8109

42

OCD-ARTESIA Month Act OCD - ARTESIA NM

ATS-07-206

Form 3160-3
(July 1992)

FORM APPROVED
OMB NO. 1004-0136
Expires: February 28, 1995

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

5. LEASE DESIGNATION AND SERIAL NO.
NM-101097

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

If earthen pits are used in association with the drilling of this well, an OCD pit permit must be obtained prior to pit construction.

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

1b. TYPE OF WELL: OIL WELL [ ] GAS WELL [X] OTHER SINGLE ZONE [X] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR
Cimarex Energy Co. of Colorado 162683

8. FARM OR LEASE NAME, WELL NO.
Dozer 30 Federal No. 1 36302

3. ADDRESS AND TELEPHONE NO.
P.O. Box 140907 Irving TX 75014 972-401-3111

9. API WELL NO.
30-015- 35419

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
1650' FNL & 1250' FEL
CARLSBAD CONTROLLED WATER BASIN

10. FIELD AND POOL, OR WILDCAT
Chosa Draw; Morrow

11. SEC. T.,R.,M., BLOCK AND SURVEY OR AREA
30-25S-26E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
16 miles SW of Carlsbad

12. COUNTY OR PARISH: Eddy
13. STATE: NM

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, T.O (Also to nearest drlg. unit line, if any): 990'

16. NO. OF ACRES IN LEASE: 2438.38

17. NO. OF ACRES ASSIGNED TO THIS WELL: 319.45

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.: N/A

19. PROPOSED DEPTH: 12650'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3466' GR

22. APPROX. DATE WORK WILL START*: 03-01-07

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE,SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17-1/2"	H-40 13-3/8"	48 #	220'	220 sx circulate
12-1/4"	J-55 9-5/8"	40 #	2700'	775 sx circulate
8-3/4"	N-80 7"	26 #	10000'	570 sx circulate
6-1/8"	P-110 4-1/2"	11.6#	12650'	250 sx TOC +/- 7880'

5000

COA

From the base of the surface pipe through the running of production casing, the well will be equipped with a 500 psi BOP system. We are requesting a variance for the 13-3/8" surface casing and BOP testing 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. During the running of surface pipe and the drilling of the intermediate hole, we do not anticipate any pressures greater than 1000 psi and are requesting a variance to test the 13-3/8" casing and BOP to 1000 psi and to use rig pumps instead of an independent service company.

COA

IN ABOVE SPACE, DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED Zeno Farris TITLE Mgr. Ops. Admin DATE 01-15-07

(This space for Federal or State office use)

PERMIT No. _____ APPROVAL DATE _____

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:

APPROVED BY /s/ James Stovall TITLE ACTING FIELD MANAGER DATE FEB 05 2007

*See Instructions On Reverse Side

APPROVAL FOR 1 YEA

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.

SEE ATTACHED FOR CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

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
	74900	Chosa Draw; Morrow

Property Code	Property Name	Well Number
	DOZER "30" FEDERAL	1

OGRID No.	Operator Name	Elevation
162683	CIMAREX ENERGY CO. OF COLORADO	3466'

