

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

S

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

OCD-ARTESIA

FORM APPROVED
OMB NO. 1004-0137
Expires March 31, 2007

1a. Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other		5. Lease Serial No. SHL NM-95630 BHL State-owned	
b. Type of Completion. ☒ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr. Other _____		6. If Indian, Allottee or Tribe Name	
2. Name of Operator Cimarex Energy Co. of Colorado		7. Unit or CA Agreement Name and No. Pending	
3. Address PO Box 140907; Irving, TX 75014		8. Lease Name and Well No. Cave Lake 13 Federal Com No. 1	
3a. Phone No. (include area code) 972-443-6489		9. API Well No. 30-015-35879 0051	
4. Location of Well (Report Location clearly and in accordance with Federal requirements)* At surface 990 FSL & 330 FWL At top prod. interval reported below 990 FSL & 330 FWL At total depth 592 FSL & 388 FEL		10. Field and Pool, or Exploratory Crow Flats; Abo	
14. Date Spudded 01.25.08		15. Date T.D. Reached 03.14.08	
16. Date Completed ☐ D & A ☒ Ready to Prod		17. Elevations (DF, RKB, RT, GL)* 3613' GR	
18. Total Depth MD 11238' TVD 6786'		19. Plug Back TD MD 10708' TVD 6766'	
20. Depth Bridge Plug Set MD Kick-off plug @ 6502' TVD		21. Type Electric & Other Mechanical Logs Run (Submit copy of each) Porosity, Resistivity	
22. Was well cored? ☒ No ☐ Yes (Submit analysis) Was DST run? ☒ No ☐ Yes (Submit report) Directional Survey ☐ No ☒ Yes (Submit copy)		23. Casing and Liner Record (Report all strings set in well)	
Hole Size		Size/Grade	
17 1/2"		13 3/4" H-40	
12 1/4"		9 5/8" J-55	
8 3/4"		7" P-110	
6 1/2"		4 1/2" P-110	
24. Tubing Record		25. Producing Intervals	
Size		Depth Set (MD)	
2 1/2"		6,357'	
26. Perforation Record		27. Acid, Fracture, Treatment, Cement Squeeze, etc.	
Formation		Top	
Abo		5,500'	
B) 6,798'		C) 7,199'	
D) 10708'		28. Production - Interval A	
Date First Produced		Test Date	
08-10-08		**08.25.08	
Hours Tested		24	
Test Production		14	
Oil BBL		104	
Gas MCF		47	
Water BBL		40.8	
Oil Gravity Corr. API		1.518	
Gas Gravity		Production Method	
Pumping		28. Production - Interval B	
Choke Size		Tbg. Press. Flwg.	
Open		100	
Csg. Press.		24 Hr. Rate	
50		7,429	
Oil BBL		Gas MCF	
Water BBL		Gas/Oil Ratio	
Well Status		Production Method	
Producing		**gas flared until 08-10-08	
Date First Produced		Test Date	
08-10-08		08-10-08	
Hours Tested		24	
Test Production		14	
Oil BBL		104	
Gas MCF		47	
Water BBL		40.8	
Oil Gravity Corr. API		1.518	
Gas Gravity		Production Method	
Pumping		28. Production - Interval C	
Choke Size		Tbg. Press. Flwg.	
Open		100	
Csg. Press.		24 Hr. Rate	
50		7,429	
Oil BBL		Gas MCF	
Water BBL		Gas/Oil Ratio	
Well Status		Production Method	
Producing		**gas flared until 08-10-08	

* (See instructions and spaces for additional data on page 2)

ACCEPTED FOR RECORD

/S/ DAVID R. GLASS
NOV 9 2008DAVID R. GLASS
PETROLEUM ENGINEER

3160-4 Completion Report Attachment - Acid, Fracture, Treatment, Cement Squeeze, etc.

Cave Lake 13 Federal Com No. 1

13-16S-28E

Eddy County, NM

Depth Interval	Amount and Type of Material Used
<u>Stage 1</u> 10197'-10708'	Pump 119 bbl of 15% HCl NeFe acid, 363 bbl slick-water, SD, 714 bbl Deepspot 15% HCl acid, 713 bbl slickwater, 239 bbl Lightning 2000 x-linker pad, 0.5 to 1 ppg 30/50# white sand in lightning 2000 gel & flush with 20# linear gel. Pump down 7" & 4 1/2" liner 70 BPM. Drop 2 3/4" ball. Pump 129 bbl of 15% HCl NeFe acid & 130 bbl slick water, seat ball open port at 9940.' 25000# 30/50 white sand pumped.
<u>Stage 2</u> 9647'-10197'	Cont pumping 170 bbl slickwater, SD, 181 bbl slickwater, 721 bbl Deepspot 15% HCl acid, 581 bbl slickwater, 238 bbl Lightning 2000 x-linker pad, 0.5 to 1 ppg 30/50# white sand 476 bbl slickwater, & flush with 20# linear gel. Drop 2 1/2" ball. Pump 134 bbl 15% HCl NeFe acid, 180 bbl slickwater, seat ball, open port at 9270.' 12500# 30/50 white sand pumped.
<u>Stage 3</u> 8896'-9647'	Cont pumping 189 bbl slickwater, SD, 581 bbl Deepspot 15% HCl acid, 954 bbl slickwater, 240 bbl Lightning 2000 x-linker pad, 0.5 to 1 ppg 30/50# white sand, 966 bbl slickwater, & flush with 20# linear gel. Drop 2 3/4" ball. Pump 119 bbl 15% HCl NeFe acid, 185 bbl slickwater, seat ball, open port at 8557.' 20000# 30/50# whits sand pumped.
<u>Stage 4</u> 8183'-8896'	Cont pumping 119 bbl slickwater, SD, 357 bbl Deepspot 15% HCl acid, 952 bbl slickwater, 238 bbl Lightning 2000 x-linker pad, 0.5 to 1 ppg 30/50# white sand, 967 bbl slickwater & flush with 20# linear gel. Drop 3" ball. Pump 119 bbl 15% HCl NeFe acid, 120 bbl slickwater, seat ball, open port at 7884.' 20000 30/50# white sand pumped.

28b. Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg Press. Flwg SI	Csg Press	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg Press. Flwg SI	Csg Press	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

29. Disposition of Gas (*Sold, used for fuel, vented, etc.*)

Flared from 04-16-08 to 08-10-08 (WO pipeline). Sold starting 08-10-08.

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top
					Meas. Depth
				Glorieta	3503'
				Paddock	3547'
				Blinebry	4436'
				Tubb	4782'
				Abo	5500'
				L Abo	6571'
				Base Anhydrite	6723'
				Hueco Wolfcamp	6798'

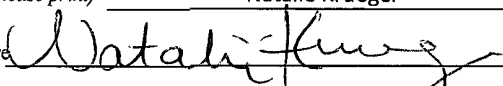
32. Additional remarks (include plugging procedure):

04-12-08 2½" x 2" x 20' RHBC frac pump installed.

