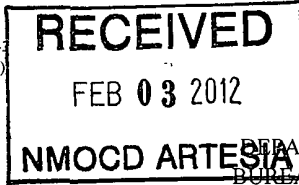


AT5-12-261

OCD-ARTESIA

Form 3160-2
(April 2004)



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

| | | |
|--|---|--|
| 1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER | | 5. Lease Serial No SHL NM-94839 BHL NM-19423 |
| 1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone | | 6. If Indian, Allottee or Tribe Name |
| 2. Name of Operator Cimarex Energy Co. of Colorado | | 7. If Unit or CA Agreement, Name and No |
| 3a. Address 600 N. Marienfeld St., Ste. 600; Midland, TX 79701 | 3b. Phone No (include area code) 432-571-7800 | 8. Lease Name and Well No. Cottonwood Draw 22 Federal Com 12H |
| 4. Location of Well (Report location clearly and in accordance with any State requirements. *) At Surface 300 FSL & 793 FEL At proposed prod. Zone 330 FNL & 660 FEL Horizontal Bone Spring Test | | 9. API Well No 30-015-39890 |
| 14. Distance in miles and direction from nearest town or post office* | | 10. Field and Pool, or Exploratory WILDCAT S252622A; B.S. GAS |
| 15. Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line if any) 300 | | 11. Sec., T. R. M. or Blk. and Survey or Area 22-25S-26E |
| 16. No of acres in lease NM-94839 - 1480 acres NM-19423 - 2560 acres | | 12. County or Parish Eddy |
| 17. Spacing Unit dedicated to this well E/2E/2 160 acres | | 13. State NM |
| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 50 | 19. Proposed Depth MD 12248, TVD 7719 | 20. BLM/BIA Bond No on File NM-2575 |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc) 3272' GR | 22. Approximate date work will start* 02.15.12 | 23. Estimated duration 30-35 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 | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator Certification |
| 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) | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

| | | |
|-------------------------------------|-------------------------------------|------------------|
| 25. Signature <i>Zeno Farris</i> | Name (Printed/Typed) Zeno Farris | Date 01.09.12 |
|-------------------------------------|-------------------------------------|------------------|

Title

| | |
|--|--------------------------------------|
| Manager Operations Administration | |
| Approved By (Signature) <i>/s/ Don Peterson</i> | Name (Printed/Typed) Don Peterson |
| Title FIELD MANAGER | Office CARLSBAD FIELD OFFICE |

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

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

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

Carlsbad Controlled Water Basin

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Operator Certification Statement
Cottonwood Draw 22 Federal Com No. 12H
Cimarex Energy Co. of Colorado
Unit P, Section 22
T25S-R26E, Eddy County, NM

Operator's Representative

Cimarex Energy Co. of Colorado
600 N. Marienfeld St., Ste. 600
Midland, TX 79701
Office Phone: (432) 571-7800
Zeno Farris

CERTIFICATION: I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 9th day of January, 2012

NAME: Zeno Farris
Zeno Farris

TITLE: Manager Operations Administration

ADDRESS: 600 N. Marienfeld St., Ste. 600
Midland, TX 79701

TELEPHONE: (432) 620-1938

EMAIL: zfarris@cimarex.com

Field Representative: Same as above

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

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

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

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

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Form C-102
Revised July 16, 2010
Submit one copy to appropriate District Office

RECEIVED
FEB 03 2012
NMOCD ARTESIA

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

| | | |
|-----------------------------------|--|--|
| API Number 30-DIS-39890 | Pool Code 97807 | Pool Name WILDCAT S252622A; Bone Spring; GAS |
| Property Code 37373 | Property Name COTTONWOOD DRAW 22 FED COM | Well Number 12H |
| UGRID No. 162683 | Operator Name CIMAREX ENERGY CO. OF COLORADO | Elevation 3272 |

Surface Location

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| P | 22 | 25 S | 26 E | | 300 | SOUTH | 793 | 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 |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| A | 22 | 25 S | 26 E | | 330 | NORTH | 660 | EAST | EDDY |

| | | | |
|-------------------------------|-----------------|--------------------|-----------|
| Dedicated Acres 160 | Joint or Infill | Consolidation Code | Order No. |
|-------------------------------|-----------------|--------------------|-----------|

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

| | | | |
|--|--|--|---|
| <p>PROPOSED BOTTOM HOLE LOCATION Lat - N 32°07'17.99" Long - W 104°16'26.91" N 408003.1 E 559622.0 (NAD-83)</p> | <p>SURFACE LOCATION Lat - N 32°06'31.92" Long - W 104°16'28.31" NMSPC- N 403352.3 E 559544.1 (NAD-83)</p> | <p>330'</p> <p>660'</p> <p>B.H.</p> <p>4653.4'</p> <p>NM-19423</p> | <p>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 or has a right to drill this well at this 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.</p> <p>Signature: <u>Zeno Farris</u> Date: <u>1/9/2012</u></p> <p>Printed Name: <u>Zeno Farris</u></p> <p>Email Address: _____</p> |
| | | <p>3284.3'</p> <p>3279.7'</p> <p>300'</p> <p>793'</p> <p>S.L.</p> <p>3261.2'</p> <p>NM-94839</p> | <p>SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.</p> <p>Date Surveyed: <u>January 30, 2012</u></p> <p>Signature: <u>[Signature]</u> Seal of Professional Surveyor</p> <p>Certificate No. <u>Gary L. Jones 7977</u></p> <p>BASIN SURVEYS <u>25921</u></p> |

Cottonwood Draw 22 Federal Com No. 12H

Cimarex Energy Co. of Colorado

Unit P, Section 22

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: SHL 300 FSL & 793 FEL
BHL 330 FNL & 660 FEL

2. Elevation above sea level: 3272' GR

3. Geologic name of surface formation: Quaternary 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: MD 12248, TVD 7719

6. Estimated tops of geological markers:

| | | | |
|---------------|-------------|-----------------------|------|
| Rustler | Spotty, N/A | Bone Spring "A" Shale | 5567 |
| Top Salt | 1001 | Bone Spring "C" Shale | 5822 |
| Base Salt | 1607 | 1st Bone Spring Ss | 6390 |
| Delaware | 1805 | 2nd Bone Spring Ss | 6324 |
| Cherry Canyon | 2789 | 2nd BS Ss Lower | 6879 |
| Brushy Canyon | 3791 | 3rd Bone Spring Ss | 7762 |
| Bone Spring | 5337 | | |

7. Possible mineral bearing formations:

| | |
|-------------|-----|
| Bone Spring | Gas |
| Delaware | Oil |

8. Proposed drilling Plan

After setting surface and intermediate, drill 8 3/4" hole to KOP @ 7432 and then drill through curve to TD @ 12248 MD, 7719 TVD. Run 5 1/2" production casing from 0-12248 and cement.

9. Mud Circulating System:

| Depth | Mud Wt | Visc | Fluid Loss | Type Mud |
|---------------|-----------|-------|------------|---|
| 0' to 450 | 8.4 - 8.8 | 30-32 | NC | FW spud mud. Add FW to control weight & viscosity and paper to prevent seepage. |
| 450 to 1780 | 10 | 28-29 | NC | Saturated Brine. Sweep as needed to clean hole. |
| 1780 to 12248 | 9.0 | 28-30 | NC | Cut brine. Sweep as needed to clean hole. |

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.

