ATS-07-614
EA-07-1226

OCD-ARTESIA

FEB 22 2008

OCD-ARTESIA

Form 3160-3
(April 2004)

FORM APPROVED
OMB No 1004-0137
Expires March 31, 2007

BHL

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HIGH CAVE/KARST

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a Type of Work. [X] DRILL [ ] REENTER	5 Lease Serial No NM 103600 1 ~~State Surface~~ NM 97128 SHL 6 If Indian, Allotee or Tribe Name
1b Type of Well [X] Oil Well [ ] Gas Well [ ] Other [X] Single Zone [ ] Multiple Zone	7 If Unit or CA Agreement, Name and No. Pending 8. Lease Name and Well No Cave Lake 24 ~~State~~ Fed Com No. 1H
2 Name of Operator Cimarex Energy Co. of Colorado	9 API Well No 30-015- 36143
3a Address PO Box 140907 Irving, TX 75014	3b Phone No *(include area code)* 972-401-3111
	10 Field and Pool, or Exploratory Crow Flats; Wolfcamp; ..
4 Location of Well *(Report location clearly and in accordance with any State requirements *)* At Surface ~~660' FSL & 330' FEL~~ 910'FSL & 330'FWL At proposed prod Zone ~~660' FSL & 330' FWL~~ 660'FSL & 330'FEL	11 Sec , T R M or Blk and Survey or Area 24-16S-28E
14. Distance in miles and direction from nearest town or post office* C.L. 01/29/08 16 miles E/SE of Lake Arthur	12 County or Parish Eddy 13. State NM

15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drlg. unit line if any) 330'	16 No of acres in lease	17 Spacing Unit dedicated to this well S2S2 160
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. NA	19. Proposed Depth 6750' Pilot Hole MD 11443' TVD 7070'	20. BLM/BIA Bond No on File NM-2575
21 Elevations (Show whether DF, KDB, RT, GL, etc.) 3591' GR	22. Approximate date work will start* 11/25/2007	23. Estimated duration 35-45 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

1. Well plat certified by a registered surveyor
2. A Drilling Plan
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office)
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator Certification
6. Such other site specific information and/or plans as may be required by the authorized officer

25. Signature Zeno Farris	Name *(Printed/Typed)* Zeno Farris	Date 08.03.07
Title Manager Operations Administration		
Approved By *(Signature)* /s/ Don Peterson	Name (Printed/Typed) /s/ Don Peterson	Date FEB 20 2008
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached

APPROVAL FOR TWO YEARS

Title 18 U.S.S 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.

* *(Instructions on page 2)*

ROSWELL CONTROLLED WATER BASIN

SEE ATTACHED FOR CONDITIONS OF APPROVAL

ENTERED AFMSS 2/8

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

Cimarex Energy Co. of Colorado
5215 North O'Connor Blvd • Suite 1500 • Irving, TX 75039 • (972) 401-3111 • Fax (972) 443-6486
Mailing Address: P O. Box 140907 • Irving, TX 75014-0907
A wholly-owned subsidiary of Cimarex Energy Co , a NYSE Listed Company, "XEC"

STATEMENT ACCEPTING RESPONSIBILITY FOR OPERATIONS

Bureau of Land Management
620 East Greene Street
Carlsbad, NM 88220
Attn: Ms. Linda Denniston

Cimarex Energy Co. of Colorado accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land, or portion thereof, as described below:

Lease No.:	BHL:	~~State Surface~~	S2SE4	24-16S-28E	80 acres
		NM-103600	SE4SW4	24-16S-28E	40 acres
	SHL:	NM-097128	SW4SW4	24-16S-28E	40 acres

County: Eddy County, NM

Formation(s): Morrow

Bond Coverage: Statewide BLM Bond

BLM Bond File No.: NM-2575

Authorized Signature: Zeno Farris

Representing Cimarex Energy Co. of Colorado

Name: Zeno Farris

Title: Manager Operations Administration

Date: August 3, 2007

DISTRICT I
1625 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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
	97102	Crow Flats; Wolfcamp

Property Code	Property Name	Well Number
37029	CAVE LAKE "24" FEDERAL COM	1H

OGRID No.	Operator Name	Elevation
162683	CIMAREX ENERGY CO. OF COLORADO	3604'

Surface Location

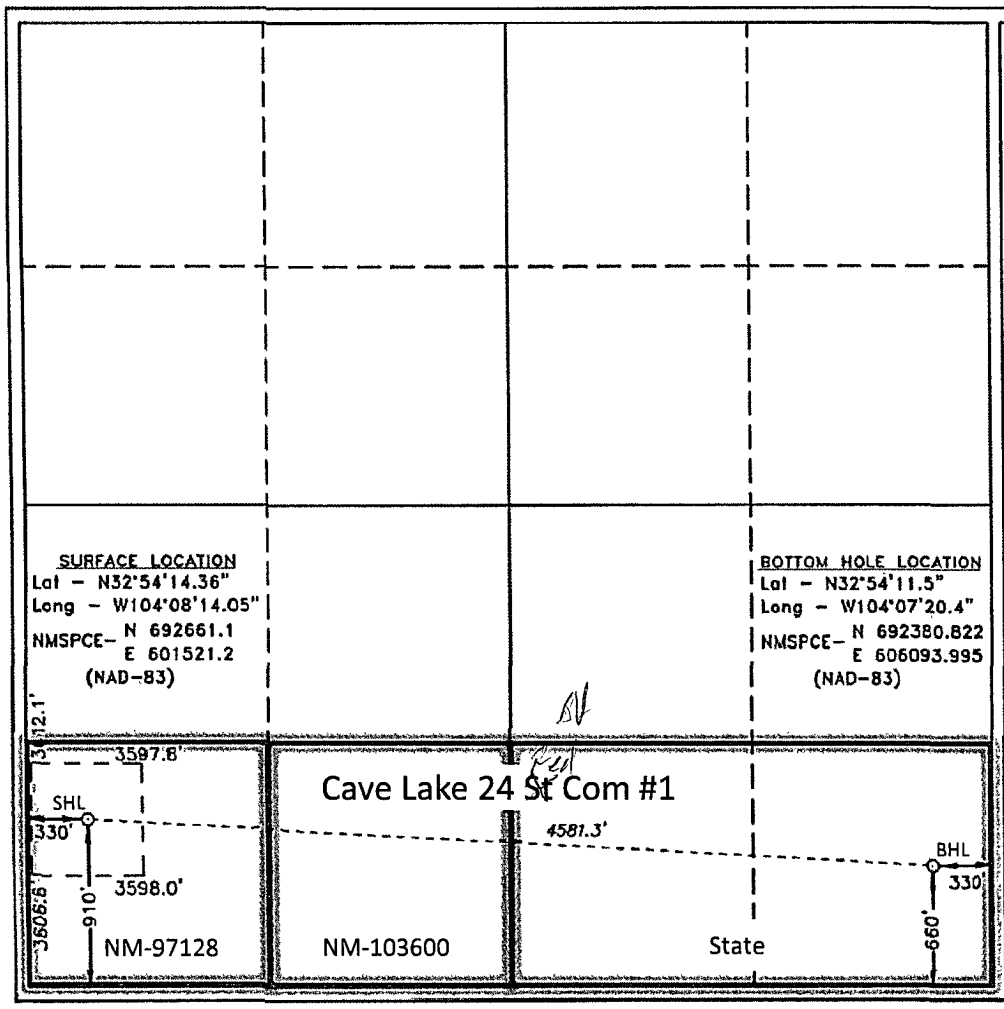
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	24	16 S	28 E		910	SOUTH	330	WEST	EDDY

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
P	24	16 S	28 E		660	SOUTH	330	EAST	EDDY

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

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



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.

Zeno Farris 11-30-07
Signature Date

Zeno Farris
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 supervison, and that the same is true and correct to the best of my belief.

NOVEMBER 4, 2007
Date Surveyed

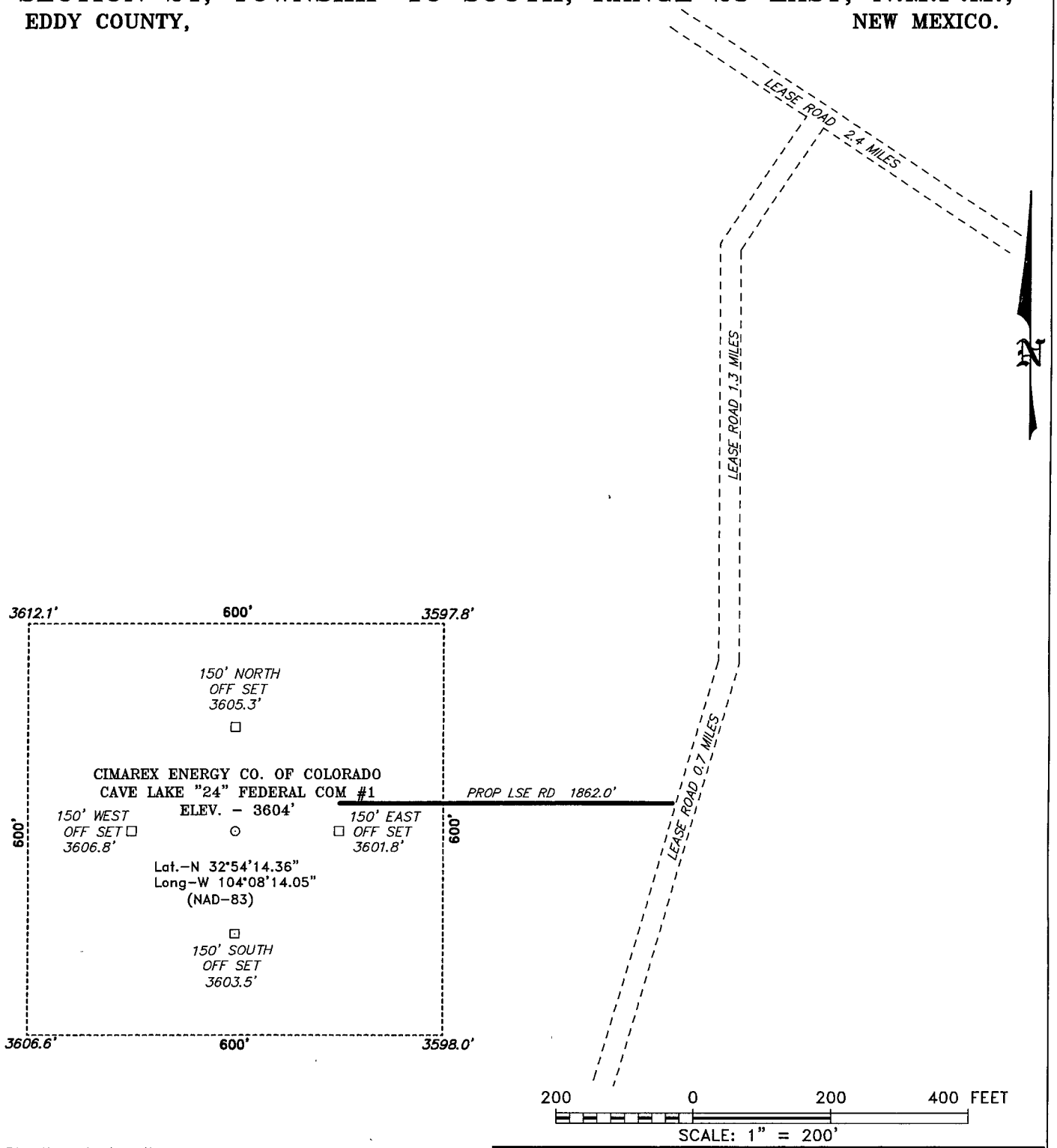
Signature & Seal of Professional Surveyor

GARY L. JONES
NEW MEXICO
7977
BASIN SURVEYS

Certificate No. Gary L. Jones 7977

BASIN SURVEYS

SECTION 24, TOWNSHIP 16 SOUTH, RANGE 28 EAST, N.M.P.M.,
EDDY COUNTY, **NEW MEXICO.**



Directions to Location:

FROM JUNCTION OF US HWY 82 AND BARNIVAL DRAW ROAD, GO NORTH ON BARNIVAL DRAW FOR 6.8 MILES TO LEASE ROAD, ON LEASE ROAD GO NORTHWEST 2.4 MILES TO LEASE ROAD, ON LEASE ROAD GO SOUTH 1.3 MILES TO LEASE ROAD, ON LEASE ROAD GO WEST 1.6 MILES TO LEASE ROAD, CONTINUE SOUTH 0.7 MILES TO PROPOSED LEASE ROAD.

BASIN SURVEYS P.O. BOX 1786 - HOBBS, NEW MEXICO

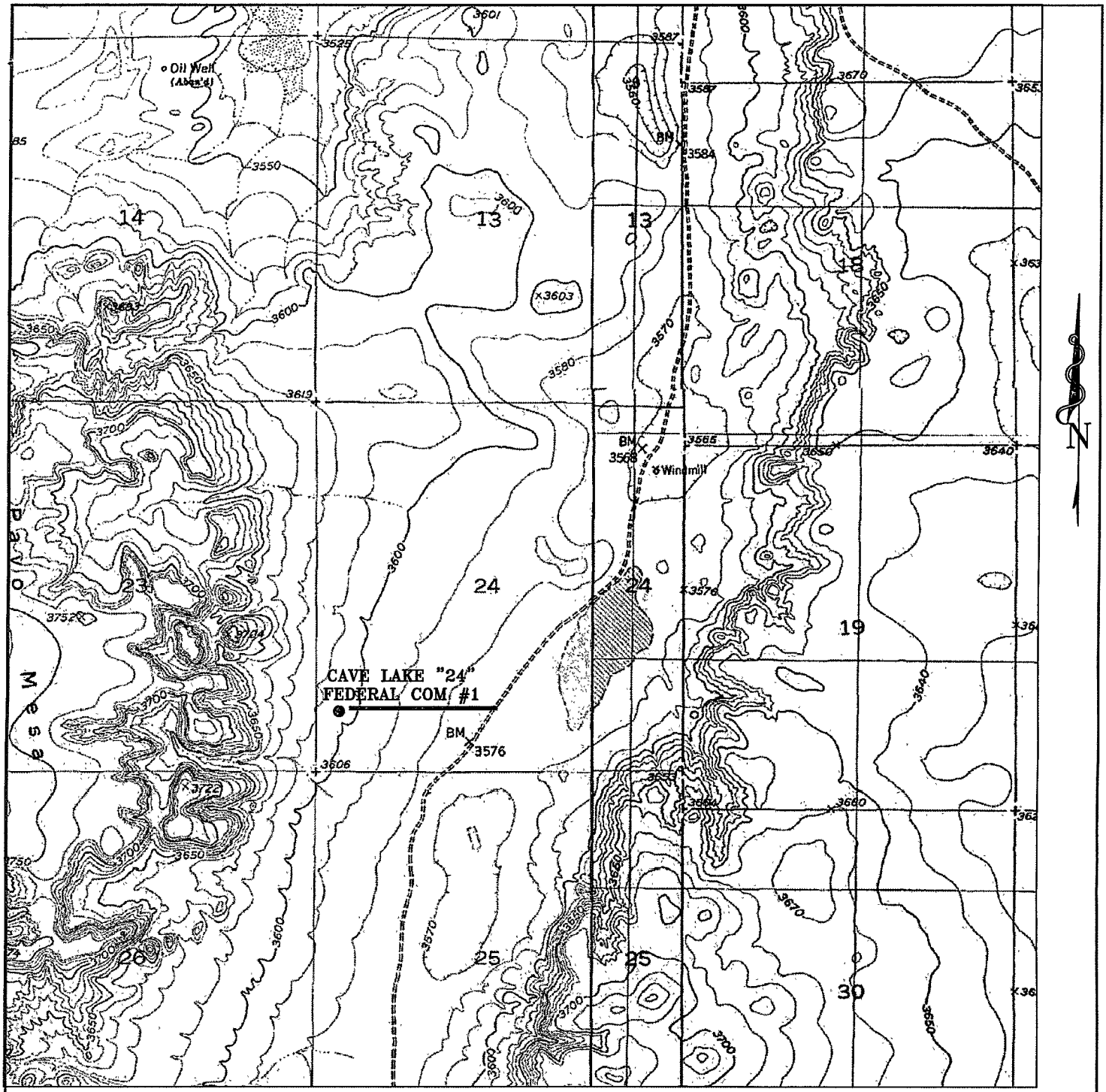
W.O. Number: 18805	Drawn By: J. SMALL
Date: 11-08-2007	Disk: JMS 18805W