33. Indicate which items have been attached by placing a check in the appropriate boxes:

☒ Electrical/Mechanical Logs (1 full set req'd.)
 ☐ Geologic Report
 ☐ DST Report
 ☒ Directional Survey
☐ Sundry Notice for plugging and cement verification
 ☐ Core Analysis
☒ Other: PEAK Systems Drawing, Frac Job Attachment

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

Name (*please print*) Natalie Krueger Title Regulatory Analyst
 Signature  Date October 31, 2008

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.



Cimarex Energy Co., Inc.

Eddy Co., New Mexico

Cave Lake '13' Federal Com #1

Cave Lake '13' Federal Com #1

Lateral #1

Survey: MWD Survey #1

Standard Survey Report

13 March, 2008





Black Viper Energy
Survey Report



Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Cave Lake '13' Federal Com #1
Project:	Eddy Co., New Mexico	TVD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Site:	Cave Lake '13' Federal Com #1	MD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Well:	Cave Lake '13' Federal Com #1	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14 1 0 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:	Cave Lake '13' Federal Com #1		
Site Position:	Northing:	698,081.50 ft	Latitude: 32° 55' 7.978 N
From: Map	Easting:	601,521.80 ft	Longitude: 104° 8' 13.941 W
Position Uncertainty: 0.00 ft	Slot Radius:	"	Grid Convergence: 0.11 °

Well:	Cave Lake '13' Federal Com #1		
Well Position	+N/-S	0.00 ft	Northing: 698,081.50 ft
	+E/-W	0.00 ft	Easting: 601,521.80 ft
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
			Ground Level: 3,613.00 ft

Wellbore:	Lateral #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	09/06/2007	8.34
			Dip Angle (°)
			60.83
			Field Strength (nT)
			49,397

Design:	Lateral #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	6,500.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°)
			94.99

Survey Program	Date	03/13/2008		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	6,500.00	Gyro Survey (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s
6,500.00	11,210.00	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)	
6,500.00	0.59	49.95	6,499.30	33.71	10.01	7.05	0.00	0.00	0.00	
6,555.00	8.90	85.60	6,554.06	34.22	14.48	11.45	15.32	15.11	64.82	
6,565.00	9.10	83.80	6,563.94	34.36	16.04	12.99	3.45	2.00	-18.00	
First MWD Survey										
6,575.00	10.40	80.50	6,573.79	34.60	17.71	14.64	14.15	13.00	-33.00	
6,587.00	12.50	80.10	6,585.56	35.00	20.06	16.94	17.51	17.50	-3.33	
6,597.00	15.20	81.80	6,595.26	35.37	22.43	19.27	27.30	27.00	17.00	
6,607.00	17.60	83.00	6,604.86	35.74	25.22	22.02	24.24	24.00	12.00	
6,619.00	20.00	83.10	6,616.22	36.21	29.06	25.81	20.00	20.00	0.83	
6,629.00	22.70	83.00	6,625.53	36.65	32.68	29.37	27.00	27.00	-1.00	
6,639.00	24.90	84.40	6,634.68	37.09	36.69	33.32	22.71	22.00	14.00	
6,651.00	27.30	85.10	6,645.45	37.57	41.94	38.52	20.16	20.00	5.83	



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Site:	Cave Lake '13' Federal Com #1	MD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Well:	Cave Lake '13' Federal Com #1	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14.1.0 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)
6,661.00	30.00	84.40	6,654.23	38.01	46.72	43.24	27.21	27.00	-7.00
6,671.00	33.00	84.30	6,662.75	38.53	51.92	48.37	30.00	30.00	-1.00
6,683.00	35.00	84.20	6,672.70	39.20	58.59	54.96	16.67	16.67	-0.83
6,693.00	38.50	82.80	6,680.71	39.88	64.54	60.83	35.99	35.00	-14.00
6,703.00	41.60	81.60	6,688.37	40.76	70.91	67.10	31.95	31.00	-12.00
6,714.00	44.40	82.00	6,696.41	41.83	78.33	74.40	25.58	25.45	3.64
6,729.00	48.70	83.50	6,706.72	43.19	89.13	85.04	29.57	28.67	10.00
6,747.00	52.60	84.30	6,718.14	44.67	102.97	98.70	21.94	21.67	4.44
6,757.00	55.40	84.50	6,724.01	45.46	111.02	106.65	28.05	28.00	2.00
6,767.00	58.50	85.80	6,729.47	46.17	119.37	114.91	32.86	31.00	13.00
6,779.00	62.30	87.90	6,735.39	46.74	129.79	125.24	35.13	31.67	17.50
6,789.00	65.70	89.30	6,739.78	46.95	138.77	134.17	36.25	34.00	14.00
6,799.00	69.00	90.30	6,743.63	46.99	148.00	143.36	34.27	33.00	10.00
6,811.00	72.80	91.20	6,747.55	46.84	159.34	154.66	32.45	31.67	7.50
6,821.00	76.00	91.90	6,750.24	46.58	168.96	164.28	32.70	32.00	7.00
6,839.00	81.60	94.20	6,753.74	45.63	186.59	181.91	33.54	31.11	12.78
6,875.00	90.10	93.70	6,756.34	43.16	222.37	217.78	23.65	23.61	-1.39
6,906.00	90.60	93.40	6,756.15	41.24	253.31	248.77	1.88	1.61	-0.97
6,938.00	90.30	93.30	6,755.90	39.37	285.26	280.76	0.99	-0.94	-0.31
6,969.00	90.50	93.10	6,755.68	37.64	316.21	311.74	0.91	0.65	-0.65
7,000.00	92.30	94.70	6,754.92	35.54	347.13	342.72	7.77	5.81	5.16
7,033.00	94.00	95.70	6,753.11	32.55	379.94	375.67	5.97	5.15	3.03
7,064.00	93.90	96.10	6,750.98	29.37	410.70	406.59	1.33	-0.32	1.29
7,096.00	93.70	96.10	6,748.86	25.98	442.45	438.52	0.63	-0.63	0.00
7,128.00	94.00	96.40	6,746.71	22.50	474.19	470.44	1.32	0.94	0.94
7,160.00	94.20	96.80	6,744.42	18.83	505.89	502.34	1.39	0.63	1.25
7,192.00	92.30	97.40	6,742.60	14.88	537.60	534.27	6.23	-5.94	1.88
7,224.00	90.80	98.50	6,741.74	10.46	569.28	566.21	5.81	-4.69	3.44
7,256.00	90.20	98.40	6,741.46	5.76	600.93	598.15	1.90	-1.88	-0.31
7,288.00	90.40	98.60	6,741.29	1.03	632.58	630.09	0.88	0.63	0.63
7,320.00	90.40	98.60	6,741.07	-3.76	664.21	662.03	0.00	0.00	0.00
7,352.00	90.40	99.00	6,740.85	-8.65	695.84	693.96	1.25	0.00	1.25
7,416.00	89.20	102.70	6,741.07	-20.70	758.68	757.61	6.08	-1.88	5.78
7,447.00	88.90	102.30	6,741.58	-27.41	788.94	788.34	1.61	-0.97	-1.29
7,479.00	88.40	101.90	6,742.34	-34.11	820.22	820.08	2.00	-1.56	-1.25
7,511.00	88.30	101.60	6,743.26	-40.63	851.54	851.85	0.99	-0.31	-0.94
7,543.00	88.70	101.80	6,744.10	-47.11	882.86	883.62	1.40	1.25	0.63
7,574.00	89.10	101.90	6,744.69	-53.48	913.20	914.39	1.33	1.29	0.32
7,606.00	89.10	101.70	6,745.19	-60.02	944.52	946.16	0.62	0.00	-0.63
7,637.00	88.00	101.10	6,745.98	-66.15	974.89	976.95	4.04	-3.55	-1.94
7,669.00	87.80	101.10	6,747.15	-72.30	1,006.27	1,008.75	0.63	-0.63	0.00
7,701.00	87.60	101.20	6,748.43	-78.49	1,037.64	1,040.54	0.70	-0.63	0.31
7,732.00	87.70	101.30	6,749.71	-84.53	1,068.02	1,071.33	0.46	0.32	0.32
7,764.00	89.60	100.70	6,750.46	-90.63	1,099.43	1,103.14	6.23	5.94	-1.88
7,797.00	89.10	101.20	6,750.83	-96.90	1,131.82	1,135.96	2.14	-1.52	1.52
7,829.00	88.10	101.00	6,751.62	-103.06	1,163.21	1,167.77	3.19	-3.13	-0.63
7,861.00	88.30	100.90	6,752.62	-109.13	1,194.62	1,199.58	0.70	0.63	-0.31
7,893.00	90.50	101.20	6,752.96	-115.27	1,226.02	1,231.40	6.94	6.88	0.94
7,924.00	90.20	101.40	6,752.77	-121.34	1,256.42	1,262.21	1.16	-0.97	0.65
7,956.00	90.50	101.40	6,752.57	-127.67	1,287.79	1,294.01	0.94	0.94	0.00
7,988.00	90.30	101.30	6,752.35	-133.96	1,319.16	1,325.81	0.70	-0.63	-0.31
8,020.00	90.40	101.20	6,752.15	-140.21	1,350.54	1,357.62	0.44	0.31	-0.31
8,052.00	90.30	101.60	6,751.96	-146.53	1,381.91	1,389.42	1.29	-0.31	1.25
8,084.00	90.20	101.90	6,751.82	-153.05	1,413.24	1,421.19	0.99	-0.31	0.94



