

Conscientious Engineering

Look at the diagram displayed of the land fill. The cross-section drawing shows the structure of a municipal solid waste landfill. The arrows indicate the flow of leachate.

- **Bottom liner system** – The job of a landfill is to stop waste from creating environmental problems. The bottom liner, generally made of a synthetic material (plastic) and is sometimes combined with a clay lining or surrounded on either side by fabric to protect it from anything in the earth that may puncture the liner. This separates garbage and its run-off from getting into the ground water.
- **Cells (old and new)** – Garbage is divided into sections and stored within the landfill. These cells are designed to separate sections of trash for easier compacting.
- **Storm water drainage system** – It would be very dangerous for liquid to escape from the landfill into the soil. Rain water needs to be captured or collected so that it does not get into the garbage and create a run-off. Methods for being sure waste does not have a great amount of liquid are also used to keep the waste materials as dry as possible.
- **Leachate collection system** – Leachate is the liquid that does end up becoming run-off as it is impossible to keep the landfill totally dry. This liquid filters through the landfill and picks up contaminants (or pollutants). Special drain pipes are put in place in order to direct the liquid to a “holding tank” or specially monitored pond.
- **Methane collection system** – Materials in these airtight landfills break down due to landfill gasses, about 50% carbon dioxide and 50% methane. Since methane is combustible (or burns easily) it needs to be removed. To prevent an explosion the methane is piped out and burned or used elsewhere to provide energy.
- **Covering or cap** – Most landfills are covered with 6 inches of soil to protect the materials from “getting out”, as well as keeping animals and rodents from getting into the landfill. Scientists are trying to find alternative materials to cover the landfill that will not require 6 inches of space.