CIMAREX ENERGY CO. OF COLORADO

REF: CAVE LAKE "24" FEDERAL COM #1 / WELL PAD TOPO

THE CAVE LAKE "24" FEDERAL COM #1 LOCATED 910' FROM THE SOUTH LINE AND 330' FROM THE WEST LINE OF SECTION 24, TOWNSHIP 16 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

Survey Date: 11-04-2007	Sheet 1 of 1 Sheets



CAVE LAKE "24" FEDERAL COM #1
Located 910' FSL and 330' FWL
Section 24, Township 16 South, Range 28 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(505) 393-7316 - Office
(505) 392-3074 - Fax
basinsurveys.com

W.O. Number:	JMS 18805T
Survey Date:	11-04-2007
Scale:	1" = 2000'
Date:	11-08-2007

CIMAREX ENERGY CO. OF COLORADO

Application to Drill
Cimarex Energy Co. of Colorado
Cave Lake 24 State Com No. 1
Unit P Section 24
T16S R28E Eddy County, NM

In response to questions asked under Section II B of Bulletin NTL-6, the following information is provided for your consideration:

1 Location. SHL ~~600' FSL & 330' FEL~~ 910'/S & 330'/W
BHL ~~600' FSL & 330' FWL~~ 660'/S & 330'/E

2 Elevation above sea level. 3591' GR

3 Geologic name of surface formation: Quaternery Alluvium Deposits

4 Drilling tools and associated equipment. Conventional rotary drilling rig using fluid as a circulating medium for solids removal.

5 Proposed drilling depth: 6750' Pilot Hole□MD 11443'□TVD 7070'

6 Estimated tops of geological markers:

Yates	813	Strawn	9686
7 Rivers	1000	Atoka	9900
Queen	1405	Morrow	10235
San Andres	2478	Mississippian	10370
Glorieta	4138		
Tubb	5130		
Abo	6040		
Wolfcamp	7135		

7 Possible mineral bearing formation:

Wolfcamp Oil

11 Proposed Mud Circulating System:

Depth			Mud Wt	Visc	Fluid Loss	Type Mud
0	to	~~340~~	8.4 - 8 6	30-32	May lose circ	Fresh water gel spud mud
~~340~~	to	1,800	8.4 - 8.6	28-29	May lose circ	Fresh water mud
1,800	to	11,443	8.4 - 9 7	28-29	NC	Fresh water and brine, use hi-vis sweeps to keep hole clean

Sufficient mud materials will be kept on location at all times in order to combat lost circulation, or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs. Mud system monitoring equipment with derrick floor indicators and visual/audio alarms shall be installed and operative prior to drilling into the Wolfcamp formation. This equipment will remain in use until production casing is run and cemented.

Application to Drill
Cimarex Energy Co. of Colorado
Cave Lake 24 State Com No. 1
Unit P Fed Section 24
T16S R28E Eddy County, NM

8 Casing & Cementing Program: see COA

Hole Size	Depth			Casing OD		Weight	Thread	Collar	Grade
17-1/2	0	to	340	New	13-3/8	48#	8-R	STC	H-40
11	0	to	1,800	New	8-5/8	24#	8-R	LTC	J-55
7-7/8	0	to	11,443	New	5-1/2	17#	8-R	LTC	N-80

STC

9 Cementing & Setting Depth: see COA

13-3/8 Surface — Set 340 of 13-3/8 48# H-40 STC
Lead: 300 sx Thixotropic/Premium Plus + 10# Gilsonite + 10# Cal-Seal + 1% CaCl + 0.125# Poly-e-flake (wt 14.2, yld 1.64)
Tail: 220 sx Premium Plus + 2% CaCl (wt 14.8, yld 1.35)
TOC Surface

8-5/8 Intermediate — Set 1,800 of 8-5/8 24# J-55 LTC STC
Lead: 425 sx Interfill C + 0 125# flocele (wt 11.9, yld 2.45)
Tail: 200 sx Prem Plus + 1% CaCl (wt 14.8, yld 1.33)
TOC Surface

5-1/2 Production — Set 11,443 of 5-1/2 17# N-80 LTC
Lead: 640 sx Permian Basin Super H + 0.5% Halad 344 + 0.25% D-AIR 3000 + 0.4% CFR-3 + 1# Salt + 5# Gilsonite + 0.125# Poly-E-Flake + 0.35% HR-7 (wt 13.0, yld 1.68).
see COA
TOC 1,300

Fresh water will be protected by setting 13-3/8 casing at 340 and cementing to Surface
Hydrocarbon zones will be protected by setting 8-5/8 casing at 1,800 and cementing to Surface
and by setting 5-1/2 casing at 11,443 and cementing to 1,300

Cimarex uses the following minimum safety factors:

Burst	Collapse	Tension
1.125	1.0	1.80

10 Pressure control Equipment:

Exhibit "E". A 13 3/8" 5000 PSI working pressure B.O.P. consisting of one set of blind rams and one set of pipe rams and a 5000 # annular type preventer. A choke manifold and 120 gallon accumulator with floor and remote operating stations and auxiliary power system. Rotating head below 6000'. A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

BOP unit will be hydraulically operated. BOP will be nipped up on the 8-5/8" casing and will be operated at least once a day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling. From the base of the surface pipe through the running of production casing, the well will be equipped with a 5000 psi BOP system.

We are requesting a variance for testing the 13-3/8" surface casing from Onshore Order No. 2, which states that all casing strings below the conductor shall be pressure tested to 0.22 psi per foot or 1500 psi, whichever is greater, but not to exceed 70% of the manufacturer's stated maximum internal yield. We are requesting to test the 13-3/8" casing to 1000 psi using rig pumps. The BOP will be tested to 5000 PSI by an independent service company.

Application to Drill
Cimarex Energy Co. of Colorado
Cave Lake 24 State Com No. 1
Unit P FED Section 24
T16S R28E Eddy County, NM

12 Testing, Logging and Coring Program:

A. Mud logging program: 2 man unit from KOP to TD
B. Electric logging program. CNL / LDT / CAL / GR, DLL / CAL / GR
C. No DSTs are planned at this time.

13 Potential Hazards.

No abnormal pressures or temperatures are expected. The area has a potiential H2S hazard. An H2S drilling plan is attached. Adequate flare lines will be installed off the mud / gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used.

Estimated BHP **4000 psi** Estimated BHT **175**

14 Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.
Drilling expected to take 35-45 days
If production casing is run an additional 30 days will be required to complete and construct surface facilities.

15 Other Facets of Operations:

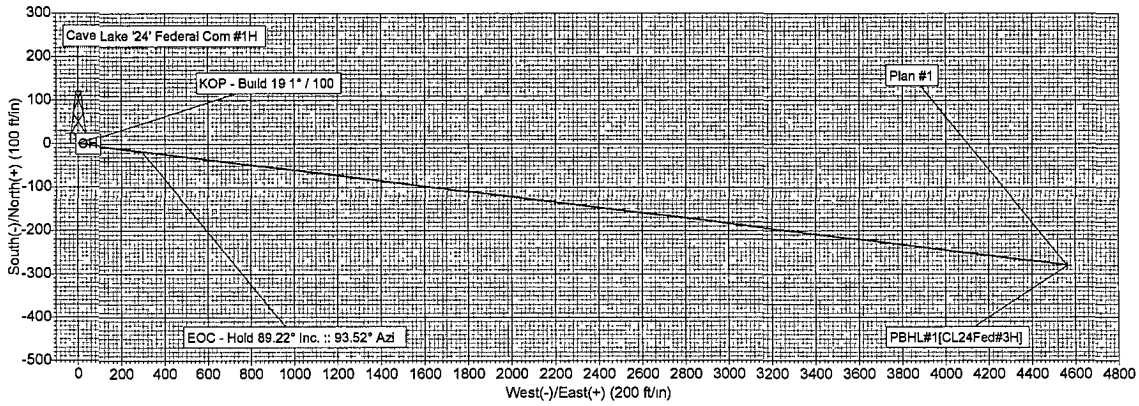
After running casing, cased hole gamma ray neutron collar logs will be run from total depth over possible pay intervals.

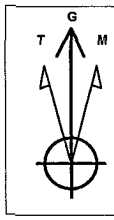
Wolfcam pay will be perforated and stimulated.
The proposed well will be tested and potentialed as **an oil well**

CIMAREX

Project Eddy Co., New Mexico
Site Cave Lake '24' Federal Com #1H
Well Cave Lake '24' Federal Com #1H
Wellbore Lateral #1
Plan: Plan #1 (Cave Lake '24' Federal Com #1H/Lateral #1)

BLACK VIPER ENERGY SERVICES, LTD.





Azimuths to Grid North
True North: -0 11°
Magnetic North 8 21°

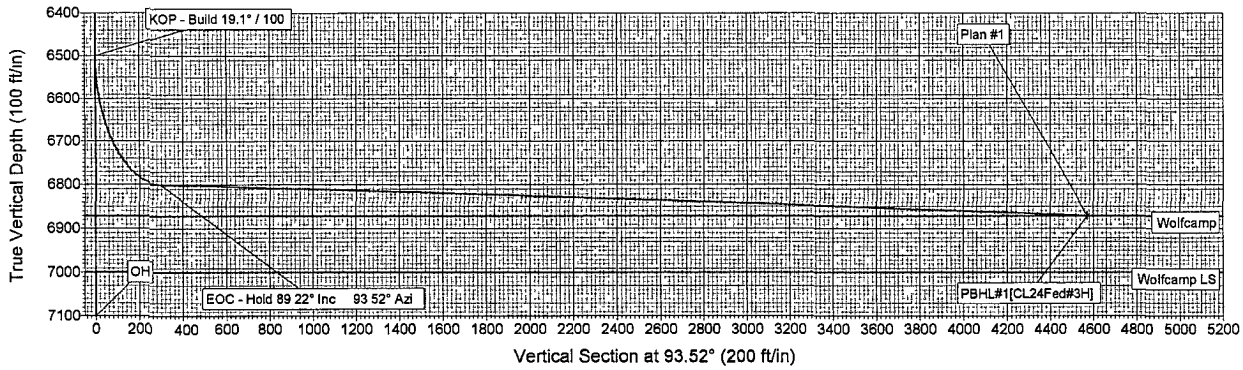
Magnetic Field
Strength 49368 4nT
Dip Angle 60 81°
Date 11/19/2007
Model IGRF200510

ANNOTATIONS

TVD	MD	Annotation
6500.00	6500 00	KOP - Build 19 1° / 100
6800 00	6967.20	EOC - Hold 89 22° Inc. :: 93 52° Azi

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	6500 00	0 00	0.00	6500.00	0 00	0 00	0 00	0 00	0.00	
2	6967.20	89.22	93 51	6800 00	-18 12	295.39	19.10	93 51	295 94	
3	11243.23	88 90	93 52	6870 00	-280 28	4562 80	0 01	178 02	4571 40	PBHL#1[CL24Fed#3H]



Plan Plan #1 (Cave Lake '24' Federal Com #1H/Lateral #1)
Created By L D Burton Date November 29, 2007

CIMAREX

Cimarex Energy Co., Inc.

Eddy Co., New Mexico
Cave Lake '24' Federal Com #1H
Cave Lake '24' Federal Com #1H
Lateral #1

Plan: Plan #1

Standard Survey Report

29 November, 2007

BLACK VIPER ENERGY SERVICES, LTD.

Company:	Cimarex Energy Co , Inc.	**Local Co-ordinate Reference:**	Site Cave Lake '24' Federal Com #1H
Project:	Eddy Co., New Mexico	**TVD Reference:**	Rig KB @ 3615.00ft (Rig KB)
Site:	Cave Lake '24' Federal Com #1H	**MD Reference:**	Rig KB @ 3615.00ft (Rig KB)
Well:	Cave Lake '24' Federal Com #1H	**North Reference:**	Grid
Wellbore:	Lateral #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #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 '24' Federal Com #1H

Site Position:		**Northing:**	692,661.10 ft	**Latitude:**	32° 54' 14.344 N
From:	Map	**Easting:**	601,521.20 ft	**Longitude:**	104° 8' 14.066 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	"	**Grid Convergence:**	0.11 °

Well Cave Lake '24' Federal Com #1H

Well Position	**+N/-S**	0.00 ft	**Northing:**	692,661.10 ft	**Latitude:**	32° 54' 14.344 N
	+E/-W	0 00 ft	**Easting:**	601,521.20 ft	**Longitude:**	104° 8' 14.066 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	3,615.00 ft

Wellbore Lateral #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/19/2007	8.32	60.82	49,368

Design Plan #1

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	6,500.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	93.52

Survey Tool Program **Date** 11/29/2007

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
6,500.00	11,243.23	Plan #1 (Lateral #1)		

Planned 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	0.00	0.00	6,500.00	0.00	0.00	0 00	0.00	0.00	0.00
KOP - Build 19.1° / 100									
6,525.00	4.77	93.51	6,524.97	-0.06	1.04	1.04	19.10	19.10	0.00
6,550.00	9.55	93.51	6,549.77	-0.25	4.15	4.16	19 10	19 10	0 00
6,575.00	14.32	93.51	6,574.22	-0.57	9.31	9.33	19.10	19.10	0.00
6,600.00	19.10	93.51	6,598.16	-1.01	16.48	16.51	19.10	19.10	0.00
6,625.00	23.87	93.51	6,621.42	-1.57	25.62	25.66	19.10	19.10	0.00
6,650.00	28.65	93.51	6,643.83	-2.25	36.65	36.72	19.10	19.10	0.00
6,675.00	33.42	93.51	6,665.24	-3.04	49.51	49.61	19.10	19.10	0 00
6,700.00	38 19	93.51	6,685.51	-3.93	64.11	64.23	19.10	19.10	0.00
6,725.00	42.97	93.51	6,704.50	-4.93	80.34	80.49	19.10	19.10	0.00
6,750.00	47.74	93.51	6,722.06	-6.02	98 08	98 27	19.10	19.10	0.00
6,775.00	52.52	93.51	6,738.08	-7.19	117.23	117.45	19.10	19.10	0.00

Company:	Cimarex Energy Co , Inc.	**Local Co-ordinate Reference:**	Site Cave Lake '24' Federal Com #1H
Project:	Eddy Co., New Mexico	**TVD Reference:**	Rig KB @ 3615 00ft (Rig KB)
Site:	Cave Lake '24' Federal Com #1H	**MD Reference:**	Rig KB @ 3615.00ft (Rig KB)
Well:	Cave Lake '24' Federal Com #1H	**North Reference:**	Grid
Wellbore:	Lateral #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM 2003.14.1.0 Server DB

