APS-08-946

OCT 28 2008

OCD-ARTESIA

OCD-ARTESIA

Form 3160-3
(August 2007)

FORM APPROVED
OMB No 1004-0137
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

| | |
|---|---|
| 5 Lease Serial No. NMNM 100555 | |
| 6. If Indian, Allotee or Tribe Name | |
| 7 If Unit or CA Agreement, Name and No. | |
| 8. Lease Name and Well No. Cooper "31" Federal, Well #2H 37127 | |
| 9. API Well No. 30 015 36755 | |
| 10. Field and Pool, or Exploratory 52775 Rock Spur Bone Spring | |
| 11. Sec., T. R. M. or Blk. and Survey or Area Sec 31, T25S, R29E | |
| 12 County or Parish Eddy | 13. State NM |

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☑ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone

2. Name of Operator: OGX RESOURCES, LLC (217955) — Carlsbad Controlled Water Basin

3a. Address: P.O. Box 2064, Midland, TX 79702

3b Phone No. *(include area code)*: 432 684-6381/685-1287

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

At surface 660' FSL & 660' FEL ( P)

At proposed prod. zone 660' FSL & 330' FWL (M) BHL

14. Distance in miles and direction from nearest town or post office*: 16 miles southeast of Malaga, NM

| 15. Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig. unit line, if any) | 16. No. of acres in lease | 17 Spacing Unit dedicated to this well |
|---|---|---|
| 330 | 160 project area | 160 acres |
| **18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.** | **19 Proposed Depth** | **20 BLM/BIA Bond No. on file** |
| | TVD: 8000'; MD: ~~11,300~~ 11618 | NMB 000244 |
| **21 Elevations (Show whether DF, KDB, RT, GL, etc.)** | **22. Approximate date work will start*** | **23. Estimated duration** |
| 2934' GL | 08/31/2008 | 28 days |

24. Attachments

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

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

| 25. Signature | Name *(Printed/Typed)* | Date |
|---|---|---|
| | Ann E. Ritchie | 07/30/2008 |

Title: Regulatory Agent

| Approved by *(Signature)* | Name *(Printed/Typed)* | Date |
|---|---|---|
| /s/ Don Peterson | /s/ Don Peterson | OCT 23 2008 |
| **Title** FIELD MANAGER | **Office** CARLSBAD FIELD OFFICE | |

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached. APPROVAL FOR TWO YEARS

Title 18 U.S.C. 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.

(Continued on page 2)

*(Instructions on page 2)

SEE ATTACHED FOR CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

ENTERED

Form 3160-5
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

## SUNDRY NOTICES AND REPORTS ON WELLS

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

***SUBMIT IN TRIPLICATE*** – *Other instructions on page 2.*

5. Lease Serial No.
NMNM 100555

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☑ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
Cooper "31" Federal, Well #2H

2. Name of Operator
OGX Resources, LLC

9. API Well No.
30 015 – 36755

3a. Address
P.O. Box 2064, Midland, TX 79702

3b. Phone No. *(include area code)*
432 684-6381/685-1287

10. Field and Pool or Exploratory Area
Rock Spur; Bone Spring

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*
Section 31, T25S, R29E (P) 660 FSL & 660 FEL (SL); (M) 660 FSL & 330 FWL

11. Country or Parish, State
Eddy County, NM

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

| TYPE OF SUBMISSION | TYPE OF ACTION | | | |
|---|---|---|---|---|
| ☐ Notice of Intent | ☐ Acidize | ☐ Deepen | ☐ Production (Start/Resume) | ☐ Water Shut-Off |
| | ☐ Alter Casing | ☐ Fracture Treat | ☐ Reclamation | ☐ Well Integrity |
| ☑ Subsequent Report | ☐ Casing Repair | ☐ New Construction | ☐ Recomplete | ☑ Other C-102 Correct field |
| | ☐ Change Plans | ☐ Plug and Abandon | ☐ Temporarily Abandon | |
| ☐ Final Abandonment Notice | ☐ Convert to Injection | ☐ Plug Back | ☐ Water Disposal | |

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

Please see attached amended form C-102 filed to correct the field name.
Cooper "31" Federal, Well #1 located in UL A, 660 FL & 660 FEL is completed in the Rock Spur; Bone Spring also.

14. I hereby certify that the foregoing is true and correct.
Name *(Printed/Typed)*
Ann E. Ritchie

Title Regulatory Agent

Signature

Date 10/31/2008

## THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Accepted for record
NMOCD

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

(Instructions on page 2)

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
DISTRICT II
1301 W. Grand Avenue, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Form C-102
Revised October 12, 2005

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

## WELL LOCATION AND ACREAGE DEDICATION PLAT

| API Number | Pool Code | Pool Name |
|---|---|---|
| 30-015-36755 | 52775 | Rock Spur; Bone Spring * |

| Property Code | Property Name | Well Number |
|---|---|---|
| 37127 | COOPER "31" FEDERAL | 2H |

| OGRID No. | Operator Name | Elevation |
|---|---|---|
| 217955 | OGX RESOURCES, L.L.C. | 2934' |

### Surface Location

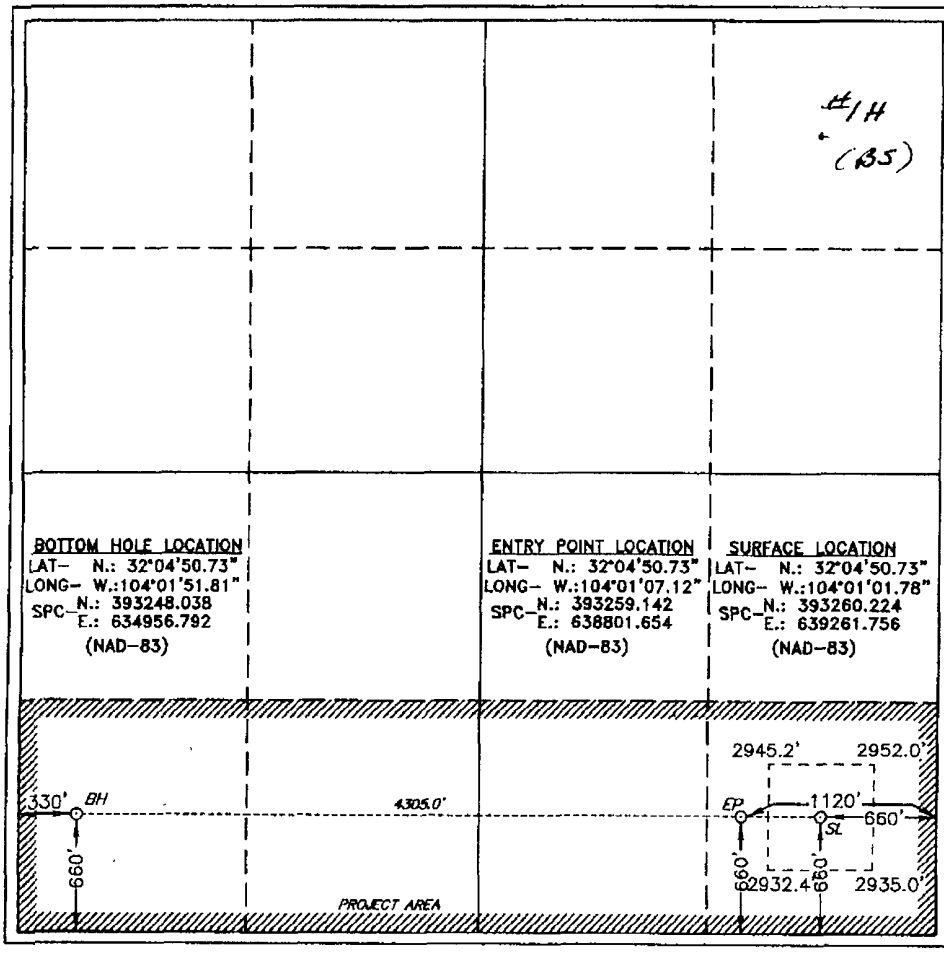
| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| P | 31 | 25 S | 29 E | | 660 | SOUTH | 660 | EAST | EDDY |

### 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 |
|---|---|---|---|---|---|---|---|---|---|
| M | 31 | 25 S | 29 E | | 660 | SOUTH | 330 | WEST | EDDY |

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

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




### OPERATOR CERTIFICATION

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

Ann E. Ritchie 10-31-08 *
Signature 7-25-08 Date

Ann E. Ritchie, Agent
Printed Name

### SURVEYOR CERTIFICATION

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

JULY 16, 2008
Date Surveyed

Signature & Seal of Professional Surveyor

GARY L. JONES
NEW MEXICO
7977
REGISTERED PROFESSIONAL SURVEYOR

W.O. [illegible] 2008 05

Certificate No. Gary L. Jones 7977

BASIN SURVEYS

United States Department of the Interior
Bureau of Land Management
Carlsbad Field Office
620 E. Green Street
Carlsbad, New Mexico 88220

Statement Accepting Responsibility for Operations

| | |
|---|---|
| Operator Name: | OGX Resources LLC |
| Street or Box: | P.O. Box 2064 |
| City, State: | Midland, Texas |
| Zip Code: | 79702 |

The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Lease No: 100555

Legal Description of Land: Cooper 31 Federal, Well #2H

Section 31, Township 25 South, Range 29 East, Eddy, New Mexico

Bond Coverage: _____

Statewide Oil and Gas Surety Bond, OGX Resources, LLC

**BLM Bond File No.:** NMB-000244

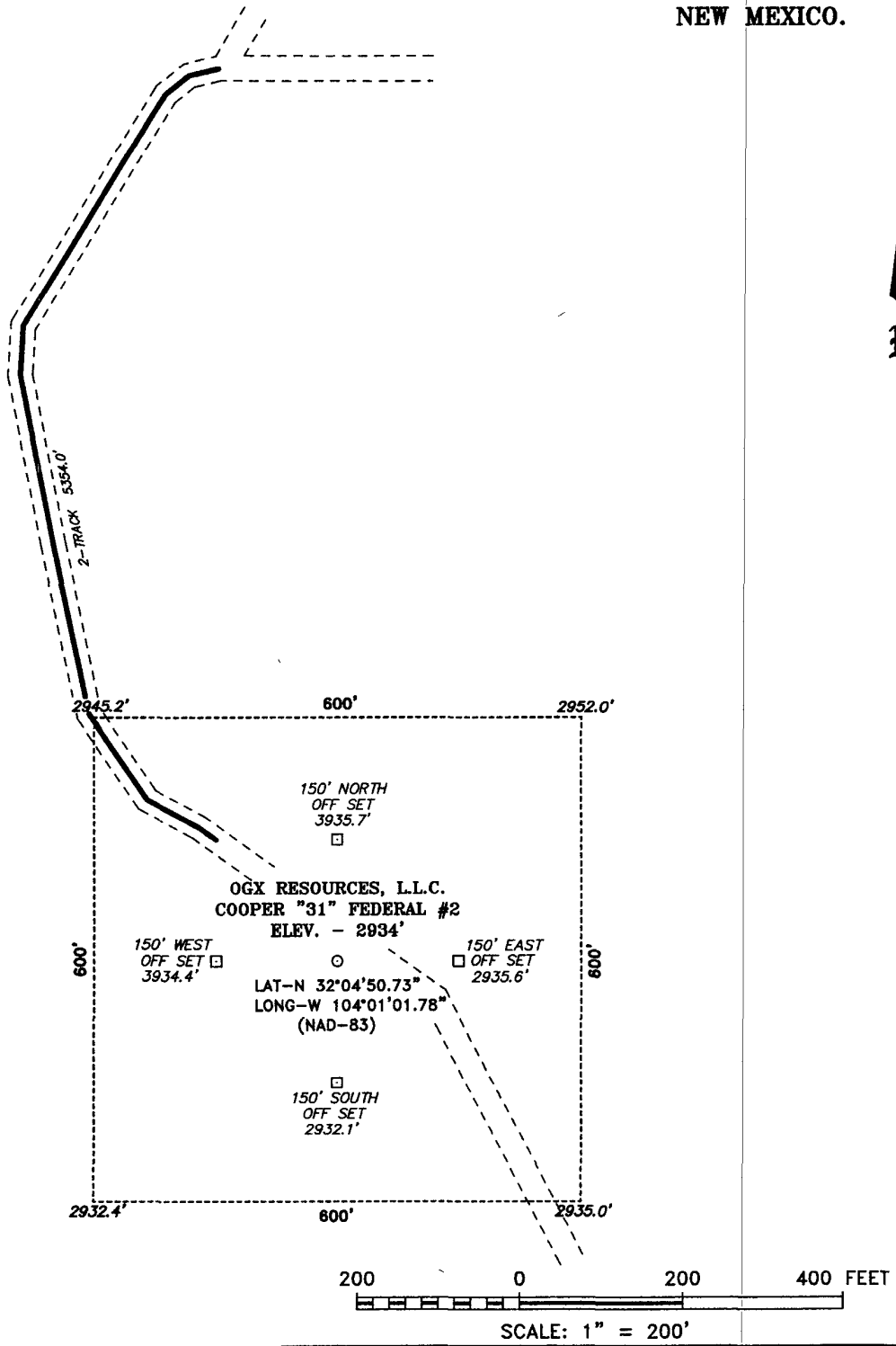
Signature

MANAGER
Title

July 24, 08
Date

# SECTION 31, TOWNSHIP 25 SOUTH, RANGE 29 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO.




*DIRECTIONS TO LOCATION:*

*FROM THE JUNCTION OF HWY 285 AND LONGHORN, GO 3.8 MILES TO LEASE ROAD, ON LEASE ROAD GO EAST 1.7 MILES THENCE NORTH 0.1 MILES, THENCE NORTHWEST 1.6 MILES; THENCE 0.6 MILES TO 2-TRACK.*

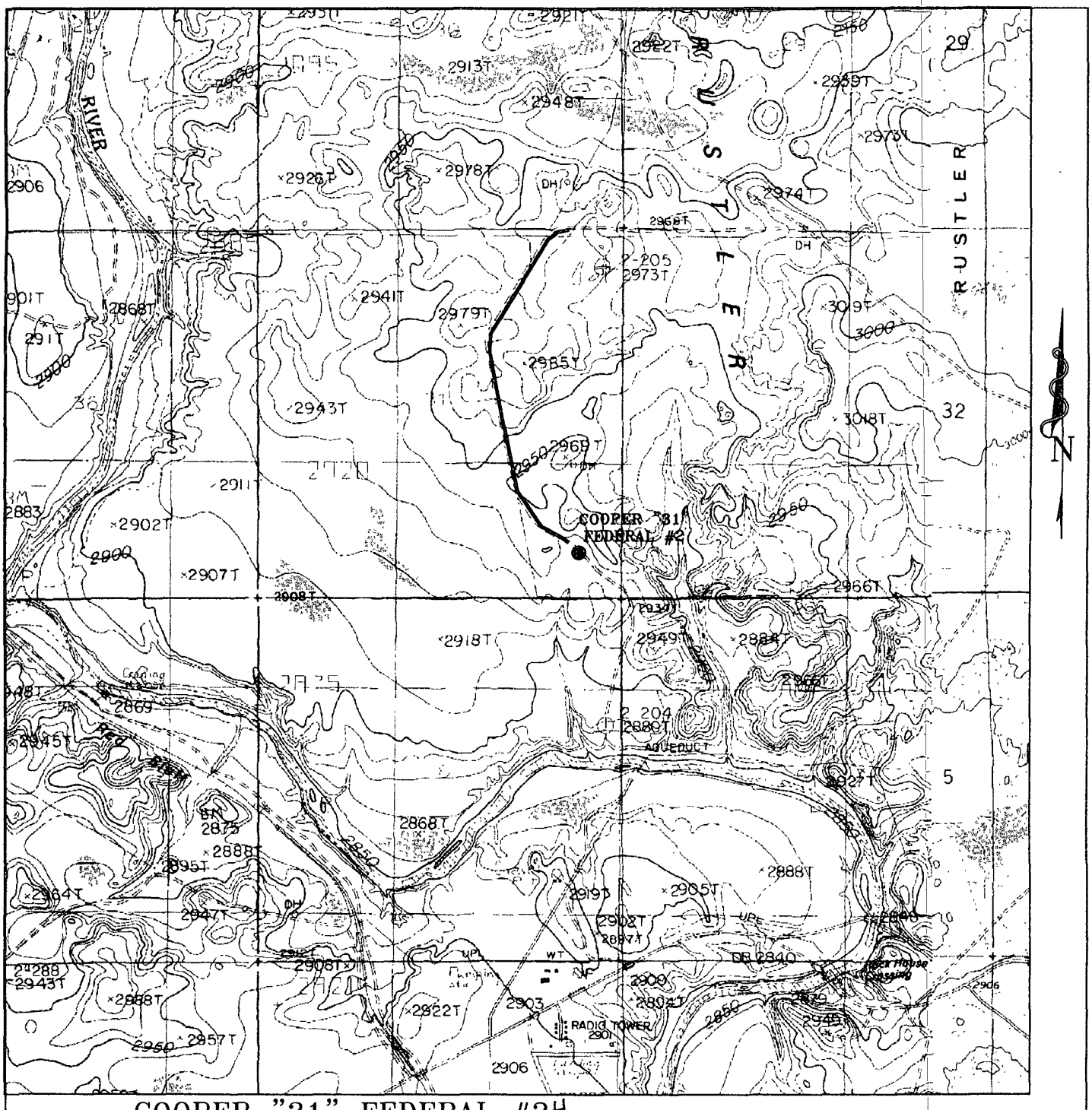
**OGX RESOURCES, L.L.C.**

REF: COOPER "31" FEDERAL #2H/ Well Pad Topo

THE COOPER "31" FEDERAL #2 LOCATED 660' FROM THE SOUTH LINE AND 660' FROM THE EAST LINE OF SECTION 17, TOWNSHIP 26 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

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

| | | | |
|---|---|---|---|
| W.O. Number: 20075 | Drawn By: J. M. SMALL | | |
| Date: 07-21-2008 | Disk: JMS 20075 | Survey Date: 07-16-2008 | Sheet 1 of 1 Sheets |



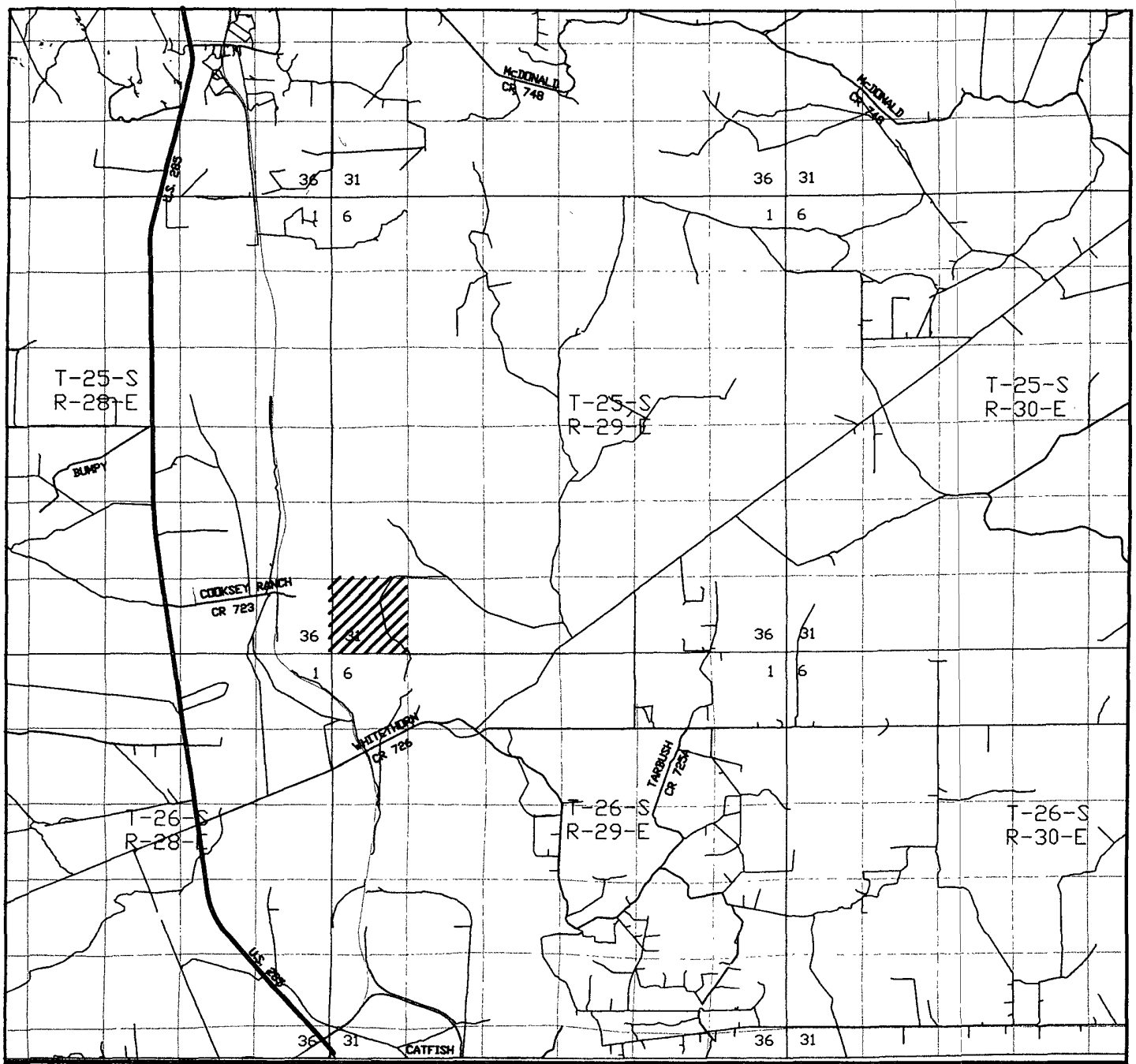

COOPER "31" FEDERAL #2H
Located at 660' FSL and 660' FEL
Section 31, Township 25 South, Range 29 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

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

| | |
|---|---|
| W.O. Number: | 20075 |
| Survey Date: | 07-16-2008 |
| Scale | 1" = 2000' |
| Date: | 07-21-2008 |

OGX RESOURCES, L.L.C.




COOPER "31" FEDERAL #2
Located at 660' FSL and 660' FEL
Section 31, Township 25 South, Range 29 East,
N.M.P.M., Eddy County, New Mexico.

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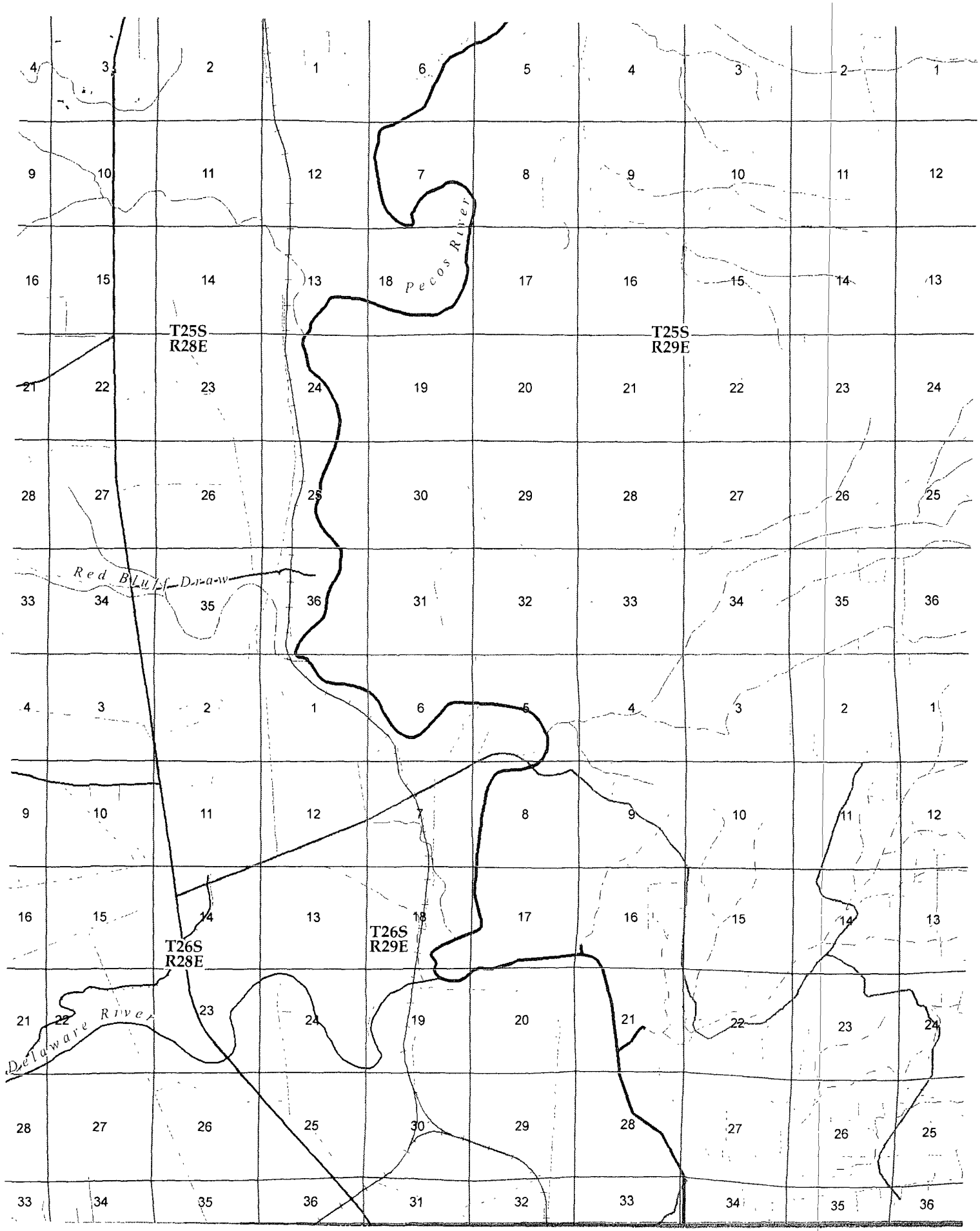
1120 N. West County Rd.
Hobbs, New Mexico 88241
(505) 393-7316 - Office
(505) 392-3074 - Fax
basinsurveys.com

| | |
|---|---|
| W.O. Number: | JMS 20075 |
| Survey Date: | 07-16-2008 |
| Scale: | 1" = 2 MILES |
| Date: | 07-21-2008 |

OGX RESOURCES, L.L.C.


Pecos River
T25S
R28E
T25S
R29E
Red Bluff Draw
T26S
R28E
T26S
R29E
Delaware River

# Nine Point Drilling Plan

## (Supplement to BLM 3160-3)

OGX Resources, LLC

Cooper "31" Federal, Well # 2H

Surface Location: Section 31, T-25S, R-29E, 660' FSL & 660' FEL (P)

Bottom hole Location: Section 31, T-25S, R-29E, 660' FSL & 330' FWL(M)

See attached directional plan.

Field: Willow Lake (Delaware/Morrow)

Eddy Co., NM

1. **Name and estimated tops of geologic horizons:**

See attached

Surface formation is the Quaternary Alluvium.