Black Viper Energy
Survey Report



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Design:	Lateral #1	Database:	EDM 2003.14.1 0 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)
8,116.00	90.10	101.40	6,751.73	-159.51	1,444.58	1,452.98	1.59	-0.31	-1.56
8,147.00	89.90	101.00	6,751.73	-165.53	1,474.99	1,483.80	1.44	-0.65	-1.29
8,179.00	89.50	101.00	6,751.90	-171.64	1,506.40	1,515.62	1.25	-1.25	0.00
8,211.00	89.60	100.60	6,752.15	-177.63	1,537.83	1,547.45	1.29	0.31	-1.25
8,243.00	89.80	100.50	6,752.32	-183.49	1,569.29	1,579.30	0.70	0.63	-0.31
8,275.00	89.60	100.30	6,752.49	-189.27	1,600.77	1,611.16	0.88	-0.63	-0.63
8,307.00	89.50	100.60	6,752.74	-195.07	1,632.23	1,643.01	0.99	-0.31	0.94
8,338.00	89.40	100.00	6,753.04	-200.61	1,662.73	1,673.88	1.96	-0.32	-1.94
8,371.00	91.40	100.00	6,752.81	-206.34	1,695.23	1,706.75	6.06	6.06	0.00
8,403.00	91.50	99.70	6,752.00	-211.82	1,726.75	1,738.62	0.99	0.31	-0.94
8,434.00	91.40	99.70	6,751.21	-217.04	1,757.30	1,769.51	0.32	-0.32	0.00
8,466.00	91.20	99.70	6,750.49	-222.43	1,788.83	1,801.39	0.63	-0.63	0.00
8,498.00	90.20	99.60	6,750.09	-227.79	1,820.37	1,833.28	3.14	-3.13	-0.31
8,530.00	90.30	101.10	6,749.96	-233.54	1,851.85	1,865.14	4.70	0.31	4.69
8,561.00	89.90	99.70	6,749.90	-239.14	1,882.34	1,896.00	4.70	-1.29	-4.52
8,593.00	89.80	99.80	6,749.98	-244.56	1,913.88	1,927.89	0.44	-0.31	0.31
8,624.00	89.10	99.20	6,750.28	-249.67	1,944.45	1,958.79	2.97	-2.26	-1.94
8,657.00	89.20	98.40	6,750.77	-254.72	1,977.06	1,991.72	2.44	0.30	-2.42
8,688.00	88.80	98.70	6,751.31	-259.33	2,007.71	2,022.65	1.61	-1.29	0.97
8,719.00	89.20	98.40	6,751.85	-263.94	2,038.36	2,053.59	1.61	1.29	-0.97
8,751.00	88.60	98.90	6,752.47	-268.75	2,069.99	2,085.52	2.44	-1.88	1.56
8,782.00	88.80	97.70	6,753.17	-273.22	2,100.66	2,116.46	3.92	0.65	-3.87
8,814.00	90.20	97.30	6,753.45	-277.40	2,132.38	2,148.42	4.55	4.38	-1.25
8,845.00	90.50	95.90	6,753.26	-280.96	2,163.18	2,179.41	4.62	0.97	-4.52
8,878.00	89.30	96.60	6,753.32	-284.55	2,195.98	2,212.40	4.21	-3.64	2.12
8,909.00	88.80	96.50	6,753.83	-288.09	2,226.77	2,243.38	1.64	-1.61	-0.32
8,941.00	88.80	94.30	6,754.50	-291.10	2,258.62	2,275.37	6.87	0.00	-6.88
8,972.00	88.50	93.70	6,755.23	-293.26	2,289.54	2,306.36	2.16	-0.97	-1.94
9,004.00	89.70	96.60	6,755.74	-296.13	2,321.40	2,338.35	9.81	3.75	9.06
9,036.00	90.00	93.80	6,755.82	-299.03	2,353.26	2,370.35	8.80	0.94	-8.75
9,067.00	90.00	93.70	6,755.82	-301.06	2,384.20	2,401.34	0.32	0.00	-0.32
9,099.00	89.60	94.10	6,755.93	-303.24	2,416.12	2,433.34	1.77	-1.25	1.25
9,130.00	89.50	92.50	6,756.18	-305.02	2,447.07	2,464.32	5.17	-0.32	-5.16
9,162.00	91.70	93.20	6,755.84	-306.61	2,479.03	2,496.29	7.21	6.88	2.19
9,194.00	91.40	93.80	6,754.97	-308.57	2,510.96	2,528.27	2.10	-0.94	1.88
9,226.00	91.50	92.70	6,754.17	-310.38	2,542.89	2,560.25	3.45	0.31	-3.44
9,258.00	90.60	93.10	6,753.58	-312.00	2,574.85	2,592.22	3.08	-2.81	1.25
9,289.00	90.10	92.60	6,753.39	-313.54	2,605.81	2,623.20	2.28	-1.61	-1.61
9,321.00	89.30	92.70	6,753.56	-315.02	2,637.77	2,655.17	2.52	-2.50	0.31
9,353.00	89.90	92.20	6,753.78	-316.39	2,669.74	2,687.14	2.44	1.88	-1.56
9,385.00	89.30	92.10	6,754.00	-317.59	2,701.72	2,719.10	1.90	-1.88	-0.31
9,417.00	88.50	92.20	6,754.62	-318.79	2,733.69	2,751.05	2.52	-2.50	0.31
9,448.00	90.00	94.00	6,755.02	-320.46	2,764.64	2,782.03	7.56	4.84	5.81
9,480.00	92.30	94.70	6,754.38	-322.89	2,796.54	2,814.02	7.51	7.19	2.19
9,511.00	91.80	95.30	6,753.27	-325.59	2,827.40	2,845.00	2.52	-1.61	1.94
9,543.00	92.10	94.00	6,752.18	-328.18	2,859.28	2,876.98	4.17	0.94	-4.06
9,575.00	92.00	94.10	6,751.04	-330.44	2,891.18	2,908.96	0.44	-0.31	0.31
9,607.00	90.90	94.50	6,750.23	-332.84	2,923.08	2,940.94	3.66	-3.44	1.25
9,639.00	90.50	94.80	6,749.84	-335.43	2,954.97	2,972.94	1.56	-1.25	0.94
9,670.00	90.40	96.00	6,749.59	-338.35	2,985.83	3,003.94	3.88	-0.32	3.87
9,702.00	90.40	96.10	6,749.37	-341.72	3,017.65	3,035.93	0.31	0.00	0.31
9,734.00	90.20	94.10	6,749.20	-344.57	3,049.52	3,067.93	6.28	-0.63	-6.25
9,776.00	90.50	94.10	6,748.95	-347.57	3,091.41	3,109.92	0.71	0.71	0.00
9,798.00	90.50	93.90	6,748.76	-349.11	3,113.36	3,131.92	0.91	0.00	-0.91
9,830.00	90.60	94.00	6,748.45	-351.31	3,145.28	3,163.91	0.44	0.31	0.31