10. Casing Program:

| | Hole Size | Depth | Casing OD | Weight | Collar | Grade |
|--------------|-----------|------------|------------|--------|--------|-------|
| Surface | 17½" | 0 to 450 | New 13½" | 48# | STC | H-40 |
| Intermediate | 12½" | 0 to 1780 | New 9½" | 36# | LTC | J-55 |
| Production | 8½" | 0 to 12248 | New 5 1/2" | 17# | LTC | P-110 |

11. Cementing Program:

| | |
|----------------------------|--|
| Surface | Lead: 200 sx Halcem (C) +4% Bentomite+2% CaCl 13.5 ppg 1.75 yld 100% Excess Tail: 185 sx. Halcem (C) +2% CaCl 14.8 ppg 1.34 yld. 50% Excess TOC Surface Centralizers per Onshorder 2.III.B.1.f |
| Intermediate Excess 25% | Lead: 470 sx. EconoCem(C) 4% D20 + .2% D46 + 1% S1. YIELD 1.96, MIX WATER 10.85, WT. 12.9 Tail: 173 sx. (C) + .1% D13. YIELD 1.33, MIX WATER 3.36, WT. 14.8 TOC Surface |
| Production Excess 25% | Lead: 605 sx Interfill H with 0.3% HR-601, 5 lb/ sx Gilsonite, 0.125 lb/ sx Poly-E-Flake, mixed at 11.9 ppg. Yield 2.47 cf/ sx. Tail: 440 sx Super H with 0.5% Halad ® 344, 0.25% D-Air 3000, 0.4% CFR-3, 1 lb/ sx Salt, 5 lb/ sx Gilsonite, 0.125 lb/ sx Poly-E-Flake, 0.35% HR-7 mixed at 13.2 ppf. Yield 1.61 cf/ sx TOC Surface |

According to the State Engineer, depth to groundwater is 21. Fresh water zones will be protected by setting 13½" casing at 450 and cementing to surface. Hydrocarbon zones will be protected by setting 9½" casing at 1872 and 7" to 9240 and cementing to surface.

Collapse Factor

1.125

Burst Factor

1.125

Tension Factor

1.6

Application to Drill
Cottonwood Draw 22 Federal Com No. 12H
Cimarex Energy Co. of Colorado
Unit P, Section 22
T25S-R26E, Eddy County, NM

12. Pressure control Equipment:

Exhibit "E". A 13 $\frac{3}{8}$ " 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 1872.' 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. Mud gas separator will be utilized if drilling in potential H2S area.

BOP unit will be hydraulically operated. BOP will be nipped 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.

Before drilling out of the surface casing BOPs will be tested to 250 psi high and 3000 psi high by and independent service company. Hydril will be tested to 250 psi high and 1500 high. Before drilling out of the intermediate casing BOPs will be tested by an independent service company to 250 psi low and 5000 psi high. Hydril will be tested to 250 psi low and 2500 psi high.

Cimarex Energy Co. of Colorado (operator) requests a variance if Cactus 122 (rig name) is used to drill this well to use a co-flex line between the BOP and choke manifold.

Manufacturer: Midwest Hose & Specialty

Serial Number: 211964 See attached htdrostatic test report

Length: 35' Size: 4-1/16" Ends - flanges/clamps

WP rating: 10,000 psi Anchors required by manufacturer – Yes/No

13. Testing, Logging and Coring Program: *See COA*

- A. Mud logging program: No mud logging program.
- B. Electric logging program: CNL / LDT / CAL / GR, DLL / CAL / GR
- C. No DSTs or cores are planned at this time.

14. Potential Hazards:

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Cimarex has encountered H₂S in a one-time encounter in an Intra-salt Pocket and while drilling and completing wells in the Delaware Mountain Group. In this regard, attached is an H₂S Drilling Operations Plan. The ROEs encountered do not meet the BLM's minimum requirements for the submission of a "Public Protection Plan" for the drilling and completion of this well. 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 3500 psi Estimated BHT 175°

15. Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.

Drilling expected to take 25-35 days

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

16. Other Facets of Operations:

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

Bone Spring pay will be perforated and stimulated.

The proposed well will be tested and potentialized as an oil well.



Cimarex Energy Co. (Midland)
Project: Eddy County (NM83E)
Site: Sec 22-T25S-R26E
Well: Cottonwood Draw 22 Fed Com #12H
Wellbore: Wellbore #1
Design: Design #2
Lat: 32° 6' 31.972 N
Long: 104° 16' 28.310 W
Pad GL: 3272.0
KB: WELL @ 3289.0usft (Original Well Elev)



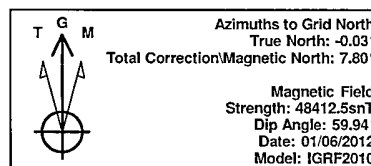
| WELL DETAILS: Cottonwood Draw 22 Fed Com #12H | | | | | | |
|---|-------|-----------|---------------|-----------------|-------------------|-----------|
| +N/-S | +E/-W | Northing | Ground Level: | 3272.0 | | Slot |
| 0.0 | 0.0 | 403352.30 | Easting | 559544.10 | Latitude | Longitude |
| | | | | 32° 6' 31.972 N | 104° 16' 28.310 W | |

| WELLBORE TARGET DETAILS (LAT/LONG) | | | | | | |
|------------------------------------|--------|--------|-------|-----------------|-------------------|-------|
| Name | TVD | +N/-S | +E/-W | Latitude | Longitude | Shape |
| Cottonwood Draw 22 Fed Com #12H | 7719.0 | 4650.8 | 77.9 | 32° 7' 17.997 N | 104° 16' 27.374 W | Point |