Rustler – 950'

Salado – 2050'

Lamar – 2800'

Bell Canyon – 2830'

Cherry Canyon – 3650'

Brushy Canyon – 4800'

1st Bone Springs Sand– 6990' – TARGET PRODUCING ZONE

2. Protection of possible useable water will be achieved by setting 13-3/8" surface casing @ ~~525'~~ +/- and cementing it to surface. Isolation of any evaporate/ anhydrite section will be achieved by setting 9-5/8" casing @ 2700' +/- and cementing back to surface. Isolation of the productive horizons will be achieved by setting 5-1/2" casing @ 10,000' and cementing back to a depth of ~~2700'~~. ← See COA

See COA

3. The well control equipment to be employed during the drilling of this well is illustrated on attached EXHIBIT A. This equipment includes a 13-5/8"- 2 ram BOP, annular BOP and choke manifold of comparable pressure rating. Equipment will be rated for 5000 PSI and will be tested to 1500 psi prior to drilling out of the 9-5/8" intermediate casing. Prior to drilling out of the 13-3/8" surface casing the same equipment and casing shall be tested to 1211 PSI or 70% of the burst rating of the casing utilizing the rig pumps. BOPs will be tested as per BLM Drilling Operations Order #2. A hydraulic closing unit will be a part of this equipment and will be function tested daily. Pipe rams will be operated and checked each 24 hr period and each time the drill pipe is out of the hole. These functional tests will be incorporated in the drilling spool below the ram-type BOP. Other accessory BOP Equipment will include a Kelly cock, floor safety valve, choke lines & choke manifold having a 5000 psi WP rating.

See attached for BOP/BOPE test

September 9, 2008

Bureau of Land Management
Attn: Cheryl Ryan, Permitting
620 W. Greene St.
Carlsbad, NM 88220

RE: OGX Resources, LLC, Cooper 31 Federal, Well #2H, Eddy County, NM
Issues: "All potential hydrocarbon zones must be mentioned, not just target.
Minimum tie back for production casing is 200' -- 2700' is not acceptable.
BOP paragraph is unclear -- Need to revise. Refers to 13 3/8, then 9 5/8, then 13 3/8.
BOP schematic has incorrect well name.
BOP schematic has 2M/3M spool -- that reduces BOP rating to 2M. -- Not adequate based on operator provided BHP -- 5M is required."

Cheryl,

As per your request for delinquent data concerning the application to drill for the referenced well, we submit the following:

BOP/BOPE Test

BOP: Diagram attached. The BOP stack will be tested by a service company, Monahans Nipple Up, to 100% of its rating each time the BOP is nippled-up. Each casing string will be tested to 70% of its burst. Subsequent to drilling out the surface and intermediate shoes, a shoe test will be performed at 11# MWE.

In order to get the cement behind pipe up to 200' rather than the 2700' submitted for the production string, we propose to add 375 sx Cl C cement to the job submitted.

Formation Issues:
Rustler @ 950', 411#, water
Salado @ 2050', 888#
Basal Anhydrite @ 2700', 10 ppge, drilling fluid must be saturated salt water
Lamar @ 2800', 1212#, base of salt
Bell Canyon @ 2830, 1225#, 8.4 ppge, oil, gas, formation water, possible H2S-plan submitted
Cherry Canyon @ 3650', 1580#, 8.4 ppg, oil, gas, formation water
Brushy Canyon @ 4800', 2078#, 8.4 ppge, oil, gas, formation water
1st Bone Springs @ 6990', 3027#, 8.4 ppge, oil, gas, formation water
No over-pressured formations are expected to be encountered.

Please review and let me know if you need any further information concerning this application to drill. I appreciate your assistance on this well.

Thank you,

Ann E. Ritchie, Regulatory Agent
OGX Resources

4. The casing strings will consist of the following:

Conductor 20" set @ 40'

Surface: 13-3/8" OD, 54.50 #/ft, K-55, STC, new pipe @ 525'+/- in 17-1/2" hole.

Intermediate: 9-5/8" OD, 36 #/ft, J-55, LTC, new pipe @ 2700+/- in 12-1/4" hole.

Production: 5-1/2" OD, 17#/ft, N-80, LTC, new pipe @ 7,000'+/- in 8-3/4" hole.

5-1/2" OD, 20#/ft, P-110, BTC, new pipe from 7,000 – ~~10,000~~ 11618

Minimum Casing Design Factors: Collapse 1.1, Burst 1.2, and Tensile Strength 1.8

see COA

5. Cementing programs for the above casing strings are: ← see COA

**Conductor @ 40'** cemented to surface utilizing redi-mix cement

**Surface @ 525':** **Slurry**: 380 sks 35/65 Poz Class C with 6% Bentonite, 0.125% Cello Flake, yld ~ 1.34 cu ft/ sk, mixed @ 14.8 ppg

*The above volume represents 100% excess over calculated hole volume, and will be adjusted to actual setting depth of casing. The slurries will be preceded by a fresh water spacer, and displaced with fresh water. Circulated to surface.*

**Intermediate 1 @ 2700':**

**Lead Slurry**: 400 sks Class C 35/65 Poz w/ additives, yld ~ 2.02 cu ft/sk

**Tail Slurry:** 200 sks Class C w/ 2% CaCl, yld ~ 1.34 cu ft/sk

*The above volume represents 15% excess over calculated hole volume - actual volumes will be adjusted to a fluid caliper run at TD of this hole section with 20% excess added. . The cement slurries will be preceded by 20 bbls cement wash for mud removal and displaced with fresh water.*

**Production 1:** ~~**10,000 to 6000'**~~ 11618

**Slurry**: 1445 sks Premium Pls H with additives, yld ~ 1.18 cu ft/sk

**Production 2:** **6000 to 2700'** – min 3500 – 200' inside 9 5/8"

**Slurry:** Lead :535 sx.Class C 50/50 Poz with additives, yld~2.44 cu ft/sk

Tail – 100 sks Premium Plus C w/ additives, yld.~1.33 cu ft/sk.

see COA

*Actual cement type and additives will be determined from hole conditions encountered and prospective zones determined from e-logs. Actual volumes pumped will be*

*determined from an open hole caliper recorded over this interval. Centralizers every 4th joint from 6800'+/- to TD casing depth. TOC @ approx 2700'.*

6. It is anticipated that this well will be drilled to TD utilizing the fluids shown below:

**0-525':** Gel/Lime "spud mud" 8.6 – 8.8 PPG. Utilize native solids to maintain sufficient viscosity to clean hole. Mix paper as required to control seepage loss.

**525-2700':** Brine Water 10.0 – 10.2 PPG. Circulate thru inner reserve pit. Add paper as required to control seepage loss while maintaining pH at 9.0 using Lime. Add 3 – 4% oil to system if drag is encountered.

**2700-8000':** Fresh Water / Cut brine 8.4 – 10.0 Circulate thru reserve pit.; sweeps for hole cleaning and LCM as needed for seepage.

**8000-10,000'** Fresh Water/ Cut Brine 8.4 – 10.0

Safety Factors: Burst 1.0 Collapse: 1.125 Tension: 1.8

7. Auxiliary equipment will include an upper kelly cock valve, safety valve to fit drill pipe and pressure gauges. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached. We do not anticipate H2S with this Bone Springs/Delaware test.

8. No drill stem testing or coring is planned for this wellbore. Mud logging will commence at 6000' under the current plan. A Schlumberger Platform Express Triple Combo electric log suite or equivalent will be run at TD.

9. The estimated BHP at TD is not expected to exceed 5500 psi, and a BHT of 175 F is anticipated. Should any H2S be encountered all supervisors will be prepared to take necessary steps to ensure safety of all personnel, and environment. Lost circulation could occur but is not expected to be a serious problem in this area, and hole seepage will be compensated for by additions of small amounts of LCM in the drilling fluid.

9. It is estimated that this well will be drilled and cased in 40 days. Drilling will commence as soon approval is received and services can be contracted.

# Cooper 31 Federal No. 2H
# Willow Lake (Delaware/Morrow) Field
# Eddy County, New Mexico
# Drilling Procedure
# July 2008

## General Information

| | | | |
|---|---|---|---|
| Lease: | Cooper 31 Federal | AFE BCP: | $ |
| Well No.: | 2 | AFE ACP: | |
| Field: | Willow Lake (Morrow) | AFE Total: | |
| County: | Eddy | AFE NO: | 801500X |
| State: | New Mexico | API No.: | 30-015-XXXXX |
| Section: | 31 | Permit Date: | XX/XX/08 |
| Township: | 25S | Permit TVD: | 8,000' |
| Range: | 29E | Proposed MD: | 11,300' |
| Section Ties: | 660' FSL & 660" FEL | Drilling Days: | 28 |
| Ground Level: | XXXX' | KB: | XXXX' |
| Latitude: | | Longitude | |

## Well Objectives

The primary objective of this well is to evaluate potential within the Delaware & Bone Spring intervals. The well will be drilled to ~ 8,000', logged and taken horizontal if it is decided.

## Directions To Well

From the junction of US Hwy 285 & Co.Rd. 725 (mile marker 4) / Est on 725 for

## Special Drilling Considerations

1. No hunting for game is permitted. No fire arms are to be taken to the location. Keep trash picked up on location and road.
2. Do not run hard-banded or hard-faced drill pipe in casing without consulting OGX.
3. Cement must be circulated on surface and intermediate. If cement does not circulate, run a temperature survey and contact the BLM and Operations Engineer for remedial instructions.
4. BOP equipment will be NU on the 13-3/8" surface casing. All safety and well control equipment should be rigged up and operational prior to drilling out the 13-3/8" casing shoe.

| OGX **Resources Contact List** | | |
|---|---|---|
| Operations Engineer | Steve Douglas | Mobile: 432-934-6800<br>Home: 432-682-1734 |
| Operations Engineer | Jeff Birkelbach | Office: 432-685-1287<br>Home: 432-694-7880<br>Mobile: 432-553-0391 |
| Vice President-Operations | Kip Agar | Office: 432-685-1287<br>Mobile: 432-631-1736<br>Home: 432-685-4114 |
| Geologist | Bill Hardie | Office: 432-685-1287<br>Cell: 432-553-0259 |
| | | Office: |
| Production Foreman | | Mobile:<br>Home:<br>Pager: |
| Production Foreman-Assistant | | Mobile:<br>Home: |
| Landman | | Office: 432-685-1287 |
| Regulatory | Ann Richey | Office:<br>Office: 432-684-6381 |
| Drilling Well Supervision | Donny Leek | Cell:<br>Mobile: 432-634-4862<br>Home: 432-399-4489 |

| Vendor Contact List | | | |
|---|---|---|---|
| **Service** | **Vendor** | **Telephone Number** | **Contact / Location** |
| Rig Contractor | JW Drilling<br><br>Rig 5 | Office: 505-748-8704<br>Rig 505-513-2414<br>Mobile: 505-513-2415<br>Cell: 505-513-0321 | <br>Clarence Dornan<br>Tool Pusher |
| Casing | DGM Supply | Office: 432-686-0628<br>Cell 432-556-8750 | Rooster McCaugnhey |
| Directional Drilling | PathFinder | Office: 432-687-1544<br>Cell: 432-559-5911 | Ron McIntyre |
| Cementing | BJ Services | Office: 505-746-3140<br>Cell 432-556-6357 | Artesia<br>Randy Kuiper |
| Mud | Cobra | Cell: 432-664-3003<br>Office 432- | Midland – Ron Bailey |
| Mud Logging | Suttles | Office:: 432-687-3148 | Frank Suttles |
| Open Hole Logs | Halliburton | Office: 505- 392-7541 | Hobbs |
| Regulatory | BLM<br><br>NMOCD | Office: 505-887-6544<br>505-438-7400<br>Office: 505-393-6161<br>505-748-1283 | Carlsbad<br>Santa Fe<br>Hobbs<br>Artesia |
| | | | |
| Water-Fresh | Black River Machine & Water | Office. 505-706-5324<br>Mobile: 505-785-2319 | Jim Davis |
| Wellhead | Cameron | Office. 505-397-1325<br>Cell 505-631-2614 | Jon Bulman |
| BOP Testing / NU | Monahans Nippleup | Office: 800-753-7558<br>Cell 432-940-8527 | Vernon Venters |
| Pit Lining & Poly Line | Dubose | Office: 432-550-9956<br>Cell: 432-894-5049 | Buckshot |
| Pipe & Rentals | Smith International | Office: 432-570-0065<br>Cell: 432-425-6534 | Ronnie Burnett |
| Dirt Contractor | B & H | Cell: 505-706-0551 | Justin Magby |
| Closed Loop | MI Swaco | Cell 432-556-8411 | Keith Solley |

| Vendor Contact List | | | |
|---|---|---|---|
| **Service** | **Vendor** | **Telephone Number** | **Contact / Location** |
| Bits | Hughes Tool Co. | Office: 505-392-1284<br>Mobile: 432- 230-7799 | Hobbs<br>Scott Newland - Midland |
| Liner Hanger | Halliburton | Office: 432-682-4305<br>Cell 432-631-4626 | Midland<br>Lynn Talley |
| Forklift | | Office:<br>Cell: | |
| Fuel | United | Office: 505-885-5560<br>Cell | Carlsbad<br>Devan Spearman |
| I | | Office: | |
| Water – Brine & Fresh | Great Basin<br><br>JWS<br><br>C&R | Office: 505-628-3323<br>Cell: 505-706-1432<br>Office: 505-748-1352<br>Cell: 505-748-5140<br>Office 505-887-6697<br>Cell: | <br>Randy Billett<br><br>Dimas Herrera<br><br>Danhy Franco |
| Casing Crew | Bull Roger's | Office: 505-393-9342<br>Cell: 505-390-2008 | <br>Nathan Jernigan |

| Emergency Contact List | | | |
|---|---|---|---|
| **Service** | **Vendor** | **Telephone Number** | **Contact / Location** |
| Ambulance/Fire | | Office 505-885-2111 | Carlsbad |
| Helicopter | Odessa Regional | Office: 432-624-3571 | Odessa |
| Hospital | | Office: 505-887-6633 | Carlsbad |
| Sheriff's Office | | Office: 505-887-7551 | Carlsbad |
| State Police | | Office: 505-885-3137 | Carlsbad |

## Surface Interval (0 – 525')

### OBJECTIVE

The objective of this interval is to drill a 17-1/2" hole to ~520' and set casing to protect usable water intervals. Cement must be circulated to the surface.

### FORMATION TOPS

| Formation Name | Depth | Remarks |
|---|---|---|
| Usable quality water zones | 0' – 525' | Must circ cement to surface. |

### DRILLING FLUID

| Interval | Density | FV | PV | YP | FL | pH | Max. % Solids | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0' - 525' | 8.6 – 8.8 | 36 - 38 | 6 -10 | 6 -20 | NC | 9.0 | 6 | FW spud mud |

Spud with a fresh water-bentonite system with lime for viscosity and 5-7 sacks of paper for seepage. Use periodic sweeps of MF-55 (2-3 quarts down the DP) to aid in cuttings removal.

### HYDRAULICS

| Mud Weight (ppg) | Depth (feet) | Flow Rate (gpm) | Nozzle Size (32nds) | HHP Per $IN^2$ | ΔP Bit (psi) | ΔP DP (psi) | ΔP Annulus (psi) | ΔP Total (psi) | Min. A. V. (fpm) | ECD (ppg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9.0 | 525 | 400 | 14-14-12 | 2.97 | 1500 | | | | 54 | 9.1 |

### BITS

| Bit # | Bit Size | Bit Type | Mfg | IADC | Estimated Depth in | Ftg | Hrs | ROP | Recommended WOB | RPM | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17.500" | GTXC-1 | HTC | 5-1-7-X | 40' | 525 | 8.5 | 60 | 30/40 | 100+ | Rotary |

### BOTTOMHOLE ASSEMBLY & DRILLSTRING

17-1/2" bit, shock sub, 8" DC, reamer, 8" DC's, 6-1/4" DC's

### SURVEYS

Take TOTCO drift shots at 200' and upon reaching the interval TD. Limit maximum deviation and dog leg severity to 1-1/2° and 1.5°/100'.

### LOGGING / FORMATION EVALUATION PROGRAM

None planned for this interval.

## CASING

### Casing Design

| Size | Interval | Length | Wt./ft. | Grade | Connection | Section Weight | Design Factors Collapse | Burst | Tension |
|---|---|---|---|---|---|---|---|---|---|
| 13-3/8" | 0' - 525' | 525' | 54.50 | K55 | STC | 29 | | | |

### Casing Strengths / Make-up Torques / Dimensions

| Casing Ratings PSI Burst | Collapse | Tensile Tube | Conn. | *Make-Up Torques (ft-lbs) Minimum | Optimum | Maximum | Dimensions ID | Drift | Coupling OD |
|---|---|---|---|---|---|---|---|---|---|
| 2730 | 1130 | 853 | 547 | 4100 | 5470 | 6840 | 12.615 | 12.459 | 14.375 |

### Casing Accessories

Run a guide shoe, 1 jt csg, insert float and balance of casing. Dope both pin and box with lead-free Best-of-Life 2000 or equivalent. Tack weld shoe and 2nd collar. Run centralizers (7) as follows: 10' above shoe, on 1st collar and every other collar to surface. Chain down casing to prevent "float" while cementing.

## CEMENTING PROGRAM

### Slurry Design Criteria

Casing OD, wt and grade..... 13-3/8" 54.4# K55 STC
Depth..... 525'
Bit Size..... 17-1/2"
BHST..... 85° F
BHCT..... 70° F

### Cement Volumes

Estimated volumes are based on an annular volume 13 3/8" x 17 ½" + 100% excess

### Slurry Composition

Spacer.....50 bbls of fresh water
Slurry.....Lead: 35:65:6 – Poz: Prem Plus C + 6% Bentonite + 5% salt + 5% MPA-5 + .7% Sodium Metasilicate + 5 lbs LCM + 97.9 fresh water
Tail: Premium Plus C + 2% $CaCl_2$ + 56.4% Fresh Water

| Cement Properties | Lead | Tail |
|---|---|---|
| Est Volume (sacks) | 180 | 200 |
| Density (ppg) | 12.80 | 14.80 |
| Yield (ft3/sx) | 2.00 | 1.34 |
| Mix Water, gps | 10.21 | 6.36 |
| Thickening Time, hrs:min | | ~3:30 |
| Free Water, % | | 0 |
| Fluid Loss, cc's | | ~850 |
| Top of Cement | | 0 |

**Cementing Procedure**

For all cementing operations the drilling supervisor is responsible for coordinating with the service company the required cement tests using samples from the actual mix water source. Actual thickening times, free water, fluid loss and compressive strengths should be obtained well in advance of pumping cement.

Utilize one cement truck with a re-circulating mixer and pressurized mud scales to verify cement density.

a. Test cementing equipment and lines to 2,000 psi prior to cementing.
b. Precede cement with 50 bbls of fresh water. Mix cement at a rate that allows for a consistent slurry density of ± 0.1 ppg. Pump cement and displace at 6-8 bpm.
c. Drop wiper plug and displace cement with ~ 79.8 BFW. Do not over displace. Bump plug with 150 - 650 psi. (Record maximum pressure immediately prior to bumping plug, and increase pressure at least 500 psi above.) Release pressure & check float. If float fails, maintain pressure on the casing for 4 hours. Do not exceed MASP's show above.
d. If cement fails to circulate, run a temperature survey 3-4 hours after the cement job to determine TOC. After TOC is determined, notify the BLM to discuss remedial plans then notify the Operations Engineer.
e. WOC a minimum of 4 hours prior to cutting casing and 12 hours prior to pressure testing casing and drilling out.

**WELLHEAD**

Wellhead equipment from Cameron will be utilized. The drilling supervisor is responsible for verifying all wellhead dimensions and space-out. Cut off casing and install 13-5/8" 3M x 13-3/8" SOW w/ 36" BP.

**CASING AND BOP PRESSURE TEST**

RU and test BOP equipment (SA) 13-5/8" 3M annular prior to drill out. Record all tests on chart and note on daily report. Prior to drilling out, pressure test the casing and BOP equipment as follows:

| ITEM | Hi TEST | Low | DURATION | REMARKS |
|---|---|---|---|---|
| Annular | 1350 | 250 | 5 Min | " |
| Flowlines & valves | 3000 | 250 | 5 Min | Test each component |
| Choke Manifold | 3000 | 250 | 5 Min | " |
| Casing | 2180 | | 30 Min | ~80% burst |
| Shoe | 110 | | 30 Min | 14# MWE w/ 10# brine |

## Intermediate Interval (525' – 2700')

### OBJECTIVE

The objective of this interval is to drill to 12-1/4" hole to the base of the anhydrite and set casing to isolate red bed and anhydrite intervals. Cement must be circulated on this string, and $H_2S$ equipment is not required for this interval. There have been deviation problems in this interval in the surrounding area. Run a packed hole assembly to minimize deviation and allow greater WOB.

### DRILLING FLUID

| Interval | Density | FV | PV | YP | FL | pH | Max. % Solids | Remarks |
|---|---|---|---|---|---|---|---|---|
| 525' - 2700' | 10.0 – 10.2 | 34 -37 | 2 - 5 | 13 - 18 | NC | 9.0 | Reserve | Brine/native w/ 3-4% oil |

- Drill out from under surface with brine water circulating inner reserve. If redbed is encountered let viscosity build naturally to 32-33 vis diluting with water.
- Pump sweeps of paper and starch while drilling red beds.
- Add 3-4% oil to system if torque or drag is encountered.
- Use salt gel pill sweeps to ensure a clean hole and paper to control seepage.
- If returns are lost, pull reamers and/or stabilizers out of the hole and dry drill to TD using gel sweeps to clean hole.

### HYDRAULICS

| Mud Weight (ppg) | Depth (feet) | Flow Rate (gpm) | Nozzle Size (32nds) | HHP Per $IN^2$ | ΔP Bit (psi) | ΔP DP (psi) | ΔP Annulus (psi) | ΔP Total (psi) | Min. A. V. (fpm) | ECD (ppg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.2 | 2460 | 400 | 14-14-B | 3.29 | 1657 | 616 | 12 | 2285 | 75 | 10.3 |

### BITS

| | | | | | Estimated | | | | Recommended | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bit # | Bit Size | Bit Type | Mfg | IADC | Depth in | Ftg | Hrs | ROP | WOB | RPM | Remarks |
| 2 | 12.250" | GT-28 | HTC | 5-4-7-X | 520' | 1940 | 125 | 20 | 50/55 | 60/70 | Rotary |

### BOTTOMHOLE ASSEMBLY & DRILLSTRING

12-1/4" bit, (2) 8"DCs, 3 pt reamer, (1) 8" DC, IBS, SS, (3) 8" DC's, 6-1/4" DC's. Run sufficient drill collars to allow 70M# effective weight in 10 # fluid (BF +/- .847). This will require a minimum of 83 M# dry weight of drill collars.

## SURVEYS

Take TOTCO drift shots at intervals no greater than 500' and upon reaching the interval TD. Maximum deviation and dog leg severity to be 3° and 1.5°/100'.

## LOGGING / FORMATION EVALUATION PROGRAM

None planned for this interval.

## CASING

### Casing Design

| Size | Interval | Length | Wt./ft. | Grade | Connection | Section Weight | Design Factors Collapse | Burst | Tension |
|---|---|---|---|---|---|---|---|---|---|
| 9-5/8" | 525' - 2700' | 2700' | 36 | J55 | LTC | 88.6 | 1.35 | 1.70 | 1.63 |

### Casing Strengths / Make-up Torques / Dimensions

| | Casing Ratings PSI | | Tensile | | Make-Up Torques | | | Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Casing | Burst | Collapse | Tube | Conn | Min | Opt | Max | ID | Drift | Cplng OD |
| 9-5/8" 36# J55 STC | 3520 | 2020 | 564 | 394 | 2960 | 3940 | 4930 | 8.921 | 8.765 | 10.625 |
| | | | | | **2630** | **3500** | **4390** | **Adj for $F_f$ = 0.89** | | |

### Casing Accessories

Run a float shoe, 1 jt csg, float collar and balance of casing. Dope both pin and box with lead-free Best-of-Life 2000 or equivalent. Tack weld float collar and float shoe. Run centralizers as follows: 10' above shoe, on 1st collar and every third collar to surface.

## CEMENTING PROGRAM

### Slurry Design Criteria

Casing OD, wt and grade..... 9-5/8" 36# J55 STC
Depth..... 2460'
Bit Size..... 12-1/4"
BHST..... 95° F
BHCT..... 83° F

### Cement Volumes

Estimated volumes are based on an assumed average hole size of 12 ¼" + 25%. Run a fluid caliper and use 10% excess plus 100 sx.

### Slurry Composition

Spacer..... 30 bbls of fresh water
Lead..... 35:65 – Poz: Prem Plus C + 4% Bentonite + 5% salt + 5% MPA-5 + .7% Sodium Metasilicate + 5 lbs LCM + 99.6% fresh water
Tail..... C + 2% $CaCl_2$ + 56.4% fresh water

**Cement Properties**

| | Lead | Tail |
|---|---|---|
| Est Volume (sacks) | 400 | 200 |
| Density (ppg) | 12.7 | 14.8 |
| Yield (ft3/sx) | 2.02 | 1.34 |
| Mix Water, gps | 10.39 | 6.36 |
| Thickening Time, hrs:min | 4:07 | 3:32 |
| Free Water, % | 2.0 | 0 |
| Fluid Loss, cc's | ~750 | ~600 |
| Top of Cement | 0 | 2050 |

**Cementing Procedure**

For all cementing operations the drilling supervisor is responsible for coordinating with the service company the required cement tests using samples from the actual mix water source. Actual thickening times, free water, fluid loss and compressive strengths should be obtained well in advance of pumping cement. Utilize one cement truck with a re-circulating mixer and pressurized mud scales to verify cement density.

a. Test cementing equipment and lines to 2,500 psi prior to cementing.
b. Precede cement with 50 bbls of fresh water. Mix cement at a rate that allows for a consistent slurry density of ± 0.1 ppg. Pump cement and displace at 6-8 bpm.
c. Drop wiper plug and displace cement with ~ 204 BFW. Do not over displace. Bump plug with 800 - 1300 psi. (Record maximum pressure immediately prior to bumping plug, and increase pressure at least 500 psi above.) Release pressure & check floats. If floats fail, maintain pressure on the casing for 4 hours. Do not exceed MASP's show above.
d. If cement fails to circulate, run a temperature survey 3-4 hours after the cement job to determine TOC. After TOC is determined, notify the BLM to discuss remedial plans then notify the Operations Engineer.
e. WOC a minimum of 4 hrs prior to cutting csg and 12 hours prior to pressure testing csg and drilling out.

**WELLHEAD**

ND BOP's. Cut casing & NU 11" 5M x 13-5/8" 3M casing spool. NU 11" 5M SRRAG BOP's with blinds on top.

**CASING AND BOP PRESSURE TEST**

RU and test all BOP (11" 5M SRRAG & 5M manifold) and well control equipment prior to drill out. Record all tests on chart and note on daily report. Prior to drilling out, pressure test the casing and BOPs as follows:

| ITEM | Hi TEST | Low | DURATION | REMARKS |
|---|---|---|---|---|
| Rams | 3000 | 250 | 5 Min | Blinds on top |
| Annular | 3000 | 250 | 5 Min | " |
| Flowlines & valves | 3000 | 250 | 5 Min | Test each component |
| Choke Manifold | 3000 | 250 | 5 Min | " |
| Casing | 2675 | | 30 Min | 76% csg burst |
| Shoe | 650 | | 30 Min | 13# MWE w/ fresh water |

## Production Interval (2700' – 8000')

### OBJECTIVE

The objective is to drill an 8-3/4" hole to 8000' to evaluate the Delaware & Bone Springs for horizontal potential.

