

30-015-38294



CACTUS DRILLING COMPANY, L.L.C.

REPORT OF PROOF OF APPARENT DEVIATION
NEW MEXICO

OPERATOR CIMAREX CO OF COLORADO

600 N. MARIENFELD ST
MIDLAND, TX 79701

FIELD NAME

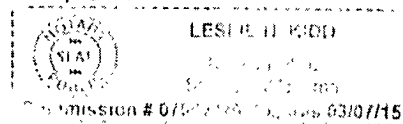
COUNTY/PARISH EDDY

WELL NAME & NO. WEST SHUGART 32 ST 1H

LEGAL SEC 32-18S-31E

MEASURED DEPTH (FT)	COURSE LENGTH (HUNDREDS OF FT)	ANGLE OF INCLINATION (DEGREES)	DISPLACEMENT PER HUNDRED FT (SINE OF ANGLE X 100)	COURSE DISPLACEMENT (FEET)	ACCUMULATIVE DISPLACEMENT (FEET)	REMARKS
191	1.91	1	1.7452	3.33	3.33	
955	7.64	1	1.7452	13.33	16.67	
1250	2.95	1/2	0.8727	2.57	19.24	
1750	5.00	1	1.7452	8.73	27.97	
2205	4.55	1	1.7452	7.94	35.91	
2705	5.00	1 1/5	2.0942	10.47	46.38	
3212	5.07	4/9	0.7854	3.98	50.36	
4206	9.94	8/9	1.5533	15.44	65.80	
4830	6.24	1	1.7452	10.89	76.69	
5285	4.55	0	0.1745	0.79	77.49	
5485	2.00	0	0.1745	0.35	77.83	
6285	8.00	1	1.7452	13.96	91.80	
6785	5.00	0	0.1745	0.87	92.67	
7285	5.00	2	3.4899	17.45	110.12	
7740	4.55	0	0.1745	0.79	110.91	
8240	5.00	1	1.7452	8.73	119.64	
8730	4.90	0	0.0000	0.00	119.64	

Leslie N. Kidd
9-29-11



P.O. Box 270848 • Oklahoma City, OK 73137-0848
(405) 577-5347 • Fax (405) 577-9306

9/29/2011



Cimarex Energy Co.

Location: Eddy County, NM
Field: (West Shugart) Sec 32, T18S, R31E
Facility: West Shugart 32 State Com No. 1

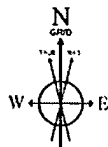
Slot: No. 1H SHL
Well: No. 1H
Wellbore: No. 1H PWD



