

OSHA Training Toolbox Talk: Be Aware of Potentially Hazardous Atmospheres Inside Excavations

[Reference 1926 Subpart P]

When working inside of an excavation, the last thing on most people's mind is the potential for a hazardous atmosphere to develop. That lack of concern may be attributed to the fact that you are usually working outdoors, and the top of the excavation is open. But OSHA's excavation standards require the employer to test the atmosphere inside any excavation that is four feet or deeper any time there is a reasonable potential for a worker to be exposed to a potentially harmful atmospheric hazard. Here are just a few examples of such situations:

- **Working inside an excavation located near a landfill.** Methane gas, which is an odorless, colorless gas that is highly flammable, is created when organic material – the trash – decomposes. The Methane can travel through cracks and fissures in the soil, and seep into an excavation. Not only can Methane gas readily ignite, it can also fill up a space and displace the oxygen, resulting in an oxygen deficient atmosphere.
- **Breaching a pipeline located inside of an excavation.** Methane gas, which we just discussed, is also commonly found inside sewer lines, as is Hydrogen Sulfide gas, commonly referred to as H₂S. Like Methane, the H₂S gas is also a by-product of decomposing organic materials, and is extremely toxic! H₂S gas is easily distinguishable by its offensive odor, which is comparable to the smell of rotten eggs. However, exposure to low levels of H₂S gas can temporarily desensitize your sense of smell, meaning you can eventually be exposed to higher levels of the gas without even realizing it is present. In addition to sewer lines, there are underground pipelines that transport other potentially harmful gasses (such as natural gas) that may be breached when you work inside of an excavation.
- **Contaminated soil created by leaking containers, pipelines, and improper disposal.** It is not uncommon for liquid chemical storage tanks and transport pipelines that are buried underground to develop leaks, or even rupture. And in the past, there were actually situations where people buried hazardous chemicals in pits dug in the ground as a means of disposal! As a result, the fluids soak into the surrounding soil and become trapped for extremely long periods of time. But once we dig up the soil around these vessels and expose it to sunlight and warmth, any liquids that are flammable or toxic could volatilize and create hazardous gasses in the air within the excavation, or even displace the oxygen inside the excavation.
- **Operating internal combustion-powered tools and equipment inside an excavation.** Think of all the tools and equipment we operate when working inside excavations that run on engines powered by gasoline, diesel, kerosene, LPG, and other fuels. These could include generators, welders, tampers, mini-excavators, and chop saws. And one component of the engine exhaust emitted by these devices is Carbon Monoxide, also known as CO. Carbon Monoxide is a colorless, odorless gas that is very toxic, even deadly, when present in high enough concentrations.

So our message today is this: Be aware of these, and other, situations where a hazardous atmosphere could be present. And make sure to notify your supervisor or the Competent Person if you become aware of such a situation so they can assess the need to test the atmosphere. And if one is detected, we will take precautionary measures, such as ventilating the excavation, to make sure the atmosphere is safe.

Can anyone think of any examples of other situations where a hazardous atmosphere might be present inside of an excavation? Thank you for your participation today. And please be sure you sign your name to the training certification form so you get credit for attending this training session.