

ATS-09-502 RM

OCD Artesia

Form 3160-3  
(April 2004)

SEP 14 2009

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

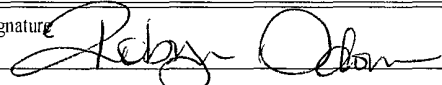
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

|   |   |   |
|---|---|---|
| 1a. Type of work. <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER  |   | 5 Lease Serial No.<br><b>NMLC 028936D</b>                 |
| 1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other SWD <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone |   | 6 If Indian, Allottee or Tribe Name<br>N/A                |
| 2 Name of Operator<br><b>COG Operating LLC</b>  |   | 7 If Unit or CA Agreement, Name and No.<br>N/A            |
| 3a Address<br><b>550 W. Texas, Suite 1300 Midland TX 79701</b>  | 3b Phone No. (include area code)<br><b>(432) 685-4385</b>   | 8 Lease Name and Well No.<br><b>Loco Hills SWD #4-33</b>  |
| 4 Location of Well (Report location clearly and in accordance with any State requirements *)<br>At surface <b>840' FSL &amp; 660' FEL, UL P</b><br>At proposed prod zone  |   | 9 API Well No.<br><b>30-015- 37269</b>                    |
| 11 Sec., T, R M or Blk and Survey or Area<br><b>Sec 33, T17S, R30E</b>  |   | 10 Field and Pool, or Exploratory<br><b>SWD; Wolfcamp</b> |
| 12 County or Parish<br><b>Eddy</b>  |   | 13 State<br><b>NM</b>                                     |
| 14 Distance in miles and direction from nearest town or post office*<br><b>4 miles South East of Loco Hills, NM</b>   | 15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line, if any)<br><b>660'</b> | 16 No. of acres in lease<br><b>835.320</b>                |
| 17 Spacing Unit dedicated to this well<br><b>N/A</b>  | 18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft<br><b>2750'</b>          | 19 Proposed Depth<br><b>9750'</b>                         |
| 20 BLM/BIA Bond No. on file<br><b>NMB000215</b>   | 21 Elevations (Show whether DF, KDB, RT, GL, etc )<br><b>3580' GL</b>   | 22 Approximate date work will start*<br><b>08/31/2009</b> |
| 23 Estimated duration<br><b>10 days</b>   |   | 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  | Name (Printed/Typed)<br><b>Robyn M. Odom</b> | Date<br><b>05/15/2009</b> |
| Title<br><b>Regulatory Analyst</b>  |  |                           |

|   |  |                            |
|---|--|----------------------------|
| Approved by (Signature) <b>/s/ Don Peterson</b> | Name (Printed/Typed)                   | Date<br><b>SEP 10 2009</b> |
| Title<br><b>FOR FIELD MANAGER</b>               | Office<br><b>CARLSBAD FIELD OFFICE</b> |                            |

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 USC Section 1001 and Title 43 USC 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)

Approval Subject to General Requirements  
& Special Stipulations Attached

Roswell Controlled Water Basin

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

## 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 DepartmentForm C-102  
Revised October 12, 2005

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

## OIL CONSERVATION DIVISION

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

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

|                                   |   |                                   |
|-----------------------------------|---|-----------------------------------|
| API Number<br><b>30.015.3721A</b> | Pool Code<br><b>96135</b>                       | Pool Name<br><b>SWD, Wolfcamp</b> |
| Property Code<br><b>374107</b>    | Property Name<br><b>LOCO HILLS SWD 33</b>       | Well Number<br><b># 4-33</b>      |
| OGRID No. <b>37823</b><br>229137  | Operator Name<br><b>C.O.G. OPERATING L.L.C.</b> | Elevation<br><b>3580'</b>         |

## 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             | 33      | 17 S     | 30 E  |         | 840           | SOUTH            | 660           | EAST           | EDDY   |

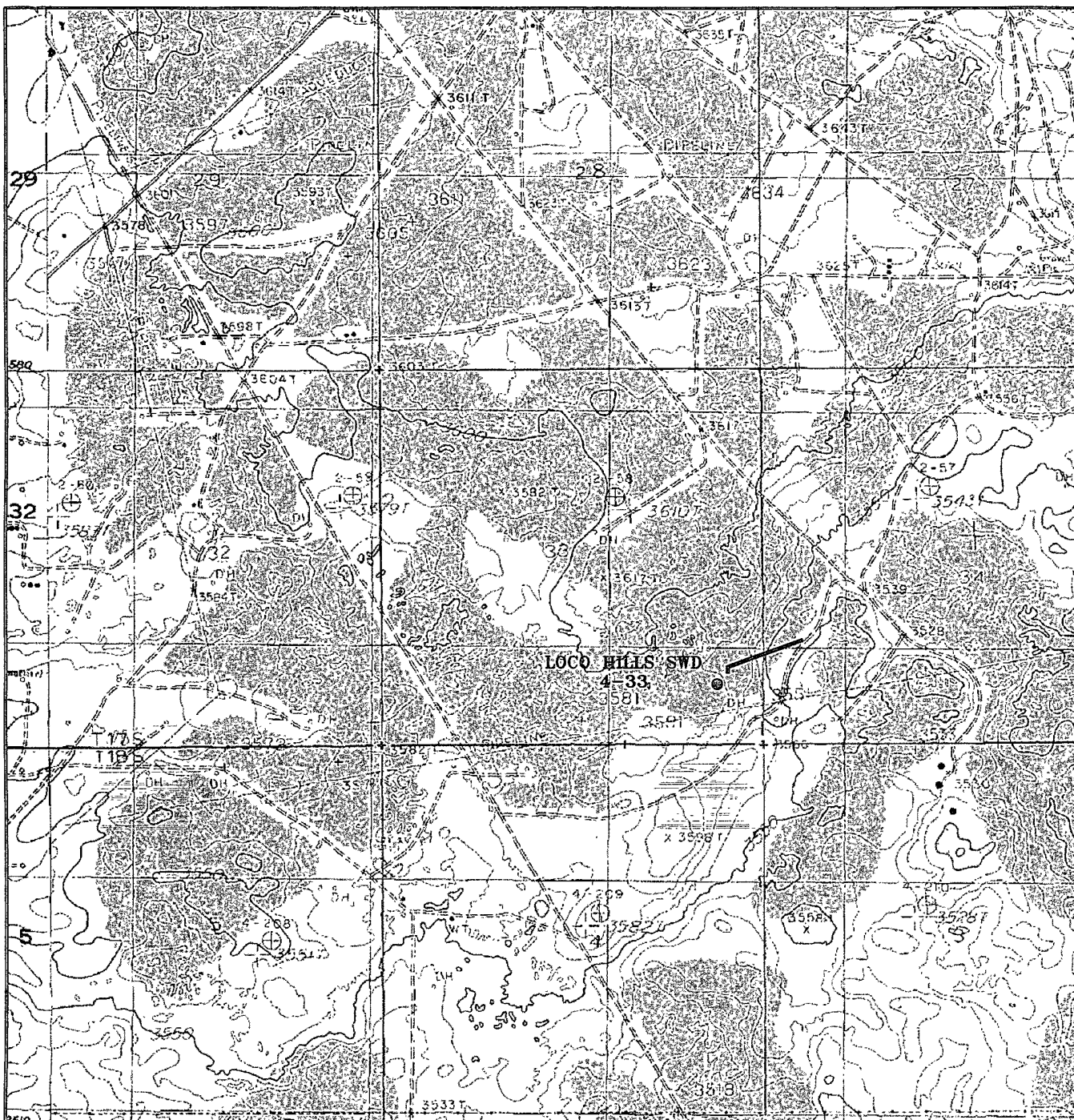
## Bottom Hole Location If Different From Surface

| 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. |
|-----------------|-----------------|--------------------|-----------|
| <b>N/A</b>      |                 |                    |           |

