

Legal requirements for acceptance and control during operation of landfills



Information Exchange and Awareness Raising Event on LANDFILL of Waste

Cyprus

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BiPRO

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Council Directive 1999/31/EC on the landfill of waste

Overall Objective: Member States shall ensure that waste is disposed of without endangering human health and without using process or methods which could harm the environment (Art. 4, Waste Framework Directive 2006/12/EC)

- Annex I General requirements for all classes of landfills
- **Annex II Waste acceptance criteria and procedures (general principles and procedures) (Article 11)**
- Annex III Control and monitoring procedures in operation and after-care process (Article 12)

Taking into account general principles and procedures for testing and acceptance criteria as set out in Annex II the Commission is to adopt **specific criteria** and/or **test methods** and **associated limit values** should be set for each class of landfill (Article 16)



Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC

Only landfilling of waste which is compatible with the protection afforded by each landfill class!

Member States shall apply/ensure:

- Annex I: Procedure for the acceptance of waste at landfills (Article 1)
- Annex II: Waste acceptance criteria (Article 2)
- Annex III: Sampling and test methods (Article 3)

To be applied since July 2005



Procedure for the acceptance of waste at landfills

1. Basic characterisation of waste

2. Compliance testing

3. On-site verification

Records of information obtained have to be kept for a period to be defined by MS



Acceptance of waste at landfills - basic characterisation

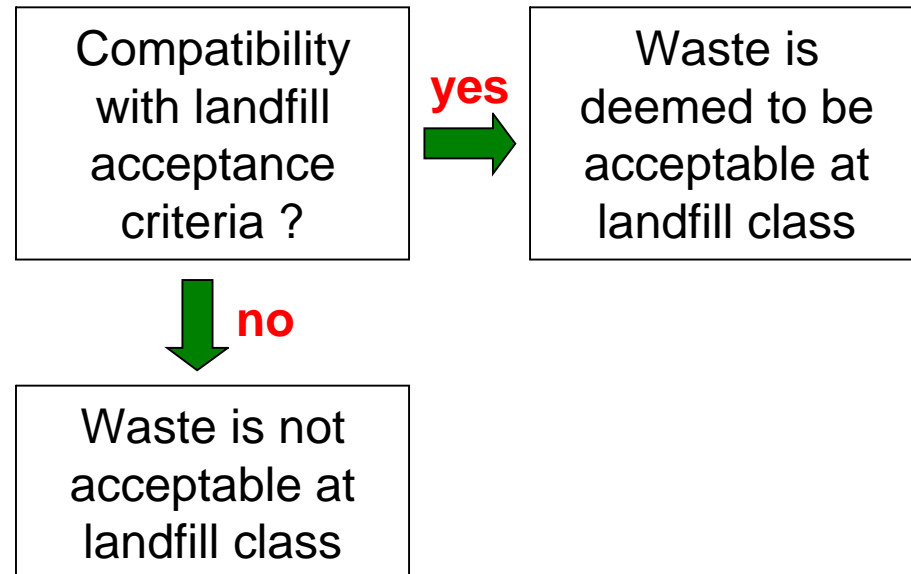
Basic characterisation of waste

Info on source and origin, source process, pre-treatment, composition, leaching behaviour, hazard properties, appearance, EWC, recipient landfill category, precautionary measures, exclusion check recycling/recovery

Testing leaching behaviour, composition

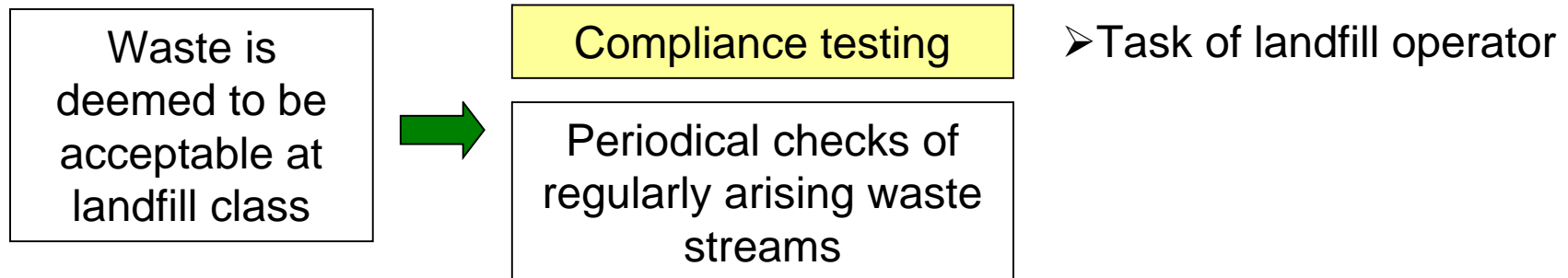
As a general rule waste has to be tested to obtain the above information