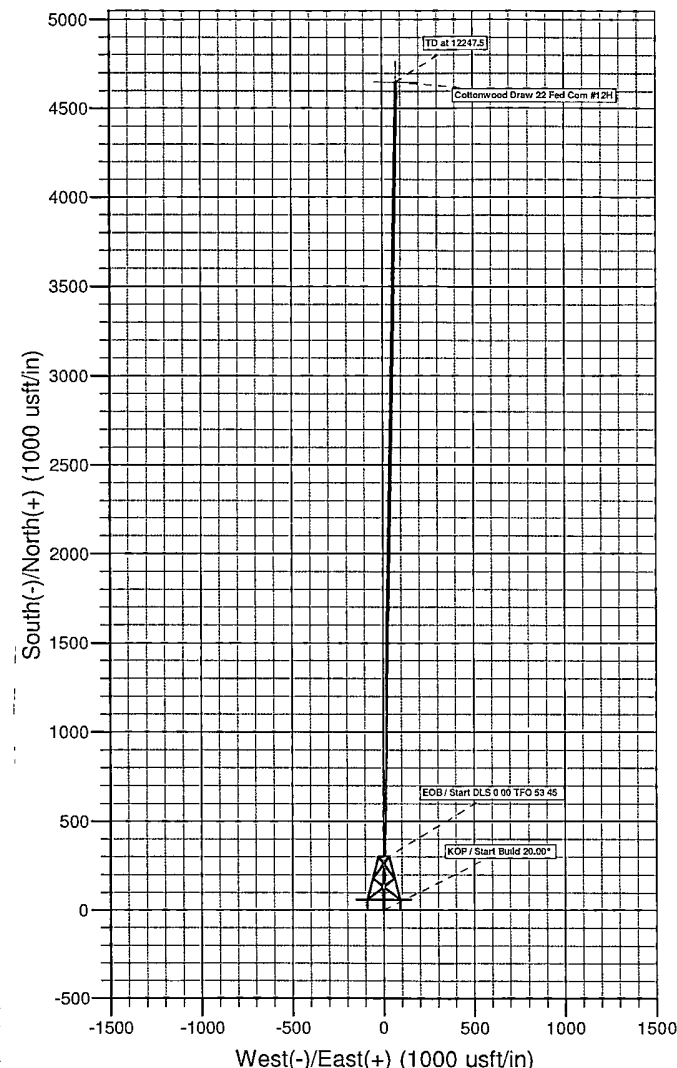
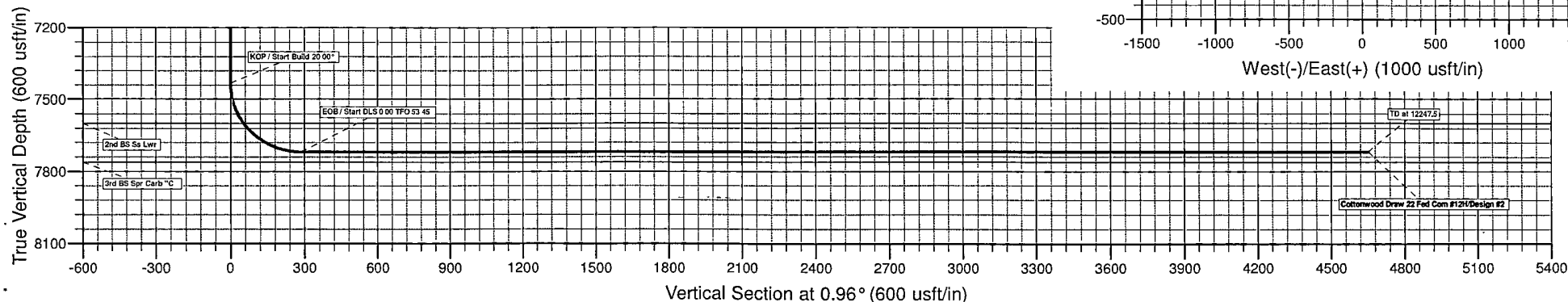
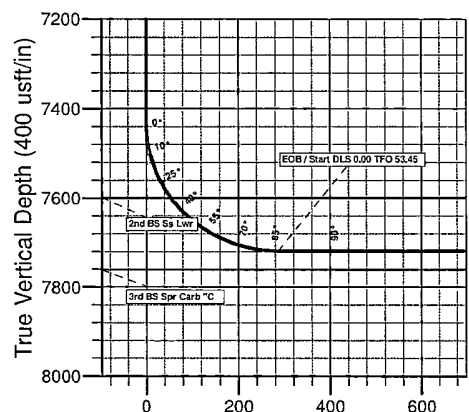
| SECTION DETAILS | | | | | | | | | | |
|-----------------|-------|------|--------|--------|-------|-------|-------|--------|--------------------------------|--|
| MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Annotation | |
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | |
| 7432.5 | 0.00 | 0.00 | 7432.5 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | KOP / Start Build 20.00° | |
| 7882.5 | 90.00 | 0.96 | 7719.0 | 286.4 | 4.8 | 20.00 | 0.96 | 286.5 | EOB / Start DLS 0.00 TFO 53.45 | |
| 12247.5 | 90.00 | 0.96 | 7719.0 | 4650.8 | 77.9 | 0.00 | 53.45 | 4651.5 | TD at 12247.5 | |

| CASING DETAILS |
|-----------------------------|
| No casing data is available |

| FORMATION TOP DETAILS | | |
|-----------------------|--------|-------------------|
| TVDPATH | MDPATH | Formation |
| 1001.0 | 1001.0 | Top Salt |
| 1607.0 | 1607.0 | Base Salt |
| 1805.0 | 1805.0 | Delaware |
| 2789.0 | 2789.0 | Cherry Canyon |
| 3791.0 | 3791.0 | Brushy Canyon |
| 5086.0 | 5086.0 | Brushy Canyon Lwr |
| 5337.0 | 5337.0 | Bone Spring |
| 5567.0 | 5567.0 | BS "A" Shale |
| 5822.0 | 5822.0 | BS "C" Shale |
| 6324.0 | 6324.0 | 1st BS Ss |
| 6879.0 | 6879.0 | 2nd BS Ss |
| 7599.0 | 7610.2 | 2nd BS Ss Lwr |



| PROJECT DETAILS: Eddy County (NM83E) | |
|--------------------------------------|---------------------------|
| Geodetic System: | US State Plane 1983 |
| Datum: | North American Datum 1983 |
| Ellipsoid: | GRS 1980 |
| Zone: | New Mexico Eastern Zone |
| System Datum: | Mean Sea Level |



Cimarex Energy Co. (Midland)

Eddy County (NM83E)

Sec 22-T25S-R26E

Cottonwood Draw 22 Fed Com #12H

Wellbore #1

Plan: Design #2

Standard Planning Report

06 January, 2012

Great White Directional Services

Planning Report

| | | | |
|-----------|---------------------------------|------------------------------|--|
| Database: | EDM, 5000.1 Single User Db | Local Co-ordinate Reference: | Well Cottonwood Draw 22 Fed Com #12H |
| Company: | Cimarex Energy Co. (Midland) | TVD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Project: | Eddy County (NM83E) | MD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Site: | Sec 22-T25S-R26E | North Reference: | Grid |
| Well: | Cottonwood Draw 22 Fed Com #12H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Design #2 | | |

| | | | |
|-------------|---------------------------|---------------|----------------|
| Project | Eddy County (NM83E) | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | New Mexico Eastern Zone | | |

| | | | |
|-----------------------|------------------|-------------------|-------------------|
| Site | Sec 22-T25S-R26E | | |
| Site Position: | Map | Northing: | 403,352.30 usft |
| From: | | Easting: | 559,544.10 usft |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " |
| | | Latitude: | 32° 6' 31.972 N |
| | | Longitude: | 104° 16' 28.310 W |
| | | Grid Convergence: | 0.03 ° |

| | | | |
|----------------------|---------------------------------|---------------------|---------------|
| Well | Cottonwood Draw 22 Fed Com #12H | | |
| Well Position | +N/-S | 0.0 usft | Northing: |
| | +E/-W | 0.0 usft | Easting: |
| Position Uncertainty | 0.0 usft | Wellhead Elevation: | Ground Level: |
| | | | 3,272.0 usft |
| | | | Latitude: |
| | | | Longitude: |

| | | | |
|-----------|-------------|-------------|----------------|
| Wellbore | Wellbore #1 | | |
| Magnetics | Model Name | Sample Date | Declination |
| | | | (°) |
| | IGRF2010 | 01/06/12 | 7.83 |
| | | | Dip Angle |
| | | | (°) |
| | | | Field Strength |
| | | | (nT) |
| | | | 59.94 |
| | | | 48,413 |

| | | | |
|-------------------|------------------|--------|---------------|
| Design | Design #2 | | |
| Audit Notes: | | | |
| Version: | Phase: | PLAN | Tie On Depth: |
| | | | 0.0 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W |
| | (usft) | (usft) | (usft) |
| | 7,719.0 | 0.0 | 0.0 |
| | | | Direction |
| | | | (°) |
| | | | 0.96 |

| | | | | | | | | | | |
|---------------|-------------|---------|----------|---------|--------|-------------|-------------|-------------|-------|--------------------|
| Plan Sections | | | | | | | | | | |
| Measured | Inclination | Azinuth | Vertical | +N/-S | +E/-W | Dogleg | Build | Turn | TFO | Target |
| Depth | (°) | (°) | Depth | (usft) | (usft) | Rate | Rate | Rate | (°) | |
| (usft) | | | (usft) | | | (°/100usft) | (°/100usft) | (°/100usft) | | |
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,432.5 | 0.00 | 0.00 | 7,432.5 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,882.5 | 90.00 | 0.96 | 7,719.0 | 286.4 | 4.8 | 20.00 | 20.00 | 0.00 | 0.96 | |
| 12,247.5 | 90.00 | 0.96 | 7,719.0 | 4,650.8 | 77.9 | 0.00 | 0.00 | 0.00 | 53.45 | Cottonwood Draw 22 |

