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EA-12-1098

Form 3160-3  
(March 2012)

SEP 06 2012

NMOC D ARTESIA

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SECRETARY'S POTASH

FORM APPROVED  
OMB No 1004-0137  
Expires October 31, 2014

APPLICATION FOR PERMIT TO DRILL OR REENTER

|  |                                       |   |              |
|--|---------------------------------------|---|--------------|
| 1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER   |                                       | 6. If Indian, Allottee or Tribe Name  |              |
| 1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone |                                       | 7. If Unit or CA Agreement, Name and No.                                    |              |
| 2. Name of Operator RKI EXPLORATION & PRODUCTION, LLC.   |                                       | 8. Lease Name and Well No. LONGVIEW DEEP FEDERAL 1-21                       |              |
| 3a. Address 3817 NW EXPRESSWAY, SUITE 950 OKLAHOMA CITY, OK. 73112   |                                       | 9. API Well No. 30-015-40651  |              |
| 3b. Phone No. (include area code) 405-996-5750   |                                       | 10. Field and Pool, or Exploratory UNDESIGNATED MORROW                      |              |
| 4. Location of Well (Report location clearly and in accordance with any State requirements *)<br>At surface 1215 FNL & 1260 FWL<br>At proposed prod. zone SAME   |                                       | 11. Sec., T. R. M. or Blk. and Survey or Area SECTION 1, T. 23 S., R. 28 E. |              |
| 14. Distance in miles and direction from nearest town or post office* 5 MILES NORTHEAST OF LOVING, NM  |                                       | 12. County or Parish EDDY   | 13. State NM |
| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 1215'  | 16. No. of acres in lease 800 798.88  | 17. Spacing Unit dedicated to this well 320 319.16                          |              |
| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 300' southeast of #15 well  | 19. Proposed Depth 13,500'            | 20. BLM/BIA Bond No. on file NLM-NMB-000460                                 |              |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3057.37' GL  | 22. Approximate date work will start* | 23. Estimated duration 35 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.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification   |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM.             |

|                                    |                                    |             |
|------------------------------------|------------------------------------|-------------|
| 25. Signature <i>Barry W. Hunt</i> | Name (Printed/Typed) BARRY W. HUNT | Date 5/8/12 |
|------------------------------------|------------------------------------|-------------|

Title PERMIT AGENT FOR RKI EXPLORATION & PRODUCTION, LLC.

|  |                      |                  |
|--|----------------------|------------------|
| Approved by (Signature) <i>/s/ Jesse J. Juen</i> | Name (Printed/Typed) | Date AUG 24 2012 |
|--|----------------------|------------------|

Title STATE DIRECTOR

Office NM STATE 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)

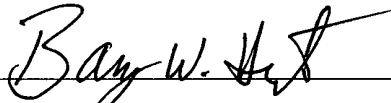
Carlsbad Controlled Water Basin

Approval Subject to General Requirements  
& Special Stipulations Attached

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

## CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct, and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or RKI Exploration and Production, LLC am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U. S. C. 1001 for the filing of false statements. Executed this 8<sup>th</sup> day of May 2012.

Signed:  \_\_\_\_\_

Printed Name: Barry Hunt

Position: Agent for RKI Exploration & Production, LLC.

Address: 1403 Springs Farm Place, Carlsbad, NM 88220

Telephone: (575) 361-4078

E-mail: [specialtpermitting@gmail.com](mailto:specialtpermitting@gmail.com)

Field Representative: Gene Simer

Address: P. O. Box 370, Carlsbad, NM 88221

Telephone: Office: (575) 885-1313, Cell: (575) 706-3225

# **RKI** Exploration & Production LLC

P.O. Box 370, Carlsbad, NM 88221  
Office 505-885-1313 Fax 505-885-3509

July 17, 2009

To Whom It May Concern:

Mr. Barry Hunt is employed by RKI Exploration & Production to sign as their agent for APD's and Right of Ways in the states of New Mexico and Texas.

If you have any questions, please contact me at my office at 575-885-1313.

Sincerely,

RKI Exploration & Production, LLC

A handwritten signature in cursive script, appearing to read "Gene Simer".

Gene Simer  
Production Superintendent

DISTRICT I  
1625 N French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
DISTRICT II  
811 S First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
DISTRICT III  
1000 Rio Hondo Rd., Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
DISTRICT IV  
1220 S St Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office  
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

|                                   |  |   |
|-----------------------------------|--|---|
| API Number<br><b>30-015-40651</b> | Pool Code<br><b>96642</b>                                | Pool Name<br><b>Laguna Salado</b><br><b>UNDESIGNATED MORROW</b> |
| Drumery Code<br><b>39431</b>      | Property Name<br><b>LONGVIEW DEEP FEDERAL 1</b>          | Well Number<br><b>21</b>  |
| UGRID No<br><b>246289</b>         | Operator Name<br><b>RKI EXPLORATION &amp; PRODUCTION</b> | Elevation<br><b>3057.37'</b>                                    |

Surface Location

| UL or lot no | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|--------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| 4            | 1       | 23 S     | 28 E  |         | 1215          | NORTH            | 1260          | WEST           | EDDY   |

Bottom Hole Location If Different From Surface

| UL or lot no | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|--------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
|              |         |          |       |         |               |                  |               |                |        |

| Dedicated Acres             | Joint or Infill | Consolidated Code | Order No          |
|-----------------------------|-----------------|-------------------|-------------------|
| <b>319.16</b><br><b>320</b> |                 |                   | <b>13500 8/24</b> |