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

|  |  |  |
|--|--|--|
|  | <b>OPERATOR CERTIFICATION</b><br>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.<br><br>Signature _____ Date <b>5/15/2009</b><br>Robyn Odom<br>Printed Name _____ |  |
|  | <b>SURVEYOR CERTIFICATION</b><br>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.<br><b>FEBRUARY 19, 2009</b><br>Date Surveyed _____<br><br>Signature & Professional Surveyor _____<br>W.O. _____ 21126<br>Certificate No. Gary L. Jones 7977<br><b>BASIN SURVEYS</b>   |  |
|  | <b>SURFACE LOCATION</b><br>LAT.: N 32°47'09.79"<br>LONG.: W103°58'13.87"<br>SPC- N.: 649889.1<br>E.: 652835.7<br>(NAD-83)  |  |
|  |  |  |



# **LOCO HILLS SWD 4-33**

Located at 840' FSL and 660' FEL

Section 33, Township 17 South, Range 30 East,  
N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786  
1120 N. West County Rd.  
Hobbs, New Mexico 88241  
(575) 393-7316 - Office  
(575) 392-2206 - Fax  
basinsurveys.com

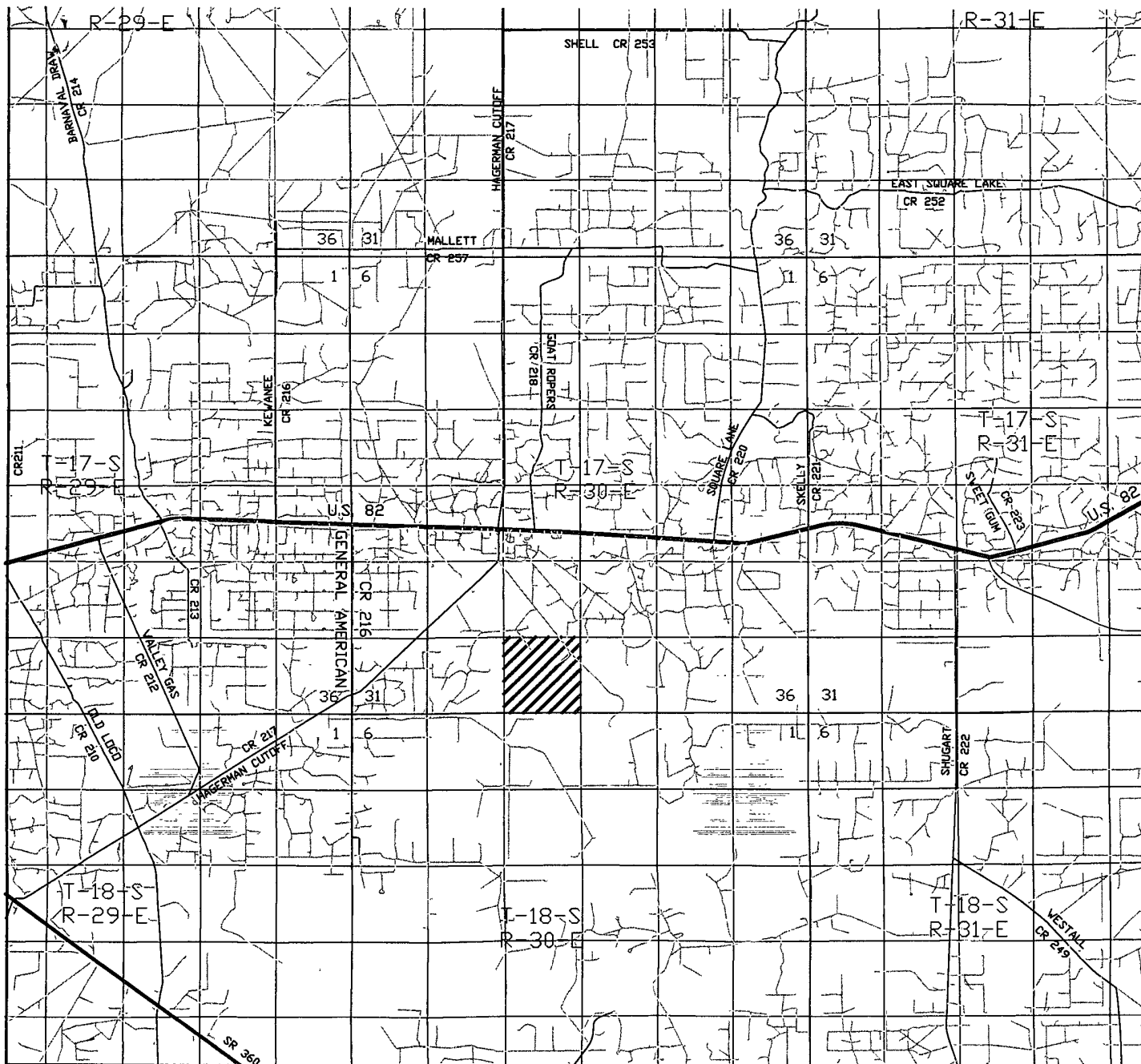
W.O. Number: JMS 21126

Survey Date: 02-19-2009

Scale: 1" = 2000'

Date: 02-23-2009

**C.O.G.  
OPERATING  
L.L.C.**



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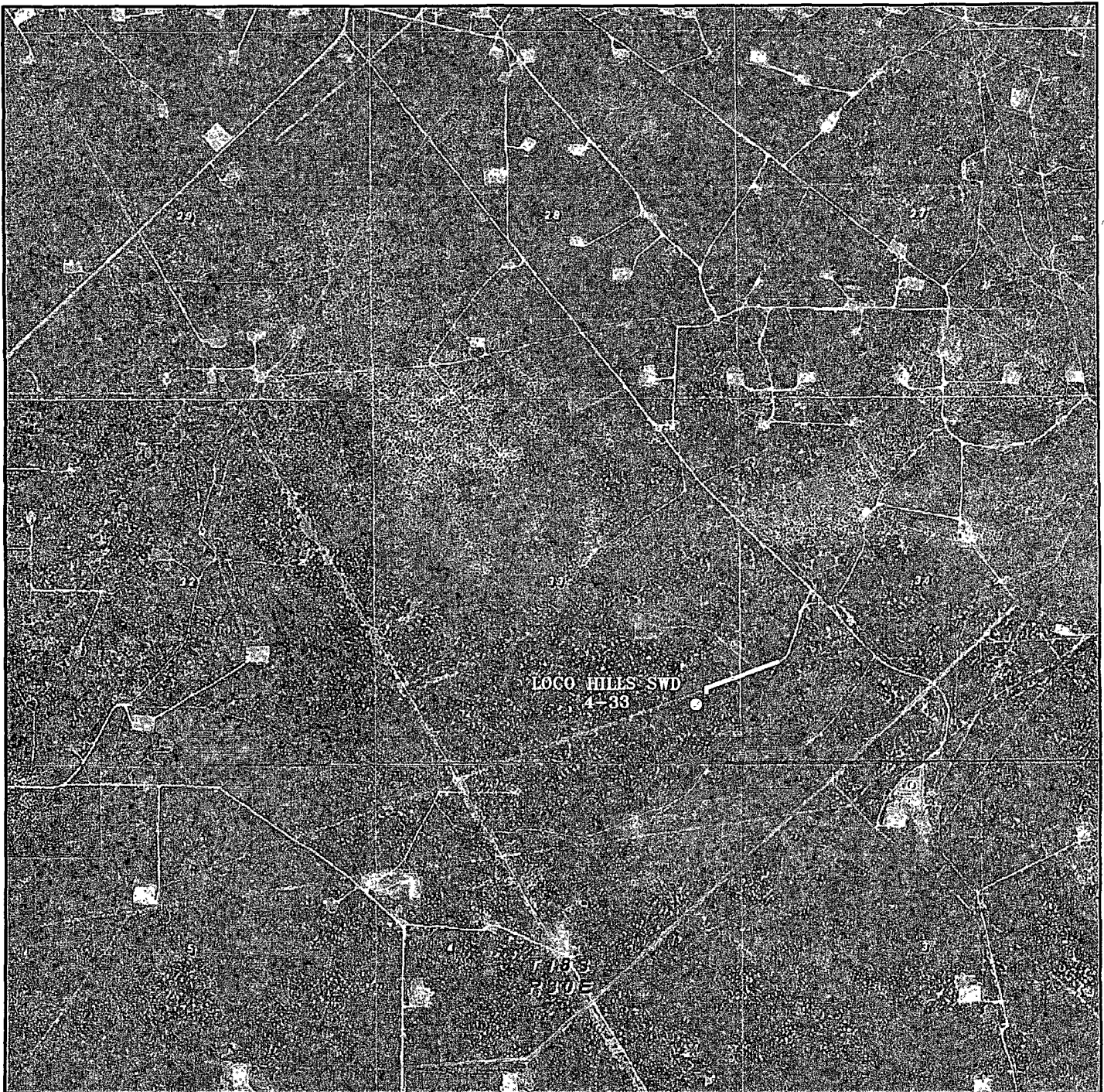
Survey Date: 02-20-2009