Black Viper Energy Survey Report



Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Cave Lake '13' Federal Com #1
Project:	Eddy Co., New Mexico	TVD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Site:	Cave Lake '13' Federal Com #1	MD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Well:	Cave Lake '13' Federal Com #1	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14.1.0 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)
9,862.00	90.50	91.60	6,748.14	-352.87	3,177.24	3,195.88	7.51	-0.31	-7.50
9,926.00	87.10	95.40	6,749.48	-356.78	3,241.08	3,259.83	7.97	-5.31	5.94
9,958.00	87.00	96.30	6,751.13	-360.03	3,272.87	3,291.78	2.83	-0.31	2.81
9,990.00	87.70	96.40	6,752.61	-363.57	3,304.64	3,323.74	2.21	2.19	0.31
10,022.00	88.00	96.10	6,753.81	-367.05	3,336.43	3,355.71	1.33	0.94	-0.94
10,054.00	88.00	96.10	6,754.93	-370.45	3,368.23	3,387.68	0.00	0.00	0.00
10,085.00	88.20	96.00	6,755.95	-373.71	3,399.04	3,418.66	0.72	0.65	-0.32
10,117.00	88.50	96.00	6,756.87	-377.06	3,430.85	3,450.64	0.94	0.94	0.00
10,149.00	88.80	95.60	6,757.63	-380.29	3,462.68	3,482.63	1.56	0.94	-1.25
10,181.00	89.00	95.50	6,758.24	-383.39	3,494.52	3,514.62	0.70	0.63	-0.31
10,212.00	89.10	95.40	6,758.76	-386.33	3,525.38	3,545.62	0.46	0.32	-0.32
10,244.00	89.20	95.50	6,759.23	-389.37	3,557.23	3,577.61	0.44	0.31	0.31
10,276.00	89.30	95.50	6,759.65	-392.44	3,589.08	3,609.61	0.31	0.31	0.00
10,308.00	89.30	95.20	6,760.04	-395.42	3,620.94	3,641.60	0.94	0.00	-0.94
10,340.00	89.10	95.30	6,760.49	-398.35	3,652.80	3,673.60	0.70	-0.63	0.31
10,372.00	89.00	95.20	6,761.02	-401.27	3,684.66	3,705.60	0.44	-0.31	-0.31
10,404.00	89.30	95.20	6,761.49	-404.17	3,716.53	3,737.59	0.94	0.94	0.00
10,436.00	89.00	95.00	6,761.97	-407.02	3,748.40	3,769.59	1.13	-0.94	-0.63
10,468.00	89.00	94.80	6,762.53	-409.75	3,780.28	3,801.58	0.62	0.00	-0.63
10,500.00	89.10	94.90	6,763.06	-412.46	3,812.16	3,833.58	0.44	0.31	0.31
10,532.00	89.00	94.80	6,763.59	-415.16	3,844.04	3,865.58	0.44	-0.31	-0.31
10,564.00	89.10	94.60	6,764.12	-417.78	3,875.93	3,897.57	0.70	0.31	-0.63
10,596.00	89.30	94.70	6,764.56	-420.38	3,907.82	3,929.57	0.70	0.63	0.31
10,627.00	89.10	94.70	6,765.00	-422.92	3,938.71	3,960.56	0.65	-0.65	0.00
10,659.00	89.40	94.60	6,765.42	-425.51	3,970.60	3,992.56	0.99	0.94	-0.31
10,691.00	89.20	94.40	6,765.81	-428.02	4,002.50	4,024.56	0.88	-0.63	-0.63
10,723.00	89.30	94.50	6,766.23	-430.50	4,034.40	4,056.55	0.44	0.31	0.31
10,755.00	89.70	94.50	6,766.51	-433.01	4,066.30	4,088.55	1.25	1.25	0.00
10,787.00	89.90	94.30	6,766.62	-435.47	4,098.21	4,120.55	0.88	0.63	-0.63
10,819.00	89.90	94.50	6,766.67	-437.92	4,130.11	4,152.55	0.63	0.00	0.63
10,850.00	90.70	94.00	6,766.51	-440.22	4,161.03	4,183.54	3.04	2.58	-1.61
10,883.00	90.70	93.90	6,766.11	-442.49	4,193.95	4,216.53	0.30	0.00	-0.30
10,914.00	91.90	94.10	6,765.40	-444.66	4,224.86	4,247.52	3.92	3.87	0.65
10,946.00	92.00	94.10	6,764.32	-446.94	4,256.76	4,279.50	0.31	0.31	0.00
10,979.00	92.00	94.00	6,763.16	-449.27	4,289.66	4,312.47	0.30	0.00	-0.30
11,010.00	92.30	93.70	6,762.00	-451.35	4,320.57	4,343.45	1.37	0.97	-0.97
11,042.00	92.30	93.80	6,760.72	-453.44	4,352.47	4,375.41	0.31	0.00	0.31
11,074.00	91.90	93.50	6,759.54	-455.48	4,384.39	4,407.38	1.56	-1.25	-0.94
11,106.00	92.00	93.30	6,758.46	-457.38	4,416.31	4,439.35	0.70	0.31	-0.63
11,138.00	92.00	93.20	6,757.34	-459.19	4,448.24	4,471.32	0.31	0.00	-0.31
11,170.00	92.10	93.00	6,756.19	-460.92	4,480.17	4,503.28	0.70	0.31	-0.63
Last MWD Survey									
11,210.00	92.10	93.00	6,754.73	-463.01	4,520.09	4,543.23	0.00	0.00	0.00
Proj. to Bit / TD									
11,237.89	89.41	95.88	6,785.46	-397.95	4,561.60	4,578.93	14.12	-9.65	10.31
PBHL#2[CL13FCom#1]									