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

|  |   |   |   |
|--|---|---|---|
|  | LONGVIEW DEEP<br>FEDERAL 1-21<br>NMSP-E (NAD 83)<br>Y = 487066.5' N<br>X = 630331.4' E<br>N LAT. = 32° 20' 19.28"<br>W LONG. = -104° 02' 42.65" | <p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>Signature: <b>Barry W. Hunt</b> Date: <b>6/1/12</b></p> <p>Print Name: <b>Barry W. Hunt</b></p> <p>E-mail Address: _____</p> |   |
|  | NMSP-E (NAD 27)<br>Y = 487006.85' N<br>X = 589148.9' E<br>N LAT. = 32.3385673°<br>W LONG. = -104.0446863°                                       |   | <p><b>SURVEYORS CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>March 19, 2012</p> <p>Date of Survey</p> <p>Signature and Seal of Professional Surveyor</p> |
|  |   |   |   |
|  |   |   | <p>Job No.: <b>WTC48404</b></p> <p><b>JAMES E. TOMPKINS 14729</b></p> <p>Certificate Number</p>   |

DRILLING PLAN

Well Longview Deep Fed 1-21  
Location 1,215 FNL 1,260 FWL  
Section 1-26S-28E  
County Eddy  
State New Mexico

- 1) The elevation of the unprepared ground is 3,057 feet above sea level.
- 2) The geologic name of the surface formation is Quaternary - Alluvium.
- 3) A rotary rig will be utilized to drill the well to 13,500 feet and run casing.  
This equipment will then be rigged down and the well will be completed with a workover rig.
- 4) Proposed depth is 13,500 feet.

5) Estimated tops:

|                              |            | BHP       | Anticipated<br>MW |
|------------------------------|------------|-----------|-------------------|
| <i>Top of Salt</i> → Rustler | 203        |           |                   |
| Base of Salt                 | 2,555      |           |                   |
| Base of Lime                 | 2,775      |           |                   |
| Delaware Top                 | 2,820 Oil  | 1,221 psi | 8.33 ppg          |
| Bone Spring                  | 6,355 Oil  | 2,752 psi | 8.33 ppg          |
| Wolfcamp                     | 9,680 Gas  | 4,191 psi | 8.33 ppg          |
| Strawn                       | 11,405 Gas | 5,703 psi | 9.62 ppg          |
| Atoka                        | 11,770 Gas | 5,885 psi | 9.62 ppg          |
| Morrow                       | 12,240 Gas | 7,099 psi | 11.15 ppg         |
| Lower Morrow                 | 12,725 Gas | 7,381 psi | 11.15 ppg         |
| Barnett                      | 12,885     |           |                   |
| TD                           | 13,500     | 7,827 psi | 175 degree F      |

Fresh water anticipated at 150 feet.

6) Casing program: All new casing

|              |        |        |         |               |            | Safety Factors                        |                                |                                    |
|--------------|--------|--------|---------|---------------|------------|---------------------------------------|--------------------------------|------------------------------------|
| Hole<br>Size | Top    | Bottom | OD Csg  | Wt/Grade      | Connection | 1.125<br>Collapse<br>Design<br>Factor | 1<br>Burst<br>Design<br>Factor | 1.8<br>Tension<br>Design<br>Factor |
| 17 1/2"      | 0      | 235    | 13 3/8" | 54.5#/J-55    | ST&C       | 11.11                                 | 54.54                          | 42.71                              |
| 12 1/2"      | 0      | 4,000  | 9 5/8"  | 40#/J-55      | LT&C       | 1.48                                  | 4.64                           | 3.25                               |
| 8 3/4"       | 0      | 11,700 | 7"      | 29#/HCP-110   | LT&C       | 1.68                                  | 2.66                           | 2.35                               |
| 6 1/8"       | 11,400 | 13,500 | 4 1/2"  | 11.6#/HCP-110 | LT&C       | 1.12                                  | 1.55                           | 9.75                               |

All new pipe

7) Cement program:

**Surface** 17 1/2" hole  
 Pipe OD 13 3/8"  
 Setting Depth 235 ft  
 Annular Volume 0.69462 cf/ft  
 Excess 1 100 %

Lead: 244 sx 1.34 cf/sk 13.5 ppg  
 Lead: "C" + 4% PF20 (gel) + 2% PF1 (CC) + .125 pps PF29 (CelloFlake) + .2% PF46 (antifoam)  
 Top of cement: Surface

**Intermediate** 12 1/2" hole  
 Pipe OD 9 5/8"  
 Setting Depth 4,000 ft  
 Annular Volume 0.31318 cf/ft 0.3627 cf/ft  
 Excess 1 100 %  
 DV Tool Depth 2000 ft

Stage 1  
 Lead: 477 sx 2.07 cf/sk 12.6 ppg  
 Tail: 200 sx 1.33 cf/sk 14.8 ppg  
 Lead: 35/65 Poz "C" + 5% PF44 (salt) + 6% PF20 (gel) + 3 pps PF42 (KoalSeal) + .125 pps PF29 (CelloFlake) + .25 pps PF 46 (antifoam)  
 Tail: "C" + .2% PF13 (retarder)  
 Top of cement: DV tool

Stage 2  
 Lead: 580 sx 1.97 cf/sk 12.9 ppg  
 Tail: 100 sx 1.33 cf/sk 14.8 ppg  
 Lead: 35/65 Poz "C" + 4% PF20 (gel) + 2% PF1 (CC) + .125 pps PF29 (CelloFlake) + .25 pps PF46 (antifoam)  
 Tail: "C" + .1% PF13 (retarder)  
 Top of cement: Surface

**Production/Inter.** 8 3/4" hole  
 Pipe OD 7"  
 Setting Depth 11,700 ft  
 Annular Volume 0.15033 cf/ft 0.15848 cf/ft 300 ft  
 Excess 0.35 35 %  
 DV Tool Depth 5500 ft

Stage 1  
 Lead: 856 sx 1.47 cf/sk 13.0 ppg  
 Lead: PVL (C) + 2% PF174 (expanding agent) + .3% PF167 (UNIFLAC) + .1% PF65 (dispersant) + .2% PF13 (retarder) + .25 pps PF46 (antifoam)  
 Top of cement: DV tool

*See COA*  
 Stage 2  
 Lead: 109 sx 2.04 cf/sk 12.6 ppg  
 Tail: 100 sx 1.47 cf/sk 13.0 ppg  
 Lead: 35/65 Poz "C" + 4% PF20 (gel) + 2% PF1(CC) + .125 pps PF29 (CelloFlake) + .25 pps PF46 (antifoam)  
 Tail: "C" + .1% PF13 (retarder)  
 Top of cement: 3,700 ft

