

Underground Storage Tanks Exposures and Controls

There are currently over 2.5 million underground storage tanks in use in the United States. It is estimated that 20% of these tanks are leaking today, and a projected 60% of them will be leaking within the next 10 years.

Metal tanks leak primarily as a result of corrosion— tank metal is chemically corroded (high acid or alkali soil content) and/or galvanically corroded (difference in electrical potential between the tank and the soil). In addition, a large percentage of leaks occur as a result of damage to or corrosion of the tank's underground piping system.

Although the costs to control underground tank leakage are high (\$1,600–\$2,000 per test per tank, \$65,000–\$75,000 for tank replacement) the cleanup costs are much higher. An “average” leak cleanup cost of approximately \$160,000 reflects the physical cleanup only, and does not include the costs of damages to the environment, property, people, public image, nor the cost of fines levied by local, state and federal authorities.

In an attempt to reduce the underground storage tank leak potential, the following programs/ guidelines are suggested for single-walled steel, double-walled steel, fiberglass-coated steel and fiberglass tanks.

Minimum Program for Existing Tanks in Soil

- Inventory proving—should be computed at least weekly. Records should be kept indefinitely.
- Resistivity testing—should be completed semiannually to check the amperage in the ground. If resistance is less than 10,000 OHMS, or voltage is less than -0.85 volts, an impressed current system should be provided.
- Precision testing—should be completed annually by a qualified outside consultant.

Minimum Program for Existing Tanks in a Vault

- Inventory proving—should be computed at least weekly. Records should be kept indefinitely.
- Resistivity testing—should be completed semiannually to check the amperage in the ground. If resistance is less than 10,000 OHMS or voltage is less than -0.85 volts, an impressed current system should be provided.
- Precision testing—should be completed annually by a qualified outside consultant.
- Visual inspection of tank from inside the vault— should be completed annually.

New Metal Tank Installation Guidelines

- Tanks and/or piping should not be located below the maximum groundwater elevation unless they are inside a vault. Vault should be inspected annually.
- Single wall tanks buried in soil should have the following items as specified by the Steel Tank Institute (STI-P3):

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- Exterior tank coating
- Sacrificial anode
- Isolation of fittings to prevent galvanic reaction
- A secondary confinement system should be provided:
 - Vault with leak detection system, or
 - Double liner with leak detection system
- Resistivity testing should be completed. If resistance is less than 10,000 OHMS or voltage is less than -0.85 volts, an impressed current system should be provided.

New Fiberglass Tank Installation Guidelines

- Tanks should be compatible with stored liquids.
- Tanks should be pressure tested to 5 psi and checked for leaks.
- Tanks and/or piping should not be located below the maximum groundwater elevation unless they are inside a vault. Vault should be inspected annually.
- Cathodic protection should be provided for metal pipes, fittings, connections.
- A secondary confinement system should be provided:
 - Vault with leak detection system, or
 - Double liner with leak detection system
- Resistivity testing should be completed. If resistance is less than 10,000 OHMS or voltage is less than -0.85 volts, an impressed current system should be provided.

In general, tanks and piping that are 20 years old or older should be replaced, and tanks that are no longer in service should be removed from the ground.

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