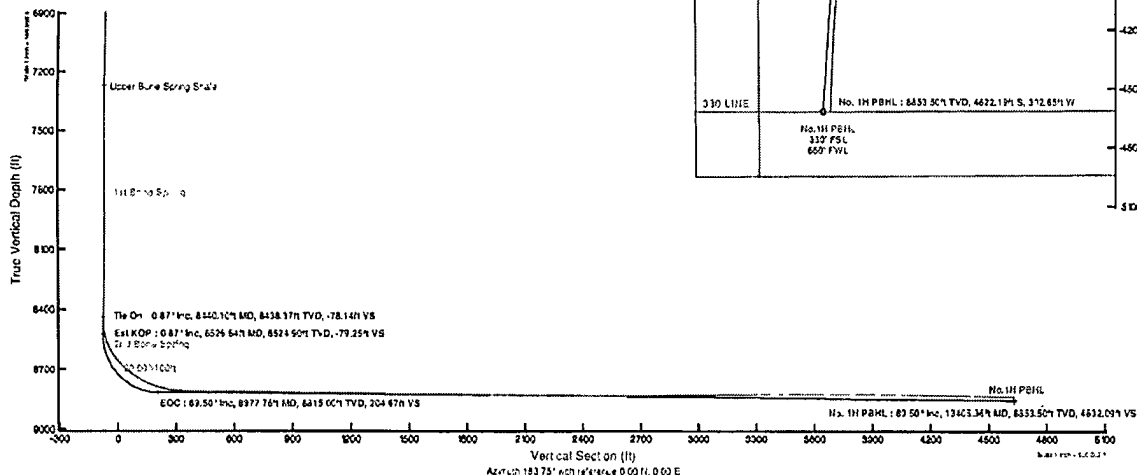
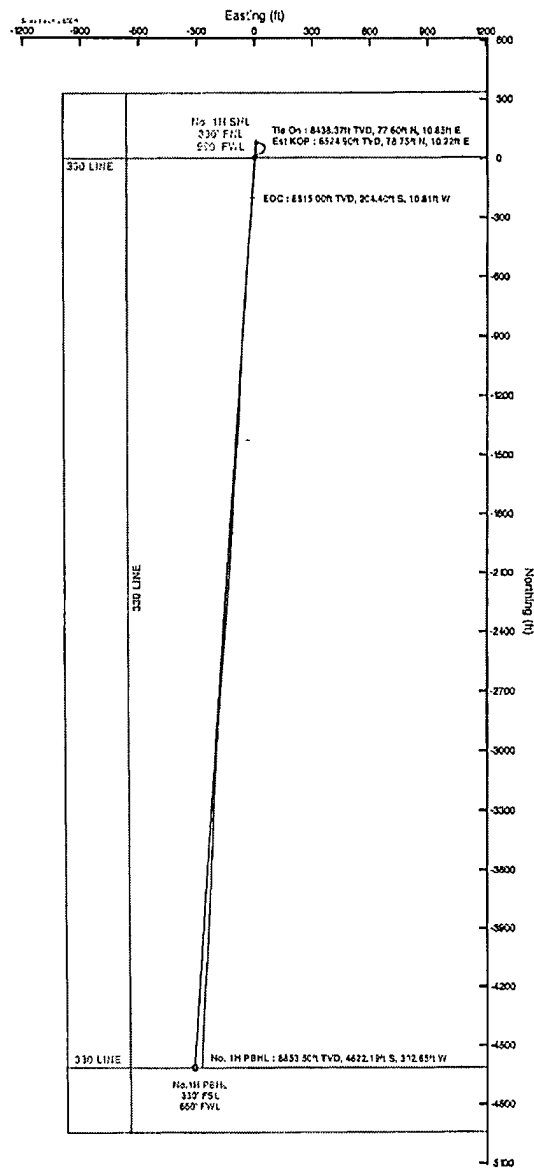
Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (γ100ft)	VS (ft)
Tie On	8440.10	0.870	331.680	8438.37	77.60	10.85	0.00	-78.14
Est KOP	8526.64	0.870	331.680	8524.90	78.75	10.22	0.00	-79.25
EOC	8977.76	89.502	183.779	8815.00	-204.40	-10.81	20.00	204.67
No. 1H PBHL	13405.36	89.502	183.780	8853.50	-4622.19	-302.65	0.00	4632.09

Reference well: No. 1H SHL	Grid Elevation: 5463.71 ft = 5463.71 ft (2011 US Feet)
Estimated depth to reference well: 1H SHL (97)	Actual Reference Grid North
Depth to 1H SHL (97) to Mean Sea Level: 3103 feet	Base True Azimuth
Mean Sea Level to Grid (97) to 1H SHL: 3103 feet	Estimated Well
Source: 1H SHL (97) to 1H SHL	Estimated Wellbore



BGM (1915.0 to 2012.0) Dp: 80.99' Field: 43313.9 nT
Magnetic North is 7.84 degrees East of True North (at 11/2011)
Grid North is 0.24 degrees East of True North
To correct azimuth from True to Grid: Add 0.24 degrees
To correct azimuth from Magnetic to Grid: Add 7.60 degrees
For example if the Magnetic North Azimuth = 60 degrees then the Grid North Azimuth = 60 + 7.60 = 67.60





Actual Wellpath Report

No. 1H AWP

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REFERENCE WELLPATH IDENTIFICATION				
Operator	Cimarex Energy Co.		Slot	No. 1H SHL
Area	Eddy County, NM		Well	No. 1H
Field	(West Shugart) Sec 32, T18S, R31E		Wellbore	No. 1H AWP
Facility	West Shugart 32 State Com No.1			