*See COA*  
**Liner** 6 1/8" hole  
 Pipe OD 4 1/2"  
 Setting Depth 13,500 ft Top of Liner 11,400  
 Annular Volume 0.09417 cf/ft 0.09813 cf/ft 300 ft  
 Excess 0.35 35 %

Stage 1  
 Lead: 206 sx 1.21 cf/sk 14.6 ppg  
 Lead: 50:50 Poz "H" + 2% PF20 (gel) + .25 pps PF46 (antifoam) + .7% 606A (gel supressing agent) + .2% PF65 (dispersant)  
 Top of cement: Liner top

#### 8) Pressure control equipment:

The blowout preventer equipment (BOP) shown in Exhibit #1 will consist of a double ram type (5,000 psi WP) preventer, a bag-type annular preventer (5,000 psi WP), and rotating head. Both units will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and pipe rams (sized to accommodate the drill pipe size being utilized) on bottom.

A 13 3/8" SOW x 13 5/8" 5M casing head will be installed on the 13 3/8" casing and utilized until total depth is reached.

The 13 3/8" casing and BOP equipment will be tested to .22 psi per ft of length or 1,500 psi whichever is greater, but not exceeding 70% burst rating of the casing.

The 9 5/8" casing will be hung in the casing head and the BOP stack will not be nipped down.

The BOP equipment will be isolated with a test plug and tested to 250 psi / 5,000 psi.

The annular will be tested to 250 psi / 2,500 psi.

The 9 5/8" casing will be tested to .22 psi per ft of length

or 1,500 psi whichever is greater, but not exceeding 70% of the burst rating of the casing.

The 7" intermediate casing will be hung in the casing head and the BOP stack will not be nipped down.

The BOP equipment will be isolated with a cup test plug and tested to 250 psi / 5,000 psi.

The annular will be tested to 250 psi / 2,500 psi.

The 7" casing will be tested to .22 psi per ft of length

or 1,500 psi whichever is greater, but not exceeding 70% of the burst rating of the casing.

Based on a 11.2 ppg formation gradient for the Morrow (from offset data) the BOP pressure rating requirement is calculated as:  $(11.2 \text{ ppg})(.052)(13,500 \text{ ft}) = 7,862 \text{ psi}$

Assuming a partially evacuated hole with a .22 psi/ft gradient:  $7,862 \text{ psi} - (.22 \text{ psi/ft})(13,500 \text{ ft}) = 4,892 \text{ psi}$

After drilling approximately 10 feet of new formation below the 7" intermediate the shoe will be tested to an 11.5 ppg equivalent mud weight.

Pipe rams will be operated and checked each 24 hour period and each time the drill string is out of the hole.

These function test will be documented on the daily driller's log.

A drilling spool or blowout preventer with 2 side outlets (choke side shall be 3" minimum diameter, kill side shall be at least 2" diameter).

2 kill line valves, one of which will be a check valve.

2 chokes on the manifold along with a pressure gauge.

Upper kelly cock valve with handle available.

Safety valve and subs to fit all drill string connections in use.

All BOP equipment connections subjected to pressure will be flanged, welded, or clamped.

Fill up line above the upper most preventer.

*See COA*

*Requires extra ram  
or 10M system  
within 10% of  
5000 psi  
O.O.Z. III. A.Z.O. IV.*

#### 9) Mud program:

| Top    | Bottom | Mud Wt.     | Vis      | PV      | YP      | Fluid Loss | Type System           |
|--------|--------|-------------|----------|---------|---------|------------|-----------------------|
| 0      | 235    | 8.5 to 8.9  | 32 to 36 | 6 - 12  | 2 - 8   | NC         | Fresh Water           |
| 235    | 4,000  | 9.8 to 10.0 | 28 to 30 | 1 - 6   | 1 - 6   | NC         | Brine                 |
| 4,000  | 11,700 | 8.9 to 9.1  | 28 to 36 | 1 - 6   | 1 - 6   | NC         | Cut Brine/Fresh Water |
| 11,700 | 13,500 | 9.5 to 11.2 | 36 to 45 | 15 - 25 | 12 - 20 | 6 - 8      | Cut Brine/Fresh Water |

