.00	0.430	94.260	3047.84	-13.88	-17.07	13.93	721709.22	636795.87	32°44'57.175"N	103°44'47.941"W	0.47	
3111.50	0.350	82.990	3111.34	-14.31	-17.07	14.36	721709.65	636795.87	32°44'57.175"N	103°44'47.936"W	0.17	
3175.00	0.180	89.210	3174.84	-14.60	-17.04	14.65	721709.94	636795.90	32°44'57.175"N	103°44'47.932"W	0.27	
3238.50	0.220	94.630	3238.34	-14.82	-17.05	14.87	721710.16	636795.89	32°44'57.175"N	103°44'47.930"W	0.07	
3302.00	0.170	98.210	3301.84	-15.04	-17.08	15.09	721710.38	636795.87	32°44'57.175"N	103°44'47.927"W	0.08	
3365.50	0.320	124.520	3365.34	-15.28	-17.19	15.33	721710.62	636795.75	32°44'57.174"N	103°44'47.924"W	0.29	
3429.00	0.380	107.170	3428.84	-15.62	-17.35	15.67	721710.96	636795.59	32°44'57.172"N	103°44'47.920"W	0.19	
3492.50	0.410	117.350	3492.34	-16.03	-17.52	16.08	721711.37	636795.42	32°44'57.170"N	103°44'47.916"W	0.12	
3556.00	0.420	97.020	3555.84	-16.46	-17.65	16.51	721711.80	636795.29	32°44'57.169"N	103°44'47.911"W	0.23	
3619.50	0.520	138.620	3619.33	-16.88	-17.90	16.93	721712.22	636795.05	32°44'57.167"N	103°44'47.906"W	0.55	
3683.00	0.550	88.210	3682.83	-17.37	-18.10	17.43	721712.72	636794.84	32°44'57.165"N	103°44'47.900"W	0.72	
3746.50	0.880	98.570	3746.33	-18.16	-18.17	18.21	721713.50	636794.78	32°44'57.164"N	103°44'47.891"W	0.56	
3810.00	0.960	102.670	3809.82	-19.16	-18.35	19.21	721714.50	636794.59	32°44'57.162"N	103°44'47.879"W	0.16	
3873.50	1.280	106.250	3873.31	-20.36	-18.67	20.41	721715.70	636794.27	32°44'57.159"N	103°44'47.865"W	0.52	
3937.00	1.340	112.910	3936.79	-21.72	-19.16	21.78	721717.07	636793.78	32°44'57.154"N	103°44'47.849"W	0.26	
4000.50	2.040	110.550	4000.26	-23.46	-19.84	23.52	721718.81	636793.10	32°44'57.147"N	103°44'47.829"W	1.11	
4064.00	2.120	117.750	4063.72	-25.56	-20.79	25.62	721720.91	636792.15	32°44'57.138"N	103°44'47.804"W	0.43	
4184.80	2.410	124.560	4184.42	-29.62	-23.27	29.69	721724.98	636789.67	32°44'57.113"N	103°44'47.757"W	0.33	
4248.10	2.920	124.240	4247.66	-32.05	-24.93	32.12	721727.41	636788.01	32°44'57.096"N	103°44'47.728"W	0.81	
4311.10	4.110	126.530	4310.54	-35.18	-27.18	35.26	721730.55	636785.76	32°44'57.074"N	103°44'47.692"W	1.90	
4374.70	4.680	122.220	4373.95	-39.20	-29.92	39.28	721734.57	636783.02	32°44'57.046"N	103°44'47.645"W	1.04	
4438.00	5.250	118.520	4437.01	-43.92	-32.68	44.01	721739.30	636780.27	32°44'57.019"N	103°44'47.590"W	1.03	
4501.30	5.630	120.630	4500.03	-49.13	-35.64	49.23	721744.52	636777.30	32°44'56.989"N	103°44'47.529"W	0.68	
4564.60	6.240	132.640	4562.99	-54.32	-39.55	54.43	721749.72	636773.39	32°44'56.950"N	103°44'47.468"W	2.18	
4627.90	6.850	142.940	4625.88	-59.11	-44.90	59.24	721754.53	636768.05	32°44'56.897"N	103°44'47.412"W	2.09	
4691.20	7.680	144.810	4688.67	-63.80	-51.37	63.95	721759.24	636761.58	32°44'56.833"N	103°44'47.357"W	1.36	
4754.50	8.950	145.570	4751.30	-69.00	-58.88	69.17	721764.46	636754.06	32°44'56.758"N	103°44'47.297"W	2.01	
4817.80	10.270	142.500	4813.71	-75.20	-67.42	75.39	721770.68	636745.52	32°44'56.673"N	103°44'47.224"W	2.24	
4881.10	11.100	143.950	4875.92	-82.19	-76.83	82.41	721777.70	636736.12	32°44'56.580"N	103°44'47.143"W	1.38	
4944.40	11.400	148.050	4938.00	-89.06	-87.06	89.31	721784.60	636725.88	32°44'56.478"N	103°44'47.063"W	1.35	
5007.70	11.030	149.040	5000.09	-95.46	-97.56	95.74	721791.02	636715.38	32°44'56.374"N	103°44'46.988"W	0.66	
5071.00	9.990	137.260	5062.34	-102.27	-106.79	102.58	721797.86	636706.16	32°44'56.282"N	103°44'46.909"W	3.76	
5134.30	9.430	139.700	5124.73	-109.33	-114.78	109.66	721804.94	636698.17	32°44'56.203"N	103°44'46.826"W	1.10	
5197.60	8.800	143.950	5187.23	-115.51	-122.65	115.86	721811.15	636690.30	32°44'56.125"N	103°44'46.754"W	1.46	
5260.90	8.180	143.890	5249.84	-120.99	-130.20	121.37	721816.65	636682.75	32°44'56.050"N	103°44'46.690"W	0.98	
5324.20	6.780	142.430	5312.60	-125.91	-136.80	126.30	721821.58	636676.15	32°44'55.984"N	103°44'46.633"W	2.23	
5387.50	5.800	141.650	5375.52	-130.15	-142.27	130.56	721825.84	636670.68	32°44'55.930"N	103°44'46.583"W	1.55	
5450.80	5.060	142.560	5438.53	-133.82	-146.99	134.24	721829.52	636665.95	32°44'55.883"N	103°44'46.541"W	1.18	
5514.10	4.510	141.440	5501.61	-137.06	-151.16	137.49	721832.77	636661.79	32°44'55.842"N	103°44'46.503"W	0.88	
5577.40	4.050	134.150	5564.73	-140.20	-154.66	140.65	721835.93	636658.29	32°44'55.807"N	103°44'46.466"W	1.12	
5640.70	3.600	123.490	5627.89	-143.46	-157.31	143.91	721839.19	636655.64	32°44'55.780"N	103°44'46.428"W	1.33	



