

JAN 05 2009
OCD-ARTESIAUNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Confidential

OCD-ARTESIA

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

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

1a. Type of Well ☐ Oil Well ☒ Gas Well ☐ Dry ☐ Other		5. Lease Serial No. NM-94076 & NM-26105	
b. Type of Completion: ☐ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr. Other Re-enter and test horizontal Cisco canyon		6. If Indian, Allottee or Tribe Name	
2. Name of Operator Cimarex Energy Co. of Colorado		7. Unit or CA Agreement Name and No.	
3. Address PO Box 140907; Irving, TX 75014		8. Lease Name and Well No. Pintail 23 Federal 1	
3a. Phone No. (include area code) 972-443-6489		9. API Well No. 30-015-33431	
4. Location of Well (Report Location clearly and in accordance with Federal requirements)* At surface 1340' FNL & 990' FWL At top prod. interval reported below 1422' FNL & 937' FWL At total depth 806' FNL & 1385' FWL		10. Field and Pool, or Exploratory Cottonwood Draw; Upper Penn (GAS)	
14. Date Spudded 05.26.05		15. Date T.D. Reached 09.10.08	
16. Date Completed ☐ D & A ☒ Ready to Prod.		17. Elevations (DF, RKB, RT, GL)* 3291' GL	
18. Total Depth: TVD 10544' TMD 13,477'		19. Plug Back TD: TVD 10544' TMD 13,394'	
20. Depth Bridge Plug Set: MD TVD		21. Type Electric & Other Mechanical Logs Run (Submit copy of each)	
22. Was well cored? ☒ No ☐ Yes (Submit analysis)		Was DST run? ☒ No ☐ Yes (Submit report)	
Directional Survey ☐ No ☒ Yes (Submit copy)			

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23. Casing and Liner Record (Report all strings set in well)									
Hole Size	Size/Grade	Wt. (#/ft.)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sks. & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
17 1/2"	13 3/8" J-55	54.5#	0'	216'		250 sx prem Plus		0'	
12 1/4"	9 5/8" J55/p110	40#	0'	3431'		1100 sx Interfill C		0'	
8 3/4"	7" P-110	26#	0'	10754'		805 sx intr/prem H		0'	
6 1/8"	4 1/2" P-110	11.6#	10249'	13475'		400 sx POZ		10249'	

24. Tubing Record									
Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	
2 3/8"	10212'	10190'	2 3/8" X 2 7/8"						

25. Producing Intervals					26. Perforation Record			
Formation	Top	Bottom	Perforated Interval	Size	No. Holes	Perf. Status		
A) Cisco Canyon	10,316'	10,632'	13146'-13350'	0.43	96	Producing		
B) Cisco Canyon	10,316'	10,632'	12600'-12984'	0.43	96	Producing		
C) Cisco Canyon	10,316'	10,632'	11940'-12364'	0.43	96	Producing		
D) Cisco Canyon	10,316'	10,632'	11440'-11714'	0.43	96	Producing		
E) Cisco Canyon	10,316'	10,632'	10944'-11290'	0.43	96	Producing		

27. Acid, Fracture, Treatment, Cement Squeeze, etc.	
Depth Interval	Amount and Type of Material
13146'-13350'	Acid with 1000 gals of 15% NEFE, Frac with 447804 gals of slick water, 4500# 100 mesh white sand and 59137# of 30/50 white sand
12600'-12984'	Acid with 1000 gals of 15% NEFE, Frac with 562716 gals of slick water, 4650# 100 mesh white sand and 80161# of 30/50 white sand
11940'-12364'	Acid with 1000 gals of 15% NEFE, Frac with 679560 gals of slick water, 4286# 100 mesh white sand and 88956# of 30/50 white sand
11440'-11714'	Acid with 1000 gals of 15% NEFE, Frac with 453810 gals of slick water, 3950# 100 mesh white sand and 65872# of 30/50 white sand
10944'-11290'	Acid with 1000 gals of 15% NEFE, Frac with 548310 gals of slick water, 4250# 100 mesh white sand and 85160# of 30/50 white sand

28. Production - Interval A -									
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
10.05.08	10.20.08	24	→	0	1674	571		1.007	Flowing
Choke Size	Tbg. Press. Flwg.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio		Well Status
22/64	SI 1060	0	→	0	1674	571		Producing	DEC 22 2008
28. Production - Interval B -									
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.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	
	SI		→						

Accepted for record - NMOCD

8b. 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
Shoke ize	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

8c. 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
Shoke ize	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.*)

Sold

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
				Base Salt	1690'
				Delaware	1891'
				Bonespring	5,415'
				Wolfcamp	8595'
				Cisco Canyon	10316'
				Strawn	10632,

32. Additional remarks (include plugging procedure):

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 C-102, deviation report, Liner assembly

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*) Scott Haynes Title Regulatory Analyst

Signature *Scott Haynes* Date December 5, 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.

DISTRICT I
1625 N. FRANCH 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

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-33431	Pool Code 97354	Pool Name Cottonwood Draw; Upper Penn (GAS)
Property Code	Property Name PINTAIL 23 FEDERAL COM	Well Number 1
OGRID No. 162683	Operator Name CIMAREX ENERGY CO. OF COLORADO	Elevation 3330'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	23	25-S	26-E		1340	NORTH	990	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	23	25-S	26-E		806	NORTH	1385	EAST	EDDY

Dedicated Acres 320	Joint or Infill	Consolidation Code P	Order No.
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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

