

A Citizen's Guide to Excavation of Contaminated Soil



What Is the Excavation of Contaminated Soil?

Excavation of contaminated soil from a site involves digging it up for “ex situ” (above-ground) treatment or for disposal in a landfill. Excavation also may involve removing old drums of chemicals and other buried debris that might be contaminated. Removing these potential sources of contamination keeps people from coming into contact with contamination and helps speed the cleanup of contaminated groundwater that may be present.

How Does It Work?

Before excavation can begin, the contaminated areas must be identified. This requires researching past activities at the site to identify what contaminants may have been released and where. The soil is then tested to better define where contaminants are present.

Contaminated soil is excavated using standard construction equipment, like backhoes and excavator trackhoes. The equipment chosen depends on how large and deep the contaminated area is, and whether access is limited by the presence of buildings or other structures that cannot be moved. Long-arm excavators can reach as deep as 100 feet below ground, but excavations are generally limited to much shallower depths due to safety concerns and difficulty



Soil piles are covered with plastic tarps during excavation.



Worker collects soil samples to confirm that soil left onsite is clean.

keeping the hole open. Sometimes soil is excavated below the water table, which requires walling off the contaminated area and pumping out the water to keep dry during excavation.

If excavated soil will be disposed of in a landfill, it may be placed directly on a dump truck for transport. If it is to be disposed of elsewhere on the site or treated, it first may be stock piled on plastic tarps or in containers. The soil is then covered with tarps to prevent wind and rain from blowing or washing it away and to keep workers from coming into contact with contaminated soil. Excavation is complete when test results show that the remaining soil around the hole meets established cleanup levels.

The excavated soil may be cleaned using a mobile treatment facility brought to the site or disposed of offsite. If the soil is treated onsite, treated soil may be used to fill in the excavated area. Clean soil obtained from other locations may be needed to fill in holes as well. After an excavation is filled in, the area may be landscaped to prevent soil erosion and make the site more attractive.

How Long Will It Take?

Excavating contaminated soil may take as little as one day or as long as several years. The actual time it takes to excavate will depend on several factors. For example, it may take longer where:

- The contaminated area is large, very deep, or below the water table.

- Contaminant concentrations are high, requiring extra safety precautions.
- The contaminated soil contains a lot of rocks or debris.
- Buildings or site activities limit the movement of equipment.
- The site is remote, or the treatment and disposal facilities are far away.

These factors vary from site to site.

Is Excavation Safe?

Handling contaminated soil requires precautions to ensure safety. Site workers are trained to follow safety procedures while excavating soil to avoid contact with contaminants and prevent the spread of contamination offsite. Site workers typically wear protective clothing such as rubber gloves, boots, hard hats, and coveralls. These items are either washed or disposed of before leaving the site to keep workers from carrying contaminated soil offsite on their shoes and clothing. The tires and exteriors of trucks and other earth-moving equipment are also washed before leaving the site so that the soil is not tracked through neighboring streets.

Workers monitor the air to make sure dust and contaminant vapors are not present at levels that may pose a breathing risk, and monitors may be placed around the site to ensure that dust or vapors are not leaving it. Site workers close to the excavation may need to wear “respirators,” which are face masks equipped with filters that remove dust and contaminants from the air. Contaminated soil is usually covered until it can be treated or disposed of to prevent airborne dust or being washed away with rainwater. Contaminant vapors may be suppressed with foams or other materials.

How Might It Affect Me?

Nearby residents and businesses may notice increased truck traffic during soil excavation and the noise of earth-moving equipment. Excavations are fenced off to prevent entry to the area until it is backfilled and covered with clean soil.

Why Excavate Contaminated Soil?

Excavation is commonly used where in situ cleanup methods will not work quickly enough or will be too expensive. Offsite disposal and ex situ treatment are often the fastest ways to deal with high levels of contamination that pose an immediate risk to people or the environment. Excavation is also a cost-effective approach for small amounts of contaminated soil.

Example

Soil excavation for offsite treatment and disposal was used to clean up the Federal Creosote Superfund site in New Jersey. Residential housing and a shopping mall had been built on the 50-acre property after a wood-treating facility closed in the 1950s. Creosote and waste chemicals that had been stored in lagoons were buried during construction.

Contamination was discovered in the 1990s. Between 2002 and 2008, soil was excavated from as deep as 35 feet near 93 homes. Some residents were relocated, and 18 homes were demolished to reach the contaminated soil beneath. A total of 275,000 tons of soil from this area was transported offsite for treatment and disposal. Another 177,000 tons were excavated from the mall property. Clean soil was used to fill in the excavations.

Throughout the work, workers monitored the air. Soil was covered with foam and plastic sheets to reduce odors from the creosote. Trucks were cleaned prior to leaving the property.

For More Information

For more information on this and other technologies in the Citizen's Guide Series, contact:

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