### FORMATION TOPS

| Formation | Depth | Frm Pres |
|---|---|---|
| Rustler | 950' | 411# |
| Salado | 2050' | 888# |
| Lamar | 2800' | 1212# |
| Bell Canyon | 2830' | 1225# |
| Cherry Canyon | 3650' | 1580# |
| Brushy Canyon | 4800' | 2078# |
| 1st BSS | 6990' | 3027# |
| TVD | 8000' | |

### DRILLING FLUID

| Interval | Density | FV | PV | YP | FL | pH | Max. % Solids | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2700' - 8000' | 8.4 - 9.5 | 28 - 34 | 1 - 2 | 1 - 2 | NC | 9 - 10 | Reserve | Fresh water to FW/cut brine |

- Drill out floats, cement, and shoe. Drill out of reserve w/ FW utilizing periodic sweeps of MF-55 as needed to ensure hole cleaning/cuttings removal. Use paper for seepage control and sweeps.
- Spot a high-vis pill on bottom for logs.

### HYDRAULICS

| Mud Weight (ppg) | Depth (feet) | Flow Rate (gpm) | Nozzle Size (32nds) | HHP Per $IN^2$ | ΔP Bit (psi) | ΔP DP (psi) | ΔP Annulus (psi) | ΔP Total (psi) | Min. A. V. (fpm) | ECD (ppg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9.0 | 8000 | 350 | 11-11-14 | 3.15 | 1350 | | | | | 9.1 |

### BITS

| Bit # | Bit Size | Bit Type | Mfg | IADC | Estimated Depth in | Ftg | Hrs | ROP | Recommended WOB | RPM | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 8.75 | GX38CH | HTC | | 2700 | 4300 | 144 | 30 | 50-55 | 55-60 | Rotary |
| 4 | 8.75 | GX38CH | HTC | | 6760 | 2590 | 137 | 20 | 55 | 55-60 Rotary | |

### BOTTOMHOLE ASSEMBLY & DRILLSTRING

8-3/4" bit, 3 pt RR , (1) 6 ½" DC, 3 pt RR, (22) 6 ½" DC's , 6 ½" drilling jars, (3) 6 ½" DC's.

Run sufficient drill collars to allow 65M# effective weight in 9.2 # fluid (BF +\- .860).

**SURVEYS**

Take TOTCO drift shots at intervals no greater than 500' and upon reaching the interval TD. Maximum deviation and dog leg severity to be 5° and 1.5°/100'. Run Gyro prior to OH Logs.

**FORMATION EVALUATION PROGRAM**

| Logs | From | To | |
|---|---|---|---|
| (CN-TDL-PE, HR Laterlog, M-CFL, GR, Cal) | TD | 2460 | |
| GR-CNL | TD | 0 | RU mud logger prior to DO int csg.. |
| Side wall cores | TBD | | |

**PLUG BACK OF PILOT HOLE TO KO @ 7100' (6800' to 7600')**

360 sx Premium Plus H + 1% CD-32 + 29.6% Fresh water
17.5 ppg / 0.94 cf/sx / 3.33 mix watr

**DRESS OFF PLUG TO KO @ 7100'**

**BUILD CURVE - 12.73 DEGREES TO LAND @ +/- 7550 W/ 7 7/8" CONE BIT**

**DRILL HORIZONTAL W/ 7 7/8" PDC BIT AS PER ADJUSTED DIRECTIONAL PLAN**

**CASING DESIGN**

| Size | Interval | Length | Wt./ft. | Grade | Connection | Cum Sec Weight |
|---|---|---|---|---|---|---|
| 5 ½" | 0' - 7000' | 7000' | 17 | N80 | LTC | 119.0 |
| 51/2" | 7000' - MDTD' | 3000'+ | 20 | P110 | BTC | 60.0 |

**Casing Strengths / Make-up Torques / Dimensions**

| | Casing Ratings | | | | Make-Up Torques | | | Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PSI | | Tensile | | | | | | | |
| Casing | Burst | Collapse | Tube | Conn | Min | Opt | Max | ID | Drift | Cplng OD |
| 5-1/2" 17# N80 LTC | 7740 | 6280 | 397 | 348 | 2610 | 3480 | 4350 | 4.892" | 4.767" | 6.050" |
| 5 ½" 20# P110 BTC | 10640 | 11080 | 546 | 568 | 4270 | 5690 | 7110 | 4.778" | 4.653" | 6.050" |

**Casing Accessories**

Run a float shoe, 1 jt csg, float collar and balance of casing. Dope both pin and box with lead-free Best-of-Life 2000 or equivalent. Baker lock each connection from the float collar down. Stage tool below Delaware (6000') Run centralizers in the curve & Delaware pay section.

## CEMENTING PROGRAM

### Slurry Design Criteria

Previous casing string ..... 9-5/8" 36# J55 STC @ 2700'
Casing size, weight and grade ..... 5 ½"
Depth ..... 11,000'
Bit Size ..... 7 7/8" & 8-3/4"
BHST ..... 128 F
BHCT ..... 108 F

### Cement Volumes

Estimated volumes are based on an average actual hole size + 50% excess. Actual volumes will be calculated from a fluid caliper at TD & OH logs.

### Slurry Composition

**Stage 1:**
Spacer ..... 30 bbls FW
Lead ..... Premium Plus H + .7% FL-62 + .4% BA-10A + .1% FL-52 + 45.8% Fresh water

**Stage 2:**
Spacer ..... 30 bbls FW
Lead ..... 50:50 Poz C + 10% Bentonite + 5% NaCl + 139.7% Fresh water
Tail ..... Prem Plus C

| Cement Properties | Stage 1 | Stage 2 | |
|---|---|---|---|
| | Lead | Lead | Tail |
| Estimated Volume, sx | 1445 | 535 | 100 |
| Density, ppg | 15.6 | 11.8 | 14.8 |
| Yield, cf/sk | 1.18 | 2.44 | 1.33 |
| Mix water required, gps | 5.17 | 14.07 | 6.33 |
| Free Water, % | | | |
| Fluid Loss, cc | | | |
| Top of cement, ft | DV Tool | 9 5/8" csg | |

**Cementing Procedure**

For all cementing operations the drilling supervisor is responsible for coordinating with the service company the required cement tests using samples from the actual mix water source. Actual thickening times, free water, fluid loss and compressive strengths should be obtained well in advance of pumping cement.

Utilize one cement truck with a re-circulating mixer and pressurized mud scales to verify cmt density.

a. Test lines to 2500 psi for 5 minutes, prior to cementing.
b. Establish circulation and pump at least 360 bbls prior to cementing. Record the buoyed string weight and fluid density on the daily drilling report.
c. If feasible, reciprocate casing 5'-10' (2-3 minutes/stroke) while conditioning the hole. Stop reciprocating prior to pumping cement.
d. Pump 30 bbls of fresh water spacer. Mix cement at a rate that allows for a consistent slurry density of ±0.1 ppg. Pump cement at 6-8 bpm.
e. After pumping cement, drop plug and displace with FW at 5-6 BPM. Reduce rate to 2 BPM 10 bbl prior to calculated displacement. Bump plug with 2000 - 2500 psi. (Record maximum pressure immediately prior to bumping plug, and increase pressure at least 500 psi above.) Do not over displace. Hold pressure for 5 minutes and release to check floats. Record the string weight with cement in place and the volume of cement circulated on the daily drilling report.
f. Drop bomb and open DV tool & circulate 4 hrs
g. Cement Stage 2 repeating (d.) & (e.)
h. RDMO cement company.

**WELLHEAD**

Unbolt BOP's & set slips. Make rough cut on casing. ND BOP. Make final cut on casing and install 7-1/16" 5M x 11" 10M tubing head w/ dry hole tree. Clean pits and location. Release rig & RDMO.

Newpark Drilling Fluids, LLC

# DRILLING FLUIDS PROGRAM

***PREPARED FOR:***

Cooper 31 Fed #2

***Section 31, T-25-S, R-29-E***
***Eddy County, New Mexico***

***SUBMITTED TO:***

***Mr. Jeff Birkelbach***

***OGX Resources, LLC***
***P.O. Box 2064***
***Midland, Texas 79702***

*PREPARED BY:*

***Mike Davis***

# Newpark Drilling Fluids, LLC

July 11, 2008

Mr. Jeff Birkelbach
OGX Resources, LLC
P.O. Box 2064
Midland, Texas 79702

Dear Mr. Birkelbach,

Enclosed are our drilling fluids recommendations for your Cooper 31 Fed #2 well in section 31, T-25-S, R-29-E, Eddy County, New Mexico. They are derived from information from your office, offset well data, and our knowledge of the area.

Estimated mud cost is $40,000.00 to $45,000.00 based on 22 to 24 total days with ideal conditions. Severe losses, excessive pressure, stuck pipe or extended days on the well could raise the estimate considerably.

For questions or comments call (800) 592-4627 or (432) 697-8661. Both are 24-hour numbers.

Sincerely,

Mike Davis

# Newpark Drilling Fluids, LLC

## OGX Resources, LLC

Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

## PROGRAM HIGHLIGHTS:

| | | |
|---|---|---|
| **TOTAL DEPTH** | : | **12,000' MD** |
| **CASING REQUIREMENTS** | : | **Interval 1: 17-1/2" hole to 575', set 13-3/8" casing.** |
| | : | **Interval 2: 12-1/4" hole to 2,700', set 9-5/8" casing.** |
| | : | **Interval 3: 8-3/4" hole to 12,000', set 5-1/2" casing.** |
| **MUD WEIGHT REQUIREMENTS** | : | **8.6 – 9.0 ppg @ 575'** |
| | : | **10.0 – 10.1 ppg @ 2,700'** |
| | : | **8.4 – 10.0 ppg @ 12,000'** |
| **DAYS TO REACH TD** | : | **22 – 24** |
| **COST ESTIMATE** | : | **$40,000.00 to $45,000.00** |
| **WAREHOUSE** | : | **Lovington, New Mexico** (800) 592-4627 |
| | | **David Volz**, Distribution Manager |
| **PERMIAN BASIN PERSONNEL** | : | **Midland, Texas** (800) 592-4627 |
| | : | **Joe Henderson**, Permian Basin Business Unit Manager |
| | : | **Al Boudreaux**, Sales Manager |
| | : | **Doug Thomas**, Sales |
| | : | **Ken Anthony**, Engineering Manager |
| | : | **Mike Davis**, Technical Manager |

## MUD PROPERTIES SUMMARY:

| Depth (feet) | Weight (ppg) | Viscosity (sec/1000cc) | Fluid Loss (cc/30min) | PV (cps) | YP (lb/100ft²) | Mud Type |
|---|---|---|---|---|---|---|
| **0' – 575' Set 13-3/8" Casing** | 8.6 – 9.0 | 36 – 38 | N/C | 6 – 10 | 6 – 20 | **Spud Mud** |
| **575' – 2,700' Set 9-5/8" Casing** | 10.0 – 10.1 | 29 – 30 | N/C | 0 – 1 | 0 – 1 | **Brine** |
| **2,700' – K.O.P.** | 8.4 – 10.0 | 28 – 29 | N/C | 0 – 1 | 0 – 1 | **Fresh Water to Brine** |
| **K.O.P. – 12,000' MD Set 4-1/2"** | 8.4 – 10.0 | 34 – 36 | 10 – 12 cc | 4 – 8 | 6 – 10 | **Dynazan/ Starch** |

Note: The mud weight schedule is intended as a guideline only. Actual mud weights used should be determined by hole conditions and drilling parameters.

Newpark Drilling Fluids, LLC

**OGX Resources, LLC**
Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

## PROGRAM HIGHLIGHTS (CONT'D):

### HOLE & CASING DESIGN:

| INTERVAL | DEPTH (feet) | BIT SIZE | CASING (OD) | ANTICIPATED MUD WT. (ppg) |
|---|---|---|---|---|
| INTERVAL 1 | 575' | 17-1/2" | 13-3/8" | 8.6 – 8.8 |
| INTERVAL 2 | 2,700' | 12-1/4" | 9-5/8 | 10.0 – 10.1 |
| INTERVAL 3 | 12,000' MD | 8-3/4" | 4-1/2 | 8.4 – 10.0 |

### SOLIDS CONTROL:

| INTERVAL | RECOMMENDED SOLIDS CONTROL EQUIPMENT |
|---|---|
| INTERVAL 1 | Linear motion shale shakers and one desander. |
| INTERVAL 2 | Reserve. |
| INTERVAL 3 | Linear motion shale shakers and one desilter |

### ESTIMATED FORMATION TOPS:

| FORMATION | DEPTH |
|---|---|
| Delaware | 3,120' |
| Cherry Canyon | 4,000' |
| Brushy Canyon | 5,300' |
| Bone Spring | 6,800' |
| Total Depth | 12,000' MD |

# Newpark Drilling Fluids, LLC

## OGX Resources, LLC

Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

**Interval 1:** **17-1/2" Hole**
**Interval :** **0' – 575'**
**Casing:** **13-3/8**
**Days:** **2**

### Drilling Fluid Properties:

| Depth (feet) | Weight (ppg) | Viscosity (sec/1000cc) | PV (cps) | YP (lb/100ft²) | pH (value) | Fluid Loss (cc/30min) | LG Solids (%) |
|---|---|---|---|---|---|---|---|
| 0' – 575' | 8.6 – 9.0 | 36 – 38 | 6-10 | 6 20 | 9.0 10.0 | No Control | <6 |

### Drilling Fluid Recommendations:

A non-dispersed **NewGel** system is recommended for this interval, with pre-hydrated **NewGel** and **Soda Ash** as the primary system components for rheological control. Utilize **Paper** sweeps to aid in seepage control. If losses occur batch treat with 12-15 ppb **Fiber Seal** in a 50 bbl premix with 36-38 sec/1000cc viscosity.

At total depth, sweep the hole with 100-barrels of fresh water and **New Gel** for a 80-90 sec/1000cc viscosity and 0.25-ppb **Super Sweep**. Circulate hole clean prior to running casing.

### Materials Consumption

| | | |
|---|---|---|
| 100 | sx | New Gel |
| 10 | sx | Soda Ash |
| 10 | sx | Paper |
| 2 | bx | Super Sweep |

**Interval 2:** **12-1/4" Hole**

# Newpark Drilling Fluids, LLC

## OGX Resources, LLC

Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

**Interval:** **575' – 2,700'**
**Casing:** **9-5/8"**
**Days:** **3**

### Drilling Fluid Properties:

| Depth (feet) | Weight (ppg) | Viscosity (sec/1000cc) | PV (cps) | YP (lb/100ft²) | pH (value) | Fluid Loss (cc/30min) | LG Solids (%) |
|---|---|---|---|---|---|---|---|
| 575 – 2,700' | 10.0 – 10.1 | 29 – 30 | 0-1 | 0-1 | 9.0-10.0 | No Control | <6 |

### Drilling Fluid Recommendations:

Drill out below surface casing with 10.0-ppg brine. Circulate through a controlled portion of the reserve pit for maximum gravitational solids removal. Mix **Paper** to control seepage losses. Maintain pH control with additions of **Caustic Soda**. Mix at flow line one gallon of **New-55** every 250 feet drilled to promote solids removal. Sweep hole every 500 feet using .25-ppb of **Super Sweep**. Deviation on this interval can become severe; proper planning of the bottom hole assembly should reduce the deviation.

At total depth sweep the hole using 100-barrels of system fluid - **Saltwater Gel** for a 60-70 sec/1000cc viscosity and 0.25 pounds per barrel of **Super Sweep**.

### Materials Consumption:

| | | |
|---|---|---|
| 70 | sx | Saltwater Gel |
| 20 | sx | Paper |
| 10 | sx | Caustic Soda |
| 2 | bx | Super Sweep |
| 2 | cn | New-55 |

### Interval 3a: 8-3/4" Hole

# Newpark Drilling Fluids, LLC

## OGX Resources, LLC

Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

**Interval:** **2,700' – K.O.P.**
**Casing:** **-**
**Days:** **6**

### Drilling Fluid Properties:

| Depth (feet) | Weight (ppg) | Viscosity (sec/1000cc) | PV (cps) | YP (lb/100ft²) | pH (value) | Fluid Loss (cc/30min) | LG Solids (%) |
|---|---|---|---|---|---|---|---|
| 2,700' - K.O.P | 8.4 – 10.0 | 28 – 29 | 0 – 1 | 0 – 1 | 9.0-10.0 | N/C | <5 |

### Drilling Fluid Recommendations:

Drill out from 9-5/8" casing with fresh water. Circulate through the remaining portion of the reserve pit for gravitational solids removal. Use sweeps of **Paper** to control seepage loss. Mix **Caustic Soda** for pH control. Mix one gallon of **New-55** at flow line for every 250 feet drilled to promote solids settling. Sweep hole with 1-lbs of **Super Sweep** every 500 feet drilled.

Maintain sufficient brine water on location to raise the mud weight in the event of abnormal pressure.

### Materials Consumption

40 sx Paper
20 sx Caustic Soda
3 cn New-55
3 bx Super Sweep

**Interval 3b:** **8-3/4" Hole**
**Interval:** **K.O.P. – 12,000' MD**
**Casing:** **4-1/2"**

# Newpark Drilling Fluids, LLC

## OGX Resources, LLC

Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

**Days:** 10

### Drilling Fluid Properties:

| Depth (feet) | Weight (ppg) | Viscosity (sec/1000cc) | PV (cps) | YP (lb/100ft²) | API Fluid Loss (cc/30min) | pH (value) | LG Solids (%) |
|---|---|---|---|---|---|---|---|
| K.O.P. – 12,000' | 8.4 – 10.0 | 34 – 36 | 4 – 6 | 6 – 10 | 10 – 12 | 9 – 10 | <6 |

### Drilling Fluid Recommendations:

At **K.O.P.** divert the flow line to the steel pits. Pre-treat the system with **Newcide** to prevent bacterial degradation of organic materials. Mix **Starch (white)** to lower the API filtrate to 10-12 cc. Mix **Caustic Soda** for pH control. Mix **Dynazan** to increase viscosity to 34-36 sec/1000cc. For torque and drag mix 1 drum **New 100N** in 50-bbls of system fluid and sweep hole with 25-bbls as needed. Mix small amounts of **Defoam-S** to control foaming while mixing products.

At total depth sweep hole with a high viscosity sweep. Mix in the premix pit 100 barrels of system fluid and use **Dynazan** for a viscosity of 65-75 sec/1000cc. Sweep the hole with 50-barrels and spot the remaining 50-barrels on bottom for logging and casing operations.

### Materials Consumption

| | | |
|---|---|---|
| 60 | sx | Dynazan |
| 200 | sx | Starch (White) |
| 15 | sx | Caustic |
| 10 | pl | Newcide |
| 5 | pl | Defoam S |
| 4 | dm | New 100 N |

*ENGINEER / WAREHOUSE INFORMATION*

**OGX Resources, LLC**
Cooper 31 Fed #2
Section 31, T-25-S, R-29-E
Eddy County, New Mexico

*WELL NAME:* *Cooper 31 Fed #2*

*LOCATION:* *Section 31, T-25-S, R-29-E*

*Eddy County, New Mexico*

*MUD ENGINEER:* *Lynn Pearson* *Carlsbad, New Mexico*

*Wally Pearson* *Artesia, New Mexico*

*(800) 592-4627 or (432) 697-8661. Both 24 hours.*

*WAREHOUSE:* *Artesia & Lovington, New Mexico*

*(800) 592-4627 or (432) 697-8661. Both 24 hours.*

# Lost Circulation Procedures

**Seepage Losses** – Mud consumed at the rate of 18.5± barrels of mud per 100' of 8-3/4" hole drilled can be expected. This is due to mud retained on cuttings and filtration

losses down hole. Volumes in excess of 20 bbls per 100' of hole should be considered seepage losses and the following remedial action taken:

1. Discontinue drilling and circulate cuttings out of the hole at a reduced rate for 5 minutes. Pull one stand and stop pumps to see if the hole is standing full. Keep pipe moving while checking fluid level.

2. If the hole is standing full while static, the seepage losses may be from excessive cuttings, out of gauge hole or circulating pressure losses (ECD). Break circulation slowly and return to drilling, carefully monitoring mud consumption rates and static hole conditions on connections

3. If the hole is taking fluid while static, prepare a 50-60 bbl pill of 45-50 viscosity mud with 10-20 ppb of Fiber-Plug and 10-20 ppb of Fiber-Seal, and spot near bottom. Pull five stands and check static level of fluid in the hole. Keep hole full at all times and monitor the mud loss rate.

4. If little or no improvement is noted after pumping the 50-60 barrel LCM pill, prepare a balanced, high-filtrate (50cc/30min@100psi) water based pill (40 bbls). This pill can be formulated with Dynazan or New Gel (flocculated with CaCl2 or Lime) and Barite. Pull pipe above the suspected loss zone and spot the pill outside the drill pipe at 1 barrel per minute. Pull out of the pill, close the hydril and if a float collar is in the string, pump down the annulus until sufficient backpressure is established. Hold the maximum allowable backpressure (300-900 psi) for 2-4 hours, open the hydril and establish full circulation before going to bottom.

**Severe Losses:**

1. Should complete returns be lost, stop the pumps and pull the pipe into the casing while pumping through the fill-up line to keep the hole full.

2. Allow the hole to remain static while filling with mud on the annulus side, monitoring the rate of mud loss.

3. Build 50-60 bbl pill of 45-50-viscosity mud with 10-20 ppb of Fiber-Plug and 10-20 ppb of Fiber-Seal. and spot near bottom. Pull five stands and check static level of fluid in the hole. Keep hole full at all times and monitor the mud loss rate. Should the hole stand full, allow 4-6 hours of healing time before staging back to bottom slowly and resuming drilling.

4. Should only partial returns be established, repeat the LCM pill once more. If complete loss of circulation persist, or if only partial returns can be established after the 2nd LCM pill, prepare a balanced, high-filtrate (50cc/30min@100psi) water based pill (40 bbls). Pull pipe above the suspected loss zone and spot the pill outside the drill pipe at 1 barrel per minute Pull out of the pill, close the hydril and if a float collar is in the string, pump down the annulus until sufficient backpressure is established. Hold the maximum allowable backpressure (300-900 psi) for 2-4 hours, open the hydril and establish full circulation before going to bottom.

5. Should the LCM pills fail to establish returns, be prepared to squeeze cement into loss zone.

Loss of circulation is a possibility on any well. Although each well is different, there are some basic procedures and drilling practices that can aid in reducing the severity and in some, cases prevent lost circulation. Below is a list of several parameters, which may prove helpful.

1. Maintain viscosities as low as possible and still clean the hole
2. Maintain mud weights as low as possible without jeopardizing safety.
3. Use slower tripping speeds to prevent swabbing and surging.
4. Break circulation in stages while tripping in the hole
5. Rotate pipe while breaking circulation.

## Solids Control

The most important contributing factor to good mud properties is a low native solids content. Conventional means of solids control (dilution, desanders, and desilters), used for water based muds are not economical because these methods can cause loss of

liquid portion of the mud and increase chemical consumption. The solids control equipment for this well should include:

- High Speed shale shaker with fine mesh screens.
- Mud Cleaners

**Shale Shaker**

Use a high-speed shale shaker with fine mesh screens. It is imperative to remove cuttings as quickly as possible before they have a chance to mechanically break up in the circulating system.

**Mud Cleaner**

Use a mud cleaner using the smallest screen possible (200 mesh). Monitor the discharge to avoid stripping excess amounts of product from the mud.

# Hydraulics

While drilling the deep mature shales in the Permian Basin, it is important to maintain an API filtrate to prevent hydration of the clays contained in those shales. Equally important

is to maintain a Laminar Hydraulic Profile in the annulus while drilling those shales. These shale exhibit a high degree of erosion when the annular profile is in turbulent flow.

The annular velocity in the well bore is a measure to control hole cleaning and to determine the annular hydraulic profile. Critical velocity is the point at which flow transitions from laminar to turbulent flow. Mud weight, Plastic Viscosity, Yield Point, Pump Rate, Hole Diameter and tool diameter all are factors in determining critical velocity.

If adjusting the pump rate will affect the bit nozzle optimization, then the rheology can be adjusted to bring the annular profile into laminar flow.

$$\tau C = \frac{1.08\ PV + 1.08\sqrt{PV^2 + 9\ 26(dh-dp)^2\ YP\ M}}{M\ (dh-dp)}$$

PV = Plastic Viscosity
YP = Yield Point
M = Mud Weight (ppg)
Dh = Diameter of hole (inches)
Dp = Diameter of pipe (inches)

$\tau C$ = Critical Velocity in feet per second.

**Filtration Control & Filter Cake Quality:**

Sealing permeable zones in the well bore has long been accepted as a major function of a drilling fluid. The cost of the filtration control represents a major portion of the mud cost. Traditionally, most of this cost has resulted from controlling the filtration rate as opposed to controlling the filter cake quality. This is understandable since a definitive number is more a

comfortable target than a subjective evaluation of a filter cake.

The primary objectives of filtration are:
- Minimize damage to the production zones.
- Optimize formation evaluation.
- Avoid differential pressure sticking of the pipe.
- Avoid under gauged holes due to thick filter cakes.

These objectives are achieved by focusing on important design factors:
- Compatibility of filtrate with formation solids.
- Thin, impermeable, and deformable filter cakes
- Lubricious and shearable filter cakes.

**Filtration Control Mechanisms:**
There are four basic mechanisms for controlling filtration control and reducing the filter cake permeability. Understanding these mechanisms along with how filtration control products function is important.

1. **Bridging**- Bridging reduces filtration rates and permeability by plugging or blocking the pore spaces at the face of the filter medium. It generally requires solids about one-third the diameter of the pore space to form a bridge. New Gel, Calcium Carbonate, Lost Circulation Materials, Starch, and Soltex (LST-MD) are primary bridging materials.

2. **Bonding**- Bonding is the connecting or binding of solids together. New Pac, Dynazan, WL-100 and other high molecular weight polymers function as bonding materials. Secondarily, these materials function as bridging materials as well as increasing the viscosity of the filtrate.

3. **Deflocculation**- Deflocculants reduce the electro-chemical attraction between solids. This allows solids to be filtered individually, as opposed to flocs, and also reduces the void spaces in the cake created by flocs of solids. Lignite, Chrome Ligno-Sulphonates, Desco, and other low molecular weight polymers perform as deflocculants.

4. **Viscosity**- Fluid loss decreases proportional to the increase in viscosity of the filtrate. Temperature alone will change the filtrate viscosity. Therefore, filtration control is more difficult at high temperatures. Any soluble material added to the fluid will viscosify the filtrate.

**Hydration, Flocculation, and Deflocculation**

The degree of hydration and flocculation of the filtered solids influence filter cake permeability. The effectiveness in permeability reduction may be demonstrated by ranking of clay solids according to their surface characteristics:

1. Dehydration/Aggregated/Flocculated (high permeability)

2. Hydrated/Flocculated (medium permeability)
3. Hydrated/Deflocculated (low permeability)

Since fluid loss and filter cake quality are important design factors, it is important to understand the predominate electro-chemical state of the solids. Initially, cake permeability is reduced as pre-hydrated bentonite is added to the system. When flocculated, these hydrated solids promote deformability or permeability reduction with increased pressure. This results from the compaction of hydrated flocs. With deflocculation, permeability is further decreased, as the void spaces created by the flocs diminish.

During drilling operations, hydrated solids are eventually dehydrated as the solids content increases and/or the system is converted to an inhibitive fluid. At this point, a decision must be made on the basis of economic and operational objectives. More pre-hydrated bentonite and/or other products may be added. These other products include New Pac, Calcium Carbonate, CMC, starch, or one of the new generation polymers.

Fluid loss control is a very complex process. The major factors that affect the process include time, pressure, temperature, filtrate viscosity, solids hydration, flocculation and filter cake erodability. Effective evaluation of the process requires that all factors be given strong consideration. Testing the fluids relative to the various factors is necessary to understand how a fluid may perform under down-hole conditions.

