

Results of Directional Survey

API number:	30-025-39853		
OGRID:		Operator:	CIMAREX ENERGY CO OF COLORADO
		Property:	SOUTHERN CALIFORNIA 29 FEDERAL # 16H

surface	ULSTR:	E	29	T	19S	R	32E
				1980	FNL	375	FWL

BH Loc	ULSTR:	H	29	T	19S	R	32E
13571	MD	9211.5	TVD	1953	FNL	4876	FWL

Top Perf/OH	ULSTR:	E	29	T	19S	R	32E
9317	MD	9146.8	TVD	1888	FNL	627	FWL

Bot Perf/OH	ULSTR:	H	29	T	19S	R	32E
13502	MD	9210.2	TVD	1955	FNL	4807	FWL

	MD	N/S	E/W	VD
	9304	92.41	239.71	9143.8
TOP PERFS/OH	9317	92.09	252.36	9146.77
	9336	91.63	270.86	9151.11
	13339	21.33	4268.90	9207.03
BOT PERFS/OH	13502	25.30	4431.82	9210.16
	13403	22.89	4332.87	9208.26

NEXT TO LAST	13339	21.33	4268.90	9207.03
LAST READING	13403	22.89	4332.87	9208.26
TD	13571	26.99	4500.79	9211.49

Surface Location	1980	FN	375	FW
Projected BHL	1953	FN	4876	FW
Location of				
Top Perfs/OH	1888	FN	627	FW
Bottom Perfs/OH	1955	FN	4807	FW

SUMMARY of Subsurface Locations

Surface Location	E-29-19S-32E	1980	FN	375	FW	Vert. Depth
Top Perfs/OH	E-29-19S-32E	1888	FN	627	FW	9146.77
Bottom Perfs/OH	H-29-19S-32E	1955	FN	4807	FW	9210.16
Projected TD	H-29-19S-32E	1953	FN	4876	FW	9211.49



Actual Wellpath Report

No.16H AWP

Page 1 of 7



INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet	Software System	WellArchitect® 2.0
North Reference	Grid	User	Gomeoscr
Scale	0.99994	Report Generated	11/29/2010 at 7:56:19 AM
Convergence at slot	0.29° East	Database/Source file	WA Midland/No.16H_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[USft]	Northing[USft]	Latitude	Longitude
Slot Location	0.00	0.00	706833.70	594530.10	32°37'59.741"N	103°47'44.627"W
Facility Reference Pt			706833.70	594530.10	32°37'59.741"N	103°47'44.627"W
Field Reference Pt			706799.20	591606.30	32°37'30.812"N	103°47'45.203"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 16H SHL (RKB) to GL	20.00ft
Horizontal Reference Pt	Slot	Rig on No. 16H SHL (RKB) to Mean Sea Level	3575.00ft
Vertical Reference Pt	Rig on No. 16H SHL (RKB)	GL to Mud Line (Facility)	0.00ft
MD Reference Pt	Rig on No. 16H SHL (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	89.83°

SUR @ E-29-19s-32e, 1980/N & 375/W
BHL @ H-29-19s-32e, 1953/N & 4876/W
API # 30-025-39853