#### 10) Logging, coring, and testing program: *See COA*

No drillstem test are planned

Total depth to intermediate: CNL, Caliper, GR, DLL,

Intermediate to surface: CNL, GR

No coring is planned

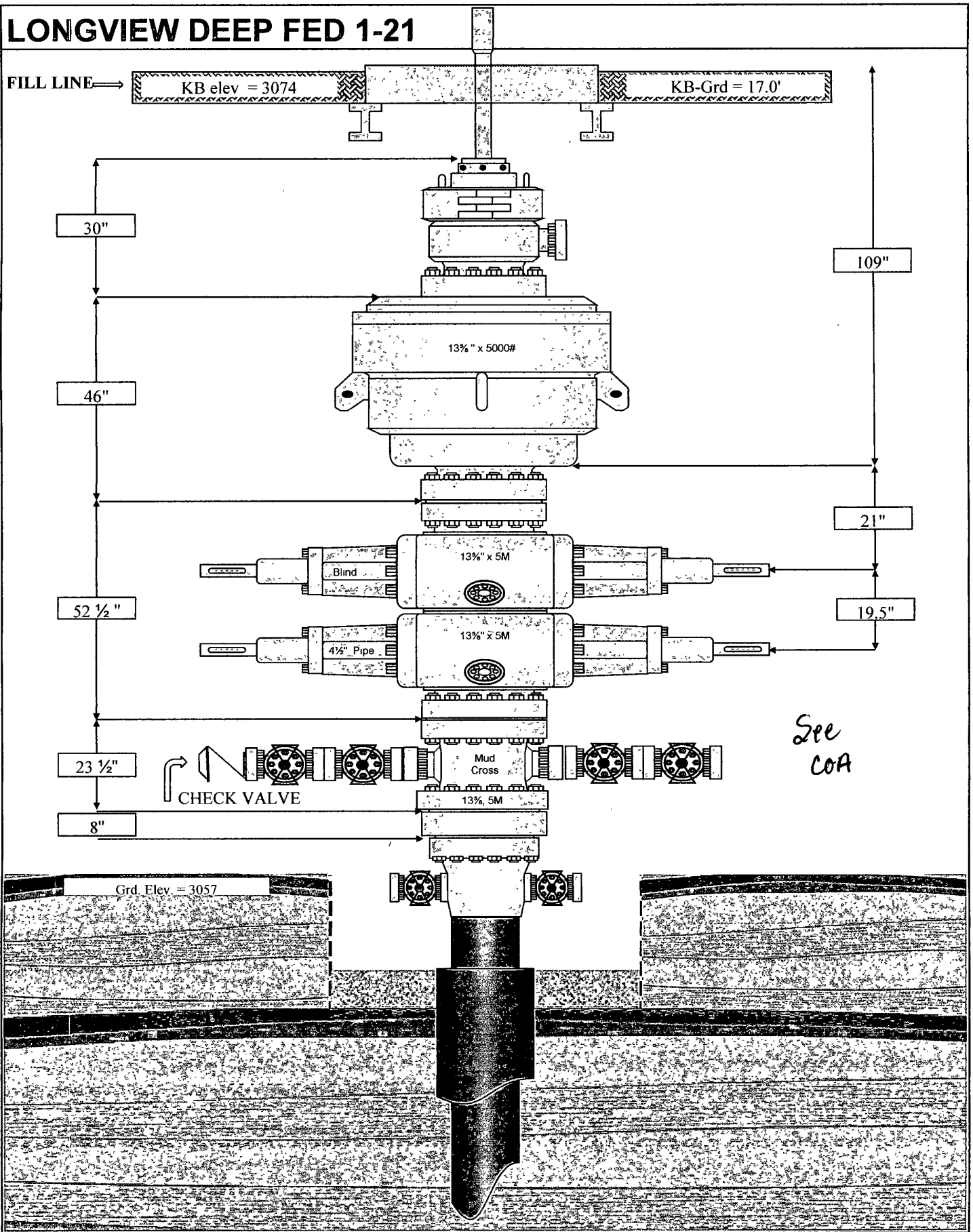
11) Potential hazards:

No abnormal pressure or temperature is expected. No H2S is known to exist in the area.  
Though lost circulation is not anticipated, lost circulation material will be available on location.

|                            |          |
|----------------------------|----------|
| 12) Anticipated Start Date | June '12 |
| Duration                   | 35 days  |

