

Cimarex Energy Co., Inc.

Eddy Co., New Mexico

Cottonwood Draw 22 Federal Com #2H

Cottonwood Draw "22" Federal #2H

Lateral #1

Survey: MWD Survey #1

Standard Survey Report

18 December, 2008

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Site Cottonwood Draw 22 Federal Corn #2H
Project:	Eddy Co., New Mexico	TVD Reference:	KB Elevation @ 3323.00ft (KB Elevation)
Site:	Cottonwood Draw 22 Federal Corn #2H	MD Reference:	KB Elevation @ 3323.00ft (KB Elevation)
Well:	Cottonwood Draw #22 Federal #2H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14 Server Db

Project:	Eddy Co., New Mexico		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:		Cottonwood Draw 22 Federal Corn #2H			
Site Position:		Northing:	405,357.90 ft	Latitude:	32° 6' 51.810 N
From:	Map	Easting:	559,950.80 ft	Longitude:	104° 16' 23.581 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0 03 °

Well:	Cottonwood Draw #22 Federal #2H					
Well Position	+N/-S	0.00 ft	Northing:	405,357.90 ft	Latitude:	32° 6' 51.810 N
	+E/-W	0.00 ft	Easting:	559,950.80 ft	Longitude:	104° 16' 23.581 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	3,323.00 ft	Ground Level:	3,303.00 ft

Wellbore		Lateral #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	8/28/2008	8 22	60.04	48,775

Design:	Lateral #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	2,760.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	138.09	

Survey Program		Date 12/18/2008		
From	To	Survey (Wellbore)	Tool Name	Description
(ft)	(ft)			
100.00	2,760.00	Gyro Survey #1 (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s
2,760.00	4,904.00	MWD Survey #1 (Lateral #1)	MWD	MWD - Standard

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,760.00	1.49	110.59	2,759.11	-18.46	55.02	50.49	0.00	0.00	0.00
First MWD Survey									
2,790.00	1.50	105.90	2,789.10	-18.71	55.76	51.17	0.41	0.03	-15.63
2,798.00	1.90	108.10	2,797.09	-18.78	55.99	51.37	5.07	5.00	27.50
2,829.00	3.00	137.90	2,828.06	-19.54	57.02	52.63	5.32	3.55	96.13
2,861.00	9.10	173.60	2,859.88	-22.68	57.87	55.53	21.53	19.06	111.56
2,893.00	18.10	181.30	2,890.95	-30.18	58.04	61.22	28.63	28.13	24.06
2,924.00	27.00	183.40	2,919.55	-42.04	57.51	69.70	28.82	28.71	6.77
2,954.00	35.10	184.20	2,945.23	-57.47	56.47	80.49	27.03	27.00	2.67
2,985.00	47.00	187.10	2,968.57	-77.68	54.41	94.15	38.87	38.39	9.35
3,017.00	59.80	189.40	2,987.61	-103.04	50.69	110.54	40.41	40.00	7.19
3,048.00	72.20	190.20	3,000.20	-130.89	45.87	128.05	40.07	40.00	2.58

