



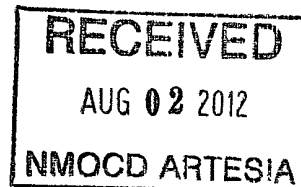
A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

30-015-39967

May 9, 2012

Cimarex Energy Company
600 N. Marienfeld St., Ste. 600
Midland, TX 79701



Attn: Carolyn Larson

Re: **Cottonwood Hills 32 State Com 1**

Please find enclosed a copy of the survey from 0' to 8,975.50' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976.

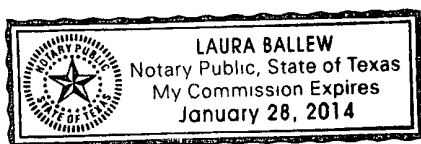
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
COUNTY OF NUECES §

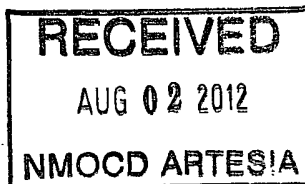
This instrument was acknowledged before me on the 9th day of May, A.D., 2012, by Keith Havelka.

Laura Ballew
Notary Public, State of Texas





Company: Cimarex Energy
 Lease/Well: Cottonwood Hills 32 State Com/1
 Location: S32, T25s, R27e
 Rig Name: Cactus 122
 State/County: New Mexico/Eddy
 Latitude: 32.08
 GRID North is 0.06 Degrees East of True North
 VS-Azi: 0.00 Degrees



Depth Reference : RKB=28.5 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: cottonwood-01_gyro_survey.ut

Minimum Curvature Method

Report Date/Time: 5/9/2012 / 10:10

Vaughn Energy Services

Gardendale, Texas

432-563-5444

Surveyor: Seth Hardin

Cottonwood Hills 32 State Com 1 / API 30-015-39967

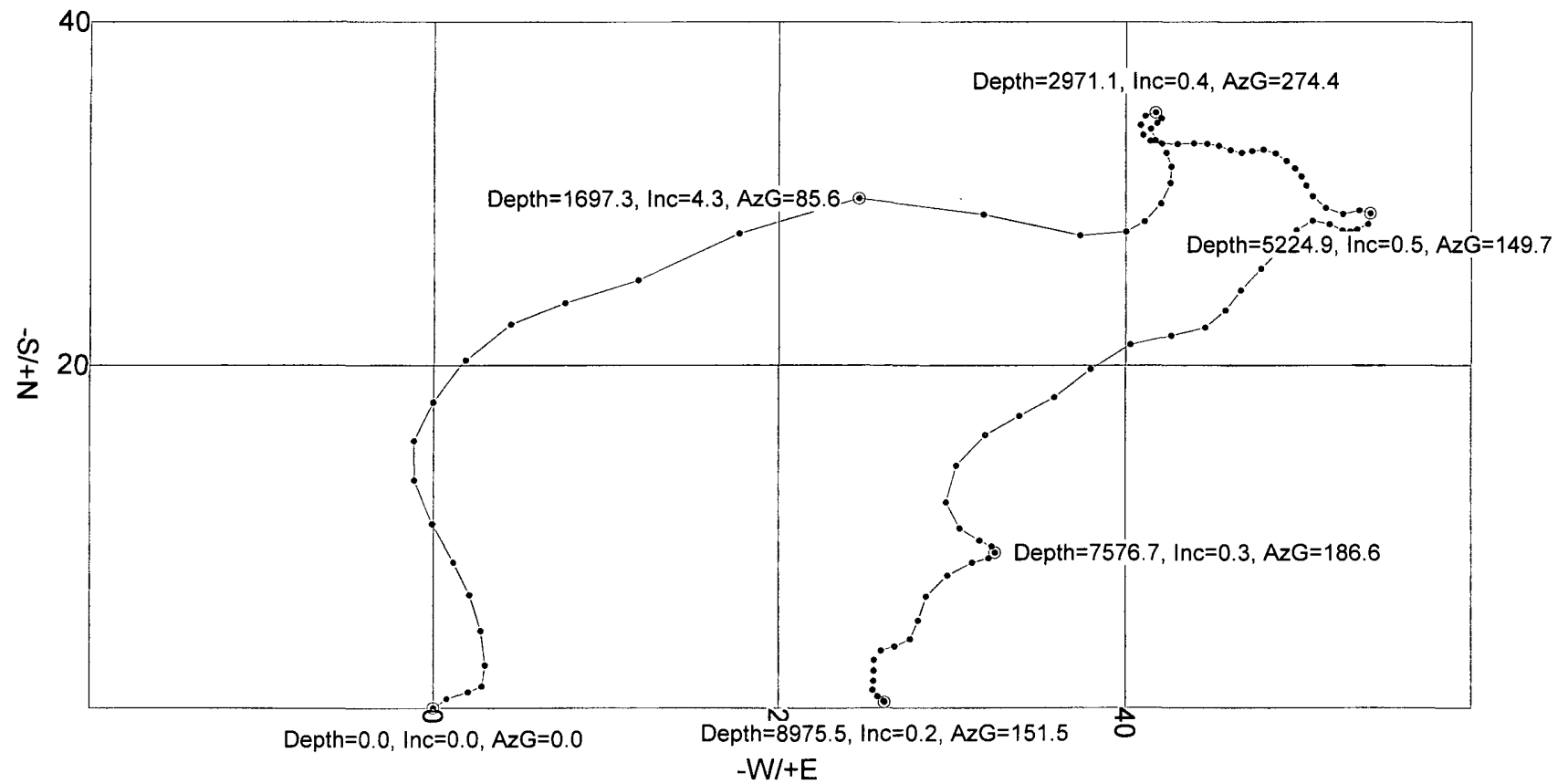
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
129.43	0.85	55.75	129.43	0.54	0.80	0.54	0.96	55.75	0.66
227.42	0.79	91.98	227.41	0.93	2.07	0.93	2.27	65.81	0.52
325.41	0.45	16.35	325.39	1.27	2.85	1.27	3.12	65.93	0.82
423.40	1.02	5.23	423.37	2.51	3.04	2.51	3.94	50.47	0.60
521.39	1.39	343.45	521.34	4.51	2.78	4.51	5.30	31.62	0.59
619.38	1.18	342.65	619.31	6.61	2.14	6.61	6.95	17.92	0.21
717.37	1.31	325.55	717.27	8.50	1.20	8.50	8.59	8.06	0.40
815.36	1.73	333.92	815.23	10.75	-0.08	10.75	10.75	359.58	0.48
913.35	1.51	342.16	913.18	13.31	-1.13	13.31	13.36	355.17	0.32
1011.34	1.30	20.41	1011.14	15.59	-1.13	15.59	15.63	355.84	0.96
1109.33	1.65	31.52	1109.10	17.83	-0.01	17.83	17.83	359.97	0.46
1207.32	1.99	42.62	1207.04	20.28	1.88	20.28	20.37	5.29	0.50
1305.31	1.99	59.85	1304.97	22.39	4.50	22.39	22.84	11.37	0.61
1403.30	1.99	77.07	1402.90	23.63	7.64	23.63	24.83	17.92	0.61
1501.29	3.18	69.45	1500.79	24.96	11.85	24.96	27.63	25.39	1.26
1599.28	4.37	61.83	1598.57	27.68	17.68	27.68	32.85	32.57	1.31
1697.27	4.32	85.63	1696.29	29.72	24.66	29.72	38.62	39.68	1.83
1795.26	4.28	109.44	1794.01	28.79	31.79	28.79	42.89	47.84	1.81