Actual Wellpath Report

No.16H AWP

Page 2 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

WELLPATH DATA (225 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00	0.000	98.080	0.00	0.00	0.00	0.00	706833.70	594530.10	32°37'59.741"N	103°47'44.627"W	0.00	
105.29	0.400	98.080	105.29	0.36	-0.05	0.36	706834.06	594530.05	32°37'59.741"N	103°47'44.622"W	0.38	
168.80	0.480	43.530	168.80	0.77	0.11	0.77	706834.47	594530.21	32°37'59.742"N	103°47'44.618"W	0.64	
232.40	0.480	49.430	232.40	1.15	0.48	1.15	706834.85	594530.58	32°37'59.746"N	103°47'44.613"W	0.08	
295.90	1.180	23.350	295.89	1.62	1.25	1.61	706835.31	594531.35	32°37'59.754"N	103°47'44.608"W	1.23	
359.50	1.370	20.980	359.47	2.15	2.56	2.15	706835.85	594532.66	32°37'59.767"N	103°47'44.601"W	0.31	
423.00	1.510	13.870	422.95	2.63	4.08	2.62	706836.32	594534.18	32°37'59.782"N	103°47'44.596"W	0.36	
486.50	1.860	4.550	486.43	2.92	5.92	2.90	706836.60	594536.02	32°37'59.800"N	103°47'44.592"W	0.70	
550.10	2.280	351.240	549.98	2.81	8.20	2.79	706836.49	594538.30	32°37'59.822"N	103°47'44.593"W	1.00	
613.60	2.900	341.920	613.42	2.13	10.98	2.10	706835.80	594541.08	32°37'59.850"N	103°47'44.601"W	1.18	
677.20	3.260	332.690	676.93	0.81	14.11	0.77	706834.47	594544.21	32°37'59.881"N	103°47'44.617"W	0.96	
740.70	2.930	331.610	740.33	-0.78	17.14	-0.83	706832.87	594547.24	32°37'59.911"N	103°47'44.635"W	0.53	
804.20	2.600	331.140	803.76	-2.24	19.83	-2.30	706831.40	594549.93	32°37'59.938"N	103°47'44.652"W	0.52	
867.80	2.280	335.040	867.30	-3.46	22.24	-3.53	706830.17	594552.34	32°37'59.962"N	103°47'44.667"W	0.57	
931.30	2.200	333.800	930.75	-4.52	24.48	-4.60	706829.10	594554.58	32°37'59.984"N	103°47'44.679"W	0.15	
994.90	1.770	336.880	994.32	-5.44	26.48	-5.52	706828.18	594556.58	32°38'00.004"N	103°47'44.690"W	0.70	
1058.40	1.910	16.470	1057.79	-5.52	28.40	-5.61	706828.09	594558.50	32°38'00.023"N	103°47'44.690"W	1.97	
1121.90	1.520	357.060	1121.26	-5.26	30.25	-5.35	706828.35	594560.35	32°38'00.041"N	103°47'44.687"W	1.09	
1185.50	1.430	352.900	1184.84	-5.40	31.88	-5.49	706828.21	594561.98	32°38'00.057"N	103°47'44.689"W	0.22	
1249.00	1.330	353.000	1248.32	-5.58	33.40	-5.68	706828.02	594563.50	32°38'00.072"N	103°47'44.691"W	0.16	
1312.60	1.230	352.010	1311.90	-5.76	34.81	-5.87	706827.83	594564.91	32°38'00.086"N	103°47'44.693"W	0.16	
1376.10	0.630	346.700	1375.39	-5.93	35.82	-6.04	706827.66	594565.92	32°38'00.096"N	103°47'44.695"W	0.95	
1439.60	0.630	344.630	1438.89	-6.10	36.50	-6.21	706827.49	594566.60	32°38'00.103"N	103°47'44.697"W	0.04	
1503.20	0.640	61.990	1502.49	-5.88	37.01	-5.99	706827.71	594567.10	32°38'00.108"N	103°47'44.694"W	1.25	
1566.70	0.700	20.020	1565.98	-5.43	37.54	-5.55	706828.15	594567.63	32°38'00.113"N	103°47'44.689"W	0.76	
1630.30	0.140	79.070	1629.58	-5.22	37.92	-5.34	706828.36	594568.01	32°38'00.117"N	103°47'44.687"W	1.01	
1693.80	0.480	29.770	1693.08	-5.01	38.16	-5.13	706828.57	594568.26	32°38'00.119"N	103°47'44.684"W	0.63	
1757.30	0.930	20.990	1756.58	-4.69	38.87	-4.81	706828.89	594568.97	32°38'00.126"N	103°47'44.681"W	0.73	
1820.90	1.300	48.690	1820.16	-3.97	39.83	-4.09	706829.61	594569.93	32°38'00.136"N	103°47'44.672"W	1.01	
1884.40	1.690	52.520	1883.64	-2.68	40.88	-2.80	706830.90	594570.97	32°38'00.146"N	103°47'44.657"W	0.63	
1948.00	1.870	44.730	1947.21	-1.20	42.18	-1.33	706832.37	594572.28	32°38'00.159"N	103°47'44.640"W	0.47	
2011.50	2.160	44.690	2010.67	0.38	43.77	0.24	706833.94	594573.87	32°38'00.175"N	103°47'44.621"W	0.46	
2075.00	2.390	43.980	2074.12	2.14	45.58	2.00	706835.70	594575.67	32°38'00.192"N	103°47'44.600"W	0.36	
2138.60	2.680	40.400	2137.66	4.03	47.66	3.89	706837.59	594577.76	32°38'00.213"N	103°47'44.578"W	0.52	
2202.10	2.850	38.540	2201.09	5.99	50.03	5.84	706839.53	594580.12	32°38'00.236"N	103°47'44.555"W	0.30	
2265.70	2.900	41.710	2264.61	8.05	52.46	7.89	706841.59	594582.56	32°38'00.260"N	103°47'44.531"W	0.26	
2329.20	2.840	43.640	2328.03	10.21	54.80	10.05	706843.74	594584.90	32°38'00.283"N	103°47'44.506"W	0.18	
2392.70	2.270	50.790	2391.46	12.28	56.74	12.11	706845.80	594586.83	32°38'00.302"N	103°47'44.482"W	1.03	
2456.30	1.440	27.650	2455.03	13.63	58.24	13.45	706847.15	594588.34	32°38'00.317"N	103°47'44.466"W	1.73	
2519.80	0.840	53.980	2518.52	14.38	59.22	14.20	706847.90	594589.32	32°38'00.327"N	103°47'44.457"W	1.23	
2583.40	0.620	76.070	2582.11	15.09	59.58	14.91	706848.61	594589.67	32°38'00.330"N	103°47'44.449"W	0.56	
2646.90	0.850	93.990	2645.61	15.89	59.63	15.71	706849.41	594589.72	32°38'00.331"N	103°47'44.439"W	0.51	
2710.40	0.960	66.170	2709.10	16.85	59.81	16.67	706850.37	594589.91	32°38'00.332"N	103°47'44.428"W	0.71	
2774.00	1.000	73.060	2772.69	17.87	60.19	17.69	706851.39	594590.28	32°38'00.336"N	103°47'44.416"W	0.20	
2837.50	0.920	58.140	2836.18	18.83	60.62	18.65	706852.35	594590.71	32°38'00.340"N	103°47'44.405"W	0.41	