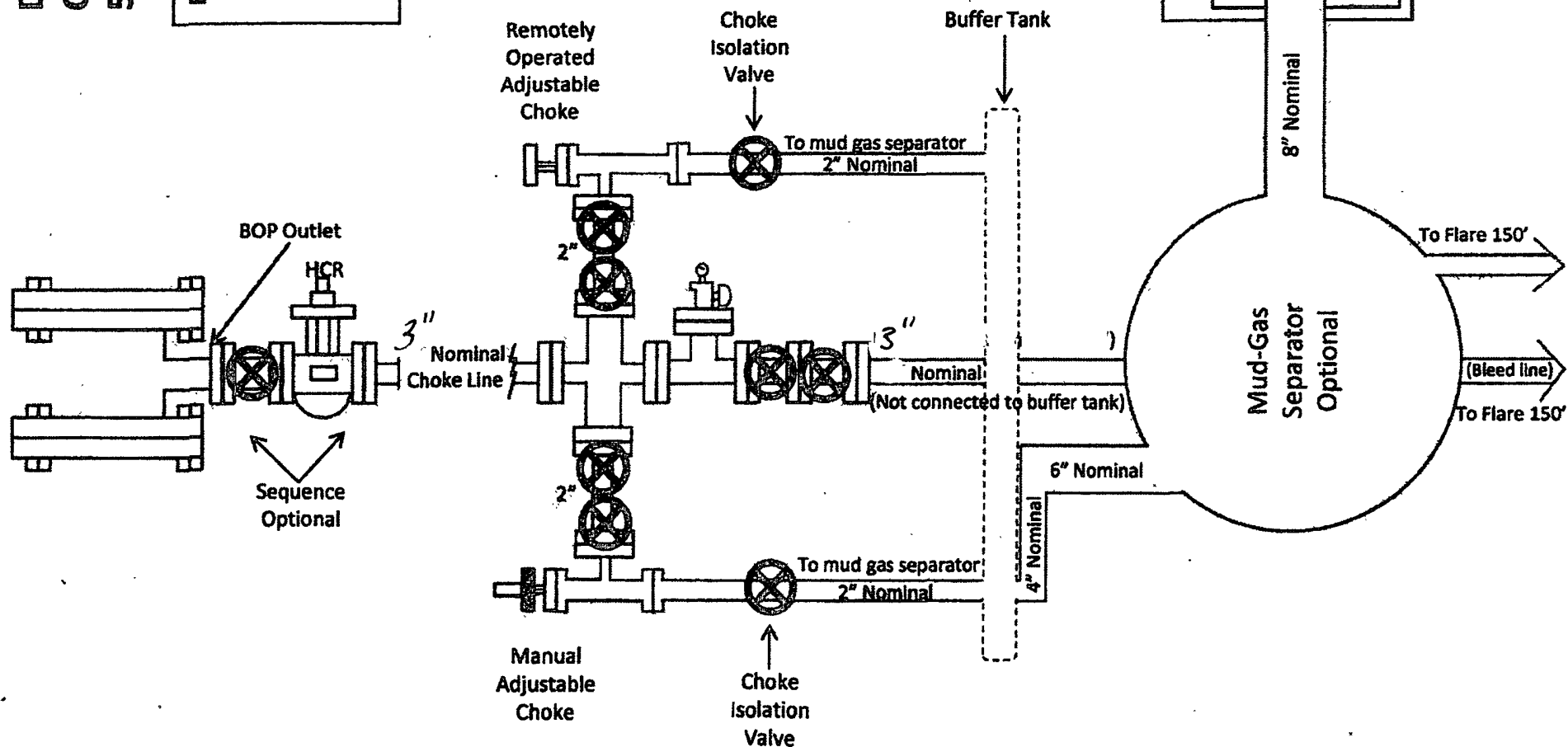


# LONGVIEW DEEP FED 1-21



**Drilling Operations  
Choke Manifold  
5M Service**

Exhibit E-1 – Choke Manifold Diagram



**RKI Exploration & Production**  
**Hydrogen Sulfide Contingency Plan**  
**For Drilling/Workover/Facility**

This well and its anticipated facility are not expected to have Hydrogen Sulfide releases. However, there may be Hydrogen Sulfide production in the nearby area. There are no private Residences in the area but a contingency plan has been orchestrated. RKI Exploration and Production will have a Company Representative available to rig personnel through out drilling or production operations. If hydrogen sulfide is detected or suspected, monitoring equipment will be acquired for monitoring and/or testing.

**RKI Exploration & Production**  
**Hydrogen Sulfide Contingency Plan**  
**For Drilling/Workover/Facility**

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# **RKI Exploration & Production**

## **HYDROGEN SULFIDE (H<sub>2</sub>S) CONTINGENCY DRILLING PLAN**

This well and its anticipated facility are not expected to have hydrogen sulfide releases. However, there may be hydrogen sulfide production in the nearby area. There are no private residences in the area but a contingency plan has been orchestrated. RKI Exploration & Production will have a company representative available to rig personnel throughout the drilling and production operations. If hydrogen sulfide is detected or suspected, monitoring equipment will be acquired for monitoring and or testing.

### **GENERAL H<sub>2</sub>S EMERGENCY ACTIONS**

1. All personnel will immediately evacuate to an up-wind and if possible up- hill "safe area".
2. If for any reason a person must enter the hazardous area, they must wear a SCBA (Self Contained Breathing Apparatus).
3. Always use the "buddy system"
4. Isolate the well/problem if possible
5. Account for all personnel
6. Display the proper colors warning all unsuspecting personnel of the danger at hand.
7. Contact the Company personnel as soon as possible if not at the location (use the enclosed call list)

At this point the company representative will evaluate the situation and coordinate the necessary duties to bring the situation under control, and if necessary, the notification of the emergency response agencies and nearby residents.

### **EMERGENCY PROCEDURES FOR AN UNCONTROLLABLE RELEASE OF H<sub>2</sub>S**

1. All personnel will don the self-contained breathing apparatus
2. Remove all personnel to the "safe area" (always use the buddy system)
3. Contact company personnel if not on location
4. Set in motion the steps to protect and or remove the general public to an upwind "safe area". Maintain strict security and safety procedures while dealing with the source.
5. No entry to any unauthorized personnel
6. Notify the appropriate agencies.
7. Call NMOCD

If at this time the supervising person determines the release of the H<sub>2</sub>S cannot be contained to the site location and the general public is in danger he will take the necessary steps to protect the workers and the public.

**EMERGENCY CALL LIST (Start and continue until ONE of these people has been contacted)**

|                              |                |
|------------------------------|----------------|
| RKI Exploration & Production | 1-800-667-6958 |
| Frank Collins                | 575-725-9334   |
| Gene Simer                   | 575-706-3225   |
| Lonnie Catt                  | 575-202-1444   |
| Brent Umberham               | 405-623-5080   |
| Tim Haddican                 | 405-823-2872   |

**EMERGENCY RESPONSE NUMBERS**

|                        |                                    |                     |
|------------------------|------------------------------------|---------------------|
| State Police           | Eddy County                        | 575-748-9718        |
| State Police           | Lea County                         | 575-392-5588        |
| Sheriff                | Eddy County                        | 575-746-2701        |
| Emergency Medical      | Eddy County                        | 911 or 505-746-2701 |
| Ambulance              | Lea County                         | 911 or 505-394-3258 |
| Emergency Response     | Eddy County SERC                   | 575-476-2701        |
| Carlsbad Police Dept   |                                    | 575-885-2111        |
| Carlsbad Fire Dept     |                                    | 575-885-3125        |
| Loco Hills Police Dept |                                    | 575-677-2349        |
| Jal Police Dept        |                                    | 575-395-2501        |
| Jal Fire Dept          |                                    | 575-394-3258        |
| Jal Abulance           |                                    | 575-395-2221        |
| NMOCD                  | District 1 (Lea, Roosevelt, Curry) | 575-393-6161        |
|                        | District 2 (Eddy, Chavez)          | 575-392-2973        |
| Baker                  | Artesia                            | 575-746-3140        |
| Halliburton            | Artesia                            | 1-800-523-2482      |
|                        | Hobbs                              | 1-800-523-2482      |
| ParFive                | Artesia                            | 575-748-1288        |
| Wild Well Control      | Midland                            | 432-550-6202        |

## **PROTECTION OF THE GENERAL PUBLIC**

1. 100 ppm at any public area (any place not associated with this site)
2. 500 ppm at any public road (any road the general public may travel)
3. 100 ppm radius of ¼ mile in New Mexico will be assumed if there is insufficient data to calculate radius of exposure and there is reasonable expectation that H2S could be present in concentrations greater than 100 ppm in the gas mixture.

