ATS-08-158
EA-08-710

Split Estate

OCD-ARTESIA

OCT 21 2008

OCD-ARTESIA

Form 3160-3
(April 2004)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
SHL NM-97128 | BHL State Minerals

6. If Indian, Allotee or Tribe Name

1a. Type of Work: [X] DRILL [ ] REENTER

7. If Unit or CA Agreement, Name and No
Pending

1b. Type of Well: [X] Oil Well [ ] Gas Well [ ] Other [X] Single Zone [ ] Multiple Zone

8. Lease Name and Well No.
Cave Lake 24 Federal Com No. 4

2. Name of Operator
Cimarex Energy Co. of Colorado

9. API Well No.
30-015- 36949

3a. Address
PO Box 140907
Irving, TX 75014

3b Phone No. *(include area code)*
972-401-3111

10. Field and Pool, or Exploratory
Abo Wildcat

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At Surface 1360' FNL & 330' FWL C.L. 10/16/08

At proposed prod Zone 660' FNL & 330' FEL *Horizontal Abo test*

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*

12. County or Parish
Eddy

13. State
NM

15 Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig unit line if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
330	880	N2N2 160
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19. Proposed Depth**	**20. BLM/BIA Bond No on File**
N/A	Pilot Hole 7,350' MD 11,253' TVD 6,870'	NM-2575
21. Elevations (Show whether DF, KDB, RT, GL, etc)	**22. Approximate date work will start***	**23. Estimated duration**
3,619' GR	05.01.08	25-30 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	Name *(Printed/Typed)*	Date
Zeno Farris	Zeno Farris	03.18.08

Title
Manager Operations Administration

Approved By *(Signature)*	Name (Printed/Typed) /S/ DAVID D. EVANS	Date OCT 18 2008
Title /S/ DAVID D. EVANS 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)*

Held C-144 for NSL

Roswell Controlled Water Basin

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

Form 3160-5
(November 1994)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-ARTESIA

FORM APPROVED
OMB No. 1004-0135
Expires July 31, 1996

5. Lease Serial No.
SHL NM-97128 BHL State-owned

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

6. If Indian, Allottee or Tribe Name

7 If Unit or CA/Agreement, Name and/or No.
Pending

SUBMIT IN TRIPLICATE - Other instructions on reverse side

1. Type of Well
[X] Oil Well [ ] Gas Well [ ] Other

8. Well Name and No.
Cave Lake 24 Federal Com No. 4

2. Name of Operator
Cimarex Energy Co. of Colorado

9. API Well No.
30-015-

3a. Address
PO Box 140907; Irving, TX 75014-0907

3b. Phone No. *(include area code)*
972-401-3111

10. Field and Pool, or Exploratory Area
Crow Flats; Abo

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
SHL 360 FNL & 330 FWL
BHL 660 FNL & 330 FEL
24-16S-28E

11. County or Parish, State
Eddy County, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
[X] Notice of Intent	[ ] Acidize	[ ] Deepen	[ ] Production (Start/Resume)	[ ] Water Shut-Off
	[ ] Alter Casing	[ ] Fracture Treat	[ ] Reclamation	[ ] Well Integrity
[ ] Subsequent Report	[ ] Casing Repair	[ ] New Construction	[ ] Recomplete	[ ] Other
	[X] Change Plans	[ ] Plug and Abandon	[ ] Temporarily Abandon	
[ ] Final Abandonment Notice	[ ] Convert to Injection	[ ] Plug Back	[ ] Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, included estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones Attach the bond under which the work will be performed or provide the Bond No on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Per BLM archaeology request, Cimarex has changed the proposed location and access road for the ***Cave Lake 24 Federal Com No. 4.***

Old Location
SHL 360 FNL & 330 FWL
BHL 660 FNL & 330 FEL
24-16S-28E

New Location
SHL 160 FNL & 330 FWL
BHL 660 FNL & 330 FEL
24-16S-28E

The new location has been scheduled for archaeological survey.

Please see attached revised drilling plan, plats, and preliminary directional survey.

14. I hereby certify that the foregoing is true and correct

Name *(Printed/Typed)*	Title
Natalie Krueger	Regulatory Analyst
Signature	Date
Natalie Krueger	September 26, 2008

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
/S/ DAVID D. EVANS	FIELD MANAGER	OCT 18 2008
Conditions of Approval, if any, are attached. Approval of this notice 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.	Office CARLSBAD FIELD OFFICE	

Title 18 U.S.C. Section 1001, makes 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 reverse)

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
30-015-36949	97691	WC; Crow Flats; Abo

Property Code	Property Name	Well Number
37029	CAVE LAKE "24" FEDERAL COM	4

OGRID No.	Operator Name	Elevation
162683	CIMAREX ENERGY CO. OF COLORADO	3617'

Surface Location

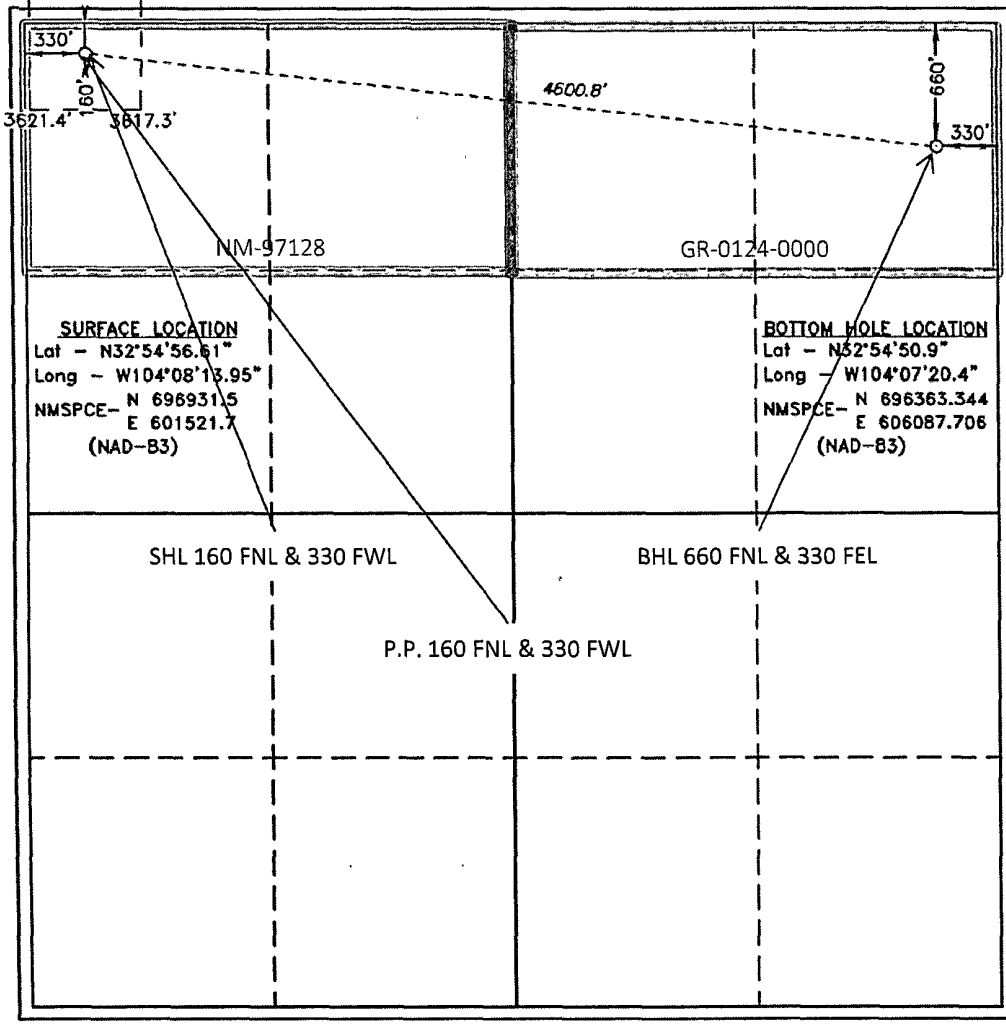
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	24	16 S	28 E		160	NORTH	330	WEST	EDDY

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
A	24	16 S	28 E		660	NORTH	330	EAST	EDDY

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

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.

Natalie Krueger 09-26-08
Signature Date

Natalie Krueger
Printed Name

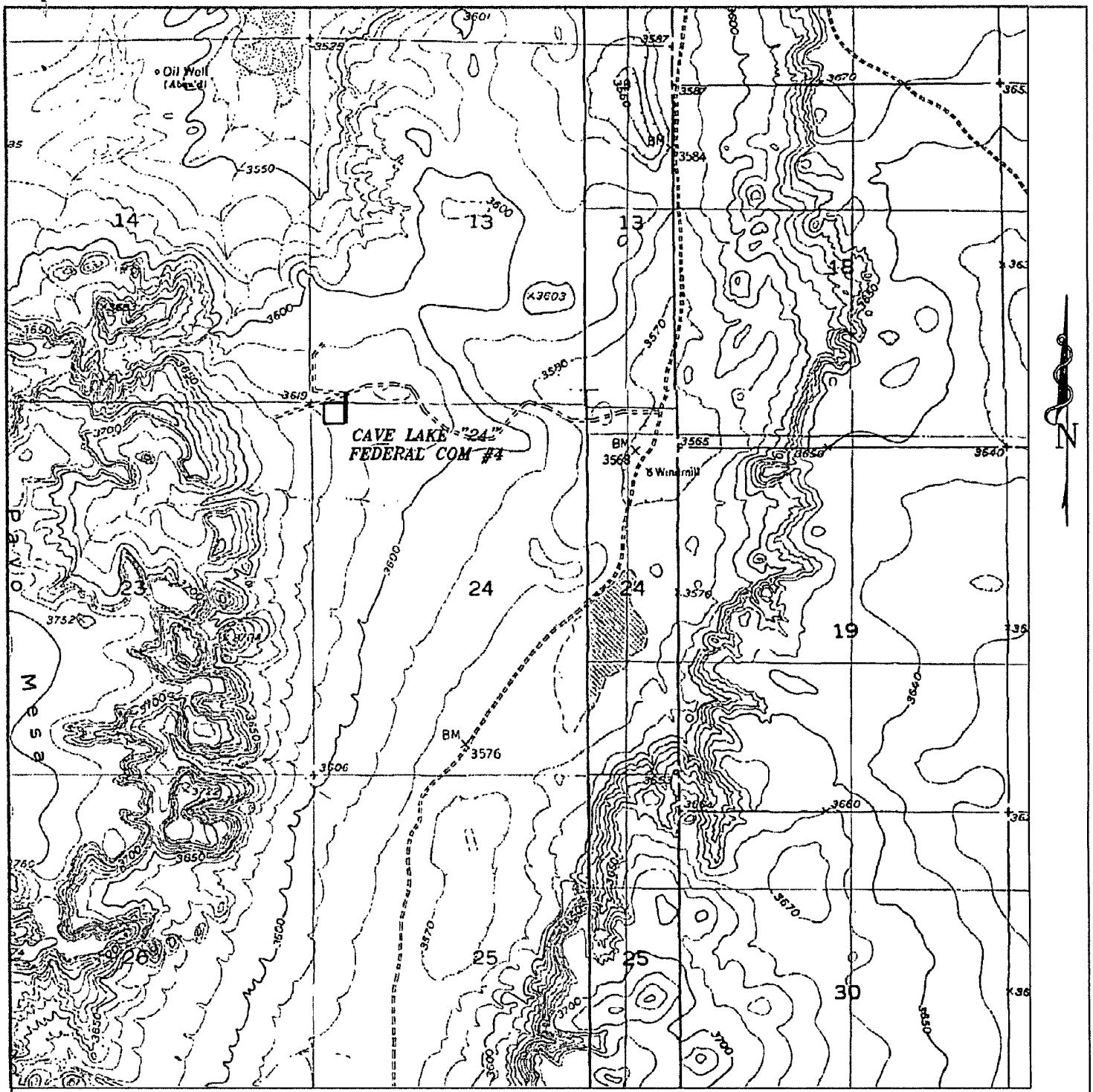
SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervison, and that the same is true and correct to the best of my belief.

AUGUST 8, 2008
Date Surveyed
Signature & Seal of Professional Surveyor

Certificate No. Gary L. Jones 7977

BASIN SURVEYS



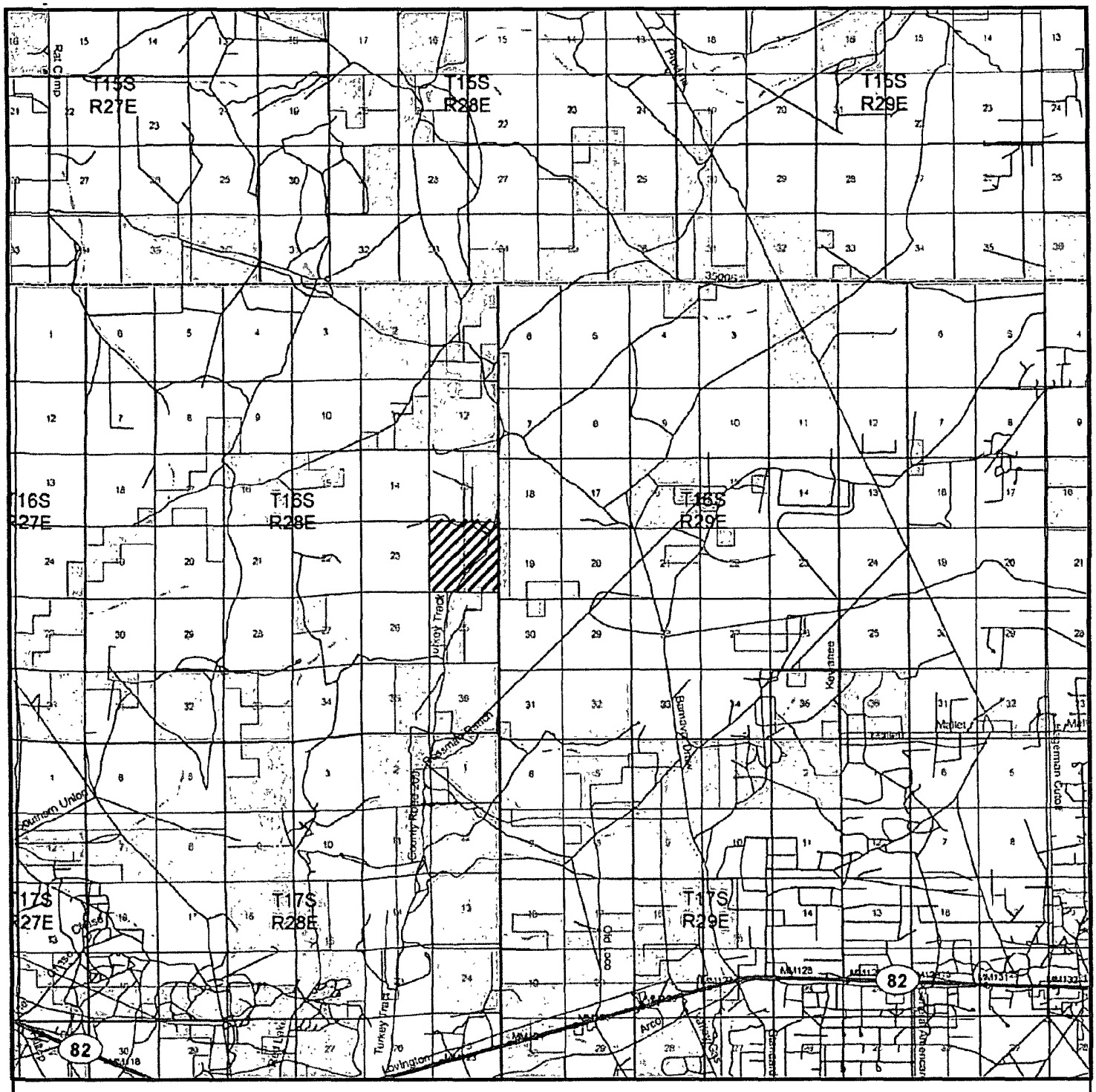
CAVE LAKE "24" FEDERAL COM #4
Located 160' FNL and 330' FWL
Section 13, Township 16 South, Range 28 East,
N.M.P.M., Eddy County, New Mexico.