Diagram showing Surface Location (S.L.) and Bottom Hole Location (B.H.). Surface Location: 3330.2', 3324.7', 3327.5', 3323.5'. Distances: 990', 600'. Bottom Hole Location: 806' FNL & 1385' FEL. Horizontal Distance: 2904.68'. Geodetic Coordinates: NAD 27 NME, SURFACE LOCATION Y=406937.2 N, X=520132.3 E. LAT.=32°07'07.60" N, LONG.=104°16'05.90" W.	OPERATOR CERTIFICATION I hereby certify that the information 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 or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Scott Haynes</i> 12-05-08 Signature Date Scott Haynes 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. RONALD J. EIDSON MARCH 04 2004 Date Surveyed Signature & Seal of Professional Surveyor RONALD J. EIDSON Certificate No. GARY EIDSON 12841 RONALD EIDSON 3239
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DISTRICT LOCATION		Baker Oil Tools Liner Hanger Products		Baker Oil Tools				
Odessa, Texas		432-563-1900						
OPERATOR CIMAREX ENERGY CORPORATION	COMPANY REP. Guy Embry		SIZE	WEIGHT	GRADE	THREAD	DEPTH	
FIELD #1H	WELL NO. #1H	CASING	7.000	26.0	P-110	LT&C	10,754	
STATE New Mexico	LEASE Pintail 23 Fed		SIZE	WEIGHT	GRADE	THREAD	LENGTH	
RIG NAME PATTERSON #80	DATE SERVICE TICKET # 65363	LINER #1	4.500	11.6	P-110	BTC/LTC	3,226	
MD (ft.) 13,477		LINER #2						
FLUID TYPE Water Base	FLUID WEIGHT (PPG) 12.8		SIZE	WEIGHT	GRADE	THREAD	LENGTH	
DATE SUBMITTED 9/15/2008	SERVICE TICKET # 65363	DRILL PIPE #1	3.500	15.5	X-95	IF	10,260	
PREPARED BY JUNIOR AGUILAR	PHONE # 432-563-1900	DRILL PIPE #2						
KICK OFF POINT 10,285		DRILL PIPE #3						
		DRILL PIPE #4						
		DRILL PIPE #5						
Item Number	Material Number	Description	Depth (ft.)	Length (ft.)	OD (in.)	ID (in.)		
1	H29628AP09	ZXP PACKER- 5" X 7" Liner Top Packer with HR Profile, 5" 18.0# New Vam Box down, 10' PBR 5.750' X 5.250" P-110	10,249.04	20.61	6.000	4.276		
2	H297010597	PBR- 5" 18.0# New Vam Pin X 5" LT&C Pin 5.00" X 4.250" P-110	10,269.65	4.29	5.000	4.250		
3	H297010597	COLLAR- 5" 18.0# LT&C Box X Box	10,273.94	0.65	5.590	4.276		
4	H292330094	HYFLO II- 5" X 7" Hydraulic Liner Hanger with 3 slips 5" 18.0# LT&C Pin X Pin Q-125	10,274.59	5.43	6.043	4.276		
5	H299890233	COMBO COLLAR- 5" LT&C Box up X 4.5" 11.60# Buttress Box Down P-110	10,280.02	1.06	5.567	4.276		
6	H299890233	SPACER NIPPLE- 4.5" 11.60# Buttress Pin X Pin P-110	10,281.08	4.36	4.500	4.000		
7	CUSTOMER	LINER- 12 Joints of 4.5" 11.60# Buttress Liner P-110	10,285.44	509.75	4.500	4.000		
8	CUSTOMER	CROSSOVER- Crossover Joint 4.5" 11.60# Buttress Box Up X LT&C Pin down P-110	10,795.19	21.20	4.500	4.000		
9	CUSTOMER	LINER- 61 Joints of 4.5" 11.60# LT&C Liner P-110	10,816.39	2,569.53	4.500	4.000		
10	H274100100	LANDING COLLAR- 4.5" 11.60# LT&C Type I landing Collar with baffle P-110	13,385.92	1.60	5.000	4.000		
11	HNB131114X	FLOAT COLLAR- 4.5" 11.60# LT&C Double Valve Float Collar P-110	13,387.52	1.20	5.000	4.000		
12	CUSTOMER	LINER- 2 Joints of 4.5" 11.60# LT&C Liner P-110	13,388.72	84.56	4.500	4.000		
13	HNB131114X	SHOE- 4.5" 11.60# LT&C Double Valve Float Collar P-110	13,473.28	1.72	5.000	4.000		
14		BOTTOM OF LINER	13,475.00					
ALL DEPTHS ARE GIVEN AS TOPS UNLESS OTHERWISE NOTED								
A		TOP OF LINER: 10,249.04'						
B		OVERLAP: 504.96'						
C		TOTAL DEPTH: 13,477'						



2406 Gravel Drive
Ft. Worth, Texas 76118
firethorneenergy.com

TEL 817-595-2519
FAX 817-595-2537

Cimarex Energy Company of Colorado
P.O. Box 140907
Irving, TX 75014-0907

Attention: Natalie Krueger

Re: Pintail 23 Federal Com #1H
Eddy Co, New Mexico
API No. 30-015-33431

Enclosed, please find the original and one copy of the survey performed on the referenced well by Firethorne Energy Services, L.P. (P-5 No. 268988). Other information required by your office is as follows:

<u>Name & Title</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Date Performed</u>	<u>Type of Survey</u>
of Surveyor Ian Noble Vice-President	Original Hole	10281' – 10686	7/13/08 – 7/29/08	Directional MWD

If any other information is required, please contact the undersigned at the letterhead address and phone number.



Ian Noble
Vice-President

Enclosures

cc: Halliburton



2406 Gravel Drive
Ft. Worth, Texas 76118
firethorneenergy.com

TEL 817-595-2519
FAX 817-595-2537

State of New Mexico
County of Eddy

I, Ian Noble, certify that; I am employed by Firethorne Energy Services, L.P.; that I did on the day(s) of 07/13/08 through 07/29/08 conduct or supervise the taking of a directional MWD survey from a depth of 10281 feet to a depth of 10686 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Firethorne Energy Services, L.P.; that I am authorized and qualified to make this report; that this survey was conducted at the request of Cimarex Energy Company of Colorado for the Pintail 23 Federal Com #1H Well API No. 30-015-33431 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Firethorne Energy Services, L.P.