- Task of waste producer, check by landfill operator, definition of **key variables**
- Full characterisation of waste; required for each type of waste





Acceptance of waste at landfills – compliance testing



➤ Leaching test focusing on key variables (critical parameters as identified during basic characterisation)

➤ At least once a year

➤ Tests methods as used for basic characterisation shall be applied



Acceptance of waste at landfills – procedures in relation to waste characterisation

Wastes that are regularly generated in the same process

- Installation and process are well known
- Input materials and process are well defined
- Single installation or processes well known (e.g. incineration ashes)

Producer has to inform on changes



After one basic characterisation subsequently compliance testing of key variables may be sufficient

The basic characterisation then should especially contain the **compositional range** for the individual wastes and the **range and variability for characteristic properties**

Wastes that are not regularly generated

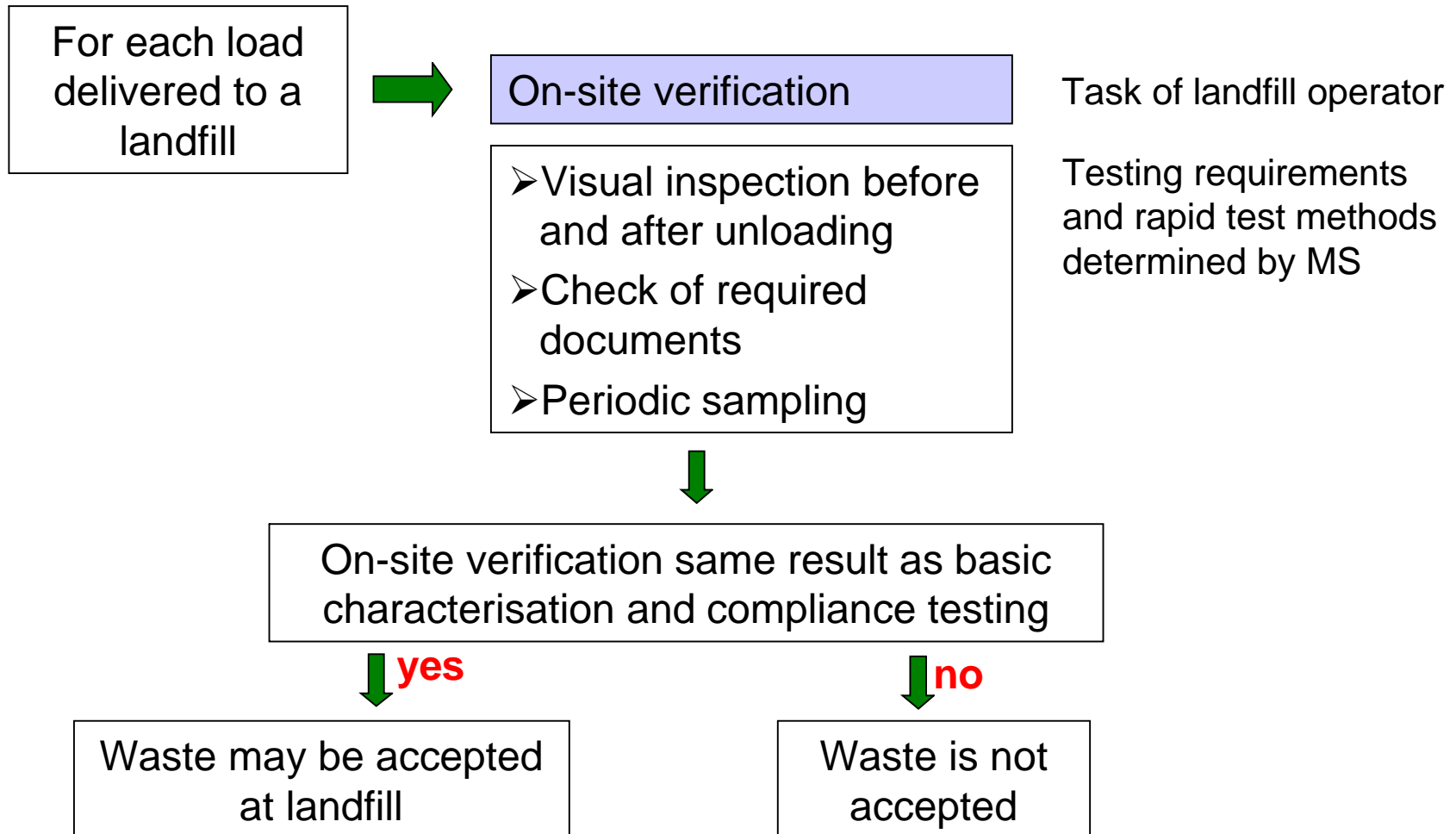
- Not part of a well characterised waste stream