Actual Wellpath Report

No. 3H AWP

Page 4 of 7



BAKER HUGHES

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWP
Facility	West Shinnery 15 Fed Com		

WELLPATH DATA (231 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
5704.00	3.500	118.650	5691.07	-146.80	-159.34	147.26	721842.54	636653.61	32°44'55.760"N	103°44'46.389"W	0.50	
5767.30	3.240	112.120	5754.26	-150.15	-160.94	150.61	721845.89	636652.01	32°44'55.744"N	103°44'46.350"W	0.73	
5830.60	2.850	115.140	5817.47	-153.23	-162.28	153.69	721848.98	636650.67	32°44'55.731"N	103°44'46.314"W	0.67	
5893.90	2.430	113.220	5880.71	-155.88	-163.48	156.35	721851.63	636649.47	32°44'55.719"N	103°44'46.283"W	0.68	
5957.20	2.160	114.720	5943.95	-158.20	-164.50	158.67	721853.95	636648.45	32°44'55.708"N	103°44'46.256"W	0.44	
6020.50	1.920	133.480	6007.22	-160.05	-165.73	160.52	721855.80	636647.22	32°44'55.696"N	103°44'46.234"W	1.11	
6083.80	1.550	144.110	6070.49	-161.31	-167.16	161.79	721857.07	636645.79	32°44'55.682"N	103°44'46.219"W	0.77	
6147.10	1.630	145.260	6133.76	-162.33	-168.59	162.81	721858.09	636644.36	32°44'55.668"N	103°44'46.208"W	0.14	
6210.40	1.130	159.150	6197.04	-163.06	-169.91	163.54	721858.82	636643.04	32°44'55.655"N	103°44'46.199"W	0.94	
6273.70	0.960	163.380	6260.33	-163.43	-171.00	163.92	721859.20	636641.95	32°44'55.644"N	103°44'46.195"W	0.29	
6337.00	0.650	164.870	6323.63	-163.67	-171.86	164.16	721859.44	636641.09	32°44'55.635"N	103°44'46.192"W	0.49	
6400.30	0.060	218.130	6386.93	-163.74	-172.23	164.24	721859.52	636640.72	32°44'55.632"N	103°44'46.191"W	0.97	
6463.60	0.070	334.450	6450.23	-163.71	-172.22	164.20	721859.48	636640.73	32°44'55.632"N	103°44'46.191"W	0.17	
6526.90	0.530	353.340	6513.52	-163.66	-171.90	164.15	721859.43	636641.05	32°44'55.635"N	103°44'46.192"W	0.73	
6590.20	0.380	320.110	6576.82	-163.49	-171.44	163.98	721859.26	636641.51	32°44'55.639"N	103°44'46.194"W	0.47	
6653.50	0.560	7.360	6640.12	-163.39	-170.98	163.89	721859.17	636641.97	32°44'55.644"N	103°44'46.195"W	0.65	
6716.80	0.200	37.860	6703.42	-163.50	-170.58	163.99	721859.27	636642.37	32°44'55.648"N	103°44'46.194"W	0.63	
6780.10	0.040	8.570	6766.72	-163.57	-170.47	164.06	721859.34	636642.48	32°44'55.649"N	103°44'46.193"W	0.26	
6843.40	0.460	232.770	6830.02	-163.38	-170.61	163.86	721859.15	636642.34	32°44'55.648"N	103°44'46.195"W	0.77	
6906.70	0.880	202.450	6893.31	-162.99	-171.21	163.48	721858.76	636641.74	32°44'55.642"N	103°44'46.200"W	0.85	
6970.00	1.070	162.800	6956.61	-162.97	-172.22	163.47	721858.75	636640.73	32°44'55.632"N	103°44'46.200"W	1.08	
