

PATRIOT DRILLING, LLC

OPERATOR: Cimarex Energy Co.
WELL/LEASE: Cave Lake 13 Federal Com. # 4-I
COUNTY: Eddy Co., New Mexico
Sec. 13, T16S, R28E

30-015-39593

**STATE OF NEW MEXICO
DEVIATION REPORT**

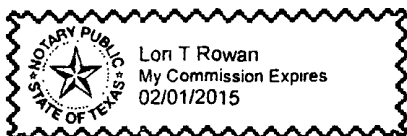
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
143	1	3,759	1
231	2	4,045	1
603	1	4,328	1
815	1	4,612	1
1,100	1	4,899	1
1,385	1	5,181	1
1,670	2	5,465	1
1,955	1	5,655	1
2,335	1	5,939	1
2,622	1	6,224	1
2,905	1	6,508	1
3,190	1	6,794	1
3,477	1	7,078	1

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 27th day of
December, 2011 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015



Lori T. Rowan
Notary Public for Ector Co., Texas



INTEQ



End of Well Report

Cimarex Energy Co.

Eddy County, NM

Cave Lake 13 Fed No. 4H

Patriot 4

Well Specifications

Well Name: Cave Lake 13 Fed No. 4H
Start Date: 11/28/2011
Client: Cimarex Energy Co.
Rig Name: Patriot 4
County: Eddy County, NM
Field: (Cave) Sec 13, T16S, R28E

Well Location:

NAD 83 / TM New Mexico SP, Eastern Zone (3001)

Grid Coordinates

Easting: 606248.90'
Northing: 701670.70'

Geographical Coordinates

Latitude: 32°55'43.416"N
Longitude: 104°07'18.385"W

RT: 3,608' above M.S.L.

Date TD Reached: 12/21/2011

Final Depth MD: 11,378'

Final Depth TVD: 6,621.71'



Cimarex Energy Co.

Location Eddy County, NM
Field (Cave) Sec 13, T16S, R28E
Facility Cave Lake 13 Fed Com

Slot No. 4H SHL
Well No. 4H
Wellbore No. 4H ST01



Well Profile Data

Design Comment	MD (ft)	Inc. (°)	Az. (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	6479.40	0.740	83.990	6478.84	8.24	-46.02	0.00	46.51
Est KOP	6533.00	0.740	83.990	6532.44	8.31	-45.33	0.00	45.83
EOC	6910.76	90.000	280.000	6774.00	50.59	-280.14	24.01	283.18
Target Line	7221.61	90.000	273.783	6774.00	87.87	-588.59	2.00	593.58
No.2H PBHL Rev 1	11390.02	90.000	273.783	6774.00	362.89	-4747.92	0.00	4761.77

Plot reference wellpath is Plan #2 ST01

True vertical depths are referenced to Rig on No. 4H SHL (RT)

Grid System: NAD83 / TM New Mexico SP, Eastern Zone (3001), 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 3608 feet

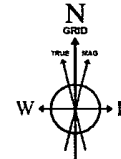
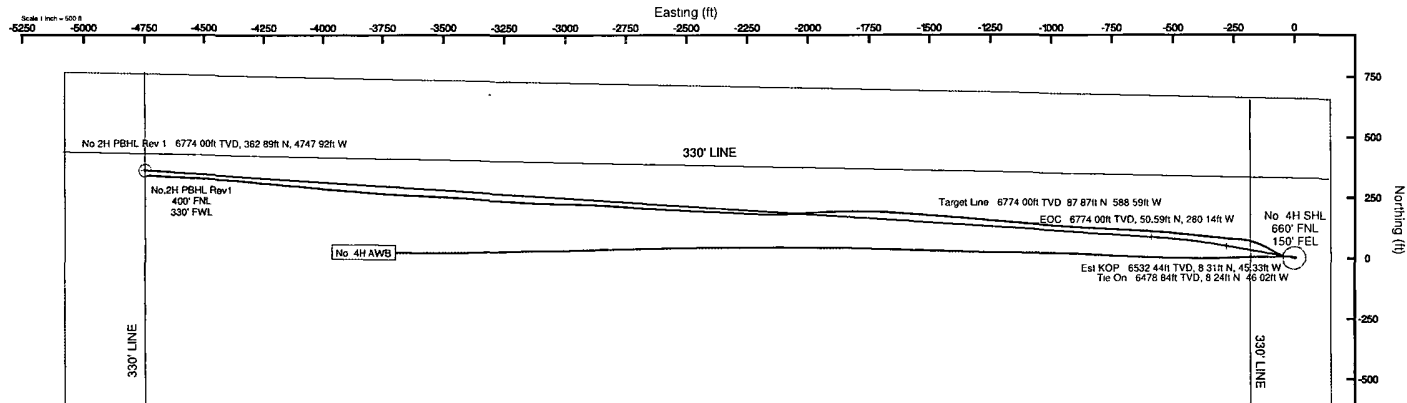
Scale True distance