**Proposal No:** 180271896A

# OGX Resources,LLC
**Horizontal Package**

Eddy County, New Mexico
July 15, 2008

## Well Proposal

**Prepared for:**
Jeff Birkelbach

**Prepared by:**
Adam Pruett
Field Engineer
Houston, Texas

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**Service Point:**
Artesia
Bus Phone: (505) 746-3140
Fax: (505) 746-2293

**Service Representatives:**
Randy Kuiper
Executive Account Manager

**Operator Name:** OGX Resources,LLC
**Well Name:** Horizontal Package
**Job Description:** 13 3/8" Surface Casing @ 525'
**Date:** July 15, 2008

**Proposal No:** 180271896A

## JOB AT A GLANCE

| | |
|---|---|
| **Depth (TVD)** | 525 ft |
| **Depth (MD)** | 525 ft |
| **Hole Size** | 17.5 in |
| **Casing Size/Weight :** | 13 3/8 in, 48 lbs/ft |
| **Pump Via** | 13 3/8" O.D. (12.715" .I.D) 48 |
| **Total Mix Water Required** | 3,108 gals |
| **Lead Slurry** | |
| **35:65:6** | 180 sacks |
| **Density** | 12.8 ppg |
| **Yield** | 2.00 cf/sack |
| **Tail Slurry** | |
| **Class C** | 200 sacks |
| **Density** | 14.8 ppg |
| **Yield** | 1.34 cf/sack |
| **Displacement** | |
| **Displacement** | 76 bbls |

**Operator Name:** OGX Resources,LLC
**Well Name:** Horizontal Package
**Job Description:** 13 3/8" Surface Casing @ 525'
**Date:** July 15, 2008

**Proposal No:** 180271896A

## WELL DATA

### ANNULAR GEOMETRY

| ANNULAR I.D. (in) | DEPTH(ft) | |
|---|---|---|
| | MEASURED | TRUE VERTICAL |
| 17.500 HOLE | 525 | 525 |

### SUSPENDED PIPES

| DIAMETER (in) | | WEIGHT (lbs/ft) | DEPTH(ft) | |
|---|---|---|---|---|
| O.D. | I.D. | | MEASURED | TRUE VERTICAL |
| 13.375 | 12.715 | 48 | 525 | 525 |

| | |
|---|---|
| **Float Collar set @** | 485 ft |
| **Mud Density** | 8.60 ppg |
| **Est. Static Temp.** | 84 ° F |
| **Est. Circ. Temp.** | 80 ° F |

### VOLUME CALCULATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 256 ft | x | 0.6946 cf/ft | with | 100 % excess | = | 355.5 cf |
| 269 ft | x | 0.6946 cf/ft | with | 25 % excess | = | 233.7 cf |
| 40 ft | x | 0.8818 cf/ft | with | 0 % excess | = | 35.3 cf (inside pipe) |
| | | | | **TOTAL SLURRY VOLUME** | = | 624.4 cf |
| | | | | | = | 111 bbls |

## FLUID SPECIFICATIONS

| FLUID | VOLUME CU-FT | VOLUME FACTOR | AMOUNT AND TYPE OF CEMENT |
|---|---|---|---|
| Lead Slurry | 355 | / 2 | = 180 sacks (35:65) Poz (Fly Ash):Premium Plus C Cement + 6% bwoc Bentonite + 5% bwow Sodium Chloride + 5% bwoc MPA-5 + 0.7% bwoc Sodium Metasilicate + 5 lbs/sack LCM-1 + 97.9% Fresh Water |
| Tail Slurry | 269 | / 1.3 | = 200 sacks Premium Plus C Cement + 2% bwoc Calcium Chloride + 56.4% Fresh Water |
| Displacement | | | 76.2 bbls Displacement |

### CEMENT PROPERTIES

| | SLURRY NO. 1 | SLURRY NO. 2 |
|---|---|---|
| Slurry Weight (ppg) | 12.80 | 14.80 |
| Slurry Yield (cf/sack) | 2.00 | 1.34 |
| Amount of Mix Water (gps) | 10.21 | 6.36 |

## JOB AT A GLANCE

| | |
|---|---|
| **Depth (TVD)** | 2,700 ft |
| **Depth (MD)** | 2,700 ft |
| **Hole Size** | 12.25 in |
| **Casing Size/Weight :** | 9 5/8in, 36 lbs/ft |
| **Pump Via** | 9 5/8" O.D. (8.921" .I.D) 36 |
| **Total Mix Water Required** | 5,427 gals |
| **Lead Slurry** | |
| **35:65:4** | 400 sacks |
| **Density** | 12.7 ppg |
| **Yield** | 2.02 cf/sack |
| **Tail Slurry** | |
| **Class C** | 200 sacks |
| **Density** | 14.8 ppg |
| **Yield** | 1.34 cf/sack |
| **Displacement** | |
| **Dislplacement** | 206 bbls |

## WELL DATA

### ANNULAR GEOMETRY

| ANNULAR I.D. (in) | DEPTH(ft) | |
|---|---|---|
| | MEASURED | TRUE VERTICAL |
| 12.715 CASING | 525 | 525 |
| 12.250 HOLE | 2,700 | 2,700 |

### SUSPENDED PIPES

| DIAMETER (in) | | WEIGHT | DEPTH(ft) | |
|---|---|---|---|---|
| O.D. | I.D. | (lbs/ft) | MEASURED | TRUE VERTICAL |
| 9.625 | 8.921 | 36 | 2,700 | 2,700 |

**Float Collar set @** 2,660 ft

**Mud Density** 9.00 ppg

### VOLUME CALCULATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 525 ft | x | 0.3765 cf/ft | with | 0 % excess | = | 197.7 cf |
| 1,532 ft | x | 0.3132 cf/ft | with | 25 % excess | = | 599.9 cf |
| 643 ft | x | 0.3132 cf/ft | with | 25 % excess | = | 251.6 cf |
| 40 ft | x | 0.4341 cf/ft | with | 0 % excess | = | 17.4 cf (inside pipe) |
| | | | | **TOTAL SLURRY VOLUME** | = | 1066.5 cf |
| | | | | | = | 190 bbls |

## FLUID SPECIFICATIONS

| FLUID | VOLUME CU-FT | VOLUME FACTOR | AMOUNT AND TYPE OF CEMENT |
|---|---|---|---|
| Lead Slurry | 798 | / 2.0 | = 400 sacks (35:65) Poz (Fly Ash):Premium Plus C Cement + 4% bwoc Bentonite + 5% bwow Sodium Chloride + 5% bwoc MPA-5 + 0.7% bwoc Sodium Metasilicate + 5 lbs/sack LCM-1 + 99.6% Fresh Water |
| Tail Slurry | 269 | / 1.3 | = 200 sacks Premium Plus C Cement + 2% bwoc Calcium Chloride + 56.4% Fresh Water |
| Displacement | | 205.6 bbls Dislplacement | |

**CEMENT PROPERTIES**

| | SLURRY NO. 1 | SLURRY NO. 2 |
|---|---|---|
| Slurry Weight (ppg) | 12.70 | 14.80 |
| Slurry Yield (cf/sack) | 2.02 | 1.34 |
| Amount of Mix Water (gps) | 10.39 | 6.36 |

## JOB AT A GLANCE

| | |
|---|---|
| **Depth (TVD)** | 7,600 ft |
| **Depth (MD)** | 7,600 ft |
| **Hole Size** | 8.75 in |
| **Pump Via** | Casing 4 1/2" O.D. (3.920" .I.D) 13.5 |
| **Total Mix Water Required** | 1,201 gals |
| **Cement Slurry** | |
| **Class H** | 360 sacks |
| **Density** | 17.5 ppg |
| **Yield** | 0.94 cf/sack |
| **Displacement** | |
| **Displacement** | 101 bbls |

## FLUID SPECIFICATIONS

| PLUG NO. | VOLUME CU-FT | | VOLUME FACTOR | AMOUNT AND TYPE OF CEMENT |
|---|---|---|---|---|
| 1 | 338 | / | .94 | = 360 sacks Premium Plus H Cement + 1% bwoc CD-32 + 29.6% Fresh Water |
| Displacement | | | | = 100.7 bbls Displacement |

### CEMENT PROPERTIES

| | PLUG NO. 1 |
|---|---|
| Slurry Weight (ppg) | 17.50 |
| Slurry Yield (cf/sack) | 0.94 |
| Amount of Mix Water (gps) | 3.33 |

## PLUG GEOMETRY

| | PLUG TOP | | PLUG BOTTOM | |
|---|---|---|---|---|
| 1 | 6800 ft | to | 7600 ft | with 8.75 inch Open Hole |

## JOB AT A GLANCE

| | |
|---|---|
| **Depth (TVD)** | 7,600 ft |
| **Depth (MD)** | 10,500 ft |
| **Hole Size** | 8.75 in |
| **Casing Size/Weight :** | 5 1/2 in, 17 lbs/ft |
| **Pump Via** | 5 1/2" O.D. (4.892" .I.D) 17 |
| **Total Mix Water Required** | 15,625 gals |

**Stage No: 1** **Float Collar set @** 10,460 ft

| | |
|---|---|
| **Cement Slurry** | |
| **Class H** | 1,445 sacks |
| **Density** | 15.6 ppg |
| **Yield** | 1.18 cf/sack |
| **Displacement** | |
| **Displacement** | 243 bbls |

**Stage No: 2** **Stage Collar set @** 6,000 ft

| | |
|---|---|
| **Lead Slurry** | |
| **50:50:10** | 535 sacks |
| **Density** | 11.8 ppg |
| **Yield** | 2.44 cf/sack |
| **Tail Slurry** | |
| **Class C** | 100 sacks |
| **Density** | 14.8 ppg |
| **Yield** | 1.33 cf/sack |
| **Displacement** | |
| **Displacement** | 139 bbls |

## WELL DATA

### ANNULAR GEOMETRY

| ANNULAR I.D. (in) | DEPTH(ft) | |
|---|---|---|
| | MEASURED | TRUE VERTICAL |
| 8.921 CASING | 2,700 | 2,700 |
| 8.750 HOLE | 10,500 | 7,600 |

### SUSPENDED PIPES

| DIAMETER (in) | | WEIGHT | DEPTH(ft) | |
|---|---|---|---|---|
| O.D. | I.D. | (lbs/ft) | MEASURED | TRUE VERTICAL |
| 5.500 | 4.892 | 17 | 10,500 | 7,600 |

**STAGE: 1**

| | |
|---|---|
| **Float Collar set @** | 10,460 ft |
| **Mud Density** | 10.00 ppg |
| **Est. Static Temp.** | 138 ° F |
| **Est. Circ. Temp.** | 121 ° F |

### VOLUME CALCULATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 4,500 ft | x | 0.2526 cf/ft | with | 50 % excess | = | 1705.0 cf |
| 40 ft | x | 0.1305 cf/ft | with | 0 % excess | = | 5.2 cf (inside pipe) |
| | | | | **TOTAL SLURRY VOLUME** | = | 1710.2 cf |
| | | | | | = | 305 bbls |

**STAGE: 2**

| | |
|---|---|
| **Stage Collar set @** | 6,000 ft |
| **Mud Density** | 10.00 ppg |
| **Est. Static Temp.** | 126 ° F |
| **Est. Circ. Temp.** | 111 ° F |

### VOLUME CALCULATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 700 ft | x | 0.2691 cf/ft | with | 0 % excess | = | 188.4 cf |
| 2,950 ft | x | 0.2526 cf/ft | with | 50 % excess | = | 1117.8 cf |
| 350 ft | x | 0.2526 cf/ft | with | 50 % excess | = | 132.6 cf |
| | | | | **TOTAL SLURRY VOLUME** | = | 1438.7 cf |
| | | | | | = | 256 bbls |

## FLUID SPECIFICATIONS

### STAGE NO.: 1

| FLUID | VOLUME CU-FT | VOLUME FACTOR | AMOUNT AND TYPE OF CEMENT |
|---|---|---|---|
| Cement Slurry | 1710 | / 1.1 | = 1445 sacks Premium Plus H Cement + 0.7% bwoc FL-62 + 0.4% bwoc BA-10A + 0.1% bwoc FL-52 + 45.8% Fresh Water |
| Displacement | | | 243.2 bbls Displacement |

**CEMENT PROPERTIES**

| | SLURRY NO. 1 |
|---|---|
| Slurry Weight (ppg) | 15.60 |
| Slurry Yield (cf/sack) | 1.18 |
| Amount of Mix Water (gps) | 5.17 |

### STAGE NO.: 2

| FLUID | VOLUME CU-FT | VOLUME FACTOR | AMOUNT AND TYPE OF CEMENT |
|---|---|---|---|
| Lead Slurry | 1306 | / 2.4 | = 535 sacks (50:50) Poz (Fly Ash):Premium Plus C Cement + 10% bwoc Bentonite + 5% bwow Sodium Chloride + 139.7% Fresh Water |
| Tail Slurry | 133 | / 1.3 | = 100 sacks Premium Plus C Cement |
| Displacement | | | 139.5 bbls Displacement |

**CEMENT PROPERTIES**

| | SLURRY NO. 1 | SLURRY NO. 2 |
|---|---|---|
| Slurry Weight (ppg) | 11.80 | 14.80 |
| Slurry Yield (cf/sack) | 2.44 | 1.33 |
| Amount of Mix Water (gps) | 14.07 | 6.33 |

## PRODUCT DESCRIPTIONS

**BA-10A**
Improves cement bonding and acts as a matrix flow control agent. BA-10A is effective in a wide variety of slurries.

**Bentonite**
Commonly called gel, it is a clay material used as a cement extender and to control excessive free water.

**CD-32**
A patented, free-flowing, water soluble polymer that is an efficient and effective dispersant for primary and remedial cementing.

**Calcium Chloride**
A powdered, flaked or pelletized material used to decrease thickening time and increase the rate of strength development.

**FL-52**
A water soluble, high molecular weight fluid loss additive used in medium to low density slurries. It is functional from low to high temperature ranges.

**FL-62**
A patented dry blend of water soluble polymers that are formulated to control the loss of fluid during cementing operations. A dispersant and bonding additive are proportioned to deliver consistent performance and control fluid loss in primary and squeeze cementing applications at low to moderate temperatures.

**LCM-1**
A graded (8 to 60 mesh) naturally occurring hydrocarbon, asphaltite. It is used as a lost circulation material at low to moderate temperatures and will act as a slurry extender. Cement compressive strength is reduced.

**MPA-5**
Used to enhanced compressive, tensile, fleural strength development and reduced permeability

**Poz (Fly Ash)**
A synthetic pozzolan, (primarily Silicon Dioxide). When blended with cement, Pozzolan can be used to create lightweight cement slurries used as either a filler slurry or a sulfate resistant completion cement.

**Premium Plus H Cement**
Class H cement is an API type, all purpose oil well cement which is used without modification in wells up to 8,000 ft. It possesses a moderate sulfate resistance. With the use of accelerators or retarders, it can be used in a wide range of well depths and temperatures.

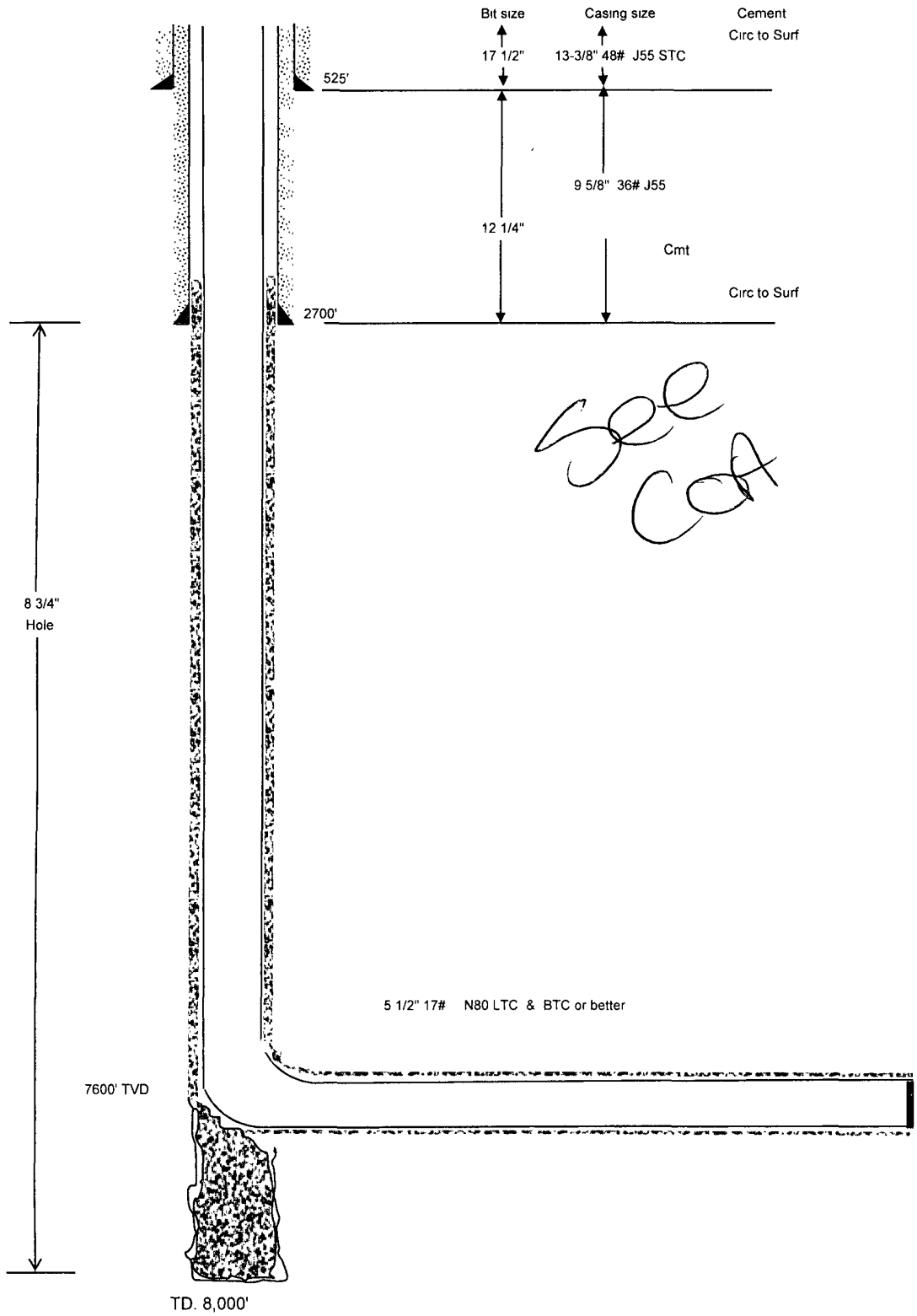
**Sodium Chloride**
At low concentrations, it is used to protect against clay swelling. At high concentrations, it is used to increase the

**Sodium Metasilicate**
An extender used to produce an economical, low density cement slurry.

# OGX Resources LLC

COOPER 31 FED No.2
660' FNL & 660'FEL
Sec 31, T25S, R29E
Eddy County, New Mexico

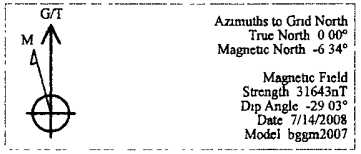
API: 30-015-XXXXX




7/11/2008

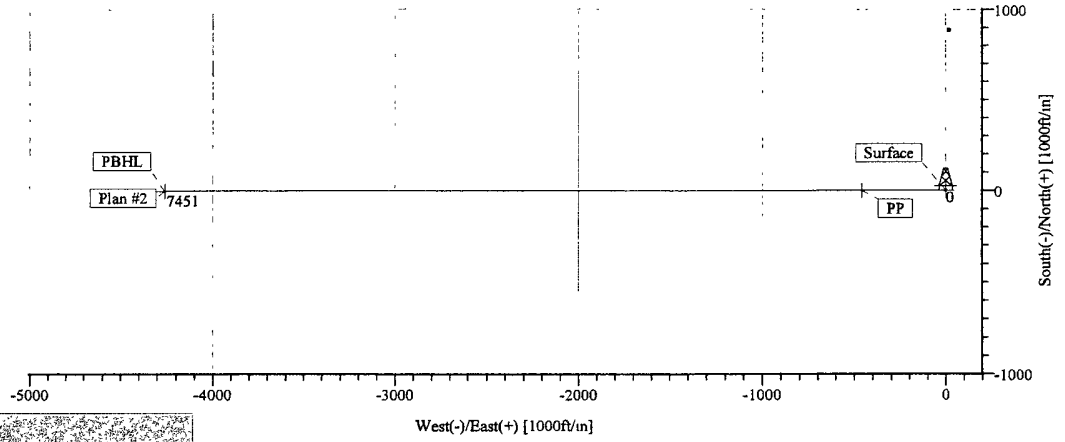
LEAM Drilling Systems, Inc.

# OGX Resources LLC
## Cooper 31 Fed. #2
## Eddy County, New Mexico




Azimuths to Grid North
True North 0 00°
Magnetic North -6 34°

Magnetic Field
Strength 31643nT
Dip Angle -29 03°
Date 7/14/2008
Model bggm2007




SECTION DETAILS

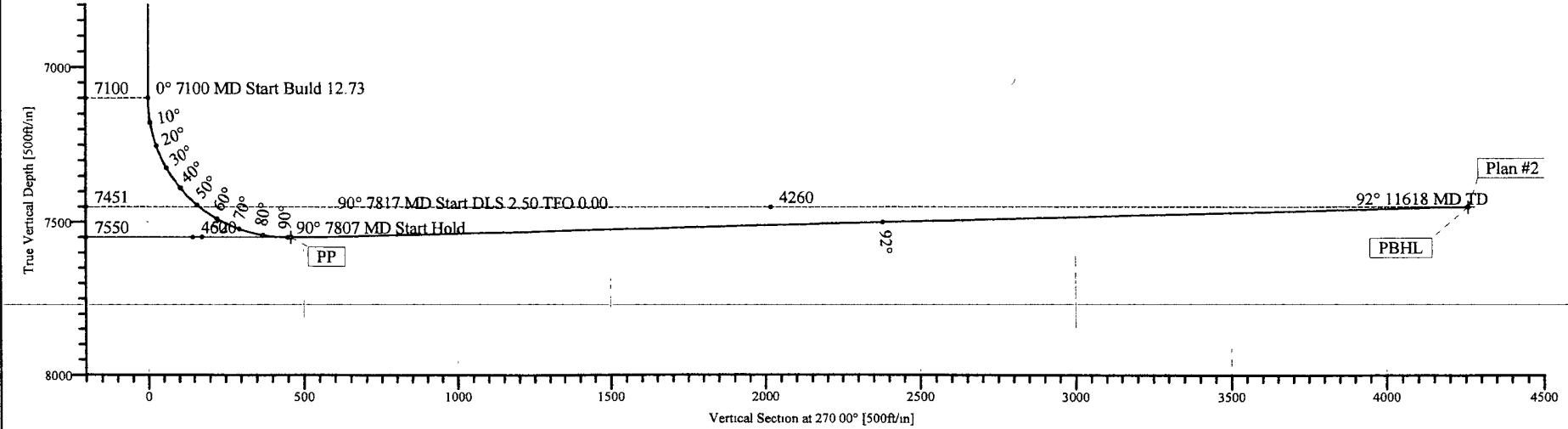
| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | VSec | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 00 | 0 00 | 270 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | |
| 2 | 7100 00 | 0 00 | 270 00 | 7100 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | |
| 3 | 7806 86 | 90 00 | 270 00 | 7550 00 | 0 00 | -450 00 | 12 73 | 270 00 | 450 00 | |
| 4 | 7816 86 | 90 00 | 270 00 | 7550 00 | 0 00 | -460 00 | 0 00 | 0 00 | 460 00 | PP |
| 5 | 7876 86 | 91 50 | 270 00 | 7549 21 | 0 00 | -519 99 | 2 50 | 0 00 | 519 99 | PBHL |
| 6 | 11618 15 | 91 50 | 270 00 | 7451 28 | 0 00 | -4260 00 | 0 00 | 0 00 | 4260 00 | PBHL |

TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|
| Surface | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | 00°00'00 000S | 000°00'00 000W | Point |
| PBHL | 7451 28 | 0 00 | -4260 00 | 0 00 | 0 00 | 00°00'00 000S | 000°00'00 000W | Point |
| PP | 7550 00 | 0 00 | -460 00 | 0 00 | 0 00 | 00°00'00 000S | 000°00'00 000W | Point |

WELL DETAILS

| Name | +N/-S | +E/-W | Latitude | Longitude | Slot |
|---|---|---|---|---|---|
| 31 Fed. #2 | 0 00 | 0 00 | 30°59'24 512N | 105°55'44 137W | N/A |




Plan 2 Cooper 31 Fed #2.gpl32

Created By T LeRoux Date 07/14/08

Checked _____ Date _____

Reviewed _____ Date _____

Approved _____ Date _____

# Leam Drilling Systems, Inc.
## Planning Report

| | | | | | |
|---|---|---|---|---|---|
| **Company:** | OGX RESOURCES | **Date:** 7/24/2008 | **Time:** 13:22:32 | **Page:** | 1 |
| **Field:** | Eddy County, New Mexico | **Co-ordinate(NE) Reference:** | Site: Cooper 31 Fed. #2, Grid North | | |
| **Site:** | Cooper 31 Fed. #2 | **Vertical (TVD) Reference:** | SITE 0.0 | | |
| **Well:** | 31 Fed. #2 | **Section (VS) Reference:** | Well (0.00N,0.00E,270.00Azi) | | |
| **Wellpath:** | OH | **Survey Calculation Method:** | Minimum Curvature | **Db:** | Sybase |

**Field:** Eddy County, New Mexico

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane Coordinate System 1927 | **Map Zone:** | New Mexico, Eastern Zone |
| **Geo Datum:** | NAD27 (Clarke 1866) | **Coordinate System:** | Site Centre |
| **Sys Datum:** | Mean Sea Level | **Geomagnetic Model:** | bggm2007 |

**Site:** Cooper 31 Fed. #2

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | ft | **Latitude:** | |
| **From:** | Local Only | **Easting:** | ft | **Longitude:** | |
| **Position Uncertainty:** | 0.00 ft | | | **North Reference:** | Grid |
| **Ground Level:** | 0.00 ft | | | **Grid Convergence:** | deg |

**Well:** 31 Fed. #2 **Slot Name:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position:** | +N/-S | 0.00 ft | **Northing:** | ft | **Latitude:** | |
| | +E/-W | 0.00 ft | **Easting :** | ft | **Longitude:** | |
| **Position Uncertainty:** | | 0.00 ft | | | | |

**Wellpath:** OH **Drilled From:** Surface

| | | | | | |
|---|---|---|---|---|---|
| **Current Datum:** | SITE | **Height** | 0.00 ft | **Tie-on Depth:** | 0.00 ft |
| **Magnetic Data:** | 7/14/2008 | | | **Above System Datum:** | Mean Sea Level |
| **Field Strength:** | 31643 nT | | | **Declination:** | -6.34 deg |
| | | | | **Mag Dip Angle:** | -29.03 deg |

| **Vertical Section:** Depth From (TVD) ft | +N/-S ft | +E/-W ft | Direction deg |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 270.00 |

| | | | |
|---|---|---|---|
| **Plan:** | Plan #2 | **Date Composed:** | 7/24/2008 |
| | | **Version:** | 1 |
| **Principal:** | No | **Tied-to:** | From Surface |

**Plan Section Information**

| MD ft | Incl deg | Azim deg | TVD ft | +N/-S ft | +E/-W ft | DLS deg/100ft | Build deg/100ft | Turn deg/100ft | TFO deg | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 270.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7100.00 | 0.00 | 270.00 | 7100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7806.86 | 90.00 | 270.00 | 7550.00 | 0.00 | -450.00 | 12.73 | 12.73 | 0.00 | 270.00 | |
| 7816.86 | 90.00 | 270.00 | 7550.00 | 0.00 | -460.00 | 0.00 | 0.00 | 0.00 | 0.00 | PP |
| 7876.86 | 91.50 | 270.00 | 7549.21 | 0.00 | -519.99 | 2.50 | 2.50 | 0.00 | 0.00 | PBHL |
| 11618.15 | 91.50 | 270.00 | 7451.28 | 0.00 | -4260.00 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL |

