

Leak-detection Systems for On-ground Hazardous Waste Tanks

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This fact sheet is intended for owners of on-ground hazardous waste storage tanks.

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Environmental Concerns

Liquids leaking from storage tanks can contaminate soils and groundwater. Visual inspection alone is not sufficient to detect all leaks from on-ground hazardous waste storage tanks. This fact sheet discusses leak detection technology options that may be used to supplement visual inspection.

General Information

Minnesota Hazardous Waste Rules specify that leaks in hazardous waste tanks be detected within 24 hours [Minn. Rules pt. 7045.0528 (7045.0628) subp. 4, item C (3)]. In Minnesota, the majority of tanks used for storage or treatment of hazardous waste are either aboveground or on-ground tanks. Aboveground tanks are those situated in such a way that the entire surface of the tank, including the tank bottom, is off the ground and a leak from any spot on the tank can be easily detected. **On-ground tanks are those situated in such a way that the bottom rests on a surface, preventing visual detection of leaked liquids from the bottom of the tank**

Using Visual Inspection as a Leak-Detection Method

Using visual inspection, by itself, as a leak detection method is adequate for aboveground tanks *if* inspections are done 365 days a year. **Because on-ground tanks can leak through both the tank bottom and a secondary containment system below the tank with no visual sign of leakage, visual inspection, by itself, is not adequate as a leak detection method for on-ground tanks.**

Visual inspection of on-ground tanks may only be used as a leak detection system *if* inspections are done 365 days a year *and* are used with one of the four options below. (NOTE: The *leak detection* requirements addressed in this fact sheet are **not the same as** the *inspection* requirements found in Minn. R. pt. 7045.0528, (7045.0628) subp. 7.)

Leak Detection Technology for On-ground Hazardous Waste Tanks

If you have an on-ground hazardous waste tank, you must use an approved leak detection technology. At present there are four options available:

- 1. Channel support systems** which use a support lattice, such as angle irons, to create a space between the external tank bottom and the floor. A release from the tank bottom can freely flow laterally and be observed either visually or automatically in the secondary containment system.
- 2. Double (false) bottoms** work in much the same way as the channel support by creating an interstitial space to detect leaks. In this case, however, the false bottom will contain the release internally within the existing outer primary tank shell. A port hole through the outer tank shell may be provided to allow for manual observation of the release. An automated alarm may be installed to monitor the space between the inner and outer tank shells for vacuum, pressure, vapor or liquid.



- 3. Automated leak sensors** provide continuous leak detection by using *electrical resistivity* or *thermal conductivity*.

Electrical resistivity systems use electrical sensors in a wire grid between the external tank bottom and the secondary containment floor to detect a release. Each wire in the grid is connected to a minicomputer which continuously monitors its electrical properties. Any deterioration of a wire or its coating results in a change in the circuit resistivity and signals a release by activating a warning device. The extent and location of the release is determined by the minicomputer. These systems can be connected to audible or visual alarms. They can also be used to activate control equipment such as pump valves and computers. After a release, the sensing wires usually require replacement.

Thermal conductivity sensors use temperature changes to detect leaks. These sensors can be used in either a wet or dry environment. They appear to be particularly effective in detecting hydrocarbons such as alcohols and trichloroethylene. The thermal conductivity sensor is connected to a control device. A relay contact within the control device can activate external alarms, recovery pumps, or other automated controls.

- 4. Equivalent leak detection technologies** may also be effective. A company may submit a petition to the MPCA, to use alternate design or operating practices that meet leak detection requirements for secondary containment of tank systems [Minn. R. pt. 7045.0075, subp. 6]. If approved, the alternate design may be used in place of the requirements discussed above.

For More Information

Your metropolitan county and the Minnesota Pollution Control Agency have staff available to answer waste management questions. For more information, contact your metropolitan county hazardous waste office or the MPCA office closest to your county.

Metro County Hazardous Waste Offices

Anoka County	(763) 422-7093
Carver County	(952) 361-1800
Dakota County	(952) 891-7020
Hennepin County	(612) 348-8100
Ramsey County	(651) 773-4466
Scott County	(952) 496-8177
Washington County	(651) 430-6655

Minnesota Pollution Control Agency

Toll free	(800) 657-3864
Brainerd	(218) 828-2492
Detroit Lakes	(218) 847-1519
Duluth	(218) 723-4660
Marshall	(507) 537-7146
Rochester	(507) 285-7343
St. Paul	(651) 297-2274
Willmar	(320) 214-3786
Web Site	http://www.pca.state.mn.us