Actual Wellpath Report

No.16H AWP

Page 3 of 7



INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

WELLPATH DATA (225 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]	Comments
2901.10	1.120	27.620	2899.77	19.56	61.44	19.37	706853.07	594591.53	32°38'00.348"N	103°47'44.396"W	0.90	
2964.60	1.010	52.620	2963.26	20.29	62.33	20.11	706853.80	594592.42	32°38'00.357"N	103°47'44.388"W	0.75	
3028.10	1.170	61.730	3026.75	21.31	62.97	21.12	706854.82	594593.07	32°38'00.363"N	103°47'44.376"W	0.37	
3091.70	1.360	52.800	3090.33	22.49	63.74	22.29	706855.99	594593.83	32°38'00.371"N	103°47'44.362"W	0.43	
3155.20	1.450	48.280	3153.82	23.69	64.73	23.49	706857.19	594594.82	32°38'00.381"N	103°47'44.348"W	0.22	
3218.80	1.070	32.530	3217.40	24.61	65.76	24.41	706858.11	594595.86	32°38'00.391"N	103°47'44.337"W	0.80	
3282.30	0.920	32.240	3280.89	25.21	66.70	25.00	706858.70	594596.79	32°38'00.400"N	103°47'44.330"W	0.24	
3345.80	0.760	51.080	3344.38	25.81	67.39	25.60	706859.30	594597.49	32°38'00.407"N	103°47'44.323"W	0.50	
3409.40	0.310	66.250	3407.98	26.29	67.73	26.09	706859.79	594597.82	32°38'00.410"N	103°47'44.317"W	0.74	
3472.90	1.330	17.580	3471.47	26.68	68.50	26.47	706860.17	594598.59	32°38'00.418"N	103°47'44.313"W	1.81	
3536.50	1.880	17.370	3535.05	27.22	70.20	27.00	706860.70	594600.29	32°38'00.435"N	103°47'44.307"W	0.86	
3600.00	2.330	26.130	3598.51	28.10	72.35	27.88	706861.58	594602.44	32°38'00.456"N	103°47'44.296"W	0.87	
3663.50	2.300	39.170	3661.95	29.48	74.50	29.26	706862.96	594604.59	32°38'00.477"N	103°47'44.280"W	0.83	
3727.10	2.160	268.880	3725.53	29.09	75.46	28.86	706862.56	594605.56	32°38'00.487"N	103°47'44.285"W	6.36	
3790.60	1.840	45.130	3789.02	28.62	76.16	28.39	706862.09	594606.25	32°38'00.494"N	103°47'44.290"W	5.85	
3854.20	1.530	42.670	3852.59	29.92	77.50	29.69	706863.39	594607.60	32°38'00.507"N	103°47'44.275"W	0.50	
3917.70	1.450	26.620	3916.07	30.86	78.84	30.62	706864.32	594608.94	32°38'00.520"N	103°47'44.264"W	0.67	
3981.20	1.290	47.050	3979.55	31.75	80.05	31.51	706865.21	594610.15	32°38'00.532"N	103°47'44.253"W	0.80	
4044.80	1.230	62.700	4043.13	32.88	80.85	32.64	706866.34	594610.95	32°38'00.540"N	103°47'44.240"W	0.55	
4108.30	1.220	49.370	4106.62	34.00	81.60	33.76	706867.45	594611.70	32°38'00.547"N	103°47'44.227"W	0.45	
4171.90	1.140	36.760	4170.21	34.90	82.55	34.65	706868.35	594612.65	32°38'00.556"N	103°47'44.217"W	0.43	
4235.40	0.970	12.470	4233.70	35.40	83.58	35.14	706868.84	594613.68	32°38'00.567"N	103°47'44.211"W	0.75	
4298.90	0.410	335.640	4297.19	35.42	84.31	35.17	706868.86	594614.41	32°38'00.574"N	103°47'44.210"W	1.08	
4362.50	0.410	325.850	4360.79	35.20	84.71	34.94	706868.64	594614.80	32°38'00.578"N	103°47'44.213"W	0.11	
4426.00	0.480	297.860	4424.29	34.84	85.02	34.58	706868.28	594615.12	32°38'00.581"N	103°47'44.217"W	0.36	
4489.60	0.500	283.650	4487.89	34.33	85.21	34.08	706867.77	594615.31	32°38'00.583"N	103°47'44.223"W	0.19	
4553.10	0.590	291.750	4551.38	33.76	85.40	33.50	706867.20	594615.49	32°38'00.585"N	103°47'44.230"W	0.19	
4616.60	0.620	292.350	4614.88	33.14	85.65	32.88	706866.58	594615.75	32°38'00.587"N	103°47'44.237"W	0.05	
4680.20	0.590	302.990	4678.48	32.55	85.96	32.29	706865.99	594616.05	32°38'00.590"N	103°47'44.244"W	0.18	
4743.70	0.410	302.550	4741.97	32.08	86.26	31.82	706865.52	594616.35	32°38'00.593"N	103°47'44.249"W	0.28	
4807.30	0.300	312.110	4805.57	31.77	86.49	31.51	706865.21	594616.59	32°38'00.596"N	103°47'44.253"W	0.20	
4870.80	0.530	290.700	4869.07	31.37	86.71	31.11	706864.81	594616.80	32°38'00.598"N	103°47'44.258"W	0.43	
4934.30	0.670	292.640	4932.57	30.76	86.96	30.49	706864.19	594617.05	32°38'00.600"N	103°47'44.265"W	0.22	
4997.90	0.740	293.030	4996.16	30.03	87.26	29.77	706863.47	594617.35	32°38'00.603"N	103°47'44.273"W	0.11	
5061.40	0.720	295.640	5059.66	29.30	87.59	29.03	706862.73	594617.69	32°38'00.607"N	103°47'44.282"W	0.06	
5125.00	0.690	291.050	5123.25	28.58	87.90	28.32	706862.01	594618.00	32°38'00.610"N	103°47'44.290"W	0.10	
5188.50	0.690	304.550	5186.75	27.91	88.26	27.64	706861.34	594618.35	32°38'00.613"N	103°47'44.298"W	0.26	
5252.00	0.760	292.960	5250.24	27.21	88.64	26.94	706860.64	594618.73	32°38'00.617"N	103°47'44.306"W	0.26	
5315.60	0.780	291.970	5313.84	26.42	88.97	26.15	706859.85	594619.06	32°38'00.620"N	103°47'44.316"W	0.04	
5379.10	0.610	286.030	5377.33	25.70	89.22	25.43	706859.12	594619.31	32°38'00.623"N	103°47'44.324"W	0.29	
5442.70	0.580	276.090	5440.93	25.05	89.35	24.78	706858.48	594619.44	32°38'00.624"N	103°47'44.332"W	0.17	
5506.20	0.570	293.080	5504.43	24.44	89.51	24.17	706857.87	594619.60	32°38'00.626"N	103°47'44.339"W	0.27	
5569.70	0.730	264.910	5567.92	23.75	89.59	23.48	706857.18	594619.69	32°38'00.627"N	103°47'44.347"W	0.55	
5633.30	0.780	285.520	5631.52	22.93	89.67	22.66	706856.36	594619.77	32°38'00.628"N	103°47'44.356"W	0.43	
5696.80	0.760	287.290	5695.01	22.11	89.91	21.84	706855.54	594620.01	32°38'00.630"N	103°47'44.366"W	0.05	