WELLPATH DATA (158 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
11306.00	90.600	184.500	8835.17	2580.66	-2575.84	-158.04	675388.97	619823.85	32°42'11.450"N	103°53'51.128"W	0.71	
11402.00	91.100	184.700	8833.74	2676.64	-2671.52	-165.74	675381.27	619728.17	32°42'10.504"N	103°53'51.223"W	0.56	
11497.00	91.000	184.200	8832.00	2771.62	-2766.22	-173.11	675373.90	619633.48	32°42'09.567"N	103°53'51.314"W	0.54	
11593.00	90.400	183.900	8830.83	2867.61	-2861.97	-179.89	675367.12	619537.74	32°42'08.620"N	103°53'51.398"W	0.70	
11688.00	90.500	183.300	8830.08	2962.60	-2956.78	-185.86	675361.16	619442.94	32°42'07.682"N	103°53'51.472"W	0.64	
11783.00	90.400	183.000	8829.34	3057.59	-3051.63	-191.08	675355.94	619348.09	32°42'06.744"N	103°53'51.538"W	0.33	
11878.00	90.200	183.000	8828.84	3152.59	-3146.50	-196.05	675350.97	619253.23	32°42'05.805"N	103°53'51.600"W	0.21	
11974.00	90.300	182.600	8828.42	3248.57	-3242.38	-200.74	675346.28	619157.35	32°42'04.857"N	103°53'51.660"W	0.43	
12069.00	90.600	182.700	8827.67	3343.55	-3337.28	-205.13	675341.89	619062.46	32°42'03.918"N	103°53'51.716"W	0.33	
12165.00	90.800	182.200	8826.50	3439.52	-3433.18	-209.23	675337.78	618966.56	32°42'02.969"N	103°53'51.768"W	0.56	
12260.00	89.700	182.500	8826.09	3534.49	-3528.10	-213.13	675333.89	618871.65	32°42'02.030"N	103°53'51.819"W	1.20	
12356.00	89.800	181.900	8826.50	3630.45	-3624.03	-216.81	675330.20	618775.73	32°42'01.081"N	103°53'51.866"W	0.63	
12451.00	90.100	182.700	8826.59	3725.42	-3718.95	-220.63	675326.39	618680.82	32°42'00.142"N	103°53'51.915"W	0.90	
12546.00	90.600	181.900	8826.01	3820.39	-3813.87	-224.44	675322.58	618585.90	32°41'59.203"N	103°53'51.965"W	0.99	
12641.00	89.300	183.100	8826.09	3915.36	-3908.78	-228.58	675318.44	618491.00	32°41'58.264"N	103°53'52.018"W	1.86	
12737.00	89.100	183.600	8827.43	4011.35	-4004.60	-234.19	675312.83	618395.18	32°41'57.316"N	103°53'52.088"W	0.56	
12832.00	89.500	183.400	8828.59	4106.34	-4099.42	-239.99	675307.03	618300.38	32°41'56.378"N	103°53'52.160"W	0.47	
12928.00	89.200	183.500	8829.68	4202.33	-4195.24	-245.77	675301.25	618204.56	32°41'55.431"N	103°53'52.233"W	0.33	
13023.00	88.600	183.000	8831.50	4297.31	-4290.07	-251.15	675295.87	618109.74	32°41'54.493"N	103°53'52.300"W	0.82	
13118.00	88.700	182.900	8833.74	4392.28	-4384.92	-256.04	675290.98	618014.90	32°41'53.554"N	103°53'52.362"W	0.15	
13214.00	88.900	182.100	8835.75	4488.23	-4480.80	-260.23	675286.79	617919.02	32°41'52.606"N	103°53'52.415"W	0.86	
13308.00	89.000	181.800	8837.48	4582.17	-4574.73	-263.42	675283.60	617825.10	32°41'51.676"N	103°53'52.457"W	0.34	
13354.00	89.000	181.800	8838.28	4628.14	-4620.70	-264.87	675282.15	617779.13	32°41'51.222"N	103°53'52.477"W	0.00	Project to Bit

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
No.1H PBHL		8853.50	-4622.19	-302.65	675244.37	617777.64	32°41'51.208"N	103°53'52.919"W	point

WELLPATH COMPOSITION - Ref Wellbore: No. 1H AWP Ref Wellpath: No. 1H AWP				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model		Log Name/Comment
20.00	8440.10	Generic gyro - northseeking (Standard)		Gyro
8440.10	13354.00	NaviTrak (Standard)		MWD



Actual Wellpath Report

No. 1H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(West Shugart) Sec 32, T18S, R31E	Wellbore	No. 1H AWP
Facility	West Shugart 32 State Com No.1		