Great White Directional Services

Planning Report

| | | | |
|-----------|---------------------------------|------------------------------|--|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Cottonwood Draw 22 Fed Com #12H |
| Company: | Cimarex Energy Co. (Midland) | TVD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Project: | Eddy County (NM83E) | MD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Site: | Sec 22-T25S-R26E | North Reference: | Grid |
| Well: | Cottonwood Draw 22 Fed Com #12H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Design #2 | | |

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 700.0 | 0.00 | 0.00 | 700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 900.0 | 0.00 | 0.00 | 900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,001.0 | 0.00 | 0.00 | 1,001.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Top Salt | | | | | | | | | |
| 1,100.0 | 0.00 | 0.00 | 1,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,500.0 | 0.00 | 0.00 | 1,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,600.0 | 0.00 | 0.00 | 1,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,607.0 | 0.00 | 0.00 | 1,607.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Base Salt | | | | | | | | | |
| 1,700.0 | 0.00 | 0.00 | 1,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,800.0 | 0.00 | 0.00 | 1,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,805.0 | 0.00 | 0.00 | 1,805.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Delaware | | | | | | | | | |
| 1,900.0 | 0.00 | 0.00 | 1,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 0.00 | 0.00 | 2,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 0.00 | 0.00 | 2,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,300.0 | 0.00 | 0.00 | 2,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,400.0 | 0.00 | 0.00 | 2,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,500.0 | 0.00 | 0.00 | 2,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,600.0 | 0.00 | 0.00 | 2,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 0.00 | 0.00 | 2,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,789.0 | 0.00 | 0.00 | 2,789.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Cherry Canyon | | | | | | | | | |
| 2,800.0 | 0.00 | 0.00 | 2,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 0.00 | 0.00 | 2,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 0.00 | 0.00 | 3,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 0.00 | 0.00 | 3,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 0.00 | 0.00 | 3,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 0.00 | 0.00 | 3,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,400.0 | 0.00 | 0.00 | 3,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,500.0 | 0.00 | 0.00 | 3,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 0.00 | 0.00 | 3,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,700.0 | 0.00 | 0.00 | 3,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,791.0 | 0.00 | 0.00 | 3,791.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Brushy Canyon | | | | | | | | | |
| 3,800.0 | 0.00 | 0.00 | 3,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 0.00 | 0.00 | 3,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 0.00 | 0.00 | 4,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 0.00 | 0.00 | 4,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 0.00 | 0.00 | 4,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 0.00 | 0.00 | 4,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |

Great White Directional Services

Planning Report

| | | | |
|-----------|---------------------------------|------------------------------|--|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Cottonwood Draw 22 Fed Com #12H |
| Company: | Cimarex Energy Co. (Midland) | TVD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Project: | Eddy County (NM83E) | MD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Site: | Sec 22-T25S-R26E | North Reference: | Grid |
| Well: | Cottonwood Draw 22 Fed Com #12H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Design #2 | | |

| Planned Survey | | | | | | | | | |
|--------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 4,400.0 | 0.00 | 0.00 | 4,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,500.0 | 0.00 | 0.00 | 4,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 0.00 | 0.00 | 4,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,700.0 | 0.00 | 0.00 | 4,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,800.0 | 0.00 | 0.00 | 4,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 4,900.0 | 0.00 | 0.00 | 4,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,000.0 | 0.00 | 0.00 | 5,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,086.0 | 0.00 | 0.00 | 5,086.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Brushy Canyon Lwr | | | | | | | | | |
| 5,100.0 | 0.00 | 0.00 | 5,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,200.0 | 0.00 | 0.00 | 5,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,300.0 | 0.00 | 0.00 | 5,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,337.0 | 0.00 | 0.00 | 5,337.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Bone Spring | | | | | | | | | |
| 5,400.0 | 0.00 | 0.00 | 5,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,500.0 | 0.00 | 0.00 | 5,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,567.0 | 0.00 | 0.00 | 5,567.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| BS "A" Shale | | | | | | | | | |
| 5,600.0 | 0.00 | 0.00 | 5,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,700.0 | 0.00 | 0.00 | 5,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,800.0 | 0.00 | 0.00 | 5,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 5,822.0 | 0.00 | 0.00 | 5,822.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| BS "C" Shale | | | | | | | | | |
| 5,900.0 | 0.00 | 0.00 | 5,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,000.0 | 0.00 | 0.00 | 6,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,100.0 | 0.00 | 0.00 | 6,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,200.0 | 0.00 | 0.00 | 6,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,300.0 | 0.00 | 0.00 | 6,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,324.0 | 0.00 | 0.00 | 6,324.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1st BS Ss | | | | | | | | | |
| 6,400.0 | 0.00 | 0.00 | 6,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,500.0 | 0.00 | 0.00 | 6,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,600.0 | 0.00 | 0.00 | 6,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,700.0 | 0.00 | 0.00 | 6,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,800.0 | 0.00 | 0.00 | 6,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 6,879.0 | 0.00 | 0.00 | 6,879.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2nd BS Ss | | | | | | | | | |
| 6,900.0 | 0.00 | 0.00 | 6,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,000.0 | 0.00 | 0.00 | 7,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,100.0 | 0.00 | 0.00 | 7,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,200.0 | 0.00 | 0.00 | 7,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,300.0 | 0.00 | 0.00 | 7,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,400.0 | 0.00 | 0.00 | 7,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 7,432.5 | 0.00 | 0.00 | 7,432.5 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| KOP / Start Build 20.00° | | | | | | | | | |
| 7,450.0 | 3.50 | 0.96 | 7,450.0 | 0.5 | 0.0 | 0.5 | 20.00 | 20.00 | 0.00 |
| 7,475.0 | 8.50 | 0.96 | 7,474.8 | 3.1 | 0.1 | 3.1 | 20.00 | 20.00 | 0.00 |
| 7,500.0 | 13.50 | 0.96 | 7,499.4 | 7.9 | 0.1 | 7.9 | 20.00 | 20.00 | 0.00 |
| 7,525.0 | 18.50 | 0.96 | 7,523.4 | 14.8 | 0.2 | 14.8 | 20.00 | 20.00 | 0.00 |
| 7,550.0 | 23.50 | 0.96 | 7,546.7 | 23.8 | 0.4 | 23.8 | 20.00 | 20.00 | 0.00 |
| 7,575.0 | 28.50 | 0.96 | 7,569.2 | 34.7 | 0.6 | 34.7 | 20.00 | 20.00 | 0.00 |
| 7,600.0 | 33.50 | 0.96 | 7,590.6 | 47.6 | 0.8 | 47.6 | 20.00 | 20.00 | 0.00 |
| 7,610.2 | 35.53 | 0.96 | 7,599.0 | 53.3 | 0.9 | 53.4 | 20.00 | 20.00 | 0.00 |

Great White Directional Services

Planning Report

| | | | |
|-----------|---------------------------------|------------------------------|--|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Cottonwood Draw 22 Fed Com #12H |
| Company: | Cimarex Energy Co. (Midland) | TVD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Project: | Eddy County (NM83E) | MD Reference: | WELL @ 3289.0usft (Original Well Elev) |
| Site: | Sec 22-T25S-R26E | North Reference: | Grid |
| Well: | Cottonwood Draw 22 Fed Com #12H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Design #2 | | |