Scale: 1" = 2000'

Date: 02-23-2009

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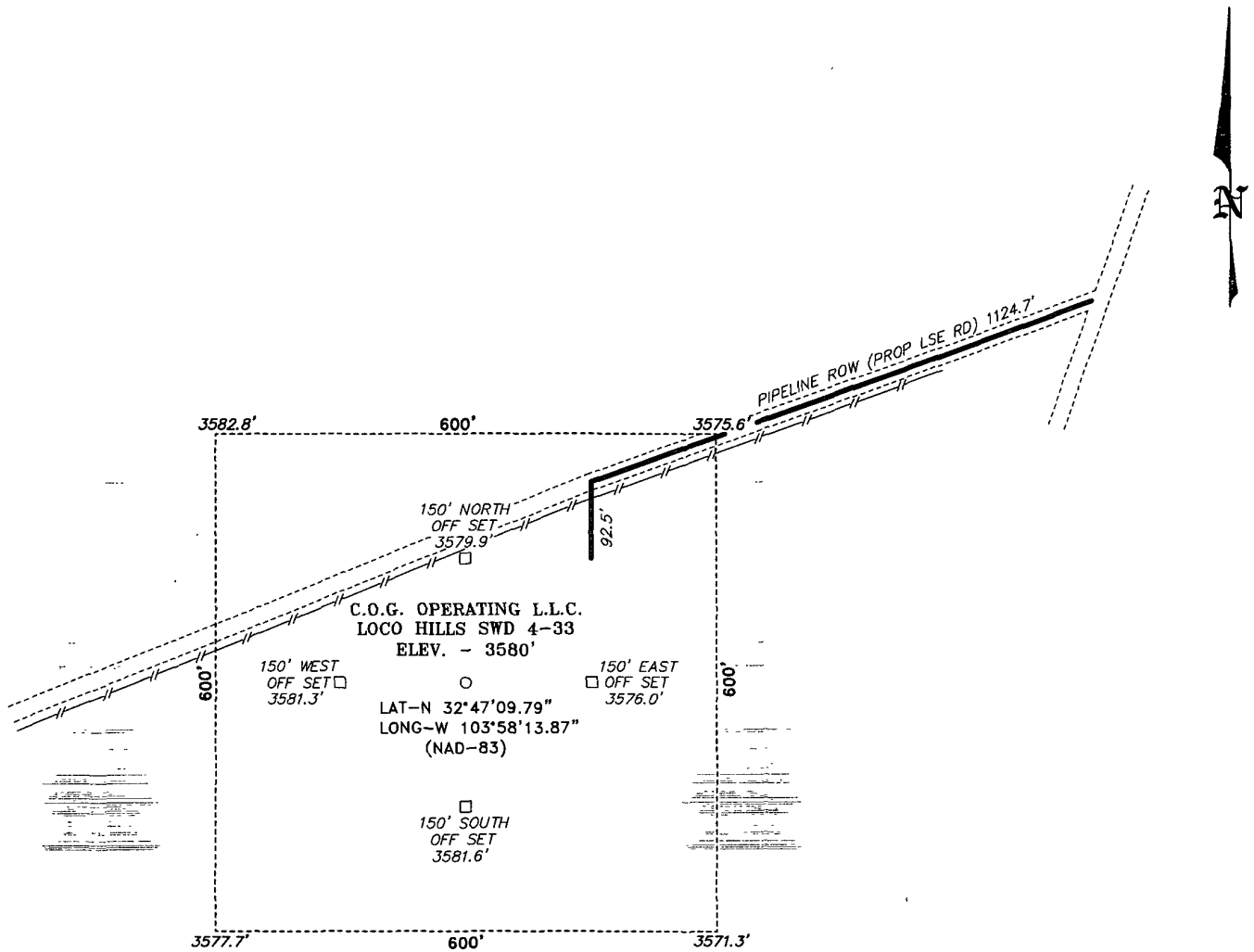
W.O. Number: JMS 21126

Scale: 1" = 2000'

YELLOW TINT - USA LAND  
BLUE TINT - STATE LAND  
NATURAL COLOR - FEE LAND

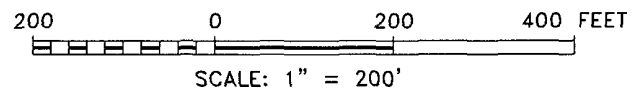
**C.O.G.  
OPERATING  
L.L.C.**

SECTION 33, TOWNSHIP 17 SOUTH, RANGE 30 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.



DIRECTIONS TO LOCATION:

FROM THE JUNCTION OF US HWY 82 AND CO. RD. 217, GO SOUTH 0.4 MILES TO LEASE ROAD, ON LEASE ROAD GO SOUTHEAST 2.0 MILES TO LEASE ROAD, ON LEASE ROAD GO SOUTHWESTERLY 0.2 MILES TO PIPELINE ROW AND PROPOSED LEASE ROAD.



**C.O.G. OPERATING L.L.C.**

REF: LOCO HILLS SWD 4-33 / Well Pad Topo

THE LOCO HILLS SWD 4-33 LOCATED 840' FROM

THE SOUTH LINE AND 660' FROM THE EAST LINE OF

SECTION 33, TOWNSHIP 17 SOUTH, RANGE 30 EAST,

N.M.P.M., EDDY COUNTY, NEW MEXICO.

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

W.O. Number: 21126

Drawn By: J. M. SMALL

Date: 02-23-2009

Disk: JMS 21126

Survey Date: 02-19-2009

Sheet 1 of 1 Sheets

## SWD WELL DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

### 2. Estimated Tops of Important Geologic Markers:

|              |         |
|--------------|---------|
| Quaternary   | Surface |
| Rustler      | 600'    |
| Yates        | 1,600   |
| Seven Rivers | 1,825'  |
| Queen        | 2,475'  |
| Grayburg     | 2,875'  |
| San Andres   | 3,375'  |
| Glorietta    | 6,470'  |
| Tubb         | 8,000'  |
| Wolfcamp     | 8,175'  |
| Cisco        | 9,150'  |

### 3. Estimated Depths of Anticipated Fresh Water, Oil and Gas

|             |        |         |
|-------------|--------|---------|
| Fresh Water | None   |         |
| Grayburg    | 2,875' | Oil/Gas |
| San Andres  | 3,375' | Oil/Gas |

No other formations are expected to give up oil, gas in measurable quantities. No interval capable of fresh water production is expected at any point in the well. Any salt and/or hydrocarbon bearing intervals will be protected by setting 9 5/8" casing to 4,000' and circulating cement back to the surface. All other zones above TD will be cased with 7" casing and that casing cemented to surface.