Black Viper Energy

Survey Report

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Project:	Eddy Co., New Mexico	TVD Reference:	KB Elevation @ 3323.00ft (KB Elevation)
Site:	Cottonwood Draw 22 Federal Com #2H	MD Reference:	KB Elevation @ 3323.00ft (KB Elevation)
Well:	Cottonwood Draw 22 Federal #2H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14 Server Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
3,080.00	79.00	192.50	3,008.15	-161.26	39.76	146.57	22.36	21.25	7.19	
3,111.00	86.10	192.20	3,012.17	-191.27	33.19	164.52	22.92	22.90	-0.97	
3,142.00	90.20	193.20	3,013.17	-221.49	26.38	182.46	13.61	13.23	3.23	
3,173.00	91.50	191.80	3,012.71	-251.75	19.67	200.50	6.16	4.19	-4.52	
3,205.00	93.30	189.60	3,011.37	-283.16	13.74	219.91	8.88	5.63	-6.88	
3,236.00	93.30	188.00	3,009.59	-313.74	9.00	239.51	5.15	0.00	-5.16	
3,267.00	92.40	188.50	3,008.04	-344.38	4.56	259.35	3.32	-2.90	1.61	
3,298.00	93.00	186.60	3,006.58	-375.08	0.49	279.48	6.42	1.94	-6.13	
3,329.00	90.90	183.00	3,005.53	-405.94	-2.10	300.72	13.44	-6.77	-11.61	
3,361.00	88.50	182.70	3,005.70	-437.90	-3.69	323.44	7.56	-7.50	-0.94	
3,393.00	89.40	183.60	3,006.28	-469.85	-5.45	346.04	3.98	2.81	2.81	
3,424.00	89.90	181.40	3,006.47	-500.82	-6.80	368.19	7.28	1.61	-7.10	
3,456.00	87.80	180.60	3,007.11	-532.80	-7.36	391.62	7.02	-6.56	-2.50	
3,488.00	88.50	182.00	3,008.15	-564.78	-8.08	414.93	4.89	2.19	4.38	
3,519.00	88.90	179.30	3,008.85	-595.76	-8.44	437.76	8.80	1.29	-8.71	
3,551.00	88.30	182.60	3,009.63	-627.75	-8.97	461.21	10.48	-1.88	10.31	
3,582.00	88.80	178.70	3,010.42	-658.73	-9.32	484.03	12.68	1.61	-12.58	
3,614.00	89.20	182.40	3,010.98	-690.72	-9.62	507.63	11.63	1.25	11.56	
3,645.00	88.90	184.10	3,011.49	-721.66	-11.38	529.49	5.57	-0.97	5.48	
3,677.00	89.10	180.70	3,012.05	-753.62	-12.72	552.38	10.64	0.63	-10.63	
3,708.00	89.00	183.60	3,012.56	-784.59	-13.88	574.65	9.36	-0.32	9.35	
3,739.00	88.40	185.20	3,013.27	-815.49	-16.26	596.06	5.51	-1.94	5.16	
3,771.00	87.90	185.50	3,014.30	-847.34	-19.24	617.77	1.82	-1.56	0.94	
3,802.00	89.40	186.10	3,015.03	-878.17	-22.38	638.62	5.21	4.84	1.94	
3,833.00	90.90	182.90	3,014.95	-909.07	-24.81	660.00	11.40	4.84	-10.32	
3,865.00	89.70	185.30	3,014.78	-940.98	-27.10	682.22	8.39	-3.75	7.50	
3,897.00	89.90	183.00	3,014.89	-972.90	-29.41	704.43	7.21	0.63	-7.19	
3,928.00	90.80	182.70	3,014.70	-1,003.86	-30.95	726.44	3.06	2.90	-0.97	
3,959.00	91.50	183.00	3,014.08	-1,034.81	-32.49	748.45	2.46	2.26	0.97	
3,991.00	93.50	182.20	3,012.68	-1,066.75	-33.94	771.25	6.73	6.25	-2.50	
4,022.00	94.10	180.80	3,010.63	-1,097.67	-34.75	793.72	4.90	1.94	-4.52	
4,053.00	93.20	184.40	3,008.66	-1,128.57	-36.16	815.78	11.95	-2.90	11.61	
4,085.00	92.70	186.20	3,007.01	-1,160.39	-39.11	837.49	5.83	-1.56	5.63	
4,117.00	92.20	184.90	3,005.64	-1,192.21	-42.20	859.10	4.35	-1.56	-4.06	
4,148.00	92.70	186.60	3,004.32	-1,223.02	-45.30	879.96	5.71	1.61	5.48	
4,180.00	91.20	186.10	3,003.23	-1,254.81	-48.84	901.26	4.94	-4.69	-1.56	
4,211.00	89.40	185.40	3,003.06	-1,285.65	-51.95	922.14	6.23	-5.81	-2.26	
4,243.00	90.20	185.70	3,003.18	-1,317.50	-55.04	943.77	2.67	2.50	0.94	
4,274.00	90.50	188.50	3,002.99	-1,348.26	-58.87	964.11	9.08	0.97	9.03	
4,306.00	89.00	186.90	3,003.13	-1,379.96	-63.16	984.84	6.85	-4.69	-5.00	
4,338.00	87.70	188.70	3,004.05	-1,411.65	-67.50	1,005.53	6.94	-4.06	5.63	
4,369.00	88.60	191.00	3,005.05	-1,442.18	-72.80	1,024.71	7.96	2.90	7.42	
4,401.00	89.90	187.70	3,005.47	-1,473.75	-78.00	1,044.73	11.08	4.06	-10.31	
4,432.00	90.00	189.00	3,005.50	-1,504.42	-82.50	1,064.55	4.21	0.32	4.19	
4,463.00	90.10	191.60	3,005.47	-1,534.91	-88.04	1,083.54	8.39	0.32	8.39	
4,495.00	90.20	191.30	3,005.38	-1,566.28	-94.39	1,102.64	0.99	0.31	-0.94	
4,527.00	90.60	189.00	3,005.16	-1,597.77	-100.03	1,122.32	7.30	1.25	-7.19	
4,559.00	91.10	187.20	3,004.69	-1,629.45	-104.54	1,142.88	5.84	1.56	-5.63	
4,591.00	91.20	187.50	3,004.04	-1,661.18	-108.63	1,163.76	0.99	0.31	0.94	
4,623.00	91.30	186.90	3,003.35	-1,692.92	-112.64	1,184.71	1.90	0.31	-1.88	
4,653.00	91.30	189.50	3,002.66	-1,722.60	-116.92	1,203.94	8.66	0.00	8.67	
4,684.00	90.90	188.30	3,002.07	-1,753.22	-121.72	1,223.53	4.08	-1.29	-3.87	
4,716.00	90.80	188.00	3,001.60	-1,784.90	-126.25	1,244.07	0.99	-0.31	-0.94	
4,747.00	90.90	187.10	3,001.14	-1,815.62	-130.32	1,264.22	2.92	0.32	-2.90	