Ian Noble
Vice-President

Target TVD: 10680

Target Angle: 90

Section Plane: 78.73

Declination: 8.25

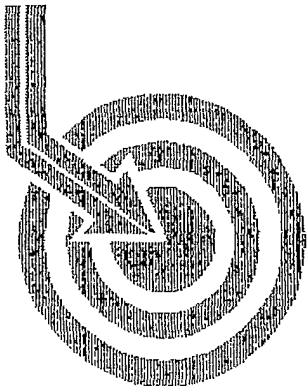
Survey Offset: 49 Feet

Job Number: FW-08028

SURVEY CALCULATION REPORT

Calculations: Minimum Curvature

[illegible]



Scientific Drilling

CIMAREX ENERGY

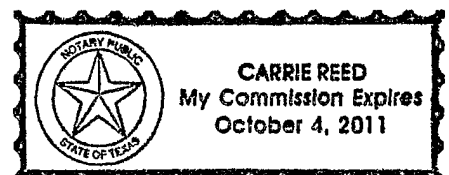
Field: Cottonwood Draw
Site: Eddy County, NM
Well: Pintail 23 Federal Com #1
Wellpath: VH - Job #32K0708529
Survey: 07/11/08

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

.....*Richard*.....Company Representative

Notorized this date 11th of August, 2008.

Carrie Reed
Notary Signature
County of Midland
State of Texas





Scientific
Drilling

Scientific Drilling International

Survey Report

Company: CIMAREX ENERGY	Date: 08/10/2008	Time: 17:11:40	Page: 1
Field: Cottonwood Draw	Co-ordinate(NE) Reference:	Site: Eddy County, NM, Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE: 0.0	
Well: Pintail 23 Federal Com #1	Section (VS) Reference:	Well (0.00N,0.00E,78.73Azi)	
Wellpath: VH - Job #32K0708529	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Survey: 07/11/08	Start Date: 07/11/2008
Company: Scientific Drilling Internatio	Engineer: Guebara/Madrid w/P&M
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	359.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.46	259.29	100.00	-0.40	-0.07	-0.39	0.46	0.40	259.29
200.00	0.89	275.81	199.99	-1.55	-0.07	-1.56	0.47	1.56	267.41
300.00	0.78	274.62	299.98	-2.94	0.06	-3.01	0.11	3.01	271.20
400.00	0.76	290.29	399.97	-4.16	0.35	-4.31	0.21	4.33	274.61
500.00	0.77	296.97	499.96	-5.25	0.88	-5.53	0.09	5.60	279.06
600.00	0.67	327.68	599.96	-5.99	1.68	-6.45	0.39	6.66	284.62
700.00	0.80	322.57	699.95	-6.51	2.73	-7.18	0.15	7.68	290.81
800.00	0.58	308.87	799.94	-7.14	3.60	-8.00	0.27	8.77	294.24
900.00	0.70	311.39	899.93	-7.84	4.32	-8.85	0.12	9.85	296.03
1000.00	0.38	344.14	999.93	-8.23	5.05	-9.40	0.43	10.67	298.22
1100.00	0.93	51.56	1099.92	-7.54	5.87	-8.86	0.86	10.63	303.53
1200.00	1.28	57.43	1199.91	-5.78	6.98	-7.28	0.37	10.08	313.78
1300.00	1.65	61.60	1299.87	-3.36	8.26	-5.07	0.38	9.69	328.45
1400.00	1.93	72.25	1399.82	-0.31	9.46	-2.20	0.43	9.71	346.90
1500.00	2.70	76.02	1499.74	3.71	10.54	1.69	0.78	10.68	9.09
1600.00	3.01	80.35	1599.62	8.69	11.55	6.56	0.38	13.28	29.60
1700.00	3.05	79.60	1699.48	13.98	12.47	11.77	0.06	17.15	43.33
1800.00	2.72	85.01	1799.35	19.00	13.16	16.75	0.43	21.30	51.84
1900.00	2.43	82.33	1899.25	23.47	13.65	21.21	0.31	25.22	57.24
2000.00	2.00	82.22	1999.17	27.33	14.17	25.04	0.43	28.77	60.50
2100.00	1.64	81.93	2099.12	30.50	14.60	28.19	0.36	31.75	62.61
2200.00	1.51	82.18	2199.09	33.24	14.98	30.91	0.13	34.35	64.14
2300.00	1.26	77.93	2299.06	35.66	15.39	33.29	0.27	36.68	65.18
2400.00	1.05	76.95	2399.04	37.67	15.83	35.26	0.21	38.65	65.82
2500.00	0.87	79.58	2499.02	39.35	16.17	36.90	0.19	40.29	66.33
2600.00	0.63	70.31	2599.01	40.65	16.50	38.16	0.27	41.57	66.62
2700.00	0.52	90.68	2699.01	41.64	16.68	39.13	0.23	42.54	66.92
2800.00	0.40	69.99	2799.01	42.43	16.79	39.91	0.20	43.30	67.19
2900.00	0.34	74.49	2899.00	43.07	16.99	40.53	0.07	43.94	67.26
3000.00	0.30	358.25	2999.00	43.41	17.33	40.81	0.40	44.33	66.99
3100.00	0.41	336.41	3099.00	43.37	17.92	40.65	0.17	44.43	66.21
3200.00	0.66	325.83	3199.00	43.07	18.72	40.19	0.27	44.34	65.02
3300.00	0.56	319.11	3298.99	42.61	19.57	39.54	0.12	44.12	63.67
3400.00	0.60	291.79	3398.99	41.93	20.13	38.74	0.28	43.66	62.54
3500.00	0.55	288.49	3498.98	41.07	20.48	37.80	0.06	42.99	61.55
3600.00	1.09	237.80	3598.97	39.77	20.13	36.54	0.85	41.71	61.15
3700.00	0.54	270.31	3698.96	38.42	19.62	35.26	0.70	40.35	60.91
3800.00	0.43	285.43	3798.96	37.62	19.72	34.43	0.17	39.68	60.19
3900.00	0.54	268.93	3898.95	36.82	19.82	33.60	0.18	39.00	59.47
4000.00	0.48	285.54	3998.95	35.98	19.92	32.72	0.16	38.31	58.67
4100.00	0.57	259.99	4098.95	35.11	19.94	31.83	0.25	37.56	57.93
4200.00	0.49	267.86	4198.94	34.19	19.84	30.91	0.11	36.73	57.30
4300.00	0.62	247.40	4298.94	33.24	19.62	29.98	0.24	35.83	56.80
4400.00	0.65	242.93	4398.93	32.16	19.15	28.98	0.06	34.74	56.54
4500.00	0.79	228.06	4498.92	31.02	18.43	27.96	0.23	33.49	56.61
4600.00	0.85	215.12	4598.91	29.89	17.37	27.02	0.19	32.12	57.27
4700.00	0.87	195.67	4698.90	29.01	16.03	26.39	0.29	30.88	58.73
4800.00	0.94	195.47	4798.89	28.30	14.51	25.97	0.07	29.74	60.81



