



# Hydrogen Sulfide (H<sub>2</sub>S) Contingency Plan

## For

Mustang 33 Federal 2H

SHL: 150' FSL & 1980' FWL

BHL: 330' FNL & 1980' FWL

Sec 33-25S-35E

Lea Co, NM

### Escape:

In the event of an emergency, crews shall escape upwind of any H<sub>2</sub>S gas that is released. Primary escape route will utilize the location entrance on the southeast side of the pad and continue due west down the lease road. Secondary Egress will be made available due west of the location. Depending on prevailing wind direction, the intersection of the lease road and El Paso Pipeline Rd will be the Mustard Point. Necessary adjustments will be made during preliminary safety meetings. Crews should then block entrance to location from the lease road so as not to allow anyone traversing into a hazardous area. This blockade should be at a safe distance outside of the ROE. ***There are no homes or buildings in or near the ROE.***

OCT 28 2015



**Assumed 100ppm ROE=3000'**

**100ppm H2S concentration shall trigger activation of this plan.**

**Emergency Procedures:**

In the event of a release of gas containing H2S, 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 H2S 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 1) detection of H2S, 2) measures for protection against the gas 3) equipment used for protection & emergency response.

**Ignition of Gas Source**

SO2 or Sulfur Dioxide must be taken in precaution should the need to ignite the H2S gas stream if well control is lost against this gas. 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. Wind direction identification whenever there is ignition of H2S must be taken into consideration as well.



#### 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 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO <sub>2</sub>	2.21 Air = 1	2 ppm	N/A	1000 ppm

#### Contacting Authorities

Endurance Resources personnel must liaison with local & state agencies to ensure a proper response to a major release. Additionally, the NMOCD must be notified of the release as soon as possible but no later than 4hrs. Agencies will ask for information such as type & volume of release, wind direction, location of release, ect. Be prepared with all information available. The following call list of essential & potential responders has been prepared for use during a release. Endurance Resources' company response must be in coordination with the HMER.

### **HYDROGEN SULFIDE DRILLING OPERATIONS PLAN**

#### I. Hydrogen Sulfide Training

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

1. The hazards & characteristics of hydrogen sulfide (H<sub>2</sub>S)
2. The proper use & maintenance of PPE & SCBA systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, & prevailing winds (seasonal).
4. The proper techniques for first aid & rescue procedures.

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





1. The effects of H2S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action & shut-in procedures when drilling or reworking a well, BOP & well control procedures.
3. The contents & requirements of the H2S Drilling Operations Plan & Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500ft) and weekly H2S & well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan.

## II. H2S Safety Equipment & Systems

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

### A. Well Control Equipment:

- Flare Line
- Choke manifold with remotely operated choke
- Blind rams & pipe rams to accommodate all pipe sizes with properly sized closing unit.
- Auxiliary equipment to include: annular preventer, mud-gas separator, & rotating head.

### B. Protective equipment for essential personnel:

- 30-minute SCBA units located in the dog house & at briefing areas. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

### C. H2S detection and monitoring equipment:

- (2) Portable H2S monitors positioned on location for best coverage & response. These units have warning lights & audible sirens when H2S



levels of 20ppm are reached. These units are also capable of detecting SO<sub>2</sub>, which is a byproduct of burning H<sub>2</sub>S.

D. Visual warning systems:

- Wind direction indicators: will be shown on well site diagram.
- Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size so that it is legible at a reasonable distance from the immediate location. Bilingual signs will also be used, when appropriate.

E. Mud program:

- The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. Proper mud weight, safe drilling practices, and the use of H<sub>2</sub>S scavengers will help minimize hazards when penetrating H<sub>2</sub>S bearing zones.