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 2nd BS Ss Lwr | | | | | | | | | |
| 7,625.0 | 38.50 | 0.96 | 7,610.8 | 62.3 | 1.0 | 62.3 | 20.00 | 20.00 | 0.00 |
| 7,650.0 | 43.50 | 0.96 | 7,629.7 | 78.7 | 1.3 | 78.7 | 20.00 | 20.00 | 0.00 |
| 7,675.0 | 48.50 | 0.96 | 7,647.1 | 96.6 | 1.6 | 96.7 | 20.00 | 20.00 | 0.00 |
| 7,700.0 | 53.50 | 0.96 | 7,662.8 | 116.1 | 1.9 | 116.1 | 20.00 | 20.00 | 0.00 |
| 7,725.0 | 58.50 | 0.96 | 7,676.8 | 136.8 | 2.3 | 136.8 | 20.00 | 20.00 | 0.00 |
| 7,750.0 | 63.50 | 0.96 | 7,688.9 | 158.6 | 2.7 | 158.7 | 20.00 | 20.00 | 0.00 |
| 7,775.0 | 68.50 | 0.96 | 7,699.0 | 181.5 | 3.0 | 181.5 | 20.00 | 20.00 | 0.00 |
| 7,800.0 | 73.50 | 0.96 | 7,707.2 | 205.1 | 3.4 | 205.1 | 20.00 | 20.00 | 0.00 |
| 7,825.0 | 78.50 | 0.96 | 7,713.2 | 229.3 | 3.8 | 229.4 | 20.00 | 20.00 | 0.00 |
| 7,850.0 | 83.50 | 0.96 | 7,717.1 | 254.0 | 4.3 | 254.0 | 20.00 | 20.00 | 0.00 |
| 7,875.0 | 88.50 | 0.96 | 7,718.9 | 278.9 | 4.7 | 279.0 | 20.00 | 20.00 | 0.00 |
| 7,882.5 | 90.00 | 0.96 | 7,719.0 | 286.4 | 4.8 | 286.5 | 20.00 | 20.00 | 0.00 |
| EOB / Start DLS 0.00 TFO 53.45 | | | | | | | | | |
| 7,900.0 | 90.00 | 0.96 | 7,719.0 | 303.9 | 5.1 | 304.0 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 90.00 | 0.96 | 7,719.0 | 403.9 | 6.8 | 404.0 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 90.00 | 0.96 | 7,719.0 | 503.9 | 8.4 | 504.0 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 90.00 | 0.96 | 7,719.0 | 603.9 | 10.1 | 604.0 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 90.00 | 0.96 | 7,719.0 | 703.9 | 11.8 | 704.0 | 0.00 | 0.00 | 0.00 |
| 8,400.0 | 90.00 | 0.96 | 7,719.0 | 803.9 | 13.5 | 804.0 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 90.00 | 0.96 | 7,719.0 | 903.9 | 15.1 | 904.0 | 0.00 | 0.00 | 0.00 |
| 8,600.0 | 90.00 | 0.96 | 7,719.0 | 1,003.8 | 16.8 | 1,004.0 | 0.00 | 0.00 | 0.00 |
| 8,700.0 | 90.00 | 0.96 | 7,719.0 | 1,103.8 | 18.5 | 1,104.0 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 90.00 | 0.96 | 7,719.0 | 1,203.8 | 20.2 | 1,204.0 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 90.00 | 0.96 | 7,719.0 | 1,303.8 | 21.8 | 1,304.0 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 90.00 | 0.96 | 7,719.0 | 1,403.8 | 23.5 | 1,404.0 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 90.00 | 0.96 | 7,719.0 | 1,503.8 | 25.2 | 1,504.0 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 90.00 | 0.96 | 7,719.0 | 1,603.8 | 26.9 | 1,604.0 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 90.00 | 0.96 | 7,719.0 | 1,703.7 | 28.5 | 1,704.0 | 0.00 | 0.00 | 0.00 |
| 9,400.0 | 90.00 | 0.96 | 7,719.0 | 1,803.7 | 30.2 | 1,804.0 | 0.00 | 0.00 | 0.00 |
| 9,500.0 | 90.00 | 0.96 | 7,719.0 | 1,903.7 | 31.9 | 1,904.0 | 0.00 | 0.00 | 0.00 |
| 9,600.0 | 90.00 | 0.96 | 7,719.0 | 2,003.7 | 33.6 | 2,004.0 | 0.00 | 0.00 | 0.00 |
| 9,700.0 | 90.00 | 0.96 | 7,719.0 | 2,103.7 | 35.2 | 2,104.0 | 0.00 | 0.00 | 0.00 |
| 9,800.0 | 90.00 | 0.96 | 7,719.0 | 2,203.7 | 36.9 | 2,204.0 | 0.00 | 0.00 | 0.00 |
| 9,900.0 | 90.00 | 0.96 | 7,719.0 | 2,303.7 | 38.6 | 2,304.0 | 0.00 | 0.00 | 0.00 |
| 10,000.0 | 90.00 | 0.96 | 7,719.0 | 2,403.6 | 40.3 | 2,404.0 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 90.00 | 0.96 | 7,719.0 | 2,503.6 | 41.9 | 2,504.0 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 90.00 | 0.96 | 7,719.0 | 2,603.6 | 43.6 | 2,604.0 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 90.00 | 0.96 | 7,719.0 | 2,703.6 | 45.3 | 2,704.0 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 90.00 | 0.96 | 7,719.0 | 2,803.6 | 47.0 | 2,804.0 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 90.00 | 0.96 | 7,719.0 | 2,903.6 | 48.6 | 2,904.0 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 90.00 | 0.96 | 7,719.0 | 3,003.6 | 50.3 | 3,004.0 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 90.00 | 0.96 | 7,719.0 | 3,103.5 | 52.0 | 3,104.0 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 90.00 | 0.96 | 7,719.0 | 3,203.5 | 53.7 | 3,204.0 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 90.00 | 0.96 | 7,719.0 | 3,303.5 | 55.3 | 3,304.0 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 90.00 | 0.96 | 7,719.0 | 3,403.5 | 57.0 | 3,404.0 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 90.00 | 0.96 | 7,719.0 | 3,503.5 | 58.7 | 3,504.0 | 0.00 | 0.00 | 0.00 |
| 11,200.0 | 90.00 | 0.96 | 7,719.0 | 3,603.5 | 60.4 | 3,604.0 | 0.00 | 0.00 | 0.00 |
| 11,300.0 | 90.00 | 0.96 | 7,719.0 | 3,703.5 | 62.0 | 3,704.0 | 0.00 | 0.00 | 0.00 |
| 11,400.0 | 90.00 | 0.96 | 7,719.0 | 3,803.4 | 63.7 | 3,804.0 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 90.00 | 0.96 | 7,719.0 | 3,903.4 | 65.4 | 3,904.0 | 0.00 | 0.00 | 0.00 |
| 11,600.0 | 90.00 | 0.96 | 7,719.0 | 4,003.4 | 67.1 | 4,004.0 | 0.00 | 0.00 | 0.00 |
| 11,700.0 | 90.00 | 0.96 | 7,719.0 | 4,103.4 | 68.7 | 4,104.0 | 0.00 | 0.00 | 0.00 |

Great White Directional Services

Planning Report

| | | | |
|-----------|---------------------------------|------------------------------|--|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Cottonwood Draw 22 Fed.Com #12H |
| Company: | Cimarex Energy Co. (Midland) | TVD Reference: | WELL @ 3289.0usft (Original Well.Elev) |
| Project: | Eddy County (NM83E) | MD Reference: | WELL @ 3289.0usft (Original Well.Elev) |
| Site: | Sec 22-T25S-R26E | North Reference: | Grid |
| Well: | Cottonwood Draw 22 Fed.Com #12H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Design #2 | | |