### 4. Casing Program *see COA*

| Hole Size | Interval              | OD      | Weight (ppf)                               | Grade | Joint  | Condition |
|-----------|-----------------------|---------|--|-------|--------|-----------|
| 30"       | 0-40'                 | 20"     | 94   | F-25  | ST & C | Used      |
| 17.5"     | <del>650'</del> 400'  | 13 3/8" | 48   | H-40  | ST & C | New       |
| 12.25"    | <del>650'</del> 4000' | 9 5/8"  | 750' of<br>36 ppf &<br>3/250' of<br>40 ppf | J-55  | ST & C | New       |

COG Operating LLC  
 SWD Drilling Plan Revised  
 Loco Hills SWD #4-33  
 Loco Hills Area  
 Eddy County, NM

|       |         |    |    |   |                  |     |
|-------|---------|----|----|---|------------------|-----|
| 8.75" | 4000-TD | 7" | 26 | 750' of<br><del>N80-HCL</del><br>&<br>9,000' of<br>N-80 | LT & C<br>HCL-80 | New |
|-------|---------|----|----|---|------------------|-----|

5. Cement Program ← See COA 0-9000' (N-80)  
 9000-9700' (HCL-80)

20" Conductor

Hole size: 30"

Class C, Neat, 1.32 cu ft/sx, 400 sxs, to surface

13 3/8" Surface Casing:

Hole size: 17 1/2"

Lead: 240 sxs Class C Light, Extended, 1.98 cu ft/sx

Tail: 300 sxs Class C w 2% Calcium Chloride, 1.35 cu ft/sx

To surface

9 5/8" Intermediate Casing:

Hole size: 12 1/4"

Lead: Class C, 65/35, 2.45 cu ft/sx, 770 sxs

Tail: Class C, 50/50, 1.34 cu ft/sx, 300 sxs

To surface.

7" Production Casing:

Actual cement volumes will be adjusted to OH caliper plus 25% excess

Hole size: 8 3/4", DV Tool at approx 7000'

All OH cement volumes calculated on 50% excess, and inside pipe volumes at 10% excess. Pmp Sxs are the number of sxs to be pumped, rounded up from the number of calculated sxs to an oilfield amount.

Below DV Tool

| Annular ID | From  | To    | Ftg   | Cu Ft/Ft | Excess | cu ft |
|------------|-------|-------|-------|----------|--------|-------|
| 8.750 OH   | 9,750 | 7,000 | 2,700 | 0.15033  | 50.00% | 620.1 |

Lead Cement: (50:50) Poz (Fly Ash):Premium Plus H Cement + 5% bwow Sodium Chloride + 3 lbs/sack LCM-1 + 0.5% bwoc FL-25 + 0.5% bwoc FL-52 +2% bwoc Bentonite + 0.2% bwoc Sodium Metasilicate + 55.3% Fresh Water





*See COA*  
~~rig pump in one test.~~ The BOP will then be nipped up on the 8 5/8" intermediate casing and tested by a third party to ~~2000~~ <sup>3000</sup> psi and used continuously until total depth is reached. All BOP's and accessory equipment will be tested to ~~2000~~ <sup>3000</sup> psi before drilling out of the intermediate casing. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment (Exhibit #10) will include a Kelly cock and floor safety valve, choke lines and a choke manifold (Exhibit #11) will a ~~2000~~ <sup>3000</sup> psi WP rating. *See COA*

#### 7. Types and Characteristics of the Proposed Mud System

The well will be drilled to TD with a combination of brine, cut brine and polymer mud system. The applicable depths and properties of this system are as follows:

*see COA*

| DEPTH                     | TYPE              | WEIGHT    | VISCOSITY | WATERLOSS |
|---------------------------|-------------------|-----------|-----------|-----------|
| <del>0-650'</del><br>400' | Fresh Water, spud | 8.9-9.4   | 32-34     | N.C.      |
| <del>650-4000</del>       | Brine             | 9.8-10.2  | 28-30     | N.C.      |
| 4000 - TD                 | Fresh Water       | 8.4 - 8.8 | 28        | N.C.      |

Sufficient mud materials will be kept at the well site to maintain mud properties and meet minimum lost circulation and weight increase requirements at all times.

#### 8. Auxiliary Well Control and Monitoring Equipment

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

#### 9. Logging, Testing and Coring Program *See COA*

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be run from TD to 9 5/8" casing shoe and Gamma Ray from 9 5/8" to base 13 3/8".
- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.

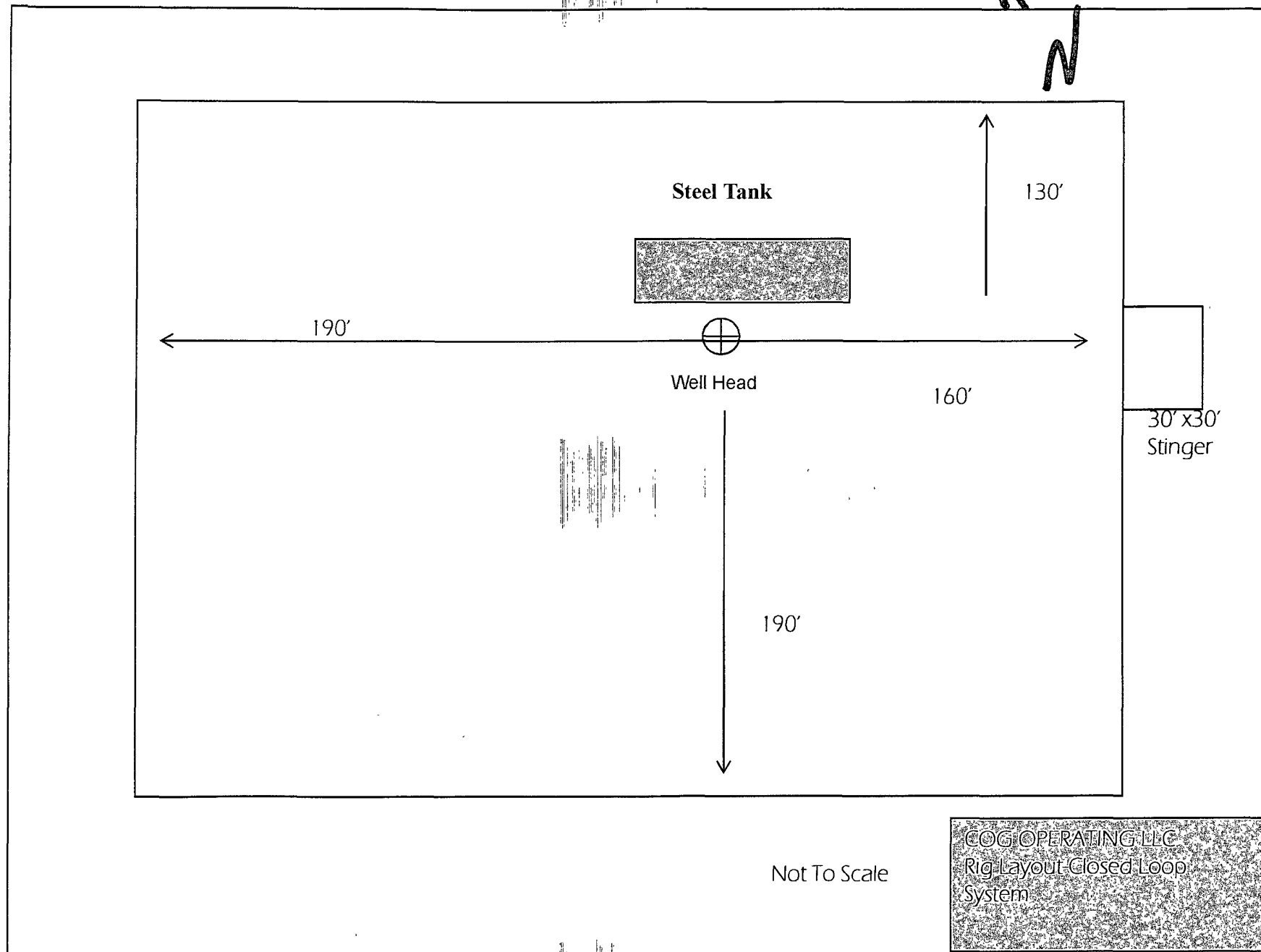
- D. Zones considered for injection will be perforated and acidized. These zones will be swabbed to insure there are no hydrocarbons present prior to injection operations.