Mean Sea Level to Mud line (At Slot No. 4H SHL) 0 feet

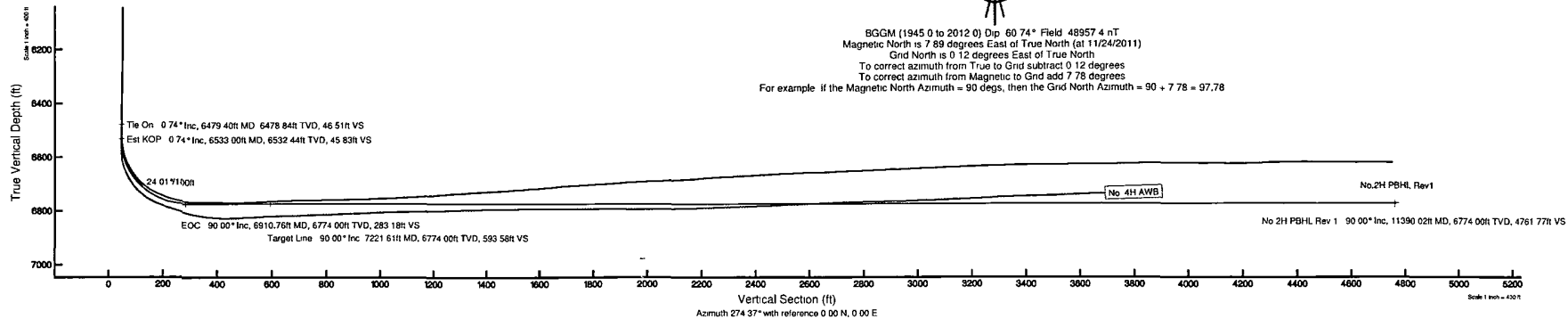
Depths are in feet

Coordinates are in feet referenced to Slot

Created by genibry on 12/11/2011



BGGM (1945.0 to 2012.0) Dip: 60.74° Field: 48957.4 nT
Magnetic North is 7.89 degrees East of True North (at 11/24/2011)
Grid North is 0.12 degrees East of True North
To correct azimuth from True to Grid subtract 0.12 degrees
To correct azimuth from Magnetic to Grid add 7.78 degrees
For example: If the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.78 = 97.78





Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Cave) Sec 13, T16S, R28E	Wellbore	No.4H AWP ST01
Facility	Cave Lake 13 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	0.999914	Report Generated	12/21/2011 at 1:55:54 PM
Convergence at slot	0.12° East	Database/Source file	WA Midland/No.4H_AWP_ST01.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	1320.12	-4.50	606248.90	701670.70	32°55'43.416"N	104°07'18.385"W
Facility Reference Pt			606253.40	700350.70	32°55'30.355"N	104°07'18.363"W
Field Reference Pt			606253.40	700350.70	32°55'30.355"N	104°07'18.363"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 4H SHL (RT) to GL	3608.00ft
Horizontal Reference Pt	Slot	Rig on No. 4H SHL (RT) to Mean Sea Level	3608.00ft
Vertical Reference Pt	Rig on No. 4H SHL (RT)	Rig on No. 4H SHL (RT) to Mud Line at Slot (No. 4H SHL)	3608.00ft
MD Reference Pt	Rig on No. 4H SHL (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	274.37°



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Cave) Sec 13, T16S, R28E	Wellbore	No.4H AWP ST01
Facility	Cave Lake 13 Fed Com		