7096.60	1.010	122.940	7083.19	-164.25	-173.96	164.75	721860.03	636638.99	32°44'55.614"N	103°44'46.185"W	0.56	
7159.90	0.500	139.820	7146.48	-164.90	-174.47	165.40	721860.68	636638.48	32°44'55.609"N	103°44'46.178"W	0.87	
7223.20	0.470	149.610	7209.78	-165.21	-174.91	165.71	721860.99	636638.04	32°44'55.605"N	103°44'46.174"W	0.14	
7286.50	0.390	153.760	7273.08	-165.43	-175.32	165.93	721861.22	636637.63	32°44'55.601"N	103°44'46.171"W	0.14	
7349.80	0.520	223.630	7336.38	-165.33	-175.73	165.83	721861.11	636637.22	32°44'55.597"N	103°44'46.173"W	0.84	
7413.10	0.710	202.450	7399.67	-164.98	-176.30	165.48	721860.76	636636.65	32°44'55.591"N	103°44'46.177"W	0.46	
7476.40	1.630	198.340	7462.96	-164.54	-177.51	165.05	721860.33	636635.44	32°44'55.579"N	103°44'46.182"W	1.46	
7539.70	1.720	191.540	7526.23	-164.06	-179.30	164.58	721859.86	636633.65	32°44'55.562"N	103°44'46.188"W	0.34	
7603.00	2.060	172.000	7589.50	-164.03	-181.36	164.55	721859.83	636631.59	32°44'55.541"N	103°44'46.188"W	1.14	
7666.30	1.370	214.080	7652.77	-163.75	-183.11	164.28	721859.56	636629.84	32°44'55.524"N	103°44'46.191"W	2.20	
7729.60	1.570	213.740	7716.05	-162.84	-184.46	163.37	721858.65	636628.49	32°44'55.511"N	103°44'46.202"W	0.32	
7792.90	1.460	230.260	7779.33	-161.74	-185.69	162.27	721857.55	636627.26	32°44'55.498"N	103°44'46.215"W	0.71	
7856.20	1.370	242.760	7842.61	-160.44	-186.56	160.98	721856.26	636626.39	32°44'55.490"N	103°44'46.230"W	0.51	
7919.50	1.230	255.770	7905.89	-159.11	-187.07	159.65	721854.93	636625.88	32°44'55.485"N	103°44'46.246"W	0.51	
7982.80	1.310	226.320	7969.18	-157.93	-187.74	158.47	721853.75	636625.21	32°44'55.478"N	103°44'46.260"W	1.03	
8046.10	1.120	224.660	8032.46	-156.97	-188.68	157.51	721852.79	636624.27	32°44'55.469"N	103°44'46.271"W	0.31	
8109.40	0.620	223.610	8095.76	-156.29	-189.36	156.84	721852.12	636623.59	32°44'55.462"N	103°44'46.279"W	0.79	
8172.70	1.060	205.890	8159.05	-155.80	-190.14	156.35	721851.63	636622.81	32°44'55.455"N	103°44'46.285"W	0.80	
8236.00	0.810	265.580	8222.34	-155.10	-190.70	155.64	721850.92	636622.25	32°44'55.449"N	103°44'46.293"W	1.51	
8299.30	1.280	182.920	8285.63	-154.61	-191.44	155.16	721850.44	636621.51	32°44'55.442"N	103°44'46.299"W	2.25	
8362.60	1.440	169.080	8348.92	-154.72	-192.93	155.28	721850.56	636620.02	32°44'55.427"N	103°44'46.297"W	0.58	
8425.90	0.970	186.360	8412.20	-154.81	-194.24	155.37	721850.65	636618.71	32°44'55.414"N	103°44'46.296"W	0.93	
8489.20	1.590	190.870	8475.49	-154.58	-195.64	155.14	721850.42	636617.32	32°44'55.400"N	103°44'46.299"W	0.99	
8552.50	1.210	210.140	8538.77	-154.08	-197.08	154.64	721849.92	636615.87	32°44'55.386"N	103°44'46.305"W	0.95	