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1893.25	2.48	89.77	1891.83	27.58	37.36	27.58	46.44	53.57	2.16
1991.24	0.67	70.11	1989.78	27.78	40.02	27.78	48.72	55.23	1.90
2089.23	0.78	52.07	2087.76	28.39	41.09	28.39	49.94	55.36	0.26
2187.22	0.89	34.04	2185.74	29.43	42.04	29.43	51.32	55.01	0.29
2285.21	0.68	12.22	2283.72	30.62	42.59	30.62	52.46	54.28	0.37
2383.20	0.47	350.41	2381.70	31.59	42.65	31.59	53.07	53.47	0.31
2481.19	0.54	329.64	2479.69	32.38	42.35	32.38	53.31	52.60	0.20
2579.18	0.60	308.88	2577.67	33.10	41.72	33.10	53.25	51.57	0.22
2677.17	0.44	20.68	2675.66	33.77	41.45	33.77	53.47	50.82	0.64
2775.16	0.28	92.49	2773.65	34.12	41.82	34.12	53.97	50.79	0.45
2873.15	0.34	3.45	2871.64	34.40	42.07	34.40	54.34	50.73	0.45
2971.14	0.41	274.42	2969.63	34.72	41.74	34.72	54.29	50.25	0.54
3069.13	0.39	229.39	3067.62	34.53	41.14	34.53	53.71	49.99	0.31
3167.12	0.37	184.36	3165.60	34.00	40.86	34.00	53.16	50.24	0.30
3265.11	0.35	147.45	3263.59	33.43	41.00	33.43	52.90	50.81	0.23
3363.10	0.33	110.54	3361.58	33.07	41.43	33.07	53.01	51.40	0.22
3461.09	0.47	98.29	3459.57	32.92	42.09	32.92	53.43	51.97	0.16
3559.08	0.60	86.04	3557.55	32.90	43.00	32.90	54.14	52.58	0.18
3657.07	0.50	90.05	3655.54	32.93	43.94	32.93	54.91	53.15	0.11
3755.06	0.40	94.05	3753.53	32.91	44.71	32.91	55.52	53.65	0.11
3853.05	0.41	104.77	3851.51	32.79	45.40	32.79	56.00	54.16	0.08
3951.04	0.42	115.48	3949.50	32.55	46.06	32.55	56.40	54.76	0.08
4049.03	0.39	91.76	4047.49	32.38	46.72	32.38	56.85	55.27	0.17
4147.02	0.35	68.03	4145.48	32.48	47.33	32.48	57.41	55.54	0.16
4245.01	0.41	94.13	4243.46	32.57	47.96	32.57	57.98	55.82	0.19
4343.00	0.48	120.23	4341.45	32.34	48.67	32.34	58.44	56.40	0.21
4440.99	0.41	128.27	4439.44	31.92	49.30	31.92	58.73	57.08	0.09
4538.98	0.35	136.31	4537.43	31.48	49.78	31.48	58.90	57.69	0.08
4636.97	0.35	147.47	4635.41	31.01	50.15	31.01	58.97	58.27	0.07
4734.96	0.35	158.63	4733.40	30.48	50.42	30.48	58.92	58.85	0.07
4832.95	0.51	141.80	4831.39	29.85	50.80	29.85	58.93	59.56	0.21
4930.94	0.67	124.96	4929.37	29.18	51.55	29.18	59.23	60.49	0.24
5028.93	0.62	92.98	5027.36	28.82	52.55	28.82	59.93	61.26	0.37
5126.92	0.56	61.00	5125.34	29.02	53.50	29.02	60.87	61.52	0.34
5224.91	0.54	149.74	5223.33	28.86	54.15	28.86	61.36	61.95	0.79
5322.90	0.51	238.49	5321.32	28.23	54.01	28.23	60.94	62.40	0.75
5420.89	0.33	250.50	5419.31	27.91	53.37	27.91	60.22	62.39	0.20
5518.88	0.15	262.52	5517.29	27.79	52.97	27.79	59.82	62.31	0.19
5616.87	0.38	283.60	5615.28	27.85	52.52	27.85	59.45	62.06	0.25