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 20302
Survey Date:	08-08-2008
Scale:	1" = 2000'
Date:	08-12-2008

CIMAREX ENERGY CO. OF COLORADO



CAVE LAKE "24" FEDERAL COM #4
Located 160' FNL and 330' FWL
Section 24, Township 16 South, Range 28 East,
N.M.P.M., Eddy County, New Mexico.

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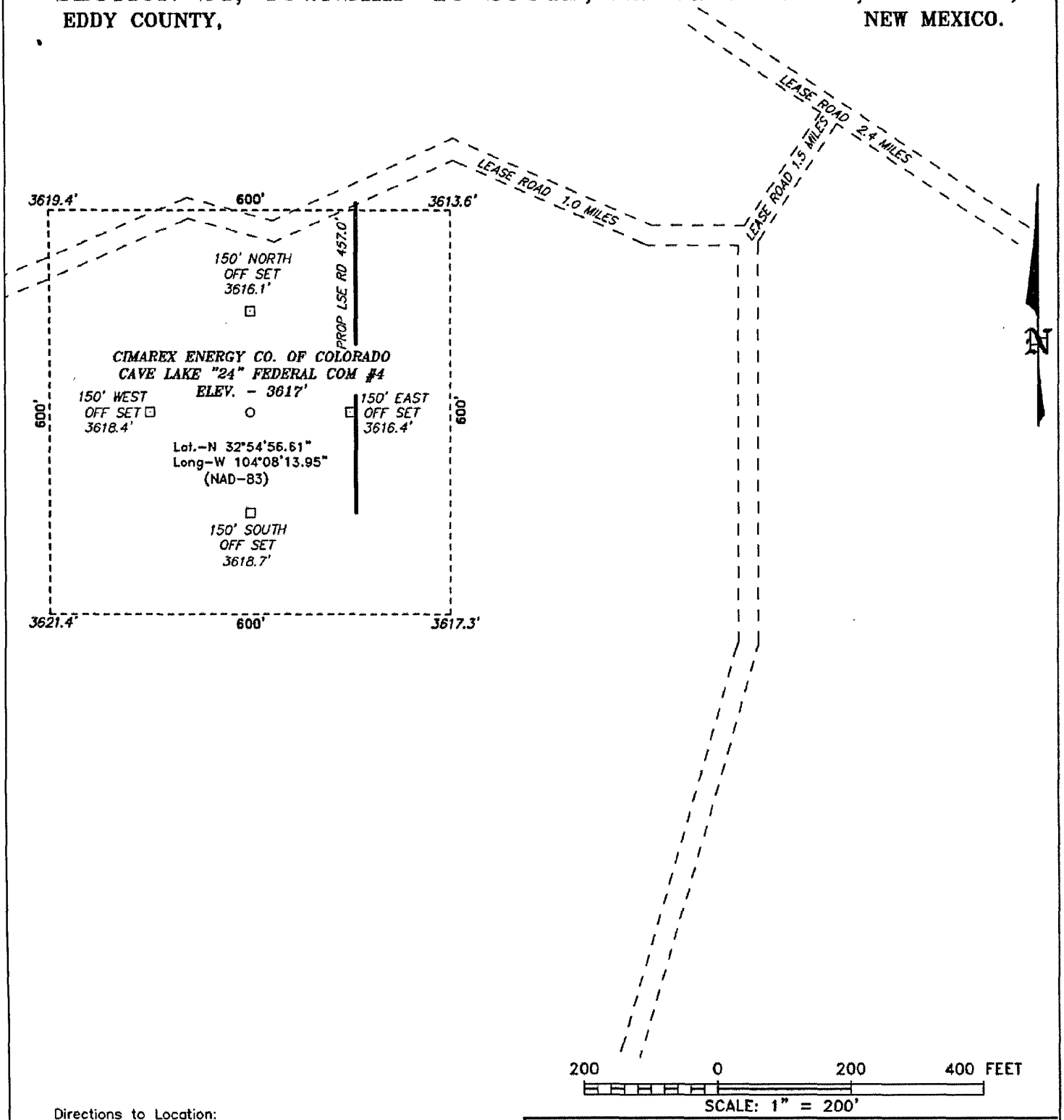
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(505) 393-7316 - Office
(505) 392-3074 - Fax
basinsurveys.com

W.O. Number:	JMS 20302
Survey Date:	08-08-2008
Scale:	1" = 2 MILES
Date:	08-12-2008

CIMAREX ENERGY CO. OF COLORADO

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 1.5 MILES TO LEASE ROAD, ON 2-TRACK GO WEST 1.0 MILES TO PROPOSED LEASE ROAD.

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

W.O. Number: 20302	Drawn By: J. SMALL
Date: 08-12-2008	Disk: JMS 20302

CIMAREX ENERGY CO. OF COLORADO

REF: CAVE LAKE "24" FEDERAL COM #4 / WELL PAD TOPO

THE CAVE LAKE "24" FEDERAL COM #4 LOCATED 160' FROM THE NORTH 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: 08-08-2008	Sheet 1 of 1 Sheets

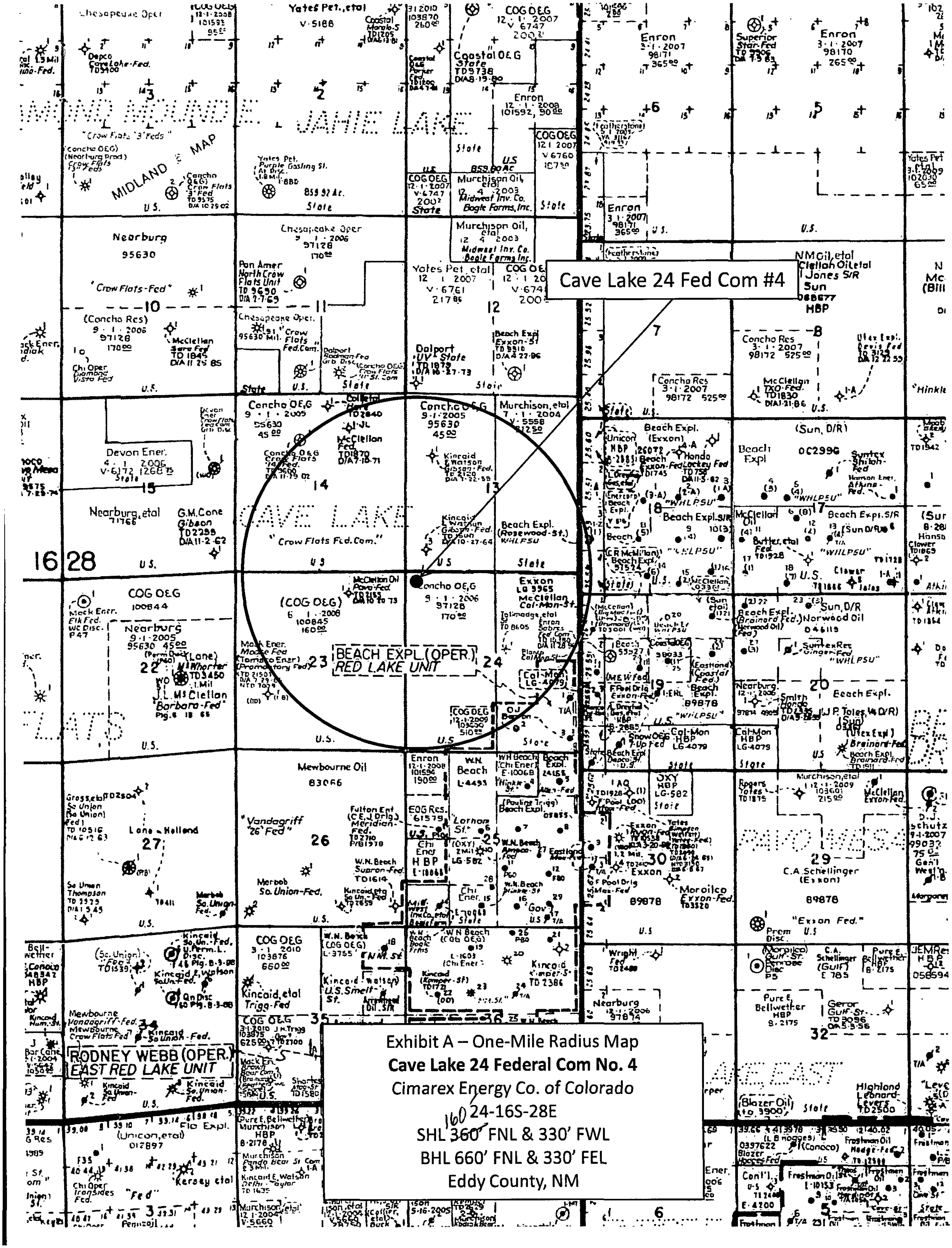


Exhibit A – One-Mile Radius Map
Cave Lake 24 Federal Com No. 4
Cimarex Energy Co. of Colorado
24-16S-28E
SHL ~~360'~~ 160 FNL & 330' FWL
BHL 660' FNL & 330' FEL
Eddy County, NM

Application to Drill
Cimarex Energy Co. of Colorado
Cave Lake 24 Federal Com No. 4
Unit D, 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 360' FNL & 330' FWL
BHL 660' FNL & 330' FEL

2 Elevation above sea level: 3,619 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: Pilot Hole 7,350' MD 11,253' TVD 6,870'

6 Estimated tops of geological markers:

San Andres	1,820'
Abo Shale	5,340'
Wolfcamp Dolomite	6,870'
Wolfcamp LS	7,000'

7 Possible mineral bearing formation:
Abo Oil

8 Proposed Mud Circulating System:

Depth			Mud Wt	Visc	Fluid Loss	Type Mud
0'	to	340'	8.4 - 8.6	28	NC	FW
340'	to	2,500'	10.0	30-32	NC	Brine water
2,500'	to	7,350'	8.4 - 9.5	30-32	NC	FW, brine
6780'	to	MD 11,253' TVD 6,870'	9.0	28-32	May lose circ	Cut brine

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.

Proposed drilling Plan
Drill 8¾" hole to 7,350' (pilot hole) and cement (see page 2 - Application to Drill). Set whipstock plug @ 6,510.' Mill window from 6,495' to 6,505.' Kick off 6⅛" lateral @ 6,500.' Drill 6⅛" hole to MD 11,523' and TVD 6,870.' Install 4½" **Peak Completion Assembly**, 500' of BTC from TOL through the curve and LTC thereafter to TD. Lateral length 4,581.' Strata-Pak RSBP @ 6,395' (TOL).

Revised Drilling Plan

Cave Lake 24 Federal Com No. 4

24-16S-28E

SHL 160 FNL & 330 FWL

BHL 660 FNL & 330 FEL

Eddy County, NM

Drill 8¾" hole to 7,350' (pilot hole) and cement (see page 2 - Application to Drill). Set whipstock plug @ 6690.' Mill window from 6675' to 6685.' Kick off 6⅛" lateral @ 6680.' Drill 6⅛" hole to MD 11395' and TVD 6800.' Install 4½" Peak Completion Assembly, BTC from RSB Packer @ 6573' to EOC @ 6993' and LTC from 6993' to 11395' TD. Lateral length: 4602' and Liner length: 4822.'

Casing Program:

String	Hole Size	Depth			Casing OD		Weight	Thread	Collar	Grade
Surface	17½"	0'	to	340'	New	13⅜"	48#	8-R	STC	H-40
Intermediate	12¼"	0'	to	2500'	New	9⅝"	40#	8-R	LTC	J-55
Pilot Hole	8¾"	0'	to	7350'	New	7"	26#	8-R	LTC	P-110
Lateral TOL-EOC	6⅛"	6573'	to	6993'	New	4½"	11.6#	8-R	BTC	P-110
Lateral EOC-TD	6⅛"	6993'	to	11395'	New	4½"	11.6#	8-R	LTC	P-110

Application to Drill
Cimarex Energy Co. of Colorado
Cave Lake 24 Federal Com No. 4
Unit D, Section 24
T16S-R28E, Eddy County, NM

9 Casing & Cementing Program:

String	Hole Size	Depth			Casing OD		Weight	Thread	Collar	Grade
Surface	17½"	0	to	340'	New	13⅜"	48#	8-R	STC	H-40
Intermediate	12¼"	0	to	2,500'	New	9⅝"	40#	8-R	LTC	J-55
Pilot Hole	8¾"	0	to	7,350'	New	7"	26#	8-R	LTC	P-110
Lateral	6⅛"	6675'	to	MD 11,253' TVD 6,870'	New	4½"	11.6#	8-R	LTC (500' BTC)	P-110

10 Cementing:

Surface Lead: 110 sx Premium Plus + 1% $CaCl_2$ + 0.125# Poly-e-flake (wt 12.5, yld 1.97)
Tail: 220 sx Premium Plus + 2% $CaCl_2$ (wt 14.8, yld 1.35)
TOC Surface

Intermediate Lead: 415 sks Interfill C + 0.125# Poly-E-Flake (wt 11.9, yld 2.45)
Tail: 215 sks Premium Plus + 1% $CaCl_2$ (wt 14.8, yld 1.34)
TOC Surface

Pilot Hole Lead: 270 sx Interfill H + 0.1% HR-7 + 0.125# Poly-e-flake (wt 11.9, yld 2.49)
Tail: 170 sx Super H + 0.5% Halad-344 + 0.4% CFR-3 + 1# Salt + 5# Gilsonite + 0.125# Poly-e-flake + 0.35% HR-7 (wt 13.2, yld 1.61)
TOC ~~2300'~~ 2000'

Lateral No cement needed. Peak completion assembly.

Fresh water zones will be protected by setting 13⅜" casing at 340' and cementing to surface. Hydrocarbon zones will be protected by setting 9⅝" casing at 2500' and cementing to surface, and by setting 7" casing at 7350' and cementing to 2300.'

Collapse Factor	*Burst Factor*	*Tension Factor*
1.125	1.125	1.6

11 Pressure control Equipment:
Exhibit "E". A 11" 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 nippled up and 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 13⅜" 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 13⅜ casing to 1000 psi using rig pumps. The BOP will be tested to 3000 psi by an independent service company.