Planned 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)
6,800.00	57.29	93.51	6,752.45	-8.44	137.64	137.90	19.10	19.10	0 00
6,825.00	62.06	93.51	6,765.07	-9.76	159.17	159 47	19 10	19.10	0.00
6,850.00	66 84	93.51	6,775.85	-11.14	181.68	182.02	19 10	19.10	0.00
6,875.00	71.61	93 51	6,784.71	-12.57	205 00	205.39	19.10	19 10	0.00
6,900.00	76.39	93.51	6,791 60	-14.05	228.98	229.41	19.10	19.10	0.00
6,925.00	81.16	93.51	6,796.47	-15.55	253.45	253.93	19.10	19.10	0.00
6,950.00	85 94	93.51	6,799.27	-17.07	278.24	278.76	19 10	19 10	0.00
6,967.20	89 22	93.51	6,800.00	-18 12	295 39	295.95	19 09	19.09	0 00
EOC - Hold 89.22° Inc. :: 93.52° Azi.									
7,000.00	89.22	93.51	6,800.45	-20.13	328.13	328 74	0.01	-0.01	0 00
7,100.00	89 21	93.51	6,801.82	-26 25	427.93	428 73	0 01	-0.01	0.00
7,200.00	89.20	93.51	6,803 20	-32.37	527.73	528.72	0.01	-0.01	0.00
7,300.00	89.20	93.51	6,804 60	-38.49	627.53	628.71	0 01	-0.01	0.00
7,400.00	89.19	93.51	6,806 01	-44.62	727.34	728.70	0.01	-0.01	0.00
7,500.00	89 18	93.51	6,807.44	-50.74	827.14	828.69	0.01	-0 01	0.00
7,600.00	89 17	93.51	6,808.87	-56 87	926.94	928.68	0.01	-0.01	0 00
7,700.00	89.17	93.51	6,810.32	-62.99	1,026.74	1,028.67	0.01	-0.01	0.00
7,800.00	89.16	93.51	6,811.78	-69.12	1,126.54	1,128.66	0.01	-0.01	0 00
7,900.00	89.15	93.51	6,813.26	-75.24	1,226.35	1,228 65	0.01	-0.01	0.00
8,000 00	89.14	93.51	6,814 75	-81.37	1,326.15	1,328.64	0.01	-0.01	0.00
8,100 00	89.14	93.51	6,816.25	-87.49	1,425.95	1,428.63	0.01	-0.01	0.00
8,200.00	89.13	93.51	6,817.76	-93.62	1,525.75	1,528.62	0 01	-0.01	0 00
8,300.00	89.12	93.51	6,819.29	-99.75	1,625 55	1,628.61	0 01	-0.01	0 00
8,400.00	89.11	93.51	6,820.83	-105.87	1,725.35	1,728.59	0 01	-0.01	0.00
8,500.00	89.11	93.51	6,822 38	-112.00	1,825.15	1,828.58	0.01	-0.01	0.00
8,600.00	89 10	93.51	6,823.95	-118.13	1,924.95	1,928.57	0.01	-0.01	0.00
8,700.00	89 09	93.51	6,825.52	-124.26	2,024 75	2,028.56	0.01	-0 01	0.00
8,800 00	89.08	93.51	6,827.12	-130.39	2,124.55	2,128.54	0 01	-0.01	0.00
8,900.00	89.08	93.51	6,828.72	-136.52	2,224.35	2,228 53	0.01	-0.01	0.00
9,000.00	89.07	93.52	6,830.34	-142.65	2,324.14	2,328.52	0.01	-0.01	0.00
9,100.00	89 06	93 52	6,831.97	-148 78	2,423 94	2,428.51	0.01	-0.01	0 00
9,200.00	89.06	93.52	6,833.61	-154.91	2,523.74	2,528.49	0.01	-0.01	0.00
9,300.00	89.05	93.52	6,835.27	-161.04	2,623 54	2,628.48	0.01	-0.01	0 00
9,400.00	89 04	93 52	6,836.93	-167.18	2,723.34	2,728.46	0 01	-0.01	0.00
9,500 00	89.03	93.52	6,838.62	-173.31	2,823.14	2,828.45	0.01	-0.01	0.00
9,600 00	89.03	93.52	6,840.31	-179 44	2,922.93	2,928.44	0.01	-0.01	0.00
9,700.00	89.02	93.52	6,842 02	-185.57	3,022.73	3,028.42	0.01	-0 01	0.00
9,800 00	89.01	93.52	6,843.74	-191.71	3,122.53	3,128.41	0.01	-0.01	0.00
9,900.00	89.00	93.52	6,845.47	-197.84	3,222 32	3,228.39	0.01	-0.01	0.00
10,000.00	89.00	93.52	6,847.22	-203.98	3,322 12	3,328.38	0.01	-0.01	0 00
10,100.00	88.99	93.52	6,848.98	-210.11	3,421.92	3,428.36	0.01	-0.01	0.00
10,200.00	88.98	93.52	6,850.75	-216 25	3,521.71	3,528.34	0.01	-0 01	0.00
10,300 00	88 97	93.52	6,852.53	-222 38	3,621.51	3,628.33	0 01	-0.01	0.00
10,400.00	88.97	93 52	6,854.33	-228.52	3,721.30	3,728.31	0 01	-0.01	0.00
10,500.00	88.96	93.52	6,856.14	-234.66	3,821.10	3,828.30	0.01	-0.01	0.00
10,600.00	88.95	93.52	6,857.96	-240.79	3,920 89	3,928.28	0.01	-0.01	0 00
10,700.00	88.94	93.52	6,859.80	-246.93	4,020.69	4,028.26	0.01	-0.01	0.00
10,800.00	88 94	93.52	6,861.65	-253.07	4,120.48	4,128.25	0.01	-0.01	0.00
10,900 00	88.93	93.52	6,863.51	-259 21	4,220.28	4,228.23	0.01	-0.01	0.00
11,000.00	88.92	93.52	6,865.39	-265.35	4,320.07	4,328.21	0.01	-0 01	0 00
11,100.00	88.91	93.52	6,867.27	-271.49	4,419.86	4,428.19	0.01	-0.01	0.00
11,200.00	88.91	93.52	6,869.17	-277.63	4,519 66	4,528 17	0 01	-0.01	0.00
11,243 23	88.90	93.52	6,870.00	-280.28	4,562.80	4,571.40	0.01	-0.01	0.00
Wolfcamp - PBHL#1[CL24Fed#3H]									

Company:	Cimarex Energy Co , Inc.	**Local Co-ordinate Reference:**	Site Cave Lake '24' Federal Com #1H
Project:	Eddy Co., New Mexico	**TVD Reference:**	Rig KB @ 3615.00ft (Rig KB)
Site:	Cave Lake '24' Federal Com #1H	**MD Reference:**	Rig KB @ 3615 00ft (Rig KB)
Well:	Cave Lake '24' Federal Com #1H	**North Reference:**	Grid
Wellbore:	Lateral #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM 2003 14.1.0 Server DB

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL#1[CL24Fed#3H] - plan hits target - Point	0.00	0.00	6,870.00	-280.28	4,562.80	692,380.82	606,083 99	32° 54' 11.483 N	104° 7' 20.552 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	5,340 00	Abo Shale		0 00	0.00
11,243.23	6,870.00	Wolfcamp		0.00	0.00
	7,000.00	Wolfcamp LS		0.00	0.00

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
6,500.00	6,500.00	0.00	0.00	KOP - Build 19 1° / 100
6,967.20	6,800.00	-18.12	295.39	EOC - Hold 89.22° Inc :: 93.52° Azi.

Checked By: _____ Approved By: _____ Date: _____

Cimarex Energy Co., Inc.
Cave Lake '24' Federal Com #1H - Plan #1

Eddy Co., New Mexico
Cave Lake '24' Federal Com #1H

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6500.00	0.000	0.000	6500.00	0.00 N	0.00 E	0.00	0.00
6510.00	1.910	93.510	6510.00	0.01 S	0.17 E	0.17	19.10
6520.00	3.819	93.510	6519.99	0.04 S	0.67 E	0.67	19.10
6530.00	5.729	93.510	6529.95	0.09 S	1.50 E	1.50	19.10
6540.00	7.639	93.510	6539.88	0.16 S	2.66 E	2.66	19.10
6550.00	9.548	93.510	6549.77	0.25 S	4.15 E	4.16	19.10
6560.00	11.458	93.510	6559.60	0.37 S	5.97 E	5.98	19.10
6570.00	13.368	93.510	6569.37	0.50 S	8.11 E	8.13	19.10
6580.00	15.277	93.510	6579.06	0.65 S	10.58 E	10.60	19.10
6590.00	17.187	93.510	6588.66	0.82 S	13.37 E	13.40	19.10
6600.00	19.097	93.510	6598.16	1.01 S	16.48 E	16.51	19.10
6610.00	21.007	93.510	6607.55	1.22 S	19.90 E	19.94	19.10
6620.00	22.916	93.510	6616.83	1.45 S	23.64 E	23.68	19.10
6630.00	24.826	93.510	6625.97	1.70 S	27.67 E	27.73	19.10
6640.00	26.736	93.510	6634.97	1.96 S	32.02 E	32.08	19.10
6650.00	28.645	93.510	6643.83	2.25 S	36.65 E	36.72	19.10
6660.00	30.555	93.510	6652.52	2.55 S	41.58 E	41.66	19.10
6670.00	32.465	93.510	6661.05	2.87 S	46.80 E	46.89	19.10
6680.00	34.374	93.510	6669.39	3.21 S	52.30 E	52.39	19.10
6690.00	36.284	93.510	6677.55	3.56 S	58.07 E	58.18	19.10
6700.00	38.194	93.510	6685.51	3.93 S	64.11 E	64.23	19.10
6710.00	40.103	93.510	6693.27	4.32 S	70.41 E	70.54	19.10
6720.00	42.013	93.510	6700.81	4.72 S	76.96 E	77.11	19.10
6730.00	43.923	93.510	6708.13	5.14 S	83.77 E	83.92	19.10
6740.00	45.832	93.510	6715.21	5.57 S	90.81 E	90.98	19.10

6750.00	47.742	93.510	6722.06	6.02	S	98.08	E	98.27
19.10								
6760.00	49.652	93.510	6728.66	6.48	S	105.58	E	105.78
19.10								
6770.00	51.561	93.510	6735.00	6.95	S	113.30	E	113.51
19.10								
6780.00	53.471	93.510	6741.09	7.44	S	121.22	E	121.44
19.10								
6790.00	55.381	93.510	6746.91	7.93	S	129.33	E	129.58
19.10								
6800.00	57.290	93.510	6752.45	8.44	S	137.64	E	137.90
19.10								
6810.00	59.200	93.510	6757.71	8.96	S	146.13	E	146.40
19.10								
6820.00	61.110	93.510	6762.69	9.49	S	154.78	E	155.07
19.10								
6830.00	63.020	93.510	6767.37	10.03	S	163.60	E	163.91
19.10								
6840.00	64.929	93.510	6771.76	10.59	S	172.57	E	172.89
19.10								
6850.00	66.839	93.510	6775.85	11.14	S	181.68	E	182.02
19.10								
6860.00	68.749	93.510	6779.63	11.71	S	190.92	E	191.28
19.10								
6870.00	70.658	93.510	6783.09	12.28	S	200.28	E	200.66
19.10								
6880.00	72.568	93.510	6786.25	12.87	S	209.75	E	210.15
19.10								
6890.00	74.478	93.510	6789.08	13.45	S	219.32	E	219.74
19.10								
6900.00	76.387	93.510	6791.60	14.05	S	228.98	E	229.41
19.10								
6910.00	78.297	93.510	6793.79	14.64	S	238.72	E	239.17
19.10								
6920.00	80.207	93.510	6795.66	15.24	S	248.53	E	248.99
19.10								
6930.00	82.116	93.510	6797.19	15.85	S	258.39	E	258.88
19.10								
6940.00	84.026	93.510	6798.40	16.46	S	268.30	E	268.80
19.10								
6950.00	85.936	93.510	6799.27	17.07	S	278.24	E	278.76
19.10								
6960.00	87.845	93.510	6799.82	17.68	S	288.21	E	288.75
19.10								
6970.00	89.220	93.510	6800.04	18.29	S	298.18	E	298.75
13.75								
6980.00	89.220	93.510	6800.17	18.90	S	308.17	E	308.74
0.00								
6990.00	89.218	93.510	6800.31	19.51	S	318.15	E	318.74
0.02								
7000.00	89.218	93.510	6800.45	20.13	S	328.13	E	328.74
0.01								
7010.00	89.218	93.510	6800.58	20.74	S	338.11	E	338.74
0.00								
7020.00	89.218	93.510	6800.72	21.35	S	348.09	E	348.74
0.00								
7030.00	89.215	93.510	6800.86	21.96	S	358.07	E	358.74
0.02								
7040.00	89.215	93.510	6800.99	22.58	S	368.05	E	368.74
0.01								
7050.00	89.214	93.510	6801.13	23.19	S	378.03	E	378.74
0.01								
7060.00	89.213	93.510	6801.27	23.80	S	388.01	E	388.74

0.01							
7070.00	89.212	93.510	6801.41	24.41 S	397.99 E	398.74	
0.01							
7080.00	89.212	93.510	6801.54	25.02 S	407.97 E	408.73	
0.01							
7090.00	89.211	93.510	6801.68	25.64 S	417.95 E	418.73	
0.01							
7100.00	89.210	93.510	6801.82	26.25 S	427.93 E	428.73	
0.01							
7110.00	89.210	93.510	6801.96	26.86 S	437.91 E	438.73	
0.00							
7120.00	89.210	93.510	6802.10	27.47 S	447.89 E	448.73	
0.00							
7130.00	89.208	93.510	6802.23	28.09 S	457.87 E	458.73	
0.02							
7140.00	89.207	93.510	6802.37	28.70 S	467.85 E	468.73	
0.01							
7150.00	89.206	93.510	6802.51	29.31 S	477.83 E	478.73	
0.01							
7160.00	89.206	93.510	6802.65	29.92 S	487.81 E	488.73	
0.01							
7170.00	89.205	93.511	6802.79	30.53 S	497.79 E	498.73	
0.01							
7180.00	89.204	93.511	6802.93	31.15 S	507.77 E	508.73	
0.01							
7190.00	89.204	93.511	6803.07	31.76 S	517.75 E	518.72	
0.01							
7200.00	89.203	93.511	6803.20	32.37 S	527.73 E	528.72	
0.01							
7210.00	89.203	93.511	6803.34	32.98 S	537.71 E	538.72	
0.00							
7220.00	89.203	93.511	6803.48	33.60 S	547.69 E	548.72	
0.00							
7230.00	89.201	93.511	6803.62	34.21 S	557.67 E	558.72	
0.02							
7240.00	89.200	93.511	6803.76	34.82 S	567.65 E	568.72	
0.01							
7250.00	89.199	93.511	6803.90	35.43 S	577.63 E	578.72	
0.01							
7260.00	89.198	93.511	6804.04	36.04 S	587.61 E	588.72	
0.01							
7270.00	89.198	93.511	6804.18	36.66 S	597.59 E	598.72	
0.01							
7280.00	89.197	93.511	6804.32	37.27 S	607.57 E	608.72	
0.01							
7290.00	89.196	93.511	6804.46	37.88 S	617.55 E	618.71	
0.01							
7300.00	89.195	93.511	6804.60	38.49 S	627.53 E	628.71	
0.01							
7310.00	89.195	93.511	6804.74	39.11 S	637.51 E	638.71	
0.00							
7320.00	89.195	93.511	6804.88	39.72 S	647.49 E	648.71	
0.00							
7330.00	89.193	93.511	6805.02	40.33 S	657.47 E	658.71	
0.02							
7340.00	89.192	93.511	6805.16	40.94 S	667.45 E	668.71	
0.01							
7350.00	89.192	93.511	6805.31	41.56 S	677.44 E	678.71	
0.01							
7360.00	89.191	93.511	6805.45	42.17 S	687.42 E	688.71	
0.01							
7370.00	89.190	93.511	6805.59	42.78 S	697.40 E	698.71	
0.01							