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5714.86	0.61	304.68	5713.27	28.23	51.77	28.23	58.97	61.40	0.29
5812.85	0.65	261.18	5811.25	28.44	50.79	28.44	58.21	60.76	0.48
5910.84	0.70	217.68	5909.24	27.88	49.88	27.88	57.14	60.80	0.51
6008.83	0.89	221.70	6007.22	26.84	49.01	26.84	55.87	61.29	0.20
6106.82	1.08	225.72	6105.19	25.62	47.84	25.62	54.27	61.83	0.21
6204.81	0.93	219.81	6203.17	24.36	46.67	24.36	52.64	62.43	0.19
6302.80	0.78	213.91	6301.15	23.20	45.78	23.20	51.32	63.13	0.18
6400.79	1.07	241.29	6399.13	22.20	44.60	22.20	49.82	63.54	0.53
6498.78	1.36	268.68	6497.09	21.73	42.63	21.73	47.85	62.99	0.65
6596.77	1.52	248.21	6595.05	21.22	40.26	21.22	45.52	62.21	0.54
6694.76	1.67	227.75	6693.01	19.78	38.00	19.78	42.84	62.50	0.60
6792.75	1.46	237.22	6790.96	18.14	35.89	18.14	40.22	63.19	0.34
6890.74	1.25	246.69	6888.92	17.04	33.86	17.04	37.91	63.28	0.31
6988.73	1.38	234.34	6986.89	15.93	31.92	15.93	35.68	63.48	0.32
7086.72	1.51	213.00	7084.85	14.16	30.26	14.16	33.41	64.92	0.56
7184.71	1.24	173.62	7182.81	12.03	29.67	12.03	32.02	67.94	0.98
7282.70	0.96	125.25	7280.78	10.50	30.46	10.50	32.22	70.97	0.95
7380.69	0.62	117.73	7378.76	9.78	31.60	9.78	33.08	72.79	0.36
7478.68	0.28	110.20	7476.75	9.45	32.29	9.45	33.65	73.68	0.35
7576.67	0.34	186.57	7574.74	9.08	32.49	9.08	33.73	74.38	0.40
7674.66	0.40	262.93	7672.73	8.75	32.12	8.75	33.29	74.76	0.47
7772.65	0.76	250.03	7770.71	8.49	31.17	8.49	32.31	74.77	0.39
7870.64	1.13	237.14	7868.69	7.74	29.75	7.74	30.74	75.41	0.43
7968.63	0.97	210.39	7966.66	6.51	28.53	6.51	29.26	77.15	0.52
8066.62	0.81	183.64	8064.64	5.10	28.06	5.10	28.52	79.69	0.45
8164.61	0.68	226.17	8162.63	4.01	27.60	4.01	27.89	81.73	0.56
8262.60	0.55	268.71	8260.61	3.60	26.71	3.60	26.95	82.33	0.47
8360.59	0.46	231.76	8358.60	3.34	25.93	3.34	26.14	82.65	0.34
8458.58	0.37	194.80	8456.58	2.80	25.54	2.80	25.69	83.75	0.28
8556.57	0.37	168.60	8554.57	2.18	25.52	2.18	25.61	85.11	0.17
8654.56	0.34	197.70	8652.56	1.59	25.49	1.59	25.54	86.42	0.18
8752.55	0.30	166.87	8750.55	1.07	25.46	1.07	25.48	87.60	0.18
8850.54	0.30	121.80	8848.54	0.68	25.74	0.68	25.75	88.48	0.23
8948.53	0.21	136.46	8946.53	0.42	26.08	0.42	26.08	89.08	0.12
8975.50	0.21	151.46	8973.50	0.34	26.14	0.34	26.14	89.25	0.20



Vaughn Energy Services
Gardendale, Texas
432-563-5444
Surveyor: Seth Hardin
Cottonwood Hills 32 State Com 1 / API 30-015-39967



VES Survey Date: 04/28/2012



Cimarex Energy Co.

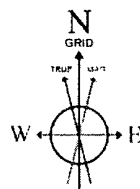
Location Eddy County, NM
Field (Cottonwood Hills) Sec. 32, T25S, R27E
Facility Cottonwood Hills 32 State Corn #1

Slot No 1 SHL
Well No 1
Wellbore No 1 PWB

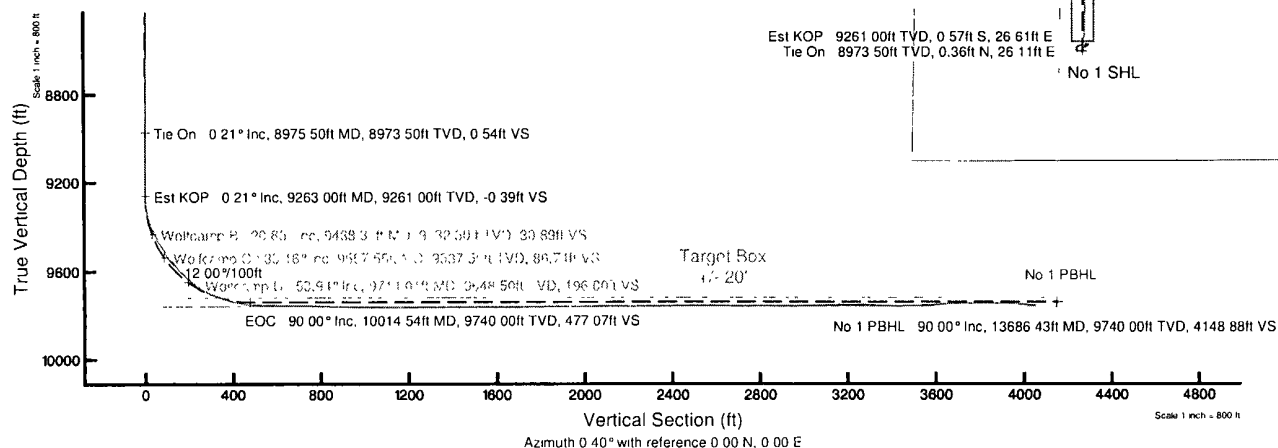
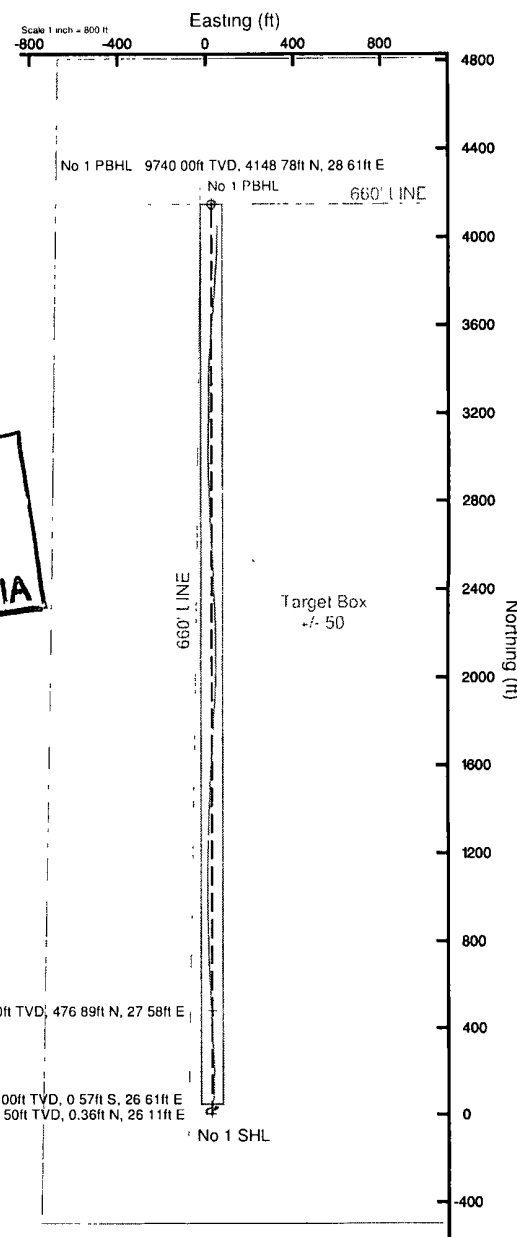


Well Profile Data								
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8975.50	0.210	151.460	8973.50	0.36	26.11	0.00	0.54
Est KOP	9263.00	0.210	151.460	9261.00	-0.57	26.61	0.00	-0.39
EOC	10014.54	90.000	0.016	9740.00	476.89	27.58	12.00	477.07
No 1 PBHL	13686.43	90.000	0.016	9740.00	4148.78	28.61	0.00	4148.88