12 Testing, Logging and Coring Program:

A. Mud logging 2 man unit from 5000' to TD
B. Electric logging program: CNL / LDT / CAL / GR, DLL / CAL / GR
C. No DSTs or cores are planned at this time.

13 Potential Hazards:

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Cimarex does not anticipate that there will be enough H_2S from the surface to the Abo formations to meet the BLM's minimum requirements for the submission of an "H_2S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an H_2S Safety package on all wells, attached is an "H_2S Drilling Operations Plan." 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 **2300 psi** Estimated BHT **110°**

14 Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.
Drilling expected to take 10-15 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.
Abo pay will be perforated and stimulated.
The proposed well will be tested and potentialed as **an oil well.**

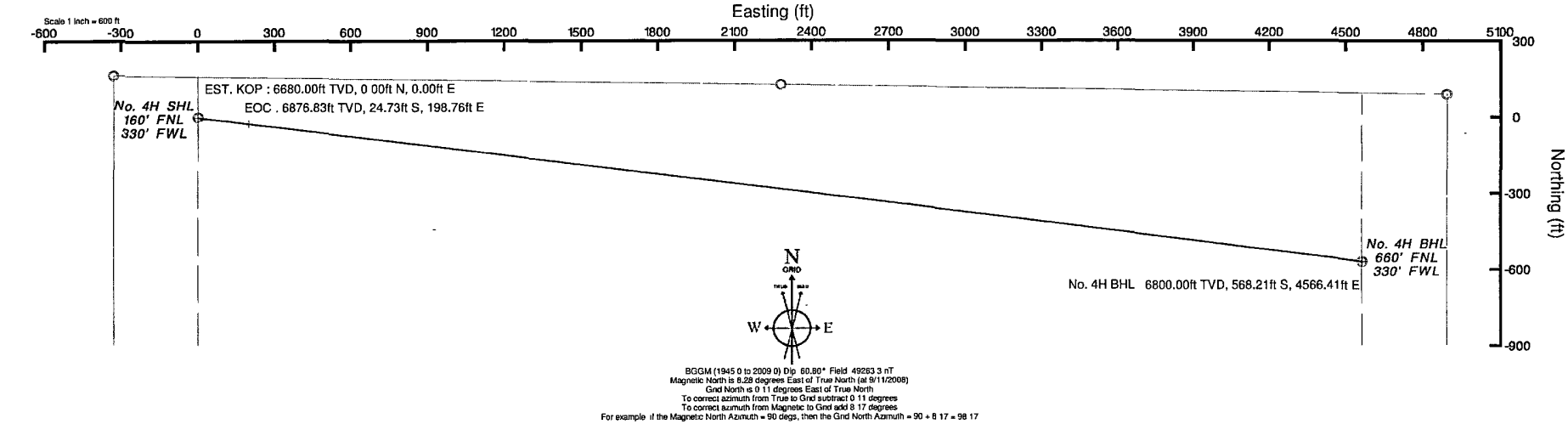
Cimarex Energy Co. of Colorado

Location: Eddy County, NM
Field: (Cave) Sec. 24, T16S, R28E
Facility: Cave Lake 24 Fed Com No. 4H
Slot: No. 4H SHL
Well: No. 4H
Wellbore: No. 4H PWB

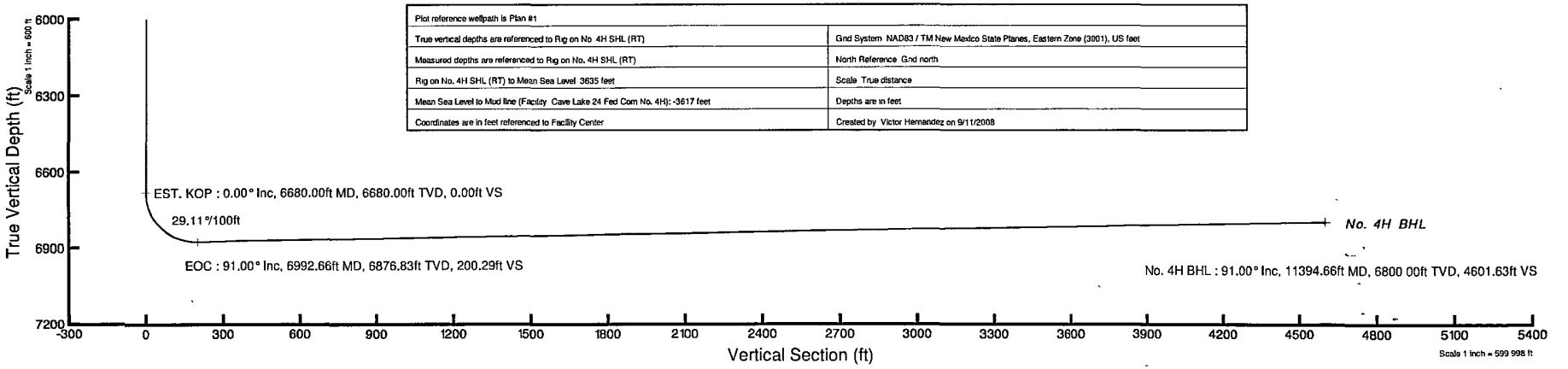
BAKER HUGHES INTEQ

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	0.00	0.000	97.093	0.00	0.00	0.00	0.00	0.00
EST. KOP	6680.00	0.000	97.093	6680.00	0.00	0.00	0.00	0.00
EOC	6992.66	91.000	97.093	6876.83	-24.73	198.76	29.11	200.29
No. 4H BHL	11394.66	91.000	97.093	6800.00	-568.21	4566.41	0.00	4601.63



Plot reference wellpath is Plan #1	
True vertical depths are referenced to Rig on No 4H SHL (RT)	Grid System NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet
Measured depths are referenced to Rig on No. 4H SHL (RT)	North Reference Grid north
Rig on No. 4H SHL (RT) to Mean Sea Level 3635 feet	Scale True distance
Mean Sea Level to Mud line (Facility Cave Lake 24 Fed Com No. 4H): -3617 feet	Depths are in feet
Coordinates are in feet referenced to Facility Center	Created by Victor Hernandez on 9/11/2008



Planned Wellpath Report

Plan #1

REFERENCE WELLPATH IDENTIFICATION			
Operator	**Cimarex Energy Co. of Colorado**	Slot	**No. 4H SHL**
Area	**Eddy County, NM**	Well	**No. 4H**
Field	**(Cave) Sec. 24, T16S, R28E**	Wellbore	**No. 4H PWB**
Facility	**Cave Lake 24 Fed Com No. 4H**		

REPORT SETUP INFORMATION			
Projection System	**NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet**	Software System	**WellArchitect® 2.0**
North Reference	**Grid**	User	**Victor Hernandez**
Scale	**0.999913**	Report Generated	**9/11/2008** at **3:24:50 PM**
Convergence at slot	**0.11° East**	Database/Source file	**WA_Midland/No._4H_PWB.xml**

WELLPATH LOCATION	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	**East[ft]**	**Easting[USft]**	**Northing[USft]**	**Latitude**	**Longitude**
Slot Location	**0.00**	**0.00**	601521.70	696931.50	32°54'56.613"N	104°08'13.953"W
Facility Reference Pt			**601521.70**	**696931.50**	32°54'56.613"N	104°08'13.953"W
Field Reference Pt			**601521.50**	**694831.90**	32°54'35.837"N	104°08'14.001"W

WELLPATH DATUM			
Calculation method	**Minimum curvature**	Rig on No. 4H SHL (RT) to Facility Vertical Datum	**18.00ft**
Horizontal Reference Pt	**Facility Center**	Rig on No. 4H SHL (RT) to Mean Sea Level	**3635.00ft**
Vertical Reference Pt	**Rig on No. 4H SHL (RT)**	Facility Vertical Datum to Mud Line (Facility)	**0.00ft**
MD Reference Pt	**Rig on No. 4H SHL (RT)**	Section Origin	**N 0.00, E 0.00 ft**
Field Vertical Reference	**Mean Sea Level**	Section Azimuth	**97.09°**

REFERENCE WELLPATH IDENTIFICATION			
Operator	**Cimarex Energy Co. of Colorado**	Slot	**No. 4H SHL**
Area	**Eddy County, NM**	Well	**No. 4H**
Field	**(Cave) Sec. 24, T16S, R28E**	Wellbore	**No. 4H PWB**
Facility	**Cave Lake 24 Fed Com No. 4H**		

WELLPATH DATA (51 stations) †= interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]	Comments
0.00	0.000	97.093	0.00	0.00	0.00	0.00	601521.70	696931.50	0.00	Tie On
6680.00	0.000	97.093	6680.00	0.00	0.00	0.00	601521.70	696931.50	0.00	EST. KOP
6780.00†	29.105	97.093	6775.75	24.86	-3.07	24.67	601546.37	696928.43	29.11	
6880.00†	58.211	97.093	6847.33	93.15	-11.50	92.44	601614.13	696920.00	29.11	
6980.00†	87.316	97.093	6876.64	187.64	-23.17	186.20	601707.89	696908.33	29.11	
6992.66	91.000	97.093	6876.83	200.29	-24.73	198.76	601720.44	696906.77	29.11	EOC
7080.00†	91.000	97.093	6875.30	287.62	-35.52	285.42	601807.10	696895.99	0.00	
7180.00†	91.000	97.093	6873.56	387.61	-47.86	384.64	601906.31	696883.64	0.00	
7280.00†	91.000	97.093	6871.81	487.59	-60.21	483.86	602005.52	696871.30	0.00	
7380.00†	91.000	97.093	6870.07	587.58	-72.55	583.08	602104.73	696858.95	0.00	
7480.00†	91.000	97.093	6868.32	687.56	-84.90	682.30	602203.94	696846.61	0.00	
7580.00†	91.000	97.093	6866.58	787.55	-97.25	781.52	602303.15	696834.26	0.00	
7680.00†	91.000	97.093	6864.83	887.53	-109.59	880.74	602402.36	696821.92	0.00	
7780.00†	91.000	97.093	6863.08	987.52	-121.94	979.96	602501.57	696809.57	0.00	
7880.00†	91.000	97.093	6861.34	1087.50	-134.28	1079.18	602600.78	696797.23	0.00	
7980.00†	91.000	97.093	6859.59	1187.49	-146.63	1178.40	602699.99	696784.88	0.00	
8080.00†	91.000	97.093	6857.85	1287.47	-158.98	1277.62	602799.20	696772.54	0.00	
8180.00†	91.000	97.093	6856.10	1387.45	-171.32	1376.84	602898.41	696760.19	0.00	
8280.00†	91.000	97.093	6854.36	1487.44	-183.67	1476.06	602997.63	696747.85	0.00	
8380.00†	91.000	97.093	6852.61	1587.42	-196.01	1575.28	603096.84	696735.50	0.00	
8480.00†	91.000	97.093	6850.87	1687.41	-208.36	1674.50	603196.05	696723.16	0.00	
8580.00†	91.000	97.093	6849.12	1787.39	-220.71	1773.71	603295.26	696710.81	0.00	
8680.00†	91.000	97.093	6847.38	1887.38	-233.05	1872.93	603394.47	696698.47	0.00	
8780.00†	91.000	97.093	6845.63	1987.36	-245.40	1972.15	603493.68	696686.12	0.00	
8880.00†	91.000	97.093	6843.89	2087.35	-257.74	2071.37	603592.89	696673.78	0.00	
8980.00†	91.000	97.093	6842.14	2187.33	-270.09	2170.59	603692.10	696661.43	0.00	
9080.00†	91.000	97.093	6840.40	2287.32	-282.44	2269.81	603791.31	696649.09	0.00	
9180.00†	91.000	97.093	6838.65	2387.30	-294.78	2369.03	603890.52	696636.74	0.00	
9280.00†	91.000	97.093	6836.91	2487.29	-307.13	2468.25	603989.73	696624.40	0.00	
9380.00†	91.000	97.093	6835.16	2587.27	-319.47	2567.47	604088.94	696612.05	0.00	

REFERENCE WELLPATH IDENTIFICATION			
Operator	**Cimarex Energy Co. of Colorado**	Slot	**No. 4H SHL**
Area	**Eddy County, NM**	Well	**No. 4H**
Field	**(Cave) Sec. 24, T16S, R28E**	Wellbore	**No. 4H PWB**
Facility	**Cave Lake 24 Fed Com No. 4H**		

WELLPATH DATA (51 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]	Comments
9480.00†	91.000	97.093	6833.42	2687.26	-331.82	2666.69	604188.15	696599.71	0.00	
9580.00†	91.000	97.093	6831.67	2787.24	-344.17	2765.91	604287.37	696587.36	0.00	
9680.00†	91.000	97.093	6829.92	2887.23	-356.51	2865.13	604386.58	696575.02	0.00	
9780.00†	91.000	97.093	6828.18	2987.21	-368.86	2964.35	604485.79	696562.67	0.00	
9880.00†	91.000	97.093	6826.43	3087.20	-381.21	3063.57	604585.00	696550.33	0.00	
9980.00†	91.000	97.093	6824.69	3187.18	-393.55	3162.79	604684.21	696537.98	0.00	
10080.00†	91.000	97.093	6822.94	3287.17	-405.90	3262.01	604783.42	696525.64	0.00	
10180.00†	91.000	97.093	6821.20	3387.15	-418.24	3361.23	604882.63	696513.29	0.00	
10280.00†	91.000	97.093	6819.45	3487.13	-430.59	3460.45	604981.84	696500.95	0.00	
10380.00†	91.000	97.093	6817.71	3587.12	-442.94	3559.67	605081.05	696488.60	0.00	
10480.00†	91.000	97.093	6815.96	3687.10	-455.28	3658.89	605180.26	696476.26	0.00	
10580.00†	91.000	97.093	6814.22	3787.09	-467.63	3758.11	605279.47	696463.91	0.00	
10680.00†	91.000	97.093	6812.47	3887.07	-479.97	3857.33	605378.68	696451.57	0.00	
10780.00†	91.000	97.093	6810.73	3987.06	-492.32	3956.55	605477.89	696439.22	0.00	
10880.00†	91.000	97.093	6808.98	4087.04	-504.67	4055.77	605577.11	696426.88	0.00	
10980.00†	91.000	97.093	6807.24	4187.03	-517.01	4154.99	605676.32	696414.53	0.00	
11080.00†	91.000	97.093	6805.49	4287.01	-529.36	4254.20	605775.53	696402.19	0.00	
11180.00†	91.000	97.093	6803.75	4387.00	-541.70	4353.42	605874.74	696389.84	0.00	
11280.00†	91.000	97.093	6802.00	4486.98	-554.05	4452.64	605973.95	696377.50	0.00	
11380.00†	91.000	97.093	6800.26	4586.97	-566.40	4551.86	606073.16	696365.15	0.00	
11394.66	91.000	97.093	6800.00[1]	4601.63	-568.21	4566.41	606087.71	696363.34	0.00	No. 4H BHL

Planned Wellpath Report

Plan #1

INTEQ

REFERENCE WELLPATH IDENTIFICATION			
Operator	**Cimarex Energy Co. of Colorado**	Slot	**No. 4H SHL**
Area	**Eddy County, NM**	Well	**No. 4H**
Field	**(Cave) Sec. 24, T16S, R28E**	Wellbore	**No. 4H PWB**
Facility	**Cave Lake 24 Fed Com No. 4H**		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	Shape
1) No. 4H BHL	11394.66	6800.00	-568.21	4566.41	**606087.71**	**696363.34**	32°54'50.904"N	104°07'20.401"W	point