Black Viper Energy
Survey Report



Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Cave Lake '13' Federal Com #1
Project:	Eddy Co., New Mexico	TVD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Site:	Cave Lake '13' Federal Com #1	MD Reference:	GL Elev @ 3613.00ft (Orig. Well Elev.)
Well:	Cave Lake '13' Federal Com #1	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 2003.14.1.0 Server DB

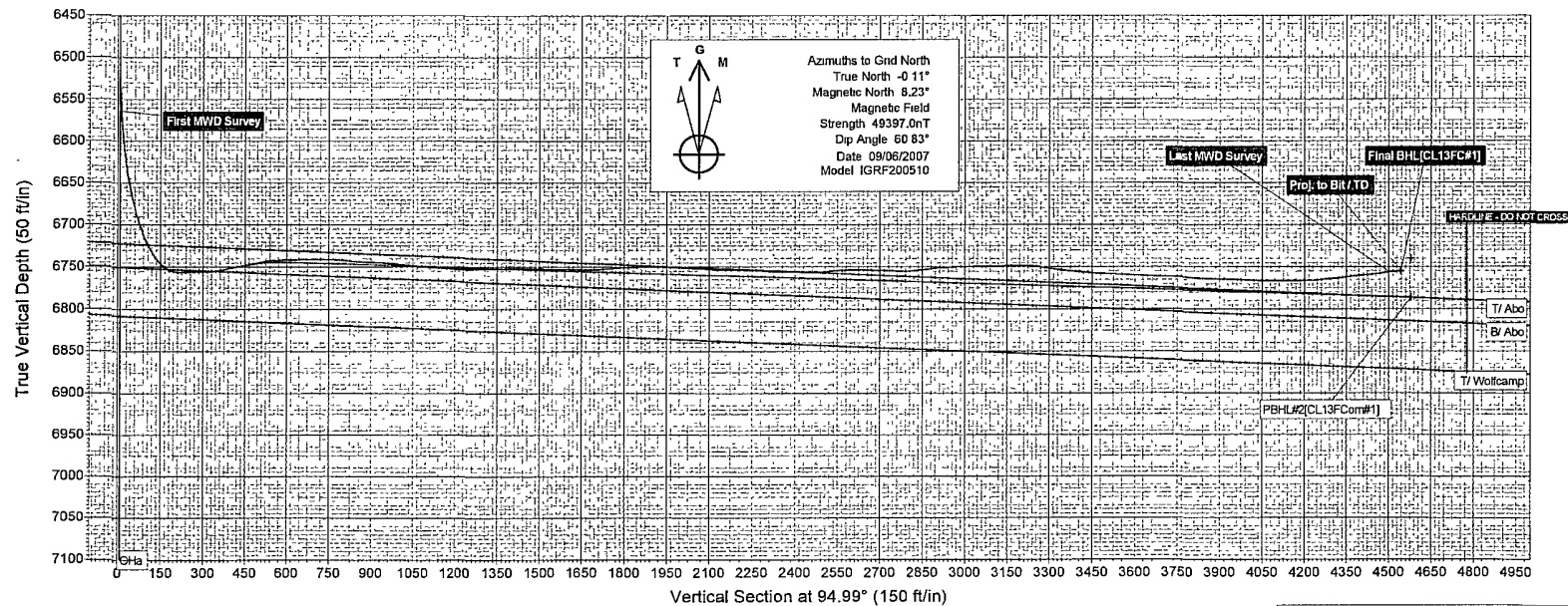
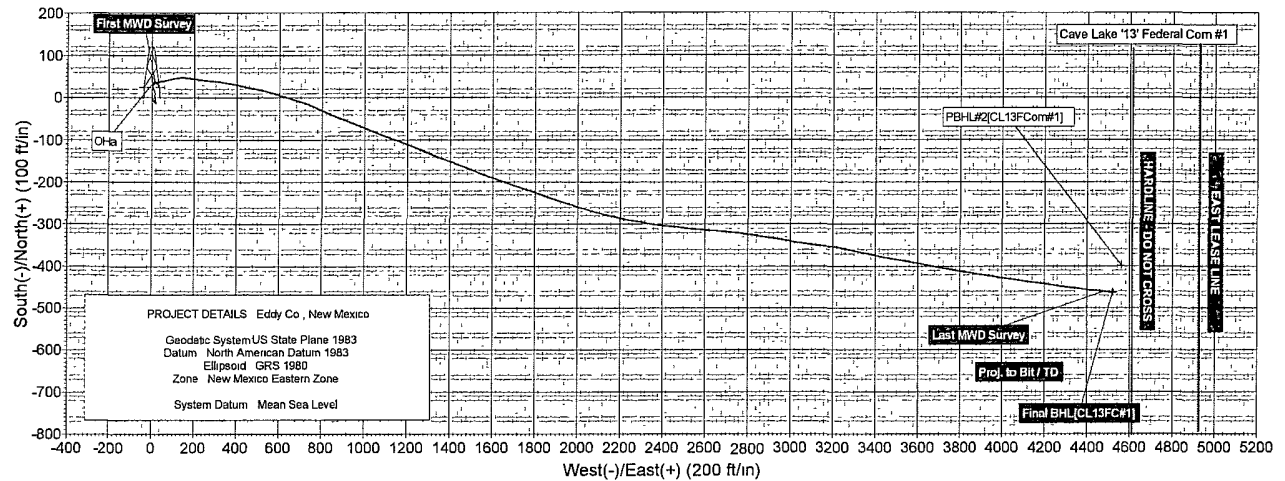
Targets:									
Target Name									
- hit/miss, target.	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
PBHL#1[CL13FCom#1]	0 00	0.00	6,740.00	-397.95	4,561.60	697,683.55	606,083.40	32° 55' 3.953 N	104° 7' 20.435 W
- survey misses by 70.88ft at 11232.24ft MD (6754.33 TVD, -464.62 N, 4542 27 E)									
- Point									
Interp @ 6754.73 (Cave			6,754.73	-463.01	4,520.09	697,618.49	606,041.89	32° 55' 3.310 N	104° 7' 20 923 W
- survey hits target									
- Point									
PBHL#2[CL13FCom#1]	0 00	0.00	6,785.46	-397.95	4,561.60	697,683.55	606,083.40	32° 55' 3.953 N	104° 7' 20.435 W
- survey hits target									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(ft)	(ft)	+N/-S	+E/-W	Comment
		(ft)	(ft)	
6,565.00	6,563.94	34.36	16.04	First MWD Survey
11,170.00	6,756 19	-460.92	4,480.17	Last MWD Survey
11,210 00	6,754.73	-463.01	4,520.09	Proj. to Bit / TD