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Survey Report

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Project:	Eddy Co, New Mexico	TVD Reference:	KB Elevation @ 3323.00ft (KB Elevation)
Site:	Cottonwood Draw 22 Federal Com #2H	MD Reference:	KB Elevation @ 3323.00ft (KB Elevation)
Well:	Cottonwood Draw #22 Federal #2H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14 Server Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,778.00	90.90	187.80	3,000.65	-1,846.36	-134.34	1,284.41	2.26	0.00	2.26	
4,809.00	91.40	185.60	3,000.03	-1,877.14	-137.96	1,304.90	7.28	1.61	-7.10	
4,840.00	91.60	188.70	2,999.21	-1,907.88	-141.82	1,325.21	10.02	0.65	10.00	
4,868.00	91.30	188.70	2,998.51	-1,935.55	-146.05	1,342.97	1.07	-1.07	0.00	
Last MWD Survey:										
4,904.00	91.00	188.00	2,997.78	-1,971.16	-151.28	1,365.98	2.12	-0.83	-1.94	
Proj. to Bit										

Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL#5[CD22FED#2H]	- survey misses by 11.17ft at 4904.00ft MD (2997.78 TVD, -1971.16 N, -151.28 E)	0.00	0.00	3,001.00	-1,978.37	-143.37	403,379.53	559,807.43	32° 6' 32.232 N	104° 16' 25.261 W
	- Point									
PBHL#2[CD22FED#2H]	- survey misses by 25.56ft at 4904.00ft MD (2997.78 TVD, -1971.16 N, -151.28 E)	0.00	0.00	3,021.00	-1,978.37	-143.37	403,379.53	559,807.43	32° 6' 32.232 N	104° 16' 25.261 W
	- Point									
PBHL#4[CD22FED#2H]	- survey misses by 17.79ft at 4904.00ft MD (2997.78 TVD, -1971.16 N, -151.28 E)	0.00	0.00	3,012.00	-1,978.37	-143.37	403,379.53	559,807.43	32° 6' 32.232 N	104° 16' 25.261 W
	- Point									
PBHL#1[CD22FED#2H]	- survey misses by 24.27ft at 4904.00ft MD (2997.78 TVD, -1971.16 N, -151.28 E)	0.00	0.00	2,976.00	-1,978.37	-143.37	403,379.53	559,807.43	32° 6' 32.232 N	104° 16' 25.261 W
	- Point									
LL[CD22Fed#2H]	- survey misses by 2759.72ft at 2760.00ft MD (2759.11 TVD, -18.46 N, 55.02 E)	0.00	0.00	0.00	0.00	0.00	405,357.90	559,950.80	32° 6' 51.810 N	104° 16' 23.581 W
	- Rectangle (sides W2,640.00 H2,640.00 D0.00)									
HL[CD22Fed#2H]	- survey misses by 2759.72ft at 2760.00ft MD (2759.11 TVD, -18.46 N, 55.02 E)	0.00	0.00	0.00	0.00	0.00	405,357.90	559,950.80	32° 6' 51.810 N	104° 16' 23.581 W
	- Rectangle (sides W1,980.00 H1,980.00 D0.00)									

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,760.00	2,759.11	-18.46	55.02	First MWD Survey	
4,868.00	2,998.51	-1,935.55	-146.05	Last MWD Survey	
4,904.00	2,997.78	-1,971.16	-151.28	Proj. to Bit	

Checked By: _____ Approved By: _____ Date: _____