Actual Wellpath Report

No. 3H AWP

Page 5 of 7



**BAKER
HUGHES**

REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWB
Facility	West Shinnery 15 Fed Com		

WELLPATH DATA (231 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
8615.80	1.900	213.240	8602.04	-153.16	-198.53	153.73	721849.01	636614.42	32°44'55.372"N	103°44'46.316"W	1.10	
8679.10	1.810	226.400	8665.31	-151.86	-200.10	152.43	721847.71	636612.85	32°44'55.356"N	103°44'46.331"W	0.69	
8742.40	2.070	239.670	8728.57	-150.14	-201.37	150.72	721846.00	636611.59	32°44'55.344"N	103°44'46.351"W	0.82	
8769.00	2.240	248.710	8755.16	-149.24	-201.80	149.82	721845.10	636611.15	32°44'55.340"N	103°44'46.362"W	1.43	
8798.00	3.000	242.200	8784.13	-148.04	-202.36	148.62	721843.90	636610.59	32°44'55.334"N	103°44'46.376"W	2.81	
8830.00	5.900	259.900	8816.03	-145.68	-203.04	146.26	721841.54	636609.92	32°44'55.328"N	103°44'46.403"W	9.92	
8861.00	11.900	269.000	8846.64	-140.91	-203.37	141.49	721836.77	636609.58	32°44'55.325"N	103°44'46.459"W	19.82	
8893.00	17.900	269.400	8877.55	-132.69	-203.48	133.27	721828.55	636609.47	32°44'55.324"N	103°44'46.556"W	18.75	
8925.00	25.800	271.000	8907.23	-120.79	-203.41	121.37	721816.65	636609.54	32°44'55.325"N	103°44'46.695"W	24.76	
8956.00	31.700	270.600	8934.40	-105.88	-203.21	106.47	721801.75	636609.74	32°44'55.328"N	103°44'46.869"W	19.04	
8988.00	40.300	270.900	8960.26	-87.10	-202.96	87.68	721782.96	636610.00	32°44'55.332"N	103°44'47.089"W	26.88	
9020.00	46.200	269.700	8983.56	-65.18	-202.85	65.76	721761.05	636610.10	32°44'55.334"N	103°44'47.346"W	18.61	
9052.00	53.600	270.400	9004.16	-40.72	-202.82	41.30	721736.59	636610.13	32°44'55.336"N	103°44'47.632"W	23.19	
9084.00	59.500	271.300	9021.79	-14.04	-202.42	14.62	721709.91	636610.53	32°44'55.341"N	103°44'47.945"W	18.59	
9114.00	68.300	271.000	9034.97	-12.87	-201.88	-12.29	721683.00	636611.07	32°44'55.348"N	103°44'48.260"W	29.35	
9146.00	72.400	272.300	9045.73	42.98	-201.01	-42.41	721652.88	636611.94	32°44'55.358"N	103°44'48.612"W	13.37	
9178.00	74.400	272.400	9054.87	73.62	-199.75	-73.05	721622.25	636613.20	32°44'55.372"N	103°44'48.971"W	6.26	
9210.00	75.600	270.000	9063.16	104.52	-199.11	-103.95	721591.35	636613.84	32°44'55.380"N	103°44'49.333"W	8.16	
9241.00	77.000	273.300	9070.50	134.61	-198.24	-134.05	721561.25	636614.71	32°44'55.391"N	103°44'49.685"W	11.28	
9273.00	79.600	274.600	9076.99	165.86	-196.08	-165.30	721530.00	636616.87	32°44'55.414"N	103°44'50.051"W	9.05	
9305.00	82.700	271.000	9081.91	197.43	-194.54	-196.88	721498.42	636618.41	32°44'55.431"N	103°44'50.420"W	14.74	
9337.00	81.800	271.700	9086.23	229.13	-193.79	-228.57	721466.73	636619.16	32°44'55.440"N	103°44'50.792"W	3.55	