**10. Abnormal Conditions, Pressure, Temperatures and Potential Hazards**

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 125 to 140 degrees and the estimated maximum bottom hold pressure is 4,417 psig. Low levels of hydrogen sulfide have been monitored in producing wells in the area, so H<sub>2</sub>S may be present while drilling the well. A Hydrogen Sulfide Drilling Operation Plan is attached to this program. No major loss of circulation zones has been reported in offsetting wells.

**11. Anticipated Starting Date and Duration of Operations**

Road and location work will not begin until approval has been received from the BLM. Once commenced drilling operations should take 20 days. Completion operations should only require 10 or less days.



Not To Scale

COG OPERATING LLC  
Rig Layout Closed Loop  
System

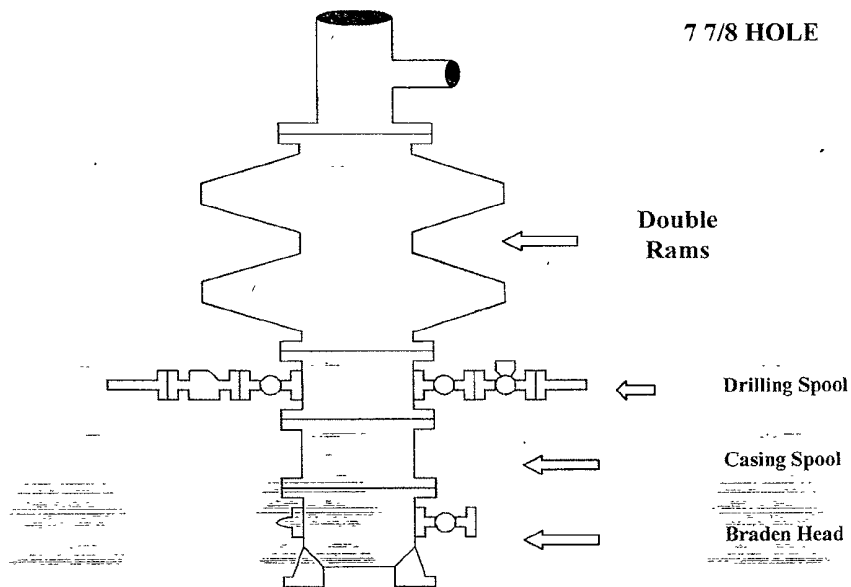
# COG Operating LLC

Exhibit #9

## BOPE and Choke Schematic

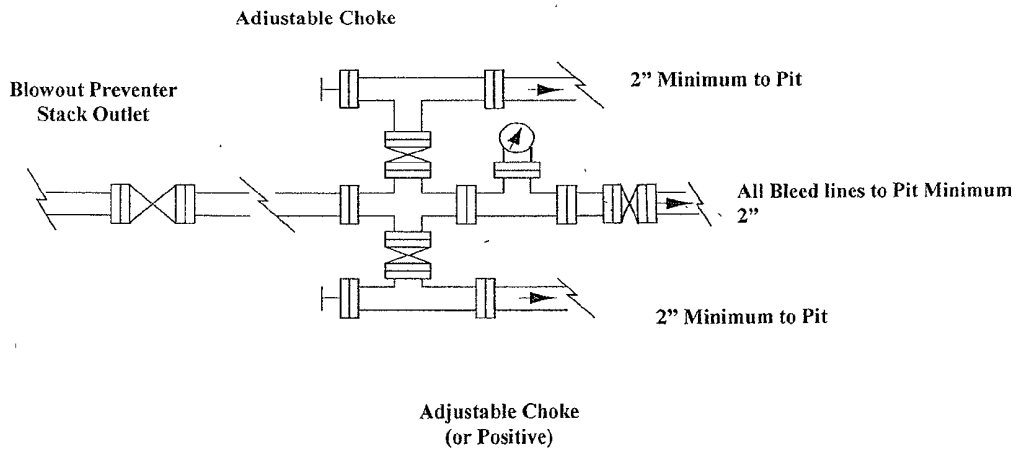
See COA

3M Required



Minimum 4" Nominal choke and kill lines

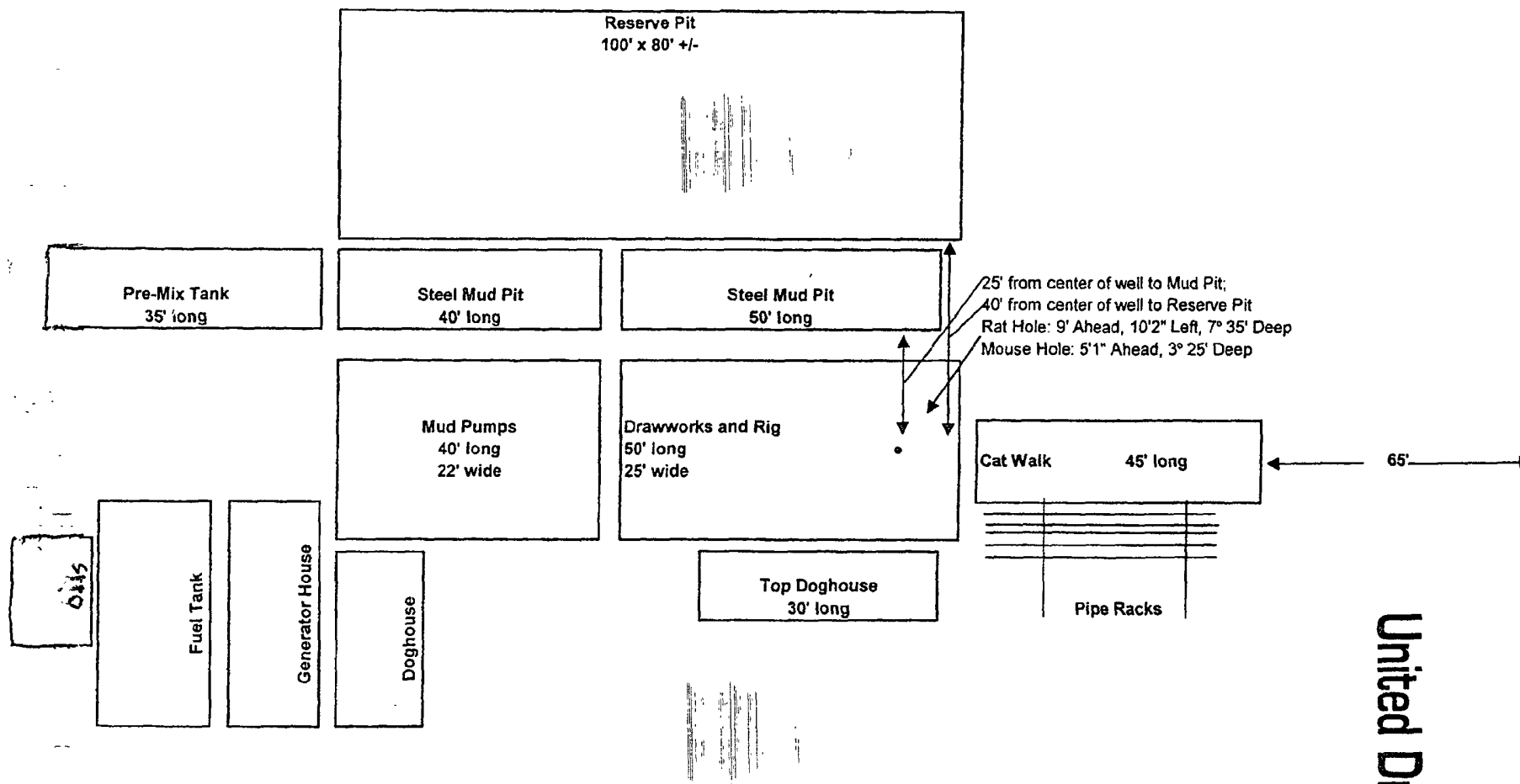
Choke Manifold Requirement (2000 psi WP)  
No Annular Required