WELLPATH DATA (158 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
8446.00	0.500	325.300	8444.27	-78.20	77.66	10.81	675557.81	622477.15	32°42'37.698"N	103°53'49.024"W	6.39	
8478.00	1.900	192.700	8476.27	-77.78	77.25	10.62	675557.62	622476.75	32°42'37.694"N	103°53'49.027"W	7.09	
8510.00	7.800	185.500	8508.14	-75.09	74.57	10.29	675557.29	622474.07	32°42'37.667"N	103°53'49.031"W	18.50	
8542.00	13.700	183.200	8539.56	-69.12	68.62	9.87	675556.87	622468.12	32°42'37.608"N	103°53'49.036"W	18.48	
8573.00	21.200	182.200	8569.12	-59.83	59.34	9.45	675556.45	622458.84	32°42'37.516"N	103°53'49.041"W	24.21	
8605.00	28.100	181.600	8598.18	-46.50	46.01	9.02	675556.02	622445.51	32°42'37.384"N	103°53'49.047"W	21.58	
8637.00	34.400	182.300	8625.53	-29.92	29.43	8.44	675555.44	622428.93	32°42'37.220"N	103°53'49.054"W	19.72	
8669.00	40.800	183.100	8650.87	-10.41	9.94	7.51	675554.51	622409.44	32°42'37.028"N	103°53'49.066"W	20.06	
8700.00	45.600	184.500	8673.46	10.81	-11.23	6.10	675553.10	622388.27	32°42'36.818"N	103°53'49.084"W	15.79	
8732.00	49.300	185.200	8695.09	34.37	-34.71	4.10	675551.10	622364.79	32°42'36.586"N	103°53'49.108"W	11.67	
8764.00	53.200	185.600	8715.12	59.31	-59.55	1.75	675548.75	622339.95	32°42'36.340"N	103°53'49.137"W	12.23	
8795.00	57.100	184.900	8732.83	84.74	-84.88	-0.57	675546.43	622314.62	32°42'36.090"N	103°53'49.165"W	12.72	
8827.00	61.000	184.300	8749.29	112.17	-112.23	-2.77	675544.23	622287.28	32°42'35.819"N	103°53'49.193"W	12.29	
8859.00	64.900	183.600	8763.84	140.67	-140.66	-4.73	675542.27	622258.85	32°42'35.538"N	103°53'49.217"W	12.34	
8891.00	68.700	183.700	8776.44	170.07	-170.01	-6.60	675540.40	622229.51	32°42'35.248"N	103°53'49.240"W	11.88	
8922.00	72.500	184.100	8786.73	199.31	-199.17	-8.59	675538.41	622200.34	32°42'34.959"N	103°53'49.265"W	12.32	
8954.00	76.600	184.400	8795.26	230.14	-229.92	-10.88	675536.12	622169.59	32°42'34.655"N	103°53'49.293"W	12.84	
8986.00	80.700	184.700	8801.55	261.51	-261.19	-13.37	675533.63	622138.33	32°42'34.346"N	103°53'49.324"W	12.85	
9018.00	84.500	185.000	8805.67	293.23	-292.81	-16.05	675530.95	622106.71	32°42'34.033"N	103°53'49.357"W	11.91	
9049.00	87.900	184.300	8807.73	324.15	-323.63	-18.56	675528.44	622075.89	32°42'33.728"N	103°53'49.387"W	11.20	
9081.00	87.700	184.100	8808.96	356.13	-355.52	-20.90	675526.10	622044.00	32°42'33.413"N	103°53'49.416"W	0.88	
9113.00	87.800	184.200	8810.21	388.10	-387.41	-23.21	675523.79	622012.11	32°42'33.097"N	103°53'49.445"W	0.44	
9176.00	90.200	184.200	8811.31	451.09	-450.23	-27.83	675519.17	621949.30	32°42'32.476"N	103°53'49.502"W	3.81	
9208.00	90.500	183.800	8811.12	483.09	-482.15	-30.06	675516.94	621917.38	32°42'32.160"N	103°53'49.530"W	1.56	
9304.00	90.600	184.100	8810.20	579.08	-577.92	-36.67	675510.33	621821.62	32°42'31.213"N	103°53'49.612"W	0.33	
9399.00	88.600	184.100	8810.86	674.07	-672.67	-43.46	675503.54	621726.88	32°42'30.276"N	103°53'49.696"W	2.11	
9495.00	88.300	183.400	8813.46	770.04	-768.43	-49.74	675497.26	621631.13	32°42'29.329"N	103°53'49.774"W	0.79	
9590.00	89.000	183.200	8815.69	865.01	-863.24	-55.21	675491.80	621536.32	32°42'28.391"N	103°53'49.842"W	0.77	
9685.00	89.700	182.600	8816.77	959.99	-958.12	-60.01	675486.99	621441.45	32°42'27.452"N	103°53'49.903"W	0.97	
9780.00	90.000	182.600	8817.02	1054.97	-1053.02	-64.32	675482.68	621346.56	32°42'26.513"N	103°53'49.958"W	0.32	
9876.00	89.400	181.800	8817.52	1150.93	-1148.94	-68.01	675479.00	621250.64	32°42'25.564"N	103°53'50.006"W	1.04	
9971.00	88.900	182.900	8818.93	1245.89	-1243.85	-71.90	675475.10	621155.74	32°42'24.625"N	103°53'50.056"W	1.27	
10066.00	88.400	182.700	8821.17	1340.85	-1338.71	-76.54	675470.46	621060.89	32°42'23.687"N	103°53'50.115"W	0.57	
10162.00	89.600	184.600	8822.85	1436.83	-1434.50	-82.65	675464.35	620965.11	32°42'22.740"N	103°53'50.191"W	2.34	
10257.00	89.700	184.000	8823.43	1531.82	-1529.23	-89.78	675457.23	620870.38	32°42'21.803"N	103°53'50.279"W	0.64	
10353.00	89.800	183.400	8823.85	1627.82	-1625.02	-95.97	675451.04	620774.59	32°42'20.855"N	103°53'50.356"W	0.63	
10448.00	89.700	183.700	8824.26	1722.82	-1719.84	-101.85	675445.15	620679.78	32°42'19.917"N	103°53'50.429"W	0.33	
10543.00	88.100	182.700	8826.08	1817.80	-1814.67	-107.15	675439.85	620584.96	32°42'18.979"N	103°53'50.496"W	1.99	
10639.00	88.600	183.500	8828.85	1913.75	-1910.49	-112.34	675434.66	620489.15	32°42'18.031"N	103°53'50.561"W	0.98	
10734.00	88.600	182.900	8831.17	2008.72	-2005.31	-117.65	675429.36	620394.33	32°42'17.093"N	103°53'50.628"W	0.63	
10829.00	89.200	184.000	8832.99	2103.69	-2100.12	-123.36	675423.65	620299.53	32°42'16.155"N	103°53'50.699"W	1.32	
10925.00	89.400	183.900	8834.17	2199.69	-2195.89	-129.97	675417.04	620203.77	32°42'15.208"N	103°53'50.781"W	0.23	
11020.00	89.200	184.100	8835.33	2294.68	-2290.65	-136.60	675410.41	620109.02	32°42'14.271"N	103°53'50.864"W	0.30	
11116.00	90.200	184.400	8835.83	2390.67	-2386.38	-143.71	675403.30	620013.29	32°42'13.324"N	103°53'50.951"W	1.09	
11211.00	90.000	184.200	8835.66	2485.67	-2481.11	-150.84	675396.17	619918.57	32°42'12.387"N	103°53'51.039"W	0.30	