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 11,800.0 | 90.00 | 0.96 | 7,719.0 | 4,203.4 | 70.4 | 4,204.0 | 0.00 | 0.00 | 0.00 |
| 11,900.0 | 90.00 | 0.96 | 7,719.0 | 4,303.4 | 72.1 | 4,304.0 | 0.00 | 0.00 | 0.00 |
| 12,000.0 | 90.00 | 0.96 | 7,719.0 | 4,403.4 | 73.8 | 4,404.0 | 0.00 | 0.00 | 0.00 |
| 12,100.0 | 90.00 | 0.96 | 7,719.0 | 4,503.3 | 75.4 | 4,504.0 | 0.00 | 0.00 | 0.00 |
| 12,200.0 | 90.00 | 0.96 | 7,719.0 | 4,603.3 | 77.1 | 4,604.0 | 0.00 | 0.00 | 0.00 |
| 12,247.0 | 90.00 | 0.96 | 7,719.0 | 4,650.3 | 77.9 | 4,651.0 | 0.00 | 0.00 | 0.00 |
| TD at 12247.5 | | | | | | | | | |
| 12,247.5 | 90.00 | 0.96 | 7,719.0 | 4,650.8 | 77.9 | 4,651.5 | 0.00 | 0.00 | 0.00 |
| Cottonwood Draw 22 Fed.Com #12H | | | | | | | | | |

Design Targets

| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---------------------------|---------------|--------------|------------|--------------|--------------|-----------------|----------------|-----------------|-------------------|
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| Cottonwood Draw 22 Fe | 0.00 | 0.00 | 7,719.0 | 4,650.8 | 77.9 | 408,003.10 | 559,622.00 | 32° 7' 17.997 N | 104° 16' 27.374 W |
| - plan hits target center | | | | | | | | | |
| - Point | | | | | | | | | |

Formations

| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|-----------------------|-----------------------|-------------------|-----------|---------|-------------------|
| 1,001.0 | 1,001.0 | Top Salt | | 0.00 | |
| 1,607.0 | 1,607.0 | Base Salt | | 0.00 | |
| 1,805.0 | 1,805.0 | Delaware | | 0.00 | |
| 2,789.0 | 2,789.0 | Cherry Canyon | | 0.00 | |
| 3,791.0 | 3,791.0 | Brushy Canyon | | 0.00 | |
| 5,086.0 | 5,086.0 | Brushy Canyon Lwr | | 0.00 | |
| 5,337.0 | 5,337.0 | Bone Spring | | 0.00 | |
| 5,567.0 | 5,567.0 | BS "A" Shale | | 0.00 | |
| 5,822.0 | 5,822.0 | BS "C" Shale | | 0.00 | |
| 6,324.0 | 6,324.0 | 1st BS Ss | | 0.00 | |
| 6,879.0 | 6,879.0 | 2nd BS Ss | | 0.00 | |
| 7,610.2 | 7,599.0 | 2nd BS Ss Lwr | | 0.00 | |

Plan Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------------|-----------------------------|-------------------|-----------------|--------------------------------|
| | | +N/-S (usft) | +E/-W (usft) | |
| 7,432.5 | 7,432.5 | 0.0 | 0.0 | KOP / Start Build 20.00° |
| 7,882.5 | 7,719.0 | 286.4 | 4.8 | EOB / Start DLS 0.00 TFO 53.45 |
| 12,247.0 | 7,719.0 | 4,650.3 | 77.9 | TD at 12247.5 |

SR & A

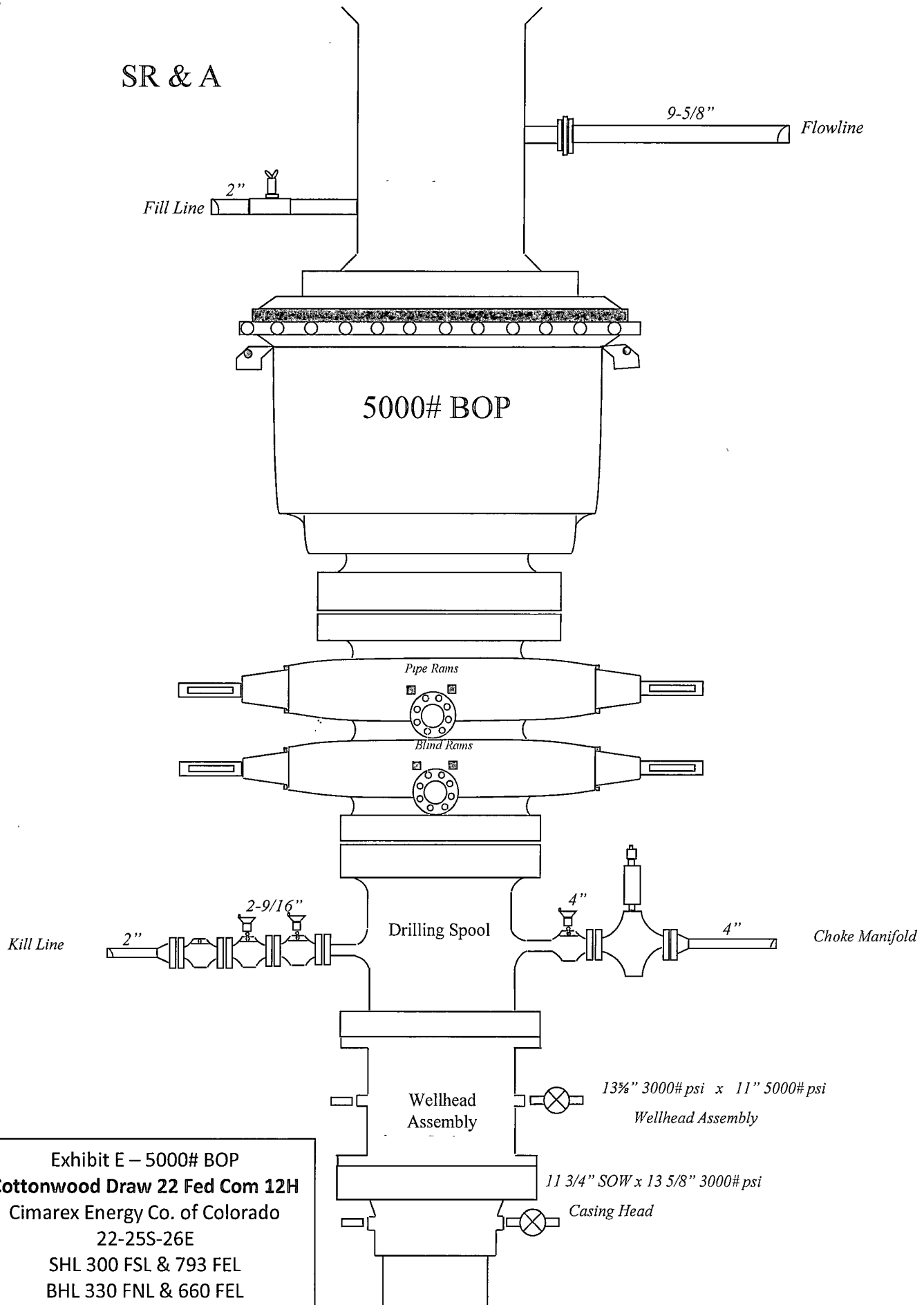
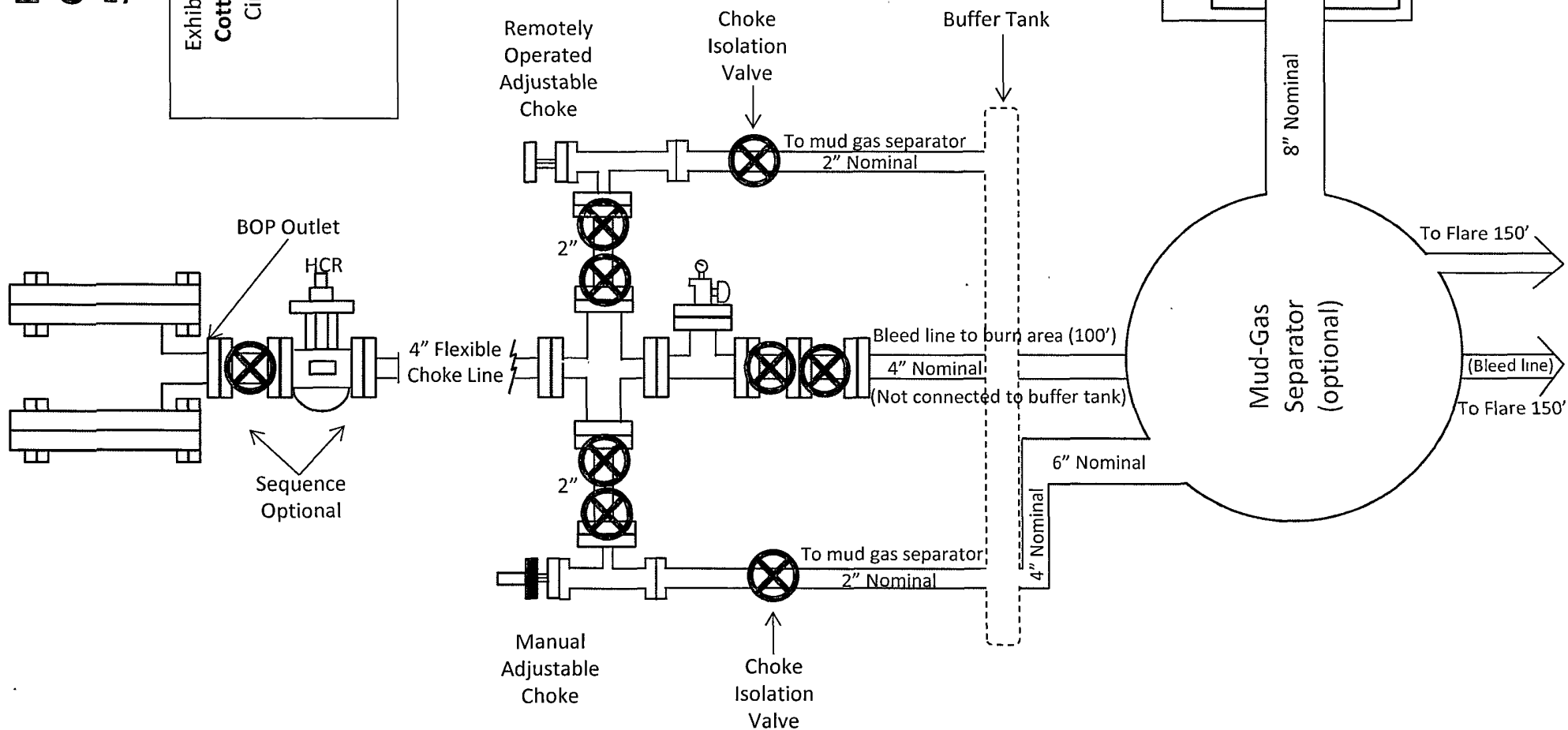