Scientific Drilling International

Survey Report

Company: CIMAREX ENERGY	Date: 08/10/2008	Time: 17:11:40	Page: 2
Field: Cottonwood Draw	Co-ordinate(NE) Reference:	Site: Eddy County, NM, Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE 0,0	
Well: Pintail 23 Federal Com #1	Section (VS) Reference:	Well (0.00N,0.00E,78.73Azi)	
Wellpath: VH - Job #32K0708529	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	1.11	180.15	4898.87	27.74	12.75	25.74	0.32	28.73	63.66
5000.00	1.37	176.72	4998.85	27.38	10.59	25.81	0.27	27.90	67.70
5100.00	1.43	175.18	5098.82	27.07	8.15	25.98	0.07	27.23	72.59
5200.00	1.70	174.41	5198.78	26.79	5.43	26.23	0.27	26.79	78.31
5300.00	1.75	184.30	5298.74	26.23	2.43	26.26	0.30	26.37	84.71
5400.00	1.77	187.89	5398.69	25.31	-0.62	25.94	0.11	25.94	91.38
5500.00	1.58	192.00	5498.65	24.26	-3.50	25.44	0.22	25.68	97.84
5600.00	1.55	175.85	5598.61	23.55	-6.20	25.25	0.44	26.00	103.79
5700.00	1.39	187.38	5698.58	23.00	-8.75	25.19	0.34	26.67	109.15
5800.00	1.41	214.43	5798.55	21.73	-10.97	24.34	0.66	26.70	114.26
5900.00	1.39	236.48	5898.52	19.72	-12.65	22.63	0.54	25.93	119.21
6000.00	0.24	261.36	5998.51	18.39	-13.35	21.41	1.18	25.24	121.95
6100.00	1.35	152.33	6098.50	18.52	-14.43	21.75	1.45	26.10	123.55
6200.00	1.50	154.10	6198.47	19.18	-16.65	22.87	0.16	28.29	126.05
6300.00	1.06	157.67	6298.44	19.69	-18.68	23.80	0.45	30.25	128.13
6400.00	1.04	180.18	6398.43	19.68	-20.45	24.14	0.41	31.64	130.26
6500.00	1.20	195.18	6498.41	19.04	-22.36	23.87	0.33	32.71	133.14
6600.00	1.43	199.63	6598.38	17.93	-24.55	23.17	0.25	33.76	136.65
6700.00	0.99	210.47	6698.36	16.71	-26.47	22.32	0.49	34.62	139.86
6800.00	1.41	289.75	6798.34	15.08	-26.80	20.72	1.56	33.87	142.29
6900.00	1.77	285.88	6898.30	12.66	-25.96	18.08	0.38	31.63	145.15
7000.00	2.39	278.23	6998.24	9.32	-25.24	14.53	0.68	29.12	150.07
7100.00	2.96	261.93	7098.13	4.77	-25.30	9.91	0.95	27.17	158.61
7200.00	3.39	253.52	7197.98	-0.75	-26.50	4.52	0.63	26.89	170.33
7300.00	3.68	246.98	7297.79	-6.84	-28.60	-1.27	0.50	28.63	182.55
7400.00	3.32	245.00	7397.60	-12.79	-31.08	-6.85	0.38	31.82	192.43
7500.00	2.91	237.76	7497.45	-17.97	-33.65	-11.62	0.57	35.60	199.05
7600.00	2.44	231.92	7597.34	-22.24	-36.32	-15.44	0.54	39.47	203.04
7700.00	2.31	228.80	7697.26	-25.89	-38.96	-18.64	0.18	43.19	205.56
7800.00	2.37	228.32	7797.17	-29.42	-41.66	-21.70	0.06	46.97	207.51
7900.00	1.74	236.91	7897.11	-32.61	-43.87	-24.51	0.70	50.25	209.20
8000.00	1.45	227.06	7997.07	-35.10	-45.56	-26.71	0.40	52.81	210.38
8100.00	1.33	220.38	8097.04	-37.09	-47.30	-28.39	0.20	55.17	210.97
8200.00	1.37	226.20	8197.01	-39.00	-49.02	-30.00	0.14	57.47	211.47
8300.00	1.36	225.66	8296.99	-41.01	-50.67	-31.72	0.02	59.78	212.04
8400.00	1.28	223.32	8396.96	-42.91	-52.31	-33.33	0.10	62.03	212.50
8500.00	1.10	218.20	8496.94	-44.55	-53.88	-34.69	0.21	64.08	212.77
8600.00	0.78	172.46	8596.93	-45.33	-55.31	-35.19	0.79	65.56	212.47
8700.00	0.79	170.68	8696.92	-45.39	-56.67	-34.99	0.03	66.60	211.70
8800.00	0.31	169.12	8796.91	-45.42	-57.61	-34.83	0.48	67.32	211.16
8900.00	0.33	180.72	8896.91	-45.48	-58.17	-34.78	0.07	67.77	210.88
9000.00	0.52	186.99	8996.91	-45.68	-58.90	-34.84	0.20	68.44	210.60
9100.00	0.38	205.41	9096.90	-46.02	-59.65	-35.04	0.20	69.18	210.43
9200.00	0.45	244.88	9196.90	-46.60	-60.12	-35.54	0.29	69.84	210.59
9300.00	0.73	243.86	9296.90	-47.60	-60.57	-36.46	0.28	70.70	211.05
9400.00	1.41	264.28	9396.88	-49.44	-60.97	-38.26	0.77	71.98	212.11
9500.00	1.42	265.17	9496.85	-51.89	-61.20	-40.72	0.02	73.51	213.64
9600.00	1.60	266.78	9596.81	-54.51	-61.38	-43.35	0.18	75.14	215.23
9700.00	1.63	252.23	9696.77	-57.30	-61.89	-46.10	0.41	77.17	216.68
9800.00	1.90	200.97	9796.73	-59.60	-63.87	-48.04	1.55	79.93	216.95
9900.00	2.59	198.92	9896.66	-61.62	-67.56	-49.37	0.69	83.68	216.16
10000.00	2.64	216.01	9996.55	-64.45	-71.56	-51.46	0.78	88.14	215.72