WELLPATH DATA (154 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	110.200	0.00	0.00	0.00	0.00	606248.90	701670.70	32°55'43.416"N	104°07'18.385"W	0.00	
21.00	0.000	110.200	21.00	0.00	0.00	0.00	606248.90	701670.70	32°55'43.416"N	104°07'18.385"W	0.00	
100.00	0.280	110.200	100.00	-0.19	-0.07	0.18	606249.08	701670.63	32°55'43.416"N	104°07'18.383"W	0.35	
200.00	0.360	88.660	200.00	-0.73	-0.14	0.72	606249.62	701670.56	32°55'43.415"N	104°07'18.377"W	0.14	
300.00†	0.440	79.320	300.00	-1.42	-0.07	1.42	606250.32	701670.63	32°55'43.416"N	104°07'18.368"W	0.10	
400.00	0.460	78.730	399.99	-2.17	0.08	2.19	606251.09	701670.78	32°55'43.417"N	104°07'18.359"W	0.02	
500.00	0.530	75.970	499.99	-3.00	0.28	3.03	606251.93	701670.97	32°55'43.419"N	104°07'18.350"W	0.07	
600.00	0.540	68.640	599.98	-3.86	0.56	3.92	606252.82	701671.26	32°55'43.422"N	104°07'18.339"W	0.07	
699.60	0.370	59.580	699.58	-4.55	0.89	4.63	606253.53	701671.59	32°55'43.425"N	104°07'18.331"W	0.18	
794.40†	0.300	54.320	794.38	-4.99	1.19	5.10	606254.00	701671.89	32°55'43.428"N	104°07'18.325"W	0.08	
889.10	0.130	21.660	889.08	-5.21	1.44	5.34	606254.24	701672.14	32°55'43.430"N	104°07'18.322"W	0.21	
983.90	0.140	338.200	983.88	-5.19	1.64	5.33	606254.23	701672.34	32°55'43.432"N	104°07'18.322"W	0.11	
1078.60	0.120	317.130	1078.58	-5.07	1.82	5.22	606254.12	701672.52	32°55'43.434"N	104°07'18.324"W	0.05	
1173.30	0.160	306.580	1173.28	-4.89	1.98	5.05	606253.95	701672.68	32°55'43.436"N	104°07'18.326"W	0.05	
1268.10†	0.110	318.540	1268.08	-4.71	2.12	4.88	606253.78	701672.82	32°55'43.437"N	104°07'18.328"W	0.06	
1362.80	0.100	313.840	1362.78	-4.58	2.25	4.76	606253.66	701672.95	32°55'43.438"N	104°07'18.329"W	0.01	
1457.60	0.160	317.800	1457.58	-4.42	2.40	4.62	606253.52	701673.10	32°55'43.440"N	104°07'18.331"W	0.06	
1552.30	0.140	315.990	1552.28	-4.24	2.58	4.45	606253.35	701673.28	32°55'43.442"N	104°07'18.333"W	0.02	
1647.10	0.200	305.140	1647.08	-4.01	2.76	4.23	606253.13	701673.46	32°55'43.444"N	104°07'18.335"W	0.07	
1741.80†	0.250	271.670	1741.78	-3.66	2.86	3.89	606252.79	701673.56	32°55'43.445"N	104°07'18.339"W	0.15	
1836.60	0.320	275.640	1836.58	-3.19	2.90	3.42	606252.32	701673.60	32°55'43.445"N	104°07'18.345"W	0.08	
2026.10	0.650	267.170	2026.07	-1.59	2.90	1.82	606250.72	701673.60	32°55'43.445"N	104°07'18.364"W	0.18	
2120.80	0.840	262.910	2120.76	-0.38	2.78	0.59	606249.49	701673.48	32°55'43.444"N	104°07'18.378"W	0.21	
2215.60	0.840	245.590	2215.55	0.91	2.41	-0.73	606248.17	701673.11	32°55'43.440"N	104°07'18.394"W	0.27	
2310.30†	0.780	260.690	2310.24	2.15	2.02	-2.00	606246.90	701672.72	32°55'43.436"N	104°07'18.408"W	0.23	
2405.10	0.690	268.980	2405.03	3.34	1.90	-3.20	606245.70	701672.60	32°55'43.435"N	104°07'18.423"W	0.15	
2594.60	0.520	272.620	2594.52	5.34	1.92	-5.20	606243.70	701672.62	32°55'43.435"N	104°07'18.446"W	0.09	
2689.30	0.490	259.120	2689.22	6.16	1.87	-6.03	606242.87	701672.57	32°55'43.435"N	104°07'18.456"W	0.13	
2784.10	0.380	275.930	2784.02	6.86	1.82	-6.74	606242.16	701672.52	32°55'43.434"N	104°07'18.464"W	0.18	
2878.80†	0.290	273.870	2878.71	7.42	1.87	-7.29	606241.61	701672.57	32°55'43.435"N	104°07'18.471"W	0.10	
2973.60	0.290	273.680	2973.51	7.90	1.90	-7.77	606241.13	701672.60	32°55'43.435"N	104°07'18.476"W	0.00	
3068.30	0.220	289.420	3068.21	8.31	1.98	-8.18	606240.72	701672.68	32°55'43.436"N	104°07'18.481"W	0.10	
3163.10	0.180	294.820	3163.01	8.63	2.10	-8.49	606240.41	701672.80	32°55'43.437"N	104°07'18.485"W	0.05	
3257.80	0.080	324.750	3257.71	8.81	2.22	-8.66	606240.24	701672.92	32°55'43.438"N	104°07'18.487"W	0.12	
3352.60†	0.080	6.020	3352.51	8.85	2.34	-8.69	606240.21	701673.04	32°55'43.440"N	104°07'18.487"W	0.06	
3447.30	0.110	37.550	3447.21	8.80	2.48	-8.63	606240.27	701673.18	32°55'43.441"N	104°07'18.486"W	0.06	
3542.10	0.150	27.520	3542.01	8.70	2.66	-8.52	606240.38	701673.36	32°55'43.443"N	104°07'18.485"W	0.05	
3636.80	0.140	21.400	3636.71	8.61	2.88	-8.42	606240.48	701673.58	32°55'43.445"N	104°07'18.484"W	0.02	
3731.60	0.220	354.200	3731.51	8.61	3.16	-8.40	606240.50	701673.86	32°55'43.448"N	104°07'18.484"W	0.12	
3826.30†	0.320	343.770	3826.21	8.74	3.60	-8.49	606240.41	701674.30	32°55'43.452"N	104°07'18.485"W	0.12	
3921.10	0.350	298.490	3921.01	9.10	3.99	-8.82	606240.08	701674.69	32°55'43.456"N	104°07'18.488"W	0.27	
4015.80	0.540	289.660	4015.70	9.79	4.28	-9.49	606239.41	701674.98	32°55'43.459"N	104°07'18.496"W	0.21	
4110.60	0.940	281.000	4110.50	10.99	4.58	-10.68	606238.23	701675.28	32°55'43.462"N	104°07'18.510"W	0.44	
4205.40	1.110	282.990	4205.28	12.67	4.93	-12.33	606236.57	701675.63	32°55'43.465"N	104°07'18.530"W	0.18	
4300.10†	0.980	280.880	4299.97	14.38	5.29	-14.02	606234.88	701675.99	32°55'43.469"N	104°07'18.549"W	0.14	