## **CALCULATION FOR THE 100 PPM (ROE) "PASQUILL-GIFFORD EQUATION**

$$X = ((1.589)(\text{mole fraction})(Q - \text{volume in scf}))^{0.6258}$$

## **CALCULATION FOR THE 500 PPM (ROE)**

$$X = ((.4546)(\text{mole fraction})(Q - \text{volume in scf}))^{0.6258}$$

Example:

A well is determined to have 150 / 500 ppm H2S in the gas mixture and the well/facility is producing at a gas rate of 100 mcf/d

150 ppm

$$X = ((1.589)(150/100,000)(100,000))^{0.6258} = 7 \text{ ft}$$

500 ppm

$$X = ((.4546)(500/100,000)(100,000))^{0.6258} = 3.3 \text{ ft}$$

These calculations will be forwarded to the appropriate NMOCD office when applicable

## **PUBLIC EVACUATION PLAN**

1. Notification of the emergency response agencies of the hazardous condition and implement evacuation procedures.
2. A trained person in H2S safety shall monitor with detection equipment the H2S concentration, wind and area of exposure. This person will determine the outer perimeter of the hazardous area. The extent of the evaluation area will be determined from the data being collected.
3. Law enforcement shall be notified to set up necessary barriers and maintain such for the duration of the situation as well as aid in the evacuation procedure. The company supervisor shall stay in communications with all agencies through the duration of the situation and inform them when the situation has been contained and the affected area(s) is safe to enter.

## **IGNITION OF THE GAS**

1. Human life and or property are in danger
2. There is no hope of bringing the situation under control with the prevailing conditions at the site
3. Two people are required. They must be equipped with positive pressure, self-contained breathing apparatus and "D" ring style full body, OSHA approved safety harness. Non-flammable rope will be attached.
4. One of the people will be qualified safety person who will test the atmosphere for H2S, oxygen and LFL. The other person will be the company supervisor, he is responsible for igniting the well.
5. Ignite up wind from a distance no closer than necessary. Before igniting, make a final check of combustible gases.
6. Following ignition, continue with the emergency actions and procedures as before.

## Characteristics of H<sub>2</sub>S and SO<sub>2</sub>

| Common Name      | Chemical Formula | Specific Gravity | Threshold Limit | Hazardous Limit | Lethal Concentration |
|------------------|------------------|------------------|-----------------|-----------------|----------------------|
| Hydrogen Sulfide | H <sub>2</sub> S | 1.189<br>Air= 1  | 10 ppm          | 100 ppm/hr      | 600 ppm              |
| Sulfur Dioxide   | SO <sub>2</sub>  | 2.21<br>Air= 1   | 2ppm            | N/A             | 1000 ppm             |

### **REQUIRED EMERGENCY EQUIPMENT**

#### 1. Breathing apparatus

Rescue Packs (SCBA) – 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer with radio communications.

Work/Escapes Packs – 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.

Emergency Escape Packs – 4 – packs shall be stored in the doghouse for emergency evacuation.

#### 2. Signage and Flagging

One color cod condition sign will be placed at the entrance to the site indicating possible conditions at the site

A colored conditions flag will be on display, indicating the conditions at the site at the time

#### 3. Briefing Area (see attachment)

#### 4. Wind Socks

Two windsocks will be placed in strategic locations, visible from all angles

#### 5. H<sub>2</sub>S Detectors & Alarms

The stationary detector with three sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible at 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: (gas sample tubes will be stored in the safety trailer)

Rig floor

Bell nipple

End of flow line or where well bore fluid is being discharged

#### 6. Auxiliary Rescue Equipment and misc.

Stretcher

Two OSHA full body harnesses

100 ft. 5/8" OSHA approved rope

1 – 20# class ABC fire extinguisher

Communication via cell phones on location and vehicles on location

Flare gun/flares



## **Well Control Equipment**

### **1. BOP Equipment**

- 5,000 psi blowout preventer (pipe and blind rams)
- 5,000 psi annular preventer
- 5,000 psi rotating head
- 5,000 choke manifold (equipped with hydraulic choke)
- Mud/gas separator
- Flare stack with solar powered igniter (with battery backup igniter) 150' from the well

## **Mud info and H<sub>2</sub>S Operating Mud Conditions**

Though no H<sub>2</sub>S is anticipated during the drilling operation, this contingency plan will provide for methods to ensure the well is kept under control in the event an H<sub>2</sub>S reading of 100 ppm or more are encountered. Once personnel are safe and the proper protective gear is in place and on personnel, the operator and rig crew essential personnel will ensure the well is under control, suspend drilling operations and shut-in the well (unless pressure build up or other operational situations dictate suspending operations will prevent well control), increase the mud weight and circulate all gas from the hole utilizing the mud/gas separator downstream of the choke, the choke manifold and the emergency flare system located 150' from the well. Bring the mud system into compliance and the H<sub>2</sub>S level below 10 ppm, then notify all emergency officers that drilling ahead is practical and safe. Proceed with drilling ahead only after all provisions of Onshore Order 6, Section III.C. have been satisfied. Mud will be a fresh water/brine system with the proper H<sub>2</sub>S scavengers on location and utilized when necessary. Mud pH will also be kept at a level to minimize sulfide stress cracking and embrittlement when H<sub>2</sub>S is present in the mud system.

**RKI Exploration & Production**  
**Hydrogen Sulfide Contingency Plan**  
**For Drilling/Workover/Facility**

**USING SELF CONTAINED BREATHING AIR EQUIPMENT (SCBA):**

- (SCBA) SHOULD BE WORN WHEN ANY OF THE FOLLOWING ARE PERFORMED:
  - Working near the top or on the top of a tank
  - Disconnecting any line where H<sub>2</sub>S can reasonably be expected
  - Sampling air in the area to determine if toxic concentration of H<sub>2</sub>S can exist.
  - Working in areas where over 10 ppm on H<sub>2</sub>S has been detected.
  - At any time there is a doubt as the level of H<sub>2</sub>S in the area.
- All personnel shall be trained in the use of SCBA prior to working in a potentially hazardous location.
- Facial hair and standard eyeglasses are not allowed with SCBA.
- Contact lenses are never allowed with SCBA.
- Air quality shall be continuously checked during the entire operation.
- After each use, the SCBA unit shall be cleaned, disinfected, serviced and inspected.
- All SCBA shall be inspected monthly.