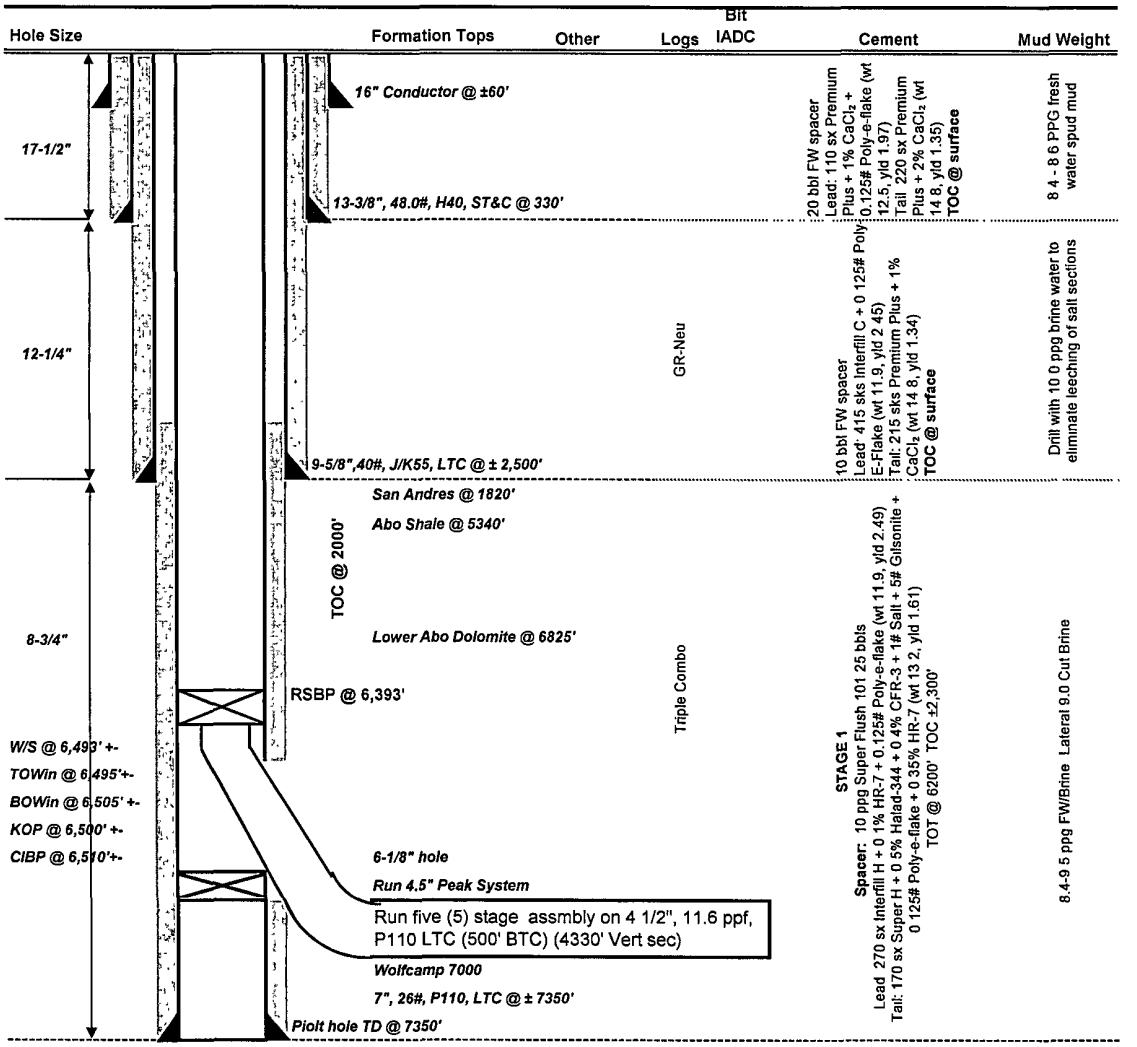
SURVEY PROGRAM Ref Wellbore: No. 4H PWB Ref Wellpath: Plan #1

Start MD [ft]	*End MD [ft]*	*Positional Uncertainty Model*	*Log Name/Comment*	Wellbore
18.00	11394.66	NaviTrak (Standard)		No. 4H PWB

DRILLING PROGNOSIS
Cimarex Energy Company

2/4/2008

Well:	**Cave Lake 24 Fed Com 4**	**Lse Serial #:**	
Location:	24-16S-28E	**Field:**	
County, State	**Eddy County, NM**	**Objective:**	
Surface Location:	360 FN, 330 FW	**TVD/MD:**	7350 / 11250
Bottomhole Loc:	660 FN, 330 FE	**Cementing:**	Halliburton
E-Mail:		**Mud:**	
Wellhead:		**Motors:**	
		OH Logs	Halliburton
		Rig:	Pat 74
Xmas Tree		**Offset Wells:**	
Tubing:			
Superintendent:			
Engineer:			



NOTES:

Install wellhead on 13⅝" and NU BOP. Test this installation to 1000 psi w/ rig pump. Then after setting 9⅝" in slips and installing the csg spool, NU BOP (5M) w/ rotating head and test BOP to 5M w/ test unit. Test casing.

Cement volumes for surface csg include a 100% excess in the open hole section. If drilling conditions deem necessary, fluid caliper hole and adjust volumes.

Cement volumes for intermediate csg include a 70% excess in the open hole section. If drilling conditions deem necessary, fluid caliper hole and adjust volumes.

Cement volumes for production csg include a 25% excess in the open hole section. Adjust volumes after caliper + 25% excess.

ALL INVOICES ARE TO SHOW CIMAREX ENERGY AS OPERATOR AND USE CIMAREX ACCOUNTING CODES.

Cave Lake 24 Fed Com 4 Lateral Plan #1

Cimarex Energy Co., Inc.
Cave Lake '24' Fed Com #4 - Plan #1

Eddy Co., New Mexico
Cave Lake '24' Fed Com #4

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	1.909	94.614	6510.00	0.01 S	0.17 E	0.17	19.09
6540.00	7.636	94.614	6539.88	0.21 S	2.65 E	2.66	19.09
6570.00	13.363	94.614	6569.37	0.65 S	8.10 E	8.13	19.09
6600.00	19.090	94.614	6598.16	1.33 S	16.45 E	16.51	19.09
6630.00	24.817	94.614	6625.97	2.23 S	27.63 E	27.72	19.09
6660.00	30.544	94.614	6652.53	3.35 S	41.51 E	41.65	19.09
6690.00	36.271	94.614	6677.56	4.68 S	57.97 E	58.16	19.09
6720.00	41.998	94.614	6700.82	6.20 S	76.83 E	77.08	19.09
6750.00	47.725	94.614	6722.08	7.90 S	97.92 E	98.24	19.09
6780.00	53.452	94.614	6741.12	9.77 S	121.01 E	121.41	19.09
6810.00	59.179	94.614	6757.75	11.77 S	145.88 E	146.36	19.09
6840.00	64.906	94.614	6771.81	13.90 S	172.29 E	172.85	19.09
6870.00	70.633	94.614	6783.15	16.14 S	199.95 E	200.60	19.09
6900.00	76.360	94.614	6791.67	18.45 S	228.61 E	229.36	19.09
6930.00	82.087	94.614	6797.28	20.82 S	257.98 E	258.82	19.09
6960.00	87.814	94.614	6799.92	23.22 S	287.75 E	288.69	19.09
6966.56	89.066	94.614	6800.10	23.75 S	294.28 E	295.24	19.09
6990.00	89.066	94.614	6800.48	25.63 S	317.65 E	318.68	0.00
7020.00	89.066	94.614	6800.97	28.05 S	347.55 E	348.68	0.00
7050.00	89.066	94.614	6801.46	30.46 S	377.45 E	378.67	0.00
7080.00	89.066	94.614	6801.95	32.87 S	407.34 E	408.67	0.00
7110.00	89.066	94.614	6802.44	35.28 S	437.24 E	438.66	0.00
7140.00	89.066	94.614	6802.92	37.70 S	467.14 E	468.66	0.00
7170.00	89.066	94.614	6803.41	40.11 S	497.04 E	498.66	0.00

7200.00	89.066	94.614	6803.90	42.52 S	526.94 E	528.65	0.00
7230.00	89.066	94.614	6804.39	44.93 S	556.84 E	558.65	0.00
7260.00	89.066	94.614	6804.88	47.35 S	586.74 E	588.64	0.00
7290.00	89.066	94.614	6805.37	49.76 S	616.64 E	618.64	0.00
7320.00	89.066	94.614	6805.86	52.17 S	646.54 E	648.64	0.00
7350.00	89.066	94.614	6806.35	54.59 S	676.43 E	678.63	0.00
7380.00	89.066	94.614	6806.84	57.00 S	706.33 E	708.63	0.00
7410.00	89.066	94.614	6807.33	59.41 S	736.23 E	738.62	0.00
7440.00	89.066	94.614	6807.82	61.82 S	766.13 E	768.62	0.00
7470.00	89.066	94.614	6808.31	64.24 S	796.03 E	798.62	0.00
7500.00	89.066	94.614	6808.80	66.65 S	825.93 E	828.61	0.00
7530.00	89.066	94.614	6809.29	69.06 S	855.83 E	858.61	0.00
7560.00	89.066	94.614	6809.77	71.47 S	885.73 E	888.60	0.00
7590.00	89.066	94.614	6810.26	73.89 S	915.62 E	918.60	0.00
7620.00	89.066	94.614	6810.75	76.30 S	945.52 E	948.60	0.00
7650.00	89.066	94.614	6811.24	78.71 S	975.42 E	978.59	0.00
7680.00	89.066	94.614	6811.73	81.12 S	1005.32 E	1008.59	0.00
7710.00	89.066	94.614	6812.22	83.54 S	1035.22 E	1038.59	0.00
7740.00	89.066	94.614	6812.71	85.95 S	1065.12 E	1068.58	0.00
7770.00	89.066	94.614	6813.20	88.36 S	1095.02 E	1098.58	0.00
7800.00	89.066	94.614	6813.69	90.78 S	1124.92 E	1128.57	0.00
7830.00	89.066	94.614	6814.18	93.19 S	1154.82 E	1158.57	0.00
7860.00	89.066	94.614	6814.67	95.60 S	1184.71 E	1188.57	0.00
7890.00	89.066	94.614	6815.16	98.01 S	1214.61 E	1218.56	0.00
7920.00	89.066	94.614	6815.65	100.43 S	1244.51 E	1248.56	0.00
7950.00	89.066	94.614	6816.13	102.84 S	1274.41 E	1278.55	0.00
7980.00	89.066	94.614	6816.62	105.25 S	1304.31 E	1308.55	0.00
8010.00	89.066	94.614	6817.11	107.66 S	1334.21 E	1338.55	0.00
8040.00	89.066	94.614	6817.60	110.08 S	1364.11 E	1368.54	0.00
8070.00	89.066	94.614	6818.09	112.49 S	1394.01 E	1398.54	0.00
8100.00	89.066	94.614	6818.58	114.90 S	1423.90 E	1428.53	0.00
8130.00	89.066	94.614	6819.07	117.32 S	1453.80 E	1458.53	

8160.00	89.066	94.614	6819.56	119.73 S	1483.70 E	1488.53
0.00						
8190.00	89.066	94.614	6820.05	122.14 S	1513.60 E	1518.52
0.00						
8220.00	89.066	94.614	6820.54	124.55 S	1543.50 E	1548.52
0.00						
8250.00	89.066	94.614	6821.03	126.97 S	1573.40 E	1578.51
0.00						
8280.00	89.066	94.614	6821.52	129.38 S	1603.30 E	1608.51
0.00						
8310.00	89.066	94.614	6822.01	131.79 S	1633.20 E	1638.51
0.00						
8340.00	89.066	94.614	6822.50	134.20 S	1663.10 E	1668.50
0.00						
8370.00	89.066	94.614	6822.98	136.62 S	1692.99 E	1698.50
0.00						
8400.00	89.066	94.614	6823.47	139.03 S	1722.89 E	1728.49
0.00						
8430.00	89.066	94.614	6823.96	141.44 S	1752.79 E	1758.49
0.00						
8460.00	89.066	94.614	6824.45	143.86 S	1782.69 E	1788.49
0.00						
8490.00	89.066	94.614	6824.94	146.27 S	1812.59 E	1818.48
0.00						
8520.00	89.066	94.614	6825.43	148.68 S	1842.49 E	1848.48
0.00						
8550.00	89.066	94.614	6825.92	151.09 S	1872.39 E	1878.47
0.00						
8580.00	89.066	94.614	6826.41	153.51 S	1902.29 E	1908.47
0.00						
8610.00	89.066	94.614	6826.90	155.92 S	1932.18 E	1938.47
0.00						
8640.00	89.066	94.614	6827.39	158.33 S	1962.08 E	1968.46
0.00						
8670.00	89.066	94.614	6827.88	160.74 S	1991.98 E	1998.46
0.00						
8700.00	89.066	94.614	6828.37	163.16 S	2021.88 E	2028.45
0.00						
8730.00	89.066	94.614	6828.86	165.57 S	2051.78 E	2058.45
0.00						
8760.00	89.066	94.614	6829.35	167.98 S	2081.68 E	2088.45
0.00						
8790.00	89.066	94.614	6829.83	170.39 S	2111.58 E	2118.44
0.00						
8820.00	89.066	94.614	6830.32	172.81 S	2141.48 E	2148.44
0.00						
8850.00	89.066	94.614	6830.81	175.22 S	2171.38 E	2178.43
0.00						
8880.00	89.066	94.614	6831.30	177.63 S	2201.27 E	2208.43
0.00						
8910.00	89.066	94.614	6831.79	180.05 S	2231.17 E	2238.43
0.00						
8940.00	89.066	94.614	6832.28	182.46 S	2261.07 E	2268.42
0.00						
8970.00	89.066	94.614	6832.77	184.87 S	2290.97 E	2298.42
0.00						
9000.00	89.066	94.614	6833.26	187.28 S	2320.87 E	2328.41
0.00						
9030.00	89.066	94.614	6833.75	189.70 S	2350.77 E	2358.41
0.00						
9060.00	89.066	94.614	6834.24	192.11 S	2380.67 E	2388.41
0.00						