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Cave) Sec 13, T16S, R28E	Wellbore	No.4H AWP ST01
Facility	Cave Lake 13 Fed Com		

WELLPATH DATA (154 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
4394.90	1.090	276.850	4394.75	16.09	5.55	-15.71	606233.19	701676.25	32°55'43.472"N	104°07'18.569"W	0.14	
4489.60	1.250	268.320	4489.43	18.02	5.63	-17.64	606231.26	701676.33	32°55'43.472"N	104°07'18.592"W	0.25	
4584.40	1.460	262.680	4584.20	20.23	5.45	-19.87	606229.03	701676.15	32°55'43.471"N	104°07'18.618"W	0.26	
4679.10	1.330	267.280	4678.88	22.50	5.24	-22.17	606226.74	701675.94	32°55'43.469"N	104°07'18.645"W	0.18	
4773.90	1.260	272.150	4773.65	24.63	5.23	-24.31	606224.60	701675.93	32°55'43.468"N	104°07'18.670"W	0.14	
4868.60	1.280	275.320	4868.33	26.73	5.36	-26.40	606222.50	701676.06	32°55'43.470"N	104°07'18.695"W	0.08	
4963.40	1.380	272.590	4963.10	28.93	5.51	-28.60	606220.31	701676.21	32°55'43.471"N	104°07'18.720"W	0.12	
5058.10	1.490	270.480	5057.77	31.30	5.58	-30.97	606217.94	701676.28	32°55'43.472"N	104°07'18.748"W	0.13	
5152.90	1.420	277.080	5152.54	33.70	5.73	-33.36	606215.54	701676.43	32°55'43.474"N	104°07'18.776"W	0.19	
5247.60	1.310	276.700	5247.22	35.96	6.00	-35.60	606213.30	701676.70	32°55'43.476"N	104°07'18.803"W	0.12	
5342.40	1.240	276.550	5341.99	38.06	6.25	-37.70	606211.20	701676.94	32°55'43.479"N	104°07'18.827"W	0.07	
5437.10	1.230	275.370	5436.67	40.11	6.46	-39.73	606209.17	701677.16	32°55'43.481"N	104°07'18.851"W	0.03	
5531.90	0.780	279.080	5531.46	41.77	6.65	-41.38	606207.52	701677.35	32°55'43.483"N	104°07'18.870"W	0.48	
5626.60	1.070	274.040	5626.14	43.29	6.82	-42.90	606206.01	701677.52	32°55'43.485"N	104°07'18.888"W	0.32	
5721.40	1.090	270.990	5720.93	45.08	6.90	-44.68	606204.22	701677.60	32°55'43.485"N	104°07'18.909"W	0.06	
5816.10	1.130	273.930	5815.61	46.91	6.98	-46.51	606202.39	701677.68	32°55'43.486"N	104°07'18.931"W	0.07	
5910.90	1.050	271.100	5910.39	48.71	7.06	-48.31	606200.59	701677.76	32°55'43.487"N	104°07'18.952"W	0.10	
6005.60	0.740	271.800	6005.08	50.19	7.09	-49.79	606199.11	701677.79	32°55'43.487"N	104°07'18.969"W	0.33	
6100.40	0.220	315.500	6099.88	50.94	7.24	-50.53	606198.37	701677.94	32°55'43.489"N	104°07'18.978"W	0.63	
6195.10	0.540	74.960	6194.57	50.65	7.49	-50.23	606198.67	701678.19	32°55'43.491"N	104°07'18.974"W	0.71	
6289.90	1.000	78.510	6289.37	49.44	7.77	-48.99	606199.92	701678.47	32°55'43.494"N	104°07'18.960"W	0.49	
6384.60	0.950	81.210	6384.05	47.88	8.05	-47.40	606201.50	701678.75	32°55'43.497"N	104°07'18.941"W	0.07	