**NOTES REGARDING THE BLOWOUT PREVENTERS**  
**Master Drilling Plan**  
**Eddy County, New Mexico**

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

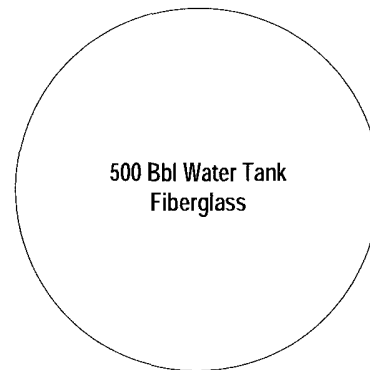
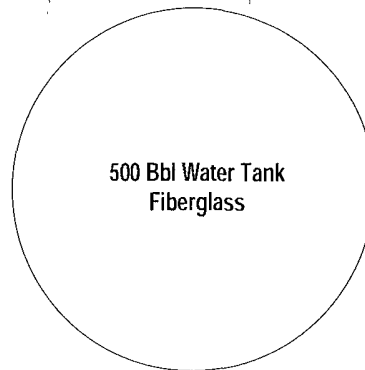
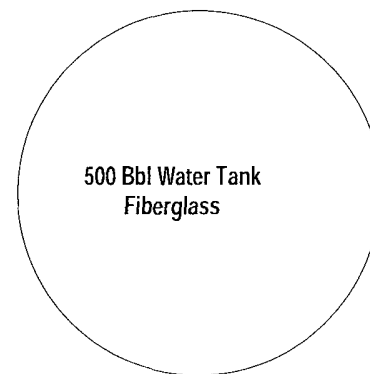
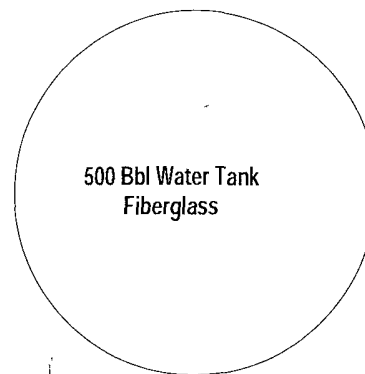




UNITED DRILLING, INC.  
RIG NO. 41

United Drilling, Inc.





SWD Wellhead

**COG Operating LLC**  
**SWD Battery**  
**Tankage and Equipment**  
**Plat**

# COG Operating LLC

## Hydrogen Sulfide Drilling Operation Plan

### I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile tubular are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H<sub>2</sub>S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

---

## II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

### 1. Well Control Equipment:

- A. Flare line.
- B. Choke manifold.
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- D. Auxiliary equipment may include if applicable: annular preventer & rotating head.

### 2. Protective equipment for essential personnel:

- A. Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

### 3. H2S detection and monitoring equipment:

- A. 1 portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

### 4. Visual warning systems:

- A. Wind direction indicators as shown on well site diagram (Exhibit #8).
- B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

### 5. Mud program:

- A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.
-

**6. Metallurgy:**

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
- B. All elastomers used for packing and seals shall be H2S trim.

**7. Communication:**

- A. Radio communications in company vehicles including cellular telephone and 2-way radio.
- B. Land line (telephone) communication at Office.

**8. Well testing:**

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

**EXHIBIT #7**

**WARNING  
YOU ARE ENTERING AN H<sub>2</sub>S  
AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED
- 2. HARD HATS REQUIRED
- 3. SMOKING IN DESIGNATED AREAS ONLY
- 4. BE WIND CONSCIOUS AT ALL TIMES
- 5. CHECK WITH COG OPERATING FOREMAN AT

**COG OPERATING LLC  
1-432-683-7443  
1-575-746-2010**

**EDDY COUNTY EMERGENCY NUMBERS**

ARTESIA FIRE DEPT. 575-746-5050  
ARTESIA POLICE DEPT. 575-746-5000  
EDDY CO. SHERIFF DEPT. 575-746-9888

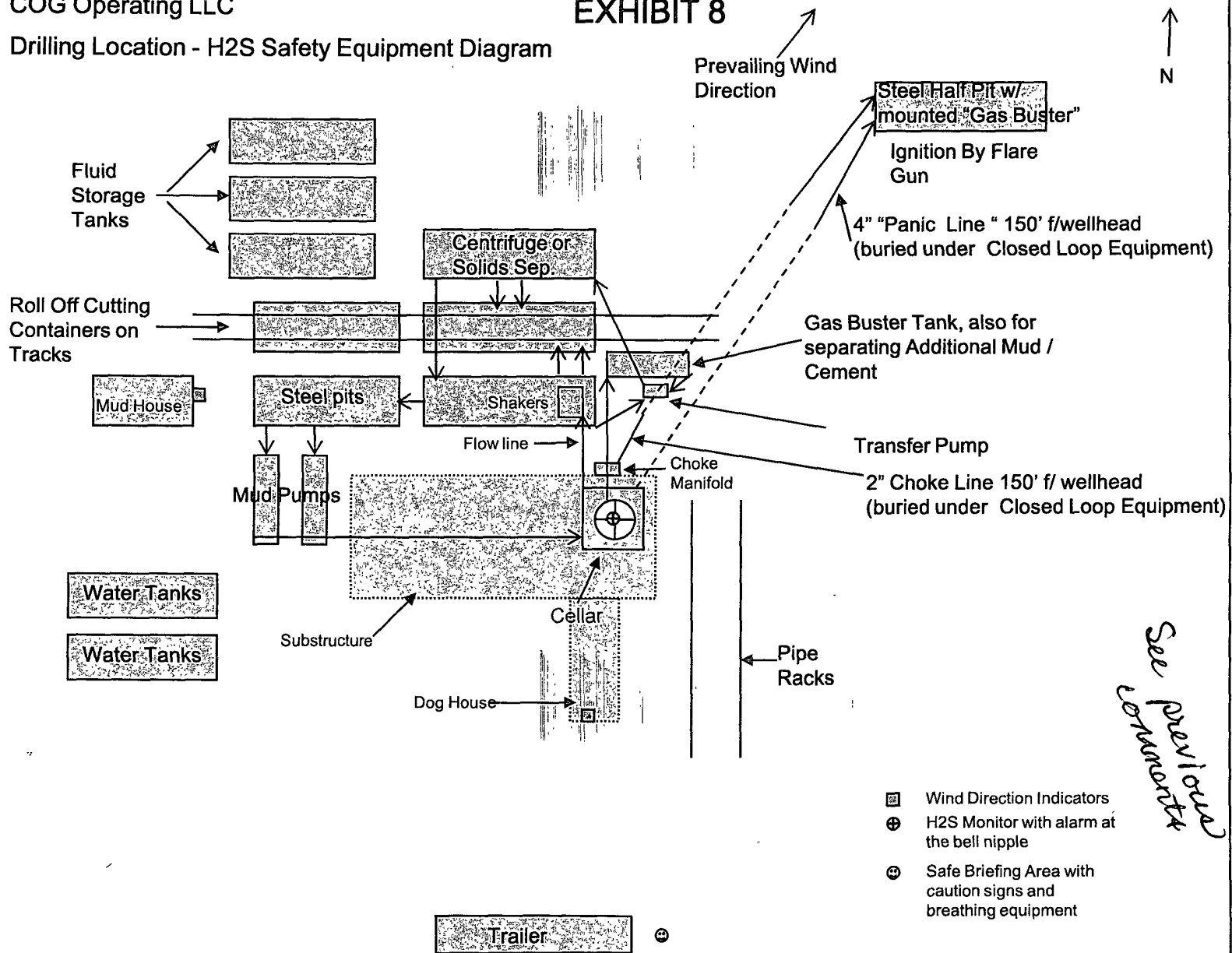
**LEA COUNTY EMERGENCY NUMBERS**

HOBBS FIRE DEPT. 575-397-9308  
HOBBS POLICE DEPT. 575-397-9285  
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