Actual Wellpath Report

No.16H AWP

Page 4 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

WELLPATH DATA (225 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]	Comments
5760.40	0.750	293.720	5758.60	21.33	90.21	21.05	706854.75	594620.30	32°38'00.633"N	103°47'44.375"W	0.13	
5823.90	0.720	296.360	5822.10	20.59	90.55	20.32	706854.01	594620.65	32°38'00.636"N	103°47'44.384"W	0.07	
5887.40	0.730	304.040	5885.59	19.90	90.95	19.62	706853.32	594621.05	32°38'00.640"N	103°47'44.392"W	0.15	
5951.00	0.710	305.310	5949.19	19.24	91.41	18.97	706852.67	594621.50	32°38'00.645"N	103°47'44.399"W	0.04	
6014.50	0.710	299.180	6012.68	18.58	91.83	18.30	706852.00	594621.92	32°38'00.649"N	103°47'44.407"W	0.12	
6078.10	0.640	303.970	6076.28	17.94	92.22	17.66	706851.36	594622.31	32°38'00.653"N	103°47'44.415"W	0.14	
6141.60	0.640	297.080	6139.78	17.33	92.58	17.05	706850.75	594622.67	32°38'00.657"N	103°47'44.422"W	0.12	
6205.10	0.630	295.000	6203.27	16.70	92.89	16.42	706850.12	594622.98	32°38'00.660"N	103°47'44.429"W	0.04	
6268.70	0.620	293.310	6266.87	16.07	93.17	15.79	706849.49	594623.27	32°38'00.663"N	103°47'44.436"W	0.03	
6332.20	0.680	298.320	6330.36	15.42	93.49	15.14	706848.84	594623.58	32°38'00.666"N	103°47'44.444"W	0.13	
6395.80	0.670	299.500	6393.96	14.77	93.85	14.49	706848.18	594623.94	32°38'00.669"N	103°47'44.452"W	0.03	
6459.30	0.660	297.530	6457.46	14.12	94.20	13.84	706847.54	594624.29	32°38'00.673"N	103°47'44.459"W	0.04	
6522.80	0.640	293.480	6520.95	13.47	94.51	13.19	706846.89	594624.61	32°38'00.676"N	103°47'44.467"W	0.08	
6586.40	0.710	285.110	6584.55	12.77	94.76	12.48	706846.18	594624.85	32°38'00.678"N	103°47'44.475"W	0.19	
6649.90	0.720	285.160	6648.04	12.00	94.96	11.72	706845.42	594625.06	32°38'00.680"N	103°47'44.484"W	0.02	
6713.50	0.660	276.310	6711.64	11.25	95.11	10.97	706844.67	594625.20	32°38'00.682"N	103°47'44.493"W	0.19	
6777.00	0.620	281.580	6775.13	10.56	95.22	10.27	706843.97	594625.31	32°38'00.683"N	103°47'44.501"W	0.11	
6840.50	0.570	279.030	6838.63	9.91	95.33	9.62	706843.32	594625.43	32°38'00.684"N	103°47'44.508"W	0.09	
6904.10	0.610	274.260	6902.23	9.26	95.41	8.97	706842.67	594625.50	32°38'00.685"N	103°47'44.516"W	0.10	
6967.60	0.590	278.210	6965.72	8.60	95.48	8.31	706842.01	594625.58	32°38'00.686"N	103°47'44.524"W	0.07	
7031.20	0.580	270.090	7029.32	7.95	95.53	7.66	706841.36	594625.62	32°38'00.686"N	103°47'44.531"W	0.13	
7094.70	0.700	266.300	7092.82	7.24	95.50	6.95	706840.65	594625.60	32°38'00.686"N	103°47'44.540"W	0.20	
7158.20	0.780	266.980	7156.31	6.42	95.46	6.13	706839.83	594625.55	32°38'00.686"N	103°47'44.549"W	0.13	
7221.80	0.920	258.780	7219.90	5.49	95.33	5.20	706838.90	594625.43	32°38'00.684"N	103°47'44.560"W	0.29	
7285.30	0.890	259.430	7283.40	4.50	95.14	4.22	706837.92	594625.24	32°38'00.683"N	103°47'44.572"W	0.05	
7348.90	0.730	265.740	7346.99	3.61	95.02	3.33	706837.03	594625.12	32°38'00.681"N	103°47'44.582"W	0.29	
7412.40	0.820	265.000	7410.48	2.76	94.95	2.47	706836.17	594625.05	32°38'00.681"N	103°47'44.592"W	0.14	
7475.90	1.020	265.180	7473.98	1.74	94.87	1.46	706835.16	594624.96	32°38'00.680"N	103°47'44.604"W	0.31	
7539.50	1.280	268.330	7537.56	0.47	94.80	0.18	706833.88	594624.89	32°38'00.679"N	103°47'44.619"W	0.42	
7603.00	1.560	265.250	7601.04	-1.10	94.71	-1.39	706832.31	594624.80	32°38'00.679"N	103°47'44.637"W	0.46	
7666.60	1.720	269.370	7664.62	-2.92	94.62	-3.21	706830.49	594624.72	32°38'00.678"N	103°47'44.658"W	0.31	
7730.10	1.820	267.260	7728.09	-4.88	94.57	-5.17	706828.53	594624.66	32°38'00.677"N	103°47'44.681"W	0.19	
7793.60	1.990	263.740	7791.55	-6.98	94.40	-7.27	706826.43	594624.49	32°38'00.676"N	103°47'44.706"W	0.32	
7857.20	2.180	259.730	7855.11	-9.27	94.06	-9.56	706824.14	594624.16	32°38'00.673"N	103°47'44.733"W	0.38	
7920.70	2.640	254.210	7918.55	-11.87	93.45	-12.15	706821.55	594623.54	32°38'00.667"N	103°47'44.763"W	0.81	
7984.30	3.040	252.040	7982.08	-14.89	92.53	-15.17	706818.53	594622.62	32°38'00.658"N	103°47'44.798"W	0.65	
8047.80	3.310	250.290	8045.48	-18.22	91.39	-18.49	706815.21	594621.49	32°38'00.647"N	103°47'44.837"W	0.45	
8111.30	3.120	251.970	8108.88	-21.59	90.24	-21.86	706811.84	594620.33	32°38'00.635"N	103°47'44.877"W	0.33	
8174.90	2.900	254.930	8172.39	-24.79	89.28	-25.06	706808.64	594619.38	32°38'00.626"N	103°47'44.914"W	0.42	
8238.40	3.160	258.520	8235.80	-28.06	88.52	-28.33	706805.37	594618.61	32°38'00.619"N	103°47'44.953"W	0.51	
8302.00	2.640	257.660	8299.32	-31.21	87.86	-31.48	706802.22	594617.95	32°38'00.612"N	103°47'44.989"W	0.82	
8365.50	2.820	256.370	8362.75	-34.16	87.18	-34.42	706799.28	594617.27	32°38'00.606"N	103°47'45.024"W	0.30	
8429.00	2.560	256.370	8426.18	-37.06	86.47	-37.32	706796.38	594616.57	32°38'00.599"N	103°47'45.058"W	0.41	
8492.60	2.060	259.220	8489.73	-39.56	85.93	-39.82	706793.88	594616.02	32°38'00.594"N	103°47'45.087"W	0.81	
8556.10	1.720	263.400	8553.19	-41.63	85.60	-41.89	706791.81	594615.70	32°38'00.591"N	103°47'45.111"W	0.58	