Surface Location

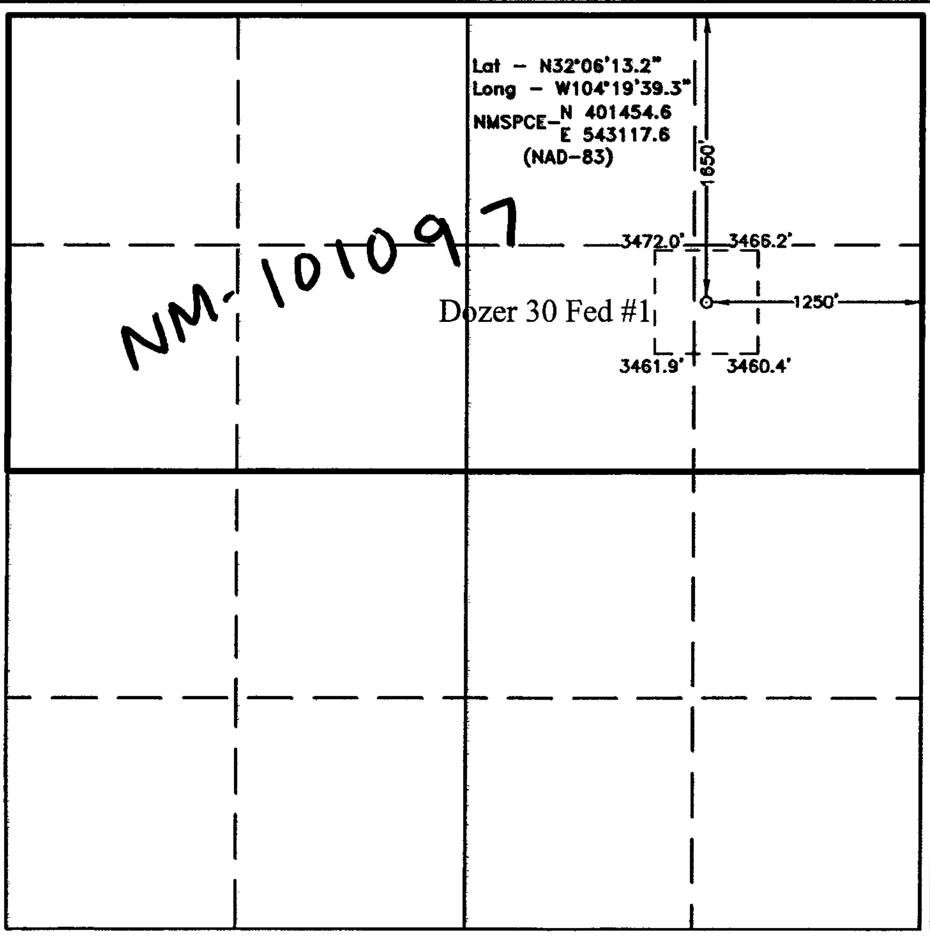
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	30	25 S	26 E		1650	NORTH	1250	EAST	EDDY

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

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
319.45	N		

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



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Zeno Farris 01-15-07

Signature Date

Zeno Farris

Printed Name

SURVEYOR CERTIFICATION

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

JANUARY 9, 2007

Date Surveyed

Signature & Seal of Professional Surveyor

W.O. Num. [illegible]16

Certificate No. Gary L. Jones 7977

BASIN SURVEYS

Application to Drill

Cimarex Energy Co. of Colorado
Dozer 30 Federal No. 1
Unit H Section 30
T25S R26E 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: 1650' FNL & 1250' FEL

2 Elevation above sea level: GR 3466'

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: 12650'

6 Estimated tops of geological markers:

Base Salt	1556'	Cisco-Canyon	10108'
Delaware	1785'	Strawn	10403'
Bone Spring	5277'	Atoka	10635'
1st Bone Spring Ss	6168'	Morrow	11148'
2nd Bone Spring Ss	7509'	Middle Morrow	11644'
3rd Bone Spring Ss	7984'	Lower Morrow	11946'
Wolfcamp	8378'		

7 Possible mineral bearing formation:

Wolfcamp	Oil
Cisco-Canyon	Oil
Morrow	Gas

8 Casing program:

Hole Size	Interval	Casing OD	Weight	Thread	Collar	Grade
17-1/2"	0-220'	13-3/8"	48#	8-R	ST&C	H-40
12-1/4"	0-2700'	9-5/8"	40#	8-R	LT&C	J-55
8-3/4"	0-10000'	7"	26#	8-R	LT&C	N-80
6-1/8"	0-12650'	4-1/2"	11.6#	8-R	LT&C	P-110

Application to Drill

Cimarex Energy Co. of Colorado
Dozer 30 Federal No. 1
Unit H Section 30
T25S R26E Eddy County, NM

9 Cementing & Setting Depth:

13-3/8"	Surface	Set 220' of 13-3/8" H-40 48 # ST&C casing. Cement with 220 Sx. Of Class "C" cement + additives, circulate cement to surface.
9-5/8"	Intermediate	Set 2700' of 9-5/8" J-55 40# LT&C casing. Cement with 775 Sx. Of Class POZ/C Cement + additives. Circulate cement to surface.
7"	Intermediate 2	Set 10000' of 7" N-80 26# LT&C casing. Cement with 570 Sx. Super H + additives. Circulate cement to surface.
4-1/2"	Production	Set 12650' of 4-1/2" P-110 11.6# LT&C casing. Cement with 250 Sx. Super H + additives. TOC 7880'.