Exhibit E – 5000# BOP
Cottonwood Draw 22 Fed Com 12H
Cimarex Energy Co. of Colorado
22-25S-26E
SHL 300 FSL & 793 FEL
BHL 330 FNL & 660 FEL
Eddy County, NM

Drilling Operations Choke Manifold 5M Service

Exhibit E-1 – Choke Manifold Diagram
Cottonwood Draw 22 Fed Com 12H
Cimarex Energy Co. of Colorado
22-25S-26E
SHL 300 FSL & 793 FEL
BHL 330 FNL & 660 FEL
Eddy County, NM



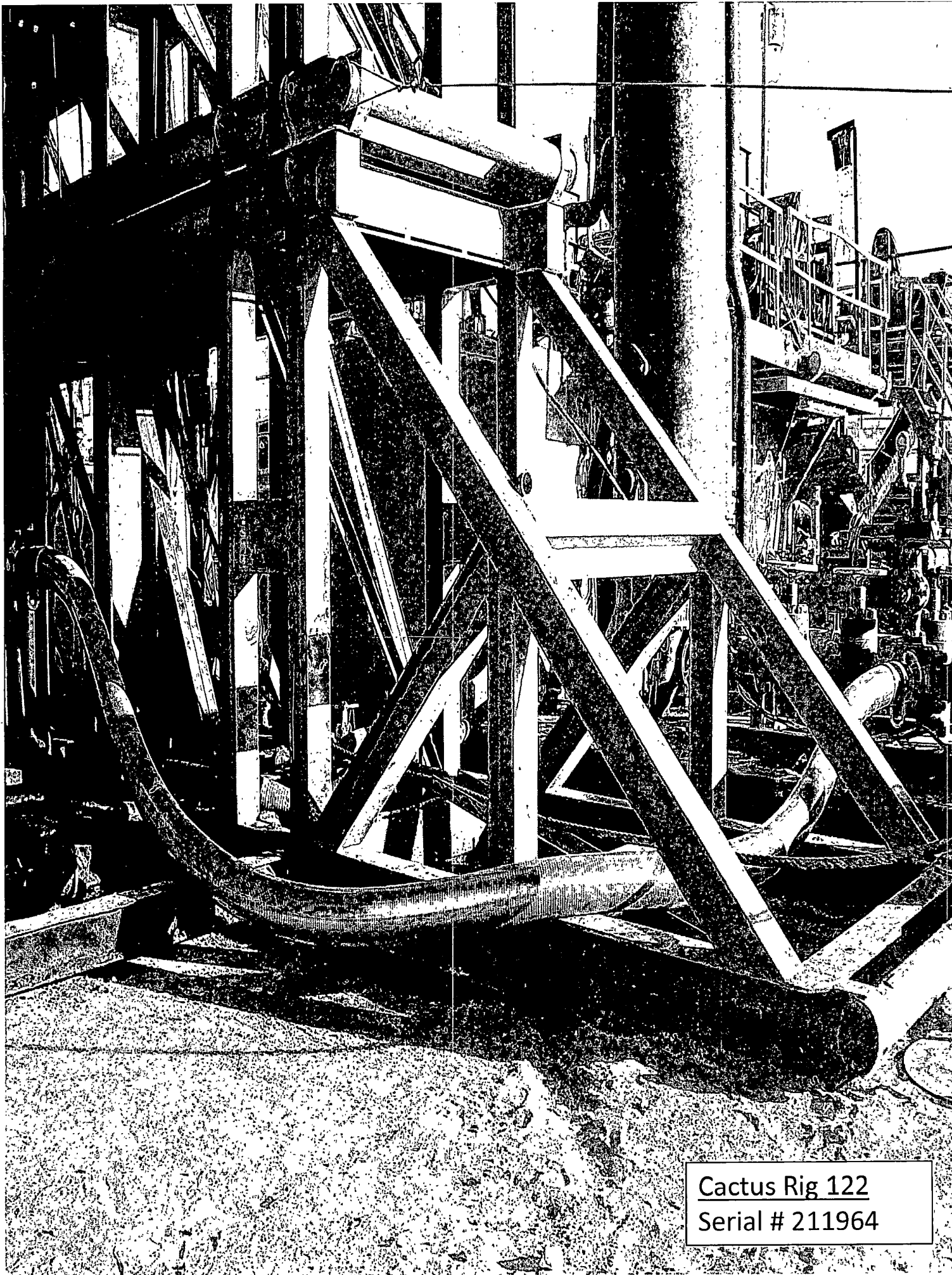


Midwest Hose
& Specialty, Inc.