6479.40	0.740	83.990	6478.84	46.51	8.24	-46.02	606202.89	701678.94	32°55'43.499"N	104°07'18.925"W	0.23	
6531.00	2.300	292.900	6530.43	47.16	8.67	-46.64	606202.27	701679.37	32°55'43.503"N	104°07'18.932"W	5.75	
6563.00	10.100	289.900	6562.22	50.48	9.88	-49.87	606199.03	701680.58	32°55'43.515"N	104°07'18.970"W	24.39	
6594.00	17.200	294.600	6592.32	57.41	12.72	-56.61	606192.30	701683.42	32°55'43.543"N	104°07'19.049"W	23.16	
6626.00	26.000	296.500	6622.05	68.37	17.83	-67.21	606181.70	701688.53	32°55'43.594"N	104°07'19.173"W	27.58	
6658.00	33.900	299.400	6649.76	82.98	25.35	-81.28	606167.63	701696.05	32°55'43.669"N	104°07'19.338"W	25.09	
6689.00	40.800	299.500	6674.38	100.00	34.59	-97.65	606151.26	701705.29	32°55'43.760"N	104°07'19.530"W	22.26	
6721.00	49.500	296.500	6696.93	120.78	45.19	-117.68	606131.24	701715.89	32°55'43.866"N	104°07'19.765"W	27.98	
6753.00	57.200	293.700	6716.02	144.78	56.04	-140.92	606108.00	701726.74	32°55'43.974"N	104°07'20.037"W	25.06	
6782.00	63.900	289.400	6730.28	168.89	65.28	-164.39	606084.52	701735.98	32°55'44.065"N	104°07'20.312"W	26.46	
6816.00	67.900	281.500	6744.18	199.32	73.51	-194.28	606054.64	701744.20	32°55'44.147"N	104°07'20.663"W	24.25	
6847.00	72.900	274.800	6754.58	228.43	77.62	-223.16	606025.76	701748.31	32°55'44.189"N	104°07'21.001"W	25.97	
6879.00	79.300	273.200	6762.27	259.47	79.78	-254.13	605994.79	701750.47	32°55'44.211"N	104°07'21.365"W	20.58	
6911.00	86.900	275.500	6766.11	291.22	82.19	-285.78	605963.14	701752.88	32°55'44.235"N	104°07'21.736"W	24.80	
6942.00	89.200	275.900	6767.16	322.19	85.27	-316.61	605932.32	701755.96	32°55'44.266"N	104°07'22.098"W	7.53	
6974.00	89.400	276.300	6767.55	354.17	88.67	-348.43	605900.50	701759.36	32°55'44.300"N	104°07'22.471"W	1.40	
7006.00	89.300	276.400	6767.92	386.15	92.20	-380.23	605868.70	701762.90	32°55'44.336"N	104°07'22.844"W	0.44	
7038.00	89.100	276.000	6768.36	418.13	95.66	-412.04	605836.90	701766.35	32°55'44.371"N	104°07'23.217"W	1.40	
7069.00	89.600	276.600	6768.72	449.11	99.06	-442.85	605806.09	701769.75	32°55'44.405"N	104°07'23.578"W	2.52	
7101.00	90.700	275.300	6768.63	481.10	102.38	-474.68	605774.27	701773.07	32°55'44.439"N	104°07'23.952"W	5.32	
7164.00	92.600	274.600	6766.82	544.06	107.81	-537.41	605711.54	701778.50	32°55'44.494"N	104°07'24.688"W	3.21	
7228.00	93.100	274.200	6763.64	607.99	112.72	-601.14	605647.81	701783.41	32°55'44.543"N	104°07'25.435"W	1.00	
7291.00	91.600	272.900	6761.05	670.92	116.61	-663.97	605584.99	701787.30	32°55'44.583"N	104°07'26.172"W	3.15	