Checked By: _____ Approved By: _____ Date: _____



Project Eddy Co., New Mexico
 Site Cave Lake '13' Federal Com #1
 Well Cave Lake '13' Federal Com #1
 Wellbore Lateral #1
 Plan Plan #2 (Cave Lake '13' Federal Com #1/Lateral #1)



Final

Plan Final (Cave Lake '13' Federal Com #1/Lateral #1)
 Created By L.D. Burton Date March 13, 2008

DISTRICT I
1626 N. French Dr., Hobbs, NM 88240

DISTRICT II
1301 W. Grand Avenue, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised October 12, 2005

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-35879	Pool Code 97691	Pool Name Crow Flats; Abo
Property Code 36811	Property Name CAVE LAKE "13" FEDERAL COM	Well Number 1
OGRI# No. 762683	Operator Name CIMAREX ENERGY CO. OF COLORADO	Elevation 3613'

Surface Location

UL or lot No. M	Section 13	Township 16 S	Range 28 E	Lot Idn	Feet from the 990'	North/South line SOUTH	Feet from the 330	East/West line WEST	County EDDY
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Bottom Hole Location If Different From Surface

UL or lot No. P	Section 13	Township 16 S	Range 28 E	Lot Idn	Feet from the	North/South line SOUTH	Feet from the	East/West line EAST	County EDDY
Dedicated Acres 160	Joint or Infill	Consolidation Code P	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

SURFACE LOCATION Lat - N32°55'07.99" Long - W104°08'13.93" NMSPEC - N 698081.5 E 601521.8 (NAD-83) SHL 990 FSL & 330 FWL P.P. 990 FSL & 330 FWL BHL 592 FSL & 388 FEL State Lease NM-95630 VB-1041-0000	OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Natalie Krueger</i> 10-31-08 Signature Date Natalie Krueger Printed Name SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. NOVEMBER 2, 2007 Date Surveyed <i>Gary L. Jones</i> Signature & Seal Professional Surveyor Certificate No. Gary L. Jones 7977 BASIN SURVEYS
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OPERATOR CIMAREX ENERGY CO.
WELL/LEASE CAVE LAKE 13 FED. COM. 1
COUNTY EDDY

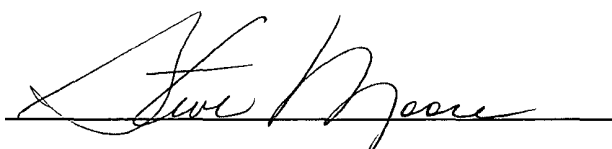
074-0053

STATE OF NEW MEXICO
DEVIATION REPORT

199	2.00
419	2.25
592	1.50
879	1.00
1,400	0.50
1,907	1.00
2,271	0.50
2,706	0.50
3,247	0.75
3,723	0.75
4,201	0.75
4,684	0.75
4,927	0.75
5,549	0.50
5,967	0.25
6,205	0.25
6,520	0.75
6,775	0.25
6,940	0.25
7,190	0.25

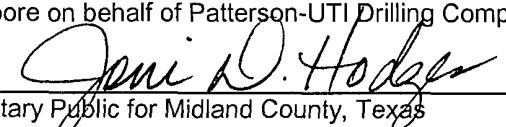
STATE OF TEXAS

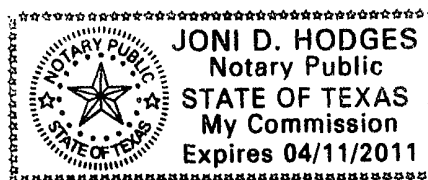
COUNTY OF MIDLAND

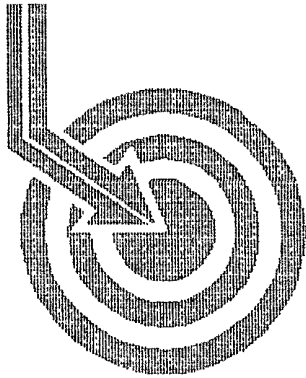
BY: 

The foregoing instrument was acknowledged before me on
Moore on behalf of Patterson-UTI Drilling Company LLC.

March 31, 2008, by Steve


Notary Public for Midland County, Texas
My Commission Expires: 4/11/11





Scientific Drilling

CIMAREX ENERGY

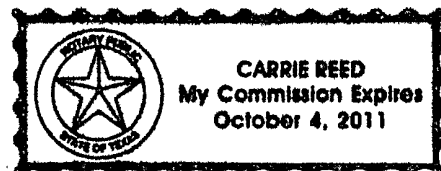
Field: Wildcat
Site: Eddy County, NM
Well: Cave Lake 13 Federal Com #1
Wellpath: VH - Job #32K0208114
Survey: 02/16/08

This survey is correct to the best of my knowledge
and is supported by actual field data.

.....*L. Wharton*.....Company Representative

Notorized this date 10th of March, 2007.