**RESCUE AND FIRST AID FOR VICTIMS OF HYDROGEN SULFIDE (H<sub>2</sub>S) POISONING:**

- Do not panic
- Remain calm and think
- Get on the breathing apparatus

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**Hydrogen Sulfide Contingency Plan**  
**For Drilling/Workover/Facility**

- Remove the victim to the safe breathing area as quickly as possible. Up wind and uphill from source or cross wind to achieve upwind.
- Notify emergency response personnel.
- Provide artificial respiration and or CPR, as necessary.
- Remove all contaminated clothing to avoid further exposure.
- A minimum of two personnel on location shall be trained in CPR and First Aid.

## RKI Exploration & Production

### Hydrogen Sulfide Contingency Plan For Drilling/Workover/Facility

H<sub>2</sub>S is extremely toxic. The acceptable ceiling for eight hours of exposure is 10 ppm, which is .001% by volume. H<sub>2</sub>S is approximately 20% heavier than air (Sp. Gr = 1.19) (Air = 1) and colorless. It forms an explosive mixture with air between 4.3% and 46%. By volume hydrogen sulfide is almost as toxic as hydrogen cyanide and is 5-6 times more toxic than carbon monoxide.

| COMMON NAME      | CHEMICAL ABBREV. | SPECIFIC GRVTY. | THRESHOLD LIMITS | HAZARDOUS LIMITS | LETHAL CONCENTRATIONS |
|------------------|------------------|-----------------|------------------|------------------|-----------------------|
| Hydrogen Sulfide | H <sub>2</sub> S | 1.19            | 10 ppm 15 ppm    | 100 ppm/hr       | 600ppm                |
| Hydrogen Cyanide | HCN              | 0.94            | 10 ppm           | 150 ppm/hr       | 300 ppm               |
| Sulfur Dioxide   | SO <sub>2</sub>  | 2.21            | 2 ppm            | N/A              | 1000 ppm              |
| Chlorine         | Cl <sub>2</sub>  | 2.45            | 1 ppm            | 4 ppm/hr         | 1000 ppm              |
| Carbon Monoxide  | CO               | 0.97            | 50 ppm           | 400 ppm/hr       | 1000 ppm              |
| Carbon Dioxide   | CO <sub>2</sub>  | 1.52            | 5000 ppm         | 5%               | 10%                   |
| Methane          | CH <sub>4</sub>  | 0.55            | 90,000           | Combustible @ 5% | N/A                   |

**Threshold Limit:** Concentrations at which it is believed that all workers may be repeatedly exposed, day after day without adverse effects.

**Hazardous Limit:** Concentrations that may cause death.

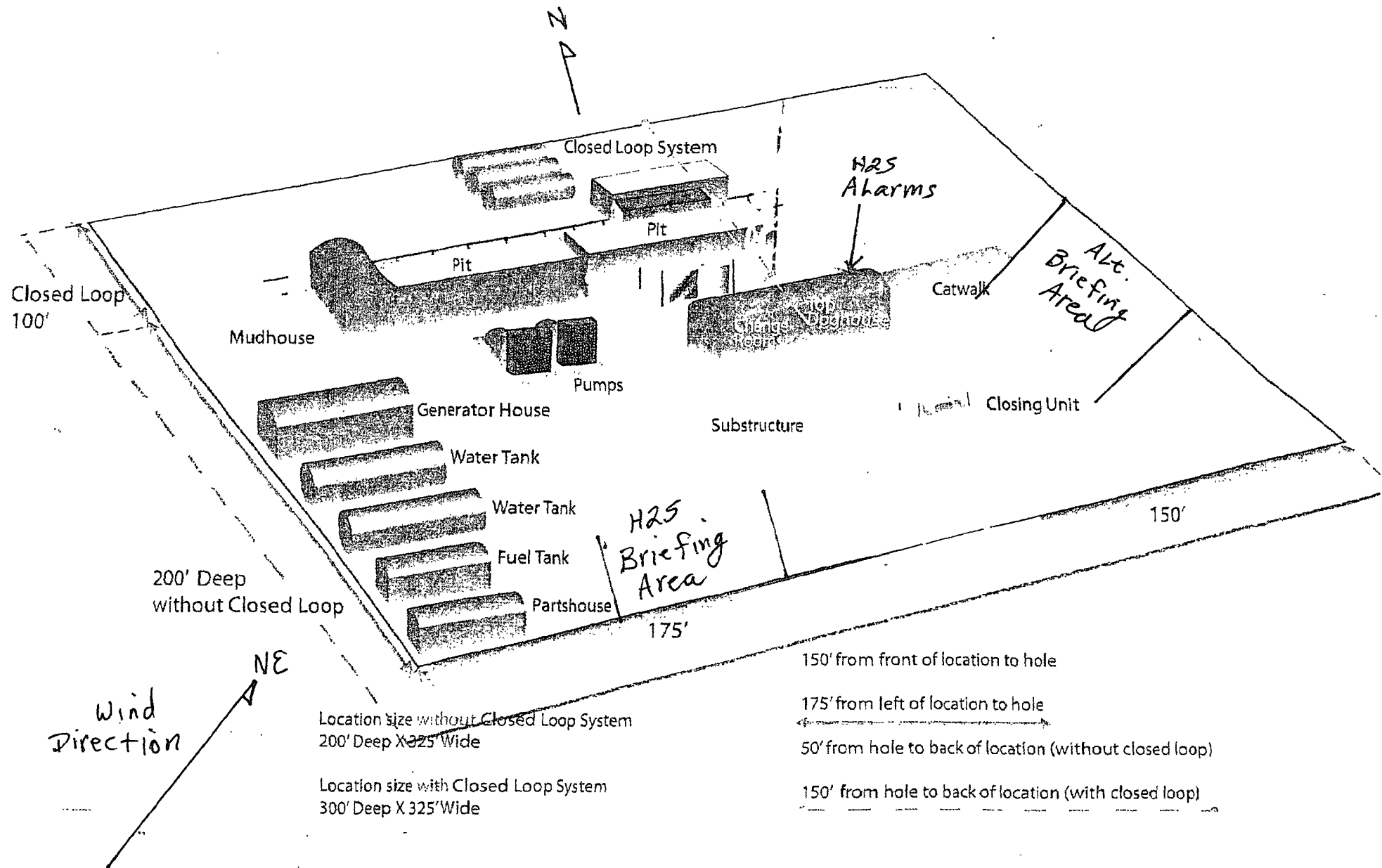
**Concentrations:** Concentrations that will cause death with short term exposure.

