



## Landfill information sheet

For many years, landfill was the main way that general waste was disposed of in this country. Landfill sites have been filling up rapidly. Even with new ways of dealing with waste, there will always be some forms of waste where burial is still the only option for disposal. There is a push to send less waste to landfill and the Government started The Landfill Tax (which is a cost per tonne of waste sent to landfill) in 1999.

### What is a landfill site?

A landfill site is an area of land that is used to dump rubbish, either directly on the ground (land raising) or filling an unwanted hole in the ground (land filling). Landfill sites are often old quarries. Landfill sites vary in size but modern ones tend to be very large.

Landfill is now a heavily regulated, controlled and managed method of dealing with waste.

The two main potential pollutants from landfill are:

- **Leachate** – this is the liquid created by rotting organic rubbish. This would cause pollution if it got into local streams and rivers.
- **Methane gas** – this is 21 times more damaging to our climate than carbon dioxide. It is also explosive.

Landfill sites are carefully constructed to collect both leachate and landfill gas. The leachate is collected to be treated until it is safe and the landfill gas is collected to be used to make electricity.

Other issues about landfill include:

- the smell (odour)
- pests such as flies, rodent vermin and birds
- windblown litter escaping off the site
- the size of the site and how that looks in the local area

A positive aspect of landfill is that the methane gas can be drawn off (captured) and used to generate electricity.





### How is a landfill site constructed?

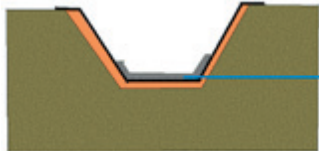
A landfill site hole is divided into individually engineered "cells". Each cell is often different size. Landfill sites vary in the number of cells.



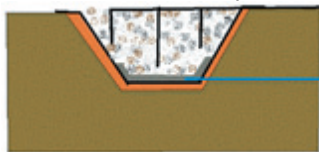
1. The sides of the cell are lined with clay to sculpt them and minimise leachate leakage



2. The cell is lined with thick black HDPE plastic.

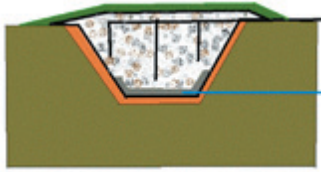


3. The base is layered with gravel / stone which is where the leachate collects.





4. As waste is deposited into the cell, gas pipes are inserted to start drawing off the gas.



5. Once the cell is full, it is "capped" with layers of HDPE plastic liner, clay and soil. Eventually it is planted with grasses.



The site will continue to produce gas and leachate for many years that will be extracted as above.



### The landfill process and landfill management



1. Waste arriving at the site is weighed. Then also checked that only permitted materials are accepted. The amount of landfill tax is calculated that the disposer has to pay.



2. Even though most landfill sites are huge, the truck driver is directed to a very controlled spot on the cell about the size of a tennis court.



3. As waste is deposited onto the cell, a compacter drives over the waste to compress (squash) it down. Every evening, a layer of soil is deposited on the waste to prevent debris from being blown away. It also helps to deter pests and minimise smells / odours.



4. Landfill gas is made when the waste decomposes under anaerobic conditions underground. The composition of the gas varies between landfill sites but it is on average:



- 57% Methane
- 33% Carbon dioxide
- 10% other gases



Methane is flammable so it can be exploded to create energy. As the site is constructed, pipes are inserted for collection of the landfill gas. The gas is exploded in gas engines. On average one 16 cylinder gas engine generates just under one Megawatt (1,000 Watts of electricity). Many sites have more than one engine so they contribute significantly to the UK's resources of alternative, renewable energy supplies.



5. Leachate Treatment. Leachate is the liquid that is produced by the rotting rubbish in the cells combined with any rainwater that has entered the cell.





It contains; water, dissolved organic matter, silt and small inorganic compounds, microorganisms, substances such as heavy metals (e.g. iron), ammonia and nitrogen.



If leachate escaped into local streams and rivers and seeped into groundwater, it could have a devastating effect.



As the sites are built and engineered, a network of pipes for collecting leachate are inserted which is drawn off to the leachate treatment tanks. In the tanks, the solids and silt debris settle out of the liquid.



Then the leachate enters a large main tank where air is bubbled through to aerate the liquid. The tank contains bacteria, protozoa, algae and multi cellular organisms that break down (digest) the material within the leachate.



The leachate is constantly sampled and when it is considered 'clean' enough, the treated liquid is released in batches into the sewerage water system. This goes to the waste water treatment works (sewerage works) where it is essentially treated again.



### Minimising the impact of landfill on the local environment



Landfill sites have many processes in place to minimise their impact on the local environment:

- Trucks leaving the site drive through a wheel washer to remove debris and mud and water is sprayed over the site in dry conditions to minimise dust.
- Pests such as crows and seagulls are deterred by scaring them with fireworks or an artificial gunshot noise. Many sites also employ a Falconer who flies a bird of prey across the site.
- The sites also have high fences in prevailing wind directions to trap litter.
- Surface water runs off into lagoons to settle out solids.
- The site is constantly monitored to check leachate and gas systems. On occasions when there is a strong smell from the waste, an odour suppressant (perfume) is sprayed around the site.
- The sites are usually well landscaped to reduce the visual impact

