LANDFILL

A landfill is a carefully constructed space on the ground to store waste as it gradually breaks down into chemically inactive material.

Modern landfills are made up of a series of "cells". To build a landfill cell, an area approximately the size of a football field is dug out to at least two stories deep. While waste such as household garbage breaks down it needs to be kept separate from the outside environment. The barriers below are put in place to ensure this seperation:

SOIL AND GRASS

The clay capping is covered with a layer of soil and planted with local native trees, bushes and grasses.

CLAY CAPPING

When the landfill cell has reached its height capacity it is capped off with a one metre thick layer of clay. The final surface is formed as a small hill so that rainwater runs off the cap.

WASTE & SOIL LAYERS

The landfill cell is now ready to receive waste. Every day the waste is compressed by a compactor and covered with a layer of soil to stop animals and the wind from moving the rubbish around.

The waste and soil layers continue until the landfill cell reaches its height capacity.

METHANE GAS COLLECTION

Bacteria which breaks down organic waste in the landfill cell creates methane gas and carbon dioxide gas. The methane gas created in a landfill is 25 times more potent in its greenhouse effect than carbon dioxide.

Landfill gas is combustible and is collected in pipes which allow the gasses to flow into a flare for burning. The burning process removes the methane component from the gas which is then expelled into the atmosphere.

DRAINAGE LAYER

When it rains, rainwater trickles down through the cell layers dissolving some of the waste and releasing different types of chemicals, most commonly salts and ammonia, on its way. The resulting liquid is called leachate. By the time the leachate reaches the bottom of the landfill cell it is very black and smells.

The drainage layer is a one metre layer of mulch which is used to filter the leachate before it drains through the gravel into the leachate collection pipes.

GRAVEL

A layer of gravel sits over the leachate piping system to stop any decomposing waste clogging up the pipes.

LEACHATE COLLECTION PIPE

The leachate is collected in pipes that run the length of the landfill cell. The leachate is then pumped to the top of the landfill cell and reinjected back into the waste. The reinjected leachate filters down through the waste and is absorbed by the dry waste which helps it to break down quicker.

GEOTEXTILE MAT

A thick protective underlay called a geo-textile mat is placed on top of the plastic liner to protect it from being punctured.

PLASTIC LINER

To make the landfill even safer, a layer of plastic two millimetres thick is placed on top of the clay.

It would take over 1000 years for any leachate to move through the plastic liner.

COMPACTED CLAY

The cell bottom and sides are covered with a one metre thick layer of clay. The clay is moistened and compacted by special machinery so that water cannot move through it easily.

It would take over 25 years for any contaminated water or leachate to move down through the clay liner.