Carrie Reed
Notary Signature
County of Midland
State of Texas





Scientific Drilling International

Survey Report

Company: CIMAREX ENERGY	Date: 03/09/2008	Time: 11:21:08	Page: 1
Field: Wildcat	Co-ordinate(NE) Reference:	Site: Eddy County, NM, Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE 0.0	
Well: Cave Lake 13 Federal Com #1	Section (VS) Reference:	Well (0.00N,0.00E,94.99Azi)	
Wellpath: VH - Job #32K0208114	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Survey: 02/16/08	Start Date: 02/16/2008
KSRG 0'-7168'	
Company: Scientific Drilling Internatio	Engineer: Madrid w/GeoGyro
Tool: Keeper;Keeper Gyro	Tied-to: From Surface

Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg
0.00	0.00	359.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	1.37	154.35	99.99	0.61	-1.08	0.52	1.37	1.20	154.35
200.00	1.98	132.44	199.95	2.59	-3.32	2.31	0.87	4.05	145.18
300.00	2.54	120.19	299.87	5.97	-5.60	5.50	0.74	7.85	135.52
400.00	2.44	118.67	399.78	9.92	-7.74	9.28	0.12	12.08	129.81
500.00	1.73	115.91	499.71	13.28	-9.42	12.51	0.72	15.66	126.98
600.00	1.35	119.19	599.67	15.76	-10.65	14.89	0.39	18.31	125.57
700.00	0.90	123.12	699.65	17.53	-11.66	16.58	0.46	20.27	125.10
800.00	0.74	120.92	799.64	18.81	-12.42	17.79	0.16	21.70	124.91
900.00	0.52	117.04	899.64	19.81	-12.95	18.75	0.22	22.79	124.64
1000.00	0.03	229.94	999.64	20.21	-13.18	19.13	0.53	23.23	124.55
1100.00	0.12	281.98	1099.64	20.09	-13.17	19.01	0.10	23.13	124.72
1200.00	0.46	304.82	1199.63	19.63	-12.92	18.58	0.35	22.63	124.82
1300.00	0.87	304.84	1299.63	18.63	-12.26	17.63	0.41	21.47	124.82
1400.00	1.07	311.27	1399.61	17.22	-11.21	16.30	0.23	19.78	124.51
1500.00	1.26	329.87	1499.59	15.83	-9.64	15.05	0.42	17.87	122.65
1600.00	1.26	345.99	1599.57	14.84	-7.62	14.23	0.35	16.15	118.18
1700.00	1.14	349.93	1699.55	14.22	-5.58	13.79	0.15	14.88	112.02
1800.00	1.08	354.79	1799.53	13.80	-3.66	13.53	0.11	14.02	105.14
1900.00	0.67	353.32	1899.52	13.51	-2.14	13.38	0.41	13.55	99.09
2000.00	0.50	349.17	1999.51	13.28	-1.13	13.23	0.18	13.28	94.89
2100.00	0.46	348.53	2099.51	13.04	-0.31	13.07	0.04	13.07	91.36
2200.00	0.41	346.93	2199.50	12.82	0.43	12.91	0.05	12.91	88.08
2300.00	0.46	352.28	2299.50	12.62	1.18	12.77	0.06	12.82	84.73
2400.00	0.35	347.13	2399.50	12.44	1.87	12.65	0.12	12.79	81.57
2500.00	0.37	332.22	2499.50	12.17	2.46	12.43	0.10	12.67	78.82
2600.00	0.38	351.50	2599.50	11.92	3.07	12.23	0.13	12.61	75.91
2700.00	0.39	340.58	2699.49	11.70	3.72	12.07	0.07	12.63	72.87
2800.00	0.27	11.21	2799.49	11.58	4.27	12.00	0.21	12.74	70.41
2900.00	0.42	10.97	2899.49	11.65	4.86	12.12	0.15	13.06	68.13
3000.00	0.57	3.83	2999.49	11.68	5.72	12.22	0.16	13.49	64.92
3100.00	0.57	9.48	3099.48	11.70	6.71	12.33	0.06	14.04	61.47
3200.00	0.71	1.14	3199.47	11.70	7.82	12.43	0.17	14.68	57.84
3300.00	0.73	358.01	3299.47	11.58	9.07	12.42	0.04	15.38	53.85
3400.00	0.71	1.82	3399.46	11.47	10.33	12.42	0.05	16.15	50.25
3500.00	0.72	350.55	3499.45	11.28	11.57	12.33	0.14	16.91	46.84
3600.00	0.69	355.90	3599.44	11.03	12.79	12.19	0.07	17.66	43.62
3700.00	0.61	341.24	3699.44	10.72	13.89	11.97	0.18	18.34	40.76
3800.00	0.54	325.16	3799.43	10.20	14.78	11.53	0.18	18.75	37.96
3900.00	0.42	324.59	3899.43	9.66	15.47	11.05	0.12	19.01	35.54
4000.00	0.65	323.60	3999.42	9.05	16.22	10.50	0.23	19.33	32.92
4100.00	0.53	313.01	4099.42	8.31	17.00	9.83	0.16	19.63	30.04
4200.00	0.62	311.88	4199.41	7.51	17.67	9.09	0.09	19.87	27.21
4300.00	0.63	317.34	4299.41	6.68	18.44	8.31	0.06	20.22	24.26
4400.00	0.65	322.43	4399.40	5.89	19.29	7.59	0.06	20.73	21.48
4500.00	0.63	319.24	4499.40	5.11	20.16	6.89	0.04	21.30	18.86
4600.00	0.68	314.52	4599.39	4.26	20.99	6.11	0.07	21.86	16.22
4700.00	0.72	323.09	4699.38	3.38	21.91	5.31	0.11	22.54	13.61
4800.00	0.72	319.60	4799.37	2.51	22.89	4.52	0.04	23.33	11.17



Scientific
Drilling

Scientific Drilling International

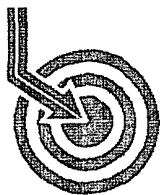
Survey Report

Company: CIMAREX ENERGY
Field: Wildcat
Site: Eddy County, NM
Well: Cave Lake 13 Federal Com #1
Wellpath: VH - Job #32K0208114

Date: 03/09/2008 Time: 11:21:08 Page: 2
Co-ordinate(NE) Reference: Site: Eddy County, NM, Grid North
Vertical (TVD) Reference: SITE 0.0
Section (VS) Reference: Well (0.00N,0.00E,94.99Azi)
Survey Calculation Method: Minimum Curvature Db: Sybase