Actual Wellpath Report

No.16H AWP

Page 5 of 7



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

WELLPATH DATA (225 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8619.70	1.350	263.250	8616.77	-43.33	85.40	-43.58	706790.12	594615.50	32°38'00.589"N	103°47'45.131"W	0.58	
8683.20	0.960	246.320	8680.26	-44.56	85.10	-44.81	706788.89	594615.20	32°38'00.586"N	103°47'45.146"W	0.81	
8746.70	1.420	256.750	8743.74	-45.81	84.71	-46.07	706787.64	594614.80	32°38'00.582"N	103°47'45.160"W	0.80	
8810.30	1.740	260.740	8807.32	-47.53	84.37	-47.79	706785.92	594614.47	32°38'00.579"N	103°47'45.180"W	0.53	
8827.00	1.840	257.660	8824.01	-48.04	84.27	-48.30	706785.40	594614.37	32°38'00.578"N	103°47'45.186"W	0.83	
8859.00	0.280	49.470	8856.00	-48.49	84.22	-48.74	706784.96	594614.31	32°38'00.577"N	103°47'45.192"W	6.53	
8891.00	5.950	77.680	8887.94	-46.80	84.62	-47.06	706786.64	594614.72	32°38'00.581"N	103°47'45.172"W	17.83	
8923.00	13.620	82.310	8919.46	-41.44	85.48	-41.70	706792.00	594615.57	32°38'00.589"N	103°47'45.109"W	24.08	
8954.00	20.580	80.730	8949.07	-32.43	86.85	-32.69	706801.01	594616.94	32°38'00.602"N	103°47'45.004"W	22.50	
8986.00	28.520	78.980	8978.15	-19.35	89.22	-19.62	706814.08	594619.31	32°38'00.625"N	103°47'44.851"W	24.91	
9018.00	35.380	80.160	9005.29	-2.70	92.27	-2.98	706830.72	594622.36	32°38'00.654"N	103°47'44.656"W	21.53	
9050.00	42.620	83.870	9030.14	17.24	95.01	16.95	706850.65	594625.10	32°38'00.681"N	103°47'44.423"W	23.76	
9082.00	47.930	88.760	9052.66	39.91	96.42	39.62	706873.32	594626.52	32°38'00.694"N	103°47'44.158"W	19.82	
9114.00	54.590	91.480	9072.68	64.86	96.34	64.56	706898.26	594626.44	32°38'00.691"N	103°47'43.866"W	21.84	
9145.00	61.470	90.470	9089.08	91.13	95.91	90.84	706924.54	594626.00	32°38'00.686"N	103°47'43.559"W	22.36	
9177.00	66.850	90.750	9103.02	119.92	95.60	119.63	706953.32	594625.69	32°38'00.681"N	103°47'43.222"W	16.83	
9209.00	68.660	91.670	9115.14	149.53	94.97	149.24	706982.93	594625.07	32°38'00.674"N	103°47'42.876"W	6.25	
9241.00	71.390	91.790	9126.07	179.58	94.06	179.30	707012.99	594624.16	32°38'00.663"N	103°47'42.524"W	8.54	
9273.00	73.540	91.530	9135.71	210.08	93.18	209.80	707043.48	594623.27	32°38'00.653"N	103°47'42.168"W	6.76	
9304.00	76.200	91.430	9143.80	239.99	92.41	239.71	707073.40	594622.50	32°38'00.644"N	103°47'41.818"W	8.59	
9336.00	77.390	91.420	9151.11	271.13	91.63	270.85	707104.54	594621.73	32°38'00.635"N	103°47'41.454"W	3.72	
9368.00	78.920	90.870	9157.68	302.44	91.01	302.17	707135.85	594621.10	32°38'00.627"N	103°47'41.088"W	5.07	
9400.00	80.340	91.370	9163.44	333.91	90.39	333.64	707167.31	594620.49	32°38'00.619"N	103°47'40.720"W	4.70	
9432.00	81.560	92.370	9168.47	365.49	89.36	365.22	707198.90	594619.45	32°38'00.607"N	103°47'40.351"W	4.90	
9463.00	83.700	92.800	9172.45	396.19	87.97	395.93	707229.61	594618.07	32°38'00.592"N	103°47'39.992"W	7.04	
9495.00	85.400	93.300	9175.49	428.00	86.28	427.74	707261.41	594616.37	32°38'00.574"N	103°47'39.620"W	5.54	
9527.00	87.900	93.000	9177.36	459.89	84.52	459.63	707293.31	594614.62	32°38'00.555"N	103°47'39.247"W	7.87	
9559.00	89.100	92.100	9178.19	491.84	83.10	491.59	707325.26	594613.19	32°38'00.539"N	103°47'38.873"W	4.69	
9591.00	89.300	92.400	9178.64	523.81	81.84	523.56	707357.23	594611.94	32°38'00.525"N	103°47'38.500"W	1.13	
9654.00	90.400	92.300	9178.81	586.74	79.26	586.51	707420.17	594609.36	32°38'00.496"N	103°47'37.764"W	1.75	
9718.00	89.700	91.500	9178.75	650.70	77.14	650.47	707484.13	594607.23	32°38'00.472"N	103°47'37.016"W	1.66	
9781.00	90.100	91.200	9178.86	713.68	75.65	713.45	707547.11	594605.75	32°38'00.454"N	103°47'36.280"W	0.79	
9845.00	90.500	91.300	9178.52	777.66	74.26	777.44	707611.09	594604.35	32°38'00.437"N	103°47'35.531"W	0.64	
9909.00	89.700	90.600	9178.41	841.65	73.20	841.43	707675.08	594603.29	32°38'00.423"N	103°47'34.783"W	1.66	
9973.00	90.300	90.500	9178.41	905.64	72.58	905.42	707739.07	594602.68	32°38'00.414"N	103°47'34.035"W	0.95	
10036.00	90.900	90.400	9177.75	968.63	72.09	968.42	707802.06	594602.18	32°38'00.406"N	103°47'33.298"W	0.97	
10100.00	88.600	89.700	9178.03	1032.63	72.03	1032.41	707866.05	594602.13	32°38'00.402"N	103°47'32.550"W	3.76	
10163.00	89.500	90.200	9179.08	1095.62	72.09	1095.40	707929.04	594602.18	32°38'00.400"N	103°47'31.814"W	1.63	
10227.00	90.000	89.900	9179.36	1159.62	72.03	1159.40	707993.03	594602.13	32°38'00.396"N	103°47'31.065"W	0.91	
10291.00	88.900	92.500	9179.97	1223.59	70.69	1223.38	708057.00	594600.79	32°38'00.379"N	103°47'30.317"W	4.41	
10354.00	89.900	93.700	9180.63	1286.48	67.28	1286.28	708119.90	594597.38	32°38'00.343"N	103°47'29.582"W	2.48	
10418.00	90.200	93.200	9180.57	1350.35	63.43	1350.17	708183.78	594593.53	32°38'00.301"N	103°47'28.835"W	0.91	
10482.00	88.800	92.200	9181.13	1414.27	60.42	1414.09	708247.70	594590.51	32°38'00.268"N	103°47'28.088"W	2.69	
10545.00	87.500	90.200	9183.17	1477.21	59.10	1477.04	708310.65	594589.20	32°38'00.252"N	103°47'27.352"W	3.78	
10609.00	86.600	89.800	9186.46	1541.12	59.10	1540.95	708374.56	594589.20	32°38'00.249"N	103°47'26.604"W	1.54	



