Manure Pits Meeting Kit



WHAT□S AT STAKE

Manure can be stored in above-ground tanks and vats or below ground in pits or ponds. Manure pits can be covered with closed or slotted flooring and used below livestock in buildings or pens.

WHAT□S THE DANGER

DANGERS/HAZARDS OF MANURE PITS

Inside the pit the manure decays and ferments. This process generates four potentially lethal gasses: methane, hydrogen sulfide, carbon dioxide, and ammonia.

The characteristics of these gases that are produced include:

Methane: Methane is an odorless gas that is flammable or explosive at concentrations of 5% to 15% by volume of air. The gas is lighter than air and typically found near the top of the pit and high enough concentrations can cause death by suffocation.

Hydrogen Sulfide: Hydrogen sulfide is an extremely toxic gas with a □rotten egg□ smell at low concentrations and which at high concentrations can paralyze the olfactory senses. It is heavier than air and often settles towards the bottom of the manure pit. At low concentrations it can cause dizziness, headache, nausea, and respiratory tract irritation. At high concentrations it can cause unconsciousness, respiratory failure, and death within minutes. It is also explosive at various concentrations.

Carbon Dioxide (CO2). Carbon Dioxide is an odorless gas that is heavier than air and often settles near the bottom of the manure pit. At low concentrations it causes labored breathing, drowsiness, and headaches. In high concentrations it can displace enough oxygen and cause death via suffocation.

Ammonia (NH3). Ammonia has sharp odor characteristics that irritate the eyes, nose, throat, and lungs. Exposure to high concentrations can be fatal.

HOW TO PROTECT YOURSELF

SAFETY CONSIDERATIONS FOR MANURE PITS

Ventilate, Ventilate, Ventilate. The goal of the ventilation system is to exhaust the

gases out of the barn, and SOPs should ensure the ventilation system is set right to provide high ventilation rates.

Maximize ventilation in the area through fans and blowers. Be cautious not to place the equipment too close to the manure, an electric spark or open flame could ignite flammable methane gas and cause an explosion.

Install Fences and Locks. The first level of safety around manure pits is to control unauthorized access by installing fences and locks on pit doors and covers. Place warning signs about the unstable walking surface to prevent drowning and engulfment.

Buddy System. A buddy system is important in the event something happens and someone collapses. Any worker who enters the manure pit should wear a safety belt or harness as a lifeline in case of exposure and collapse. The second person should be able to call for emergency help if needed, providing adequate directions and a description of the emergency hazard so emergency personnel are adequately prepared.

Training and Testing. Get the training and testing required and wear an air-supplying respirator to ensure a supply of good breathing air before you enter a manure pit. Use confined space entry procedures by wearing a harness and lifeline.

Lockout/Tagout. Lock out and tag out to make sure people can't get into a confined space or through the fence without others knowing they are there other co-workers or someone else could be in the maintenance area or fixing the equipment. Keep people a safe distance away from the pit for 20 or 40 minutes until the pit has been adequately agitated.

Minimize the Need to Enter. When you must enter a manure pit, note that many accidents and deaths occur when people become overwhelmed by the gas buildup. Minimize your need to enter manure pits. Install pumps and other equipment in easily accessible areas so that you do not need to enter too far into the pit.

Self Contained breathing apparatus. Another necessary piece of equipment to be kept near the manure pit is a positive-pressure, self-contained, breathing apparatus (SCBA). It should be used by anyone entering the pit. This is specialized equipment and special training is required for its use, therefore, it is not likely to be found on the average farmstead.

TRAINING AND COMMUNICATION

Manure gases can be sort of out of sight out of mind, so building awareness and communication for everyone in the operation is key. There are various tools and resources, including a checklist for addressing the hazards around pit safety, including considerations before, during and after manure handling and disposal, to keep workers in the environment safe.

When developing SOPs and training around manure pits and other safety hazards, consider a safety hierarchy for controlling exposure. Try to eliminate or remove the hazard. With livestock operations, manure will always be produced and can't be eliminated, so the next step is to prevent exposure to the hazard through engineering controls, warnings and training.

BEST SAFETY PRECAUTION TO REDUCE MANURE PIT GAS DANGERS

- Never enter a pit, especially during or just after agitation. Without testing for toxic gases, there is no way to know if it is safe.
- Always wear a self-contained breathing equipment with oxygen supplying tanks.
- Always wear a safety line and work with at least two other people outside the

pit.
- Remove all people and all animals from buildings over pits before pit agitation.
- Provide maximum ventilation when agitating or pumping manure.
- Do not smoke or have any other fire or ignition source around manure pits.

FINAL WORD

Farmers and farm workers appear to be unaware of the immediate danger posed by entry into manure pits. This is because the dangerous atmospheric conditions may exist intermittently. Being able to enter the pit numerous times without harmful effects, creates a false sense of safety for the farmer or farm workers.