9369.00	80.500	271.100	9091.15	260.74	-193.02	-260.18	721435.12	636619.93	32°44'55.449"N	103°44'51.162"W	4.46	
9400.00	78.800	268.700	9096.72	291.23	-193.07	-290.68	721404.63	636619.88	32°44'55.450"N	103°44'51.519"W	9.38	
9432.00	78.100	266.100	9103.13	322.55	-194.49	-321.99	721373.32	636618.46	32°44'55.438"N	103°44'51.885"W	8.26	
9464.00	79.400	265.800	9109.37	353.86	-196.71	-353.30	721342.01	636616.24	32°44'55.418"N	103°44'52.252"W	4.17	
9496.00	83.200	269.100	9114.21	385.45	-198.11	-384.89	721310.42	636614.84	32°44'55.406"N	103°44'52.622"W	15.65	
9527.00	87.000	270.800	9116.86	416.33	-198.14	-415.77	721279.55	636614.81	32°44'55.407"N	103°44'52.984"W	13.42	
9559.00	90.300	273.400	9117.61	448.29	-196.96	-447.73	721247.58	636615.99	32°44'55.420"N	103°44'53.358"W	13.13	
9591.00	90.700	271.000	9117.33	480.26	-195.74	-479.70	721215.61	636617.21	32°44'55.434"N	103°44'53.732"W	7.60	
9623.00	90.600	274.500	9116.97	512.21	-194.20	-511.66	721183.66	636618.75	32°44'55.451"N	103°44'54.106"W	10.94	
9655.00	90.800	277.000	9116.58	544.04	-191.00	-543.49	721151.83	636621.95	32°44'55.485"N	103°44'54.479"W	7.84	
9718.00	90.800	274.700	9115.70	606.68	-184.58	-606.16	721089.17	636628.37	32°44'55.552"N	103°44'55.212"W	3.65	
9782.00	90.900	274.400	9114.75	670.46	-179.50	-669.95	721025.38	636633.45	32°44'55.605"N	103°44'55.958"W	0.49	
9845.00	90.300	274.100	9114.09	733.27	-174.83	-732.77	720962.56	636638.12	32°44'55.655"N	103°44'56.694"W	1.06	
9909.00	90.900	273.400	9113.42	797.11	-170.65	-796.63	720898.71	636642.30	32°44'55.700"N	103°44'57.441"W	1.44	
9972.00	91.800	273.100	9111.94	859.98	-167.07	-859.51	720835.83	636645.87	32°44'55.739"N	103°44'58.177"W	1.51	
10035.00	91.700	272.900	9110.01	922.86	-163.78	-922.39	720772.95	636649.17	32°44'55.775"N	103°44'58.913"W	0.35	
10098.00	91.100	272.500	9108.47	985.76	-160.81	-985.30	720710.04	636652.14	32°44'55.807"N	103°44'59.649"W	1.14	
10162.00	91.100	272.600	9107.25	1049.68	-157.97	-1049.23	720646.12	636654.98	32°44'55.839"N	103°45'00.398"W	0.16	
10225.00	91.200	272.400	9105.98	1112.60	-155.22	-1112.16	720583.20	636657.73	32°44'55.870"N	103°45'01.134"W	0.35	
10289.00	91.100	272.500	9104.70	1176.52	-152.48	-1176.08	720519.27	636660.47	32°44'55.900"N	103°45'01.883"W	0.22	
10352.00	91.400	272.800	9103.32	1239.43	-149.57	-1239.00	720456.36	636663.38	32°44'55.932"N	103°45'02.619"W	0.67	
10416.00	91.100	272.500	9101.93	1303.33	-146.61	-1302.92	720392.44	636666.34	32°44'55.965"N	103°45'03.367"W	0.66	
10480.00	91.000	272.000	9100.75	1367.27	-144.10	-1366.86	720328.51	636668.85	32°44'55.993"N	103°45'04.116"W	0.80	