10 Pressure control Equipment: Exhibit "E". A 13 3/8" 5000 PSI working pressure B.O.P. consisting of one set of blind rams and one set of pipe rams and a 5000 # annular type preventer. A choke manifold and 120 gallon accumulator with floor and remote operating stations and auxiliary power system. Rotating head below 6000'. A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor. BOP unit will be hydraulically operated. BOP will be nippled up on the 9 5/8" casing and will be operated at least once a day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling.

11 Proposed Mud Circulating System:

Depth	Mud Wt	Viscosity	Fluid Loss	Type Mud
0 - 220'	8.4 - 8.6	30 - 32	May lose circ.	Fresh water spud mud. Add paper to control seepage and high viscosity sweeps to clean hole.
220' - 2700'	9.7 - 9.9	28 - 29	May lose circ.	Brine water. Add paper as needed to control seepage and add lime to control pH (9-10). Use high viscosity sweeps to clean hole.
2700' - 8300'	8.4 - 9.9	28 - 29	NC	Brine water. Paper for seepage. Lime for PH (9 - 9.5)
8300' - 10000'	8.45 - 8.9	28 - 29	NC	Cut brine. Caustic for pH control.
10000' - 12650'	8.9 - 9.7	29 - 45	NC	Cut Brine. Caustic for pH control.

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

Application to Drill

Cimarex Energy Co. of Colorado
Dozer 30 Federal No. 1
Unit H Section 30
T25S R26E Eddy County, NM

12 Testing, Logging and Coring Program:

A. Mud logging program: Two-man unit from 2700' 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. The area has a potiential H2S hazard. An H2S drilling plan is attached. Adequate flare lines will be installed off the mud / gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used. Estimated BHP 6000 PSI, estimated BHT 175.

14 Anticipated Starting Date and Duration of Operations:

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

15 Other Facets of Operations:

After running casing, cased hole gamma ray neutron collar logs will be run from total depth over possible pay intervals. The Morrow pay will be perforated and stimulated. The well will be tested and potentialed as a gas well.

Hydrogen Sulfide Drilling Operations Plan

Cimarex Energy Co. of Colorado
Dozer 30 Federal No. 1
Unit H Section 30
T25S R26E Eddy County, NM

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

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

2 H2S Detection and Alarm Systems

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

3 Windsock and/or wind streamers

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

4 Condition Flags and Signs

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

5 Well control equipment

A. See exhibit "E"

6 Communication

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

7 Drillstem Testing not anticipated.

Hydrogen Sulfide Drilling Operations Plan

Cimarex Energy Co. of Colorado
Dozer 30 Federal No. 1
Unit H Section 30
T25S R26E Eddy County, NM

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

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

Surface Use Plan

Cimarex Energy Co. of Colorado
Dozer 30 Federal No. 1
Unit H Section 30
T25S R26E Eddy County, NM

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

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

B. From the junction of US Hwy 62-180 and Co Rd 772 (Means), proceed South 1.7 miles to end of pavement. Turn left on Creosote Rd and go through Cattle Guard. Thence South 5.3 miles to Co Rd 724. Continue South 0.4 miles to location.

