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## Hydrogen Sulfide Drilling Plan Summary To be in place prior to drilling the Grayburg Formation

- A. All personnel shall have proper H<sub>2</sub>S training in accordance with Onshore Order 6 III.C.3.a. and carry their certification card.
- B. Briefing Area: two perpendicular areas will be designated by signs and readily accessible.
- C. Required Emergency Equipment:
  - ❑ Well control equipment
    - a. Flare line from wellhead to be ignited by flare gun.
    - b. Choke manifold with an adjustable choke.
  - ❑ Protective equipment for essential personnel.

### Breathing Air Trailer:

- a. Rescue Packs (SCBA) — 2 shall be stored in the safety trailer.
  - b. Work/Escapes packs — 4 packs shall be stored on the rig floor with sufficient air hose so as not to restrict work activity.
- ❑ H<sub>2</sub>S detection and monitoring equipment:

The stationary detector with four wireless sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor / Bell nipple / End of flow line or where well bore fluid is being discharged.  
(Gas sample tubes will be stored in the safety trailer)
  - ❑ Visual warning systems.
    - a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
    - b. A colored condition flag will be on display, reflecting the current condition at the site at the time.
    - c. Two wind socks will be placed in strategic locations, visible from all angles.
  - ❑ Mud program:

The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H<sub>2</sub>S bearing zones.
  - ❑ Metallurgy:
    - a. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H<sub>2</sub>S service.
    - b. All elastomers used for packing and seals shall be H<sub>2</sub>S trim.
  - ❑ Communication: Communication will be via two way radio in emergency and company vehicles. Cell phones and land lines where available.

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# Hydrogen Sulfide Contingency Plan

Assumed 100 ppm ROE – 3,000'

100 ppm H2S concentration shall trigger activation of this plan

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## Emergency Procedures

In the event of a release of gas containing H2S, the first responders 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.
- Have received training in the:
  - Detection of H2S
  - Measures for protection against H2S
  - 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 (SO2). Intentional ignition must be coordinated with the NMOCD and the 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 there is an ignition of the gas.

## Characteristics of H2S and SO2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H2S	1.189 Air=1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO2	2.210 Air=1	2 ppm	N/A	1000 ppm

## Contacting Authorities

Cross Timber Energy, LLC's 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. Cross Timbers Energy, LLC's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan (HMER).

Cross Timbers Energy LLC Buckeye Office in Lea County, NM:

From Hobbs, NM take Highway 62/180 West for approximately 10 miles to SH 529, turn right on SH 529 and go NW for 3 miles to Highway 238, turn North on Highway 238 and proceed North for approximately 8 miles to the Buckeye Field Office.

## **Cross Timbers Energy, LLC Personnel:**

Buckeye Field Office	575-396-0542
Jerry Parker, Buckeye Production Foreman	575-441-1628
Gene Hudson, Lease Operator	575-441-1634
Al Lujan, Lease Operator	575-441-1638
Kevin Bennett, Lease Operator	575-513-8156
Jose Casas, Lease Operator	575-746-7220
James Embree, Lease Operator	575-704-2241
Kasey Guinn, Lease Operator	575-746-7212
Ian Peterson, Operations Engineer	432-634-4922
Bill Frey, Operations Manager	817-334-7709
George Ramsey, Drilling Engineer	903-253-5001
Robbie Grigg, Regulatory Compliance	817-917-5341

## **Sheriff Departments:**

**911**

Lea County	575-396-3611
Eddy County	575-887-7551

## **New Mexico State Police**

575-392-5588

## **Fire Departments:**

**911**

Eunice	575-394-2111
Hobbs	575-397-9308
Jal	575-395-2221
Lovington	575-396-2359
Carlsbad	575-885-2111

## **Hospitals:**

**911**

Eunice Medical Emergency	575-394-2112
Hobbs Medical Emergency	575-397-9308
Jal Medical Emergency	575-395-2221
Lovington Medical Emergency	575-396-2359
Carlsbad Medical Emergency	575-885-2111

## **Agency Notifications:**

Bureau of Land Management	575-393-3612
New Mexico Oil Conservation Division	575-393-6161

## **Contractors:**

Windmill Weed Control – Light Towers/Trash Trailers	575-631-0969
Spur Services – Trucking/Forklift/Light Towers	575-942-9503
Catalyst Chemical	575-390-7782
Lucky Health & Safety	575-492-7777
Indian Health & Safety	575-393-3093
Watson - Dirt Contractor	575-391-0537
Sweatt – Dirt Contractor	575-397-4541
Cesar Trucking – Dirt Contractor/Backhoe	575-605-1802
Ono's – Richard Cruz – Contract Gang	575-631-0146