7380.00	89.189	93.511	6805.73	43.39 S	707.38 E	708.71	0.01
7390.00	89.189	93.511	6805.87	44.01 S	717.36 E	718.70	0.01
7400.00	89.188	93.511	6806.01	44.62 S	727.34 E	728.70	0.01
7410.00	89.188	93.511	6806.15	45.23 S	737.32 E	738.70	0.00
7420.00	89.188	93.511	6806.30	45.84 S	747.30 E	748.70	0.00
7430.00	89.186	93.511	6806.44	46.45 S	757.28 E	758.70	0.02
7440.00	89.185	93.511	6806.58	47.07 S	767.26 E	768.70	0.01
7450.00	89.184	93.511	6806.72	47.68 S	777.24 E	778.70	0.01
7460.00	89.184	93.511	6806.87	48.29 S	787.22 E	788.70	0.01
7470.00	89.183	93.511	6807.01	48.90 S	797.20 E	798.70	0.01
7480.00	89.182	93.511	6807.15	49.52 S	807.18 E	808.70	0.01
7490.00	89.181	93.511	6807.29	50.13 S	817.16 E	818.69	0.01
7500.00	89.181	93.511	6807.44	50.74 S	827.14 E	828.69	0.01
7510.00	89.181	93.511	6807.58	51.35 S	837.12 E	838.69	0.00
7520.00	89.181	93.511	6807.72	51.97 S	847.10 E	848.69	0.00
7530.00	89.178	93.511	6807.87	52.58 S	857.08 E	858.69	0.02
7540.00	89.178	93.511	6808.01	53.19 S	867.06 E	868.69	0.01
7550.00	89.177	93.511	6808.15	53.80 S	877.04 E	878.69	0.01
7560.00	89.176	93.512	6808.30	54.42 S	887.02 E	888.69	0.01
7570.00	89.175	93.512	6808.44	55.03 S	897.00 E	898.69	0.01
7580.00	89.175	93.512	6808.58	55.64 S	906.98 E	908.69	0.01
7590.00	89.174	93.512	6808.73	56.25 S	916.96 E	918.68	0.01
7600.00	89.173	93.512	6808.87	56.87 S	926.94 E	928.68	0.01
7610.00	89.173	93.512	6809.02	57.48 S	936.92 E	938.68	0.00
7620.00	89.173	93.512	6809.16	58.09 S	946.90 E	948.68	0.00
7630.00	89.171	93.512	6809.31	58.70 S	956.88 E	958.68	0.02
7640.00	89.170	93.512	6809.45	59.32 S	966.86 E	968.68	0.01
7650.00	89.170	93.512	6809.60	59.93 S	976.84 E	978.68	0.01
7660.00	89.169	93.512	6809.74	60.54 S	986.82 E	988.68	0.01
7670.00	89.168	93.512	6809.89	61.15 S	996.80 E	998.68	0.01
7680.00	89.167	93.512	6810.03	61.77 S	1006.78 E	1008.67	0.01
7690.00	89.167	93.512	6810.18	62.38 S	1016.76 E	1018.67	

0.01						
7700.00	89.166	93.512	6810.32	62.99 S	1026.74 E	1028.67
0.01						
7710.00	89.166	93.512	6810.47	63.60 S	1036.72 E	1038.67
0.00						
7720.00	89.166	93.512	6810.61	64.22 S	1046.70 E	1048.67
0.00						
7730.00	89.164	93.512	6810.76	64.83 S	1056.68 E	1058.67
0.02						
7740.00	89.163	93.512	6810.91	65.44 S	1066.66 E	1068.67
0.01						
7750.00	89.162	93.512	6811.05	66.05 S	1076.64 E	1078.67
0.01						
7760.00	89.161	93.512	6811.20	66.67 S	1086.62 E	1088.67
0.01						
7770.00	89.161	93.512	6811.34	67.28 S	1096.60 E	1098.67
0.01						
7780.00	89.160	93.512	6811.49	67.89 S	1106.58 E	1108.66
0.01						
7790.00	89.159	93.512	6811.64	68.50 S	1116.56 E	1118.66
0.01						
7800.00	89.158	93.512	6811.78	69.12 S	1126.54 E	1128.66
0.01						
7810.00	89.158	93.512	6811.93	69.73 S	1136.52 E	1138.66
0.00						
7820.00	89.158	93.512	6812.08	70.34 S	1146.50 E	1148.66
0.00						
7830.00	89.156	93.512	6812.23	70.95 S	1156.48 E	1158.66
0.02						
7840.00	89.156	93.512	6812.37	71.57 S	1166.46 E	1168.66
0.01						
7850.00	89.155	93.512	6812.52	72.18 S	1176.44 E	1178.66
0.01						
7860.00	89.154	93.512	6812.67	72.79 S	1186.42 E	1188.66
0.01						
7870.00	89.153	93.512	6812.82	73.40 S	1196.40 E	1198.65
0.01						
7880.00	89.153	93.512	6812.96	74.02 S	1206.38 E	1208.65
0.01						
7890.00	89.152	93.512	6813.11	74.63 S	1216.36 E	1218.65
0.01						
7900.00	89.151	93.512	6813.26	75.24 S	1226.35 E	1228.65
0.01						
7910.00	89.151	93.512	6813.41	75.85 S	1236.33 E	1238.65
0.00						
7920.00	89.151	93.512	6813.56	76.47 S	1246.31 E	1248.65
0.00						
7930.00	89.149	93.512	6813.70	77.08 S	1256.29 E	1258.65
0.02						
7940.00	89.148	93.512	6813.85	77.69 S	1266.27 E	1268.65
0.01						
7950.00	89.147	93.513	6814.00	78.30 S	1276.25 E	1278.65
0.01						
7960.00	89.147	93.513	6814.15	78.92 S	1286.23 E	1288.64
0.01						
7970.00	89.146	93.513	6814.30	79.53 S	1296.21 E	1298.64
0.01						
7980.00	89.145	93.513	6814.45	80.14 S	1306.19 E	1308.64
0.01						
7990.00	89.144	93.513	6814.60	80.75 S	1316.17 E	1318.64
0.01						
8000.00	89.144	93.513	6814.75	81.37 S	1326.15 E	1328.64
0.01						

8010.00	89.144	93.513	6814.90	81.98	S	1336.13	E	1338.64
0.00								
8020.00	89.144	93.513	6815.05	82.59	S	1346.11	E	1348.64
0.00								
8030.00	89.141	93.513	6815.20	83.20	S	1356.09	E	1358.64
0.02								
8040.00	89.141	93.513	6815.35	83.82	S	1366.07	E	1368.64
0.01								
8050.00	89.140	93.513	6815.50	84.43	S	1376.05	E	1378.63
0.01								
8060.00	89.139	93.513	6815.65	85.04	S	1386.03	E	1388.63
0.01								
8070.00	89.139	93.513	6815.80	85.66	S	1396.01	E	1398.63
0.01								
8080.00	89.138	93.513	6815.95	86.27	S	1405.99	E	1408.63
0.01								
8090.00	89.137	93.513	6816.10	86.88	S	1415.97	E	1418.63
0.01								
8100.00	89.136	93.513	6816.25	87.49	S	1425.95	E	1428.63
0.01								
8110.00	89.136	93.513	6816.40	88.11	S	1435.93	E	1438.63
0.00								
8120.00	89.136	93.513	6816.55	88.72	S	1445.91	E	1448.63
0.00								
8130.00	89.134	93.513	6816.70	89.33	S	1455.89	E	1458.63
0.02								
8140.00	89.133	93.513	6816.85	89.94	S	1465.87	E	1468.62
0.01								
8150.00	89.133	93.513	6817.00	90.56	S	1475.85	E	1478.62
0.01								
8160.00	89.132	93.513	6817.16	91.17	S	1485.83	E	1488.62
0.01								
8170.00	89.131	93.513	6817.31	91.78	S	1495.81	E	1498.62
0.01								
8180.00	89.130	93.513	6817.46	92.39	S	1505.79	E	1508.62
0.01								
8190.00	89.130	93.513	6817.61	93.01	S	1515.77	E	1518.62
0.01								
8200.00	89.129	93.513	6817.76	93.62	S	1525.75	E	1528.62
0.01								
8210.00	89.129	93.513	6817.91	94.23	S	1535.73	E	1538.62
0.00								
8220.00	89.129	93.513	6818.07	94.85	S	1545.71	E	1548.61
0.00								
8230.00	89.127	93.513	6818.22	95.46	S	1555.69	E	1558.61
0.02								
8240.00	89.126	93.513	6818.37	96.07	S	1565.67	E	1568.61
0.01								
8250.00	89.125	93.513	6818.52	96.68	S	1575.65	E	1578.61
0.01								
8260.00	89.124	93.513	6818.68	97.30	S	1585.63	E	1588.61
0.01								
8270.00	89.124	93.513	6818.83	97.91	S	1595.61	E	1598.61
0.01								
8280.00	89.123	93.513	6818.98	98.52	S	1605.59	E	1608.61
0.01								
8290.00	89.122	93.513	6819.14	99.13	S	1615.57	E	1618.61
0.01								
8300.00	89.122	93.513	6819.29	99.75	S	1625.55	E	1628.61
0.01								
8310.00	89.122	93.513	6819.44	100.36	S	1635.53	E	1638.60
0.00								
8320.00	89.122	93.513	6819.60	100.97	S	1645.51	E	1648.60

0.00						
8330.00	89.119	93.513	6819.75	101.59 S	1655.49 E	1658.60
0.02						
8340.00	89.119	93.514	6819.90	102.20 S	1665.47 E	1668.60
0.01						
8350.00	89.118	93.514	6820.06	102.81 S	1675.45 E	1678.60
0.01						
8360.00	89.117	93.514	6820.21	103.42 S	1685.43 E	1688.60
0.01						
8370.00	89.116	93.514	6820.37	104.04 S	1695.41 E	1698.60
0.01						
8380.00	89.116	93.514	6820.52	104.65 S	1705.39 E	1708.60
0.01						
8390.00	89.115	93.514	6820.67	105.26 S	1715.37 E	1718.59
0.01						
8400.00	89.114	93.514	6820.83	105.87 S	1725.35 E	1728.59
0.01						
8410.00	89.114	93.514	6820.98	106.49 S	1735.33 E	1738.59
0.00						
8420.00	89.114	93.514	6821.14	107.10 S	1745.31 E	1748.59
0.00						
8430.00	89.112	93.514	6821.29	107.71 S	1755.29 E	1758.59
0.02						
8440.00	89.111	93.514	6821.45	108.33 S	1765.27 E	1768.59
0.01						
8450.00	89.110	93.514	6821.60	108.94 S	1775.25 E	1778.59
0.01						
8460.00	89.110	93.514	6821.76	109.55 S	1785.23 E	1788.59
0.01						
8470.00	89.109	93.514	6821.91	110.16 S	1795.21 E	1798.59
0.01						
8480.00	89.108	93.514	6822.07	110.78 S	1805.19 E	1808.58
0.01						
8490.00	89.107	93.514	6822.23	111.39 S	1815.17 E	1818.58
0.01						
8500.00	89.107	93.514	6822.38	112.00 S	1825.15 E	1828.58
0.01						
8510.00	89.107	93.514	6822.54	112.62 S	1835.13 E	1838.58
0.00						
8520.00	89.107	93.514	6822.69	113.23 S	1845.11 E	1848.58
0.00						
8530.00	89.105	93.514	6822.85	113.84 S	1855.09 E	1858.58
0.02						
8540.00	89.104	93.514	6823.01	114.45 S	1865.07 E	1868.58
0.01						
8550.00	89.103	93.514	6823.16	115.07 S	1875.05 E	1878.58
0.01						
8560.00	89.102	93.514	6823.32	115.68 S	1885.03 E	1888.57
0.01						
8570.00	89.102	93.514	6823.48	116.29 S	1895.01 E	1898.57
0.01						
8580.00	89.101	93.514	6823.63	116.91 S	1904.99 E	1908.57
0.01						
8590.00	89.100	93.514	6823.79	117.52 S	1914.97 E	1918.57
0.01						
8600.00	89.099	93.514	6823.95	118.13 S	1924.95 E	1928.57
0.01						
8610.00	89.099	93.514	6824.10	118.74 S	1934.93 E	1938.57
0.00						
8620.00	89.099	93.514	6824.26	119.36 S	1944.91 E	1948.57
0.00						
8630.00	89.097	93.514	6824.42	119.97 S	1954.89 E	1958.57
0.02						

8640.00	89.096	93.514	6824.58	120.58 S	1964.87 E	1968.56	0.01
8650.00	89.096	93.514	6824.73	121.20 S	1974.85 E	1978.56	0.01
8660.00	89.095	93.514	6824.89	121.81 S	1984.83 E	1988.56	0.01
8670.00	89.094	93.514	6825.05	122.42 S	1994.81 E	1998.56	0.01
8680.00	89.093	93.514	6825.21	123.03 S	2004.79 E	2008.56	0.01
8690.00	89.093	93.514	6825.37	123.65 S	2014.77 E	2018.56	0.01
8700.00	89.092	93.514	6825.52	124.26 S	2024.75 E	2028.56	0.01
8710.00	89.092	93.514	6825.68	124.87 S	2034.73 E	2038.56	0.00
8720.00	89.092	93.514	6825.84	125.49 S	2044.71 E	2048.55	0.00
8730.00	89.090	93.515	6826.00	126.10 S	2054.69 E	2058.55	0.02
8740.00	89.089	93.515	6826.16	126.71 S	2064.67 E	2068.55	0.01
8750.00	89.088	93.515	6826.32	127.33 S	2074.65 E	2078.55	0.01
8760.00	89.088	93.515	6826.48	127.94 S	2084.63 E	2088.55	0.01
8770.00	89.087	93.515	6826.64	128.55 S	2094.61 E	2098.55	0.01
8780.00	89.086	93.515	6826.80	129.16 S	2104.59 E	2108.55	0.01
8790.00	89.085	93.515	6826.96	129.78 S	2114.57 E	2118.55	0.01
8800.00	89.085	93.515	6827.12	130.39 S	2124.55 E	2128.54	0.01
8810.00	89.085	93.515	6827.28	131.00 S	2134.53 E	2138.54	0.00
8820.00	89.085	93.515	6827.44	131.62 S	2144.51 E	2148.54	0.00
8830.00	89.082	93.515	6827.60	132.23 S	2154.49 E	2158.54	0.02
8840.00	89.082	93.515	6827.76	132.84 S	2164.47 E	2168.54	0.01
8850.00	89.081	93.515	6827.92	133.45 S	2174.45 E	2178.54	0.01
8860.00	89.080	93.515	6828.08	134.07 S	2184.43 E	2188.54	0.01
8870.00	89.079	93.515	6828.24	134.68 S	2194.41 E	2198.54	0.01
8880.00	89.079	93.515	6828.40	135.29 S	2204.39 E	2208.53	0.01
8890.00	89.078	93.515	6828.56	135.91 S	2214.37 E	2218.53	0.01
8900.00	89.077	93.515	6828.72	136.52 S	2224.35 E	2228.53	0.01
8910.00	89.077	93.515	6828.88	137.13 S	2234.33 E	2238.53	0.00
8920.00	89.077	93.515	6829.04	137.75 S	2244.31 E	2248.53	0.00
8930.00	89.075	93.515	6829.20	138.36 S	2254.29 E	2258.53	0.02
8940.00	89.074	93.515	6829.37	138.97 S	2264.27 E	2268.53	0.01
8950.00	89.073	93.515	6829.53	139.58 S	2274.25 E	2278.52	