Actual Wellpath Report

No. 1H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(West Shugart) Sec 32, T18S, R31E	Wellbore	No. 1H AWP
Facility	West Shugart 32 State Com No.1		

WELLPATH DATA (158 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
4246.00	0.540	74.440	4245.35	-25.71	23.31	37.50	675584.50	622422.81	32°42'37.159"N	103°53'48.715"W	0.14	
4341.30	0.900	62.240	4340.65	-26.25	23.78	38.60	675585.60	622423.28	32°42'37.163"N	103°53'48.702"W	0.41	
4436.60	1.110	49.280	4435.93	-27.29	24.73	39.96	675586.96	622424.23	32°42'37.173"N	103°53'48.686"W	0.32	
4532.00	1.270	40.120	4531.31	-28.78	26.14	41.34	675588.34	622425.64	32°42'37.187"N	103°53'48.670"W	0.26	
4627.30	1.490	36.590	4626.58	-30.68	27.94	42.76	675589.76	622427.44	32°42'37.204"N	103°53'48.653"W	0.25	
4722.60	1.540	37.670	4721.85	-32.78	29.95	44.28	675591.28	622429.45	32°42'37.224"N	103°53'48.635"W	0.06	
4817.90	1.500	39.290	4817.12	-34.86	31.93	45.86	675592.85	622431.43	32°42'37.244"N	103°53'48.616"W	0.06	
4913.20	1.450	43.400	4912.38	-36.80	33.77	47.47	675594.47	622433.27	32°42'37.262"N	103°53'48.597"W	0.12	
5008.60	1.370	42.050	5007.76	-38.62	35.49	49.07	675596.06	622434.99	32°42'37.279"N	103°53'48.579"W	0.09	
5103.90	1.260	41.280	5103.03	-40.35	37.13	50.52	675597.52	622436.62	32°42'37.295"N	103°53'48.562"W	0.12	
5199.20	1.150	35.880	5198.31	-41.99	38.69	51.77	675598.77	622438.19	32°42'37.310"N	103°53'48.547"W	0.17	
5294.50	1.040	29.080	5293.59	-43.58	40.22	52.75	675599.75	622439.72	32°42'37.325"N	103°53'48.535"W	0.18	
5389.80	0.990	27.910	5388.88	-45.11	41.70	53.56	675600.56	622441.20	32°42'37.340"N	103°53'48.526"W	0.06	
5485.20	0.940	31.160	5484.26	-46.56	43.10	54.35	675601.35	622442.60	32°42'37.354"N	103°53'48.517"W	0.08	
5580.50	0.880	27.150	5579.55	-47.93	44.42	55.09	675602.08	622443.92	32°42'37.367"N	103°53'48.508"W	0.09	
5675.80	0.830	25.520	5674.84	-49.24	45.70	55.72	675602.72	622445.19	32°42'37.379"N	103°53'48.500"W	0.06	
5771.10	0.700	14.510	5770.13	-50.45	46.88	56.16	675603.16	622446.38	32°42'37.391"N	103°53'48.495"W	0.21	
5866.40	0.740	8.840	5865.42	-51.64	48.05	56.40	675603.40	622447.55	32°42'37.403"N	103°53'48.492"W	0.09	
5961.80	0.840	7.910	5960.82	-52.95	49.36	56.59	675603.59	622448.85	32°42'37.416"N	103°53'48.490"W	0.11	
6057.10	0.960	357.990	6056.10	-54.44	50.85	56.66	675603.66	622450.34	32°42'37.430"N	103°53'48.489"W	0.21	
6152.40	1.110	349.310	6151.39	-56.13	52.55	56.46	675603.46	622452.05	32°42'37.447"N	103°53'48.491"W	0.23	