Plot reference wellpath is Rev-C 0	
True vertical depths are referenced to Rig on No 1 SHL (KB)	Grid System NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No 1 SHL (KB)	North Reference Grid north
Rig on No 1 SHL (KB) to Mean Sea Level 3288.5 feet	Scale True distance
Mean Sea Level to Mud line (At Slot No 1 SHL) -3240 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by genibry on 4/30/2012



BGGM (1945.0 to 2013.0) Dip 59.88° Field 48363.4 nT
Magnetic North is 7.87 degrees East of True North (at 2/21/2012)
Grid North is 0.06 degrees East of True North
To correct azimuth from True to Grid subtract 0.06 degrees
To correct azimuth from Magnetic to Grid add 7.80 degrees
For example if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.80 = 97.80





Actual Wellpath Report

No.1 AWP

Page 1 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No.1 SHL
Area	Eddy County, NM	Well	No.1
Field	(Cottonwood Hills) Sec. 32, T25S, R27E	Wellbore	No.1 AWB
Facility	Cottonwood Hills 32 State Com #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	Harrkol
Scale	0.999911	Report Generated	5/17/2012 at 7:50:10 AM
Convergence at slot	0.06° East	Database/Source file	WA Midland/No.1_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	576885.70	393001.30	32°04'49.398"N	104°13'06.806"W
Facility Reference Pt			576885.70	393001.30	32°04'49.398"N	104°13'06.806"W
Field Reference Pt			576885.70	393001.30	32°04'49.398"N	104°13'06.806"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No.1 SHL (KB) to Facility Vertical Datum	28.50ft
Horizontal Reference Pt	Slot	Rig on No.1 SHL (KB) to Mean Sea Level	3268.50ft
Vertical Reference Pt	Rig on No.1 SHL (KB)	Rig on No.1 SHL (KB) to Mud Line at Slot (No.1 SHL)	28.50ft
MD Reference Pt	Rig on No.1 SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	0.40°



Actual Wellpath Report

No.1 AWP

Page 2 of 6



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No.1 SHL
Area	Eddy County, NM	Well	No.1
Field	(Cottonwood Hills) Sec. 32, T25S, R27E	Wellbore	No.1 AWB
Facility	Cottonwood Hills 32 State Com #1		

WELLPATH DATA (181 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
0.00	0.000	55.750	0.00	0.00	0.00	0.00	576885.70	393001.30	32°04'49.398"N	104°13'06.806"W	0.00	
129.43	0.850	55.750	129.43	0.55	0.54	0.79	576886.49	393001.84	32°04'49.403"N	104°13'06.796"W	0.66	
227.42	0.790	91.980	227.41	0.94	0.93	2.07	576887.77	393002.23	32°04'49.407"N	104°13'06.781"W	0.52	
325.41	0.450	16.350	325.39	1.29	1.27	2.85	576888.55	393002.57	32°04'49.410"N	104°13'06.772"W	0.82	
423.40	1.020	5.230	423.37	2.53	2.51	3.04	576888.74	393003.81	32°04'49.422"N	104°13'06.770"W	0.60	
521.39	1.390	343.450	521.34	4.54	4.52	2.78	576888.48	393005.82	32°04'49.442"N	104°13'06.773"W	0.59	
619.38	1.180	342.650	619.31	6.63	6.62	2.14	576887.84	393007.92	32°04'49.463"N	104°13'06.781"W	0.22	
717.37	1.310	325.550	717.27	8.51	8.51	1.21	576886.91	393009.81	32°04'49.482"N	104°13'06.791"W	0.40	
815.36	1.730	333.920	815.23	10.76	10.76	-0.08	576885.62	393012.06	32°04'49.504"N	104°13'06.806"W	0.48	
913.35	1.510	342.160	913.18	13.31	13.32	-1.12	576884.58	393014.62	32°04'49.529"N	104°13'06.818"W	0.33	
1011.34	1.300	20.410	1011.14	15.58	15.59	-1.13	576884.57	393016.89	32°04'49.552"N	104°13'06.818"W	0.96	
1109.33	1.650	31.520	1109.10	17.83	17.83	0.00	576885.70	393019.13	32°04'49.574"N	104°13'06.805"W	0.46	