Specification Sheet Choke & Kill Hose

The Midwest Hose & Specialty Choke & Kill hose is manufactured with only premium components. The reinforcement cables, inner liner and cover are made of the highest quality material to handle the tough drilling applications of today's industry. The end connections are available with API flanges, API male threads, hubs, hammer unions or other special fittings upon request. Hose assembly is manufactured to API 7K. This assembly is wrapped with fire resistant vermiculite coated fiberglass insulation, rated at 2000 degrees with stainless steel armor cover.

| | |
|-------------------------------|--|
| Working Pressure: | 5,000 or 10,000 psi working pressure |
| Test Pressure: | 10,000 or 15,000 psi test pressure |
| Reinforcement: | Multiple steel cables |
| Cover: | Stainless Steel Armor |
| Inner Tube: | Petroleum resistant, Abrasion resistant |
| End Fitting: | API flanges, API male threads, threaded or butt weld hammer unions, unbolt and other special connections |
| Maximum Length: | 110 Feet |
| ID: | 2-1/2", 3", 3-1/2", 4" |
| Operating Temperature: | -22 deg F to +180 deg F (-30 deg C to +82 deg C) |



Cactus Rig 122
Serial # 211964

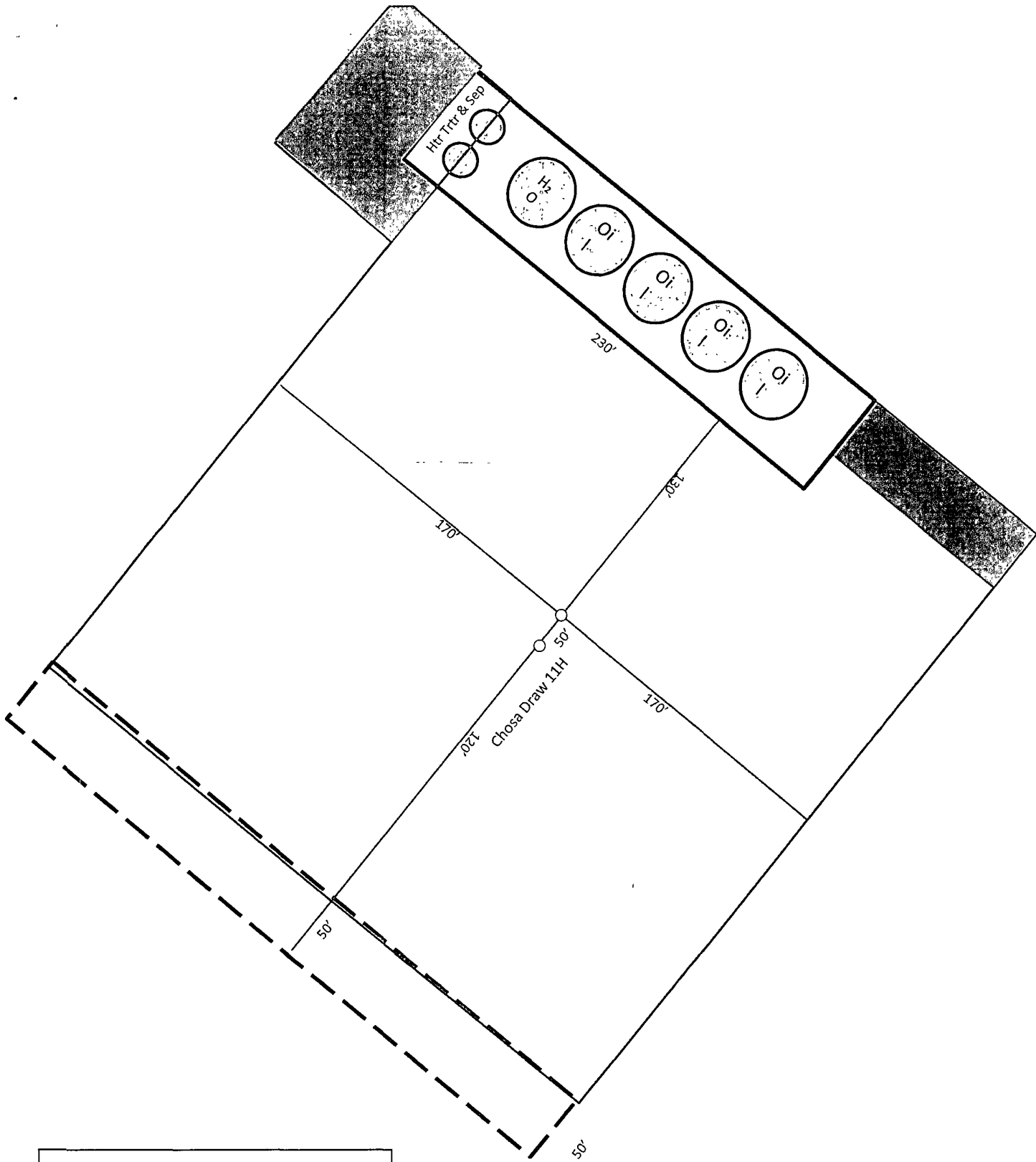


Exhibit D-1
Cottonwood Draw 22 Fed Com 12H
 Cimarex Energy Co. of Colorado
 22-25S-26E
 SHL 300 FSL & 793 FEL
 BHL 330 FNL & 660 FEL
 Eddy County, NM

Pad Extension for
 Chosa Draw 27 Fed
 Com 11H



| | |
|--|---------------------|
| | Wellbore |
| | Interim Reclamation |

1"=50'

PECOS DISTRICT CONDITIONS OF APPROVAL

| | |
|-----------------------|------------------------------------|
| OPERATOR'S NAME: | CIMAREX ENERGY |
| LEASE NO.: | NM19423 |
| WELL NAME & NO.: | 12H - COTTONWOOD DRAW 22 FED COM |
| SURFACE HOLE FOOTAGE: | 300' FNL & 793' FEL |
| BOTTOM HOLE FOOTAGE: | 330' FNL & 660' FWL |
| LOCATION: | Section 22, T.25 S., R.26 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.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Contact Allottee prior to construction**
 - Cave/Karst
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - H2S Requirements
 - Logging Requirements
 - Critical Cave/Karst
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☒ **Interim Reclamation**
- ☒ **Final Abandonment & Reclamation**

V. SPECIAL REQUIREMENT(S)

**The allottee shall be contacted prior to construction to ensure water pipeline located to the east of the proposed well pad and west of Prickeypear Road is not damaged.
Fred Beard 575-200-6646**

Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering 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.

Construction:

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

No Blasting:

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

Pad Berming:

The pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the pad. All sides will be bermed. Berms will be 1 foot tall. Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm. No drain mechanisms will be inserted into the berm.

Tank Battery Liners and Berms:

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Leak Detection System:

A method of detecting leaks is required. The method could incorporate gauges to measure loss, siting valves 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.

Automatic Shut-off Systems:

Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

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

Rotary Drilling with Fresh Water:

Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:

Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

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.

Abandonment Cementing:

Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

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 (575) 234-6235 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 in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 4 inches in depth. The topsoil 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

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 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 twenty (20) 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.

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

Wait on cement (WOC) time prior to drilling out 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 for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.

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

CRITICAL CAVE/KARST

Possible lost circulation in the Delaware.

1. The **13-3/8** inch surface casing shall be set at **approximately 450 feet (a minimum of 25 feet above the salt)** 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 surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
 - 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, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to

prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every third joint unless lateral doglegs require greater spacing between centralizers.

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

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement may be required – excess calculates to -30%.**

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

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. **Variance approved to use flex line with Serial #211964 from BOP to choke manifold. Check condition of 4-1/16" flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. Anchor requirements to be onsite for review. If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).**
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
 - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

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:

| <u>Species</u> | <u>lb/acre</u> |
|--|----------------|
| Alkali Sacaton (<i>Sporobolus airoides</i>) | 1.0 |
| DWS Four-wing saltbush (<i>Atriplex canescens</i>) | 5.0 |

DWS: DeWinged Seed

*Pounds of pure live seed:

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