9090.00	89.066	94.614	6834.73	194.52 S	2410.57 E	2418.40
0.00						
9120.00	89.066	94.614	6835.22	196.93 S	2440.46 E	2448.40
0.00						
9150.00	89.066	94.614	6835.71	199.35 S	2470.36 E	2478.39
0.00						
9180.00	89.066	94.614	6836.20	201.76 S	2500.26 E	2508.39
0.00						
9210.00	89.066	94.614	6836.68	204.17 S	2530.16 E	2538.39
0.00						
9240.00	89.066	94.614	6837.17	206.59 S	2560.06 E	2568.38
0.00						
9270.00	89.066	94.614	6837.66	209.00 S	2589.96 E	2598.38
0.00						
9300.00	89.066	94.614	6838.15	211.41 S	2619.86 E	2628.37
0.00						
9330.00	89.066	94.614	6838.64	213.82 S	2649.76 E	2658.37
0.00						
9360.00	89.066	94.614	6839.13	216.24 S	2679.66 E	2688.37
0.00						
9390.00	89.066	94.614	6839.62	218.65 S	2709.55 E	2718.36
0.00						
9420.00	89.066	94.614	6840.11	221.06 S	2739.45 E	2748.36
0.00						
9450.00	89.066	94.614	6840.60	223.47 S	2769.35 E	2778.35
0.00						
9480.00	89.066	94.614	6841.09	225.89 S	2799.25 E	2808.35
0.00						
9510.00	89.066	94.614	6841.58	228.30 S	2829.15 E	2838.35
0.00						
9540.00	89.066	94.614	6842.07	230.71 S	2859.05 E	2868.34
0.00						
9570.00	89.066	94.614	6842.56	233.12 S	2888.95 E	2898.34
0.00						
9600.00	89.066	94.614	6843.05	235.54 S	2918.85 E	2928.33
0.00						
9630.00	89.066	94.614	6843.53	237.95 S	2948.74 E	2958.33
0.00						
9660.00	89.066	94.614	6844.02	240.36 S	2978.64 E	2988.33
0.00						
9690.00	89.066	94.614	6844.51	242.78 S	3008.54 E	3018.32
0.00						
9720.00	89.066	94.614	6845.00	245.19 S	3038.44 E	3048.32
0.00						
9750.00	89.066	94.614	6845.49	247.60 S	3068.34 E	3078.31
0.00						
9780.00	89.066	94.614	6845.98	250.01 S	3098.24 E	3108.31
0.00						
9810.00	89.066	94.614	6846.47	252.43 S	3128.14 E	3138.31
0.00						
9840.00	89.066	94.614	6846.96	254.84 S	3158.04 E	3168.30
0.00						
9870.00	89.066	94.614	6847.45	257.25 S	3187.94 E	3198.30
0.00						
9900.00	89.066	94.614	6847.94	259.66 S	3217.83 E	3228.29
0.00						
9930.00	89.066	94.614	6848.43	262.08 S	3247.73 E	3258.29
0.00						
9960.00	89.066	94.614	6848.92	264.49 S	3277.63 E	3288.29
0.00						
9990.00	89.066	94.614	6849.41	266.90 S	3307.53 E	3318.28
0.00						
10020.00	89.066	94.614	6849.90	269.32 S	3337.43 E	3348.28

0.00							
10050.00	89.066	94.614	6850.38	271.73 S	3367.33 E	3378.27	
0.00							
10080.00	89.066	94.614	6850.87	274.14 S	3397.23 E	3408.27	
0.00							
10110.00	89.066	94.614	6851.36	276.55 S	3427.13 E	3438.27	
0.00							
10140.00	89.066	94.614	6851.85	278.97 S	3457.02 E	3468.26	
0.00							
10170.00	89.066	94.614	6852.34	281.38 S	3486.92 E	3498.26	
0.00							
10200.00	89.066	94.614	6852.83	283.79 S	3516.82 E	3528.25	
0.00							
10230.00	89.066	94.614	6853.32	286.20 S	3546.72 E	3558.25	
0.00							
10260.00	89.066	94.614	6853.81	288.62 S	3576.62 E	3588.25	
0.00							
10290.00	89.066	94.614	6854.30	291.03 S	3606.52 E	3618.24	
0.00							
10320.00	89.066	94.614	6854.79	293.44 S	3636.42 E	3648.24	
0.00							
10350.00	89.066	94.614	6855.28	295.86 S	3666.32 E	3678.23	
0.00							
10380.00	89.066	94.614	6855.77	298.27 S	3696.21 E	3708.23	
0.00							
10410.00	89.066	94.614	6856.26	300.68 S	3726.11 E	3738.23	
0.00							
10440.00	89.066	94.614	6856.74	303.09 S	3756.01 E	3768.22	
0.00							
10470.00	89.066	94.614	6857.23	305.51 S	3785.91 E	3798.22	
0.00							
10500.00	89.066	94.614	6857.72	307.92 S	3815.81 E	3828.21	
0.00							
10530.00	89.066	94.614	6858.21	310.33 S	3845.71 E	3858.21	
0.00							
10560.00	89.066	94.614	6858.70	312.74 S	3875.61 E	3888.21	
0.00							
10590.00	89.066	94.614	6859.19	315.16 S	3905.51 E	3918.20	
0.00							
10620.00	89.066	94.614	6859.68	317.57 S	3935.41 E	3948.20	
0.00							
10650.00	89.066	94.614	6860.17	319.98 S	3965.30 E	3978.19	
0.00							
10680.00	89.066	94.614	6860.66	322.39 S	3995.20 E	4008.19	
0.00							
10710.00	89.066	94.614	6861.15	324.81 S	4025.10 E	4038.19	
0.00							
10740.00	89.066	94.614	6861.64	327.22 S	4055.00 E	4068.18	
0.00							
10770.00	89.066	94.614	6862.13	329.63 S	4084.90 E	4098.18	
0.00							
10800.00	89.066	94.614	6862.62	332.05 S	4114.80 E	4128.17	
0.00							
10830.00	89.066	94.614	6863.11	334.46 S	4144.70 E	4158.17	
0.00							
10860.00	89.066	94.614	6863.59	336.87 S	4174.60 E	4188.17	
0.00							
10890.00	89.066	94.614	6864.08	339.28 S	4204.49 E	4218.16	
0.00							
10920.00	89.066	94.614	6864.57	341.70 S	4234.39 E	4248.16	
0.00							
10950.00	89.066	94.614	6865.06	344.11 S	4264.29 E	4278.15	
0.00							

Cave Lake 24 Fed Com 4 Lateral Plan #1

10980.00	89.066	94.614	6865.55	346.52 S	4294.19 E	4308.15	0.00
11010.00	89.066	94.614	6866.04	348.93 S	4324.09 E	4338.15	0.00
11040.00	89.066	94.614	6866.53	351.35 S	4353.99 E	4368.14	0.00
11070.00	89.066	94.614	6867.02	353.76 S	4383.89 E	4398.14	0.00
11100.00	89.066	94.614	6867.51	356.17 S	4413.79 E	4428.13	0.00
11130.00	89.066	94.614	6868.00	358.59 S	4443.69 E	4458.13	0.00
11160.00	89.066	94.614	6868.49	361.00 S	4473.58 E	4488.13	0.00
11190.00	89.066	94.614	6868.98	363.41 S	4503.48 E	4518.12	0.00
11220.00	89.066	94.614	6869.47	365.82 S	4533.38 E	4548.12	0.00
11250.00	89.066	94.614	6869.96	368.24 S	4563.28 E	4578.11	0.00
11252.73	89.066	94.614	6870.00	368.46 S	4566.01 E	4580.85	0.00

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to WELL. 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 94.614° (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 11252.73ft., the Bottom Hole Displacement is 4580.85ft., in the Direction of 94.614° (Grid).

Cimarex Energy Co., Inc.

Eddy Co., New Mexico
Cave Lake '24' Fed Com #4
Cave Lake '24' Fed Com #4
Lateral 1

Plan: Plan #1

Standard Survey Report

29 November, 2007

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	**Local Co-ordinate Reference:**	Well Cave Lake '24' Fed Com #4
Project:	Eddy Co., New Mexico	**TVD Reference:**	WELL @ 3619.00ft (Original Well Elev)
Site:	Cave Lake '24' Fed Com #4	**MD Reference:**	WELL @ 3619.00ft (Original Well Elev)
Well:	Cave Lake '24' Fed Com #4	**North Reference:**	Grid
Wellbore:	Lateral 1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM 2003.14 Server Db

Project Eddy Co , New Mexico

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Cave Lake '24' Fed Com #4

Site Position:		**Northing:**	696,731.80 ft	**Latitude:**	32° 54' 54.623 N
From:	Map	**Easting:**	601,521.70 ft	**Longitude:**	104° 8' 13.972 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	"	**Grid Convergence:**	0.11 °

Well Cave Lake '24' Fed Com #4

Well Position	**+N/-S**	0.00 ft	**Northing:**	696,731.80 ft	**Latitude:**	32° 54' 54.623 N
	+E/-W	0.00 ft	**Easting:**	601,521.70 ft	**Longitude:**	104° 8' 13.972 W
Position Uncertainty		0 00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	0.00 ft

Wellbore Lateral 1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/29/2007	8.31	60.83	49,345

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	94.61

Survey Tool Program Date 11/29/2007

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
6,500 00	11,252.65	Plan #1 (Lateral 1)	MWD	MWD - Standard

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 @ 19.09° / 100'									
6,510.00	1.91	94.61	6,510.00	-0.01	0.17	0.17	19.09	19.09	0.00
6,540.00	7.64	94.61	6,539.88	-0.21	2.65	2.66	19.09	19.09	0.00
6,570.00	13 36	94.61	6,569 37	-0.65	8.10	8.13	19.09	19.09	0.00
6,600.00	19.09	94.61	6,598.16	-1.33	16.45	16.51	19.09	19.09	0.00
6,630.00	24.82	94.61	6,625.97	-2.23	27.63	27.72	19.09	19.09	0.00
6,660.00	30.54	94.61	6,652.53	-3.35	41.51	41.65	19.09	19.09	0.00
6,690.00	36.27	94.61	6,677.56	-4.68	57.97	58.16	19.09	19 09	0.00
6,720.00	42.00	94.61	6,700.82	-6.20	76.83	77.08	19.09	19.09	0 00
6,750.00	47.72	94.61	6,722.08	-7.90	97.92	98.24	19.09	19.09	0.00
6,780.00	53.45	94.61	6,741.12	-9.77	121.01	121.41	19.09	19.09	0.00
6,810.00	59.18	94.61	6,757.75	-11 77	145.88	146.36	19.09	19 09	0.00

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	**Local Co-ordinate Reference:**	Well Cave Lake '24' Fed Com #4
Project:	Eddy Co., New Mexico	**TVD Reference:**	WELL @ 3619.00ft (Original Well Elev)
Site:	Cave Lake '24' Fed Com #4	**MD Reference:**	WELL @ 3619.00ft (Original Well Elev)
Well:	Cave Lake '24' Fed Com #4	**North Reference:**	Grid
Wellbore:	Lateral 1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM 2003.14 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)
6,840.00	64.91	94.61	6,771.81	-13.90	172.29	172.85	19.09	19.09	0.00
6,870.00	70.63	94.61	6,783.15	-16.14	199.95	200.60	19.09	19.09	0.00
6,900.00	76.36	94.61	6,791.67	-18.45	228.61	229.36	19.09	19.09	0.00
6,930.00	82.09	94.61	6,797.28	-20.82	257.98	258.82	19.09	19.09	0.00
6,960.00	87.81	94.61	6,799.92	-23.22	287.75	288.69	19.09	19.09	0.00
6,966.56	89.07	94.61	6,800.10	-23.75	294.29	295.24	19.08	19.08	0.00
EOC Hold 89.07° Inc. @ 94.61 Azm.									
6,990.00	89.07	94.61	6,800.48	-25.63	317.65	318.68	0.00	0.00	0.00
7,020.00	89.07	94.61	6,800.97	-28.05	347.55	348.68	0.00	0.00	0.00
7,050.00	89.07	94.61	6,801.46	-30.46	377.45	378.67	0.00	0.00	0.00
7,080.00	89.07	94.61	6,801.95	-32.87	407.34	408.67	0.00	0.00	0.00
7,110.00	89.07	94.61	6,802.44	-35.28	437.24	438.66	0.00	0.00	0.00
7,140.00	89.07	94.61	6,802.92	-37.70	467.14	468.66	0.00	0.00	0.00
7,170.00	89.07	94.61	6,803.41	-40.11	497.04	498.66	0.00	0.00	0.00
7,200.00	89.07	94.61	6,803.90	-42.52	526.94	528.65	0.00	0.00	0.00
7,230.00	89.07	94.61	6,804.39	-44.93	556.84	558.65	0.00	0.00	0.00
7,260.00	89.07	94.61	6,804.88	-47.35	586.74	588.64	0.00	0.00	0.00
7,290.00	89.07	94.61	6,805.37	-49.76	616.64	618.64	0.00	0.00	0.00
7,320.00	89.07	94.61	6,805.86	-52.17	646.54	648.64	0.00	0.00	0.00
7,350.00	89.07	94.61	6,806.35	-54.59	676.43	678.63	0.00	0.00	0.00
7,380.00	89.07	94.61	6,806.84	-57.00	706.33	708.63	0.00	0.00	0.00
7,410.00	89.07	94.61	6,807.33	-59.41	736.23	738.62	0.00	0.00	0.00
7,440.00	89.07	94.61	6,807.82	-61.82	766.13	768.62	0.00	0.00	0.00
7,470.00	89.07	94.61	6,808.31	-64.24	796.03	798.62	0.00	0.00	0.00
7,500.00	89.07	94.61	6,808.80	-66.65	825.93	828.61	0.00	0.00	0.00
7,530.00	89.07	94.61	6,809.29	-69.06	855.83	858.61	0.00	0.00	0.00
7,560.00	89.07	94.61	6,809.77	-71.47	885.73	888.60	0.00	0.00	0.00
7,590.00	89.07	94.61	6,810.26	-73.89	915.62	918.60	0.00	0.00	0.00
7,620.00	89.07	94.61	6,810.75	-76.30	945.52	948.60	0.00	0.00	0.00
7,650.00	89.07	94.61	6,811.24	-78.71	975.42	978.59	0.00	0.00	0.00
7,680.00	89.07	94.61	6,811.73	-81.12	1,005.32	1,008.59	0.00	0.00	0.00
7,710.00	89.07	94.61	6,812.22	-83.54	1,035.22	1,038.59	0.00	0.00	0.00
7,740.00	89.07	94.61	6,812.71	-85.95	1,065.12	1,068.58	0.00	0.00	0.00
7,770.00	89.07	94.61	6,813.20	-88.36	1,095.02	1,098.58	0.00	0.00	0.00
7,800.00	89.07	94.61	6,813.69	-90.78	1,124.92	1,128.57	0.00	0.00	0.00
7,830.00	89.07	94.61	6,814.18	-93.19	1,154.82	1,158.57	0.00	0.00	0.00
7,860.00	89.07	94.61	6,814.67	-95.60	1,184.71	1,188.57	0.00	0.00	0.00
7,890.00	89.07	94.61	6,815.16	-98.01	1,214.61	1,218.56	0.00	0.00	0.00
7,920.00	89.07	94.61	6,815.65	-100.43	1,244.51	1,248.56	0.00	0.00	0.00
7,950.00	89.07	94.61	6,816.13	-102.84	1,274.41	1,278.55	0.00	0.00	0.00
7,980.00	89.07	94.61	6,816.62	-105.25	1,304.31	1,308.55	0.00	0.00	0.00
8,010.00	89.07	94.61	6,817.11	-107.66	1,334.21	1,338.55	0.00	0.00	0.00
8,040.00	89.07	94.61	6,817.60	-110.08	1,364.11	1,368.54	0.00	0.00	0.00
8,070.00	89.07	94.61	6,818.09	-112.49	1,394.01	1,398.54	0.00	0.00	0.00
8,100.00	89.07	94.61	6,818.58	-114.90	1,423.90	1,428.53	0.00	0.00	0.00
8,130.00	89.07	94.61	6,819.07	-117.32	1,453.80	1,458.53	0.00	0.00	0.00
8,160.00	89.07	94.61	6,819.56	-119.73	1,483.70	1,488.53	0.00	0.00	0.00
8,190.00	89.07	94.61	6,820.05	-122.14	1,513.60	1,518.52	0.00	0.00	0.00
8,220.00	89.07	94.61	6,820.54	-124.55	1,543.50	1,548.52	0.00	0.00	0.00
8,250.00	89.07	94.61	6,821.03	-126.97	1,573.40	1,578.51	0.00	0.00	0.00
8,280.00	89.07	94.61	6,821.52	-129.38	1,603.30	1,608.51	0.00	0.00	0.00
8,310.00	89.07	94.61	6,822.01	-131.79	1,633.20	1,638.51	0.00	0.00	0.00
8,340.00	89.07	94.61	6,822.50	-134.20	1,663.10	1,668.50	0.00	0.00	0.00
8,370.00	89.07	94.61	6,822.98	-136.62	1,692.99	1,698.50	0.00	0.00	0.00