Scientific
Drilling

Scientific Drilling International

Survey Report

Company: CIMAREX ENERGY
Field: Cottonwood Draw
Site: Eddy County, NM
Well: Pintail 23 Federal Com #1
Wellpath: VH - Job #32K0708529

Date: 08/10/2008 Time: 17:11:40 Page: 3
Co-ordinate(NE) Reference: Site: Eddy County, NM, Grid North
Vertical (TVD) Reference: SITE 0.0
Section (VS) Reference: Well (0.00N,0.00E,78.73Azi)
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
10100.00	2.49	224.90	10096.45	-67.95	-74.96	-54.34	0.42	92.59	215.94
10200.00	2.32	230.90	10196.36	-71.54	-77.78	-57.45	0.30	96.69	216.45
10300.00	1.98	231.73	10296.29	-74.87	-80.12	-60.38	0.34	100.32	217.00
10400.00	1.86	232.66	10396.24	-77.87	-82.18	-63.02	0.12	103.56	217.48
10500.00	1.89	232.06	10496.18	-80.80	-84.18	-65.61	0.04	106.73	217.94
10600.00	1.89	228.12	10596.13	-83.69	-86.29	-68.14	0.13	109.95	218.30
10700.00	1.65	227.62	10696.08	-86.34	-88.36	-70.43	0.24	113.00	218.56
10761.00	1.65	223.83	10757.06	-87.82	-89.59	-71.69	0.18	114.74	218.67



Scientific
Drilling

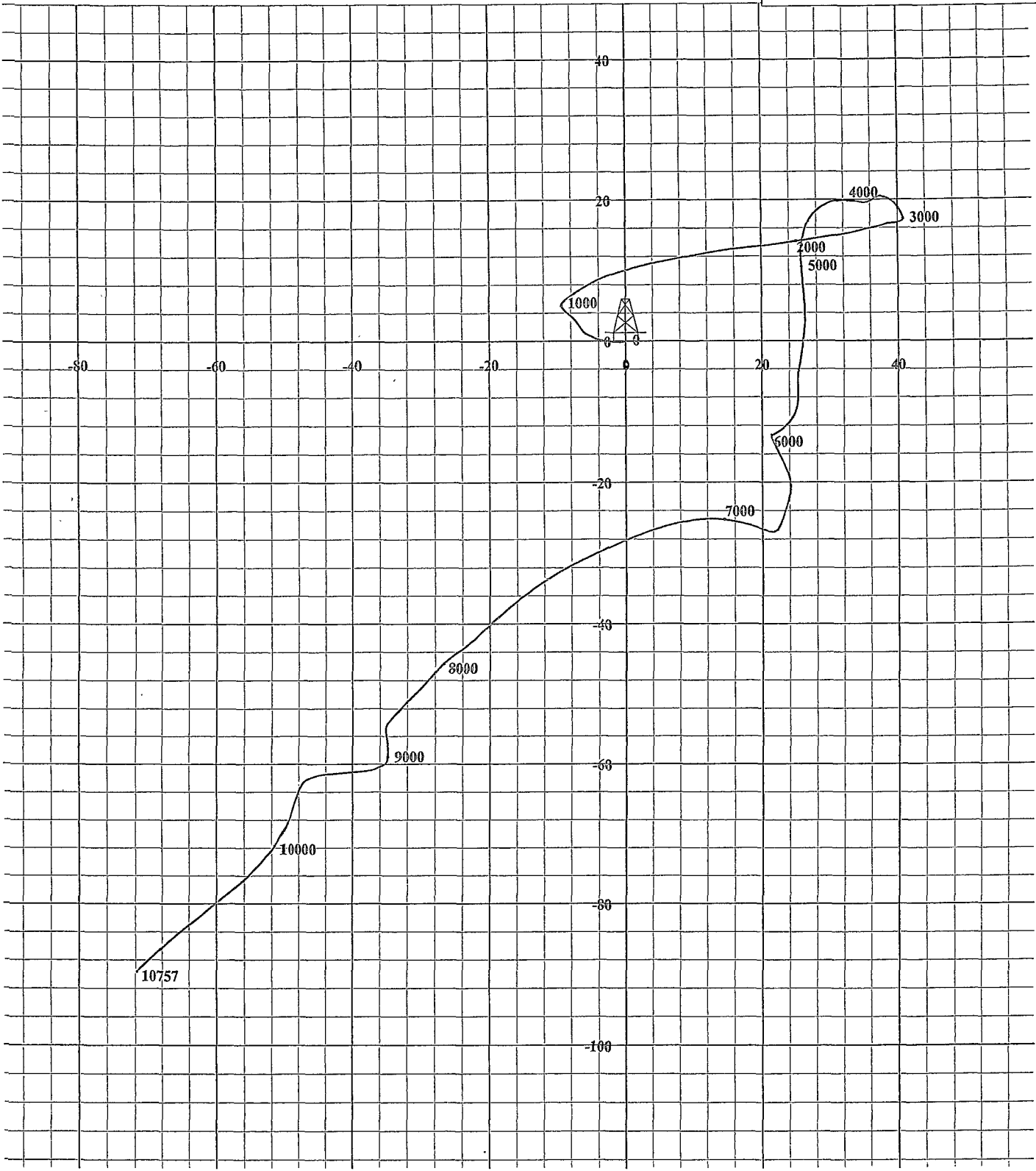
Field: Cottonwood Draw
Site: Eddy County, NM
Well: Pintail 23 Federal Com #1
Wellpath: VH - Job #32K0708529
Survey: 07/11/08