6247.70	1.220	333.520	6246.67	-57.90	54.37	55.84	675602.84	622453.86	32°42'37.465"N	103°53'48.499"W	0.35	
6343.00	1.290	325.620	6341.95	-59.62	56.16	54.78	675601.78	622455.65	32°42'37.483"N	103°53'48.511"W	0.20	
6438.40	1.400	314.180	6437.32	-61.22	57.86	53.34	675600.34	622457.35	32°42'37.500"N	103°53'48.528"W	0.30	
6533.70	1.560	312.670	6532.59	-62.79	59.55	51.55	675598.55	622459.04	32°42'37.517"N	103°53'48.548"W	0.17	
6629.00	1.580	311.990	6627.85	-64.42	61.31	49.62	675596.62	622460.80	32°42'37.534"N	103°53'48.571"W	0.03	
6724.30	1.440	308.170	6723.12	-65.91	62.92	47.70	675594.70	622462.42	32°42'37.550"N	103°53'48.593"W	0.18	
6819.60	1.560	303.150	6818.39	-67.22	64.37	45.68	675592.67	622463.87	32°42'37.565"N	103°53'48.617"W	0.19	
6915.00	1.870	309.640	6913.74	-68.77	66.08	43.39	675590.39	622465.57	32°42'37.582"N	103°53'48.644"W	0.38	
7010.30	1.740	314.590	7009.00	-70.63	68.09	41.16	675588.16	622467.58	32°42'37.602"N	103°53'48.670"W	0.21	
7105.60	1.300	306.000	7104.26	-72.15	69.74	39.26	675586.25	622469.23	32°42'37.618"N	103°53'48.692"W	0.52	
7200.90	1.460	286.800	7199.54	-73.00	70.72	37.22	675584.22	622470.22	32°42'37.628"N	103°53'48.716"W	0.51	
7296.20	1.770	272.220	7294.80	-73.24	71.13	34.59	675581.58	622470.63	32°42'37.632"N	103°53'48.746"W	0.54	
7391.60	1.850	274.800	7390.15	-73.23	71.32	31.58	675578.58	622470.81	32°42'37.634"N	103°53'48.782"W	0.12	
7486.90	1.890	275.610	7485.40	-73.31	71.60	28.48	675575.48	622471.09	32°42'37.637"N	103°53'48.818"W	0.05	
7582.20	1.680	270.120	7580.65	-73.27	71.76	25.52	675572.52	622471.25	32°42'37.639"N	103°53'48.853"W	0.28	
7677.50	1.490	269.630	7675.92	-73.09	71.75	22.89	675569.88	622471.25	32°42'37.639"N	103°53'48.883"W	0.20	
7772.80	1.150	272.040	7771.19	-72.97	71.78	20.69	675567.69	622471.27	32°42'37.639"N	103°53'48.909"W	0.36	
7868.20	0.950	274.850	7866.58	-72.96	71.88	18.95	675565.95	622471.37	32°42'37.640"N	103°53'48.929"W	0.22	
7963.50	0.950	272.620	7961.86	-72.96	71.98	17.37	675564.37	622471.48	32°42'37.641"N	103°53'48.948"W	0.04	
8058.80	0.870	278.270	8057.15	-73.00	72.12	15.87	675562.86	622471.62	32°42'37.643"N	103°53'48.966"W	0.13	
8154.10	1.150	313.640	8152.44	-73.67	72.88	14.46	675561.46	622472.38	32°42'37.650"N	103°53'48.982"W	0.70	
8249.40	1.320	323.690	8247.71	-75.13	74.43	13.11	675560.11	622473.92	32°42'37.665"N	103°53'48.998"W	0.29	
8344.80	1.250	322.270	8343.09	-76.75	76.14	11.83	675558.83	622475.63	32°42'37.682"N	103°53'49.013"W	0.08	
8440.10	0.870	331.680	8438.37	-78.14	77.60	10.85	675557.85	622477.09	32°42'37.697"N	103°53'49.024"W	0.44	