**Threshold Limit:** NIOSH guide to chemical hazards  
(10 ppm)

#### PHYSICAL EFFECTS OF HYDROGEN SULFIDE:

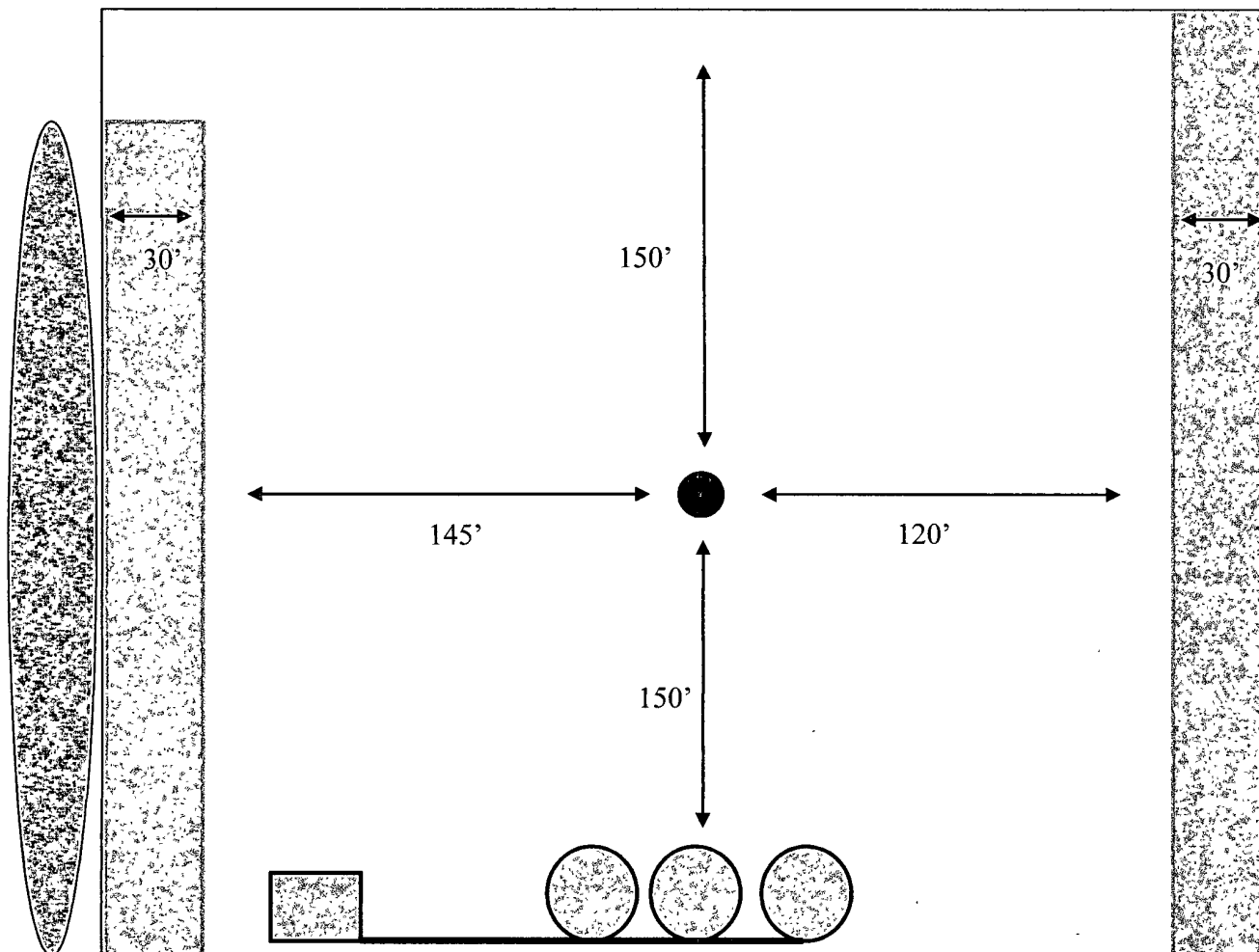
| CONCENTRATION | PHYSICAL EFFECTS   |
|---------------|--|
| .001% 10 ppm  | Obvious and unpleasant odor. Safe for 8 hr. exposure   |
| .005% 50 ppm  | Can cause some flu like symptoms and can cause pneumonia.  |
| .01% 100 ppm  | Kills the sense of smell in 3-15 minutes. May irritate the eyes and throat.  |
| .02% 200 ppm  | Kills the sense of smell rapidly. Severely irritates the eyes and throat. Severe flu-like symptoms after 4 or more hours May cause lung damage and or death. |
| .06% 600 ppm  | Loss of consciousness quickly, death will result if not rescued promptly.  |

# H2S Briefing Areas & Alarm Locations



## EXHIBIT C

### Interim Reclamation & Production Facilities LONGVIEW DEEP FEDERAL 1-21 V-DOOR EAST



#### LEGEND



Well Bore



Topsoil



Interim Reclamation



Production Facilities



NORTH

## PECOS DISTRICT CONDITIONS OF APPROVAL

|                       |                                     |
|-----------------------|-------------------------------------|
| OPERATOR'S NAME:      | RKI EXPLORATION                     |
| LEASE NO.:            | NM91078                             |
| WELL NAME & NO.:      | 21-LONGVIEW DEEP FEDERAL 1          |
| SURFACE HOLE FOOTAGE: | 1215'/N. & 1260'/W.                 |
| BOTTOM HOLE FOOTAGE   |                                     |
| LOCATION:             | Section 1, T. 23 S., R. 28 E., NMPM |
| COUNTY:               | Eddy County, New Mexico             |

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