Actual Wellpath Report

No.16H AWP

Page 6 of 7



INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

WELLPATH DATA (225 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]	Comments
10672.00	87.900	90.000	9189.48	1604.05	59.21	1603.88	708437.48	594589.31	32°38'00.247"N	103°47'25.869"W	2.09	
10736.00	89.000	90.000	9191.21	1668.03	59.21	1667.85	708501.45	594589.31	32°38'00.243"N	103°47'25.120"W	1.72	
10800.00	87.900	90.500	9192.95	1732.00	58.93	1731.83	708565.42	594589.03	32°38'00.237"N	103°47'24.372"W	1.89	
10864.00	87.700	89.900	9195.40	1795.95	58.71	1795.78	708629.37	594588.80	32°38'00.232"N	103°47'23.625"W	0.99	
10927.00	88.200	88.900	9197.66	1858.91	59.37	1858.74	708692.32	594589.46	32°38'00.235"N	103°47'22.888"W	1.77	
10990.00	89.300	89.200	9199.03	1921.89	60.41	1921.71	708755.29	594590.51	32°38'00.242"N	103°47'22.152"W	1.81	
11054.00	89.900	89.300	9199.48	1985.88	61.25	1985.70	708819.28	594591.34	32°38'00.247"N	103°47'21.404"W	0.95	
11117.00	90.400	89.200	9199.31	2048.88	62.07	2048.70	708882.27	594592.17	32°38'00.252"N	103°47'20.667"W	0.81	
11181.00	91.200	89.100	9198.42	2112.87	63.02	2112.69	708946.26	594593.12	32°38'00.259"N	103°47'19.919"W	1.26	
11244.00	91.300	90.200	9197.04	2175.85	63.41	2175.67	709009.23	594593.50	32°38'00.259"N	103°47'19.182"W	1.75	
11308.00	90.000	91.200	9196.32	2239.84	62.62	2239.66	709073.22	594592.72	32°38'00.248"N	103°47'18.434"W	2.56	
11372.00	89.600	91.500	9196.54	2303.81	61.12	2303.64	709137.20	594591.21	32°38'00.230"N	103°47'17.686"W	0.78	
11436.00	90.300	91.800	9196.60	2367.78	59.27	2367.61	709201.17	594589.37	32°38'00.209"N	103°47'16.938"W	1.19	
11497.00	89.300	91.900	9196.81	2428.74	57.30	2428.58	709262.13	594587.40	32°38'00.186"N	103°47'16.225"W	1.65	
11561.00	89.000	92.500	9197.76	2492.68	54.85	2492.52	709326.07	594584.94	32°38'00.158"N	103°47'15.478"W	1.05	
11625.00	88.600	91.700	9199.10	2556.61	52.50	2556.47	709390.01	594582.60	32°38'00.132"N	103°47'14.730"W	1.40	
11688.00	88.600	90.800	9200.64	2619.57	51.13	2619.43	709452.97	594581.23	32°38'00.115"N	103°47'13.994"W	1.43	
11752.00	90.100	91.700	9201.37	2683.55	49.73	2683.41	709516.94	594579.83	32°38'00.098"N	103°47'13.246"W	2.73	
11815.00	90.300	91.600	9201.15	2746.52	47.92	2746.38	709579.91	594578.02	32°38'00.077"N	103°47'12.510"W	0.35	
11878.00	91.300	91.000	9200.27	2809.49	46.49	2809.36	709642.89	594576.59	32°38'00.060"N	103°47'11.773"W	1.85	
11942.00	90.300	87.600	9199.37	2873.47	47.27	2873.34	709706.86	594577.37	32°38'00.064"N	103°47'11.025"W	5.54	
12006.00	89.600	87.700	9199.43	2937.42	49.90	2937.28	709770.80	594579.99	32°38'00.087"N	103°47'10.277"W	1.10	