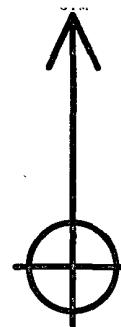
Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg
4900.00	0.69	321.11	4899.37	1.65	23.84	3.74	0.04	24.13	8.91
5000.00	0.61	320.56	4999.36	0.86	24.72	3.02	0.08	24.90	6.96
5100.00	0.58	333.95	5099.35	0.22	25.58	2.46	0.14	25.70	5.49
5200.00	0.41	337.16	5199.35	-0.20	26.37	2.10	0.17	26.45	4.55
5300.00	0.50	345.99	5299.35	-0.51	27.12	1.85	0.11	27.18	3.91
5400.00	0.32	18.55	5399.34	-0.59	27.81	1.84	0.29	27.87	3.78
5500.00	0.43	43.20	5499.34	-0.29	28.35	2.18	0.19	28.43	4.40
5600.00	0.50	55.14	5599.34	0.28	28.87	2.80	0.12	29.00	5.53
5700.00	0.52	51.19	5699.34	0.94	29.40	3.51	0.04	29.61	6.80
5800.00	0.48	54.34	5799.33	1.58	29.93	4.20	0.05	30.22	7.99
5900.00	0.45	62.56	5899.33	2.23	30.36	4.89	0.07	30.75	9.15
6000.00	0.70	57.09	5999.32	3.05	30.87	5.75	0.26	31.40	10.56
6100.00	0.49	62.62	6099.32	3.89	31.40	6.65	0.22	32.09	11.95
6200.00	0.60	49.04	6199.31	4.61	31.94	7.42	0.17	32.79	13.08
6300.00	0.80	60.35	6299.31	5.55	32.63	8.42	0.24	33.70	14.47
6400.00	0.41	55.48	6399.30	6.40	33.17	9.32	0.39	34.46	15.70
6500.00	0.59	49.95	6499.30	7.04	33.71	10.01	0.19	35.16	16.54
6600.00	0.30	43.45	6599.29	7.57	34.23	10.59	0.29	35.83	17.19
6700.00	0.46	19.09	6699.29	7.83	34.80	10.90	0.22	36.47	17.39
6800.00	0.46	40.14	6799.29	8.16	35.49	11.29	0.17	37.24	17.65
6900.00	0.48	21.46	6899.28	8.51	36.18	11.70	0.15	38.03	17.92
7000.00	0.54	13.28	6999.28	8.70	37.03	11.96	0.09	38.91	17.90
7100.00	0.63	358.12	7099.28	8.70	38.04	12.05	0.18	39.90	17.58
7168.00	0.73	352.60	7167.27	8.56	38.84	11.98	0.18	40.65	17.15



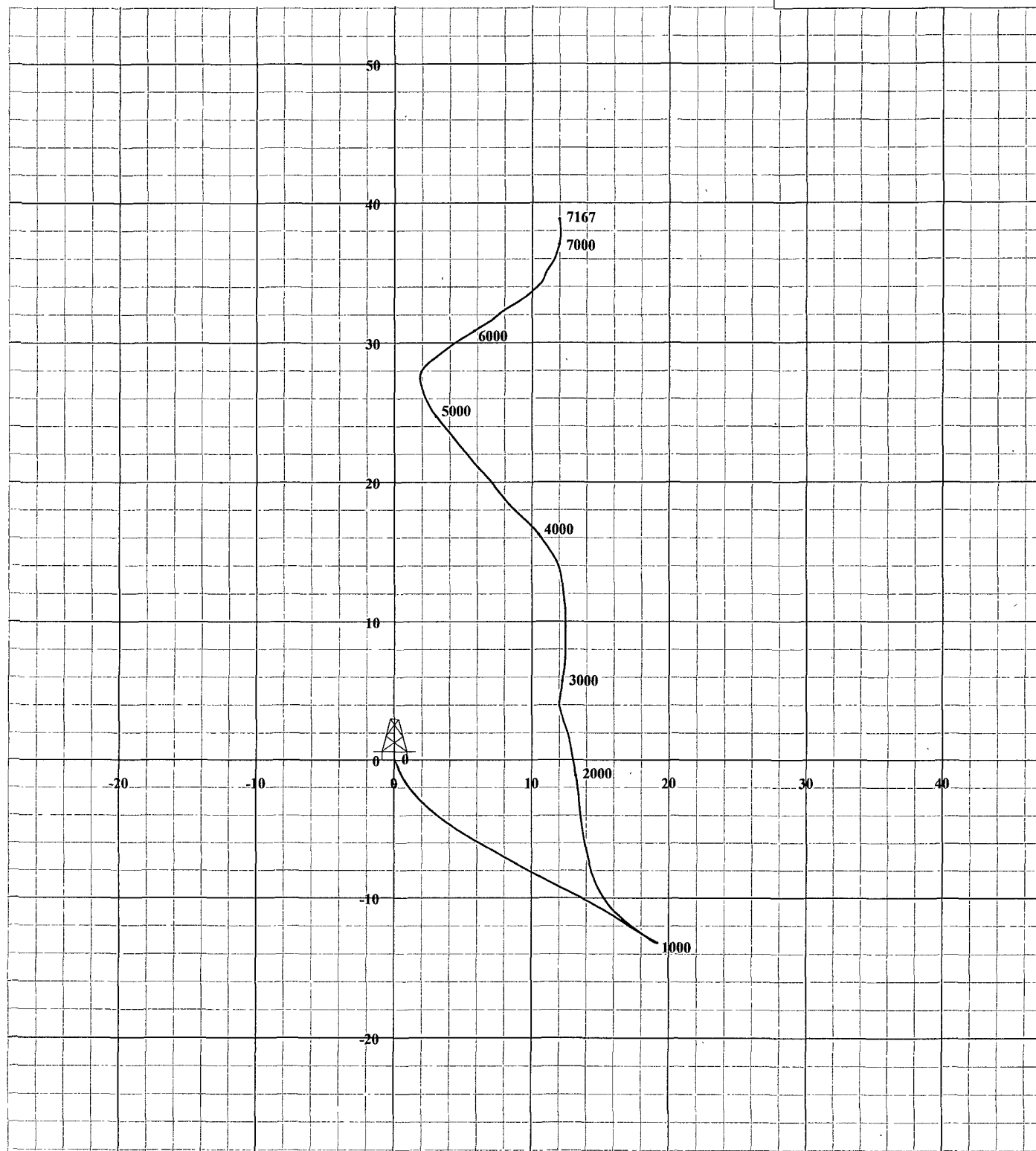
Scientific
Drilling

Field: Wildcat
Site: Eddy County, NM
Well: Cave Lake 13 Federal Com #1
Wellpath: VH - Job #32K0208114
Survey: 02/16/08



Azimuths to Grid North
True North: 0.00°
Magnetic North: 0.00°
Magnetic Field
Strength: 0nT
Dip Angle: 0.00°
Date: 03/09/2008
Model: sgr2000

South(-)/North(+) [10ft/in]



West(-)/East(+) [10ft/in]