2 PLANNED ACCESS ROADS: 218.1' of proposed access road will be contructed on-lease.

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

A. Water wells - None known

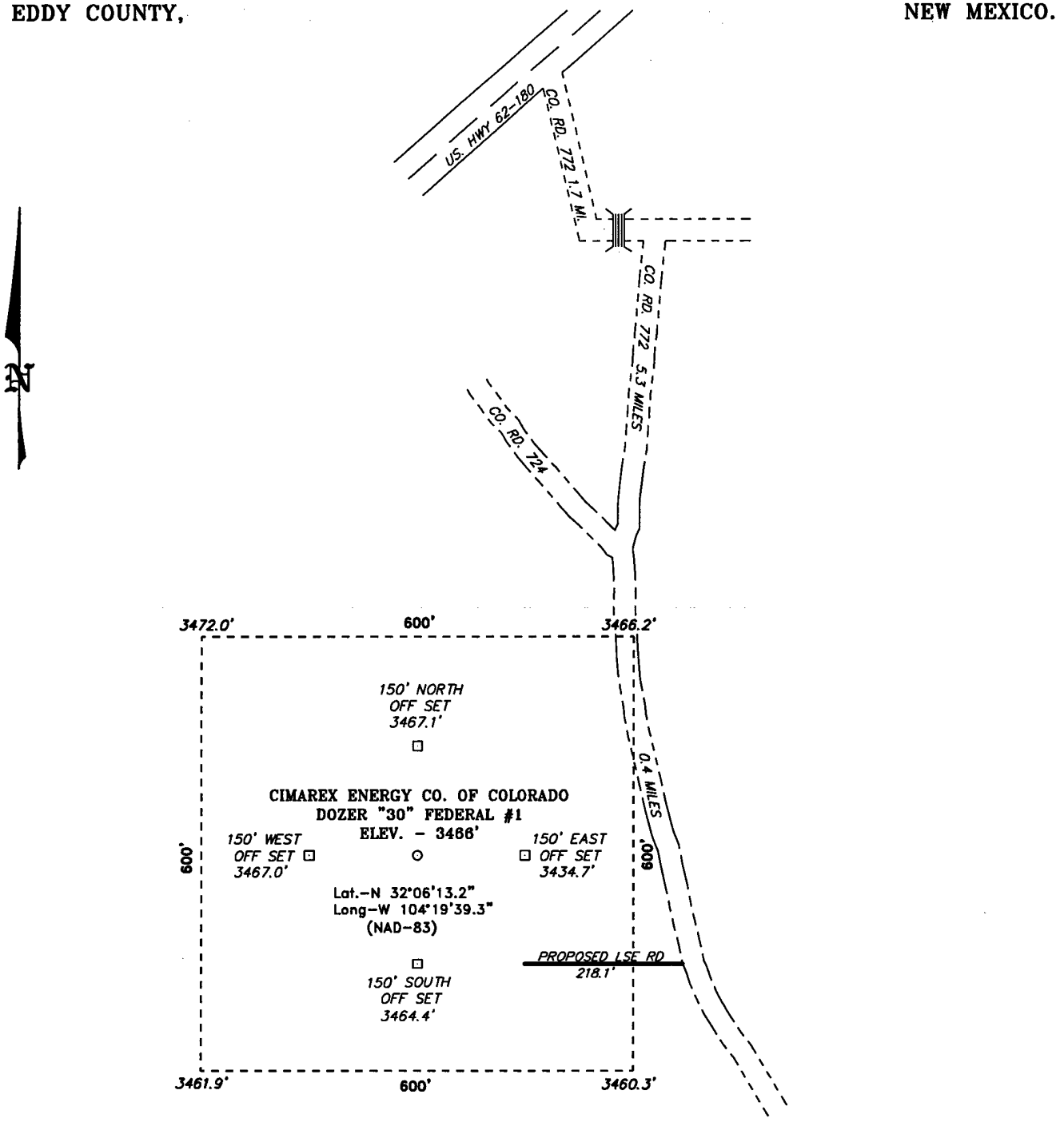
B. Disposal wells - None known

C. Drilling wells - None known

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

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

SECTION 30, TOWNSHIP 25 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, **NEW MEXICO.**



Directions to Location:

FROM THE JUNCTION OF US HWY 62-180 AND CO. RD. 772 (MEANS), PROCEED SOUTN 1.7 MILES TO END OF PAVEMENT, TURN LEFT ON CREOSOTE RD AND GO THRU CATTLE GUARD THENCE SOUTH 5.3 MILES TO CO. RD. 724, CONTINUE SOUTH 0.4 MILES TO LOCATION.