12069.00	90.000	88.700	9199.65	3000.40	51.88	3000.25	709833.77	594581.97	32°38'00.103"N	103°47'09.541"W	1.71	
12133.00	89.700	89.200	9199.82	3064.39	53.05	3064.24	709897.75	594583.14	32°38'00.111"N	103°47'08.793"W	0.91	
12196.00	88.000	90.700	9201.08	3127.37	53.10	3127.22	709960.73	594583.20	32°38'00.109"N	103°47'08.056"W	3.60	
12259.00	87.200	90.900	9203.72	3190.31	52.22	3190.16	710023.67	594582.32	32°38'00.097"N	103°47'07.320"W	1.31	
12323.00	88.000	91.500	9206.40	3254.23	50.89	3254.09	710087.59	594580.98	32°38'00.080"N	103°47'06.573"W	1.56	
12387.00	88.300	91.400	9208.46	3318.17	49.27	3318.04	710151.53	594579.36	32°38'00.061"N	103°47'05.825"W	0.49	
12449.00	88.800	91.400	9210.03	3380.13	47.75	3380.00	710213.49	594577.85	32°38'00.043"N	103°47'05.101"W	0.81	
12513.00	88.600	91.400	9211.48	3444.09	46.19	3443.96	710277.45	594576.29	32°38'00.024"N	103°47'04.353"W	0.31	
12576.00	87.200	91.400	9213.79	3507.02	44.65	3506.90	710340.38	594574.75	32°38'00.006"N	103°47'03.617"W	2.22	
12640.00	88.100	92.000	9216.42	3570.93	42.75	3570.82	710404.30	594572.85	32°37'59.984"N	103°47'02.870"W	1.69	
12703.00	88.400	93.400	9218.34	3633.82	39.79	3633.72	710467.19	594569.89	32°37'59.951"N	103°47'02.134"W	2.27	
12767.00	89.100	93.300	9219.74	3697.68	36.05	3697.59	710531.06	594566.15	32°37'59.911"N	103°47'01.388"W	1.10	
12831.00	90.400	93.400	9220.02	3761.56	32.31	3761.48	710594.95	594562.41	32°37'59.871"N	103°47'00.641"W	2.04	
12894.00	91.100	93.400	9219.19	3824.43	28.57	3824.36	710657.83	594558.67	32°37'59.830"N	103°46'59.906"W	1.11	
12957.00	91.900	93.400	9217.54	3887.29	24.84	3887.23	710720.69	594554.94	32°37'59.790"N	103°46'59.171"W	1.27	
13021.00	92.000	91.700	9215.37	3951.18	21.99	3951.13	710784.58	594552.09	32°37'59.759"N	103°46'58.424"W	2.66	
13084.00	92.300	91.700	9213.00	4014.10	20.12	4014.06	710847.51	594550.22	32°37'59.737"N	103°46'57.688"W	0.48	
13148.00	92.900	90.900	9210.10	4078.01	18.67	4077.97	710911.42	594548.77	32°37'59.720"N	103°46'56.941"W	1.56	
13212.00	90.700	89.100	9208.09	4141.97	18.67	4141.93	710975.38	594548.77	32°37'59.716"N	103°46'56.193"W	4.44	
13276.00	91.000	88.800	9207.14	4205.96	19.85	4205.92	711039.36	594549.95	32°37'59.725"N	103°46'55.445"W	0.66	
13339.00	89.200	88.500	9207.03	4268.94	21.33	4268.90	711102.33	594551.43	32°37'59.736"N	103°46'54.708"W	2.90	
13403.00	88.600	88.700	9208.26	4332.91	22.89	4332.87	711166.30	594552.99	32°37'59.748"N	103°46'53.960"W	0.99	
13571.00	88.600	88.700	9212.36	4500.83	26.71	4500.77	711334.19	594556.80	32°37'59.777"N	103°46'51.997"W	0.00	Proj to Bit