**Survey**

| MD ft | Incl deg | Azim deg | TVD ft | N/S ft | E/W ft | VS ft | DLS deg/100ft | Build deg/100ft | Turn deg/100ft | Tool/Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 270.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 100.00 | 0.00 | 270.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 200.00 | 0.00 | 270.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 300.00 | 0.00 | 270.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 400.00 | 0.00 | 270.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 500.00 | 0.00 | 270.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 600.00 | 0.00 | 270.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 700.00 | 0.00 | 270.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 800.00 | 0.00 | 270.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 900.00 | 0.00 | 270.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1000.00 | 0.00 | 270.00 | 1000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1100.00 | 0.00 | 270.00 | 1100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1200.00 | 0.00 | 270.00 | 1200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 00 | |
| 1300.00 | 0.00 | 270.00 | 1300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1400.00 | 0.00 | 270.00 | 1400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# Leam Drilling Systems, Inc.
## Planning Report

| | | | |
|---|---|---|---|
| **Company:** OGX RESOURCES | **Date:** 7/24/2008 **Time:** 13:22:32 | **Page:** 2 |
| **Field:** Eddy County, New Mexico | **Co-ordinate(NE) Reference:** Site: Cooper 31 Fed. #2, Grid North | |
| **Site:** Cooper 31 Fed. #2 | **Vertical (TVD) Reference:** SITE 0.0 | |
| **Well:** 31 Fed. #2 | **Section (VS) Reference:** Well (0.00N,0.00E,270.00Azi) | |
| **Wellpath:** OH | **Survey Calculation Method:** Minimum Curvature | **Db:** Sybase |

**Survey**

| MD ft | Incl deg | Azim deg | TVD ft | N/S ft | E/W ft | VS ft | DLS deg/100ft | Build deg/100ft | Turn deg/100ft | Tool/Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1500.00 | 0.00 | 270.00 | 1500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1600.00 | 0.00 | 270.00 | 1600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1700.00 | 0.00 | 270.00 | 1700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1800.00 | 0.00 | 270.00 | 1800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1900.00 | 0.00 | 270.00 | 1900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2000.00 | 0.00 | 270.00 | 2000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2100.00 | 0.00 | 270.00 | 2100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2200.00 | 0.00 | 270.00 | 2200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2300.00 | 0.00 | 270.00 | 2300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2400.00 | 0.00 | 270.00 | 2400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2500.00 | 0.00 | 270.00 | 2500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2600.00 | 0.00 | 270.00 | 2600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2700.00 | 0.00 | 270.00 | 2700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2800.00 | 0.00 | 270.00 | 2800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2900.00 | 0.00 | 270.00 | 2900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3000.00 | 0.00 | 270.00 | 3000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3100.00 | 0.00 | 270.00 | 3100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3200.00 | 0.00 | 270.00 | 3200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3300.00 | 0.00 | 270.00 | 3300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3400.00 | 0.00 | 270.00 | 3400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3500.00 | 0.00 | 270.00 | 3500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3600.00 | 0.00 | 270.00 | 3600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3700.00 | 0.00 | 270.00 | 3700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3800.00 | 0.00 | 270.00 | 3800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3900.00 | 0.00 | 270.00 | 3900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4000.00 | 0.00 | 270.00 | 4000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4100.00 | 0.00 | 270.00 | 4100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4200.00 | 0.00 | 270.00 | 4200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4300.00 | 0.00 | 270.00 | 4300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4400.00 | 0.00 | 270.00 | 4400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4500.00 | 0.00 | 270.00 | 4500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4600.00 | 0.00 | 270.00 | 4600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4700.00 | 0.00 | 270.00 | 4700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4800.00 | 0.00 | 270.00 | 4800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4900.00 | 0.00 | 270.00 | 4900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5000.00 | 0.00 | 270.00 | 5000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5100.00 | 0.00 | 270.00 | 5100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5200.00 | 0.00 | 270.00 | 5200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5300.00 | 0.00 | 270.00 | 5300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5400.00 | 0.00 | 270.00 | 5400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5500.00 | 0.00 | 270.00 | 5500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5600.00 | 0.00 | 270.00 | 5600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5700.00 | 0.00 | 270.00 | 5700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5800.00 | 0.00 | 270.00 | 5800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5900.00 | 0.00 | 270.00 | 5900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6000.00 | 0.00 | 270.00 | 6000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6100.00 | 0.00 | 270.00 | 6100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6200.00 | 0.00 | 270.00 | 6200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6300.00 | 0.00 | 270.00 | 6300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6400.00 | 0.00 | 270.00 | 6400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6500.00 | 0.00 | 270.00 | 6500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6600.00 | 0.00 | 270.00 | 6600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6700.00 | 0.00 | 270.00 | 6700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |

# Leam Drilling Systems, Inc.
## Planning Report

| | | | |
|---|---|---|---|
| **Company:** OGX RESOURCES | **Date:** 7/24/2008 **Time:** 13:22:32 | **Page:** 3 |
| **Field:** Eddy County, New Mexico | **Co-ordinate(NE) Reference:** Site: Cooper 31 Fed. #2, Grid North | |
| **Site:** Cooper 31 Fed. #2 | **Vertical (TVD) Reference:** SITE 0.0 | |
| **Well:** 31 Fed. #2 | **Section (VS) Reference:** Well (0.00N,0.00E,270.00Azi) | |
| **Wellpath:** OH | **Survey Calculation Method:** Minimum Curvature | **Db:** Sybase |

**Survey**

| MD ft | Incl deg | Azim deg | TVD ft | N/S ft | E/W ft | VS ft | DLS deg/100ft | Build deg/100ft | Turn deg/100ft | Tool/Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 6800.00 | 0.00 | 270.00 | 6800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6900.00 | 0.00 | 270.00 | 6900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7000.00 | 0.00 | 270.00 | 7000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7100.00 | 0.00 | 270.00 | 7100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7125.00 | 3.18 | 270.00 | 7124.99 | 0.00 | -0.69 | 0.69 | 12.73 | 12.73 | 0.00 | |
| 7150.00 | 6.37 | 270.00 | 7149.90 | 0.00 | -2.77 | 2.77 | 12.73 | 12.73 | 0.00 | |
| 7175.00 | 9.55 | 270.00 | 7174.65 | 0.00 | -6.24 | 6.24 | 12.73 | 12.73 | 0.00 | |
| 7200.00 | 12.73 | 270.00 | 7199.18 | 0.00 | -11.07 | 11.07 | 12.73 | 12.73 | 0.00 | |
| 7225.00 | 15.92 | 270.00 | 7223.40 | 0.00 | -17.25 | 17.25 | 12.73 | 12.73 | 0.00 | |
| 7250.00 | 19.10 | 270.00 | 7247.24 | 0.00 | -24.77 | 24.77 | 12.73 | 12.73 | 0.00 | |
| 7275.00 | 22.28 | 270.00 | 7270.62 | 0.00 | -33.60 | 33.60 | 12.73 | 12.73 | 0.00 | |
| 7300.00 | 25.46 | 270.00 | 7293.48 | 0.00 | -43.72 | 43.72 | 12.73 | 12.73 | 0.00 | |
| 7325.00 | 28.65 | 270.00 | 7315.74 | 0.00 | -55.09 | 55.09 | 12.73 | 12.73 | 0.00 | |
| 7350.00 | 31.83 | 270.00 | 7337.34 | 0.00 | -67.68 | 67.68 | 12.73 | 12.73 | 0.00 | |
| 7375.00 | 35.01 | 270.00 | 7358.20 | 0.00 | -81.45 | 81.45 | 12.73 | 12.73 | 0.00 | |
| 7400.00 | 38.20 | 270.00 | 7378.27 | 0.00 | -96.35 | 96.35 | 12.73 | 12.73 | 0.00 | |
| 7425.00 | 41.38 | 270.00 | 7397.47 | 0.00 | -112.35 | 112.35 | 12.73 | 12.73 | 0.00 | |
| 7450.00 | 44.56 | 270.00 | 7415.76 | 0.00 | -129.39 | 129.39 | 12.73 | 12.73 | 0.00 | |
| 7475.00 | 47.75 | 270.00 | 7433.08 | 0.00 | -147.41 | 147.41 | 12.73 | 12.73 | 0.00 | |
| 7500.00 | 50.93 | 270.00 | 7449.37 | 0.00 | -166.38 | 166.38 | 12.73 | 12.73 | 0.00 | |
| 7525.00 | 54.11 | 270.00 | 7464.58 | 0.00 | -186.21 | 186.21 | 12.73 | 12.73 | 0.00 | |
| 7550.00 | 57.30 | 270.00 | 7478.66 | 0.00 | -206.86 | 206.86 | 12.73 | 12.73 | 0.00 | |
| 7575.00 | 60.48 | 270.00 | 7491.58 | 0.00 | -228.27 | 228.27 | 12.73 | 12.73 | 0.00 | |
| 7600.00 | 63.66 | 270.00 | 7503.29 | 0.00 | -250.35 | 250.35 | 12.73 | 12.73 | 0.00 | |
| 7625.00 | 66.85 | 270.00 | 7513.75 | 0.00 | -273.05 | 273.05 | 12.73 | 12.73 | 0.00 | |
| 7650.00 | 70.03 | 270.00 | 7522.94 | 0.00 | -296.30 | 296.30 | 12.73 | 12.73 | 0.00 | |
| 7675.00 | 73.21 | 270.00 | 7530.82 | 0.00 | -320.02 | 320.02 | 12.73 | 12.73 | 0.00 | |
| 7700.00 | 76.39 | 270.00 | 7537.37 | 0.00 | -344.14 | 344.14 | 12.73 | 12.73 | 0.00 | |
| 7725.00 | 79.58 | 270.00 | 7542.58 | 0.00 | -368.59 | 368.59 | 12.73 | 12.73 | 0.00 | |
| 7750.00 | 82.76 | 270.00 | 7546.41 | 0.00 | -393.29 | 393.29 | 12.73 | 12.73 | 0.00 | |
| 7775.00 | 85.94 | 270.00 | 7548.87 | 0.00 | -418.17 | 418.17 | 12.73 | 12.73 | 0.00 | |
| 7800.00 | 89.13 | 270.00 | 7549.95 | 0.00 | -443.14 | 443.14 | 12.73 | 12.73 | 0.00 | |
| 7806.86 | 90.00 | 270.00 | 7550.00 | 0.00 | -450.00 | 450.00 | 12.73 | 12.73 | 0.00 | |
| 7816.86 | 90.00 | 270.00 | 7550.00 | 0.00 | -460.00 | 460 00 | 0.00 | 0.00 | 0.00 | PP |
| 7876.86 | 91.50 | 270.00 | 7549.21 | 0.00 | -519.99 | 519.99 | 2.50 | 2.50 | 0.00 | PBHL |
| 7900.00 | 91.50 | 270.00 | 7548.61 | 0.00 | -543.13 | 543.13 | 0.00 | 0.00 | 0.00 | |
| 8000.00 | 91.50 | 270.00 | 7545.99 | 0.00 | -643.09 | 643.09 | 0.00 | 0.00 | 0.00 | |
| 8100.00 | 91.50 | 270.00 | 7543.37 | 0.00 | -743.06 | 743.06 | 0.00 | 0.00 | 0.00 | |
| 8200.00 | 91.50 | 270.00 | 7540.76 | 0.00 | -843.02 | 843.02 | 0.00 | 0.00 | 0.00 | |
| 8300.00 | 91.50 | 270.00 | 7538.14 | 0.00 | -942.99 | 942.99 | 0.00 | 0.00 | 0.00 | |
| 8400.00 | 91.50 | 270.00 | 7535.52 | 0.00 | -1042.96 | 1042.96 | 0.00 | 0.00 | 0.00 | |
| 8500.00 | 91.50 | 270.00 | 7532.90 | 0.00 | -1142.92 | 1142.92 | 0.00 | 0.00 | 0.00 | |
| 8600.00 | 91.50 | 270.00 | 7530.29 | 0.00 | -1242.89 | 1242.89 | 0.00 | 0.00 | 0.00 | |
| 8700.00 | 91.50 | 270.00 | 7527.67 | 0.00 | -1342.85 | 1342.85 | 0.00 | 0.00 | 0.00 | |
| 8800.00 | 91.50 | 270.00 | 7525.05 | 0.00 | -1442.82 | 1442.82 | 0.00 | 0.00 | 0.00 | |
| 8900.00 | 91.50 | 270.00 | 7522.43 | 0.00 | -1542.78 | 1542.78 | 0.00 | 0.00 | 0.00 | |
| 9000.00 | 91.50 | 270.00 | 7519.81 | 0.00 | -1642.75 | 1642.75 | 0.00 | 0.00 | 0.00 | |
| 9100.00 | 91.50 | 270.00 | 7517.20 | 0.00 | -1742.72 | 1742.72 | 0.00 | 0.00 | 0.00 | |
| 9200.00 | 91.50 | 270.00 | 7514.58 | 0.00 | -1842.68 | 1842.68 | 0.00 | 0.00 | 0.00 | |
| 9300.00 | 91.50 | 270.00 | 7511.96 | 0.00 | -1942.65 | 1942.65 | 0.00 | 0.00 | 0.00 | |
| 9400.00 | 91.50 | 270.00 | 7509.34 | 0.00 | -2042.61 | 2042.61 | 0.00 | 0.00 | 0.00 | |
| 9500.00 | 91.50 | 270.00 | 7506.73 | 0.00 | -2142.58 | 2142.58 | 0.00 | 0.00 | 0.00 | |

# Leam Drilling Systems, Inc.
## Planning Report

| | | | | | |
|---|---|---|---|---|---|
| **Company:** | OGX RESOURCES | **Date:** 7/24/2008 | **Time:** 13:22:32 | **Page:** | 4 |
| **Field:** | Eddy County, New Mexico | **Co-ordinate(NE) Reference:** | Site: Cooper 31 Fed. #2, Grid North | | |
| **Site:** | Cooper 31 Fed. #2 | **Vertical (TVD) Reference:** | SITE 0.0 | | |
| **Well:** | 31 Fed. #2 | **Section (VS) Reference:** | Well (0.00N,0.00E,270.00Azi) | | |
| **Wellpath:** | OH | **Survey Calculation Method:** | Minimum Curvature | **Db:** | Sybase |

**Survey**

| MD ft | Incl deg | Azim deg | TVD ft | N/S ft | E/W ft | VS ft | DLS deg/100ft | Build deg/100ft | Turn deg/100ft | Tool/Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 9600.00 | 91.50 | 270.00 | 7504.11 | 0.00 | -2242.54 | 2242.54 | 0.00 | 0.00 | 0.00 | |
| 9700.00 | 91.50 | 270.00 | 7501.49 | 0.00 | -2342.51 | 2342.51 | 0.00 | 0.00 | 0.00 | |
| 9800.00 | 91.50 | 270.00 | 7498.87 | 0.00 | -2442.48 | 2442.48 | 0.00 | 0.00 | 0.00 | |
| 9900.00 | 91.50 | 270.00 | 7496.26 | 0.00 | -2542.44 | 2542.44 | 0.00 | 0.00 | 0.00 | |
| 10000.00 | 91.50 | 270.00 | 7493.64 | 0.00 | -2642.41 | 2642.41 | 0.00 | 0.00 | 0.00 | |
| 10100.00 | 91.50 | 270.00 | 7491.02 | 0.00 | -2742.37 | 2742.37 | 0.00 | 0.00 | 0.00 | |
| 10200.00 | 91.50 | 270.00 | 7488.40 | 0.00 | -2842.34 | 2842.34 | 0.00 | 0.00 | 0.00 | |
| 10300.00 | 91.50 | 270.00 | 7485.78 | 0.00 | -2942.30 | 2942.30 | 0.00 | 0.00 | 0.00 | |
| 10400.00 | 91.50 | 270.00 | 7483.17 | 0.00 | -3042.27 | 3042.27 | 0.00 | 0.00 | 0.00 | |
| 10500.00 | 91.50 | 270.00 | 7480.55 | 0.00 | -3142.24 | 3142.24 | 0.00 | 0.00 | 0.00 | |
| 10600.00 | 91.50 | 270.00 | 7477.93 | 0.00 | -3242.20 | 3242.20 | 0.00 | 0.00 | 0.00 | |
| 10700.00 | 91.50 | 270.00 | 7475.31 | 0.00 | -3342.17 | 3342.17 | 0.00 | 0.00 | 0.00 | |
| 10800.00 | 91.50 | 270.00 | 7472.70 | 0.00 | -3442.13 | 3442.13 | 0.00 | 0.00 | 0.00 | |
| 10900.00 | 91.50 | 270.00 | 7470.08 | 0.00 | -3542.10 | 3542.10 | 0.00 | 0.00 | 0.00 | |
| 11000.00 | 91.50 | 270.00 | 7467.46 | 0.00 | -3642.06 | 3642.06 | 0.00 | 0.00 | 0.00 | |
| 11100.00 | 91.50 | 270.00 | 7464.84 | 0.00 | -3742.03 | 3742.03 | 0.00 | 0.00 | 0.00 | |
| 11200.00 | 91.50 | 270.00 | 7462.22 | 0.00 | -3842.00 | 3842.00 | 0.00 | 0.00 | 0.00 | |
| 11300.00 | 91.50 | 270.00 | 7459.61 | 0.00 | -3941.96 | 3941.96 | 0.00 | 0.00 | 0.00 | |
| 11400.00 | 91.50 | 270.00 | 7456.99 | 0.00 | -4041.93 | 4041.93 | 0.00 | 0.00 | 0.00 | |
| 11500.00 | 91.50 | 270.00 | 7454.37 | 0.00 | -4141.89 | 4141.89 | 0.00 | 0.00 | 0.00 | |
| 11600.00 | 91.50 | 270.00 | 7451.75 | 0.00 | -4241.86 | 4241.86 | 0.00 | 0.00 | 0.00 | |
| 11618.15 | 91.50 | 270.00 | 7451.28 | 0.00 | -4260.00 | 4260.00 | 0.00 | 0.00 | 0.00 | PBHL |

**Targets**

| Name | Description Dip. | Dir. | TVD ft | +N/-S ft | +E/-W ft | Map Northing ft | Map Easting ft | <--- Latitude ---> Deg Min Sec | <--- Longitude ---> Deg Min Sec |
|---|---|---|---|---|---|---|---|---|---|
| Surface | | | 0.00 | 0.00 | 0.00 | | | 30 59 25.114 N | 105 54 55.213 W |
| PBHL | | | 7451.28 | 0.00 | -4260.00 | | | 30 59 25.114 N | 105 54 55.213 W |
| PP | | | 7550.00 | 0.00 | -460.00 | | | 30 59 25.114 N | 105 54 55.213 W |

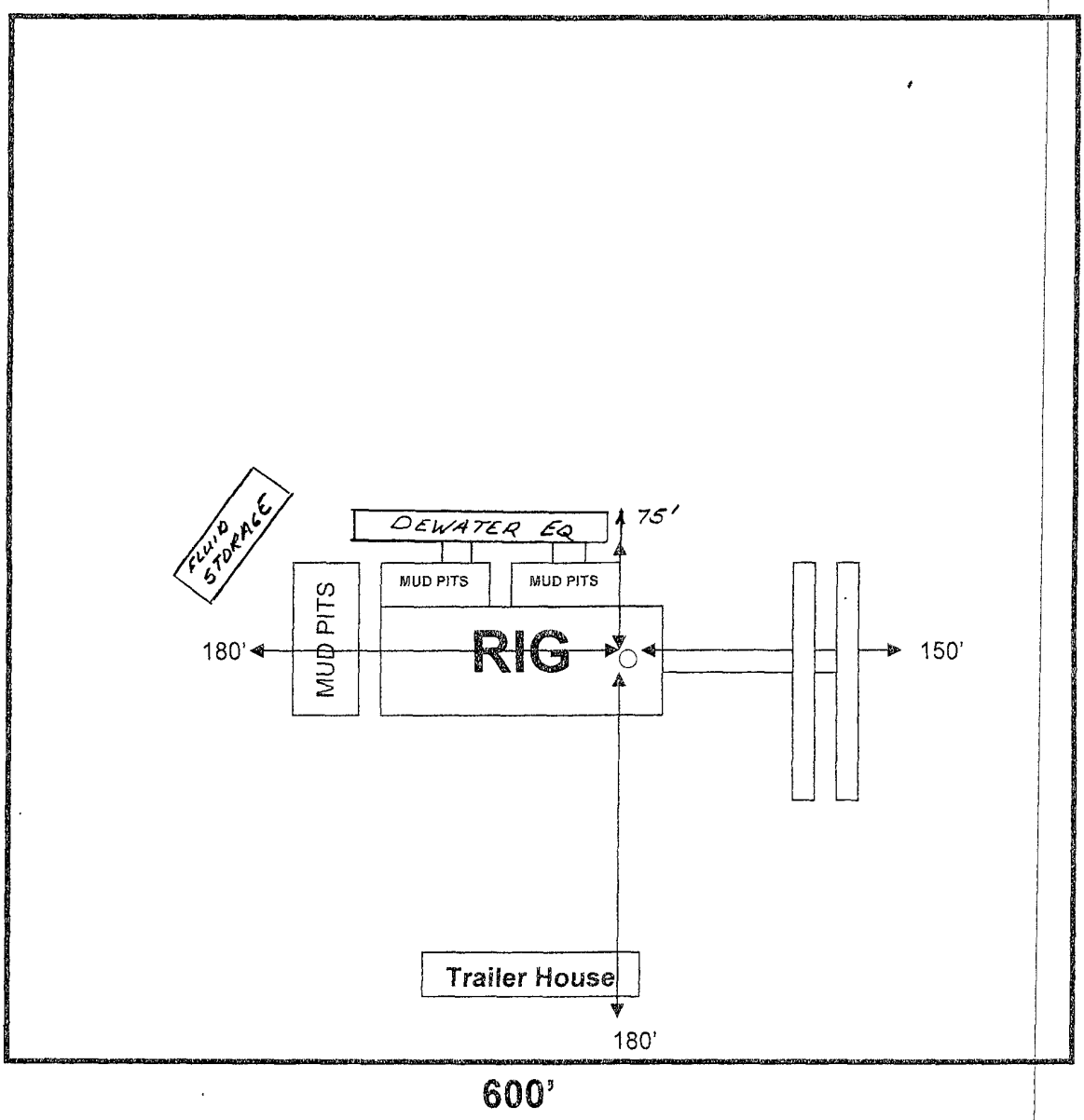
**Casing Points**

| MD | TVD | Diameter | Hole Size | Name |
|---|---|---|---|---|

**Formations**

| MD | TVD | Formations | Lithology | Dip Angle | Dip Direction |
|---|---|---|---|---|---|

# DRILLING RIG LAYOUT
# OGX Resources, LLC.

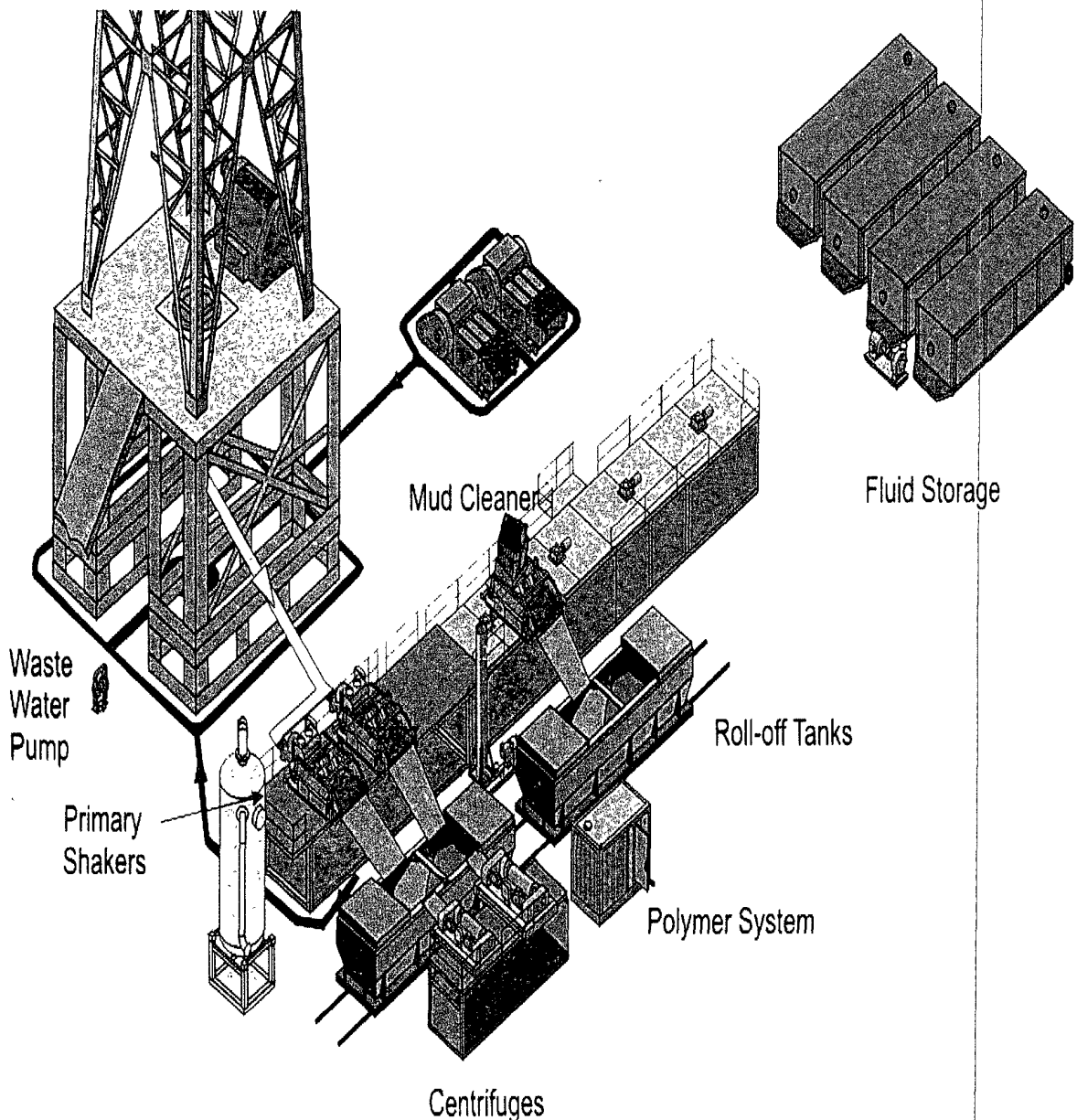


**Environmental Services Program**

**OGX Development Wells**
**, New Mexico**
**Quote: 2008-004ODE**

# OGX Energy, Inc

## Closed Loop System with Roll-off Tanks



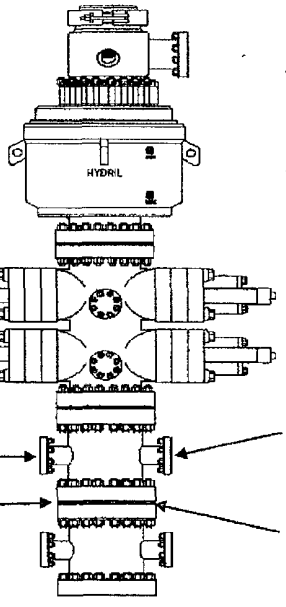

MI SWACO

MI SWACO

8522 Andrews Hwy
Odessa, Texas 79765
(432) 550-2944

**OGX RESOURCES**
**BOP SCHEMATIC**

WELL: COOPER 31 FED #2H DATE: 8-Sep




WILLIAMS ROT HD - 11" 3M X 7 1/16" 3M
23 3/4" HIGH

HYDRIL GK 11" 3M X 11" 3M
45" HIGH
W/ 1" 5M VALVES IN HYDRAULIC PORTS

SHAFFER TYPE LWS DOUBLE U 11" 3M
54.5" HIGH

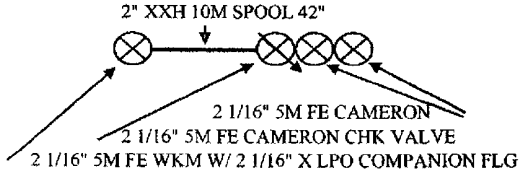
CHOKE LINE
DRILLING SPOOL 11" 3M X 11" 3M
W/ 4 1/16" & 2 1/16" 5M SIDE OUTLETS
24" HIGH
DSA 11" 3M X11" 3M (NOT SHOWN) - 5" HIGH