GTM

0

Azimuths to Grid North
True North: 0.00°
Magnetic North: 0.00°
Magnetic Field
Strength: 0nT
Dip Angle: 0.00°
Date: 05/10/2008
Model: IGR2000

South(-)/North(+) [20ft/in]



West(-)/East(+) [20ft/in]

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Pintail 23 Federal Com #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Site:	Pintail 23 Federal Com #1H	MD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Well:	Pintail 23 Federal Com #1H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Sperry MWD Survey #1	Database:	EDM 2003.14 Server Db

Project:	Eddy County, NM (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:		Pintail 23 Federal Com #1H			
Site Position:		Northings:	406,937.20 ft	Latitude:	32° 7' 7.564 N
From:	Map	Easting:	520,132.30 ft	Longitude:	104° 16' 5.911 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.03 °

Well:	Pintail 23 Federal Com #1H					
Well Position	+N-S	0.00 ft	Northings:	406,937.20 ft	Latitude:	32° 7' 7.564 N
	+E-W	0.00 ft	Easting:	520,132.30 ft	Longitude:	104° 16' 5.911 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	3,348.00 ft	Ground Level:	3,330.00 ft

Wellbore:	Lateral #1				
Magnetics:	Model Name	Sample Date	Declination (μ)	Dip Angle (δ)	Field Strength (nT)
	IGRF200510	7/30/2008	8.22	60.04	48,784

Design:	Sperry MWD Survey #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	10,200.00
Vertical Section:	Depth From (TVD)	N-S	E-W	Direction:	
	(ft)	(ft)	(ft)	(ft)	
	0.00	0.00	0.00	78.73	

Survey Program		Date: 8/10/2008		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	10,200.00	Gyro Survey #1 (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s
10,200.00	10,621.00	Sperry Survey #1 (Lateral #1)	MWD	MWD - Standard
10,686.00	10,857.00	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)
10,621.00	73.30	82.10	10,548.52	-79.93	118.58	100.67	0.00	0.00	0.00
10,686.00	83.90	81.80	10,561.35	-71.02	181.58	164.20	16.31	16.31	-0.46
First MWD Survey									
10,706.00	84.70	81.40	10,563.34	-68.11	201.26	184.07	4.47	4.00	-2.00
10,738.00	87.10	81.90	10,565.62	-63.48	232.84	215.95	7.66	7.50	1.56
10,770.00	92.10	81.00	10,565.85	-58.72	264.47	247.90	15.88	15.63	-2.81
10,802.00	95.00	80.80	10,563.87	-53.67	296.01	279.81	9.08	9.06	-0.63
Last MWD Survey									
10,857.00	93.80	80.30	10,559.65	-44.67	350.10	334.62	2.36	-2.18	-0.91
Proj. to Bit									

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Pintail 23 Federal Com #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Site:	Pintail 23 Federal Com #1H	MD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Well:	Pintail 23 Federal Com #1H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Sperry MWD Survey #1	Database:	EDM 2003.14 Server Db

Targets									
Target Name	hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	
- Shape		(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	
HL[PT23FC#1H]		0.00	0.00	0.00	0.00	0.00	406,937.20	520,132.30	32° 7' 7.564 N 104° 16' 5.911 W
- survey misses by 10549.49ft at 10621.00ft MD (10548.52 TVD, -79.93 N, 118.58 E)									
- Rectangle (sides W3,960.00 H3,960.00 D0.00)									
PBHL#1[PT23FC#1H]		0.00	0.00	10,558.00	680.00	3,630.00	407,617.20	523,762.30	32° 7' 14.270 N 104° 15' 23.696 W
- survey misses by 3359.00ft at 10857.00ft MD (10559.65 TVD, -44.67 N, 350.10 E)									
- Point									
LL[PT23FC#1H]		0.00	0.00	0.00	0.00	0.00	406,937.20	520,132.30	32° 7' 7.564 N 104° 16' 5.911 W
- survey misses by 10549.49ft at 10621.00ft MD (10548.52 TVD, -79.93 N, 118.58 E)									
- Rectangle (sides W5,280.00 H5,280.00 D0.00)									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
10,686.00	10,561.35	-71.02	181.58	First MWD Survey
10,802.00	10,563.87	-53.67	296.01	Last MWD Survey
10,857.00	10,559.65	-44.67	350.10	Proj. to Bit

Checked By: _____ Approved By: _____ Date: _____

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Pintail 23 Federal Com #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Site:	Pintail 23 Federal Com #1H	MD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Well:	Pintail 23 Federal Com #1H	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack #1	Database:	EDM 2003.14 Server Db

Project:	Eddy County, NM (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Pintail 23 Federal Com #1H		
Site Position:		Northing:	406,937.20 ft
From:	Map	Easting:	520,132.30 ft
Position Uncertainty:	0.00 ft	Slot Radius:	"
		Latitude:	32° 7' 7.564 N
		Longitude:	104° 16' 5.911 W
		Grid Convergence:	0.03 °

Well:	Pintail 23 Federal Com #1H					
Well Position	+N-S	0.00 ft	Northing:	406,937.20 ft	Latitude:	32° 7' 7.564 N
	+E-W	0.00 ft	Easting:	520,132.30 ft	Longitude:	104° 16' 5.911 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	3,348.00 ft	Ground Level:	3,330.00 ft

Wellbore:	Sidetrack #1				
Magnetics:	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	8/22/2008	8.22	60.04	48,778

Design:	Sidetrack #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	10,621.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	91.95	