Black Viper Energy

Survey Report

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Site:	Cave Lake '24' Fed Com #4	**MD Reference:**	WELL @ 3619.00ft (Original Well Elev)
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Wellbore:	Lateral 1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM 2003.14 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)
8,400.00	89.07	94.61	6,823.47	-139.03	1,722.89	1,728.49	0.00	0.00	0.00
8,430.00	89.07	94.61	6,823.96	-141.44	1,752.79	1,758.49	0.00	0.00	0.00
8,460.00	89.07	94.61	6,824.45	-143.86	1,782.69	1,788.49	0.00	0.00	0.00
8,490.00	89.07	94.61	6,824.94	-146.27	1,812.59	1,818.48	0.00	0.00	0.00
8,520.00	89.07	94.61	6,825.43	-148.68	1,842.49	1,848.48	0.00	0.00	0.00
8,550.00	89.07	94.61	6,825.92	-151.09	1,872.39	1,878.47	0.00	0.00	0.00
8,580.00	89.07	94.61	6,826.41	-153.51	1,902.29	1,908.47	0.00	0.00	0.00
8,610.00	89.07	94.61	6,826.90	-155.92	1,932.18	1,938.47	0.00	0.00	0.00
8,640.00	89.07	94.61	6,827.39	-158.33	1,962.08	1,968.46	0.00	0.00	0.00
8,670.00	89.07	94.61	6,827.88	-160.74	1,991.98	1,998.46	0.00	0.00	0.00
8,700.00	89.07	94.61	6,828.37	-163.16	2,021.88	2,028.45	0.00	0.00	0.00
8,730.00	89.07	94.61	6,828.86	-165.57	2,051.78	2,058.45	0.00	0.00	0.00
8,760.00	89.07	94.61	6,829.35	-167.98	2,081.68	2,088.45	0.00	0.00	0.00
8,790.00	89.07	94.61	6,829.83	-170.39	2,111.58	2,118.44	0.00	0.00	0.00
8,820.00	89.07	94.61	6,830.32	-172.81	2,141.48	2,148.44	0.00	0.00	0.00
8,850.00	89.07	94.61	6,830.81	-175.22	2,171.38	2,178.43	0.00	0.00	0.00
8,880.00	89.07	94.61	6,831.30	-177.63	2,201.27	2,208.43	0.00	0.00	0.00
8,910.00	89.07	94.61	6,831.79	-180.05	2,231.17	2,238.43	0.00	0.00	0.00
8,940.00	89.07	94.61	6,832.28	-182.46	2,261.07	2,268.42	0.00	0.00	0.00
8,970.00	89.07	94.61	6,832.77	-184.87	2,290.97	2,298.42	0.00	0.00	0.00
9,000.00	89.07	94.61	6,833.26	-187.28	2,320.87	2,328.41	0.00	0.00	0.00
9,030.00	89.07	94.61	6,833.75	-189.70	2,350.77	2,358.41	0.00	0.00	0.00
9,060.00	89.07	94.61	6,834.24	-192.11	2,380.67	2,388.41	0.00	0.00	0.00
9,090.00	89.07	94.61	6,834.73	-194.52	2,410.57	2,418.40	0.00	0.00	0.00
9,120.00	89.07	94.61	6,835.22	-196.93	2,440.46	2,448.40	0.00	0.00	0.00
9,150.00	89.07	94.61	6,835.71	-199.35	2,470.36	2,478.39	0.00	0.00	0.00
9,180.00	89.07	94.61	6,836.20	-201.76	2,500.26	2,508.39	0.00	0.00	0.00
9,210.00	89.07	94.61	6,836.68	-204.17	2,530.16	2,538.39	0.00	0.00	0.00
9,240.00	89.07	94.61	6,837.17	-206.59	2,560.06	2,568.38	0.00	0.00	0.00
9,270.00	89.07	94.61	6,837.66	-209.00	2,589.96	2,598.38	0.00	0.00	0.00
9,300.00	89.07	94.61	6,838.15	-211.41	2,619.86	2,628.37	0.00	0.00	0.00
9,330.00	89.07	94.61	6,838.64	-213.82	2,649.76	2,658.37	0.00	0.00	0.00
9,360.00	89.07	94.61	6,839.13	-216.24	2,679.66	2,688.37	0.00	0.00	0.00
9,390.00	89.07	94.61	6,839.62	-218.65	2,709.55	2,718.36	0.00	0.00	0.00
9,420.00	89.07	94.61	6,840.11	-221.06	2,739.45	2,748.36	0.00	0.00	0.00
9,450.00	89.07	94.61	6,840.60	-223.47	2,769.35	2,778.35	0.00	0.00	0.00
9,480.00	89.07	94.61	6,841.09	-225.89	2,799.25	2,808.35	0.00	0.00	0.00
9,510.00	89.07	94.61	6,841.58	-228.30	2,829.15	2,838.35	0.00	0.00	0.00
9,540.00	89.07	94.61	6,842.07	-230.71	2,859.05	2,868.34	0.00	0.00	0.00
9,570.00	89.07	94.61	6,842.56	-233.12	2,888.95	2,898.34	0.00	0.00	0.00
9,600.00	89.07	94.61	6,843.05	-235.54	2,918.85	2,928.33	0.00	0.00	0.00
9,630.00	89.07	94.61	6,843.53	-237.95	2,948.74	2,958.33	0.00	0.00	0.00
9,660.00	89.07	94.61	6,844.02	-240.36	2,978.64	2,988.33	0.00	0.00	0.00
9,690.00	89.07	94.61	6,844.51	-242.78	3,008.54	3,018.32	0.00	0.00	0.00
9,720.00	89.07	94.61	6,845.00	-245.19	3,038.44	3,048.32	0.00	0.00	0.00
9,750.00	89.07	94.61	6,845.49	-247.60	3,068.34	3,078.31	0.00	0.00	0.00
9,780.00	89.07	94.61	6,845.98	-250.01	3,098.24	3,108.31	0.00	0.00	0.00
9,810.00	89.07	94.61	6,846.47	-252.43	3,128.14	3,138.31	0.00	0.00	0.00
9,840.00	89.07	94.61	6,846.96	-254.84	3,158.04	3,168.30	0.00	0.00	0.00
9,870.00	89.07	94.61	6,847.45	-257.25	3,187.94	3,198.30	0.00	0.00	0.00
9,900.00	89.07	94.61	6,847.94	-259.66	3,217.83	3,228.29	0.00	0.00	0.00
9,930.00	89.07	94.61	6,848.43	-262.08	3,247.73	3,258.29	0.00	0.00	0.00
9,960.00	89.07	94.61	6,848.92	-264.49	3,277.63	3,288.29	0.00	0.00	0.00
9,990.00	89.07	94.61	6,849.41	-266.90	3,307.53	3,318.28	0.00	0.00	0.00
10,020.00	89.07	94.61	6,849.90	-269.32	3,337.43	3,348.28	0.00	0.00	0.00

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	**Local Co-ordinate Reference:**	Well Cave Lake '24' Fed Com #4
Project:	Eddy Co., New Mexico	**TVD Reference:**	WELL @ 3619.00ft (Original Well Elev)
Site:	Cave Lake '24' Fed Com #4	**MD Reference:**	WELL @ 3619.00ft (Original Well Elev)
Well:	Cave Lake '24' Fed Com #4	**North Reference:**	Grid
Wellbore:	Lateral 1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM 2003.14 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)
10,050.00	89.07	94.61	6,850.38	-271.73	3,367.33	3,378.27	0.00	0.00	0.00
10,080.00	89.07	94.61	6,850.87	-274.14	3,397.23	3,408.27	0.00	0.00	0.00
10,110.00	89 07	94.61	6,851.36	-276.55	3,427.13	3,438.27	0.00	0.00	0.00
10,140.00	89 07	94.61	6,851.85	-278.97	3,457.02	3,468.26	0.00	0.00	0.00
10,170.00	89.07	94.61	6,852.34	-281.38	3,486.92	3,498.26	0.00	0.00	0.00
10,200.00	89.07	94 61	6,852.83	-283 79	3,516.82	3,528.25	0.00	0.00	0.00
10,230.00	89.07	94.61	6,853.32	-286.20	3,546.72	3,558.25	0.00	0 00	0.00
10,260.00	89.07	94.61	6,853 81	-288.62	3,576.62	3,588.25	0.00	0 00	0.00
10,290.00	89.07	94.61	6,854.30	-291.03	3,606 52	3,618.24	0.00	0.00	0 00
10,320 00	89.07	94.61	6,854.79	-293.44	3,636.42	3,648 24	0.00	0.00	0.00
10,350.00	89.07	94.61	6,855.28	-295.86	3,666.32	3,678.23	0 00	0.00	0.00
10,380.00	89.07	94.61	6,855.77	-298.27	3,696 21	3,708.23	0.00	0.00	0.00
10,410.00	89.07	94.61	6,856.26	-300.68	3,726 11	3,738.23	0.00	0.00	0 00
10,440.00	89.07	94.61	6,856.74	-303.09	3,756 01	3,768.22	0.00	0.00	0.00
10,470.00	89.07	94.61	6,857.23	-305.51	3,785.91	3,798.22	0.00	0.00	0.00
10,500.00	89.07	94.61	6,857.72	-307.92	3,815.81	3,828.21	0.00	0.00	0.00
10,530.00	89.07	94.61	6,858.21	-310.33	3,845.71	3,858.21	0.00	0.00	0.00
10,560.00	89.07	94.61	6,858.70	-312.74	3,875.61	3,888 21	0.00	0.00	0.00
10,590 00	89.07	94.61	6,859 19	-315.16	3,905.51	3,918 20	0.00	0.00	0 00
10,620.00	89.07	94.61	6,859.68	-317.57	3,935.41	3,948.20	0.00	0.00	0.00
10,650.00	89.07	94.61	6,860.17	-319.98	3,965.30	3,978.19	0.00	0.00	0 00
10,680.00	89.07	94.61	6,860.66	-322 39	3,995.20	4,008.19	0.00	0.00	0.00
10,710.00	89.07	94 61	6,861.15	-324.81	4,025.10	4,038.19	0.00	0.00	0 00
10,740 00	89.07	94.61	6,861.64	-327.22	4,055.00	4,068.18	0.00	0.00	0.00
10,770.00	89.07	94.61	6,862.13	-329.63	4,084.90	4,098.18	0.00	0.00	0.00
10,800.00	89.07	94.61	6,862.62	-332 05	4,114.80	4,128.17	0.00	0.00	0.00
10,830.00	89.07	94.61	6,863.11	-334.46	4,144.70	4,158 17	0.00	0.00	0.00
10,860.00	89.07	94.61	6,863.59	-336.87	4,174.60	4,188.17	0.00	0.00	0.00
10,890.00	89 07	94.61	6,864.08	-339.28	4,204.49	4,218 16	0 00	0.00	0.00
10,920.00	89.07	94.61	6,864.57	-341.70	4,234.39	4,248.16	0.00	0.00	0.00
10,950.00	89 07	94.61	6,865.06	-344.11	4,264.29	4,278.15	0.00	0.00	0.00
10,980.00	89 07	94.61	6,865.55	-346.52	4,294.19	4,308 15	0.00	0.00	0.00
11,010.00	89.07	94.61	6,866 04	-348.93	4,324.09	4,338.15	0.00	0.00	0.00
11,040.00	89.07	94.61	6,866.53	-351.35	4,353.99	4,368.14	0.00	0.00	0.00
11,070.00	89.07	94.61	6,867.02	-353.76	4,383 89	4,398.14	0.00	0 00	0.00
11,100.00	89 07	94.61	6,867.51	-356 17	4,413.79	4,428.13	0.00	0.00	0 00
11,130.00	89.07	94.61	6,868 00	-358.59	4,443.69	4,458 13	0 00	0.00	0 00
11,160.00	89 07	94.61	6,868.49	-361.00	4,473.58	4,488.13	0.00	0.00	0.00
11,190.00	89.07	94.61	6,868.98	-363.41	4,503.48	4,518.12	0.00	0.00	0.00
11,220 00	89.07	94.61	6,869.47	-365.82	4,533.38	4,548 12	0.00	0.00	0.00
11,250.00	89 07	94.61	6,869.96	-368 24	4,563.28	4,578.11	0.00	0.00	0.00
11,252.73	89.07	94.61	6,870 00	-368.46	4,566.01	4,580 85	0.00	0.00	0.00
PBHL Cave Lake '24' Fed Com #4 - Wolfcamp Dolomite									

Black Viper Energy

Survey Report

Company:	Cimarex Energy Co., Inc.	Local Co-ordinate Reference:	Well Cave Lake '24' Fed Com #4
Project:	Eddy Co., New Mexico	TVD Reference:	WELL @ 3619.00ft (Original Well Elev)
Site:	Cave Lake '24' Fed Com #4	MD Reference:	WELL @ 3619.00ft (Original Well Elev)
Well:	Cave Lake '24' Fed Com #4	North Reference:	Grid
Wellbore:	Lateral 1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 2003.14 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 Cave Lake '24' Fe - plan hits target - Point	0 00	0.00	6,870.00	-368.46	4,566.01	696,363.34	606,087.71	32° 54' 50.890 N	104° 7' 20 415 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	5,340.00	Abo Shale	Shale	0.00	
11,252.73	6,870.00	Wolfcamp Dolomite	Dolomite	0.00	
	7,000.00	Wolfcamp LS	Limestone	0.00	