WELLHEAD 13 5/8" 3M X 11"3M
23" HIGH

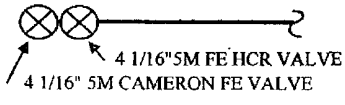
| | |
|---|---|
| WELLHEAD ( NORTH) | W/ 1 1 9/16" 3M WKM VALVE<br>W/ 1 2" TAPPED BP W/ NEEDLE VALVE |
| WELLHEAD (SOUTH) | 2" 3M BLIND FLG |

TOTAL HEIGHT F/ TOP WELLHEAD TO TOP ROT HD = 147.67" = 12.3'

**KILL LINE**




**CHOKE LINE**



# ANNULAR BOP - SURFACE CONTROL PRESSURE

## HYDRIL GK

1. CLOSING PRESSURES ARE AVERAGE & WILL VARY SLIGHTLY W/ EA ELEMENT.
2. USE CLOSING PRESSURE SHOWN & REDUCE CLOSING PRESSURE AS WELL PRESSURE INCREASES. WELL PRESSURE WILL MAINTAIN CLOSURE AFTER EXCEEDING THE REQUIRED LEVEL.
3. CLOSE CAUTIOUSLY TO PREVENT COLLAPSE OF LARGE CASINGS
4. FOR STRIPPING, GRADUALLY REDUCE THE CLOSING PRESSURE UNTIL A SMALL AMOUNT OF WELL FLUID LEAKS PAST AS THE TOOL JOINT PASES THRU THE ANNULAR. THIS WILL PROVIDE LUBRICATION & PREVENT EXCESSIVE TEMPERATURE BUILDUP AS THE ELEMENT WEARS, GRACUALLY INCREASE CLOSING PRESSURE TO PREVENT EXCESSIVE LEAKAGE. AS THE CLOSING PRESSURE APPROACHES 1500 PSI, GO TO ANOTHER BAG

| PIPE SIZE INCHES | INITIAL CLOSURE PSI | WELL PRESSURE, PSI 500 | 1500 | 2500 | 3500 | 5000 |
|---|---|---|---|---|---|---|
| | | | **7 /16" 3M/5M** | | | |
| 2 7/8 | 975 | 860 | 650 | 320 | N/A | N/A |
| 3 1/2 | 840 | 740 | 520 | 300 | N/A | N/A |
| 4 5-5 | 500 | 420 | 240 | 100 | N/A | N/A |
| | | | **7 1/16" 10M** | | | |
| 2 3/8 | 850 | 650 | 275 | 50 | 50 | 50 |
| 2 7/8 | 750 | 575 | 180 | 50 | 50 | 50 |
| 3 1/2 | 575 | 400 | 100 | 50 | 50 | 50 |
| 4 5-5 | 350 | 225 | 50 | 50 | 50 | 50 |
| | | | **11"3M** | | | |
| 2 3/8 | 850 | 825 | 700 | 650 | N/A | N/A |
| 2 7/8 | 850 | 825 | 700 | 650 | N/A | N/A |
| 3 1/2 | 850 | 825 | 700 | 650 | N/A | N/A |
| 4.5-5 | 800 | 750 | 650 | 450 | N/A | N/A |
| 5 1/2-6 5/8 | 800 | 750 | 650 | 450 | N/A | N/A |
| | | | **11"5M** | | | |
| 2 3/8 | 900 | 825 | 650 | 475 | 300 | 50 |
| 2 7/8 | 800 | 725 | 550 | 375 | 200 | 50 |
| 3 1/2 | 825 | 450 | 275 | 100 | 50 | 50 |
| 4.5-5 | 450 | 375 | 225 | 100 | 50 | 50 |
| 5 1/2-6 5/8 | 350 | 275 | 125 | 50 | 50 | 50 |
| | | | **11" 10M** | | | |
| 2 3/8 | 1100 | 1000 | 800 | 700 | 500 | 200 |
| 2 7/8 | 800 | 700 | 550 | 350 | 200 | 200 |
| 3 1/2 | 700 | 650 | 450 | 300 | 200 | 200 |
| 4.5-5 | 500 | 400 | 300 | 200 | 200 | 200 |
| | | | **13 5/8" 3M** | | | |
| 2 7/8 | 1100 | 900 | 500 | 200 | N/A | N/A |
| 3 1/2 | 1000 | 800 | 400 | 200 | N/A | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4.5-5 | 800 | 600 | 250 | 200 | N/A | N/A |
| 7 | 700 | 550 | 200 | 200 | N/A | N/A |
| 9 5/8 | 400 | 200 | 200 | 200 | N/A | N/A |
| | | | **13 5/8" 5M** | | | |
| 2 3/8 | 975 | 875 | 650 | 400 | 200 | 80 |
| 2 7/8 | 750 | 650 | 425 | 200 | 80 | 80 |
| 3 1/2 | 720 | 580 | 340 | 80 | 80 | 80 |
| 4.5-5 | 650 | 525 | 225 | 80 | 80 | 80 |
| 7-9 5/8 | 625 | 450 | 80 | 80 | 80 | 80 |
| | | | **13 5/8" 10M** | | | |
| 2 3/8 | 1400 | 1350 | 1250 | 1125 | 1000 | 850 |
| 2 7/8 | 1400 | 1350 | 1250 | 1125 | 1000 | 850 |
| 3 1/2 | 1200 | 1150 | 1050 | 950 | 850 | 700 |
| 4.5-5 | 700 | 650 | 550 | 450 | 375 | 200 |

**SHAFFER SPHERICAL ANNULARS** - SHAFFER ANNULARS ARE NOT ASSISTED BY WELLBORE PRESSURE.

1 RECOMMENDED INITIAL CLOSING PRESSURE IS **1500 PSI.**

2 FOR STRIPPING, GRADUALLY REDUCE THE CLOSING PRESSURE UNTIL A SMALL AMOUNT OF WELL FLUID LEAKS PAST AS THE TOOL JOINT PASES THRU THE ANNULAR THIS WILL PROVIDE LUBRICATION & PREVENT EXCESSIVE TEMPERATURE BUILDUP.

3 AS THE ELEMENT WEARS, GRACUALLY INCREASE CLOSING PRESSURE TO PREVENT EXCESSIVE LEAKAGE. AS THE CLOSING PRESSURE APPROACHES 1500 PSI, GO TO ANOTHER BAG.

THE SPHERICALS LISTED BELOW REQUIRE A REDUCED CLOSING PRESSURE WHEN CLOSED ON CASING ALL OTHERS REQUIRE NO PRESSURE ADJUSTMENT

| SIZE | WP, PSI | CASING SIZE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| INCHES | | 7 5/8" | 8 5/8" | 9 5/8" | 10 3/4" | 11 3/8" | 13 3/8" | 16" | 18 5/8" | 20" |
| 20 3/4 | 3M | 1400 | 1175 | 975 | 790 | 640 | 480 | 300 | 190 | 150 |
| 21 1/4 | 5M | 1400 | 1175 | 975 | 790 | 640 | 480 | 300 | 190 | 150 |
| 21 1/4 | 2M | 1400 | 1175 | 975 | 790 | 640 | 480 | 300 | 190 | 150 |
| 18 3/4 | 10M | | | 385 | | | 310 | 325 | | |
| 18 3/4 | 5M | 1400 | 1175 | 975 | 790 | 640 | 480 | 300 | | |
| 16 3/4 | 5M | 1400 | 1175 | 975 | 790 | 640 | 480 | | | |
| 13 5/8 | 3M | 1265 | 890 | 615 | 415 | 280 | | | | |
| 13 5/8 | 5M | 1265 | 890 | 615 | 415 | 280 | | | | |
| 30 | 1M | | | 1100 | | | 1100 | | | 900 |

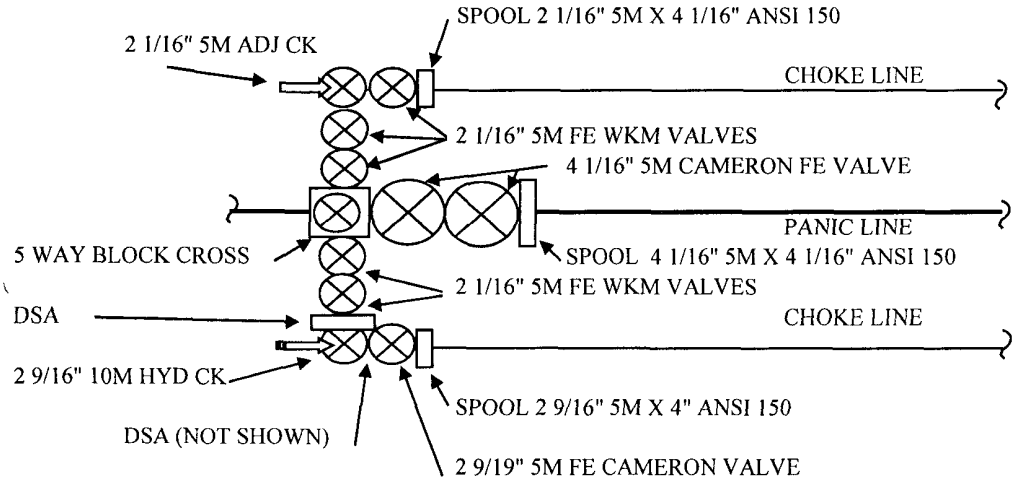
**CONTACTS:**

SHAFFER (VARCO) TOM BISHOP 713-980-8564

HYDRIL AARON SMITH 281-985-8008 ASMITH@HYDRIL.COM

# OGX RESOURCES LLC
# CHOKE MANIFOLD

WELL: COOPER 31 FED #2 DATE: JULY 11,2008



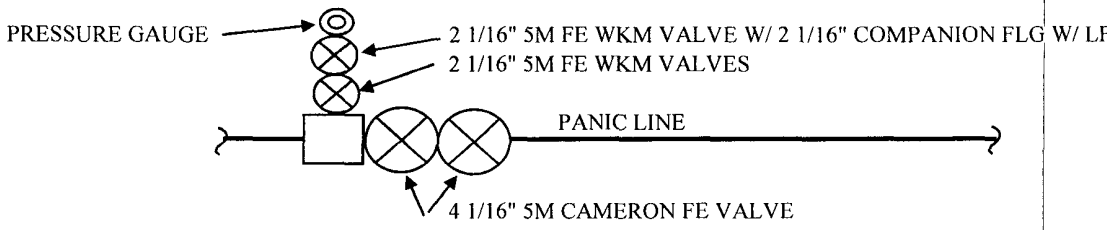

**CHOKE LINES (BLUE)** - 4" 0.237" WALL W/ 4" ANSI 150 FLANGES - ID= 4.026"

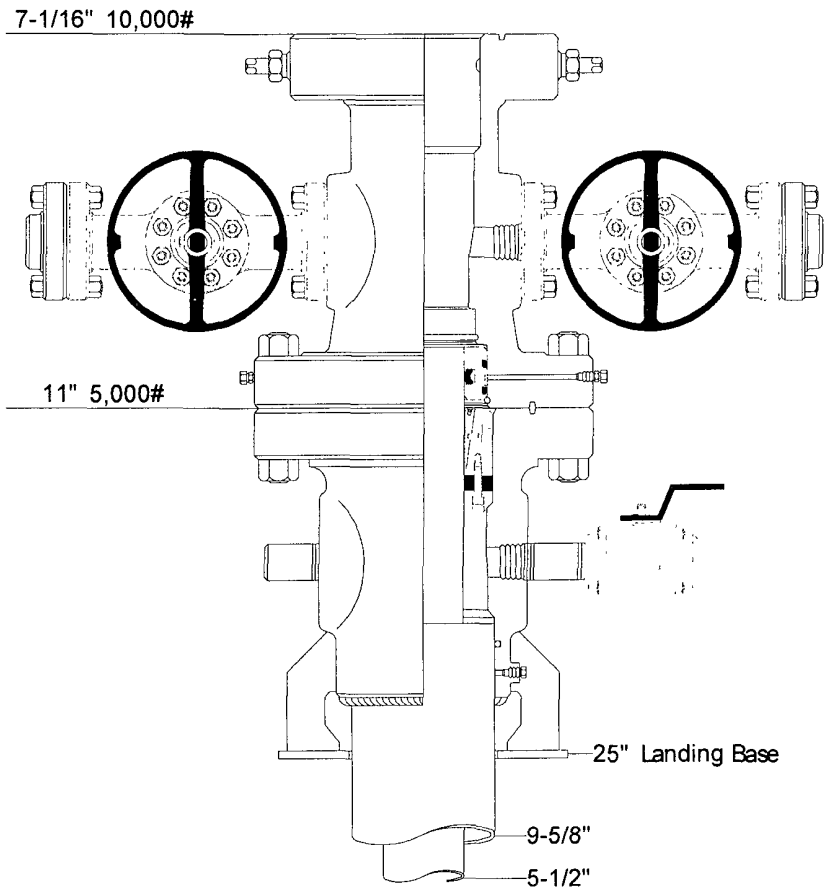
1 ALL VALVES BALON TYPE "F" W/ ANSI 150 FLANGES - FULL OPEN 4X4X4. OR 4" DSI 150 FE LUF- N GATE VALVE W/ NACE TRIM.(FULL OPEN)
2 ONE CK TO SEPARATOR W/ TEE TO PIT
3 ONE CK TO SEPARATOR W/ TEE TO FLARE PIT

**PANIC LINE (RED)** - 4" 0.156" WALL W/ 4" LIGHT WALL ANSI 150 FLGS - ID=4.188"

1 PANIC LINE - NO VALVES OR CONNECTIONS
2 PANIC LINE TO FLARE PIT - DOES NOT GO THRU WATERMELLON.

**5 WAY BLOCK CROSS**






OGX Resources

CAMERON

| Name | Jeanette | Date | 7-14-08 | Working Pressure | # | J-7988-1 |
|---|---|---|---|---|---|---|

# OGX Resources, LLC

## HYDROGEN SULFIDE ($H_2S$) CONTINGENCY PLAN

### Assumed 100 ppm ROE = 3000'

100 ppm $H_2S$ concentration shall trigger activation of this plan.

Emergency Procedures

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

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

Ignition of Gas source

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

**Characteristics of $H_2S$ and $SO_2$**

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

**Contacting Authorities**

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

# OGX Resources, LLC

## $H_2S$ CONTINGENCY PLAN EMERGENCY CONTACTS

| | |
|---|---|
| Company Office | 505-123-5555 |
| Answering Service (During Non-Office Hours) | 505-123-5556 |

Key Personnel

| Name | Title | Phone Number |
|---|---|---|
| F. M. Agar, Jr. | Manager | 432.685.1287 or 432.631.1736 |
| Chuck Nunnelee, | Consultant | 432.238.4644 |
| Jeff Birkelbach, | OGX Operations | 432.553.0391 |

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

Carlsbad

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

| | |
|---|---|
| New Mexico Emergency Response Commission (Santa Fe) | 505-476-9600 |
| 24 Hour | 505-827-9126 |
| New Mexico State Emergency Operations Center | 505-476-9635 |
| National Emergency Response Center (Washington, DC) | 800-424-8802 |

Other

| | |
|---|---|
| Smith International | 432.570-0065 |
| Halliburton | 575-746-2757 |
| B. J. Services | 575-746-3569 |
| Flight For Life – 4000 24th St. Lubbock, Texas | 806-743-9911 |
| Aerocare – R3, Box 49F, Lubbock, Texas | 806-747-8923 |
| Med Flight Air Amb – 2301 Yale Blvd SE #D3, Albuq., NM | 505-842-4433 |
| S B Air Med Service – 2505 Clark Carr Loop SE, Albuq., NM | 505-842-4949 |

# $H_2S$ CONTINGENCY PLAN

# OGX Resources LLC

Cooper 31 Fed. #2

660' FSL & 660' FEL

Sec.31; T-25-S; R-29-E

Eddy County, NM

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# HYDROGEN SULFIDE CONTINGENCY PLAN

## SCOPE

THIS CONTENGENCY PLAN ESTABLISHES GUIDELINES FOR THE PUBLIC, ALL COMPANY EMPLOYEES WHO'S WORK ACTIVITIES MAY INVOLVE EXPOSURE TO HYDROGEN SULFIDE GAS.

## OBJECTIVE

1. PREVENT ANY AND ALL ACCIDENTS, AND PREVENT THE UNCONTROLLED RELEASE OF HYDROGEN SULFIED INTO THE ATMOSPHERE.
2. PROVIDE PROPER EVACUATION PROCEDURES TO COPE WITH EMERGENCIES.
3. PROVIDE IMMEDIATE AND ADEQUATE MEDICAL ATTENTION SHOULD AN INJURY OCCUR.

## DISCUSSION

GEOLOGICAL PROGNOSIS

| | |
|---|---|
| IMPLEMENTATION: | THIS PLAN WITH ALL DETAILS IS TO BE FULLY IMPLEMENTED BEFORE DRILLING TO PRODUCTION CASING POINT. |
| EMERGENCY RESPONSE: | THIS SECTION OUTLINES THE CONDITIONS AND DENOTES STEPS TO BE TAKEN IN THE EVENT OF AN EMERGENCY |
| EMERGENCY EQUIPMENT: | THIS SECTION OUTLINES THE SAFETY AND EMERGENCY EQUIPMENT THAT WILL BE REQUIRED FOR THE DRILLING OF THIS WELL. |
| TRAINING PROVISIONS: | THIS SECTION OUTLINES THE TRAINING PROVISIONS THAT MUST BE ADHERED TO PRIOR TO DRILLING TO PRODUCTION CASING POINT. |
| EMERGENCY CALL LISTS: | INCLUDED ARE THE TELEPHONE NUMBERS OF ALL PERSONS TO BE CONTACTED SHOULD AN EMERGENCY EXISTS. |
| BRIEFING: | THIS SECTON DEALS WITH THE BRIEFING OF ALL PEOPLE INVOLVED IN THE DRILLING OPERATION. |
| PUBLIC SAFETY: | PUBLIC SAFETY PERSONNEL WILL BE MADE AWARE OF THE DRILLING OF THIS WELL. |
| CHECK LISTS: | STATUS CHECK LISTS AND PROCEDURAL CHECK LISTS HAVE BEEN INCLUDED TO INSURE ADHERENCE TO THE PLAN. |
| GENERAL INFORMATION: | A GENERAL INFORMATION SECTION HAS BEEN INCLUDED TO SUPPLY SUPPORT INFORMATION. |

## EMERGENCY PROCEDURES

A. IN THE EVENT OF ANY EVIDENCE OF $H_2S$ LEVEL ABOVE 10 PPM, TAKE THE FOLLOWING STEPS:

1. SECURE BREATHING EQUIPMENT.
2. ORDER NON-ESSENTIAL PERSONNEL OUT OF DANGER ZONE.
3. TAKE STEPS TO DETERMINE IF THE $H_2S$ LEVEL CAN BE CORRECTED OR SUPPRESSED AND, IF SO, PROCEED IN NORMAL OPERATION.

B. IF UNCONTROLLABLE CONDITIONS OCCUR.

1. TAKE STEPS TO PROTECT AND/OR REMOVE ANY PUBLIC IN THE DOWN-WIND AREA FROM THE RIG – PARTIAL EVACUATION AND ISOLATION. NOTIFY NECESSARY PUBLIC SAFETY PERSONNEL AND THE BUREAU OF LAND MANAGEMENT OF THE SITUATION.
2. REMOVE ALL PERSONNEL TO SAFE BREATHING AREA.
3. NOTIFY PUBLIC SAFETY PERSONNEL TO SAFE BREATHING AREA.
4. PROCEED WITH BEST PLAN TO REGAIN CONTROL OF THE WELL. MAINTAIN TIGHT SECURITY AND SAFETY PROCEDURES.

C. RESPONSIBILITY:

1. DESIGNATED PERSONNEL.

   a. SHALL BE RESPONSIBLE FOR THE TOTAL IMPLEMENTATION OF THIS PLAN.
   b. SHALL BE IN COMPLETE COMMAND DURING ANY EMERGENCY.
   c. SHALL DESIGNATE A BACK-UP.

## EMERGENCY PROCEDURES

(Procedures are the same for both Drilling and Tripping)

ALL PERSONNEL:

1. ON ALARM, DON ESCAPE UNIT AND REPORT IN UP WIND BREIFING AREA.
2. CHECK STATUS OF PERSONNEL (BUDDY SYSTEM).
3. SECURE BREATHING EQUIPMENT.
4. AWAIT ORDERS FROM SUPERVISOR.

DRILLING FOREMAN:

1. REPORT TO UP WIND BREIFING AREA.
2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH TOOL PUSHER OR DRILLER (BUDDY SYSTEM).
3. DETERMINE $H_2S$ CONCENTRATIONS.
4. ASSESS SITUATION AND TAKE CONTROL MEASURES.

TOOL PUSHER:

1. REPORT TO UP WIND BREIFING AREA.
2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH DRILLING FOREMAN OR DRILLER (BUDDY SYSTEM).
3. DETERMINE $H_2S$ CONCENTRATION.
4. ASSESS SITUATION AND TAKE CONTROL MEASURES.

DRILLER:

1. DON ESCAPE UNIT.
2. CHECK MONITOR FOR POINT OF RELEASE.
3. REPORT TO BREIFING AREA.
4. CHECK STATUS OF PERSONNEL (FOR RESCUE, USE THE BUDDY SYSTEM).
5. ASSIGNS LEAST ESSENTIAL PERSON TO NOTIFY DRILLING FOREMAN AND TOOL PUSHER BY QUICKEST MEANS IN CASE OF THEIR ABSENCE.

6. ASSUMES THE RESPONSIBILITIES OF THE DRILLING FOREMAN AND TOOL PUSHER UNTIL THEY ARRIVE.

## EMERGENCY PROCEDURES

DERRICK MAN / FLOOR HANDS:

1. WILL REMAIN IN BREIFING AREA UNTIL INSTRUCTED BY SUPERVISOR.

MUD ENGINEER:

1. REPORT TO BRIEFING AREA.
2. WHEN INSTRUCTED, BEGIN CHECK OF MUD FOR Ph AND $H_2S$ LEVEL (GARRETT GAS TRAIN).

SAFETY PERSONNEL:

1. MASK UP AND CHECK STATUS OF ALL PERSONNEL AND SECURE OPERATIONS AS INSTRUCTED BY DRILLING FOREMAN AND REPORT TO BRIEFING AREA.

### TAKING A KICK

WHEN TAKING A KICK DURING AN $H_2S$ EMERGENCY, ALL PERSONNEL WILL FOLLOW STANDARD BOP PROCEDURES AFTER REPORTING TO BRIEFING AREA AND MASKING UP.

### OPEN-HOLE LOGGING

ALL UNNECESSARY PERSONNEL OFF THE FLOOR. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD MONITOR CONDITION, ADVISE STATUS AND DETERMINE NEED FOR USE OF AID EQUIPMENT.

### RUNNING CASING OR PLUGGING

FOLLOWING THE SAME "TRIPPING" PROCEDURE AS ABOVE. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD DETERMINE IF ALL PERSONNEL HAVE ACCESS TO PROTECTIVE EQUIPMENT.

## IGNITION PROCEDURES

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF COMPANY FOREMAN. IN THE EVENT HE IS INCAPACITATED, IT BECOMES THE RESPONSIBILITY OF THE CONTRACT RIG TOOL PUSHER. THE DECISION SHOULD BE MADE ONLY AS A LAST RESORT AND IN A SITUATION WHERE IT IS CLEAR THAT:

1. HUMAN LIFE AND PROPERY ARE ENDANGERED.
2. THERE IS NO HOPE OF CONTROLLING THE BLOWOUT UNDER THE PREVAILING CONDITIONS AT THE WELL.

NOTIFY THE DISTRICT OFFICE IT TIME PERMITS, BUT DO NOT DELAY IF HUMAN LIFE IS IN DANGER.

INITIATE FIRST PHASE OF EVACUATION PLAN.

## IGNITION PROCEDURES

INSTRUCTIONS FOR IGNITING THE WELL:

1. TWO PEOPLE ARE REQUIRED FOR THE ACTUAL IGNITING OPERATION. THEY MUST WEAR SELF-CONTAINED BREATHING UNITS AND HAVE SAFETY ROPES ATTACHED. ONE MAN WILL CHECK THE ATMOSPHERE FOER EXPLOSIVE GASES WITH THE EXPLOSIMETER. THE OTHER MAN IS RESPONSIBLE FOR IGNITING THE WELL.
2. PRIMARY METHOD TO IGNITE: 25 MM FLARE GUN WITH RANGE OF 500 FT.
3. IGNITE UP WIND AND DO NOT APPROACH ANY CLOSER THAN IS WARRENTED.
4. SELECT THE IGNITION SITE BEST FOR PROTECTION, AND WHICH OFFERS AN EASY ESCAPE ROUTE.
5. BEFORE FIRING, CHECK PRESENCE OF COMBUSTABLE GAS.
6. AFTER LIGHTING, CONTINUE EMERGENCY ACTION AND PROCEDURE AS BEFORE.
7. ALL UNASSIGNED PERSONNEL WILL LIMIT THEIR ACTIONS TO THOSE DIRECTED BY THE DRILLING FOREMAN.

**REMEMBER:** AFTER WELL IS IGNITED, BURNING HYDROGEN SULFIDE WILL CONVERT TO SULFUR DIOXIDE, WHICH IS ALSO HIGHLY TOXIC. DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED.

## TRAINING REQUIREMENTS

WHEN WORKING IN AN AREA WHERE $H_2S$ GAS MIGHT BE ENCOUNTERED, DEFINITE TRAINING REQUIREMENTS MUST BE CARRIED OUT. ALL COMPANIES WILL INSURE THAT ALL PERSONNEL AT THE WELL SITE WILL HAVE HAD ADEQUATE TRAINING IN THE FOLLOWING:

1. HAZARDS AND CHARACTERISTICS OF $H_2S$
2. PHYSICAL EFFECTS OF HYDROGEN SULFIDE ON THE HUMAN BODY
3. TOXICITY OF HYDROGEN SULFIDE AND SULFUR DIOXIDE.
4. $H_2S$ DETECTION.
5. EMERGENCY RESCUE.
6. RESUSCITATORS.
7. FIRST AID AND ARTIFICIAL RESPIRATION.
8. EFFECTS OF $H_2S$ ON METALS.
9. LOCATION SAFETY.

### SERVICE COMPANY AND VISITING PERSONNEL

A. EACH SERVICE COMPANY THAT WILL BE ON THIS WELL WILL BE NOTIFIED IF THE ZONE CONTAINS $H_2S$.
B. EACH SERVICE COMPANY MUST PROVIDE FOR THE TRAINING AND EQUIPMENT OF THEIR EMPLOYEES BEFORE THEY ARRIVE AT THE WELLSITE.
C. EACH SERVICE COMPANY WILL BE EXPECTED TO ATTEND A SITE BRIEFING.