F. Metallurgy:

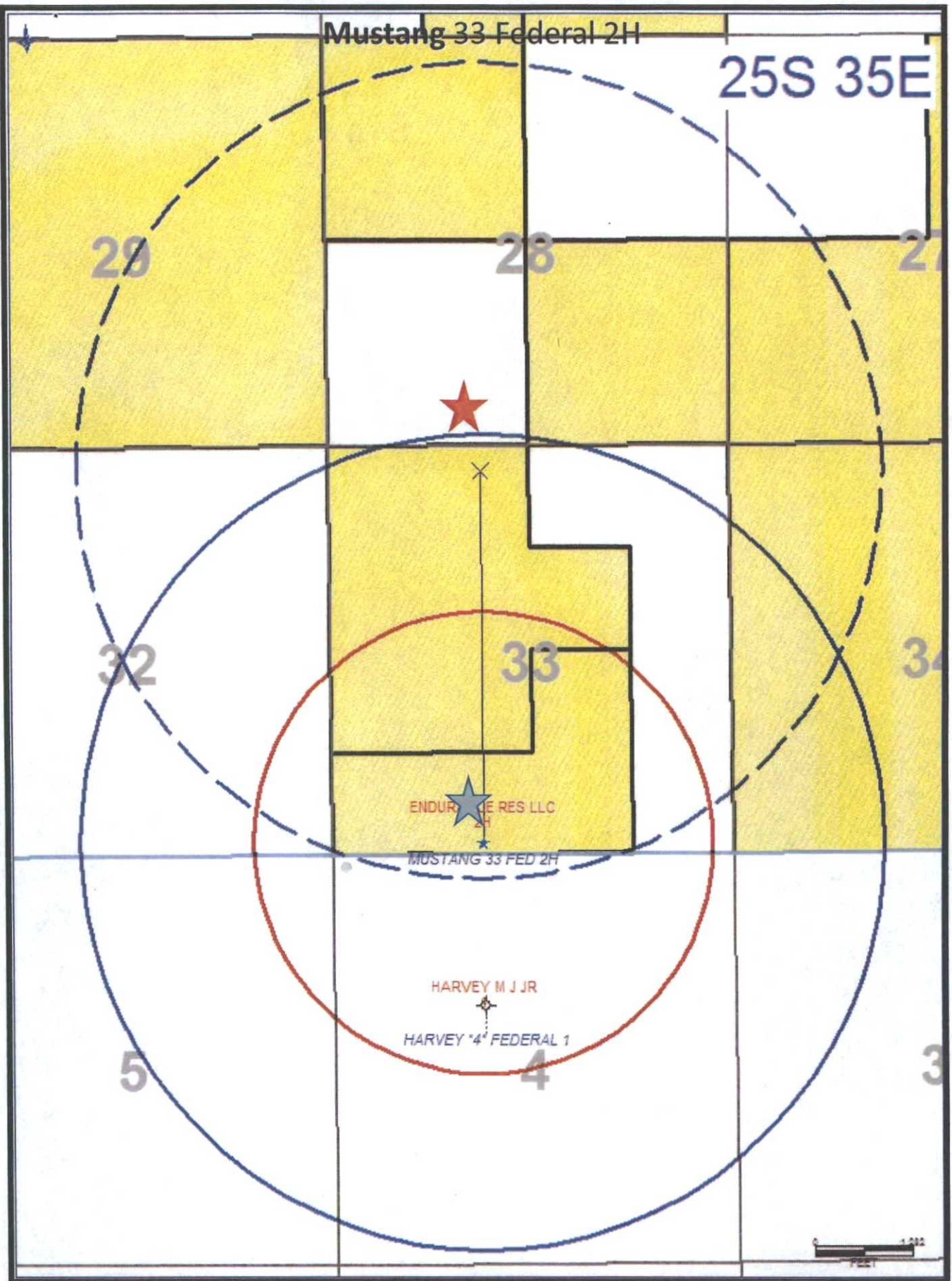
- All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, and valves shall be suitable for H<sub>2</sub>S service.




G. Communication:

- Company vehicles equipped with cellular phones, as well as a satellite phone in the company man's trailer.

**ENDURANCE RESOURCES LLC HAS CONDUCTED A REVIEW TO DETERMINE IF AN H<sub>2</sub>S CONTINGENCY PLAN IS REQUIRED FOR THE ABOVE MENTIONED WELL. WE WERE ABLE TO CONDUCT THAT ANY POTENTIAL HAZARDOUS VOLUME WOULD BE MINIMAL (IF ANY PRESENT) FROM SURFACE TO TD.**





-  Surface Location
-  Bottom Hole Location
-  Surface 5280' Radius

-  Bottom Hole 5280' Radius
-  H2S 3000' Radius



### **EMERGENCY CALL LIST**

Endurance Operations Office: (575) 308.0722

Kale Jackson-Sr Completions Engineer: (575) 914.3355

Manny Sirgo- VP Operations: (432) 413.0085

Randall Harris- VP Geology: (575) 365.7747

Don Ritter- CEO: (469) 556.3757

### **EMERGENCY RESPONSE NUMBERS**

#### **HOBBS:**

State Police: 575.392.5588

City Police: 575.397.9265

Sherriff's Office: 575.393.2515

Ambulance: 911

Fire Department: 575.397.9308

LEPC: 575.393.2870

NMOCD: 575.393.6161

BLM: 575.393.3612

#### **CARLSBAD:**

State Police: 575.885.3137

City Police: 575.885.2111

Sherriff's Office: 575.887.7551

Ambulance: 911

Fire Department: 575.885.2111

LEPC: 575.887.3798

BLM: 575.361.2822

#### **EMERGENCY SERVICES:**

Boots & Coots: 1.800.256.9688

Cudd Pressure Control: 915.699.0139

Halliburton: 575.746.2757

Baker Hughes: 575.746.3569



## Operator's Certification:

Endurance Resources LLC representatives responsible for ensuring compliance of the surface use plan are listed below.

Kale Jackson

Sr Completions Engineer

Endurance Resources LLC

11382 Lovington Highway

Artesia, NM 88211

575.914.3355

M. A. Sirgo III

Engineer

Endurance Resources LLC

203 W. Wall St, Suite 1000

Midland, TX 79701

432.413.0085

## Certification:

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

These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

11-7-2014

Date



M A. Sirgo III

Engineer

Endurance Resources LLC

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