Actual Wellpath Report

No.16H AWP

Page 7 of 7



INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 16H SHL
Area	Lea County, NM	Well	No. 16H
Field	(SC) Sec 29, T19S, R32E	Wellbore	No.16H AWB
Facility	Southern California 29 Fed No. 16H	Sidetrack from	No.16H AWB PILOT at 8810.30 MD

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	Shape
No. 16H PBHL		9224.00	13.90	4593.20	711426.62	594544.00	32°37'59.646"N	103°46'50.917"W	point

WELLPATH COMPOSITION Ref Wellbore: No.16H AWB Ref Wellpath: No.16H AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	8810.30	Generic gyro - continuous (Standard)	Gyro	No.16H AWB PILOT
8810.30	13571.00	NaviTrak (Standard)	MWD	No.16H AWB



Cimarex Energy Co.

Location: Lea County, NM
Field: (SC) Sec 29, T19S, R32E
Facility: Southern California 29 Fed No. 16H

Slot: No. 16H SHL
Well: No. 16H
Wellbore: No. 16H PWB



Well Profile Data

Design Comment	MD (ft)	Inc. (°)	Az. (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8810.30	1.740	260.740	8807.32	84.37	-47.79	0.00	-47.53
EST. KOP	8860.00	1.740	260.740	8856.99	84.13	-49.28	0.00	-49.02
End of Curve	9358.83	89.410	90.800	9180.00	78.10	260.95	18.27	261.18
EOB	9361.31	89.418	90.849	9180.03	78.07	263.43	2.00	263.67
No. 16H BHL	13691.78	89.418	90.849	9224.00	13.90	4593.20	0.00	4593.22

Plot reference wellbore is Plan #1

True vertical depths are referenced to Rig on No. 16H SHL (RKB)	Grid System: NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No. 16H SHL (RKB)	North Reference: Grid north
Rig on No. 16H SHL (RKB) to Mean Sea Level: 3575 feet	Scale: True distance
Mean Sea Level to Mud line (Facility: Southern California 29 Fed No. 16H): -3555 feet	Depths are in feet
Coordinates are in feet referenced to Surface Location	Created by: gomezcor on 11/8/2010