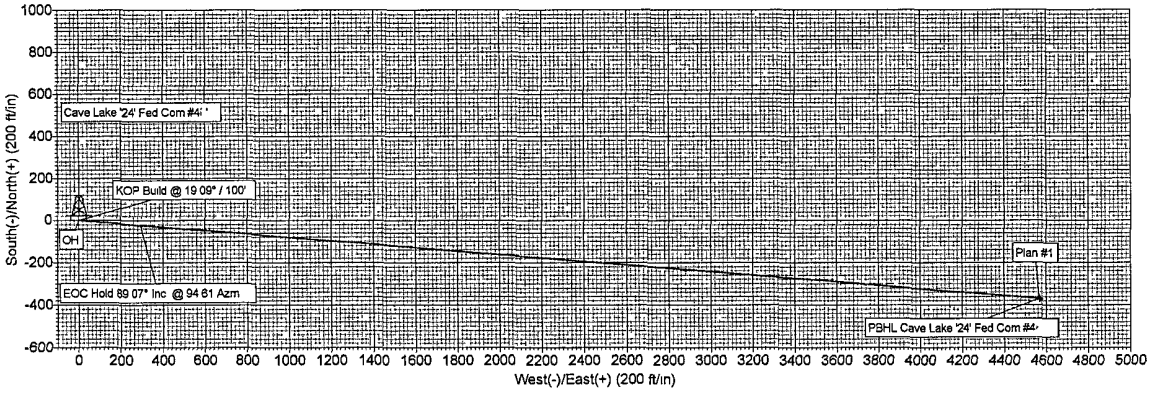
Plan Annotations

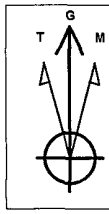
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
6,500.00	6,500.00	0.00	0.00	KOP Build @ 19.09° / 100'
6,966.56	6,800.10	-23 75	294.29	EOC Hold 89.07° Inc. @ 94.61 Azm.
11,252.73	6,870 00	-368 46	4,566.00	PBHL Cave Lake '24' Fed Com #4

Checked By: _____ Approved By: _____ Date: _____

CIMAREX

Project Eddy Co , New Mexico
Site Cave Lake '24' Fed Com #4H
Well Cave Lake '24' Fed Com #4
Wellbore Lateral 1
Plan Plan #1 (Cave Lake '24' Fed Com #4H/Lateral 1)





Azimuths to Grid North
True North -0.11°
Magnetic North 8.20°
Magnetic Field
Strength 49345 0nT
Dip Angle 60 82°
Date 11/29/2007
Model IGRF200510

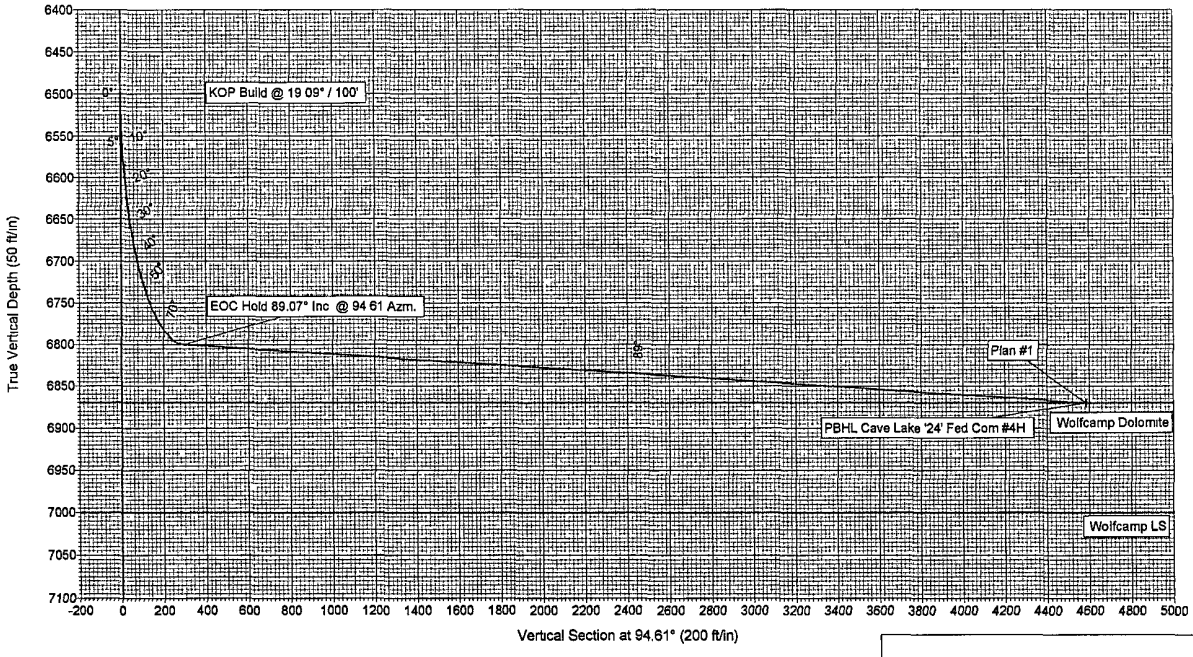
PROJECT DETAILS Eddy Co , New Mexico

Geodetic System US State Plane 1983
Datum North American Datum 1983
Ellipsoid GRS 1980
Zone New Mexico Eastern Zone

System Datum: Mean Sea Level

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	6966 56	89 07	94.61	6800 10	-23.75	294 28	19.09	94 61	295.24	
3	11252 73	89.07	94.61	6870.00	-368 46	4566.01	0 00	0.00	4580 85	PBHL Cave Lake '24' Fed Com #4H



Plan Plan #1 (Cave Lake '24' Fed Com #4H ..eral 1)
Created By Heather Vannoy Date November 28, 2007

Patterson Rig 74

Cimarex Energy Co. of Colorado

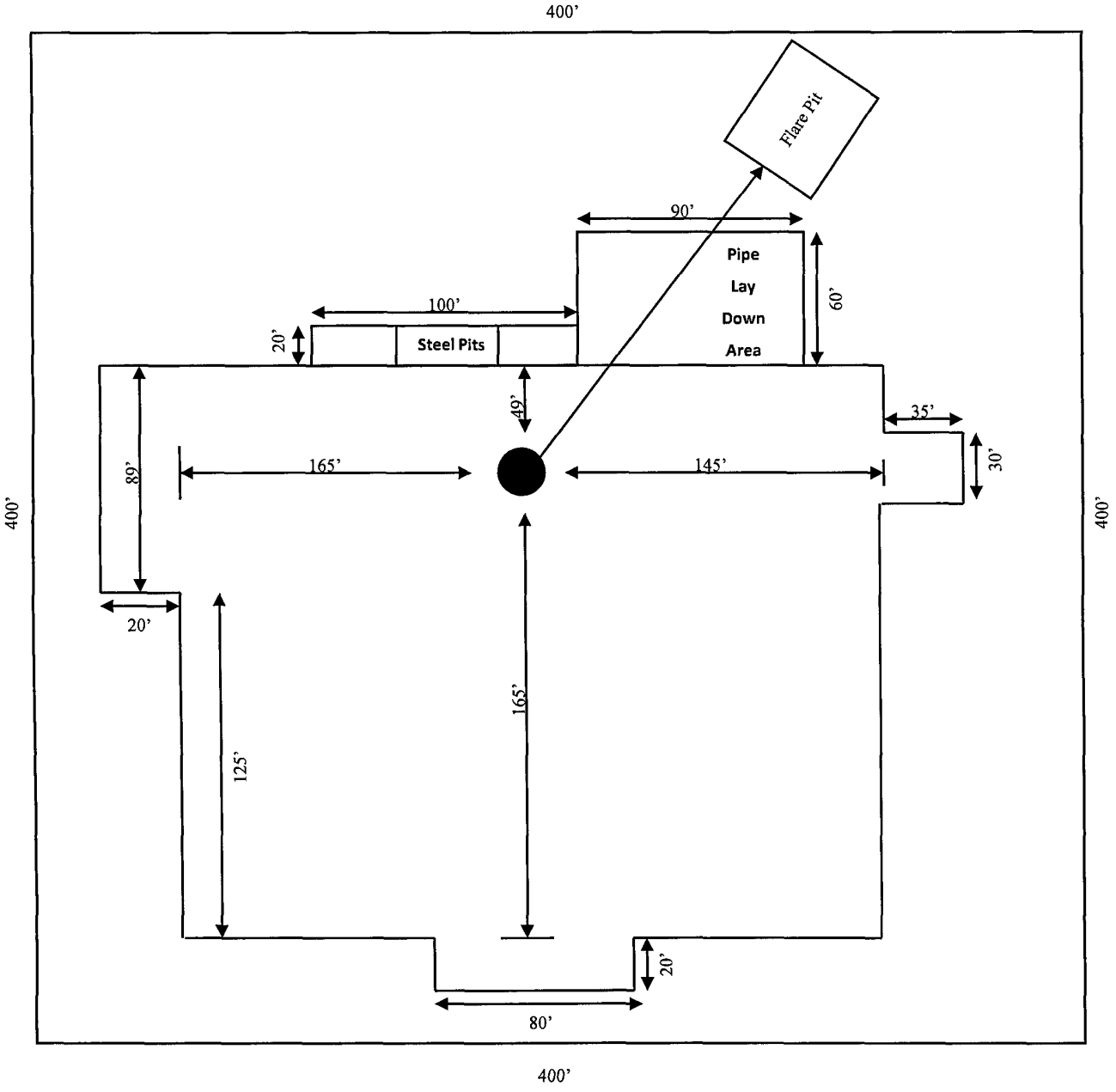


Exhibit D – Rig Layout
Cave Lake 24 Federal Com No. 4
Cimarex Energy Co. of Colorado
160 24-16S-28E
SHL ~~360'~~ FNL & 330' FWL
BHL 660' FNL & 330' FEL
Eddy County, NM

SR & A

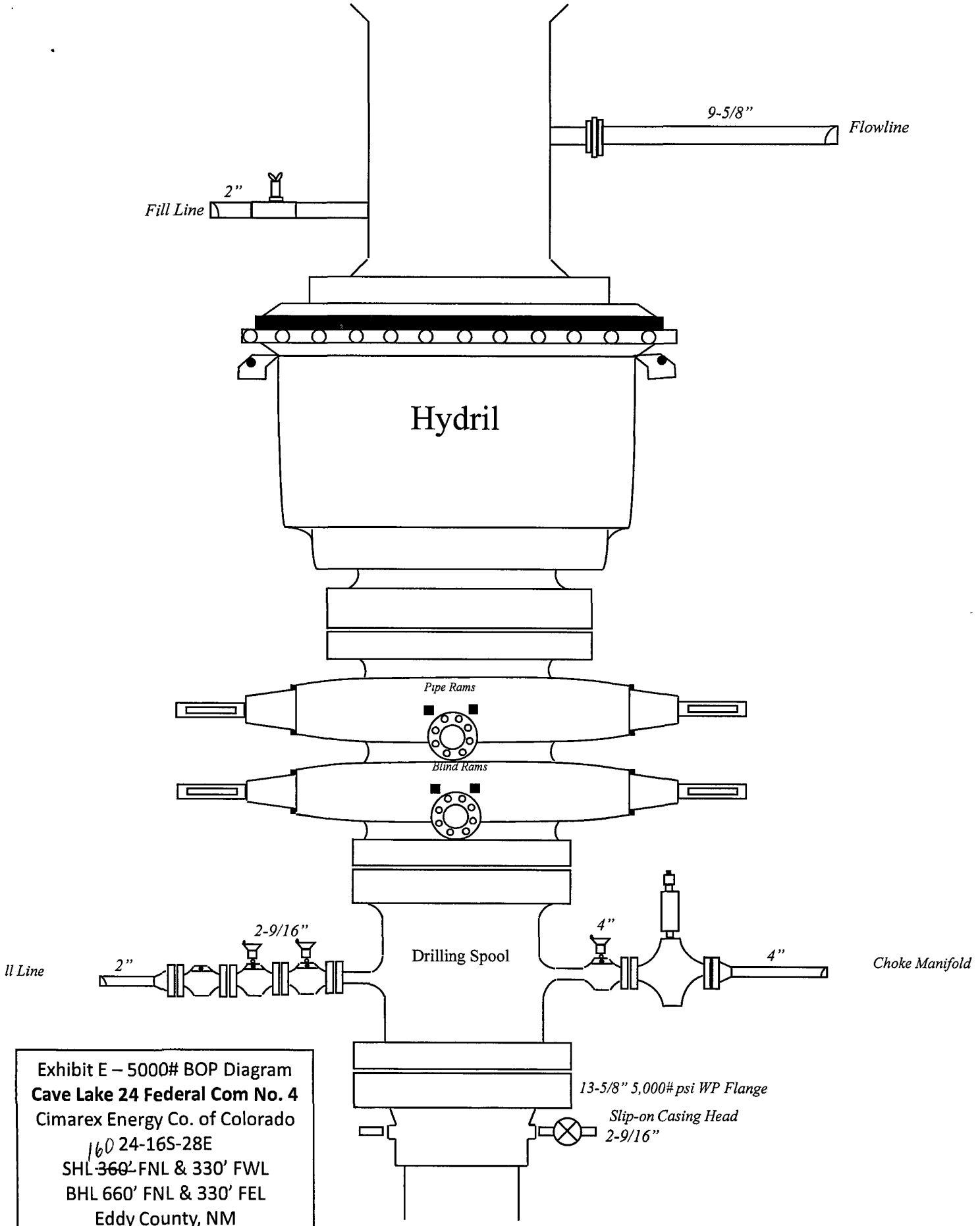


Exhibit E – 5000# BOP Diagram
Cave Lake 24 Federal Com No. 4
Cimarex Energy Co. of Colorado
160 24-16S-28E
SHL ~~360'~~ FNL & 330' FWL
BHL 660' FNL & 330' FEL
Eddy County, NM