Drilling Location - H2S Safety Equipment Diagram

EXHIBIT 8





## **SURFACE USE AND OPERATING PLAN**

### **1. Existing & Proposed Access Roads**

- A. The well site survey and elevation plat for the proposed well is shown in Exhibit #1. It was staked by Basin Surveys, Hobbs, NM.
- B. All roads to the location are shown in the topographic map Exhibit #2. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling the well will be done where necessary.
- C. Directions to location: From the junction of U.S. HWY 82 and co. Rd. 217, go south 0.4 miles to lease road, on lease road go southeast 2.0 miles to lease road, on lease road go southwesterly 0.2 miles to pipeline ROW and proposed lease road.
- D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

### **2. Proposed Access Road:**

Exhibit #4 shows that 1124.7' of new road will be required for this location. If any road is required it will be constructed as follows:

- A. The maximum width of the running surface will be 14'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.
- B. The average grade will be less than 1%.
- C. No turnouts are planned.
- D. No culverts, cattleguard, gates, low water crossings or fence cuts are necessary.
- E. Surfacing material will consist of native caliche. Caliche will be obtained from the nearest BLM approved caliche pit or site area.

### **3. Location of Existing Well:**

Exhibit #5 shows all existing wells within a one-mile radius of this well. As shown on this plat there are numerous wells producing from the San Andres and Yeso formations.

**4. Location of Existing and/or Proposed Facilities:**

- A. COG Operating LLC will operate the SWD on location.
- B. Once well is drilled, contemplated facilities will be as follows:
  - 1) Tank batteries will be set on the Loco Hills SWD 4-33 location. The facility location is shown in Exhibit #5.
  - 2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications.
  - 3) Any additional caliche will be obtained from a BLM approved caliche pit. Any additional construction materials will be purchased from contractors.
  - 4) Proposed pipelines, will follow an archaeologically approved route to the Tank Battery located at the Loco Hills SWD 4-33 location.
  - 5) It will be necessary to run electric power after the well is drilled. Power will be provided by CVE and they will submit a separate plan and ROW for service to the well location.

**5. Location and Type of Water Supply:**

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. The water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Exhibit #2. If a commercial fresh water source is nearby, fast line may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

**6. Source of Construction Materials:**

All caliche required for construction of the drill pad and proposed new access road (approximately 2600 cubic yards) will be obtained from a BLM approved caliche pit .

**7. Methods of Handling Water Disposal:**

**Ancillary Facilities:**

- A. The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud boxes and taken to an NMOCD approved disposal site.
- B. Drilling fluids will be contained in steel mud pits.

- C. Water produced from the well during completion will be held temporally in steel tanks and then taken to an NMOCD approved commercial disposal facility.
- D. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. No toxic waste or hazardous chemicals will be produced by this operation.
- E. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole, only a dry hole marker will remain.

**8. Well Site Layout:**

- A. The drill pad layout, with elevations staked by Basin Surveys, is shown in Exhibit #4. Dimensions of the pad and pits are shown on Exhibit #6. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.

**9. Plans for Restoration of the Surface:**

- A. Upon completion of the drilling and/or completion operations, if the well is found to be non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations in the area. The road will be reclaimed as directed by the BLM. The original top soil will again be returned to the pad and contoured, as close as possible, to the original topography.
- B. The location and road will be rehabilitated as recommended by the BLM.

**10. Surface Ownership:**

- A. The surface is owned by the U.S. Government and is administered by the Bureau of Land Management. The surface is multiple uses with the primary uses of the region for grazing of livestock and the production of oil and gas.
- B. The surface tenant for this site is Williams & Sons Cattle Co.
- C. The proposed road routes and surface location will be restored as directed by the BLM.

**11. Other Information:**

- A. The area around the well site is grassland and the topsoil is sandy. The vegetation is moderately sparse with native prairie grasses, some mesquite and shinnery oak. No wildlife was observed but it is likely that mule deer, rabbits, coyotes and rodents traverse the area.
- B. There is no permanent or live water in the immediate area.
- C. There are no dwellings within 2 miles of this location.
- D. If not in MOA area, a Cultural Resources Examination is being prepared by Southern New Mexico Archaeological Services, Inc. P.O. Box 1, Bent New Mexico, 88314, phone # 505-671-4797 and the results will be forwarded to your office in the near future.

**13. Bond Coverage:**

Bond Coverage is Nationwide Bond # 000215

**14. Lessee's and Operator's Representative:**

The COG Operating LLC representative responsible for assuring compliance with the surface use plan is as follows:

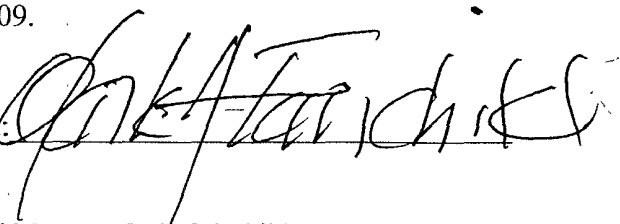
Mark Fairchild  
Operations Engineer  
COG Operating LLC  
550 W. Texas, Suite 1300  
Midland, TX 79701  
Phone (432) 686-3021 (office)

Erick Nelson.  
Division Operations Manager  
COG Operating LLC  
550 W. Texas, Suite 1300  
Midland, TX 79701  
Phone (505) 746-2210 (office)  
(432) 238-7591 (cell)

**Exhibits:**

- |                    |   |
|--------------------|---|
| <b>Exhibit #1</b>  | <b>Wellsite and Elevation Plat</b><br><b>Form C-102 Well location and acreage dedication plat</b> |
| <b>Exhibit #2</b>  | <b>Topographic Map (West)</b>   |
| <b>Exhibit #3</b>  | <b>Vicinity Map and area roads</b>  |
| <b>Exhibit #4</b>  | <b>Elevation Plat (West)</b>  |
| <b>Exhibit #5</b>  | <b>Plat showing Tanks and other equipment</b>   |
| <b>Exhibit #6</b>  | <b>Pad Layout and orientation</b>   |
| <b>Exhibit #7</b>  | <b>H2S Signage</b>  |
| <b>Exhibit #8</b>  | <b>H2S Equipment location</b>   |
| <b>Exhibit #9</b>  | <b>BOP and Choke diagrams</b>   |
| <b>Exhibit #10</b> | <b>Form C-144 NMOCD pit permit application</b>  |

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently 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 COG Operating, LLC, 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 9<sup>th</sup> day of March, 2009.

Signed: 

Printed Name: Mark Fairchild

Position: Operations Engineer

Address: 550 W. Texas, Suite 1300, Midland, Texas 79701

Telephone: (432) 686-3021

Field Representative (if not above signatory): Same

E-mail: MFairchild@conchoresources.com



# PECOS DISTRICT CONDITIONS OF APPROVAL

|                       |                                     |
|-----------------------|-------------------------------------|
| OPERATOR'S NAME:      | COG OPERATING LLC                   |
| LEASE NO.:            | NMLC028936D                         |
| WELL NAME & NO.:      | LOCO HILLS SWD #4-33                |
| SURFACE HOLE FOOTAGE: | 840' FSL & 660' FEL                 |
| BOTTOM HOLE FOOTAGE:  | 840' FSL & 660' FEL                 |
| LOCATION:             | Section 33, T. 17 S., R 30 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**
  - Lesser Prairie Chicken
- ☒ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☒ **Road Section Diagram**
- ☒ **Drilling**
  - Logging Requirements
  - BOP/BOPE Change
  - Casing Depth Change
  - H2S, Onshore Order #6
- ☐ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
  - Electric Lines
- ☒ **Closed Loop System/Interim Reclamation**
- ☐ **Final Abandonment/Reclamation**

## **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)**

### **Lesser Prairie Chicken and Low profile well marker**

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

**Ground-level Abandoned Well Marker to avoid raptor perching:** Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

## **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) 234-5972 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**

**Closed loop system and V-Door to the northeast.**

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 (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 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**

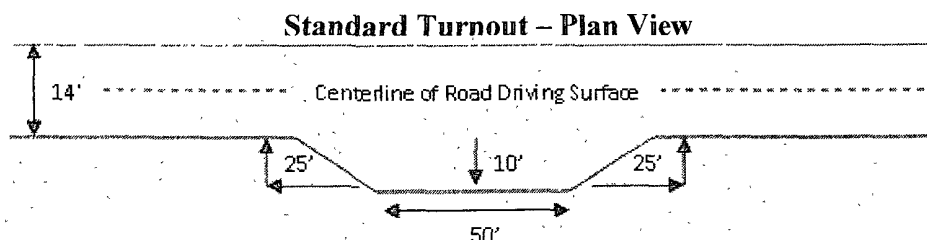
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

### **Ditching**

Ditching shall be required on both sides of the road.