Actual Wellpath Report

No. 1H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(West Shugart) Sec 32, T18S, R31E	Wellbore	No. 1H AWP
Facility	West Shugart 32 State Com No.1		

WELLPATH DATA (158 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	266.490	0.00	0.00	0.00	0.00	675547.00	622399.50	32°42'36.930"N	103°53'49.155"W	0.00	
20.00	0.000	266.490	20.00	0.00	0.00	0.00	675547.00	622399.50	32°42'36.930"N	103°53'49.155"W	0.00	
100.00	0.340	266.490	100.00	0.03	-0.01	-0.24	675546.76	622399.49	32°42'36.929"N	103°53'49.157"W	0.43	
200.00	0.490	264.940	200.00	0.13	-0.07	-0.96	675546.04	622399.43	32°42'36.929"N	103°53'49.166"W	0.15	
300.00	0.550	253.270	299.99	0.37	-0.25	-1.84	675545.16	622399.25	32°42'36.927"N	103°53'49.176"W	0.12	
400.00	0.720	244.010	399.99	0.85	-0.66	-2.87	675544.13	622398.84	32°42'36.923"N	103°53'49.188"W	0.20	
500.00	0.400	222.000	499.98	1.43	-1.19	-3.67	675543.33	622398.31	32°42'36.918"N	103°53'49.198"W	0.38	
626.90	0.220	233.310	626.88	1.94	-1.67	-4.16	675542.84	622397.83	32°42'36.913"N	103°53'49.203"W	0.15	
719.20	0.250	278.180	719.18	2.04	-1.75	-4.50	675542.50	622397.75	32°42'36.912"N	103°53'49.207"W	0.20	
814.50	0.120	355.860	814.48	1.92	-1.62	-4.71	675542.29	622397.88	32°42'36.914"N	103°53'49.210"W	0.27	
909.80	0.100	289.380	909.78	1.80	-1.49	-4.80	675542.20	622398.01	32°42'36.915"N	103°53'49.211"W	0.13	
1005.10	0.110	315.540	1005.08	1.72	-1.40	-4.94	675542.06	622398.10	32°42'36.916"N	103°53'49.213"W	0.05	
1100.40	0.180	4.000	1100.38	1.51	-1.18	-5.00	675542.01	622398.32	32°42'36.918"N	103°53'49.213"W	0.14	
1195.80	0.280	25.550	1195.78	1.14	-0.82	-4.88	675542.12	622398.68	32°42'36.922"N	103°53'49.212"W	0.14	
1291.10	0.380	34.690	1291.08	0.65	-0.35	-4.60	675542.40	622399.15	32°42'36.926"N	103°53'49.209"W	0.12	
1386.40	0.500	39.990	1386.37	0.05	0.23	-4.16	675542.84	622399.73	32°42'36.932"N	103°53'49.203"W	0.13	
1481.70	0.610	45.010	1481.67	-0.67	0.90	-3.53	675543.47	622400.40	32°42'36.939"N	103°53'49.196"W	0.13	
1577.00	0.810	53.820	1576.96	-1.48	1.66	-2.63	675544.37	622401.16	32°42'36.946"N	103°53'49.185"W	0.24	
1672.40	1.110	50.470	1672.35	-2.55	2.65	-1.37	675545.63	622402.14	32°42'36.956"N	103°53'49.171"W	0.32	
1767.70	1.680	57.530	1767.62	-4.01	3.98	-0.52	675547.52	622403.48	32°42'36.969"N	103°53'49.148"W	0.62	
1863.00	2.080	57.490	1862.87	-5.86	5.66	3.16	675550.16	622405.16	32°42'36.985"N	103°53'49.117"W	0.42	
1958.30	2.110	60.190	1958.10	-7.85	7.46	6.14	675553.14	622406.96	32°42'37.003"N	103°53'49.082"W	0.11	
2053.60	2.260	55.830	2053.33	-9.97	9.39	9.21	675556.21	622408.89	32°42'37.022"N	103°53'49.046"W	0.23	
2149.00	2.050	49.880	2148.67	-12.31	11.55	12.07	675559.07	622411.05	32°42'37.043"N	103°53'49.013"W	0.32	
2244.30	1.940	47.010	2243.91	-14.67	13.75	14.56	675561.56	622413.24	32°42'37.065"N	103°53'48.984"W	0.16	
2339.60	1.860	44.150	2339.16	-17.02	15.96	16.82	675563.81	622415.45	32°42'37.087"N	103°53'48.957"W	0.13	
2434.90	1.650	45.810	2434.41	-19.22	18.02	18.88	675565.88	622417.52	32°42'37.107"N	103°53'48.933"W	0.23	