0.01							
8960.00	89.073	93.515	6829.69	140.20 S	2284.23 E	2288.52	
0.01							
8970.00	89.072	93.515	6829.85	140.81 S	2294.21 E	2298.52	
0.01							
8980.00	89.071	93.515	6830.01	141.42 S	2304.19 E	2308.52	
0.01							
8990.00	89.071	93.515	6830.18	142.04 S	2314.16 E	2318.52	
0.01							
9000.00	89.070	93.515	6830.34	142.65 S	2324.14 E	2328.52	
0.01							
9010.00	89.070	93.515	6830.50	143.26 S	2334.12 E	2338.52	
0.00							
9020.00	89.070	93.515	6830.66	143.88 S	2344.10 E	2348.52	
0.00							
9030.00	89.068	93.515	6830.82	144.49 S	2354.08 E	2358.51	
0.02							
9040.00	89.067	93.515	6830.99	145.10 S	2364.06 E	2368.51	
0.01							
9050.00	89.066	93.515	6831.15	145.72 S	2374.04 E	2378.51	
0.01							
9060.00	89.065	93.515	6831.31	146.33 S	2384.02 E	2388.51	
0.01							
9070.00	89.065	93.515	6831.48	146.94 S	2394.00 E	2398.51	
0.01							
9080.00	89.064	93.515	6831.64	147.55 S	2403.98 E	2408.51	
0.01							
9090.00	89.063	93.515	6831.80	148.17 S	2413.96 E	2418.51	
0.01							
9100.00	89.062	93.515	6831.97	148.78 S	2423.94 E	2428.51	
0.01							
9110.00	89.062	93.515	6832.13	149.39 S	2433.92 E	2438.50	
0.00							
9120.00	89.062	93.515	6832.29	150.01 S	2443.90 E	2448.50	
0.00							
9130.00	89.060	93.516	6832.46	150.62 S	2453.88 E	2458.50	
0.02							
9140.00	89.059	93.516	6832.62	151.23 S	2463.86 E	2468.50	
0.01							
9150.00	89.059	93.516	6832.79	151.85 S	2473.84 E	2478.50	
0.01							
9160.00	89.058	93.516	6832.95	152.46 S	2483.82 E	2488.50	
0.01							
9170.00	89.057	93.516	6833.12	153.07 S	2493.80 E	2498.50	
0.01							
9180.00	89.056	93.516	6833.28	153.69 S	2503.78 E	2508.49	
0.01							
9190.00	89.056	93.516	6833.45	154.30 S	2513.76 E	2518.49	
0.01							
9200.00	89.055	93.516	6833.61	154.91 S	2523.74 E	2528.49	
0.01							
9210.00	89.055	93.516	6833.78	155.53 S	2533.72 E	2538.49	
0.00							
9220.00	89.055	93.516	6833.94	156.14 S	2543.70 E	2548.49	
0.00							
9230.00	89.053	93.516	6834.11	156.75 S	2553.68 E	2558.49	
0.02							
9240.00	89.052	93.516	6834.27	157.36 S	2563.66 E	2568.49	
0.01							
9250.00	89.051	93.516	6834.44	157.98 S	2573.64 E	2578.48	
0.01							
9260.00	89.051	93.516	6834.60	158.59 S	2583.62 E	2588.48	
0.01							

9270.00	89.050	93.516	6834.77	159.20 S	2593.60 E	2598.48	0.01
9280.00	89.049	93.516	6834.93	159.82 S	2603.58 E	2608.48	0.01
9290.00	89.048	93.516	6835.10	160.43 S	2613.56 E	2618.48	0.01
9300.00	89.048	93.516	6835.27	161.04 S	2623.54 E	2628.48	0.01
9310.00	89.048	93.516	6835.43	161.66 S	2633.52 E	2638.48	0.00
9320.00	89.048	93.516	6835.60	162.27 S	2643.50 E	2648.48	0.00
9330.00	89.045	93.516	6835.77	162.88 S	2653.48 E	2658.47	0.02
9340.00	89.045	93.516	6835.93	163.50 S	2663.46 E	2668.47	0.01
9350.00	89.044	93.516	6836.10	164.11 S	2673.44 E	2678.47	0.01
9360.00	89.043	93.516	6836.27	164.72 S	2683.42 E	2688.47	0.01
9370.00	89.042	93.516	6836.43	165.34 S	2693.40 E	2698.47	0.01
9380.00	89.042	93.516	6836.60	165.95 S	2703.38 E	2708.47	0.01
9390.00	89.041	93.516	6836.77	166.56 S	2713.36 E	2718.47	0.01
9400.00	89.040	93.516	6836.93	167.18 S	2723.34 E	2728.46	0.01
9410.00	89.040	93.516	6837.10	167.79 S	2733.32 E	2738.46	0.00
9420.00	89.040	93.516	6837.27	168.40 S	2743.30 E	2748.46	0.00
9430.00	89.038	93.516	6837.44	169.02 S	2753.28 E	2758.46	0.02
9440.00	89.037	93.516	6837.61	169.63 S	2763.26 E	2768.46	0.01
9450.00	89.037	93.516	6837.77	170.24 S	2773.24 E	2778.46	0.01
9460.00	89.036	93.516	6837.94	170.86 S	2783.22 E	2788.46	0.01
9470.00	89.035	93.516	6838.11	171.47 S	2793.20 E	2798.45	0.01
9480.00	89.034	93.516	6838.28	172.08 S	2803.18 E	2808.45	0.01
9490.00	89.034	93.516	6838.45	172.69 S	2813.16 E	2818.45	0.01
9500.00	89.033	93.516	6838.62	173.31 S	2823.14 E	2828.45	0.01
9510.00	89.033	93.516	6838.78	173.92 S	2833.12 E	2838.45	0.00
9520.00	89.033	93.516	6838.95	174.53 S	2843.09 E	2848.45	0.00
9530.00	89.031	93.517	6839.12	175.15 S	2853.07 E	2858.45	0.02
9540.00	89.030	93.517	6839.29	175.76 S	2863.05 E	2868.44	0.01
9550.00	89.029	93.517	6839.46	176.37 S	2873.03 E	2878.44	0.01
9560.00	89.028	93.517	6839.63	176.99 S	2883.01 E	2888.44	0.01
9570.00	89.028	93.517	6839.80	177.60 S	2892.99 E	2898.44	0.01
9580.00	89.027	93.517	6839.97	178.21 S	2902.97 E	2908.44	

0.01						
9590.00	89.026	93.517	6840.14	178.83 S	2912.95 E	2918.44
0.01						
9600.00	89.025	93.517	6840.31	179.44 S	2922.93 E	2928.44
0.01						
9610.00	89.025	93.517	6840.48	180.05 S	2932.91 E	2938.43
0.00						
9620.00	89.025	93.517	6840.65	180.67 S	2942.89 E	2948.43
0.00						
9630.00	89.023	93.517	6840.82	181.28 S	2952.87 E	2958.43
0.02						
9640.00	89.022	93.517	6840.99	181.89 S	2962.85 E	2968.43
0.01						
9650.00	89.022	93.517	6841.16	182.51 S	2972.83 E	2978.43
0.01						
9660.00	89.021	93.517	6841.33	183.12 S	2982.81 E	2988.43
0.01						
9670.00	89.020	93.517	6841.50	183.73 S	2992.79 E	2998.43
0.01						
9680.00	89.020	93.517	6841.68	184.35 S	3002.77 E	3008.42
0.01						
9690.00	89.019	93.517	6841.85	184.96 S	3012.75 E	3018.42
0.01						
9700.00	89.018	93.517	6842.02	185.57 S	3022.73 E	3028.42
0.01						
9710.00	89.018	93.517	6842.19	186.19 S	3032.71 E	3038.42
0.00						
9720.00	89.018	93.517	6842.36	186.80 S	3042.69 E	3048.42
0.00						
9730.00	89.016	93.517	6842.53	187.41 S	3052.67 E	3058.42
0.02						
9740.00	89.015	93.517	6842.70	188.03 S	3062.65 E	3068.42
0.01						
9750.00	89.014	93.517	6842.88	188.64 S	3072.63 E	3078.41
0.01						
9760.00	89.014	93.517	6843.05	189.25 S	3082.61 E	3088.41
0.01						
9770.00	89.013	93.517	6843.22	189.87 S	3092.59 E	3098.41
0.01						
9780.00	89.012	93.517	6843.39	190.48 S	3102.57 E	3108.41
0.01						
9790.00	89.011	93.517	6843.57	191.09 S	3112.55 E	3118.41
0.01						
9800.00	89.011	93.517	6843.74	191.71 S	3122.53 E	3128.41
0.01						
9810.00	89.011	93.517	6843.91	192.32 S	3132.51 E	3138.40
0.00						
9820.00	89.011	93.517	6844.08	192.93 S	3142.49 E	3148.40
0.00						
9830.00	89.008	93.517	6844.26	193.55 S	3152.47 E	3158.40
0.02						
9840.00	89.008	93.517	6844.43	194.16 S	3162.45 E	3168.40
0.01						
9850.00	89.007	93.517	6844.60	194.78 S	3172.43 E	3178.40
0.01						
9860.00	89.006	93.517	6844.78	195.39 S	3182.40 E	3188.40
0.01						
9870.00	89.005	93.517	6844.95	196.00 S	3192.38 E	3198.40
0.01						
9880.00	89.005	93.517	6845.12	196.62 S	3202.36 E	3208.39
0.01						
9890.00	89.004	93.517	6845.30	197.23 S	3212.34 E	3218.39
0.01						

9900.00	89.003	93.517	6845.47	197.84 S	3222.32 E	3228.39	0.01
9910.00	89.003	93.517	6845.64	198.46 S	3232.30 E	3238.39	0.00
9920.00	89.003	93.517	6845.82	199.07 S	3242.28 E	3248.39	0.00
9930.00	89.001	93.518	6845.99	199.68 S	3252.26 E	3258.39	0.02
9940.00	89.000	93.518	6846.17	200.30 S	3262.24 E	3268.39	0.01
9950.00	89.000	93.518	6846.34	200.91 S	3272.22 E	3278.38	0.01
9960.00	88.999	93.518	6846.52	201.52 S	3282.20 E	3288.38	0.01
9970.00	88.998	93.518	6846.69	202.14 S	3292.18 E	3298.38	0.01
9980.00	88.997	93.518	6846.87	202.75 S	3302.16 E	3308.38	0.01
9990.00	88.997	93.518	6847.04	203.36 S	3312.14 E	3318.38	0.01
10000.00	88.996	93.518	6847.22	203.98 S	3322.12 E	3328.38	0.01
10010.00	88.996	93.518	6847.39	204.59 S	3332.10 E	3338.37	0.00
10020.00	88.996	93.518	6847.57	205.20 S	3342.08 E	3348.37	0.00
10030.00	88.994	93.518	6847.74	205.82 S	3352.06 E	3358.37	0.02
10040.00	88.993	93.518	6847.92	206.43 S	3362.04 E	3368.37	0.01
10050.00	88.992	93.518	6848.09	207.04 S	3372.02 E	3378.37	0.01
10060.00	88.991	93.518	6848.27	207.66 S	3382.00 E	3388.37	0.01
10070.00	88.991	93.518	6848.45	208.27 S	3391.98 E	3398.37	0.01
10080.00	88.990	93.518	6848.62	208.88 S	3401.96 E	3408.36	0.01
10090.00	88.989	93.518	6848.80	209.50 S	3411.94 E	3418.36	0.01
10100.00	88.988	93.518	6848.98	210.11 S	3421.92 E	3428.36	0.01
10110.00	88.988	93.518	6849.15	210.73 S	3431.90 E	3438.36	0.00
10120.00	88.988	93.518	6849.33	211.34 S	3441.88 E	3448.36	0.00
10130.00	88.986	93.518	6849.51	211.95 S	3451.85 E	3458.36	0.02
10140.00	88.986	93.518	6849.68	212.57 S	3461.83 E	3468.35	0.01
10150.00	88.985	93.518	6849.86	213.18 S	3471.81 E	3478.35	0.01
10160.00	88.984	93.518	6850.04	213.79 S	3481.79 E	3488.35	0.01
10170.00	88.983	93.518	6850.21	214.41 S	3491.77 E	3498.35	0.01
10180.00	88.983	93.518	6850.39	215.02 S	3501.75 E	3508.35	0.01
10190.00	88.982	93.518	6850.57	215.63 S	3511.73 E	3518.35	0.01
10200.00	88.981	93.518	6850.75	216.25 S	3521.71 E	3528.34	0.01
10210.00	88.981	93.518	6850.93	216.86 S	3531.69 E	3538.34	

0.00						
10220.00	88.981	93.518	6851.10	217.47 S	3541.67 E	3548.34
0.00						
10230.00	88.979	93.518	6851.28	218.09 S	3551.65 E	3558.34
0.02						
10240.00	88.978	93.518	6851.46	218.70 S	3561.63 E	3568.34
0.01						
10250.00	88.977	93.518	6851.64	219.32 S	3571.61 E	3578.34
0.01						
10260.00	88.977	93.518	6851.82	219.93 S	3581.59 E	3588.34
0.01						
10270.00	88.976	93.518	6852.00	220.54 S	3591.57 E	3598.33
0.01						
10280.00	88.975	93.518	6852.17	221.16 S	3601.55 E	3608.33
0.01						
10290.00	88.974	93.518	6852.35	221.77 S	3611.53 E	3618.33
0.01						
10300.00	88.974	93.519	6852.53	222.38 S	3621.51 E	3628.33
0.01						
10310.00	88.974	93.519	6852.71	223.00 S	3631.49 E	3638.33
0.00						
10320.00	88.974	93.519	6852.89	223.61 S	3641.47 E	3648.33
0.00						
10330.00	88.971	93.519	6853.07	224.22 S	3651.45 E	3658.32
0.02						
10340.00	88.971	93.519	6853.25	224.84 S	3661.43 E	3668.32
0.01						
10350.00	88.970	93.519	6853.43	225.45 S	3671.41 E	3678.32
0.01						
10360.00	88.969	93.519	6853.61	226.07 S	3681.38 E	3688.32
0.01						
10370.00	88.969	93.519	6853.79	226.68 S	3691.36 E	3698.32
0.01						
10380.00	88.968	93.519	6853.97	227.29 S	3701.34 E	3708.32
0.01						
10390.00	88.967	93.519	6854.15	227.91 S	3711.32 E	3718.31
0.01						
10400.00	88.966	93.519	6854.33	228.52 S	3721.30 E	3728.31
0.01						
10410.00	88.966	93.519	6854.51	229.13 S	3731.28 E	3738.31
0.00						
10420.00	88.966	93.519	6854.69	229.75 S	3741.26 E	3748.31
0.00						
10430.00	88.964	93.519	6854.87	230.36 S	3751.24 E	3758.31
0.02						
10440.00	88.963	93.519	6855.05	230.97 S	3761.22 E	3768.31
0.01						
10450.00	88.963	93.519	6855.23	231.59 S	3771.20 E	3778.30
0.01						
10460.00	88.962	93.519	6855.41	232.20 S	3781.18 E	3788.30
0.01						
10470.00	88.961	93.519	6855.60	232.82 S	3791.16 E	3798.30
0.01						
10480.00	88.960	93.519	6855.78	233.43 S	3801.14 E	3808.30
0.01						
10490.00	88.960	93.519	6855.96	234.04 S	3811.12 E	3818.30
0.01						
10500.00	88.959	93.519	6856.14	234.66 S	3821.10 E	3828.30
0.01						
10510.00	88.959	93.519	6856.32	235.27 S	3831.08 E	3838.29
0.00						
10520.00	88.959	93.519	6856.50	235.88 S	3841.06 E	3848.29
0.00						