### **Turnouts**

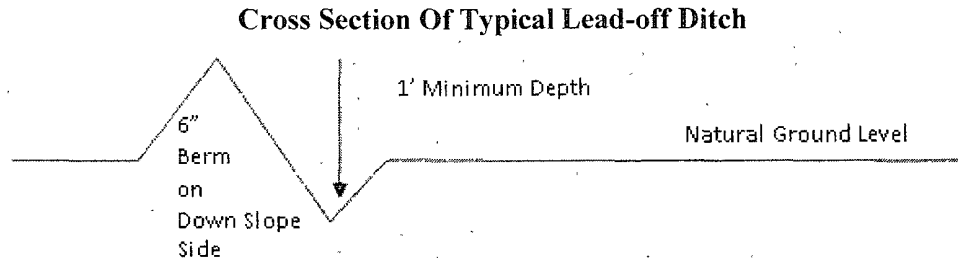
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:



### **Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing 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.



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:

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

#### **Culvert Installations**

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

#### **Cattleguards**

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

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

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

#### **Fence Requirement**

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

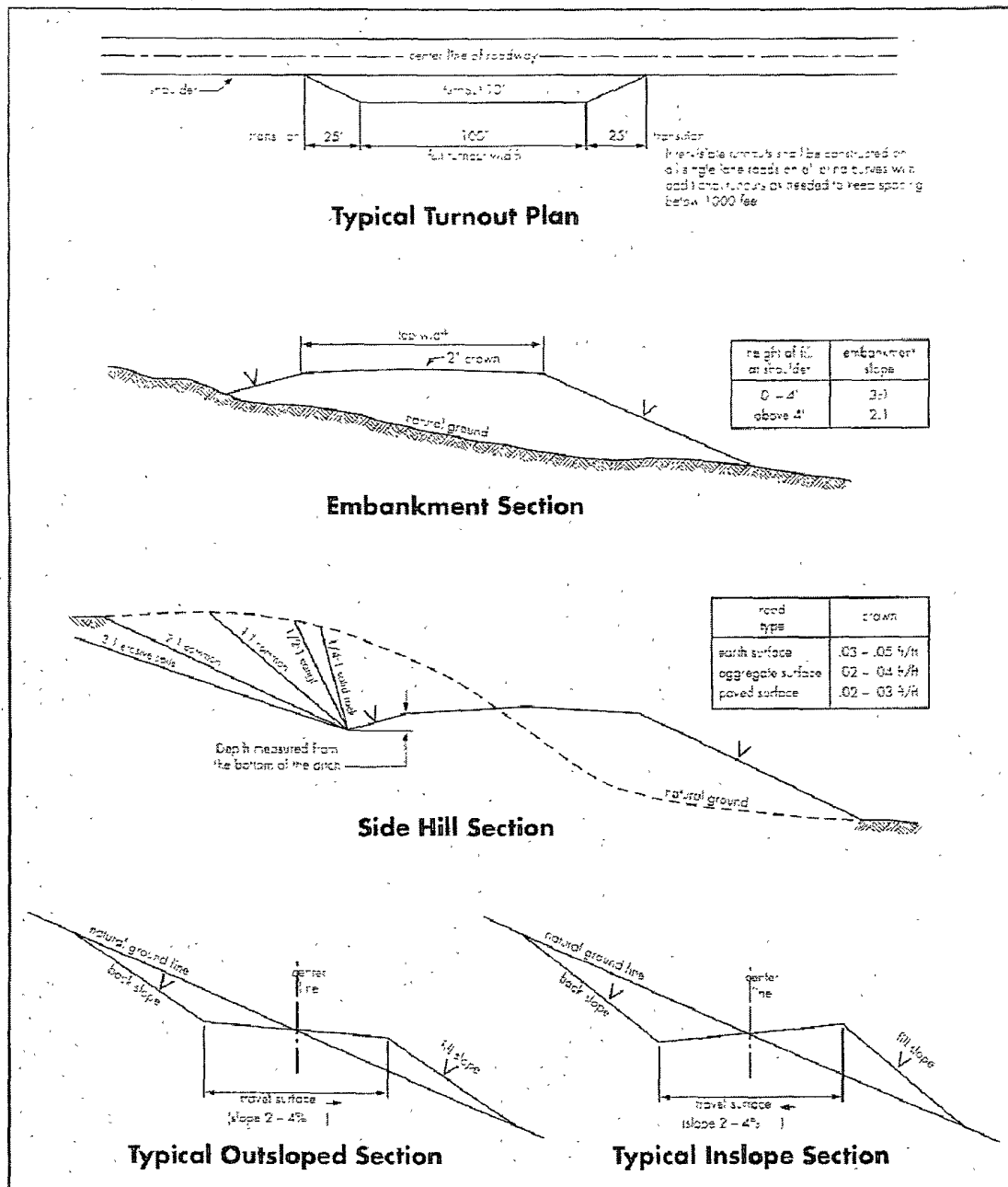


The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

**Public Access**

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

Figure 1 – Cross Sections and Plans For Typical Road Sections



## VII. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

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

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

☒ **Eddy County**

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

1. A Hydrogen Sulfide (H<sub>2</sub>S) Drilling Plan should be activated 500 feet prior to drilling into the **Grayburg** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values 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.
4. **The record of the drilling rate along with the CAL/GR/N well log run from TD to surface will be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

### B. CASING

Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.

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

**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 for all casing strings. 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.**

**Possible water flows in the Salado and Artesia Groups.**

**Possible lost circulation in the Rustler, Grayburg and San Andres Formations.**

1. The 13-3/8 inch surface casing shall be set **at approximately 400 feet (a minimum of 25 feet into the Rustler Anhydrite and 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 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 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.

**Intermediate hole is to be drilled with brine water**

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.
3. The minimum required fill of cement behind the 7 inch production casing is:
  - a. First stage to DV tool, cement shall:
    - ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool, cement shall:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.

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

### C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8"** intermediate casing shoe shall be **3000 (3M)** psi.
4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. The tests shall be done by an independent service company.
  - b. The results of the test shall be reported to the appropriate BLM office.
  - c. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
  - d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.
  - e. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

- f. **Effective November 1, 2008, no variances will be granted on reduced pressure tests on the surface casing and BOP/BOPE. Onshore Order 2 requirements will be in effect.**

**D. DRILLING MUD**

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

**Proposed mud weight may not be adequate for drilling through Wolfcamp.**

**E. DRILL STEM TEST**

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

**CRW 090409**

## **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.

The 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.



BLM Serial #:  
Company Reference:  
Well Name and Number:

Seed Mixture for LPC Sand/Shinnery 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> |
|---------------------|----------------|
| Plains Bristlegrass | 5lbs/A         |
| Sand Bluestem       | 5lbs/A         |
| Little Bluestem     | 3lbs/A         |
| Big Bluestem        | 6lbs/A         |
| Plains Coreopsis    | 2lbs/A         |
| Sand Dropseed       | 1lbs/A         |

\*\*Four-winged Saltbush 5lbs/A

\* This can be used around well pads and other areas where caliche cannot be removed.

\*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.