## EMERGENCY EQUIPMENT REQUIREMENTS

1. SIGNS
   A. ONE SIGN LOCATED AT LOCATION ENTRANCE WITH THE FOLLOWING:

**(LEASE NAME & WELL NO.)**
**CAUTION – POTENTIAL POISON GAS**
**HYDROGEN SULFIDE**
**NO ADMITTANCE WITHOUT AUTHORIZATION**

2. WIND SOCK – WIND STREAMERS
   A. ONE 36" WIND SOCK LOCATED AT PROTECTION CENTER, AT A VISIBLE HEIGHT ABOVE THE RIG FLOOR.
   B. ONE 36" WIND SOCK LOCATED AT VISIBLE HEIGHT FROM PIT AREAS.

3. HYDROGEN SULFIED DETECTOR AND ALARMS
   A. $H_2S$ MONITORS WITH ALARMS WILL BE LOCATED ON THE RIG FLOOR, AT THE BELL NIPPLE, AND AT THE FLOE LINE. THESE MONITORS WILL SET FOR VISUAL AT 10 PPM WITH RED LIGHT AND AUIBLE AT 15 PPM.
   B. HAND OPERATED DETECTORS WITH TUBES.
   C. $H_2S$ MONITOR TESTER.

4. CONDITION FLAGS
   A. ONE EACH OF GREEN, YELLOW, AND RED CONDITION FLAGS TO BE DISPLAYED TO DENOTE CONDITIONS.

   **GREEN - NORMAL CONDITIONS**

   **YELLOW - POTENTIAL DANGER**

   **RED - DANGER, $H_2S$ PRESENT**

   B. CONDITION FLAG SHALL BE POSTED AT LOCATION SIGN ENTRANCE.

5. AUXILIARY EQUIPMENT
   A. STRETCHER
   B. 100' LENGTH OF NYLON ROPE

## EMERGENCY EQUIPMENT REQUIREMENTS

6. MUD INSPECTION DEVICES

   GARRETT GAS TRAN OR HACH TESTER FOR INSPECTION OF SULFIDE CONCENTRATION IN MUD SYSTEM.

7. FIRE EXTINGUISHER

8. BLOW OUT PREVENTION EQUIPMENT

   THE WELL SHALL HAVE HYDRAULIC BOP EQUIPMENT FOR THE ANTICIPATED BHP OF 1500 PSI. EQUIPMENT IS TO BE TESTED ON INSTALLATION.

9. COMBUSTIBLE GAS DETECTOR

   THERE SHALL BE ONE COMBUSTIBLE GAS DETECTOR ON LOCATION AT ALL TIMES.

10. BOP TESTING

    BOP, CHOKE LINE, AND KILL LINE WILL BE TESTED.

11. AUDIO SYSTEM

    RADIO COMMUNICATION EQUIPMENT
    A. RIG FLOOR OR TRAILER
    B. VEHICLE

12. SPECIAL CONTROL EQUIPMENT

    A. HYDRAULIC BOP EQUIPMENT WITH REMOTE CONTROL ON GROUND.
    B. ROTATING HEAD.

13. EVACUATION PLAN

EVACUATION ROUTES SHOULD BE ESTABLISHED PRIOR TO SPUDDING EACH WELL AND DISCUSSED WITH ALL RIG PERSONNEL.

14. DESIGNATED AREA

A. PARKING AND VISITOR AREA: ALL VEHICLES ARE TO BE PARKED AT A PREDETERMINED SAFE DISTANCE FROM THE WELLHEAD. THIS WILL BE DESIGNATED AS SMOKING AREA.
B. TWO BRIEFING AREAS ON EITHER SIDE OF THE LOCATION AT THE MAXIMUM ALLOWABLE DISTANCE FROM THE WELLBORE SO THEY OFFSET PREVAILING WINDS PERPENDICULARY, OR AT A 45 DEGREE ANGLE IF WIND DIRECTION TENDS TO SHIFT IN THE AREA.
C. PROTECTION CENTERS OR IF A MOVABLE TRAILER IS USED, IT SHOULD BE KEPT UPWIND. WHEN WIND IS FROM THE PREVAILING DIRECTION, BOTH PROTECTION CENTERS SHOULD BE ACCESSIBLE.

## STATUS CHECK LIST

**NOTE: ALL TEMS ON THIS LIST MUST BE COMPLETED BEFORE DRILLING TO PRODUCTION CASING POINT.**

1. SIGN AT LOCATION ENTRANCE
2. TWO WIND SOCKS LOCATED AS REQUIRED
3. TWO 30-MINUTE PRESSURE DEMAND AIR PACKS ON LOCATION FOR ALL RIG PERSONNEL AND MUD LOGGERS.
4. AIR PACK INSPECTED FOR READY USE.
5. CASCADE SYSTEM AND HOSE LINE HOOK-UP.
6. CASCADE SYSTEM FOR REFILLING AIR BOTTLES.
7. SAFE BREATHING AREAS SET UP.
8. CONDITION FLAG LOCATION AND READY FOR USE.
9. $H_2S$ ALARM SYSTEM HOOKED UP AND READY.
10. $H_2S$ DETECTION SYSTEM HOOKED UP.
11. OXYGEN RESUSCITATOR ON LOCATION AND TESTED FOR USE.
12. STRETCHER ON LOCATION AT SAFETY TRAILER.
13. 100' LENTH OF NYLON ROPE ON LOCATION.
14. ALL RIG CREW AND SUPERVISORS TRAINED AS REQUIRED.
15. ALL OUTSIDE CONTRACTORS ADVISED OF POTENTIAL $H_2S$ HAZARD ON WELL.
16. NO SMOKING SIGN POSTED.

17. HAND OPERATED H2S DETECTOR WITH TUBES ON LOCATION.

## PROCEDURAL CHECK LIST

**PERFORM EACH TOUR:**

1. CHECK FIRE EXTINGUISHERS FOR PROPER CHARGE.
2. CHECK BREATHING EQUIPMENT
3. CHECK OPERATION OF $H_2S$ DETECTION SYSTEM.

**PERFORM EACH WEEK:**

1. CHECK EACH PIECE OF BREATHING EQUIPMENT FOR DEMAND REGULATOR FUNCTION. THIS REQUIRES THAT THE BOTTLE BE OPENED AND THE MASK ASSY BE PUT ON TIGHT ENOUGH SO THAT WHEN YOU INHALE, YOU RECEIVE AIR.
2. BLOW OUT PREVENTOR SKILLS
3. CHECK SUPPLY PRESSURE ON BOP ACCUMULATOR STAND BY SOURCE.
4. CHECK ALL SKA-PAC UNITS FOR OPERATION: DEMAND REGULATOR, ESCAPE BOTTLE AIR VOLUMES, SUPPLY BOTTLE AIR VOLUMES.
5. CHECK BREATHING EQUIPMENT MASK ASSY TO SEE THAT STRAPS ARE LOOSENED AND TURNED BACK, READY FOR DON.
6. CHECK PRESSURE ON BREATHING EQUIPMENT AIR BOTTLES FOR FULL CHARGE.
7. CONFIRM PRESSURE ON ALL SUPPLY AIR BOTTLES.
8. PERFORM BREATHING EQUIPMENT DRILLS WITH ON-SITE PERSONNEL.
9. CHECK THE FOLLOWING SUPPLIES FOR AVAILABILITY:
    A. EMERGENCY TELEPHONE LIST
    B. HAND OPERATED $H_2S$ DETECTORS AND TUBES.

## GENERAL EVACUATION PLAN

THE DIRECT LINES OF ACTION PREPARED TO PROTECT THE PUBLIC FROM HAZARDOUS GAS SITUATIONS ARE AS FOLLOWS:

1. WHEN THE COMPANY APPROVED SUPERVISOR (DRILLING FOREMAN, CONSULTANT, RIG PUSHER, OR DRILLIER) DETERMINES THE $H_2S$ GAS CANNOT BE LIMITED TO THE WELL LOCATION AND THE PUBLIC WILL BE INVOLVED, HE WILL ACTIVATE THE EVACUATION PLAN. ESCAPE ROUTES ARE NOTED ON AREA MAP.

2. "COMPANY MAN" OR DESIGNEE WILL NOTIFY LOCAL GOVERNMENT AGENCYTHAT A HAZARDOUS CONDITION EXISTS AND EVACUATION NEEDS TO BE IMPLEMENTED.

3. COMPANY SAFETY PERSONNEL THAT HAVE BEEN TRAINED IN THE USE OF $H_2S$ DETECTION EQUIPMENT AND SELF-CONTAINED BREATHING EQUIPMENT WILL MONITOR $H_2S$ CONCENTRATIONS, WIND DIRECTION, AND AREA OF EXPOSURE. THEY WILL DELINEATE THE OUTER PERIMETER OR THE HAZARDOUS GAS AREA. EXTENSION TO THE EVACUATION AREA WILL BE DETERMINED FROM INFORMATION GATHERED.

4. LAW ENFORCEMENT PERSONNEL (STATE POLICE, POLICE DEPT, FIRE DEPT, AND SHERIFF'S DEPT) WILL BE CALLED TO AID IN SETTING UP AND MAINTAINING ROAD BLOCKS. ALSO, THEY WILL AID IN EVACUATION OF THE PUBLIC IF NECESSARY.

   **LAW ENFORCEMENT PERSONNEL WILL NOT BE ASKED TO COME INTO A CONTAMINATED AREA. THEIR ASSISTANCE WILL BE LIMITED TO UNCONTAMINATED AREAS. CONSTANT RADIO CONTACT WILL BE MAINTAINED WITH THEM.**

5. AFTER THE DISCHARGE OF GAS HAS BEEN CONTROLLED, COMPANY SAFETY PERSONNEL WILL DETERMINE WHEN THE AREA IS SAFE FOR RE-ENTRY.

## EMERGENCY ACTIONS

### WELL BLOWOUT – IF EMERGENCY

1. EVACUATE ALL PERSONNEL IF POSSIBLE.
2. IF SOUR GAS – EVACUATE RIG PERSONNEL.
3. IF SOUR GAS – EVACUATE PUBLIC WITHIN 3000 FT RADIUS OF EXPOSURE.
4. DON SCBA AND RESCUE.
5. CALL 911 EMERGENCY HELP (FIRE AND AMBULANCE) AND NOTIFY SR. DRILLING FOREMAN AND DISTRICT FOREMAN.
6. GIVE FIRST AID.

### PERSON DOWN LOCATION/FACILITY

1. IF IMMEDIATELY POSSIBLE, CONTACT 911. GIVE LOCATION AND WAIT FOR CONFIRMATION.
2. DON SCBA AND RESCUE.

See COA

## EMERGENCY PHONE LIST

## GOVERNMENT AGENCIES

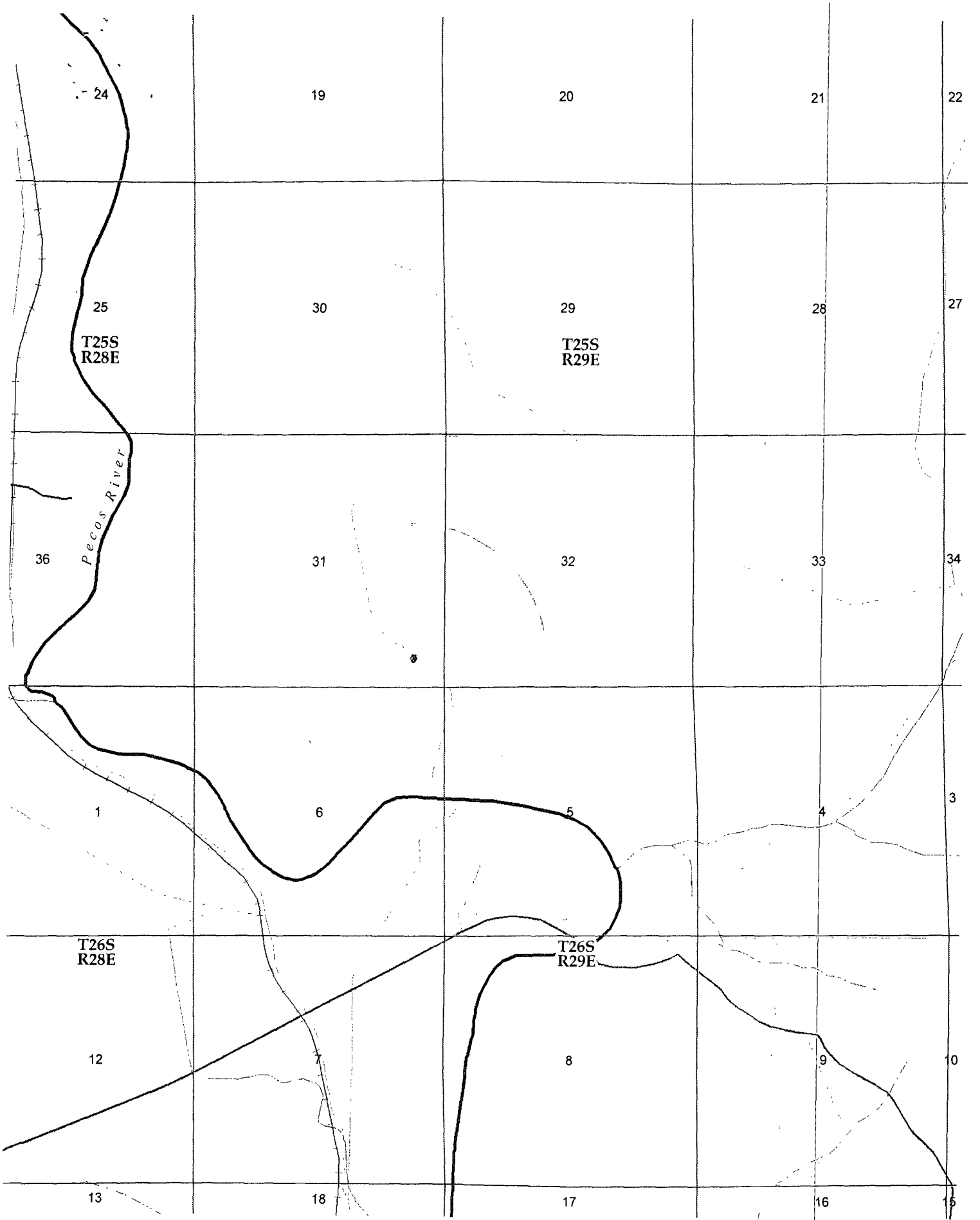
| | |
|---|---|
| EDDY COUNTY SHERIFF'S OFFICE | 911 |
| NON- EMERGENCY | 505-746-9888 |
| FIRE DEPARTMENT | 911 |
| CARLSBAD – NON EMERGENCY | 505-885-2111 |
| BLM | |
| CARLSBAD | 505-361-2822 |
| STATE POLICE DEPARTMENT | 911 |
| NON-EMERGENCY | 505-437-1313 |
| CITY OF CARLSBAD | |
| | 505-885-2111 |
| AMBULANCE | |
| CARLSBAD – NON EMERGENCY | 505-885-2111 |
| HOSPITALS | |
| CARLSBAD | 505-887-4100 |
| AREOCARE | 806-747-8923 |
| CHEMTREC | 800-424-9300 |
| OSHA | |
| LUBBOCK,TX | 800-692-4204 |

## EMERGENCY CONTACT LIST

| | | |
|---|---|---|
| OGX RESOURCES | OFFICES | 432-685-1287 |
| CHUCK NUNNELEE | CONSULTANT | 432-238-4644 |
| JEFF BIRKELBACH | OGX OPERATIONS | 432-553-0391 cell |
| STEVE DOUGLAS | OGX OPERATIONS | 432-934-6800 cell |
| KIP AGAR | OGX PRESIDENT | 432-631-1736 cell |

# OGX RESOURCES, LLC

## 3,000 FT RADIUS FROM WELL


24
19
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Pecos River
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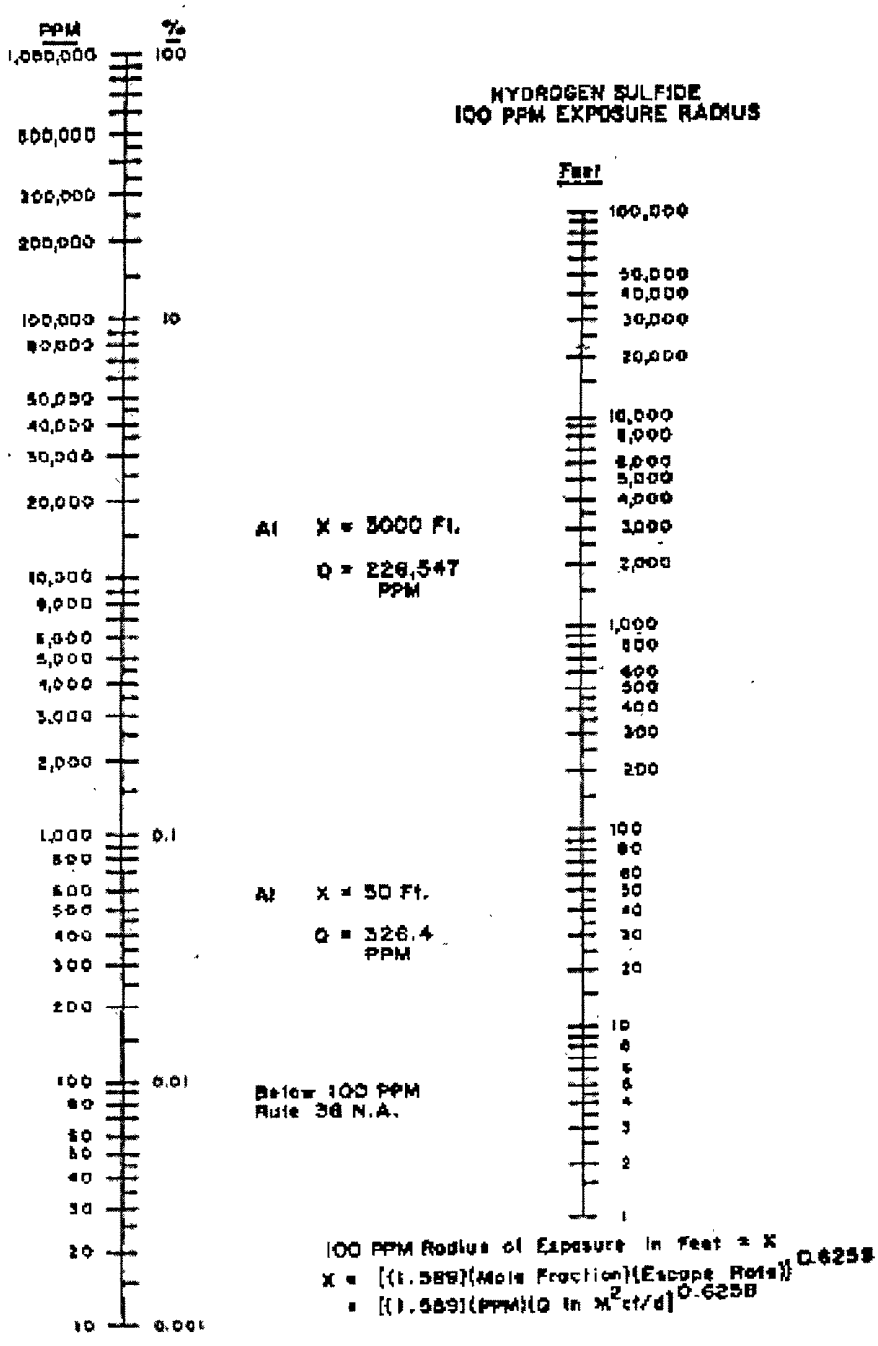
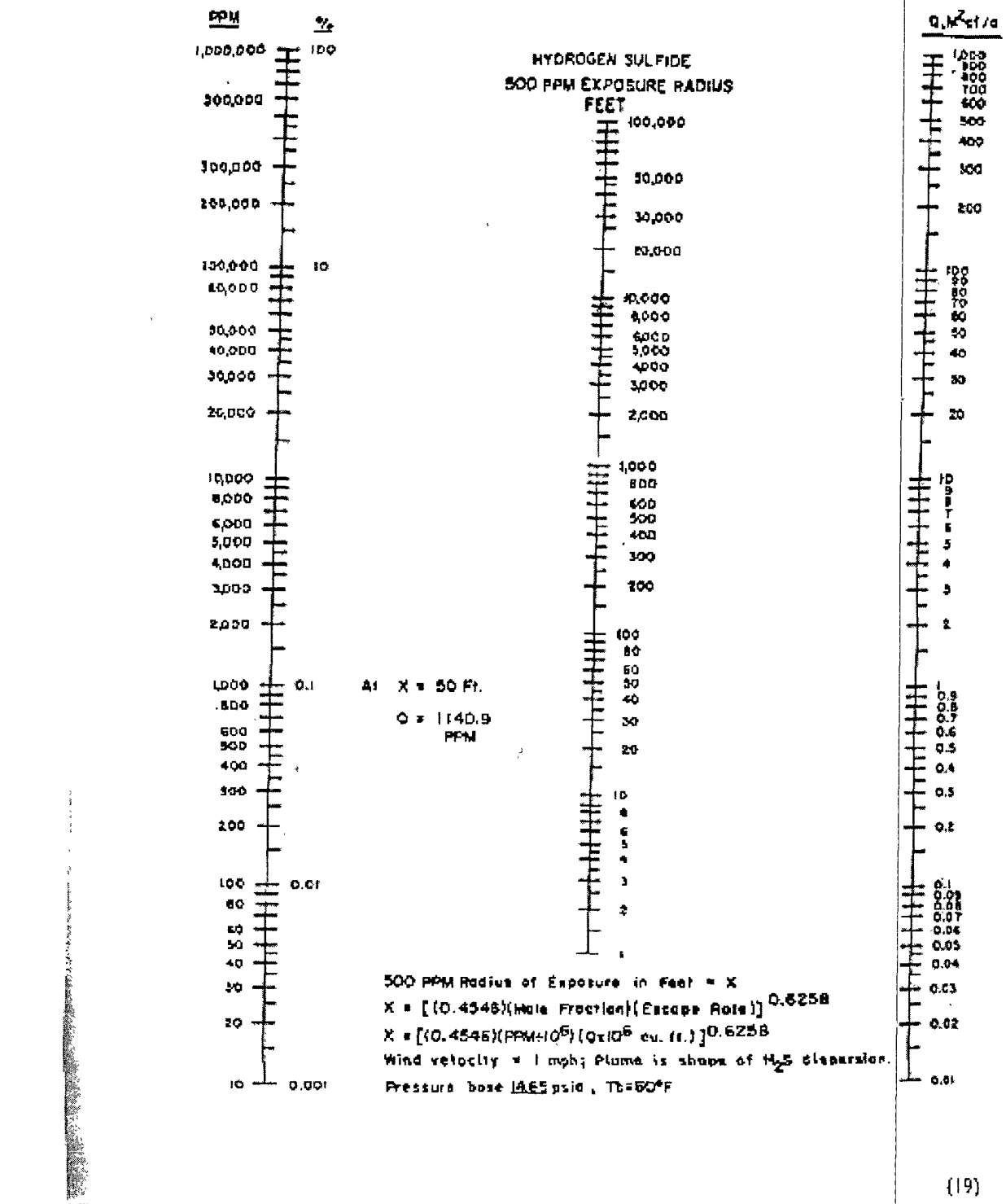

HYDROGEN SULFIDE
100 PPM EXPOSURE RADIUS
PPM
%
Feet
Q, MMcf/d
At X = 3000 Ft.
Q = 226,547 PPM
At X = 50 Ft.
Q = 326.4 PPM
Below 100 PPM Rule 36 N.A.
100 PPM Radius of Exposure in Feet = X
X = [(1.589)(Mole Fraction)(Escape Rate)]^0.6258
= [(1.589)(PPM)(Q in MMcf/d)]^0.6258
P 14.65 psia T 60 °F

(18)


PPM
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HYDROGEN SULFIDE
500 PPM EXPOSURE RADIUS
FEET
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A1 X = 50 Ft.
Q = 1140.9 PPM
Q, MCF/d
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200
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0.01
500 PPM Radius of Exposure in Feet = X
X = [(0.4546)(Mole Fraction)(Escape Rate)] 0.6258
X = [(0.4546)(PPM÷10^6)(Q×10^6 cu. ft.)] 0.6258
Wind velocity = 1 mph; Plume is shape of H2S dispersion.
Pressure base 14.65 psia, Tb=60°F

(19)

## TOXIC EFFECTS OF HYDROGEN SULFIDE

HYDROGEN SULFIDE IS EXTREMELY TOXIC. THE ACCEPTABLE CEILING CONENTRATION FOR EIGHT-HOUR EXPOSURE IS 10 PPM, WHICH IS .001% BY VOLUME. HYDROGEN SULFIED IS HEAVIER THAN AIR (SPECIFIC GRAVITY – 1.192) AND COLORLESS. IT FORMS AN EXPLOSIVE MIXTURE WITH AIR BETWEEN 4.3 & 46% BY VOLUME. HYDROGEN SULFIED IS ALMOST AS TOXIC AS HYDROGEN CYANIDE AND IS BETWEEN FIVE & SIX TIMES MORE TOXIC AS CARBON MONOXIDE. TOXICITY DATA FOR HYDROGEN SULFIDE AND VARIOUS OTHER GASES ARE COMPARED IN TABLE I. PHYSICAL EFFECTS AT VARIOUS HYDROGEN SULFIED EXPOSURE LEVELS ARE SHOWN IN TABLE II.

TABLE I.

TOXICITY OF VARIOUS GASES

| Common Name | Chem Sym | SpGr | Threshold Lm | Hazardous Lm | Lethal Lm |
|---|---|---|---|---|---|
| Hydrogen Cyanide | HCN | 0.94 | 10 PPM | 150 PPM/Hr | 300 PPM |
| Hydrogen Sulfide | $H_2S$ | 1.18 | 10 PPM | 250 PPM/Hr | 600 PPM |
| Sulfur Dioxide | $SO_2$ | 2.21 | 5 PPM | | 1000 PPM |
| Chlorine | $CL_2$ | 2.45 | 1 PPM | 4 PPM/Hr | 1000 PPM |
| Carbon Monoxide | CO | 0.97 | 50 PPM | 400 PPM/Hr | 1000 PPM |
| Carbon Dioxide | CO | 1.52 | 5000 PPM | 5% | 10% |
| Methane | $CH_4$ | 0.55 | 90,000 PPM | Combustible Above 5% in Air | |

1. THRESHOLD LIMIT – CONCENTRATION AT WHICH IT IS BELIEVED THAT ALL WORKERS MAT BE REPEATEDLY EXPOSED DAY AFTER DAY WITHOUT ADVERSE EFFECTS.

2. HAZARDOUS LIMIT – CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT TERM EXPOSURE.

3. LETHAL CONCENTRATION – CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT – TERM EXPOSURE.

# TOXIC EFFECTS OF HYDROGEN SULFIDE

## TABLE II

## PHYSICAL EFFECTS OF HYDROGEN SULFIDE

| PERCENT | PPM | Concentration Grains | Physical Effects |
|---|---|---|---|
| 0.001 | <10 | 0.65 | Obvious and unpleasant odor |
| 0.002 | 10 | 1.30 | Safe for 8 hours of exposure |
| 0.010 | 100 | 6.48 | Kills sense of smell in 3-15 minutes. May sting eyes & throat. |
| 0.020 | 200 | 12.96 | Kills sense of smell; stings eyes & throat |
| 0.050 | 500 | 32.96 | Dizziness, Breathing ceases in a few minutes, Needs prompt artificial respiration. |
| 0.070 | 700 | 45.36 | Unconscious quickly, Death will result if not rescued promptly |
| 0.100 | 1000 | 64.3 | Unconscious at once, followed by death within minutes |

## USE OF SELF-CONTAINED BREATHING EQUIPMENT

1. WRITTEN PROCEDURES SHALL BE PREPARED COVERING SAFE USE OF SCBA'S IN DANGEROUS ATMOSPHERE, WHICH MIGHT BE ENCOUNTERED IN NORMAL OPERATIONS OR IN EMERGENCIES. PERSONNEL SHALL BE FAMILIAR WITH THESE PROCEDURES AND THE AVAILABLE SCBA.