10530.00	88.957	93.519	6856.69	236.50 S	3851.04 E	3858.29	0.02
10540.00	88.956	93.519	6856.87	237.11 S	3861.02 E	3868.29	0.01
10550.00	88.955	93.519	6857.05	237.72 S	3871.00 E	3878.29	0.01
10560.00	88.955	93.519	6857.23	238.34 S	3880.97 E	3888.29	0.01
10570.00	88.954	93.519	6857.42	238.95 S	3890.95 E	3898.28	0.01
10580.00	88.953	93.519	6857.60	239.57 S	3900.93 E	3908.28	0.01
10590.00	88.952	93.519	6857.78	240.18 S	3910.91 E	3918.28	0.01
10600.00	88.952	93.519	6857.96	240.79 S	3920.89 E	3928.28	0.01
10610.00	88.952	93.519	6858.15	241.41 S	3930.87 E	3938.28	0.00
10620.00	88.952	93.519	6858.33	242.02 S	3940.85 E	3948.28	0.00
10630.00	88.949	93.519	6858.51	242.63 S	3950.83 E	3958.27	0.02
10640.00	88.949	93.519	6858.70	243.25 S	3960.81 E	3968.27	0.01
10650.00	88.948	93.519	6858.88	243.86 S	3970.79 E	3978.27	0.01
10660.00	88.947	93.519	6859.06	244.48 S	3980.77 E	3988.27	0.01
10670.00	88.946	93.519	6859.25	245.09 S	3990.75 E	3998.27	0.01
10680.00	88.946	93.519	6859.43	245.70 S	4000.73 E	4008.27	0.01
10690.00	88.945	93.520	6859.62	246.32 S	4010.71 E	4018.26	0.01
10700.00	88.944	93.520	6859.80	246.93 S	4020.69 E	4028.26	0.01
10710.00	88.944	93.520	6859.98	247.54 S	4030.67 E	4038.26	0.00
10720.00	88.944	93.520	6860.17	248.16 S	4040.65 E	4048.26	0.00
10730.00	88.942	93.520	6860.35	248.77 S	4050.63 E	4058.26	0.02
10740.00	88.941	93.520	6860.54	249.39 S	4060.60 E	4068.26	0.01
10750.00	88.940	93.520	6860.72	250.00 S	4070.58 E	4078.25	0.01
10760.00	88.940	93.520	6860.91	250.61 S	4080.56 E	4088.25	0.01
10770.00	88.939	93.520	6861.09	251.23 S	4090.54 E	4098.25	0.01
10780.00	88.938	93.520	6861.28	251.84 S	4100.52 E	4108.25	0.01
10790.00	88.938	93.520	6861.46	252.46 S	4110.50 E	4118.25	0.01
10800.00	88.937	93.520	6861.65	253.07 S	4120.48 E	4128.25	0.01
10810.00	88.937	93.520	6861.83	253.68 S	4130.46 E	4138.24	0.00
10820.00	88.937	93.520	6862.02	254.30 S	4140.44 E	4148.24	0.00
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10840.00	88.934	93.520	6862.39	255.52 S	4160.40 E	4168.24	

0.01							
10850.00	88.933	93.520	6862.58	256.14	S	4170.38	E	4178.24
0.01							
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0.01							
10870.00	88.932	93.520	6862.95	257.37	S	4190.34	E	4198.23
0.01							
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0.01							
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0.01							
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0.00							
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0.00							
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0.02							
10940.00	88.926	93.520	6864.26	261.66	S	4260.19	E	4268.22
0.01							
10950.00	88.926	93.520	6864.45	262.28	S	4270.17	E	4278.22
0.01							
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10980.00	88.923	93.520	6865.01	264.12	S	4300.11	E	4308.21
0.01							
10990.00	88.923	93.520	6865.20	264.73	S	4310.09	E	4318.21
0.01							
11000.00	88.922	93.520	6865.39	265.35	S	4320.07	E	4328.21
0.01							
11010.00	88.922	93.520	6865.57	265.96	S	4330.05	E	4338.21
0.00							
11020.00	88.922	93.520	6865.76	266.57	S	4340.03	E	4348.21
0.00							
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0.02							
11040.00	88.919	93.520	6866.14	267.80	S	4359.99	E	4368.20
0.01							
11050.00	88.918	93.520	6866.33	268.42	S	4369.97	E	4378.20
0.01							
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0.01							
11070.00	88.917	93.520	6866.71	269.64	S	4389.92	E	4398.20
0.01							
11080.00	88.916	93.521	6866.90	270.26	S	4399.90	E	4408.20
0.01							
11090.00	88.915	93.521	6867.08	270.87	S	4409.88	E	4418.19
0.01							
11100.00	88.915	93.521	6867.27	271.49	S	4419.86	E	4428.19
0.01							
11110.00	88.915	93.521	6867.46	272.10	S	4429.84	E	4438.19
0.00							
11120.00	88.915	93.521	6867.65	272.71	S	4439.82	E	4448.19
0.00							
11130.00	88.912	93.521	6867.84	273.33	S	4449.80	E	4458.19
0.02							
11140.00	88.912	93.521	6868.03	273.94	S	4459.78	E	4468.19
0.01							
11150.00	88.911	93.521	6868.22	274.56	S	4469.76	E	4478.18
0.01							

11160.00	88.910	93.521	6868.41	275.17	S	4479.74	E	4488.18
0.01								
11170.00	88.909	93.521	6868.60	275.78	S	4489.72	E	4498.18
0.01								
11180.00	88.909	93.521	6868.79	276.40	S	4499.70	E	4508.18
0.01								
11190.00	88.908	93.521	6868.98	277.01	S	4509.68	E	4518.18
0.01								
11200.00	88.907	93.521	6869.17	277.63	S	4519.66	E	4528.17
0.01								
11210.00	88.907	93.521	6869.37	278.24	S	4529.64	E	4538.17
0.00								
11220.00	88.907	93.521	6869.56	278.85	S	4539.61	E	4548.17
0.00								
11230.00	88.905	93.521	6869.75	279.47	S	4549.59	E	4558.17
0.02								
11240.00	88.904	93.521	6869.94	280.08	S	4559.57	E	4568.17
0.01								
11243.23	88.904	93.521	6870.00	280.28	S	4562.80	E	4571.40
0.01								

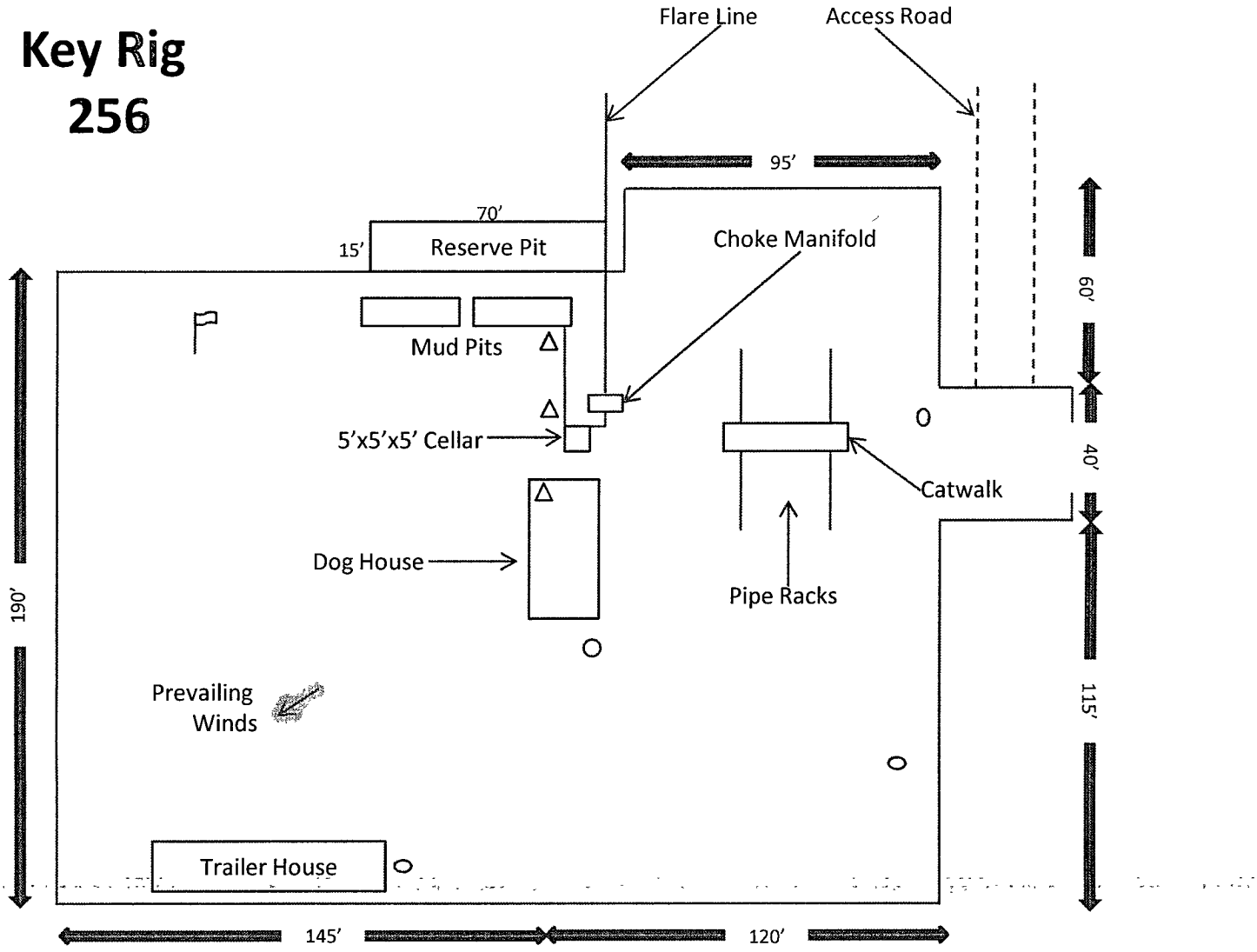
All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to Rig KB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Site and calculated along an Azimuth of 93.515° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.
Central meridian is -104.333°.
Grid Convergence at Surface is 0.107°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 11243.23ft., the Bottom Hole Displacement is 4571.40ft., in the Direction of 93.515° (Grid).

Key Rig 256



Wind Direction Indicators (wind sock or streamers)

△ H2S Monitors (alarms at bell nipple and shale shaker)

O Briefing Areas

O Remote BOP Closing Unit

SEE ATTACHED FOR CONDITIONS OF APPROVAL

Exhibit D – Rig Diagram
Cave Lake 24 State Com No. 1
Cimarex Energy Co. of Colorado
24-16S-28E
SHL ~~660' FSL & 330' FEL~~
BHL ~~660' FSL & 330' FWL~~
Eddy County, NM

SHL: 910'/S & 330'/W
BHL: 660'/S & 330'/E

SR & A

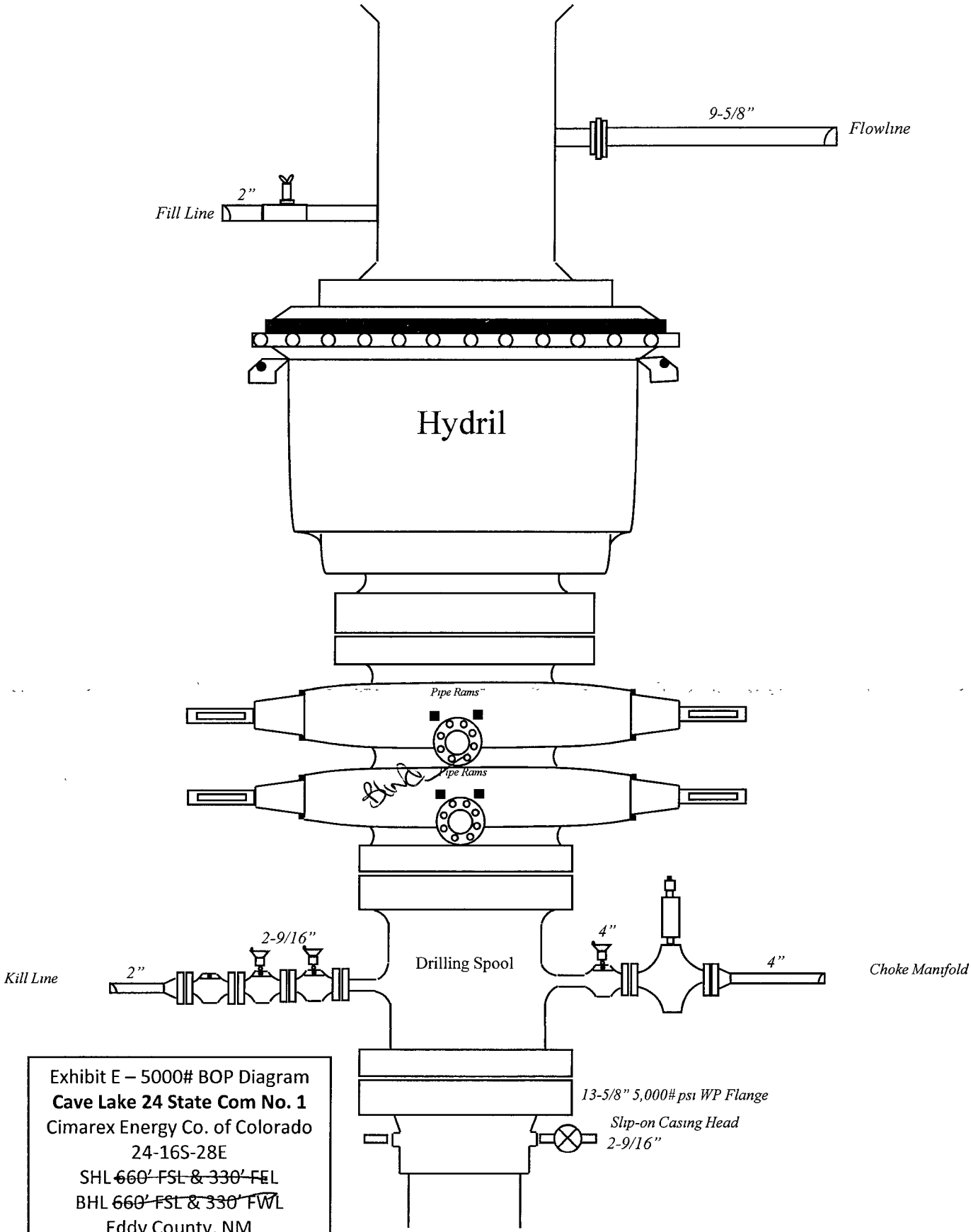


Exhibit E – 5000# BOP Diagram
Cave Lake 24 State Com No. 1
Cimarex Energy Co. of Colorado
24-16S-28E
SHL ~~660' FSL & 330' FEL~~
BHL ~~660' FSL & 330' FWL~~
Eddy County, NM