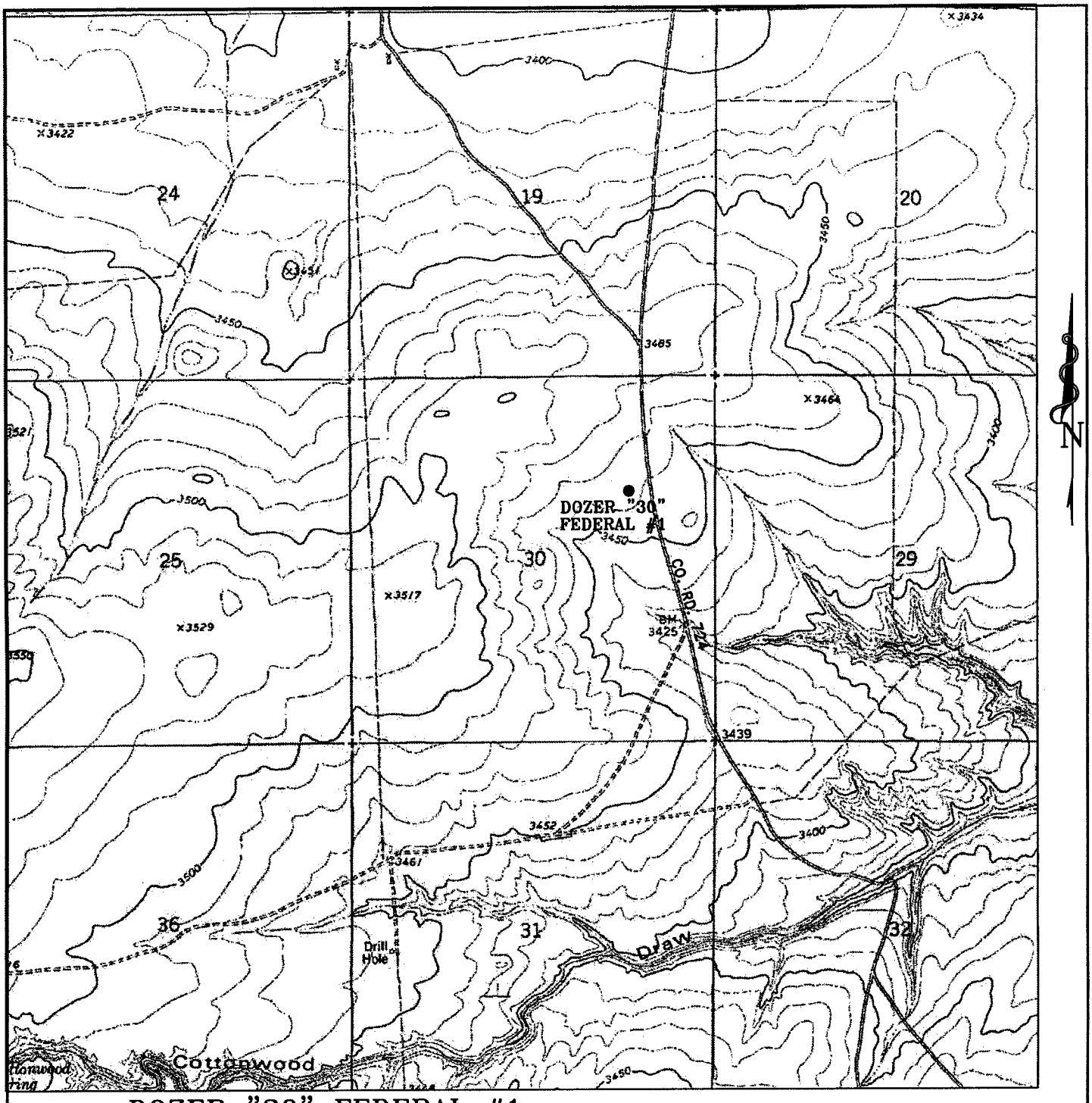
CIMAREX ENERGY CO. OF COLORADO

REF: DOZER "30" FEDERAL #1 / WELL PAD TOPO

THE DOZER "30 FEDERAL No. 1 LOCATED 1650' FROM THE NORTH LINE AND 1250' FROM THE EAST LINE OF SECTION 30, TOWNSHIP 25 SOUTH, RANGE 26 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

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

W.O. Number: 17616	Drawn By: J. M. SMALL		
Date: 01-10-2007	Disk: JMS 17616W	Survey Date: 01-09-2007	Sheet 1 of 1 Sheets



DOZER "30" FEDERAL #1
Located 1650' FNL and 1250' FEL
Section 30, Township 25 South, Range 26 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 17616T
Survey Date:	01-09-2007
Scale:	1" = 2000'
Date:	01-10-2007

CIMAREX ENERGY CO. OF COLORADO

Exhibit C

Conditions of Approval
Cave and Karst

EA#: NM-080-07-0342
Lease #: NM-101097
Cimarex Energy Company of Colorado
Dozer 30 Fed. #1, Morpheus 19 Fed. #1 & Tank 29 Fed. #1

Cave/Karst Surface Mitigation

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

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

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

Closed Mud System with Buried Cuttings Pit:
All fluids will be in steel tanks and hauled off. A cuttings pit will be utilized for this location. The cuttings pit will be lined with 4 oz. felt and a layer of 20 mil. plastic. Upon completion of the well all excess fluids will be vacuumed off the cuttings pit and allowed to dry. The pit liner will then be folded over the cuttings, covered with a 20 mil plastic cover and then covered with at least three feet of top soil.

Cave/Karst Subsurface Mitigation

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

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

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

Cementing:
All casing strings will be cemented to the surface.