1207.32	1.990	42.620	1207.04	20.30	20.29	1.88	576887.58	393021.58	32°04'49.598"N	104°13'06.783"W	0.50	
1305.31	1.990	59.850	1304.97	22.42	22.39	4.51	576890.21	393023.69	32°04'49.619"N	104°13'06.753"W	0.61	
1403.30	1.990	77.070	1402.90	23.68	23.63	7.64	576893.34	393024.93	32°04'49.631"N	104°13'06.716"W	0.61	
1501.29	3.180	69.450	1500.79	25.04	24.96	11.84	576897.54	393026.26	32°04'49.645"N	104°13'06.668"W	1.26	
1599.28	4.370	61.830	1598.57	27.80	27.68	17.68	576903.38	393028.98	32°04'49.671"N	104°13'06.600"W	1.32	
1697.27	4.320	85.630	1696.29	29.89	29.72	24.65	576910.35	393031.02	32°04'49.692"N	104°13'06.519"W	1.83	
1795.26	4.280	109.440	1794.01	29.01	28.79	31.78	576917.47	393030.08	32°04'49.682"N	104°13'06.436"W	1.81	
1893.25	2.480	89.770	1891.83	27.84	27.58	37.35	576923.04	393028.88	32°04'49.670"N	104°13'06.371"W	2.16	
1991.24	0.670	70.110	1989.78	28.06	27.78	40.01	576925.70	393029.08	32°04'49.672"N	104°13'06.340"W	1.90	
2089.23	0.780	52.070	2087.76	28.67	28.39	41.07	576926.77	393029.68	32°04'49.678"N	104°13'06.328"W	0.26	
2187.22	0.890	34.040	2185.74	29.72	29.43	42.02	576927.72	393030.73	32°04'49.688"N	104°13'06.317"W	0.29	
2285.21	0.680	12.220	2283.72	30.92	30.63	42.57	576928.27	393031.92	32°04'49.700"N	104°13'06.310"W	0.37	
2383.20	0.470	350.410	2381.70	31.88	31.59	42.63	576928.32	393032.89	32°04'49.710"N	104°13'06.310"W	0.31	
2481.19	0.540	329.640	2479.69	32.68	32.39	42.33	576928.02	393033.68	32°04'49.718"N	104°13'06.313"W	0.20	
2579.18	0.600	308.880	2577.68	33.39	33.11	41.69	576927.39	393034.40	32°04'49.725"N	104°13'06.321"W	0.22	
2677.17	0.440	20.680	2675.66	34.07	33.78	41.43	576927.12	393035.08	32°04'49.731"N	104°13'06.324"W	0.64	
2775.16	0.280	92.490	2773.65	34.41	34.12	41.80	576927.50	393035.42	32°04'49.735"N	104°13'06.319"W	0.45	
2873.15	0.340	3.450	2871.64	34.69	34.40	42.06	576927.75	393035.70	32°04'49.738"N	104°13'06.316"W	0.45	
2971.14	0.410	274.420	2969.63	35.01	34.72	41.72	576927.42	393036.02	32°04'49.741"N	104°13'06.320"W	0.54	
3069.13	0.390	229.390	3067.62	34.81	34.53	41.12	576926.82	393035.83	32°04'49.739"N	104°13'06.327"W	0.31	
3167.12	0.370	184.360	3165.60	34.28	34.00	40.84	576926.54	393035.29	32°04'49.734"N	104°13'06.330"W	0.30	
3265.11	0.350	147.450	3263.59	33.71	33.43	40.98	576926.68	393034.73	32°04'49.728"N	104°13'06.329"W	0.23	
3363.10	0.330	110.540	3361.58	33.36	33.08	41.41	576927.10	393034.37	32°04'49.725"N	104°13'06.324"W	0.22	
3461.09	0.470	98.290	3459.57	33.21	32.92	42.07	576927.76	393034.22	32°04'49.723"N	104°13'06.316"W	0.17	
3559.08	0.600	86.040	3557.55	33.19	32.90	42.98	576928.67	393034.20	32°04'49.723"N	104°13'06.306"W	0.18	
3657.07	0.500	90.050	3655.54	33.24	32.93	43.92	576929.61	393034.23	32°04'49.723"N	104°13'06.295"W	0.11	
3755.06	0.400	94.050	3753.53	33.22	32.91	44.69	576930.38	393034.21	32°04'49.723"N	104°13'06.286"W	0.11	
3853.05	0.410	104.770	3851.51	33.11	32.80	45.37	576931.06	393034.09	32°04'49.722"N	104°13'06.278"W	0.08	
3951.04	0.420	115.480	3949.50	32.87	32.55	46.03	576931.73	393033.85	32°04'49.719"N	104°13'06.270"W	0.08	
4049.03	0.390	91.760	4047.49	32.71	32.39	46.69	576932.38	393033.68	32°04'49.718"N	104°13'06.262"W	0.17	
4147.02	0.350	68.030	4145.48	32.81	32.49	47.30	576932.99	393033.79	32°04'49.719"N	104°13'06.255"W	0.16	
4245.01	0.410	94.130	4243.47	32.90	32.57	47.93	576933.62	393033.87	32°04'49.719"N	104°13'06.248"W	0.19	
4343.00	0.480	120.230	4341.45	32.68	32.34	48.63	576934.33	393033.64	32°04'49.717"N	104°13'06.240"W	0.22	



