

Storing animal manure with the intention of spreading it on ground surfaces or separating liquids from solids is a common practice on dairy farms of all sizes. Generally, these practices are more environmentally sound than daily spreading of manure. Above-ground manure storage facilities, whether they are tanks or lagoons, do not pose as high a risk of injury or fatality as do below-ground systems. Above-ground systems should be made inaccessible to animals and humans by being adequately fenced and/or having ladders 6-7 feet off the ground. There should also be signs posted at these sites warning that the surface of the storage is not solid.

Manure storage pits that are below ground are generally found underneath barn floors or at one end of a barn and have limited access, poor ventilation and are not designed for continuous occupancy. All three of these conditions contribute to the storage areas being classified as confined spaces. OSHA regulates confined space entry plans/programs in general industry, but production agriculture is exempt from these regulations at this time.

The greatest dangers to human health found in underground storage facilities are the gases produced by decomposing manure: hydrogen sulfide, methane, ammonia and carbon monoxide. When the manure in the pit is agitated, which is a necessary action before pumping it into a manure spreader, these gases can be rapidly released and may reach levels toxic to humans and/or animals or displace the oxygen needed to sustain life.

## Hazard

1. Underground manure storage facility

## Recommendations

Each manure storage facility is somewhat unique to the individual farm, therefore making general recommendations difficult. The safest scenario would be to follow the contractor's recommendations for entry or to be able to service the pit and manure pump without having to physically enter the area. The following recommendations are general safety practices.

### Minimum Compliance:

- Post warning signs about confined spaces and toxic gases being present. Inspect/clean on a routine basis.
- Manure agitator should be below the surface of manure at all times.
- All openings to the pit should be covered with at least a metal grill that will sustain the weight of a tractor.
- Ventilate area before entering according to contractor recommendations.
- No smoking or open flames near storage areas.

**Intermediate Compliance:** (In addition to the above recommendations.)

- Provide access to the manure pump from outside the pit.
- Only employees with specialized training in confined space entry should be allowed to enter the pit. Employees should work in pairs in these areas.
- Ventilation should meet the recommendations of the contractor and have alarms to warn of equipment failure. Ventilate the area before, during and after working around the pit.
- Train employees on how to deal with manure pit emergency.
- No smoking or open flames near the storage.

## **Employee Training: Manure Storage & Handling Safety**

Manure management is such a routine task on livestock and dairy farms that workers often overlook the hazards associated with long-term storage and land spreading. Entering an underground storage facility or pump-out pit can be a life-threatening situation due to toxic gases present or levels of oxygen too low to support life. Working around unguarded equipment also presents a high risk for injury/death situation.

- The following principles and safe work practices should be part of employee training:
  - ✓ Develop and implement a policy that requires employees to work in pairs when entering an underground manure storage pit.
  - ✓ Employees need to understand confined space hazards.
  - ✓ Testing the atmosphere in a manure pit prior to entry should be a normal work practice.
  - ✓ Employees must follow procedures to ventilate pits by forced air, prior to, during and for several hours after agitating or pumping manure.
  - ✓ Employees who work in manure pits must be trained in confined space entry, SCBA fit-testing and procedures.
  - ✓ A No Smoking policy should be standard practice in the manure storage areas.
  - ✓ All employees operating manure-handling equipment should be adequately trained in the safe operation of the equipment.
  - ✓ Employees driving manure tank trucks should meet the licensing requirements for the state and receive training in the safe operation of tank trucks.
  - ✓ Employees need to know the emergency procedures to take if someone collapses in a manure pit. Multiple deaths occur in many manure toxic gas situations.

**Best Practices:** (In addition to the above recommendations.)

- Develop/implement a confined space entry protocol and emergency action plan.
- Measure air quality prior to entry.
- Enter manure storage pit only with a self-contained breathing apparatus (SCBA) that is properly fitted and user is properly trained.
- Enter the pit only with a rescue harness in place, a mechanical lift available and a stand-by person. Follow confined space entry protocol.