



Black Hills Gas Resources

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 areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H_2S).
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

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

1. The effects of H_2S on metal components. If high tensile tubular are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H_2S Drilling Operations Plan and the Public Protection Plan.

A training session will be held prior to encountering a known or probable H_2S zone (within 3 days or 500 feet). The initial training sessions shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

II. H_2S safety equipment and Systems

Note: All H_2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above the zone or three days prior to penetrating zone.

A. Well control equipment:

1. Choke manifold with a minimum of one remote choke.
2. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

B. Protective equipment for essential personnel

1. Air packs (30 min) will be located in the doghouse, on mud tanks, in the cellar and at briefing areas, as indicated on well site diagram.

C. H_2S detection and monitoring equipment:

1. Two portable H_2S monitors positioned on location for best coverage and response. These units have warning lights and aquidilbesirens when H_2S levels of 10ppm.

D. Visual warning systems:

1. Wind direction indicators as shown on well site diagram.
2. 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 to be readable at a reasonable distance from the immediate location. Bilingual signs will be used when appropriate. See example attached.

E. Mud program:

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

F. Metallurgy:

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

G. Communication:

Satellite phones shall be available at well site.

Black Hills company vehicles are outfitted with two way radios and cellular phones.

1. A list of nearest emergency department numbers shall be available at well site. (See attachment)
2. Black Hills 24hrs general emergency contact
 - a 1-877-554-6349
3. Black Hills emergency contact personnel
 - a Allen Parrent, Drilling Superintendent
 - o Office: 1-720-210-1310 (Day Time)
 - o Mobile: 1-505-486-0323
 - o Email: Allen.Parrent@blackhillscorp.com
 - b Lance Nelson, Drilling Engineer
 - o Office: 1-303-566-3502 (Day Time)
 - o Mobile: 1-303-550-8849
 - o Email: Lance.Nelson@blackhillscorp.com
 - c Art Childers, Engineer Manager
 - o Office: 1-303-566-3413 (Day Time)
 - o Mobile: 1-303-453-9083
 - o Email: Art.Childers@blackhillscorp.com
 - d Doran Newlin, Production Manager
 - o Office: 1-303-568-5983 (Day Time)
 - o Mobile: 1-303-317-4805
 - o Email: Doran.Newlin@blackhillscorp.com

H. Well testing:

1. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill stem testing operations conducted in an H₂S environment will use the closed chamber method of testing.

EMERGENCY CONTACT NUMBERS

HOSPITAL

**DULCE
SAN JUAN**

**911 / 505-334-6622
575-759-3291
505-334-6622**

AMBULANCE

**DULCE
SAN JUAN**

**911 / 505-334-6622
575-759-3778
505-334-6622**

EMERGENCY HELICOPTER

911 / 505-334-6622

FIRE/RESCUE

**JICARILLA FIRE/SFTY
FOREST SERVICE FIRE/SFTY
NON-EMERGENCY**

**911 / 505-334-6622
505-759-3254
505-632-1963
505-334-6622**

POLICE

**JICARILLA PD
RIO ARRIBA SHERIFF
OFFICE
DISPATCH
NEW MEXICO STATE POLICE
SAN JUAN SHERIFF
NON-EMERGENCY**

**911 / 505-334-6622
575-759-3222

575-588-7522
505-753-3320
505-325-7547
505-334-6622
505-334-6622**

POISON CONTROL

1-800-222-1222