Actual Wellpath Report

No.1 AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No.1 SHL
Area	Eddy County, NM	Well	No.1
Field	(Cottonwood Hills) Sec. 32, T25S, R27E	Wellbore	No.1 AWB
Facility	Cottonwood Hills 32 State Com #1		

WELLPATH DATA (181 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
4440.99	0.410	128.270	4439.44	32.26	31.92	49.26	576934.96	393033.22	32°04'49.713"N	104°13'06.233"W	0.10	
4538.98	0.350	136.310	4537.43	31.83	31.49	49.74	576935.44	393032.78	32°04'49.709"N	104°13'06.227"W	0.08	
4636.97	0.350	147.470	4635.42	31.36	31.02	50.11	576935.80	393032.31	32°04'49.704"N	104°13'06.223"W	0.07	
4734.96	0.350	158.630	4733.40	30.83	30.49	50.38	576936.07	393031.78	32°04'49.699"N	104°13'06.220"W	0.07	
4832.95	0.510	141.800	4831.39	30.21	29.86	50.76	576936.45	393031.16	32°04'49.693"N	104°13'06.215"W	0.21	
4930.94	0.670	124.960	4929.38	29.55	29.19	51.50	576937.19	393030.49	32°04'49.686"N	104°13'06.207"W	0.24	
5028.93	0.620	92.980	5027.36	29.20	28.84	52.50	576938.19	393030.13	32°04'49.682"N	104°13'06.195"W	0.37	
5126.92	0.560	61.000	5125.35	29.41	29.04	53.44	576939.14	393030.34	32°04'49.684"N	104°13'06.184"W	0.34	
5224.91	0.540	149.740	5223.33	29.25	28.88	54.10	576939.79	393030.17	32°04'49.683"N	104°13'06.176"W	0.79	
5322.90	0.510	238.490	5321.32	28.62	28.25	53.96	576939.65	393029.55	32°04'49.677"N	104°13'06.178"W	0.75	
5420.89	0.330	250.500	5419.31	28.29	27.93	53.32	576939.01	393029.22	32°04'49.673"N	104°13'06.185"W	0.20	
5518.88	0.150	262.520	5517.30	28.18	27.82	52.93	576938.62	393029.11	32°04'49.672"N	104°13'06.190"W	0.19	
5616.87	0.380	283.600	5615.28	28.24	27.88	52.48	576938.18	393029.17	32°04'49.673"N	104°13'06.195"W	0.25	
5714.86	0.610	304.680	5713.27	28.60	28.25	51.74	576937.43	393029.55	32°04'49.677"N	104°13'06.204"W	0.30	
5812.85	0.650	261.180	5811.26	28.81	28.46	50.76	576936.46	393029.76	32°04'49.679"N	104°13'06.215"W	0.48	
5910.84	0.700	217.680	5909.24	28.24	27.90	49.84	576935.54	393029.20	32°04'49.673"N	104°13'06.226"W	0.51	
6008.83	0.890	221.700	6007.22	27.20	26.86	48.97	576934.67	393028.16	32°04'49.663"N	104°13'06.236"W	0.20	
6106.82	1.080	225.720	6105.20	25.98	25.65	47.81	576933.50	393026.94	32°04'49.651"N	104°13'06.250"W	0.21	
6204.81	0.930	219.810	6203.17	24.71	24.39	46.63	576932.33	393025.69	32°04'49.639"N	104°13'06.263"W	0.19	
6302.80	0.780	213.910	6301.15	23.54	23.23	45.75	576931.45	393024.52	32°04'49.627"N	104°13'06.273"W	0.18	
6400.79	1.070	241.290	6399.13	22.54	22.23	44.58	576930.28	393023.53	32°04'49.617"N	104°13'06.287"W	0.53	
6498.78	1.360	268.680	6497.10	22.06	21.77	42.61	576928.31	393023.06	32°04'49.613"N	104°13'06.310"W	0.65	
6596.77	1.520	248.210	6595.06	21.53	21.26	40.24	576925.94	393022.56	32°04'49.608"N	104°13'06.338"W	0.55	
6694.76	1.670	227.750	6693.01	20.08	19.82	37.98	576923.68	393021.11	32°04'49.593"N	104°13'06.364"W	0.60	
6792.75	1.460	237.220	6790.96	18.43	18.18	35.87	576921.57	393019.48	32°04'49.577"N	104°13'06.388"W	0.34	
6890.74	1.250	246.690	6888.92	17.31	17.08	33.84	576919.54	393018.38	32°04'49.566"N	104°13'06.412"W	0.31	
6988.73	1.380	234.340	6986.89	16.19	15.97	31.90	576917.60	393017.27	32°04'49.555"N	104°13'06.435"W	0.32	
7086.72	1.510	213.000	7084.85	14.41	14.20	30.24	576915.94	393015.50	32°04'49.538"N	104°13'06.454"W	0.56	
7184.71	1.240	173.620	7182.81	12.27	12.06	29.66	576915.35	393013.36	32°04'49.517"N	104°13'06.461"W	0.98	
7282.70	0.960	125.250	7280.79	10.74	10.53	30.44	576916.14	393011.83	32°04'49.502"N	104°13'06.452"W	0.96	
7380.69	0.620	117.730	7378.77	10.03	9.81	31.58	576917.28	393011.11	32°04'49.494"N	104°13'06.438"W	0.36	
7478.68	0.280	110.200	7476.75	9.71	9.49	32.28	576917.97	393010.78	32°04'49.491"N	104°13'06.430"W	0.35	
7576.67	0.340	186.570	7574.74	9.34	9.11	32.47	576918.17	393010.41	32°04'49.487"N	104°13'06.428"W	0.39	
7674.66	0.400	262.930	7672.73	9.00	8.78	32.10	576917.79	393010.08	32°04'49.484"N	104°13'06.432"W	0.47	
7772.65	0.760	250.030	7770.72	8.73	8.52	31.15	576916.84	393009.82	32°04'49.482"N	104°13'06.443"W	0.39	
7870.64	1.130	237.140	7868.69	7.98	7.77	29.72	576915.42	393009.07	32°04'49.474"N	104°13'06.460"W	0.43	
7968.63	0.970	210.390	7966.67	6.73	6.53	28.49	576914.19	393007.83	32°04'49.462"N	104°13'06.474"W	0.52	
8066.62	0.810	183.640	8064.64	5.32	5.13	28.03	576913.73	393006.43	32°04'49.448"N	104°13'06.480"W	0.45	
8164.61	0.680	226.170	8162.63	4.22	4.03	27.57	576913.26	393005.33	32°04'49.437"N	104°13'06.485"W	0.57	
8262.60	0.550	268.710	8260.61	3.80	3.62	26.68	576912.37	393004.92	32°04'49.433"N	104°13'06.495"W	0.47	
8360.59	0.460	231.760	8358.60	3.54	3.36	25.90	576911.59	393004.66	32°04'49.431"N	104°13'06.504"W	0.34	
8458.58	0.370	194.800	8456.59	2.99	2.82	25.51	576911.20	393004.12	32°04'49.425"N	104°13'06.509"W	0.28	
8556.57	0.370	168.600	8554.57	2.37	2.20	25.49	576911.19	393003.50	32°04'49.419"N	104°13'06.509"W	0.17	
8654.56	0.340	197.700	8652.56	1.79	1.61	25.46	576911.16	393002.91	32°04'49.413"N	104°13'06.510"W	0.18	
8752.55	0.300	166.870	8750.55	1.26	1.09	25.43	576911.13	393002.39	32°04'49.408"N	104°13'06.510"W	0.18	



Actual Wellpath Report

No.1 AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No.1 SHL
Area	Eddy County, NM	Well	No.1
Field	(Cottonwood Hills) Sec. 32, T25S, R27E	Wellbore	No.1 AWB
Facility	Cottonwood Hills 32 State Com #1		