SHL: 910'/S & 330'/W
BHL: 660'/S & 330'/E

DRILLING OPERATIONS
CHOKE MANIFOLD
5M SERVICE

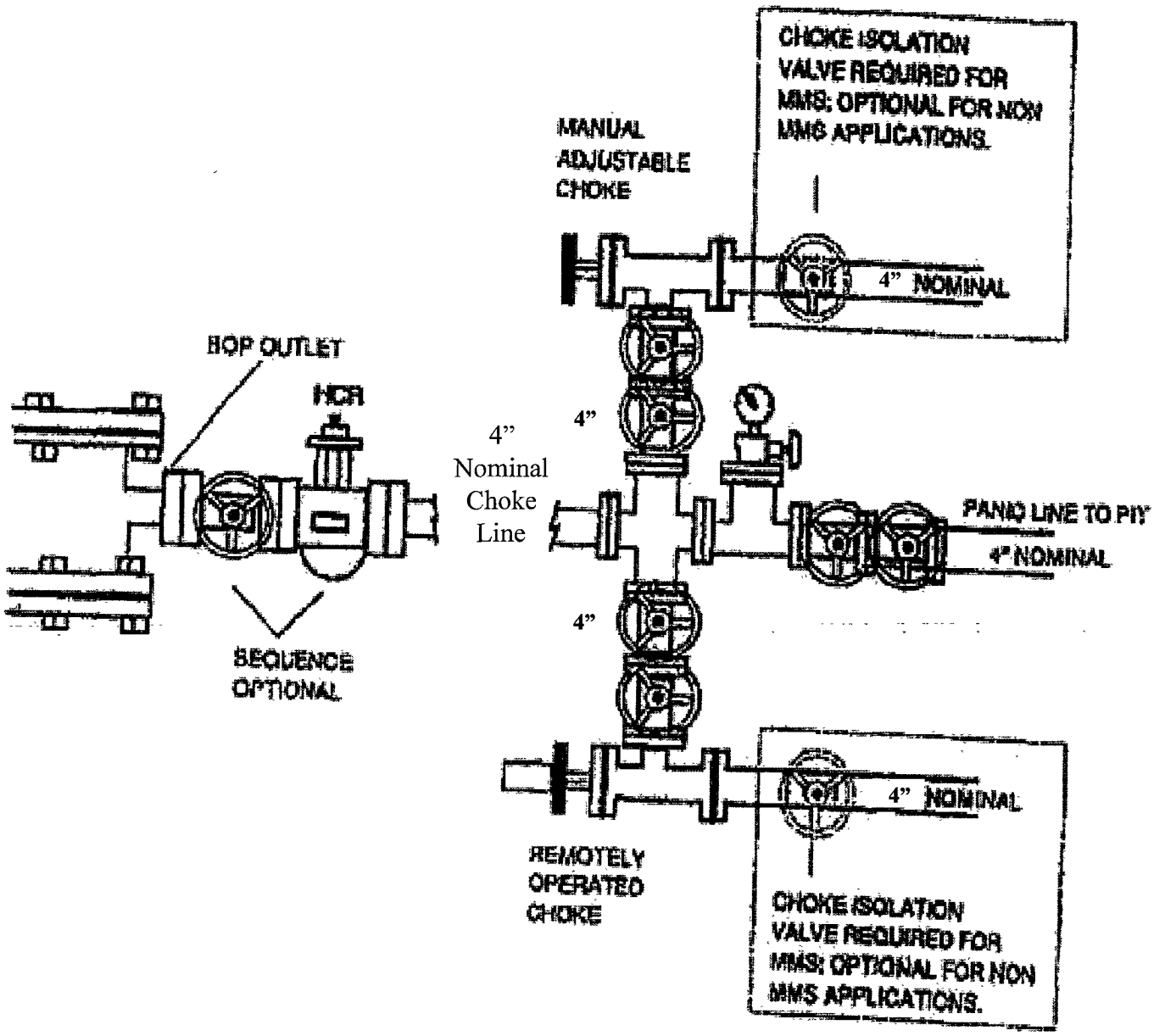


Exhibit E-1 – Choke Manifold Diagram
Cave Lake 24 State Com No. 1
Cimarex Energy Co. of Colorado
24-16S-28E
SHL ~~660' FSL & 330' FEL~~
BHL ~~691' FSL & 378' FWL~~
Eddy County, NM

SHL: 910'/S & 330'/W
BHL: 660'/S & 330'/E

Hydrogen Sulfide Drilling Operations Plan
Cimarex Energy Co. of Colorado
Cave Lake 24 State Com No. 1
Unit P Section 24
T16S R28E Eddy County, NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:

A Characteristics of H2S
B. Physical effects and hazards
C. Proper use of safety equipment and life support systems.
D. Principle and operation of H2S detectors, warning system and briefing areas.
E. Evacuation procedure, routes and first aid.
F. Proper use of 30 minute pressure demand air pack.

2 H2S Detection and Alarm Systems

A. H2S detectors and audio alarm system to be located at bell nipple, end of flow line (mud pit) and on derrick floor or doghouse.

3 Windsock and/or wind streamers

A. Windsock at mudpit area should be high enough to be visible.
B Windsock at briefing area should be high enough to be visible.

4 Condition Flags and Signs

A Warning sign on access road to location.
B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H2S present in dangerous concentration). Only emergency personnel admitted to location.

5 Well control equipment

A. See exhibit "E"

6 Communication

A. While working under masks chalkboards will be used for communication.
B. Hand signals will be used where chalk board is inappropriate.
C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drillstem Testing

No DSTs are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubular goods and other mechanical equipment.

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas seperator will be brought into service along with H2S scavengers if necessary.

Surface Use Plan
Cimarex Energy Co. of Colorado
Cave Lake 24 State Com No. 1
Unit P Fed Section 24
T16S R28E Eddy County, NM

1 Existing Roads. Area maps, Exhibit "B" is a reproduction of Eddy Co. General Highway Map. Exhibit "C" is a reproduction of a USGS Topographic Map, showing existing roads and proposed roads. All existing roads will be maintained in a condition equal to or better than current conditions Any new roads will be constructed to BLM specifications.

A. Exhibit "A" shows the proposed well site as staked.

B. From the junction of US Hwy 82 and Co Rd 214 (Barnaval Draw Road), go North for approx 6.0 miles to Pipeline R/W; thence Southwest along Pipeline R/W for 1.0 miles; thence West for 0.3 miles; thence Southwest for 0.5 miles; thence Southwest for 0.3 miles to the Red Lake location.

2 PLANNED ACCESS ROADS: ~~No new access roads will be constructed~~ A 1862.0 Feet of new access road will be required.

3 LOCATION OF EXISTING WELLS IN A ONE-MILE RADIUS EXHIBIT "A"

A. Water wells - None known

B. Disposal wells - None known

C. Drilling wells - None known

D. Producing wells - As shown on Exhibit "A"

E. Abandoned wells - As shown on Exhibit "A"

4 If on completion this well is a producer Cimarex Energy Co. of Colorado will furnish maps and/or plats showing on site facilities or off site facilities if needed. This will be accompanied by a Sundry Notice.

5 LOCATION AND TYPE OF WATER SUPPLY:

Water will be purchased locally from a commercial source and trucked over the access roads or piped in flexible lines laid on top of the ground.

6 SOURCE OF CONSTRUCTION MATERIAL:

If possible, construction will be obtained from the excavation of drill site. If additional material is needed, it will be purchased from a local source and transported over the access route as shown on Exhibit "C".

7 METHODS OF HANDLING WASTE MATERIAL:

A. Drill cuttings will be disopsed of in the reserve pit.

B. All trash, junk and other waste material will be contained in trash cages or bins to prevent scattering. When the job is completed all contents will be removed and disposed of in an approved sanitary land fill.

C. Salts remaining after completion of well will be picked up by supplier including broken sacks.

D. Sewage from living quarters will drain into holding tanks and be cleaned out periodically. A Porta-John will be provided for the rig crews. This equipment will be properly maintained during the drilling operations and removed upon completion of the well.

E. Remaining drilling fluids will be allowed to dry in the reserve pit until the pit is dry enough for breaking out. In the event that drillings fluids do not dry out in a reasonable time they will be hauled off by transports and be disposed of at a State approved disposal facility. Water produced during drilling will be put in reserve pit. Any oil or condensate produced will be stored in test tanks until sold and hauled from the site.

8 ANCILLARY FACILITIES:

A. No camps or airstrips to be constructed.

9 WELL SITE LAYOUT

A. Exhibit "D" shows location and rig layout.

B. This exhibit indicates proposed location of reserve and trash pits; and living facilities.

C. Mud pits in the active circulating system will be steel pits and the reserve pit is proposed to be lined with PVC or polyethylene liner. The pit liner will be 12 mils thick. Pit liner will extend a minimum, 2'00" over the reserve pits dikes where the liner will be anchored down.

D. The reserve pit will be fenced on three sides with four strands of barbed wire during drilling and completion phases. The fourth side will be fenced after all drilling operations have ceased. If the well is a producer, the reserve pit fence will be torn down. The reserve pit and those areas of the location not essential to production facilities will be reclaimed and seeded per BLM requirements.

10 PLANS FOR RESTORATION OF SURFACE

Rehabilitation of the location and reserve pit will start in a timely manner after all drilling operations cease. The type of reclamation will depend on whether the well is a producer or a dry hole.

However, in either event, the reserve pit will be allowed to dry properly, and fluid removed and disposed of in accordance with Article 7.B as previously noted. The pit area will then be leveled and contoured to conform to the original and surrounding area. Drainage systems, if any, will be reshaped to the original configuration with provisions made to alleviate erosion. These may need to be modified in certain circumstances to prevent inundation of the location's pad and surface facilities. After the area has been shaped and contoured, topsoil from the spoil pile will be placed over the disturbed area to the extent possible. Revegetation procedures will comply with BLM standards.

If the well is a dry hole, the pad and road area will be recountered to match the existing terrain. Topsoil will be spread to the extent possible. Revegetation will comply with BLM standards.

Should the well be a producer, the previously noted procedures will apply to those areas which are not required for production facilities.

Should the well be a producer, the previously noted procedures will apply to those areas which are not required for production facilities.

Surface Use Plan
Cimarex Energy Co. of Colorado
Cave Lake 24 ~~State~~ Fed Com No. 1
Unit P Section 24
T16S R28E Eddy County, NM

11 OTHER INFORMATION:

A. Topography consists of a sloping plane with loose tan sands. Vegetation is mainly yucca, mesquite and shin oak.

B. The wellsite is on surface owned by the ~~State of New Mexico~~ Federal Government. The land is used mainly for farming, cattle ranching, recreational use, and oil and gas production.

C. An Archaeological survey will be conducted on the location and proposed roads, and this report will be filed with the Bureau of Land Management in the Carlsbad BLM office.

D. There are no know dwellings within 1 1/2 miles of this location.

12 OPERATOR'S REPRESENTATIVE:

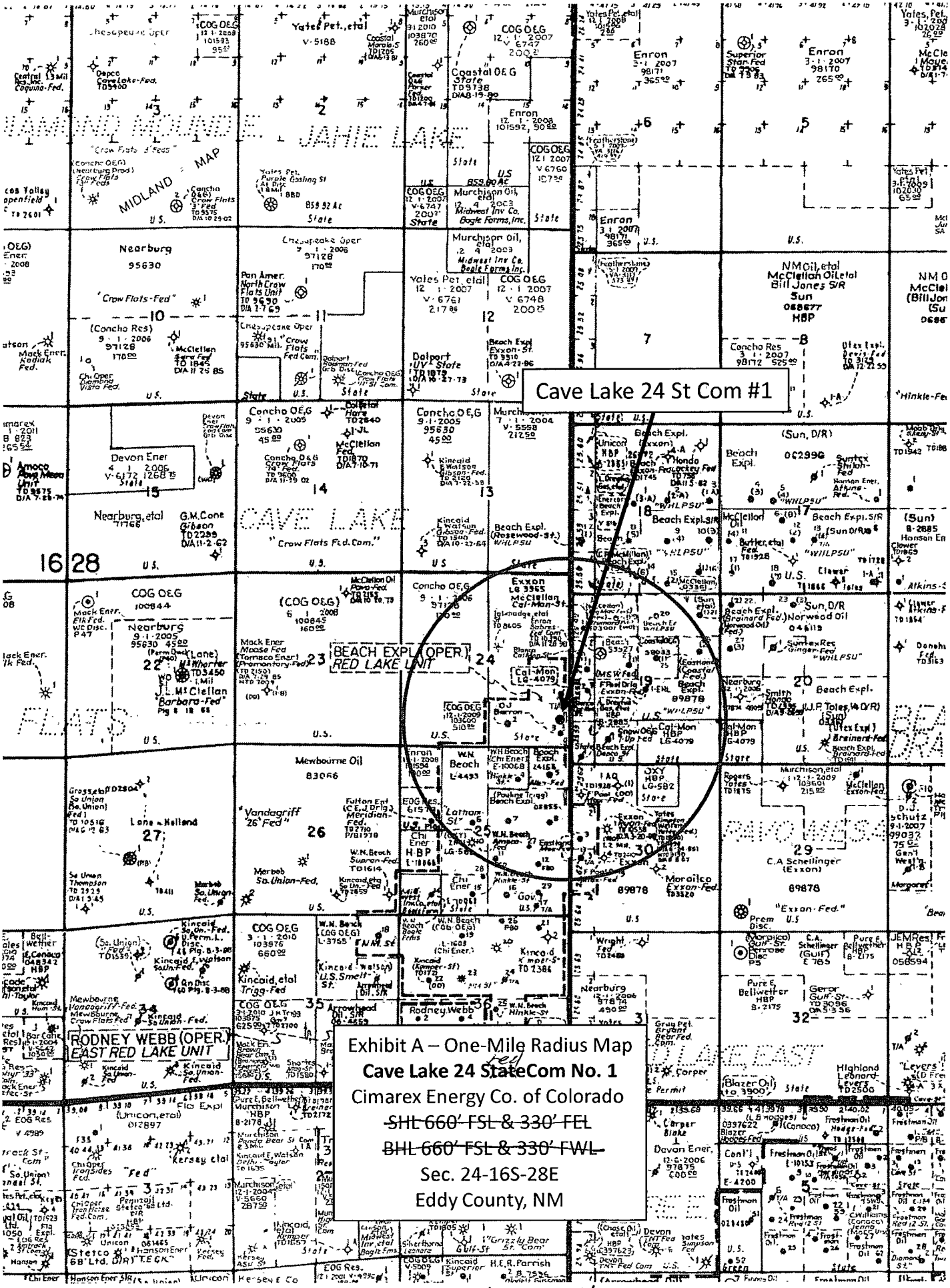
Cimarex Energy Co. of Colorado
P.O. Box 140907
Irving, TX 75014
Office Phone: (972) 443-6489
Zeno Farris