2530.20	1.840	57.630	2529.67	-21.14	19.80	21.15	675568.15	622419.30	32°42'37.125"N	103°53'48.906"W	0.43	
2625.60	1.400	82.090	2625.03	-22.27	20.78	23.60	675570.60	622420.28	32°42'37.134"N	103°53'48.877"W	0.85	
2720.90	1.000	103.270	2720.31	-22.37	20.75	25.56	675572.56	622420.25	32°42'37.134"N	103°53'48.854"W	0.62	
2816.20	0.490	107.530	2815.60	-22.14	20.43	26.76	675573.76	622419.93	32°42'37.131"N	103°53'48.840"W	0.54	
2911.50	0.440	99.310	2910.90	-22.01	20.25	27.51	675574.51	622419.75	32°42'37.129"N	103°53'48.832"W	0.09	
3006.80	0.360	87.860	3006.20	-22.00	20.20	28.17	675575.17	622419.70	32°42'37.128"N	103°53'48.824"W	0.12	
3102.20	0.220	79.740	3101.60	-22.08	20.25	28.65	675575.65	622419.75	32°42'37.129"N	103°53'48.818"W	0.15	
3197.50	0.210	103.630	3196.89	-22.09	20.24	29.00	675576.00	622419.74	32°42'37.129"N	103°53'48.814"W	0.09	
3292.80	0.310	91.530	3292.19	-22.07	20.19	29.43	675576.43	622419.69	32°42'37.128"N	103°53'48.809"W	0.12	
3388.10	0.480	68.650	3387.49	-22.25	20.33	30.06	675577.06	622419.83	32°42'37.130"N	103°53'48.802"W	0.24	
3483.40	0.530	61.890	3482.79	-22.65	20.68	30.82	675577.82	622420.18	32°42'37.133"N	103°53'48.793"W	0.08	
3578.80	0.600	62.790	3578.18	-23.14	21.12	31.65	675578.65	622420.62	32°42'37.137"N	103°53'48.783"W	0.07	
3674.10	0.590	62.310	3673.48	-23.65	21.57	32.53	675579.53	622421.07	32°42'37.142"N	103°53'48.773"W	0.01	
3769.40	0.560	51.450	3768.77	-24.22	22.09	33.33	675580.33	622421.59	32°42'37.147"N	103°53'48.764"W	0.12	
3864.70	0.600	63.790	3864.07	-24.79	22.60	34.14	675581.14	622422.10	32°42'37.152"N	103°53'48.754"W	0.14	
3960.00	0.570	72.810	3959.36	-25.20	22.96	35.04	675582.04	622422.46	32°42'37.155"N	103°53'48.743"W	0.10	
4055.40	0.510	88.630	4054.76	-25.41	23.11	35.92	675582.92	622422.61	32°42'37.157"N	103°53'48.733"W	0.17	
4150.70	0.440	85.030	4150.06	-25.50	23.16	36.71	675583.70	622422.65	32°42'37.157"N	103°53'48.724"W	0.08	



Actual Wellpath Report

No. 1H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(West Shugart) Sec 32, T18S, R31E	Wellbore	No. 1H AWB
Facility	West Shugart 32 State Com No.1		

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	Calhphik
Scale	0.99993	Report Generated	6/27/2011 at 9:06:52 AM
Convergence at slot	0.24° East	Database/Source file	WA Midland/No. 1H_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	675547.00	622399.50	32°42'36.930"N	103°53'49.155"W
Facility Reference Pt			675547.00	622399.50	32°42'36.930"N	103°53'49.155"W
Field Reference Pt			675547.00	622399.50	32°42'36.930"N	103°53'49.155"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Rig on No. 1H SHL (RKB) to Facility Vertical Datum	20.00ft
Horizontal Reference Pt	Slot	Rig on No. 1H SHL (RKB) to Mean Sea Level	3590.00ft
Vertical Reference Pt	Rig on No. 1H SHL (RKB)	Rig on No. 1H SHL (RKB) to Mud Line at Slot (No. 1H SHL)	20.00ft
MD Reference Pt	Rig on No. 1H SHL (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	183.75°