WELLPATH DATA (181 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
8850.54	0.300	121.800	8848.54	0.88	0.70	25.71	576911.41	393002.00	32°04'49.404"N	104°13'06.507"W	0.23	
8948.53	0.210	136.460	8946.53	0.61	0.43	26.05	576911.75	393001.73	32°04'49.402"N	104°13'06.503"W	0.11	
8975.50	0.210	151.460	8973.50	0.54	0.36	26.11	576911.81	393001.66	32°04'49.401"N	104°13'06.502"W	0.20	
9167.00	0.200	168.300	9165.00	-0.10	-0.28	26.34	576912.04	393001.02	32°04'49.395"N	104°13'06.499"W	0.03	
9198.00	0.600	205.800	9196.00	-0.30	-0.48	26.28	576911.98	393000.82	32°04'49.393"N	104°13'06.500"W	1.48	
9228.00	0.800	182.100	9225.99	-0.65	-0.83	26.21	576911.91	393000.47	32°04'49.389"N	104°13'06.501"W	1.16	
9260.00	0.200	198.000	9257.99	-0.93	-1.11	26.18	576911.88	393000.19	32°04'49.386"N	104°13'06.501"W	1.91	
9293.00	4.400	3.000	9290.96	0.28	0.10	26.23	576911.93	393001.40	32°04'49.398"N	104°13'06.501"W	13.92	
9323.00	10.100	5.500	9320.71	4.06	3.87	26.54	576912.24	393005.17	32°04'49.436"N	104°13'06.497"W	19.02	
9354.00	15.200	5.900	9350.95	10.81	10.63	27.22	576912.92	393011.93	32°04'49.503"N	104°13'06.489"W	16.45	
9386.00	19.700	6.500	9381.47	20.36	20.16	28.26	576913.96	393021.46	32°04'49.597"N	104°13'06.477"W	14.07	
9418.00	24.100	5.600	9411.15	32.23	32.03	29.51	576915.21	393033.33	32°04'49.714"N	104°13'06.462"W	13.79	
9449.00	26.600	6.200	9439.16	45.44	45.23	30.88	576916.58	393046.53	32°04'49.845"N	104°13'06.446"W	8.11	
9481.00	29.300	5.500	9467.43	60.37	60.15	32.41	576918.10	393061.44	32°04'49.993"N	104°13'06.428"W	8.50	
9513.00	32.500	5.400	9494.88	76.74	76.51	33.97	576919.66	393077.80	32°04'50.154"N	104°13'06.410"W	10.00	
9544.00	34.600	4.600	9520.72	93.82	93.57	35.46	576921.15	393094.87	32°04'50.323"N	104°13'06.392"W	6.92	
9576.00	37.400	2.600	9546.60	112.59	112.34	36.62	576922.32	393113.63	32°04'50.509"N	104°13'06.378"W	9.49	
9607.00	40.900	0.700	9570.64	132.15	131.90	37.18	576922.87	393133.19	32°04'50.702"N	104°13'06.372"W	11.93	
9639.00	43.300	0.300	9594.38	153.61	153.35	37.36	576923.06	393154.64	32°04'50.915"N	104°13'06.369"W	7.55	
9671.00	46.000	359.700	9617.15	176.09	175.84	37.36	576923.06	393177.12	32°04'51.137"N	104°13'06.369"W	8.54	
9702.00	49.300	359.400	9638.03	199.00	198.75	37.18	576922.87	393200.03	32°04'51.364"N	104°13'06.371"W	10.67	
9734.00	52.800	359.500	9658.14	223.88	223.63	36.94	576922.64	393224.91	32°04'51.610"N	104°13'06.373"W	10.94	
9765.00	55.800	357.800	9676.23	249.03	248.79	36.34	576922.04	393250.07	32°04'51.859"N	104°13'06.380"W	10.65	
9797.00	60.700	356.600	9693.06	276.19	275.96	35.00	576920.70	393277.23	32°04'52.128"N	104°13'06.395"W	15.64	
9828.00	66.600	355.900	9706.82	303.89	303.67	33.18	576918.88	393304.94	32°04'52.402"N	104°13'06.416"W	19.14	
9860.00	71.100	356.100	9718.36	333.64	333.43	31.10	576916.80	393334.70	32°04'52.697"N	104°13'06.440"W	14.07	
9891.00	73.000	357.300	9727.91	363.06	362.87	29.41	576915.10	393364.14	32°04'52.988"N	104°13'06.459"W	7.15	
9923.00	74.700	357.500	9736.81	393.76	393.57	28.01	576913.71	393394.84	32°04'53.292"N	104°13'06.475"W	5.35	
9955.00	77.300	357.600	9744.55	424.77	424.59	26.68	576912.38	393425.85	32°04'53.599"N	104°13'06.490"W	8.13	
9986.00	81.400	357.800	9750.28	455.19	455.03	25.46	576911.16	393456.29	32°04'53.900"N	104°13'06.504"W	13.24	
10018.00	87.600	357.100	9753.35	486.99	486.83	24.05	576909.74	393488.09	32°04'54.215"N	104°13'06.520"W	19.50	
10049.00	89.500	357.400	9754.13	517.93	517.79	22.56	576908.26	393519.04	32°04'54.521"N	104°13'06.537"W	6.20	
10083.00	88.800	357.200	9754.64	551.88	551.74	20.96	576906.66	393552.99	32°04'54.857"N	104°13'06.555"W	2.14	
10115.00	88.900	356.900	9755.28	583.82	583.70	19.31	576905.01	393584.94	32°04'55.173"N	104°13'06.574"W	0.99	
10146.00	88.800	357.200	9755.90	614.76	614.65	17.72	576903.41	393615.89	32°04'55.480"N	104°13'06.592"W	1.02	
10178.00	89.300	357.800	9756.43	646.71	646.61	16.32	576902.02	393647.85	32°04'55.796"N	104°13'06.608"W	2.44	
10209.00	89.400	358.000	9756.78	677.68	677.59	15.18	576900.88	393678.83	32°04'56.102"N	104°13'06.621"W	0.72	
10273.00	89.000	358.400	9757.68	741.63	741.55	13.17	576898.87	393742.78	32°04'56.735"N	104°13'06.643"W	0.88	
10336.00	87.700	358.300	9759.49	804.56	804.50	11.36	576897.06	393805.73	32°04'57.358"N	104°13'06.664"W	2.07	
10398.00	89.100	359.100	9761.22	866.50	866.46	9.95	576895.65	393867.68	32°04'57.971"N	104°13'06.679"W	2.60	
10463.00	88.300	358.700	9762.70	931.47	931.43	8.71	576894.41	393932.64	32°04'58.614"N	104°13'06.693"W	1.38	
10527.00	88.900	359.200	9764.26	995.43	995.40	7.53	576893.23	393996.61	32°04'59.247"N	104°13'06.706"W	1.22	
10590.00	88.500	0.500	9765.69	1058.40	1058.38	7.37	576893.07	394059.58	32°04'59.871"N	104°13'06.707"W	2.16	
10653.00	90.000	0.600	9766.51	1121.40	1121.37	7.97	576893.67	394122.57	32°05'00.494"N	104°13'06.699"W	2.39	
10717.00	91.100	1.100	9765.90	1185.39	1185.36	8.92	576894.62	394186.55	32°05'01.127"N	104°13'06.687"W	1.89	



Actual Wellpath Report

No.1 AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No.1 SHL
Area	Eddy County, NM	Well	No.1
Field	(Cottonwood Hills) Sec. 32, T25S, R27E	Wellbore	No.1 AWB
Facility	Cottonwood Hills 32 State Com #1		