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Cave) Sec 13, T16S, R28E	Wellbore	No.4H AWP ST01
Facility	Cave Lake 13 Fed Com		

WELLPATH DATA (154 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
7354.00	90.900	273.000	6759.68	733.89	119.85	-726.87	605522.10	701790.54	32°55'44.616"N	104°07'26.910"W	1.12	
7418.00	90.800	272.700	6758.73	797.86	123.04	-790.78	605458.19	701793.73	32°55'44.649"N	104°07'27.660"W	0.49	
7481.00	91.200	272.900	6757.63	860.82	126.11	-853.70	605395.28	701796.80	32°55'44.681"N	104°07'28.398"W	0.71	
7544.00	92.100	274.000	6755.81	923.79	129.90	-916.55	605332.43	701800.59	32°55'44.720"N	104°07'29.135"W	2.26	
7608.00	91.600	274.300	6753.75	987.75	134.53	-980.35	605268.63	701805.22	32°55'44.767"N	104°07'29.884"W	0.91	
7671.00	93.000	274.100	6751.22	1050.70	139.14	-1043.13	605205.86	701809.83	32°55'44.814"N	104°07'30.620"W	2.24	
7734.00	92.800	274.700	6748.03	1113.62	143.97	-1105.87	605143.13	701814.66	32°55'44.863"N	104°07'31.356"W	1.00	
7797.00	94.300	274.900	6744.13	1176.50	149.23	-1168.52	605080.48	701819.92	32°55'44.916"N	104°07'32.091"W	2.40	
7861.00	94.200	275.300	6739.39	1240.32	154.90	-1232.09	605016.92	701825.59	32°55'44.973"N	104°07'32.836"W	0.64	
7924.00	94.000	275.400	6734.89	1303.14	160.76	-1294.66	604954.36	701831.45	32°55'45.032"N	104°07'33.570"W	0.35	
7988.00	93.400	274.900	6730.75	1367.01	166.50	-1358.27	604890.75	701837.18	32°55'45.090"N	104°07'34.317"W	1.22	
8051.00	92.600	274.300	6727.46	1429.92	171.54	-1420.98	604828.05	701842.23	32°55'45.141"N	104°07'35.052"W	1.59	
8114.00	94.200	274.200	6723.72	1492.80	176.20	-1483.69	604765.34	701846.89	32°55'45.189"N	104°07'35.788"W	2.54	
8177.00	93.800	274.500	6719.33	1555.65	180.97	-1546.36	604702.68	701851.65	32°55'45.237"N	104°07'36.523"W	0.79	
8241.00	94.500	274.100	6714.70	1619.48	185.76	-1610.01	604639.03	701856.44	32°55'45.286"N	104°07'37.270"W	1.26	
8304.00	94.800	274.200	6709.59	1682.27	190.30	-1672.64	604576.41	701860.98	32°55'45.332"N	104°07'38.004"W	0.50	
8367.00	93.600	271.700	6704.97	1745.08	193.53	-1735.38	604513.68	701864.21	32°55'45.365"N	104°07'38.740"W	4.39	
8430.00	92.900	270.000	6701.40	1807.86	194.46	-1798.27	604450.79	701865.15	32°55'45.376"N	104°07'39.478"W	2.91	
8494.00	94.000	268.300	6697.55	1871.47	193.52	-1862.14	604386.92	701864.20	32°55'45.367"N	104°07'40.227"W	3.16	
8557.00	93.800	267.400	6693.26	1933.92	191.16	-1924.95	604324.12	701861.84	32°55'45.345"N	104°07'40.964"W	1.46	
8620.00	92.300	266.400	6689.91	1996.29	187.76	-1987.77	604261.31	701858.44	32°55'45.313"N	104°07'41.701"W	2.86	
8683.00	92.100	267.100	6687.49	2058.69	184.19	-2050.62	604198.46	701854.87	32°55'45.279"N	104°07'42.439"W	1.15	