DRILLING OPERATIONS
CHOKE MANIFOLD
5M SERVICE

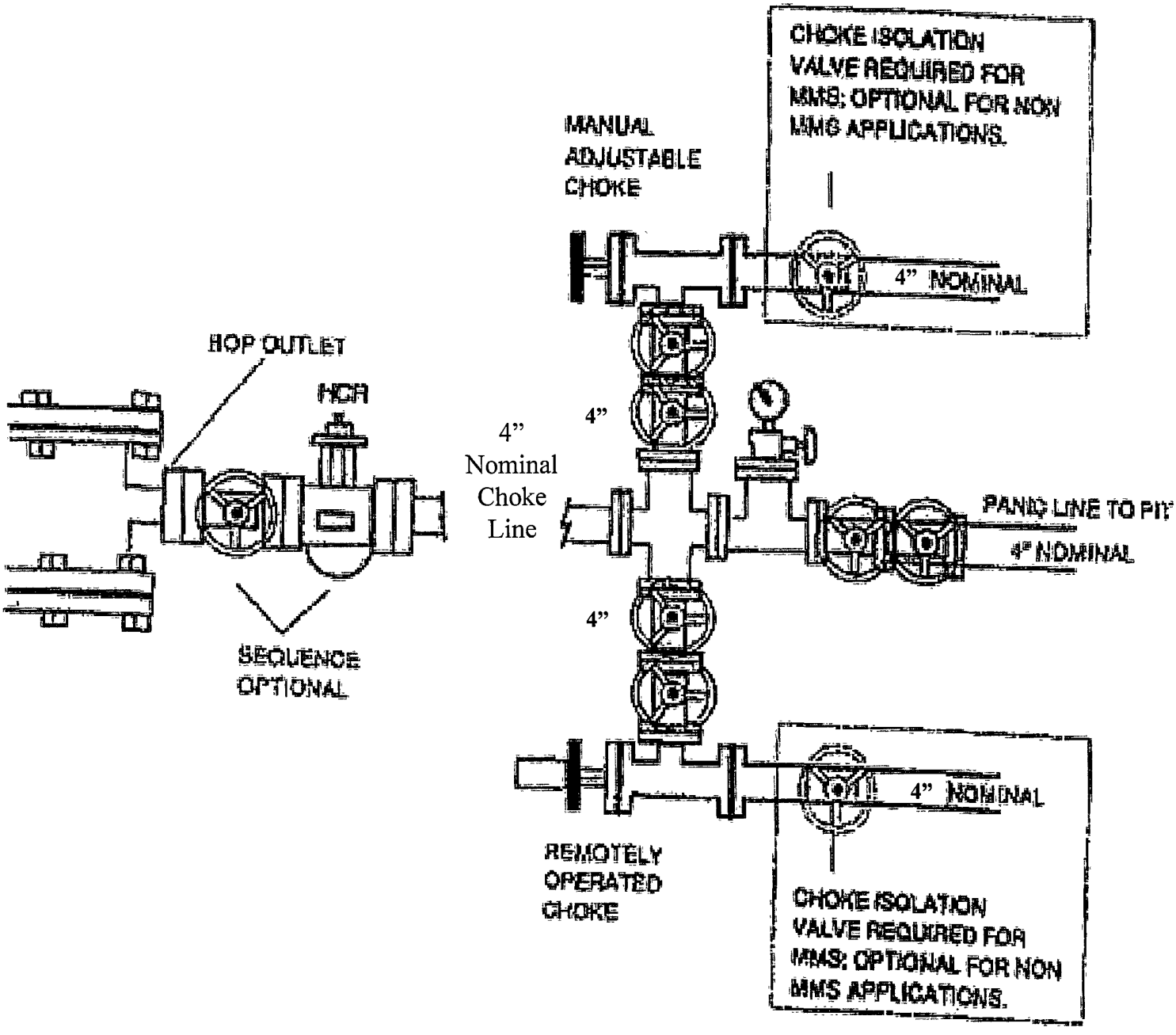


Exhibit E-1 – Choke Manifold Diagram
Cave Lake 24 Federal Com No. 4
Cimarex Energy Co. of Colorado
160 24-16S-28E
SHL ~~360~~' FNL & 330' FWL
BHL 660' FNL & 330' FEL
Eddy County, NM

Hydrogen Sulfide Drilling Operations Plan
Cimarex Energy Co. of Colorado
Cave Lake 24 Federal Com No. 4
Unit D, Section 24
T16S-R29E, Eddy County, NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H_2S safety instructor to the following:
   A. Characteristics of H_2S
   B. Physical effects and hazards
   C. Proper use of safety equipment and life support systems.
   D. Principle and operation of H_2S detectors, warning system and briefing areas.
   E. Evacuation procedure, routes and first aid.
   F. Proper use of 30 minute pressure demand air pack.

2 H_2S Detection and Alarm Systems:
   A. H_2S 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 (H_2S 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 or cores are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.

9 If H_2S 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 H_2S scavengers if necessary.

H_2S Contingency Plan
Cave Lake 24 Federal Com No. 4
Cimarex Energy Co. of Colorado
Unit D, Section 24
T16S-R29E, Eddy County, NM

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must:

- ★ Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- ★ Evacuate any public places encompassed by the 100 ppm ROE.
- ★ Be equipped with H_2S monitors and air packs in order to control the release.
- ★ Use the "buddy system" to ensure no injuries occur during the response.
- ★ Take precautions to avoid personal injury during this operation.
- ★ Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
- ★ Have received training in the:
  - ♦ Detection of H_2S, and
  - ♦ Measures for protection against the gas,
  - ♦ Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air=1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air=1	2 ppm	N/A	1000 ppm

Contacting Authorities

Cimarex Energy Co. of Colorado's personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Cimarex Energy Co. of Colorado's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

H_2S Contingency Plan Emergency Contacts
Cave Lake 24 Federal Com No. 4
Cimarex Energy Co. of Colorado
Unit D, Section 24
T16S-R29E, Eddy County, NM

Company Office		
Cimarex Energy Co. of Colorado Co. Office and After-Hours Menu	800-969-4789	

Key Personnel

Name	Title	Office	Mobile
Doug Park	Drilling Manager	972-443-6463	972-333-1407
Dee Smith	Drilling Super	972-443-6491	972-882-1010
Jim Evans	Drilling Super	972-443-6451	972-465-6564
Dorsey Rogers	Field Super		505-200-6105
Roy Shirley	Field Super		432-634-2136

Artesia		
Ambulance	911	
State Police	575-746-2703	
City Police	575-746-2703	
Sheriff's Office	575-746-9888	
Fire Department	**575-746-2701**	
Local Emergency Planning Committee	575-746-2122	
New Mexico Oil Conservation Division	575-748-1283	

Carlsbad		
Ambulance	911	
State Police	575-885-3137	
City Police	575-885-2111	
Sheriff's Office	575-887-7551	
Fire Department	**575-887-3798**	
Local Emergency Planning Committee	575-887-6544	
US Bureau of Land Management	575-887-6544	

Santa Fe	
New Mexico Emergency Response Commission (Santa Fe)	505-476-9600
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635

National	
National Emergency Response Center (Washington, D.C.)	800-424-8802

Medical	
Flight for Life - 4000 24th St.; Lubbock, TX	806-743-9911
Aerocare - R3, Box 49F; Lubbock, TX	806-747-8923
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM	505-842-4433
SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM	505-842-4949

Other		
Boots & Coots IWC	800-256-9688	or 281-931-8884
Cudd Pressure Control	432-699-0139	or 432-563-3356
Halliburton	575-746-2757	
B.J. Services	575-746-3569	

Surface Use Plan
Cimarex Energy Co. of Colorado
Cave Lake 24 Federal Com No. 4
Unit D, Section 24
T16S-R29E, 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 junction of US Hwy 82 and Barvival Draw Rd, 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 1.5 miles to lease road. On lease road, go West 1.0 miles to proposed lease road.

2 Planned Access Roads: 507' of access road is proposed. State (R-30852) and Federal (NM-119489) ROWS have been obtained.

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 seperated by a series of solids removal equipment and stored in steel containment pits and then hauled to a state-approved disposal facility.

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. Drilling fluids will be contained in steel pits in a closed circulating system. Fluids will be cleaned and reused. Water produced during testing will be contained in the steel pits and disposed of at a state approved disposal facility. 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.

C. Mud pits in the closed circulating system will be steel pits and the cuttings will be stored in steel containment pits.

D. Cuttings will be stored in steel pits until they are hauled to a state-approved disposal facility.

E. If the well is a producer, 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 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.

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 recountoured 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.

Operator Certification Statement
Cimarex Energy Co. of Colorado
Cave Lake 24 Federal Com No. 4
Unit D, Section 24
T16S-R29E, Eddy County, NM

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
Zeno Farris

DATE: March 18, 2008

TITLE: Manager Operations Administration

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CIMAREX ENERGY CO OF COLORADO
LEASE NO.:	NM-97128
WELL NAME & NO.:	Cave Lake 24 Federal Com No. 4
SURFACE HOLE FOOTAGE:	160'FNL & 330'FWL
BOTTOM HOLE FOOTAGE	660'FNL & 330' FEL
LOCATION:	Section 24, T. 16 S., R. 28 E., 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 Pecos District Conditions of Approval, the standard stipulations for High Cave/Karst Occurrence, and the standard stipulations for permanent resource roads.

All of these locations are located in a High Cave/Karst area and there seems to be some minor drainage of water through all of these locations. . An earthen berm will be constructed around the entire location of each of these wells. This will help to prevent any contamination to the soils along the drainages below the proposed well pads.

Cave Lake 24 Federal Com. # 4: Closed Loop V-Door North

EA#: NM-520-08-710
Lease #: NM-109643, NM-119269, NM-95630, NM-97128
Cimarex Energy Co. of Colorado
Drumstick 7 Federal Com. # 2, Cave Lake 13 Fed. Com. # 2, # 3, # 4, and Cave Lake 24 Fed. Com. # 4

Conditions of Approval
Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Berming:
Tank batteries will be bermed to contain 1 ½ times the content of the largest tank.

Bermed areas will be lined with a 4 oz. felt liner to prevent tears or punctures and a permanent 60 mil plastic liner.

Leak Detection System:
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Cave/Karst Subsurface Mitigation

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

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 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

No Blasting:
No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

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.

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. Closed Loop System

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

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.

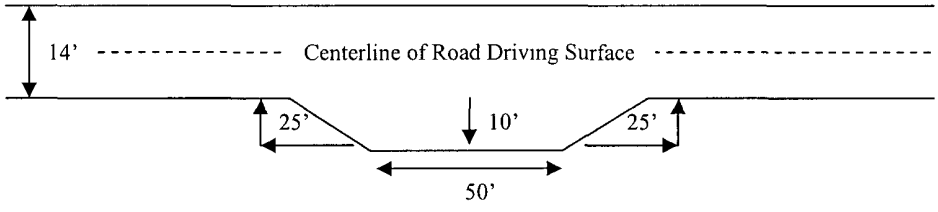
Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

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:

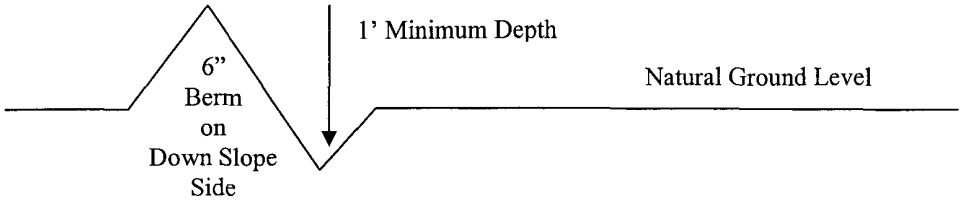
Standard Turnout – Plan View



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.

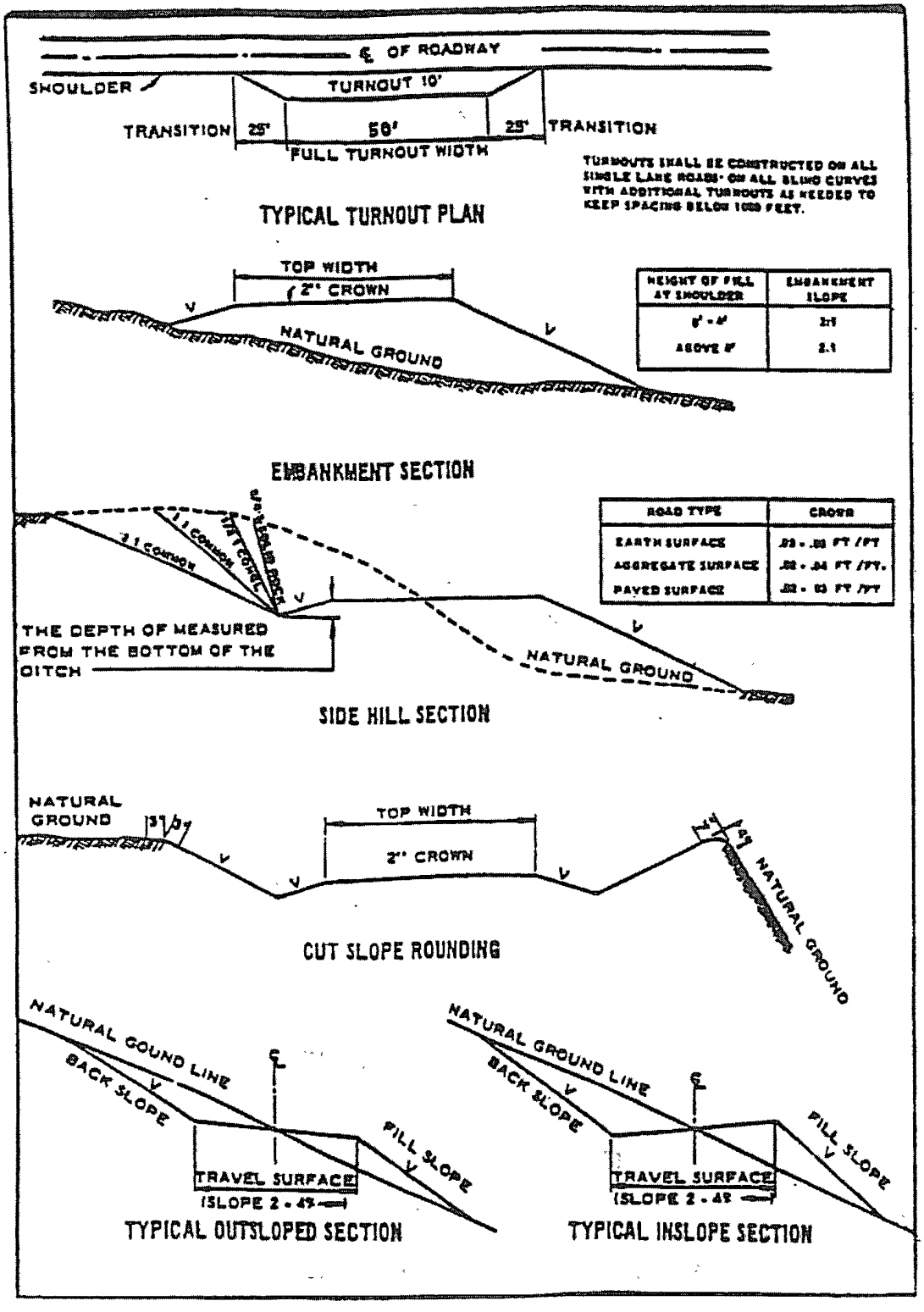
A gate shall be constructed and fastened securely to H-braces.

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

☒ **Chaves and Roosevelt Counties, T16S Eddy County**
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
(575) 627-0205 and (575) 361-2822.

1. **Hydrogen Sulfide has been reported as a hazard. It is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide and an H2S drilling plan is attached. If Hydrogen Sulfide is encountered, please report measurements and formations to the BLM.**

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. Floor controls are required for 3M or Greater systems. These 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

Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

High cave/karst.
Possible lost circulation in the Grayburg and San Andres formations.
Possible high pressure gas bursts from the Wolfcamp formation – applicable to pilot hole.

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

    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 cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

    ☒ Cement to surface. If cement does not circulate see B.1.a-d above.

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i.

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

3. The minimum required fill of cement behind the **7** inch production casing is:

    ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

Formation below the kick off point to be tested according to Onshore Order 2.III.B.1.i.

Tag cement at bottom of pilot hole and report on subsequent report.
NOTE: Pilot hole will require proper plug when well is plugged.

4. The minimum required fill of cement behind the **4-1/2** inch production casing is:

   ☒ Not required as operator is using Peak Iso-Pak liner. **Seal on Peak Systems Iso-Pack liner is to be tested per Onshore Oil and Gas Order 2.III.B.1.b. Please call BLM for witness of seal test.**

5. 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. 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. A variance to test only the surface casing to the reduced pressure of **1000** psi with the rig pumps is approved. **The BOP will be tested to 3000 psi by an independent service company.**

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

WWI 060308

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

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 the well pad is 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.

Seed Mixture 4, for Gypsum 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 seed 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
Alkali Sacaton (Sporobolus airoides)	1.0
DWS⊆ Four-wing saltbush (Atriplex canescens)	5.0

⊆DWS: DeWinged Seed

*Pounds of pure live seed:

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

(Insert Seed Mixture Here)

X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.