WELLPATH DATA (181 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
10780.00	90.900	1.500	9764.80	1248.37	1248.33	10.35	576896.05	394249.52	32°05'01.750"N	104°13'06.670"W	0.71	
10844.00	90.700	1.500	9763.91	1312.36	1312.30	12.03	576897.73	394313.48	32°05'02.383"N	104°13'06.649"W	0.31	
10907.00	90.400	2.000	9763.30	1375.33	1375.27	13.95	576899.65	394376.45	32°05'03.006"N	104°13'06.626"W	0.93	
10970.00	90.300	2.100	9762.92	1438.31	1438.23	16.21	576901.90	394439.40	32°05'03.629"N	104°13'06.599"W	0.22	
11034.00	89.800	2.100	9762.86	1502.28	1502.19	18.55	576904.25	394503.35	32°05'04.262"N	104°13'06.571"W	0.78	
11096.00	90.100	3.300	9762.92	1564.23	1564.12	21.47	576907.17	394565.27	32°05'04.875"N	104°13'06.537"W	2.00	
11160.00	90.000	3.300	9762.86	1628.15	1628.01	25.16	576910.85	394629.16	32°05'05.507"N	104°13'06.493"W	0.16	
11223.00	90.600	3.800	9762.53	1691.05	1690.89	29.06	576914.75	394692.03	32°05'06.129"N	104°13'06.447"W	1.24	
11286.00	91.000	4.100	9761.65	1753.92	1753.73	33.40	576919.09	394754.87	32°05'06.751"N	104°13'06.396"W	0.79	
11352.00	90.700	3.200	9760.67	1819.81	1819.59	37.60	576923.29	394820.72	32°05'07.403"N	104°13'06.346"W	1.44	
11416.00	90.800	3.000	9759.83	1883.73	1883.49	41.06	576926.75	394884.62	32°05'08.035"N	104°13'06.305"W	0.35	
11479.00	89.500	2.300	9759.67	1946.68	1946.42	43.97	576929.67	394947.54	32°05'08.658"N	104°13'06.270"W	2.34	
11542.00	90.500	0.800	9759.67	2009.66	2009.40	45.67	576931.37	395010.51	32°05'09.281"N	104°13'06.250"W	2.86	
11605.00	89.900	0.700	9759.45	2072.66	2072.39	46.50	576932.19	395073.50	32°05'09.904"N	104°13'06.239"W	0.97	
11665.00	90.200	359.600	9759.40	2132.66	2132.39	46.66	576932.35	395133.49	32°05'10.498"N	104°13'06.237"W	1.90	
11728.00	89.600	358.900	9759.51	2195.65	2195.38	45.83	576931.53	395196.48	32°05'11.121"N	104°13'06.246"W	1.46	
11792.00	90.700	358.200	9759.34	2259.61	2259.36	44.21	576929.91	395260.45	32°05'11.754"N	104°13'06.264"W	2.04	
11856.00	90.300	356.900	9758.78	2323.53	2323.30	41.48	576927.17	395324.39	32°05'12.387"N	104°13'06.295"W	2.13	
11919.00	90.700	357.600	9758.23	2386.43	2386.22	38.45	576924.15	395387.30	32°05'13.010"N	104°13'06.329"W	1.28	
11982.00	91.200	357.800	9757.19	2449.35	2449.16	35.93	576921.62	395450.24	32°05'13.633"N	104°13'06.358"W	0.85	
12045.00	90.700	357.700	9756.14	2512.28	2512.11	33.45	576919.15	395513.18	32°05'14.255"N	104°13'06.386"W	0.81	
12109.00	88.600	355.600	9756.53	2576.13	2575.99	29.71	576915.41	395577.05	32°05'14.888"N	104°13'06.428"W	4.64	
12172.00	89.000	356.400	9757.85	2638.93	2638.82	25.32	576911.02	395639.88	32°05'15.509"N	104°13'06.479"W	1.42	
12235.00	90.000	357.400	9758.40	2701.81	2701.72	21.91	576907.61	395702.78	32°05'16.132"N	104°13'06.517"W	2.24	
12299.00	90.600	358.100	9758.07	2765.74	2765.67	19.40	576905.10	395766.72	32°05'16.765"N	104°13'06.546"W	1.44	
12362.00	89.700	357.900	9757.90	2828.68	2828.63	17.20	576902.90	395829.67	32°05'17.388"N	104°13'06.571"W	1.46	
12425.00	89.300	358.500	9758.45	2891.64	2891.60	15.22	576900.92	395892.64	32°05'18.011"N	104°13'06.593"W	1.14	
12489.00	90.900	359.300	9758.34	2955.61	2955.59	13.99	576899.69	395956.61	32°05'18.644"N	104°13'06.606"W	2.80	
12552.00	91.300	0.000	9757.13	3018.59	3018.57	13.61	576899.31	396019.60	32°05'19.267"N	104°13'06.610"W	1.28	
12615.00	91.300	0.700	9755.70	3081.58	3081.55	13.99	576899.69	396082.57	32°05'19.891"N	104°13'06.605"W	1.11	
12679.00	91.200	0.900	9754.30	3145.56	3145.53	14.89	576900.59	396146.54	32°05'20.524"N	104°13'06.594"W	0.35	
12742.00	90.300	0.200	9753.48	3208.55	3208.52	15.49	576901.19	396209.53	32°05'21.147"N	104°13'06.586"W	1.81	
12805.00	89.400	0.000	9753.64	3271.55	3271.52	15.60	576901.30	396272.52	32°05'21.770"N	104°13'06.584"W	1.46	
12868.00	87.000	0.000	9755.62	3334.51	3334.49	15.60	576901.30	396335.48	32°05'22.393"N	104°13'06.583"W	3.81	
12931.00	88.400	1.900	9758.15	3397.46	3397.42	16.65	576902.35	396398.41	32°05'23.016"N	104°13'06.570"W	3.74	
12995.00	91.800	4.200	9758.04	3461.37	3461.32	20.05	576905.75	396462.30	32°05'23.648"N	104°13'06.530"W	6.41	
13058.00	91.900	4.600	9756.01	3524.19	3524.10	24.88	576910.58	396525.08	32°05'24.270"N	104°13'06.473"W	0.65	
13121.00	93.300	4.700	9753.15	3586.95	3586.83	29.98	576915.68	396587.80	32°05'24.890"N	104°13'06.413"W	2.23	
13184.00	93.000	5.000	9749.69	3649.66	3649.51	35.30	576921.00	396650.47	32°05'25.510"N	104°13'06.350"W	0.67	
13248.00	90.900	3.900	9747.51	3713.46	3713.27	40.26	576925.96	396714.23	32°05'26.141"N	104°13'06.292"W	3.70	
13311.00	89.900	3.200	9747.07	3776.36	3776.15	44.17	576929.86	396777.10	32°05'26.764"N	104°13'06.245"W	1.94	
13374.00	90.400	3.600	9746.90	3839.28	3839.04	47.90	576933.60	396839.99	32°05'27.386"N	104°13'06.201"W	1.02	
13437.00	89.700	3.100	9746.85	3902.19	3901.93	51.58	576937.28	396902.87	32°05'28.008"N	104°13'06.158"W	1.37	
13501.00	86.500	1.500	9748.97	3966.11	3965.83	54.15	576939.85	396966.77	32°05'28.640"N	104°13'06.127"W	5.59	
13534.00	85.800	1.400	9751.19	3999.03	3998.75	54.98	576940.68	396999.68	32°05'28.966"N	104°13'06.117"W	2.14	



Actual Wellpath Report

No.1 AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No.1 SHL
Area	Eddy County, NM	Well	No.1
Field	(Cottonwood Hills) Sec. 32, T25S, R27E	Wellbore	No.1 AWB
Facility	Cottonwood Hills 32 State Com #1		

WELLPATH DATA (181 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
13586.00	85.800	1.400	9755.00	4050.88	4050.59	56.25	576941.95	397051.52	32°05'29.479"N	104°13'06.102"W	0.00	Projection to bit

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
No.1 PBHL		9740.00	4148.78	28.60	576914.30	397149.70	32°05'30.451"N	104°13'06.422"W	rectangle

WELLPATH COMPOSITION - Ref Wellbore: No.1 AWB Ref Wellpath: No.1 AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	8975.50	Generic gyro - northseeking (Standard)	VES Gyro <129.43-8975.5>	No.1 AWB
8975.50	13534.00	NaviTrak (Standard)	BHI / Navitrak MWD 6-1/8" - <9167-13534> (PTB - 13586)	No.1 AWB
13534.00	13586.00	Blind Drilling (std)	Projection to bit	No.1 AWB