8747.00	93.100	268.000	6684.59	2122.17	181.45	-2114.49	604134.59	701852.14	32°55'45.253"N	104°07'43.188"W	2.10	
8810.00	94.400	272.400	6680.47	2184.85	181.67	-2177.34	604071.75	701852.36	32°55'45.256"N	104°07'43.926"W	7.27	
8873.00	94.400	272.800	6675.64	2247.64	184.52	-2240.09	604009.01	701855.21	32°55'45.286"N	104°07'44.662"W	0.63	
8936.00	92.700	272.600	6671.73	2310.49	187.48	-2302.90	603946.21	701858.17	32°55'45.316"N	104°07'45.399"W	2.72	
9000.00	92.200	272.700	6669.00	2374.40	190.44	-2366.77	603882.34	701861.12	32°55'45.347"N	104°07'46.148"W	0.80	
9063.00	93.500	273.000	6665.87	2437.30	193.57	-2429.61	603819.50	701864.25	32°55'45.379"N	104°07'46.885"W	2.12	
9126.00	93.400	273.000	6662.08	2500.17	196.86	-2492.41	603756.71	701867.54	32°55'45.413"N	104°07'47.622"W	0.16	
9190.00	92.000	272.700	6659.06	2564.07	200.04	-2556.26	603692.87	701870.72	32°55'45.445"N	104°07'48.371"W	2.24	
9254.00	91.600	272.700	6657.05	2628.01	203.05	-2620.16	603628.97	701873.73	32°55'45.476"N	104°07'49.120"W	0.62	
9317.00	92.500	273.900	6654.80	2690.96	206.68	-2683.01	603566.13	701877.36	32°55'45.513"N	104°07'49.858"W	2.38	
9380.00	92.500	274.600	6652.05	2753.90	211.34	-2745.78	603503.36	701882.02	32°55'45.561"N	104°07'50.594"W	1.11	
9443.00	92.100	273.800	6649.52	2816.85	215.95	-2808.56	603440.59	701886.63	32°55'45.607"N	104°07'51.330"W	1.42	
9506.00	92.300	272.900	6647.10	2879.79	219.63	-2871.40	603377.75	701890.31	32°55'45.645"N	104°07'52.068"W	1.46	
9570.00	91.900	272.200	6644.76	2943.71	222.47	-2935.29	603313.86	701893.15	32°55'45.674"N	104°07'52.817"W	1.26	
9633.00	93.000	270.600	6642.06	3006.57	224.01	-2998.22	603250.95	701894.69	32°55'45.691"N	104°07'53.555"W	3.08	
9696.00	92.800	271.700	6638.88	3069.39	225.27	-3061.12	603188.05	701895.95	32°55'45.705"N	104°07'54.293"W	1.77	
9760.00	91.600	272.500	6636.42	3133.29	227.62	-3125.03	603124.15	701898.30	32°55'45.729"N	104°07'55.043"W	2.25	
9823.00	91.900	273.200	6634.50	3196.24	230.75	-3187.92	603061.26	701901.43	32°55'45.761"N	104°07'55.781"W	1.21	
9886.00	92.200	274.100	6632.24	3259.19	234.76	-3250.75	602998.43	701905.44	32°55'45.802"N	104°07'56.518"W	1.50	
9949.00	91.300	274.100	6630.32	3322.16	239.26	-3313.56	602935.63	701909.94	32°55'45.848"N	104°07'57.255"W	1.43	
10013.00	91.200	274.300	6628.92	3386.14	243.95	-3377.37	602871.82	701914.62	32°55'45.895"N	104°07'58.003"W	0.35	
10075.00	90.600	274.000	6627.95	3448.14	248.43	-3439.20	602810.00	701919.11	32°55'45.941"N	104°07'58.728"W	1.08	
10138.00	90.100	272.900	6626.56	3511.12	252.22	-3502.09	602747.12	701922.90	32°55'45.979"N	104°07'59.466"W	1.92	