Actual Wellpath Report

No. 3H AWP

Page 6 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWB
Facility	West Shinnery 15 Fed Com		

WELLPATH DATA (231 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
10543.00	90.300	271.600	9100.04	1430.22	-142.12	-1429.82	720265.55	636670.83	32°44'56.016"N	103°45'04.853"W	1.28	
10606.00	90.600	271.100	9099.54	1493.20	-140.64	-1492.80	720202.57	636672.31	32°44'56.035"N	103°45'05.590"W	0.93	
10670.00	91.300	271.000	9098.48	1557.18	-139.46	-1556.78	720138.59	636673.48	32°44'56.050"N	103°45'06.339"W	1.10	
10733.00	91.000	270.600	9097.22	1620.15	-138.58	-1619.76	720075.62	636674.36	32°44'56.062"N	103°45'07.076"W	0.79	
10797.00	91.500	270.500	9095.82	1684.13	-137.97	-1683.75	720011.64	636674.98	32°44'56.071"N	103°45'07.825"W	0.80	
10860.00	91.200	270.900	9094.34	1747.11	-137.20	-1746.72	719948.66	636675.75	32°44'56.082"N	103°45'08.563"W	0.79	
10924.00	89.700	270.200	9093.84	1811.10	-136.59	-1810.72	719884.68	636676.36	32°44'56.092"N	103°45'09.312"W	2.59	
10987.00	90.800	271.200	9093.56	1874.09	-135.82	-1873.71	719821.69	636677.13	32°44'56.103"N	103°45'10.049"W	2.36	
11051.00	91.100	272.200	9092.50	1938.05	-133.92	-1937.67	719757.73	636679.03	32°44'56.125"N	103°45'10.798"W	1.63	
11115.00	90.900	272.100	9091.38	2001.98	-131.52	-2001.62	719693.79	636681.43	32°44'56.152"N	103°45'11.547"W	0.35	
11178.00	90.800	272.400	9090.45	2064.92	-129.05	-2064.56	719630.84	636683.90	32°44'56.180"N	103°45'12.284"W	0.50	
11242.00	90.300	273.900	9089.83	2128.81	-125.53	-2128.46	719566.95	636687.42	32°44'56.219"N	103°45'13.031"W	2.47	
11305.00	90.600	274.000	9089.34	2191.65	-121.19	-2191.31	719504.11	636691.76	32°44'56.265"N	103°45'13.767"W	0.50	
11369.00	90.800	273.900	9088.56	2255.48	-116.78	-2255.15	719440.27	636696.17	32°44'56.312"N	103°45'14.514"W	0.35	
11433.00	90.300	274.800	9087.94	2319.27	-111.93	-2318.96	719376.46	636701.02	32°44'56.363"N	103°45'15.261"W	1.61	
11496.00	88.700	274.600	9088.49	2382.04	-106.76	-2381.75	719313.68	636706.18	32°44'56.418"N	103°45'15.996"W	2.56	
11560.00	88.100	274.300	9090.28	2445.81	-101.80	-2445.53	719249.90	636711.14	32°44'56.470"N	103°45'16.742"W	1.05	
11623.00	87.500	273.000	9092.70	2508.62	-97.79	-2508.35	719187.08	636715.15	32°44'56.514"N	103°45'17.478"W	2.27	
11687.00	87.900	273.000	9095.27	2572.47	-94.45	-2572.21	719123.22	636718.50	32°44'56.550"N	103°45'18.225"W	0.62	
11750.00	88.700	273.400	9097.13	2635.34	-90.93	-2635.09	719060.35	636722.01	32°44'56.588"N	103°45'18.961"W	1.42	
11814.00	89.000	272.800	9098.42	2699.22	-87.47	-2698.98	718996.46	636725.47	32°44'56.626"N	103°45'19.709"W	1.05	
11878.00	90.000	273.800	9098.98	2763.10	-83.79	-2762.87	718932.58	636729.16	32°44'56.666"N	103°45'20.457"W	2.21	