Survey Program		Date: 9/19/2008		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	10,200.00	Gyro Survey #1 (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s
10,200.00	10,621.00	Sperry Survey #1 (Lateral #1)	MWD	MWD - Standard
10,621.00	13,477.00	MWD Survey #2 (ST#1) (Sidetrack #1)	MWD	MWD - Standard

Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn
Depth (ft)	(°)	(°)	Depth (ft)	(ft)	(ft)	Section (ft)	Rate (°/100ft)	Rate (°/100ft)	Rate (°/100ft)
10,621.00	73.30	82.10	10,548.52	-79.93	118.58	121.22	0.00	0.00	0.00
Tie On (ST #1)									
10,686.00	83.90	81.80	10,561.35	-71.02	181.58	183.88	16.31	16.31	-0.46
First MWD Survey (ST #1)									
10,706.00	84.70	81.40	10,563.34	-68.11	201.26	203.46	4.47	4.00	-2.00
10,738.00	87.10	81.90	10,565.62	-63.48	232.84	234.86	7.66	7.50	1.56
10,770.00	92.10	81.00	10,565.85	-58.72	264.47	266.32	15.88	15.63	-2.81
10,808.00	94.10	78.10	10,563.79	-51.84	301.78	303.37	9.26	5.26	-7.63
10,839.00	91.40	77.20	10,562.30	-45.22	332.03	333.37	9.18	-8.71	-2.90
10,871.00	91.50	77.30	10,561.49	-38.16	363.23	364.32	0.44	0.31	0.31
10,903.00	91.90	77.60	10,560.54	-31.21	394.45	395.28	1.56	1.25	0.94

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Pintail 23 Federal Com #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Site:	Pintail 23 Federal Com #1H	MD Reference:	KB Elev @ 3348.00ft (KB Elevation Patterson Rig #80)
Well:	Pintail 23 Federal Com #1H	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack #1	Database:	EDM 2003.14 Server Db

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)
10,934.00	91.50	78.60	10,559.63	-24.82	424.77	425.37	3.47	-1.29	3.23
10,966.00	91.00	77.70	10,558.93	-18.25	456.08	456.44	3.22	-1.56	-2.81
10,998.00	90.60	78.80	10,558.48	-11.73	487.41	487.52	3.66	-1.25	3.44
11,029.00	89.80	79.30	10,558.37	-5.84	517.84	517.74	3.04	-2.58	1.61
11,061.00	90.30	79.20	10,558.34	0.12	549.28	548.96	1.59	1.56	-0.31
11,093.00	91.00	78.90	10,557.98	6.20	580.70	580.15	2.38	2.19	-0.94
11,124.00	91.10	78.70	10,557.41	12.22	611.10	610.33	0.72	0.32	-0.65
11,156.00	90.10	78.60	10,557.08	18.52	642.47	641.47	3.14	-3.13	-0.31
11,188.00	88.80	78.50	10,557.39	24.87	673.83	672.60	4.07	-4.06	-0.31
11,219.00	89.20	78.40	10,557.93	31.08	704.20	702.74	1.33	1.29	-0.32
11,251.00	89.50	78.50	10,558.29	37.48	735.55	733.85	0.99	0.94	0.31
11,283.00	90.10	78.40	10,558.40	43.89	766.90	764.97	1.90	1.88	-0.31
11,315.00	90.60	78.30	10,558.21	50.35	798.24	796.07	1.59	1.56	-0.31
11,346.00	91.00	78.10	10,557.77	56.69	828.58	826.18	1.44	1.29	-0.65
11,378.00	90.00	77.80	10,557.49	63.37	859.88	857.23	3.26	-3.13	-0.94
11,409.00	90.20	77.50	10,557.44	70.00	890.16	887.27	1.16	0.65	-0.97
11,441.00	89.90	77.20	10,557.41	77.01	921.38	918.24	1.33	-0.94	-0.94
11,473.00	89.70	77.40	10,557.52	84.04	952.60	949.20	0.88	-0.63	0.63
11,505.00	90.00	77.10	10,557.61	91.11	983.81	980.15	1.33	0.94	-0.94
11,537.00	90.50	77.20	10,557.47	98.22	1,015.01	1,011.09	1.59	1.56	0.31
11,568.00	90.20	76.90	10,557.28	105.17	1,045.22	1,041.05	1.37	-0.97	-0.97
11,600.00	91.00	77.20	10,556.94	112.34	1,076.40	1,071.97	2.67	2.50	0.94
11,632.00	91.20	77.60	10,556.33	119.32	1,107.63	1,102.94	1.40	0.63	1.25
11,664.00	91.20	77.30	10,555.66	126.27	1,138.86	1,133.91	0.94	0.00	-0.94
11,695.00	90.80	76.90	10,555.12	133.19	1,169.07	1,163.87	1.82	-1.29	-1.29
11,727.00	90.50	76.20	10,554.75	140.63	1,200.19	1,194.72	2.38	-0.94	-2.19
11,759.00	89.90	75.70	10,554.64	148.40	1,231.23	1,225.48	2.44	-1.88	-1.56
11,791.00	90.20	76.20	10,554.61	156.17	1,262.27	1,256.24	1.82	0.94	1.56
11,822.00	90.00	76.00	10,554.56	163.62	1,292.37	1,286.06	0.91	-0.65	-0.65
11,854.00	88.90	76.10	10,554.87	171.33	1,323.42	1,316.84	3.45	-3.44	0.31
11,886.00	89.90	76.30	10,555.20	178.97	1,354.49	1,347.63	3.19	3.13	0.63
11,917.00	88.10	75.30	10,555.74	186.57	1,384.54	1,377.41	6.64	-5.81	-3.23
11,948.00	86.60	75.80	10,557.18	194.30	1,414.53	1,407.11	5.10	-4.84	1.61
11,980.00	87.30	75.80	10,558.88	202.13	1,445.51	1,437.81	2.19	2.19	0.00
12,012.00	88.50	76.30	10,560.05	209.84	1,476.54	1,468.56	4.06	3.75	1.56
12,043.00	89.90	76.50	10,560.48	217.13	1,506.67	1,498.42	4.56	4.52	0.65
12,075.00	89.70	76.40	10,560.60	224.63	1,537.78	1,529.26	0.70	-0.63	-0.31
12,107.00	89.20	76.50	10,560.90	232.13	1,568.88	1,560.10	1.59	-1.56	0.31
12,139.00	88.90	77.00	10,561.43	239.46	1,600.03	1,590.97	1.82	-0.94	1.56
12,170.00	89.50	77.00	10,561.87	246.43	1,630.23	1,620.92	1.94	1.94	0.00
12,202.00	89.20	77.40	10,562.23	253.52	1,661.43	1,651.86	1.56	-0.94	1.25
12,233.00	90.30	77.60	10,562.37	260.23	1,691.70	1,681.88	3.61	3.55	0.65
12,265.00	88.30	77.50	10,562.76	267.13	1,722.94	1,712.87	6.26	-6.25	-0.31
12,296.00	88.70	78.40	10,563.57	273.60	1,753.25	1,742.94	3.18	1.29	2.90
12,328.00	90.30	77.50	10,563.85	280.28	1,784.54	1,773.99	5.74	5.00	-2.81
12,359.00	92.10	77.90	10,563.20	286.88	1,814.82	1,804.03	5.95	5.81	1.29
12,391.00	91.20	77.70	10,562.28	293.64	1,846.08	1,835.05	2.88	-2.81	-0.63
12,422.00	91.80	78.40	10,561.47	300.06	1,876.40	1,865.13	2.97	1.94	2.26
12,453.00	92.00	79.10	10,560.44	306.10	1,906.79	1,895.29	2.35	0.65	2.26
12,485.00	91.70	79.00	10,559.40	312.18	1,938.19	1,926.47	0.99	-0.94	-0.31
12,516.00	92.20	79.40	10,558.35	317.98	1,968.62	1,956.69	2.07	1.61	1.29
12,548.00	91.40	79.20	10,557.34	323.92	2,000.05	1,987.90	2.58	-2.50	-0.63
12,580.00	91.20	79.20	10,556.62	329.91	2,031.48	2,019.10	0.63	-0.63	0.00
12,612.00	90.80	77.80	10,556.06	336.29	2,062.83	2,050.22	4.55	-1.25	-4.38

