

OCCUPATIONAL HEALTH & SAFETY

When working near H₂S, be sure:

- there is a work plan in place that has information on the hazard, as well as on the work and emergency rescue procedures
- any plans for air monitoring include frequent measurements of gas levels by a trained person
- air monitoring equipment is reliable, in good repair and calibrated according to manufacturer specifications
- at least two workers who are trained to use the procedures outlined in the work plan are present at all times
- that, while one worker does the work, another is watching and prepared to carry out a rescue if necessary
- the area is continuously ventilated with explosion-proof fans and, if practical, associated electrical wiring
- warning signs are posted in all areas where H₂S is a potential hazard

Occupational Health and Safety Requirements

The employer, along with the Occupational Health Committee, must **inspect all sites where H₂S gas may be found** to assess the risk. The job of the committee is to recommend changes or precautions, where possible, that reduce the risk.

When a worker must be in an area where H₂S may be found, **a plan must be in place that deals with the hazard and explains safe work, emergency and rescue procedures**. The employer must make sure all workers are trained on and follow the plan.

When a worker must enter a hazardous confined space, the employer, along with the Occupational Health Committee, must develop a plan for entry as described in Part 18 of *The Occupational Health and Safety Regulations, 1996*. The employer must make sure all workers who are required to enter a confined space are trained in the plan and follow it.

If you require more information, contact the Ministry of Labour Relations and Workplace Safety, Occupational Health and Safety Division.

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Ministry of
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The Manure Gas Hazard

Rotting manure produces hydrogen sulfide (H₂S), methane, ammonia and carbon dioxide. H₂S is the most dangerous.

Manure being moved or stirred up releases H₂S. One or two breaths of air, with as little as 600 parts per million (ppm) H₂S, can cause a person to lose consciousness.

NOTE: Continued exposure to H₂S will kill you!

When released suddenly in large amounts or if allowed to build up in confined or poorly ventilated areas, toxic gases such as H₂S are deadly.

Every year people are killed or injured by poisonous manure gas. Manure gas accidents usually cause more than one death or injury because co-workers or relatives attempting a rescue are themselves overcome by the gas.

The hazard increases when:

- gases concentrate or build up in a confined space are suddenly released in a work environment
- delays in emptying pits or tanks cause manure levels to rise, bringing trapped gases closer to any workers examining a pit or tank
- hot weather speeds up manure rotting, thus increasing the amount of H₂S being produced
- windless days increase the potential for localized pockets of H₂S during the agitation of lagoons

Hazardous locations include:

1. intermediate holding tanks between a barn and a lagoon
2. pits and gutters inside barns
3. lagoons

1. Intermediate holding tanks

There are two common designs for holding tanks. One puts the tank partly inside a barn and the other puts it completely outside the barn.

Work in a tank (e.g. unplugging lines) must be treated as confined space entry work. Agitation or transfer of manure in holding tanks can result in sudden releases of H₂S in hazardous concentrations.

Part 18 of *The Occupational Health and Safety Regulations* lists the rules and precautions that must be followed when dealing with a hazardous confined space.

NOTE: Regardless of design, any manure holding tank must be treated as a hazardous confined space. Entry into such a tank, for whatever reason, must be considered dangerous.

2. Pits and gutters inside barns

Pits and gutters are not usually deep. Most work (e.g. washing and emptying a pit) is done from above the pit or gutter. However, if a worker's head is below the level of the floor, hazards increase, especially if barn fans are not blowing enough air to keep concentrations of manure gases at safe levels. When manure or slurry is mixed, agitated or disturbed, the danger increases greatly.

NOTE: Any time a worker goes inside a pit or gutter, manure gases are a hazard.

3. Lagoons

Stirring lagoons before pumping releases manure gas. Pockets of toxic gas may form around the mixer when a lagoon is being agitated. These pockets of gas can be a very serious hazard.

Controlling the H₂S hazard

For family farms, the key to controlling the hazard is to identify anything that may cause a build-up or sudden release of H₂S. In a commercial enterprise (e.g. industrial hog barn), the owner/ employer and the occupational health committee should:

- review all work where H₂S could be generated or released
- inspect all work sites and operations where H₂S could be generated or released
- evaluate the risk to workers for each of these sites and operations
- document steps to be taken to ensure the safety of workers
- prepare an action plan based on the committee's recommendations

If mechanical ventilation is the primary control for manure gas, the system must have enough capacity to guarantee safety at all times. The system must be a permanent installation with an "on-off" switch outside the hazardous area.

NOTE: Ventilation must be turned on before workers enter a building or space with an H₂S hazard and kept on until all workers leave the building or space.

When mechanical ventilation is available, it should be running whenever manure is being agitated.

H₂S hazards are lessened when:

- worker contact with gases is reduced by automating the agitation or transfer of manure in holding tanks
- all areas where H₂S might build up (e.g. pits, gutters) are well ventilated
- all mechanical equipment can be removed from pits and tanks without a worker having to enter the pit or tank
- properly trained professionals are hired to do the most hazardous work (such as emptying lagoons, working inside tanks or deep pits)
- any firm hired for hazardous work has a plan for its workers that deals with workplace hazards, work practices, and emergency rescue procedures
- manure agitation is started from a safe distance outside the tank or building. Never stand near an area, including lagoons, where manure is being agitated without appropriate respirators and personal protective equipment.
- unnecessary openings into manure pits or tanks are capped or closed
- gases cannot flow back into barns from holding tanks
- guard rails are installed around openings to prevent falls

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