2. SCBA'S SHALL BE INSPECTED FREQUENTLY AT RAMDON TO INSURE THAT THEY ARE PROPERLY USED, CLEANED, AND MAINTAINED.

3. ANYONE WHO MAY USE THE SCBA'S SHALL BE TRAINED IN HOW TO INSURE PROPER FACE-PIECE TO FACE SEAL. THEY SHALL WEAR SCBA'S IN NORMAL AIR AND THEN WEAR THEM IN A TEST ATMOSPHERE. BEARD AND/OR SIDEBURNS AND EYEGLASSES WILL NOT ALLOE A PROPER SEAL. ANYONE THAT MAY BE REASONABLY EXPECTED TO WEAR SCBA'S SHOULD HAVE THESE ITEMS REMOVED BEFORE ENTERING A TOXIC ATMOSPHERE. A SPECIAL MASK MUST BE OBTAINED FOR ANYONE WHO MUST WAER EYEGLASSES OR CONTACT LENSES.

4. MAINTENANCE AND CARE OF SCBA'S:

   A. A PROGRAM FOR MAINTENANCE AND CARE OF SCBA'S SHALL INCLUDE THE FOLLOWING:
      1. INSPECTIO FOR DEFECTS, INCLUDING LEAK CHECKS
      2. CLEANING AND DISINFECTING
      3. REPAIR
      4. STORAGE

   B. INSPECTION; SELF-CONTAINED BREATHING APPARATUS FOR EMERGENCY USE SHALL BE INSPECTED MONTHLY AND THE FOLLOWING PERMANENT RECORDS KEPT OF THESE INSPECTIONS.
      1. FULLY CHARGED CYLINDERS
      2. REGULATOR AND WARNING DEVICE OPERATION.
      3. CONDITION OF FACE PIECE AND CONNECTIONS.
      4. ELASTOMER OR RUBBER PARTS SHALL BE STRETCHED OR MASSAGED TO KEEP THEM PLIABLE AND PREVENT DETERIORATION.

   C. ROUTINELY USED SCBA'S SHALL BE COLLECTED, CLEANED AND DISINFECTED AS FREQUENTLY AS NECESSARY TO INSURE PROPER PROTECTION IS PROVIDED.

5. PERSONS ASSIGNED TASKS THAT REQUIRES USE OF SELF- CONTAINED BREATHING EQUIPMENT SHALL BE CERTIFIED PHYSICALLY FIT FOR BREATHING EQUIPMENT USAGE BY THE LOCAL COMPANY PHYSICIAN AT LEAST ANNUALLY.

6. SCABA'S SHOULD BE WORN WHEN:

   A. ANY EMPLOYEE WORKS NEAR THE TOP OR ON TOP OF ANY TANK UNLESS TEST REVEALS LESS THAN 10 PPM OF $H_2S$.
   B. WHEN BREAKING OUT ANY LINE WHERE $H_2S$ CAN REASONABLY BE EXPECTED.
   C. WHEN SAMPLING AIR IN AREAS TO DETERMINE IF TOXIC CONCENTRATIONS OF $H_2S$ EXISTS.
   D. WHEN WORKING IN AREAS WHERE OVER 10 PPM $H_2S$ HAS BEEN DETECTED.
   E. AT ANY TIME THERE IS A DOUBT AS TO THE $H_2S$ LEVEL IN THE AREA TO BE ENTERED.

## RESCUE

## FIRST AID FOR $H_2S$ POISONING

DO NOT PANIC!

REMAIN CALM – THINK

1. HOLD YOUR BREATH (DO NOT INHALE FIRST)
2. PUT ON BREATHING APPARATUS.
3. REMOVE VICTIMS TO FRESH AIR AS QUICKLY AS POSSIBLE. GO UP WIND.
4. BRIEFLY APPY CHEST PRESSURE – ARM LIFT METHOD OF ARTIFICIAL RESPERATION TO CLEAN THE VICTIM'S LUNGS AND TO AVOID INHALING ANY TOXIC GAS DIRECTLY FROM THE VICTIM'S LUNGS.
5. PROVIDE FOR PROMPT TRANSPORTATION TO THE HOSPITAL, AND CONTINUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.
6. HOSPITALS OR MEDICAL FACILITIES NEED TO BE INFORMED BEFORE-HAND OF THE POSSIBILITY OF $H_2S$ GAS POISONING – NO MATTER HOW REMOTE THE POSSIBLITY.
7. NOTIFY EMERGENCY ROOM PERSONNEL THAT THE VICTIMS HAVE BEEN EXPOSED TO $H_2S$ GAS.

BESIDES BASIC FIRST AID, EVERONE ON LOCATION SHOULD HAVE A GOOD WORKING KNOWLEDGE OF ARTIFICAL RESPIRATION, AS WELL AS FIRST AID FOR EYES AND SKIN CONTACT WITH LIQUID $H_2S$. EVERYONE NEEDS TO MASTER THESE NECESSARY SKILLS.

## Surface Use Plan

## (Additional data for form 3160-3)

**OGX Resources, LLC**
**Cooper "31" Federal, Well #2H**
**SL: 660' FSL & 660' FEL (P)**
**BHL: 660' FSL and 330' FWL (M)**
**Section 31, T25S, R29E**
**Eddy County, NM**
**NMNM 100555**

1. EXISTING ROADS –

   The road log to the location is as follows:

   From the Junction of Hwy 285 ad Longhorn, go 3.8 miles to lease road, on lease road to east 1.7 miles thence north 0.1 miles, thence northwest 1.6 miles; thence 0.6 miles to 2-track. Basin Survey map shows topography as per USGS. All roads will be maintained in a condition equal to or better than current conditions. Any new roads will be constructed to BLM specifications.

2. PLANNED ACCESS ROAD —Approximately 200' of new N-S access road will be built from the existing N-S lease road to Cooper "31" Federal, Well #1H, caliche road to the north/east. All lease roads will be graded in compliance with BLM standards and made a uniform width of 20', including shoulders.

3. LOCATION OF EXISTING WELLS – The Cooper "31" Federal, Well #1H is located 660' FNL & 660' FEL (A). This will be the second well on lease.

   Water wells: None known; Disposal wells: none known; Drilling wells: none known
   Producing Wells: Closest well more than one mile. Abandoned wells: none known

4. LOCATION OF EXISTING OR PROPOSED FACILITIES – In the event this well is productive existing facilities will be utilized at Well #1H. Permanent tanks and gas measurement meter(s) will be utilized for each well as per BLM specifications.

5. LOCATION AND TYPE OF WATER SUPPLY - All water (fresh or otherwise) needed for the drilling and completion of this well will be purchased from a commercial source and trucked to the location via the existing and proposed access road. No water source wells will be drilled, and no surface water will be utilized.

6. SOURCE OF CONSTRUCTION MATERIALS - Construction material (caliche) required for the access road and well site pad will be obtained on location, if available, or from an approved pit. No surface materials will be disturbed except those necessary fir actual grading and construction of the drill site and access road.

7. METHODS FOR HANDLING WASTE DISPOSAL –

• Closed Loop System. Waste Material will be stored then hauled to a state approved disposal facility. Drilling fluids will be contained in steel pits, fluids will be cleaned & reused. Water produced during testing will be contained in steel pits and disposal at a state approved facility. Any oil or condensate will be stored in test tanks until sold & hauled from site.

• Receptacles for solid wastes (paper, plastic, etc) will be provided and equipped to prevent scattering by wind, animals, etc. This waste will be hauled to an approved landfill site. Salts remaining after completion will be picked up by supplier including broken sacks.

• Any other waste generated by the drilling, completion, testing of this well will be through a closed loop system.

• A Porta-John will be provided for the crews. This will be properly maintained during the drilling operations and removed upon completion of the well, and cleaned out periodically.

8. ANCILLARY FACILITIES – Upon completion, and/or testing of this well rental tanks, facilities will be utilized until permanent storage is established. No camps or airstrips will be constructed.

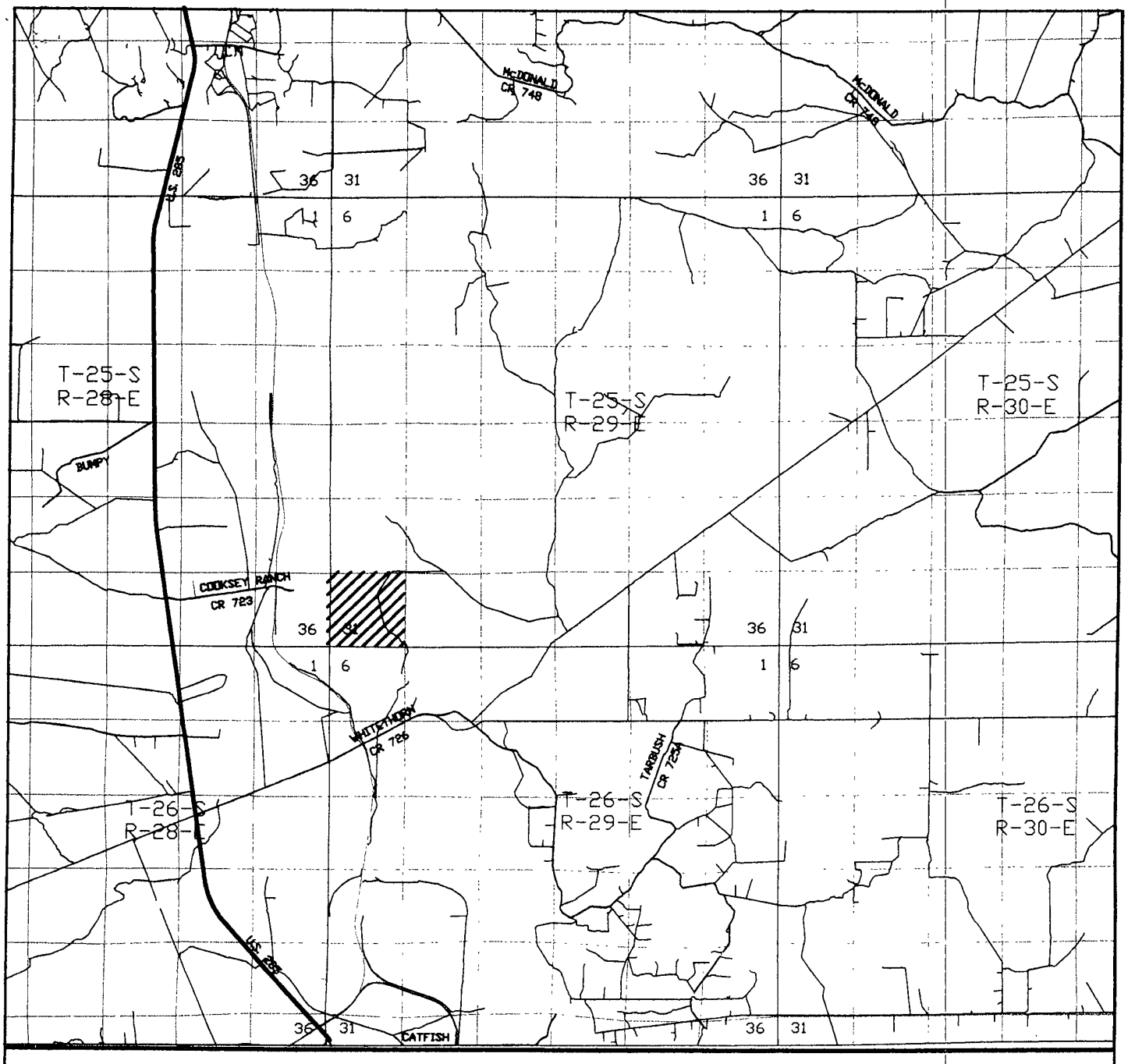
9. WELLSITE LAYOUT – Enclosed, please see "Drilling Rig Layout"

10. PLANS FOR SURFACE RESTORATION - Reclamation of the surface location will be in accordance with the requirements set forth by the BLM. As stated earlier all waste generated by this operation will be disposed of in an approved manner, and the site restored as closely as possible to its pre-operation appearance. The topsoil at the wellsite & access road is light/medium brown colored fine sand. Due to the topography of the area no problems are anticipated in achieving this status and no erosion or other detrimental effects are expected as a result of this operation.

The vegetation at the wellsite is a sparse grass cover of three-awn, grama, bluestem, dropseed, burrograss, muhly and misc. native grasses. Plants are sparse mesquite, yucca, sage, shinnery oak brush, broomweed, and cacti w/misc. weeds. The wildlife consists of rabbits, coyotes, rattlesnakes, lizards, dove and quail all typical of the semi-arid desert land. There are no ponds or streams. No dwelling with 1.5 miles of location.

Arc Survey has been submitted.

11. OTHER INFORMATION - The surface ownership of the drill site and the access routes are under the control/ownership of: Bureau of Land Management, 620 E. Greene St., Carlsbad, NM 88220, 505-887-6544. Barry Hunt w/the BLM can be reached @ the BLM number or @ 505-361-4078. Surface letter statement attached. Drilling contractor: Pending .




"A"

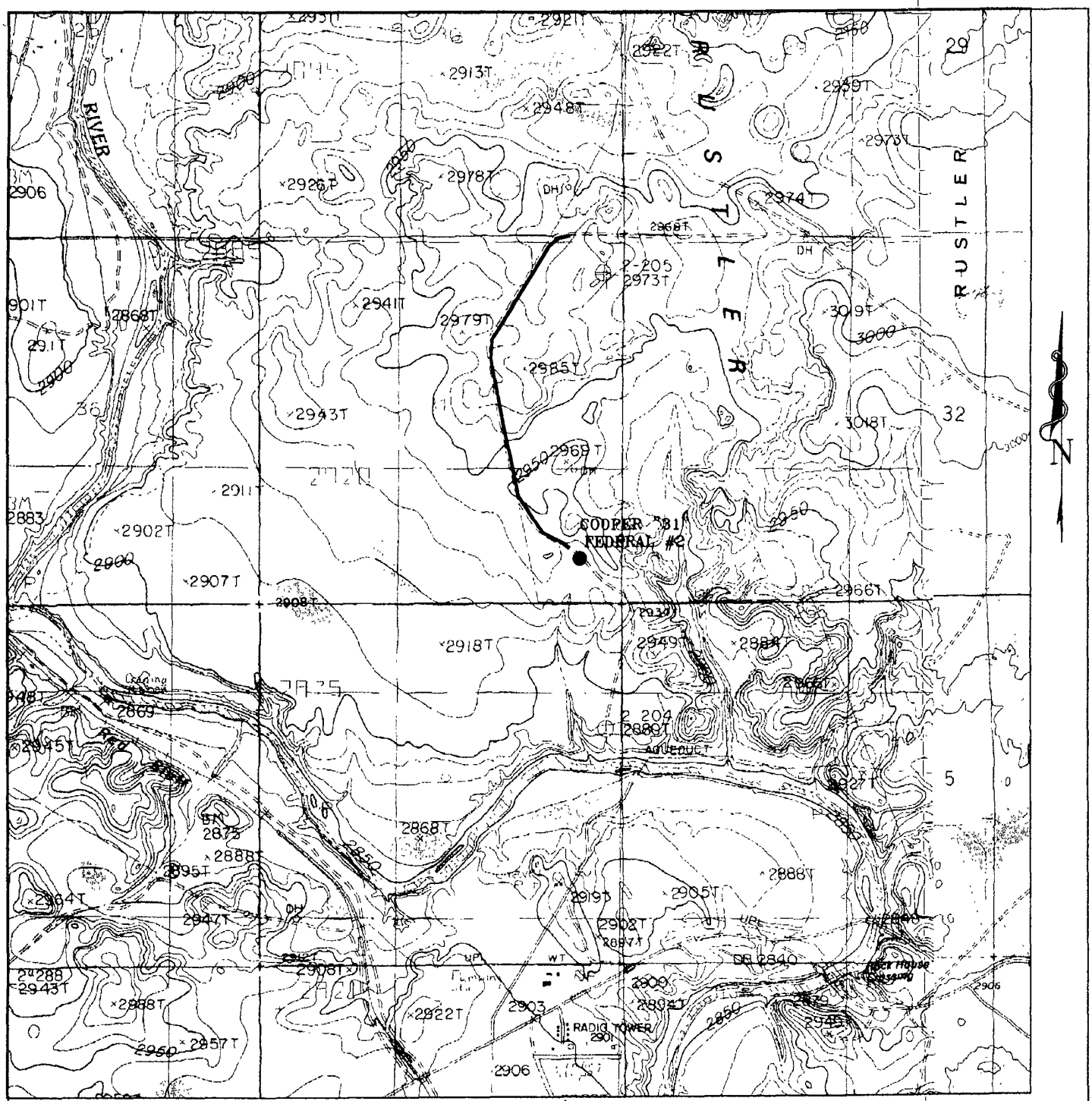
COOPER "31" FEDERAL #2
Located at 660' FSL and 660' FEL
Section 31, Township 25 South, Range 29 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

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

| | |
|---|---|
| W.O. Number: | JMS 20075 |
| Survey Date: | 07-16-2008 |
| Scale: | 1" = 2 MILES |
| Date: | 07-21-2008 |

OGX RESOURCES, L.L.C.




COOPER "31" FEDERAL #2H

"B"

Located at 660' FSL and 660' FEL

Section 31, Township 25 South, Range 29 East,

N.M.P.M., Eddy County, New Mexico.


basin surveys

focused on excellence in the oilfield

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


| | |
|---|---|
| W O Number | 20075 |
| Survey Date. | 07-16-2008 |
| Scale | 1" = 2000' |
| Date | 07-21-2008 |

OGX RESOURCES, L.L.C.

Statement of Surface Agreement
OGX Resources, LLC
Cooper "31" Federal, Well #1H
NMNM 100555
Section 31, T25S, R29E
Eddy County, New Mexico

The above stated property is owned by:

Bureau of Land Management
620 E. Greene St.
Carlsbad, M 88220

The surface tenant is:

W. P. Ranch Limited Partnership
501 West
Cherokee, TX 76832

Ann E. Ritchie, Regulatory Agent
OGX Resources, LLC
P.O. Box 2064
Midland, TX 79702
(432) 684-6381-Ann

7-29-08

D. RECORD LESSEE:

_____ 100%

E. BOND COVERAGE:

$25,000 Statewide Oil & Gas Surety Bond
BLM Bond # NMB 000244

12. OPERATOR'S REPRESENTATIVE:

The field representative for assuring compliance with the approved use and operations plan is as follows:

Jeff Birkelbach

OGX Resources, LLC, P.O. Box 2064, Midland, TX 79702

Office: (432) 685-1287; Mobile: (432) 631-1736

Home: (432) 685-4114

jeff@ogxresources.com(E-mail)

13. CERTIFICATION:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by OGX Resources, LLC and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved,

July 24, 08 Date

Signature

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| OPERATOR'S NAME: | OGX Resources, LLC |
| LEASE NO.: | NMNM100555 |
| WELL NAME & NO.: | Cooper 31 Federal #2H |
| SURFACE HOLE FOOTAGE: | 660' FSL & 660' FEL |
| BOTTOM HOLE FOOTAGE | 660' FSL & 330' FWL |
| LOCATION: | Section 31, T. 25 S., R 29 E., NMPM |
| COUNTY: | Eddy County, New Mexico |

## TABLE OF CONTENTS

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

## I. GENERAL PROVISIONS

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

## II. PERMIT EXPIRATION

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

## III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

## IV. NOXIOUS WEEDS

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

# V. CONSTRUCTION

## A. NOTIFICATION

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

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

## B. TOPSOIL

The operator shall stockpile the topsoil of the well pad. The topsoil to be stripped is approximately 6 inches in depth. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

## C. RESERVE PITS

Tanks are required for drilling operations: No Pits.

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

## D. FEDERAL MINERAL MATERIALS PIT

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

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

## E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

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

## F. ON LEASE ACCESS ROADS

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

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

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

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

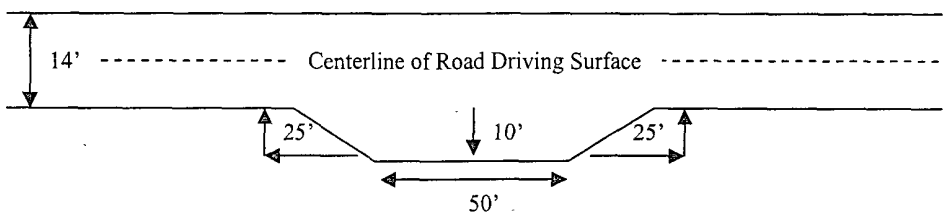
**Crowning**
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

**Ditching**

Ditching shall be required on both sides of the road.

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

**Standard Turnout – Plan View**

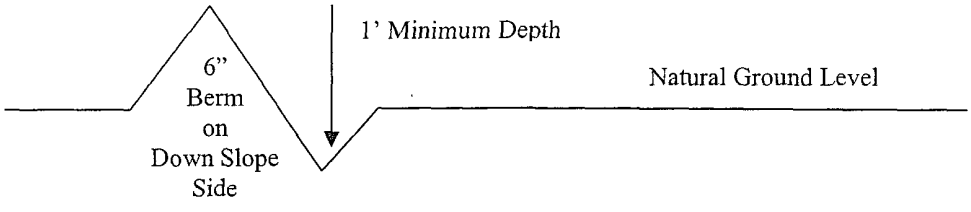



**Drainage**

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

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

**Cross Section of a Typical Lead-off Ditch**




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

**Formula for Spacing Interval of Lead-off Ditches**

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

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

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

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

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

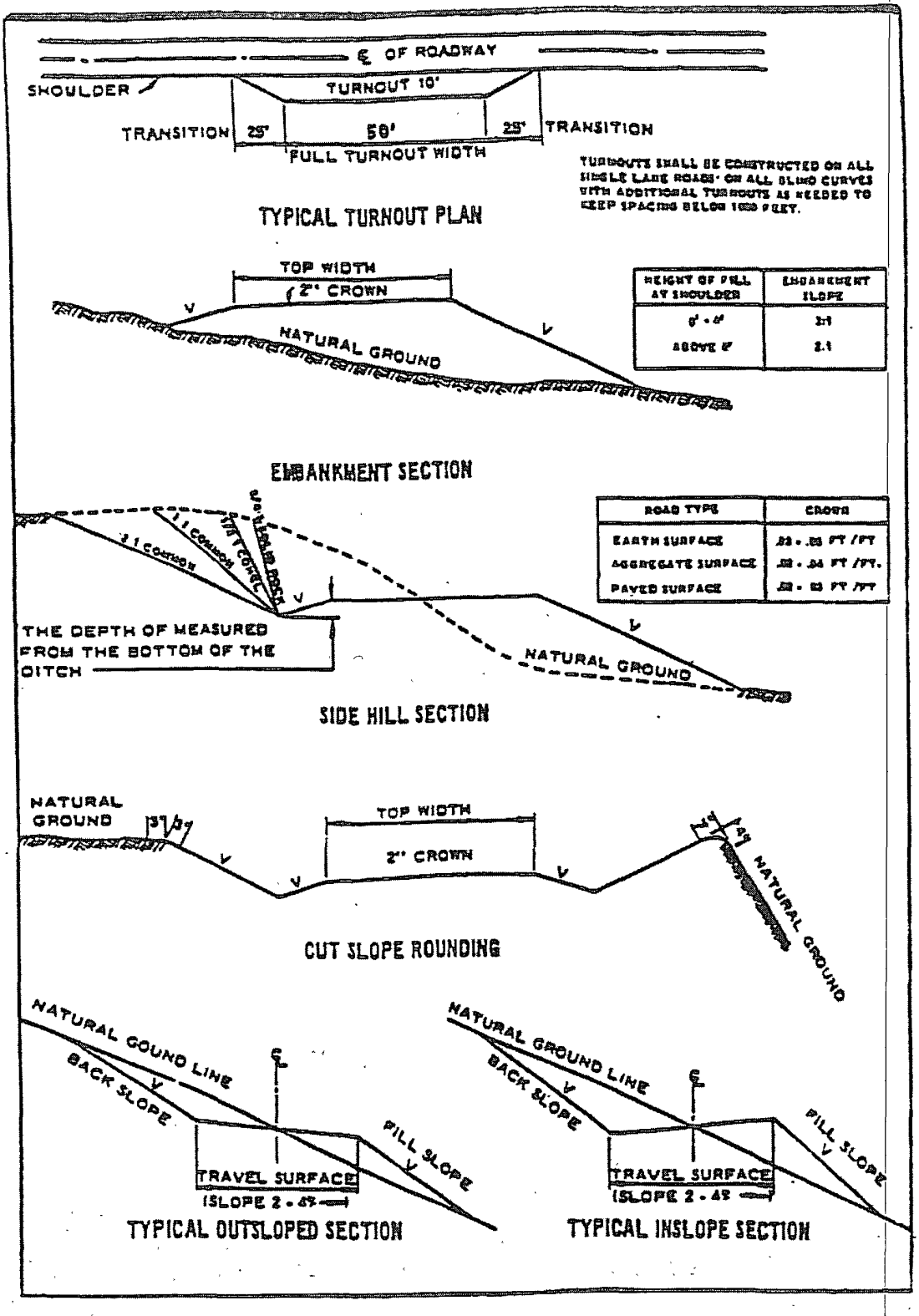
A gate shall be constructed and fastened securely to H-braces.

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

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

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

Figure 1 – Cross Sections and Plans For Typical Road Sections



## VI. DRILLING – Unorthodox BHL

### 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. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**

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

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

### B. CASING

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

**Medium cave/karst.**
**Possible water/brine flows in the Salado Group.**
**Possible lost circulation in the Delaware Mountain Group and the Bone Spring formations.**
**Possible high pressure from the Wolfcamp – applicable to pilot hole.**

1. The **13-3/8** inch surface casing shall be set **at approximately 600 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface. **Fresh water mud to be used to setting depth of casing. With added depth, excess cement calculates to less than 15%.**

    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.

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. **Casing to be set in the Lamar Limestone at approximately 2850'. With added depth, excess cement calculates to less than 15%. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst concerns.**

**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.**

**If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface. If this occurs, the wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst concerns.**

**Pilot hole to be plugged solid from TD to kick-off point.**

3. The minimum required fill of cement behind the **5-1/2** 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. **Cement proposed was for measured depth of 10000', but directional shows measured depth of 11618'. Excess cement on first stage calculates to 20%.**

    b. Second stage above DV tool, cement shall:

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

**Centralizers required on horizontal leg, must be type for horizontal service and minimum of one every other joint.**

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

## C. PRESSURE CONTROL

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

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

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

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

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

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

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

## D. DRILL STEM TEST

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

**WWI 100708**

# VII. 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

# VIII. 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.

Seed Mixture 3, for Shallow Sites

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

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

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

| Species | | lb/acre |
|---|---|---|
| Plains Bristlegrass (*Setaria magrostachya*) | 1.0 | |
| Green Spangletop (*Leptochloa dubia*) | | 2.0 |
| Side oats Grama (*Bouteloua curtipendula)* | | 5.0 |

*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.