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

Regardless of the type of drilling machinery used, if a bit drops of four feet or more and circulation losses greater then 75 percent occur simultaneously while drilling in any cave-bearing zone, drilling operations will immediately stop and the BLM will be notified by the operator. The BLM will assess the consequences of the situation and work with operator on corrective actions to resolve the problem.

Delayed Blasting:
Any blasting will be a phased and time delayed.

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.

Pressure Tests:
Annual pressure tests will be performed by the Operator on all casing annuli. If the test results indicated a casing failure, remedial actions approved by the BLM will be undertaken to correct the problem.

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

CONDITIONS OF APPROVAL - DRILLING

Well Name & No. 1-Dozer 30 Federal
Operator's Name: Cimarex Energy Co. of Colorado
Location: 1650FNL, 1250FEL, Section 30, T-25-S, R-26-E
Lease: NM-101097

I. DRILLING OPERATIONS REQUIREMENTS:

1. The Bureau of Land Management (BLM) is to be notified at the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 361-2822 - for wells in Eddy County in sufficient time for a representative to witness:

A. Spudding

B. Cementing casing: 13-3/8 inch 9-5/8 inch 7 inch 4-1/2 inch

C. BOP tests

2. A Hydrogen Sulfide (H2S) Drilling Plan should be activated prior to drilling into the **Delaware** Formation. A copy of the plan shall be posted at the drilling site. **Hydrogen Sulfide has been reported in Sec. 11 and 14 measuring 1200-1500 ppm in STVs. Canyon formation carries a high potential for H2S.**

3 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.

4. Submit a Sundry Notice (Form 3160-5, one original and five copies) for each casing string, describing the casing and cementing operations. Include pertinent information such as; spud date, hole size, casing (size, weight, grade and thread type), cement (type, quantity and top), water zones and problems or hazards encountered. The Sundry shall be submitted within 15 days of completion of each casing string. The reports may be combined into the same Sundry if they fall within the same 15 day time frame.

5. The API No. assigned to the well by NMOCD shall be included on the subsequent report of setting the first casing string.

6. A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales.

7. Gamma-Ray/Neutron logs shall be run from the base of the Salado Formation to the surface; cable speed not to exceed 30 feet per minute.

II. CASING:

1. The 13-3/8 inch surface casing shall be set at **220 feet**, below usable water and cement circulated to the surface. If cement does not circulate to the surface the appropriate BLM office shall be notified and a temperature survey or cement bond log shall be run to verify the top of the cement. Remedial cementing shall be completed prior to drilling out that string.

Possible lost circulation in the Delaware. High cave/karst area.
Possible abnormal pressures in the Wolfcamp and high pressure gas in the Pennsylvanian Section (Cisco-Canyon, Strawn, Atoka, and Morrow).

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

3. The minimum required fill of cement behind the 7 inch **second** intermediate casing is **circulate cement to the surface. Set above high pressured Cisco.**

4. The minimum required fill of cement behind the 4-1/2 inch production casing is **cement shall extend to approximately 7780 feet.**

III. PRESSURE CONTROL:

1. All BOP systems and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2. The BOP and related equipment shall be installed and operational before drilling below the **13-3/8** inch casing shoe and shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced.

2. Minimum working pressure of the blowout preventer and related equipment (BOPE) required for drilling the surface and intermediate casing shall be **5M** psi. Minimum working pressure of the blowout preventer and related equipment (BOPE) required for drilling below the **9-5/8** inch casing shall be **5M** psi.

3. The appropriate BLM office shall be notified in sufficient time for a representative to witness the tests.
- A variance to test the **BOP, BOPE, and 13-3/8 inch surface casing** to the reduced pressure of **1000** psi with the rig pumps instead of **an independent service company** is approved. **Remainder of testing steps to be completed. Independent service company to perform full test prior to drilling out of 9-5/8 inch casing.**
- The tests shall be done by an independent service company.
- The results of the test shall be reported to the appropriate BLM office.
- Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.
- Testing must be done in a safe workman-like manner. Hard line connections shall be required.
- BOPE must be tested prior to drilling into the **Wolfcamp** Formation by an independent service company.

IV. DRILLING MUD:

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

1. Recording pit level indicator to indicate volume gains and losses.
2. Mud measuring device for accurately determining the mud volumes necessary to fill the hole during trips.
3. Flow-sensor on the flow line to warn of abnormal mud returns from the well.

Engineer on call phone: 505-706-2779

WWI 012907