

# Exercise walk-through

## Solid Waste Disposal ■ 8.9

eXercise

## You must be able to

- describe **sanitary landfills** 卫生填埋场 and **incineration** 焚烧
- state the pros and cons of each
- explain **leachate** 渗滤液 and methane

## Method — Sanitary landfills

A **sanitary landfill** buries waste with a **liner** (to stop leaks) and daily soil cover.

Concerns:

- **Leachate** — liquid that seeps through waste, which can contaminate groundwater if the liner fails.
- **Methane** — produced as waste decomposes (a greenhouse gas; can be captured for energy).

## Method — Incineration

**Incineration** burns waste, **reducing its volume** and able to generate energy, but releases **air pollutants** and leaves toxic **ash**.

## Method — Trade-offs

- **Landfill** — cheaper, but uses land and risks leachate/methane.
- **Incineration** — less volume/land, but air pollution and cost.

## Method — A worked judgement

A landfill saves money but must be lined and monitored to prevent leachate polluting groundwater and to capture methane.

## Practice 2.1 ■ 1 mark

What is leachate?

## Solution 2.1

### Worked steps

Liquid that seeps through waste and can pollute groundwater **B1**.

## Practice 2.2 ■ 1 mark

What gas is produced as landfill waste decomposes?

## Solution 2.2

Method: Sanitary landfills

### Worked steps

Methane **B1**.

## Practice 2.3 ■ 1 mark

State one advantage of incineration.

## Solution 2.3

### Worked steps

Any one: reduces waste volume, can generate energy **B1**.

## Exam-style 3.1 ■ 1 mark

A liner is placed at the bottom of a landfill to

- A** produce methane
- B** stop leachate contaminating groundwater
- C** burn the waste
- D** add nutrients

## Solution 3.1

Method: Sanitary landfills

- A produce methane
- B stop leachate contaminating groundwater** 
- C burn the waste
- D add nutrients

### Worked steps

**B** — stop leachate contaminating groundwater.

## Exam-style 3.2 ■ 2 marks

A city debates a landfill vs an incinerator.

- (a) State one advantage and one disadvantage of the landfill.
- (b) State one advantage and one disadvantage of the incinerator.

## Solution 3.2

### Worked steps

(a) Landfill — advantage: cheap; disadvantage: uses land / leachate / methane **B1** **B1**. (b) Incinerator — advantage: reduces volume / energy; disadvantage: air pollution / toxic ash / cost **B1** **B1**.

## Exam-style 3.3 ■ 2 marks

Explain how landfill methane can be turned from a problem into a resource.

## Solution 3.3

### Worked steps

The methane can be **captured** and burned as fuel to generate electricity, turning a greenhouse-gas problem into an energy source **M1** **A1**.