Actual Wellpath Report

No.4H AWP ST01

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Eddy County, NM	Well	No. 4H
Field	(Cave) Sec 13, T16S, R28E	Wellbore	No.4H AWP ST01
Facility	Cave Lake 13 Fed Com		

WELLPATH DATA (154 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
10201.00	90.200	272.900	6627.40	3574.10	255.41	-3565.01	602684.21	701926.09	32°55'46.012"N	104°08'00.204"W	0.16	
10264.00	89.800	273.200	6627.40	3637.09	258.76	-3627.92	602621.30	701929.44	32°55'46.047"N	104°08'00.942"W	0.79	
10328.00	91.100	273.400	6626.90	3701.07	262.45	-3691.81	602557.42	701933.12	32°55'46.084"N	104°08'01.692"W	2.06	
10391.00	91.500	274.500	6625.47	3764.05	266.78	-3754.64	602494.59	701937.46	32°55'46.128"N	104°08'02.429"W	1.86	
10455.00	91.500	274.900	6623.79	3828.03	272.03	-3818.40	602430.83	701942.70	32°55'46.181"N	104°08'03.177"W	0.62	
10518.00	90.000	274.600	6622.97	3891.02	277.24	-3881.18	602368.06	701947.92	32°55'46.234"N	104°08'03.913"W	2.43	
10581.00	89.900	274.900	6623.02	3954.02	282.46	-3943.96	602305.28	701953.14	32°55'46.287"N	104°08'04.650"W	0.50	
10644.00	89.600	275.500	6623.30	4017.01	288.17	-4006.70	602242.55	701958.84	32°55'46.345"N	104°08'05.386"W	1.06	
10708.00	89.600	275.400	6623.74	4081.00	294.25	-4070.41	602178.85	701964.92	32°55'46.406"N	104°08'06.133"W	0.16	
10770.00	89.100	275.100	6624.45	4142.99	299.92	-4132.15	602117.12	701970.59	32°55'46.463"N	104°08'06.857"W	0.94	
10834.00	90.700	275.100	6624.56	4206.98	305.61	-4195.89	602053.38	701976.28	32°55'46.521"N	104°08'07.605"W	2.50	
10897.00	92.500	275.700	6622.80	4269.94	311.54	-4258.59	601990.69	701982.21	32°55'46.580"N	104°08'08.340"W	3.01	
10960.00	91.900	275.400	6620.38	4332.88	317.62	-4321.24	601928.04	701988.30	32°55'46.642"N	104°08'09.075"W	1.06	
11024.00	90.600	274.200	6618.98	4396.86	322.98	-4385.00	601864.28	701993.65	32°55'46.696"N	104°08'09.823"W	2.76	
11087.00	90.000	273.700	6618.65	4459.86	327.32	-4447.85	601801.44	701997.99	32°55'46.740"N	104°08'10.560"W	1.24	
11149.00	89.400	272.600	6618.98	4521.84	330.72	-4509.75	601739.54	702001.40	32°55'46.775"N	104°08'11.287"W	2.02	
11213.00	89.100	272.800	6619.82	4585.81	333.74	-4573.68	601675.62	702004.41	32°55'46.806"N	104°08'12.036"W	0.56	
11276.00	89.400	273.100	6620.64	4648.79	336.98	-4636.59	601612.72	702007.65	32°55'46.839"N	104°08'12.774"W	0.67	
11378.00	89.400	273.100	6621.71	4750.76	342.50	-4738.43	601510.88	702013.17	32°55'46.896"N	104°08'13.969"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.2H PBHL Rev1		6774.00	362.89	-4747.92	601501.40	702033.56	32°55'47.098"N	104°08'14.080"W	point

WELLPATH COMPOSITION - Ref Wellbore: No.4H AWP ST01					Ref Wellpath: No.4H AWP ST01		
Start MD [ft]	End MD [ft]	Positional Uncertainty Model			Log Name/Comment		Wellbore
21.00	6479.40	Generic gyro - northseeking (Standard)			Gyro < 100 - XXXXX >		No. 4H AWP
6479.40	11378.00	NaviTrak (Standard)			MWD NaviTrak <6531-XXXX>		No.4H AWP ST01