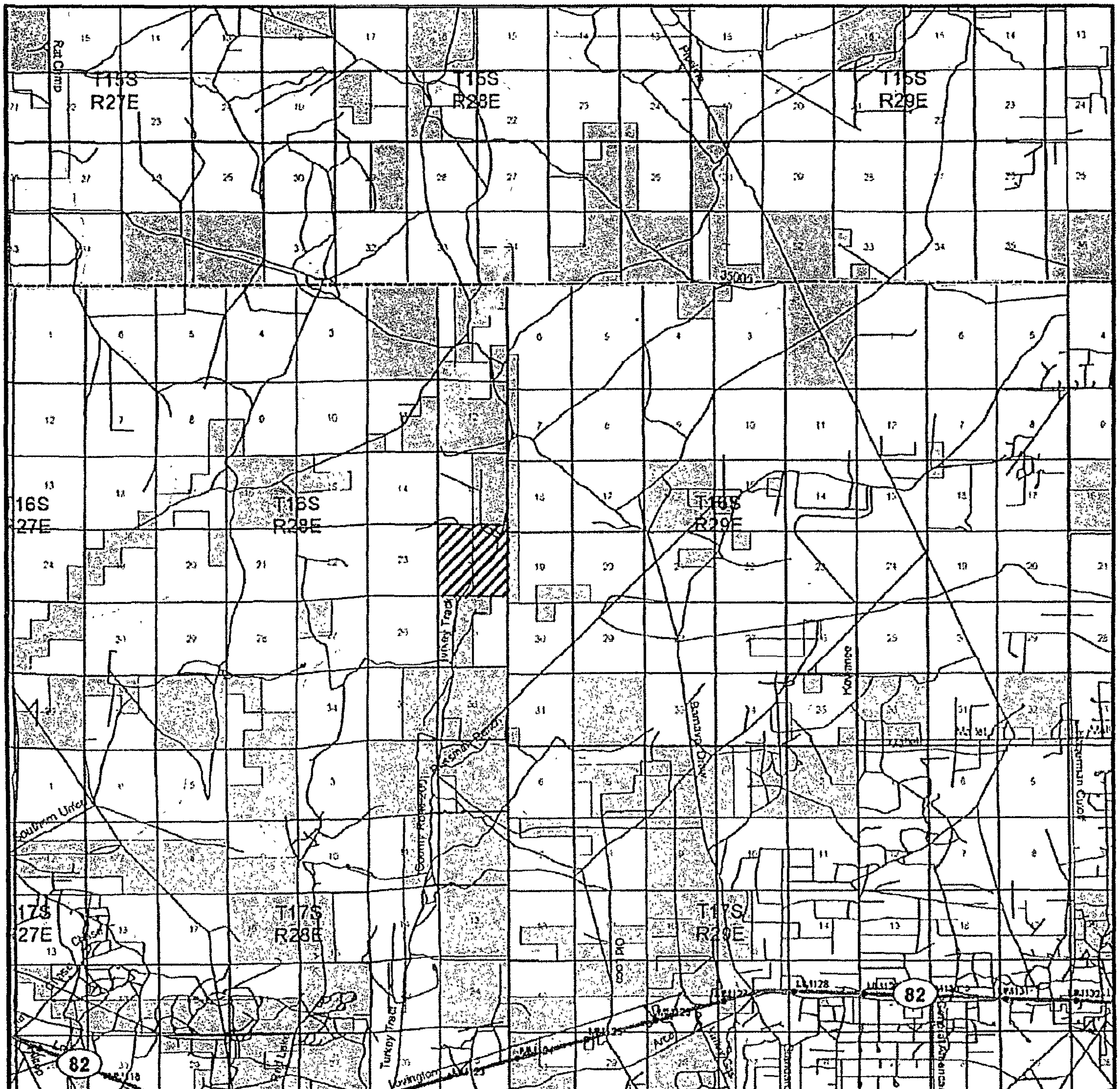
CERTIFICATION: I hereby certify that the statements and plans made in this APD are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Cimarex Energy Co. of Colorado and/or its contractors/subcontractors and is in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provision of U.S.C. 1001 for the filing of a false statement.

NAME: Zeno Farris

DATE: August 3, 2007

TITLE: Manager Operations Administration


Cave Lake 24 St Com #1
Exhibit A – One-Mile Radius Map
Cave Lake 24 StateCom No. 1
Cimarex Energy Co. of Colorado
~~SHL 660' FSL & 330' FEL~~
~~BHL 660' FSL & 330' FWL~~
Sec. 24-16S-28E
Eddy County, NM
SHL: 910'S & 330'W
BHL: 660'S & 330'E



CAVE LAKE "24" FEDERAL COM #1
Located 910' FSL and 330' FWL
Section 24, Township 16 South, Range 28 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(505) 393-7316 - Office
(505) 392-3074 - Fax
basinsurveys.com

W.O. Number: JMS 18805TR

Survey Date: 11-04-2007

Scale: 1" = 2 MILES

Date: 11-08-2007

CIMAREX ENERGY CO. OF COLORADO

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CIMAREX ENERGY CO
LEASE NO.:	NM103600
WELL NAME & NO.:	1-CAVE LAKE 24 FEDERAL COM
SURFACE HOLE FOOTAGE:	910' FSL & 330' FWL
BOTTOM HOLE FOOTAGE	660' FSL & 330' FEL
LOCATION:	Section 24, T. 16S., R 28E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Mitigation Measures: The mitigation measures include the special drilling stipulations, the standard stipulations for high cave/karst, and the standard stipulations for permanent resource roads. The well pad will need to have a large berm placed on the West side of the location. The berm will need to be located above the reserve pit in order to divert any water coming off of the side of the hill away from the proposed well pad and pits.

Cave Lake 24 State Com. # 1: Pit West V-Door North

Cave and Karst

Cave/Karst Surface Mitigation
The following stipulations will be applied to minimize impacts during construction, drilling and production.

Berming:
Any tank batteries will be constructed and bermed large enough to contain any spills that may occur.

Bermed areas will be lined with rip-stop padding to prevent tears or punctures in liners and lined with a permanent 20 mil plastic liner.

Cave/Karst Subsurface Mitigation
The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:
Rotary drilling techniques in cave or karst areas will include the use of fresh water as a circulating medium in zones where caves or karst features are expected. Use depth to the deepest expected fresh water as listed in the geologist report.

Casing:
All casing will meet or exceed National Association of Corrosion Engineers specifications pertaining to the geology of the location and be run to American Petroleum Institute and BLM standards.

Lost Circulation:
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 100 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will

assess the consequences of the situation and work with operator on corrective actions to resolve the problem.

Abandonment Cementing:
Upon well abandonment the well bore will be cemented completely from 100 feet below the bottom of the cave bearing zone to the surface.

Record Keeping:
The Operator will track customary drilling activities, including the rate of penetration, pump pressure, weight on bit, bit drops, percent of mud returns, and presence of absence of cuttings returning to the surface. As part of customary record keeping, each detectable void or sudden increase in the rate of penetration not attributable to a change in the formation type should be documented and evaluated as it is encountered.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (505) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall stockpile the topsoil of the well pad. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

C. RESERVE PITS

The reserve pit shall be constructed and closed in accordance with the NMOCD rules.

Pit West V-Door North

The reserve pit shall be constructed, so that upon completion of drilling operations, the dried pit contents shall be buried a minimum depth of three feet below ground level. Should the pit content level not meet the three foot minimum depth requirement, the excess contents shall be removed until the required minimum depth of three feet below ground level has been met. The operator shall properly dispose of the excess contents at an authorized disposal site.

The reserve pit shall be constructed and maintained so that runoff water from outside the location is not allowed to enter the pit. The berms surrounding the entire perimeter of the pit shall extend a minimum of two (2) feet above ground level. At no time will standing fluids in the pit be allowed to rise above ground level.

The reserve pit shall be fenced on three (3) sides during drilling operations. The fourth side shall be fenced immediately upon rig release.

D. FEDERAL MINERAL MATERIALS PIT

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the
Carlsbad Field Office at (505) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

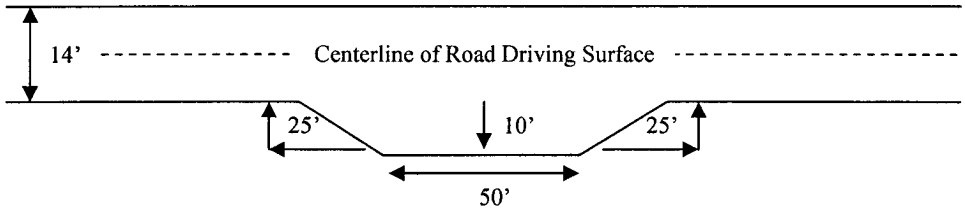
The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:

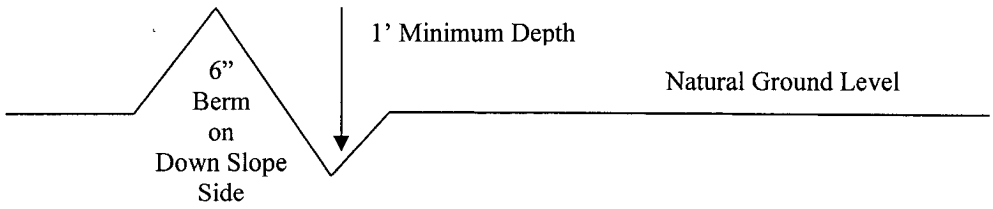
Standard Turnout – Plan View



Drainage
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Culvert Installations
Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

Cattleguards
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

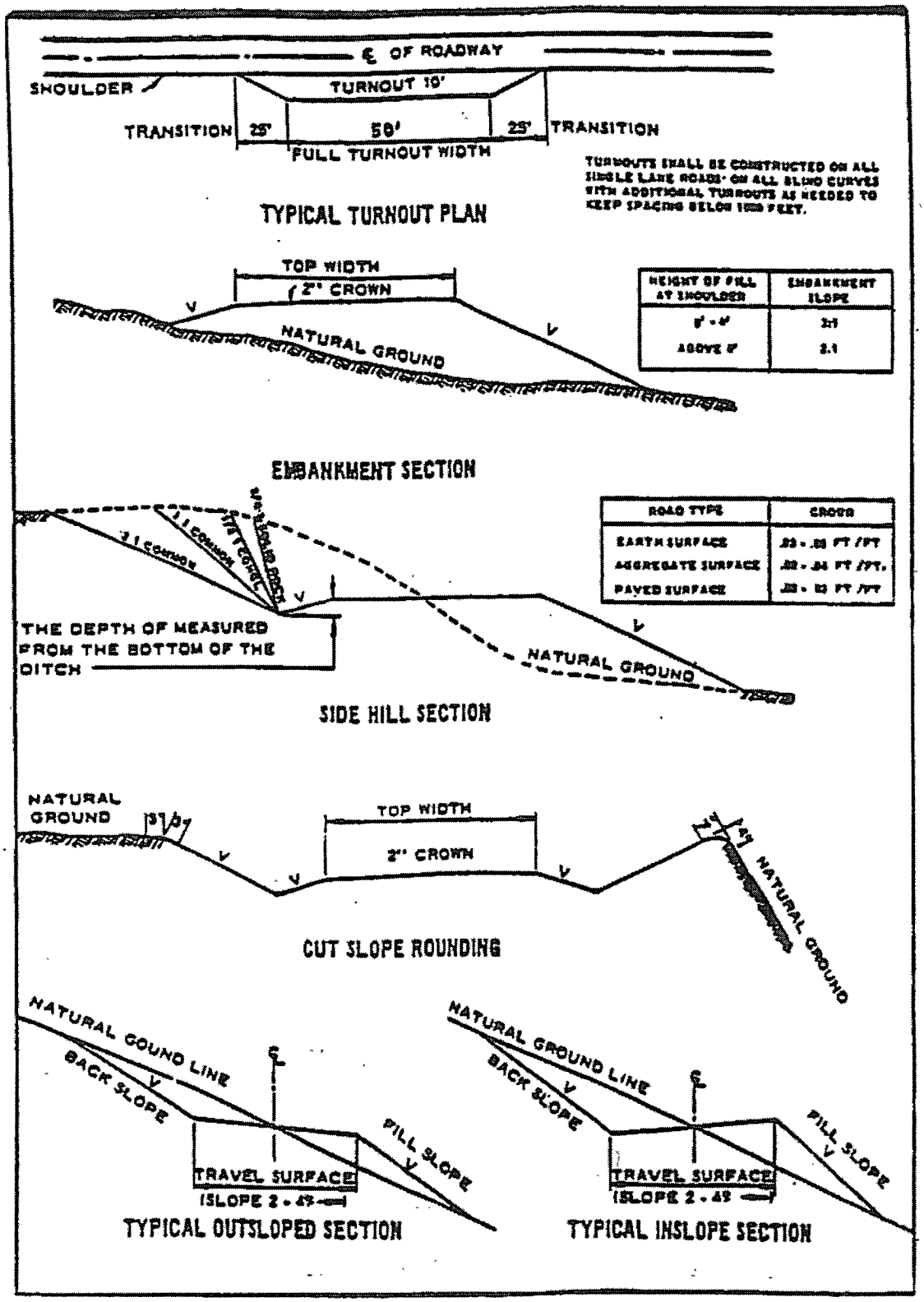
A gate shall be constructed and fastened securely to H-braces.

Fence Requirement
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. A Hydrogen Sulfide (H2S) Drilling Plan should be activated 500 feet prior to drilling into the **Yates formation.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

3. When floor controls are required, (3M or Greater) controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

B. CASING

1. The **13-3/8** inch surface casing shall be set **within the Tansill formation at approximately 400** feet and cemented to the surface.

   a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

   b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement). **Please provide WOC times to inspector for cement slurries.**

   c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours

after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

d. If cement falls back, remedial action will be done prior to drilling out that string.

High cave/karst area.
Possible lost circulation in the Grayburg and San Andres formations.
Possible high pressure gas bursts in the Wolfcamp and the Pennsylvanian Section may be over pressures.

2. The minimum required fill of cement behind the **8-5/8** inch intermediate casing is:

   ☒ Cement to surface. If cement does not circulate see B.1.a-d above. **Please provide WOC times to inspector for cement slurries.**

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

175' plug is required at the bottom of the pilot hole prior to setting the kick off plug. Plug is to be tagged.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

   ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification. **Additional cement will be necessary to achieve this height of cement.**

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. The tests shall be done by an independent service company.

    b. The results of the test shall be reported to the appropriate BLM office.

    c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

    d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

    e. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days**. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

    f. A variance to test **only the surface casing** to the reduced pressure of **1000** psi with the rig pumps is approved. **The BOP/BOPE will be tested to 5000 psi by an independent service company.**

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

WWI 082207

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures
The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color
Shale Green, Munsell Soil Color Chart # 5Y 4/2

VRM Facility Requirement

B. PIPELINES

C. ELECTRIC LINES

IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE

A. INTERIM RECLAMATION

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

At the time reserve pits are to be reclaimed, operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

B. RESERVE PIT CLOSURE

The reserve pit, when dried and closed, shall be recontoured, all trash removed, and reseeded as follows:

Seed Mixture 2, for Sandy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The see mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed

(Insert Seed Mixture Here)