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Pintail 23 Federal Com #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	KB ELev @ 3348.00ft (KB Elevation Patterson Rig #80)
Site:	Pintail 23 Federal Com #1H	MD Reference:	KB ELev @ 3348.00ft (KB Elevation Patterson Rig #80)
Well:	Pintail 23 Federal Com #1H	North Reference:	Grid
Wellbore:	Sidetrack #1	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack #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)	
12,643.00	91.00	77.70	10,555.57	342.87	2,093.12	2,080.27	0.72	0.65	-0.32	
12,675.00	91.00	78.30	10,555.01	349.52	2,124.41	2,111.32	1.87	0.00	1.88	
12,706.00	91.00	77.80	10,554.47	355.94	2,154.74	2,141.41	1.61	0.00	-1.61	
12,738.00	90.60	77.00	10,554.03	362.92	2,185.96	2,172.38	2.79	-1.25	-2.50	
12,770.00	90.80	76.60	10,553.64	370.23	2,217.12	2,203.26	1.40	0.63	-1.25	
12,802.00	90.60	76.50	10,553.24	377.67	2,248.24	2,234.11	0.70	-0.63	-0.31	
12,833.00	91.30	77.10	10,552.73	384.75	2,278.41	2,264.03	2.97	2.26	1.94	
12,865.00	90.80	77.60	10,552.14	391.75	2,309.63	2,294.99	2.21	-1.56	1.56	
12,897.00	89.50	76.90	10,552.06	398.82	2,340.84	2,325.94	4.61	-4.06	-2.19	
12,928.00	89.90	77.10	10,552.22	405.79	2,371.04	2,355.90	1.44	1.29	0.65	
12,960.00	90.50	76.90	10,552.11	412.99	2,402.22	2,386.81	1.98	1.88	-0.63	
12,991.00	90.90	76.80	10,551.73	420.04	2,432.41	2,416.74	1.33	1.29	-0.32	
13,023.00	90.90	77.90	10,551.23	427.05	2,463.63	2,447.70	3.44	0.00	3.44	
13,054.00	91.50	76.60	10,550.58	433.89	2,493.86	2,477.68	4.62	1.94	-4.19	
13,086.00	91.50	76.40	10,549.74	441.35	2,524.96	2,508.52	0.62	0.00	-0.63	
13,117.00	89.90	76.00	10,549.36	448.75	2,555.06	2,538.35	5.32	-5.16	-1.29	
13,149.00	89.50	76.30	10,549.53	456.41	2,586.13	2,569.14	1.56	-1.25	0.94	
13,181.00	89.40	76.40	10,549.84	463.96	2,617.23	2,599.96	0.44	-0.31	0.31	
13,212.00	89.20	76.30	10,550.22	471.27	2,647.35	2,629.82	0.72	-0.65	-0.32	
13,244.00	90.60	77.10	10,550.27	478.64	2,678.49	2,660.69	5.04	4.38	2.50	
13,275.00	90.60	76.50	10,549.95	485.71	2,708.67	2,690.61	1.94	0.00	-1.94	
13,307.00	90.60	76.60	10,549.61	493.16	2,739.79	2,721.46	0.31	0.00	0.31	
13,339.00	92.40	75.60	10,548.78	500.84	2,770.84	2,752.23	6.43	5.63	-3.13	
13,371.00	92.90	76.20	10,547.30	508.63	2,801.84	2,782.95	2.44	1.56	1.88	
13,403.00	91.90	76.10	10,545.96	516.28	2,832.88	2,813.72	3.14	-3.13	-0.31	
Last MWD Survey (ST #1)										
13,477.00	91.90	76.10	10,543.50	534.05	2,904.68	2,884.87	0.00	0.00	0.00	
Proj to Bit (ST #1)										