11941.00	90.400	273.500	9098.76	2825.96	-79.78	-2825.74	718869.71	636733.17	32°44'56.709"N	103°45'21.193"W	0.79	
12004.00	91.100	273.200	9097.93	2888.83	-76.10	-2888.63	718806.82	636736.85	32°44'56.749"N	103°45'21.929"W	1.21	
12068.00	90.900	272.000	9096.82	2952.75	-73.19	-2952.55	718742.90	636739.75	32°44'56.781"N	103°45'22.677"W	1.90	
12131.00	91.200	272.300	9095.66	3015.69	-70.83	-3015.49	718679.96	636742.11	32°44'56.808"N	103°45'23.414"W	0.67	
12195.00	90.900	272.100	9094.49	3079.62	-68.37	-3079.44	718616.02	636744.57	32°44'56.835"N	103°45'24.162"W	0.56	
12258.00	90.700	271.500	9093.61	3142.58	-66.39	-3142.40	718553.07	636746.55	32°44'56.858"N	103°45'24.899"W	1.00	
12322.00	91.100	271.600	9092.60	3206.54	-64.66	-3206.37	718489.10	636748.28	32°44'56.879"N	103°45'25.648"W	0.64	
12385.00	90.300	270.700	9091.83	3269.52	-63.40	-3269.35	718426.12	636749.54	32°44'56.895"N	103°45'26.385"W	1.91	
12449.00	89.600	270.400	9091.89	3333.51	-62.78	-3333.35	718362.13	636750.16	32°44'56.904"N	103°45'27.135"W	1.19	
12512.00	89.400	269.700	9092.44	3396.51	-62.73	-3396.34	718299.14	636750.21	32°44'56.908"N	103°45'27.872"W	1.16	
12576.00	90.000	269.600	9092.78	3460.51	-63.12	-3460.34	718235.14	636749.82	32°44'56.908"N	103°45'28.622"W	0.95	
12639.00	90.300	269.400	9092.61	3523.51	-63.67	-3523.34	718172.15	636749.27	32°44'56.906"N	103°45'29.359"W	0.57	
12703.00	89.900	269.200	9092.50	3587.50	-64.45	-3587.33	718108.16	636748.49	32°44'56.902"N	103°45'30.109"W	0.70	
12766.00	89.700	269.900	9092.72	3650.50	-64.95	-3650.33	718045.16	636748.00	32°44'56.900"N	103°45'30.846"W	1.16	
12830.00	89.400	270.000	9093.22	3714.50	-65.00	-3714.33	717981.17	636747.94	32°44'56.903"N	103°45'31.595"W	0.49	
12893.00	89.600	270.700	9093.77	3777.49	-64.62	-3777.32	717918.18	636748.33	32°44'56.910"N	103°45'32.333"W	1.16	
12957.00	90.000	271.300	9093.99	3841.48	-63.50	-3841.31	717854.19	636749.44	32°44'56.925"N	103°45'33.082"W	1.13	
13020.00	89.200	272.600	9094.43	3904.43	-61.36	-3904.27	717791.23	636751.59	32°44'56.949"N	103°45'33.819"W	2.42	
13084.00	89.400	272.400	9095.22	3968.36	-58.57	-3968.21	717727.30	636754.38	32°44'56.980"N	103°45'34.568"W	0.44	
13147.00	89.500	272.400	9095.82	4031.29	-55.93	-4031.15	717664.36	636757.01	32°44'57.010"N	103°45'35.304"W	0.16	
13211.00	89.600	272.200	9096.32	4095.23	-53.36	-4095.10	717600.42	636759.58	32°44'57.039"N	103°45'36.053"W	0.35	
13274.00	89.400	272.100	9096.87	4158.18	-51.00	-4158.05	717537.47	636761.95	32°44'57.065"N	103°45'36.790"W	0.35	
13338.00	89.400	272.200	9097.54	4222.12	-48.60	-4222.00	717473.52	636764.35	32°44'57.092"N	103°45'37.538"W	0.16	



Actual Wellpath Report

No. 3H AWP

Page 7 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(West Shinnery) Sec 15, T18S, R32E	Wellbore	No. 3H AWB
Facility	West Shinnery 15 Fed Com		

WELLPATH DATA (231 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
13401.00	89.400	272.300	9098.20	4285.06	-46.12	-4284.95	717410.58	636766.82	32°44'57.120"N	103°45'38.275"W	0.16	
13465.00	89.300	271.900	9098.93	4349.01	-43.78	-4348.90	717346.63	636769.17	32°44'57.147"N	103°45'39.024"W	0.64	
13528.00	88.800	271.200	9099.97	4411.97	-42.07	-4411.87	717283.67	636770.87	32°44'57.167"N	103°45'39.761"W	1.37	
13592.00	89.100	271.300	9101.15	4475.94	-40.68	-4475.84	717219.70	636772.26	32°44'57.184"N	103°45'40.510"W	0.49	
13655.00	89.500	272.000	9101.92	4538.90	-38.86	-4538.81	717156.73	636774.08	32°44'57.206"N	103°45'41.247"W	1.28	
13727.00	89.500	272.000	9102.54	4610.85	-36.35	-4610.77	717084.78	636776.59	32°44'57.234"N	103°45'42.089"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. 3H PBHL		9100.00	-13.24	-4620.57	717074.98	636799.70	32°44'57.464"N	103°45'42.203"W	point

WELLPATH COMPOSITION - Ref Wellbore: No. 3H AWB Ref Wellpath: No. 3H AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
11.00	8769.00	Generic gyro - northseeking (Standard)	Gyro	No. 3H AWB
8769.00	13727.00	NaviTrak (Standard)	MWD	No. 3H AWB