Basic characterisation for each batch of waste



Acceptance of waste at landfills – on-site verification





Acceptance of waste at landfills – without testing

Landfill for inert waste:

- Single waste streams that are assumed to fulfil the criteria as set out in the definition of inert waste in the Landfill Directive and the waste acceptance criteria set for inert waste
- Short list including glass, bricks as selected C&D waste etc with corresponding EWC

Landfill for non-hazardous waste:

- Municipal waste (Article 2(B) of the Landfill Directive) that is non-hazardous, separately collected non-hazardous fractions of household or household similar waste with prior treatment

Landfill for hazardous waste:

- All wastes have to be tested

Underground storage:

- All wastes have to be tested



Waste acceptance criteria

Leaching limits at Landfills for inert waste:

➤ Leaching limit values: heavy metals, acids, phenol index, DOC, TDS, eg:

| Component | L/S = 2 l/kg | L/S = 10 l/kg | C _o (percolation test) |
|-----------|---------------------|---------------------|--------------------------------------|
| | mg/kg dry substance | mg/kg dry substance | mg/l |
| Pb | 0,2 | 0,5 | 0,15 |
| DOC | 240 | 500 | 160 |

➤ Limit values for total content of organic parameters: TOC, BTEX, PCB, mineral oil and PAHs, eg:

| Component | Value mg/kg |
|--|----------------|
| TOC (total organic carbon) | 30 000 |
| PCBs (polychlorinated biphenyls 7 congeners) | 1 |



Waste acceptance criteria

Leaching limits at Landfills for non-hazardous waste (which is landfilled in the same cell with stable, non reactive hazardous waste)

- Leaching limit values for heavy metals, acids, DOC and TDS, eg (granular waste)

| Component | L/S = 2 l/kg | L/S = 10 l/kg | C _o (percolation test) |
|-----------|---------------------|---------------------|--------------------------------------|
| | mg/kg dry substance | mg/kg dry substance | mg/l |
| Pb | 5 | 10 | 3 |
| DOC | 380 | 800 | 250 |

- Additional criteria for stable, non-reactive hazardous waste: TOC, pH, ANC
- For monolithic waste MS shall set criteria

Member States may create subcategories of landfills for n.-h. waste



Waste acceptance criteria

Leaching limits at Landfills for hazardous waste

➤ Leaching limit values for heavy metals, acids, DOC and TDS, eg (granular waste)

| Component | L/S = 2 l/kg | L/S = 10 l/kg | C _o (percolation test) |
|-----------|---------------------|---------------------|--------------------------------------|
| | mg/kg dry substance | mg/kg dry substance | mg/l |
| Pb | 25 | 50 | 15 |
| DOC | 480 | 1 000 | 320 |

➤ Additional criteria: LOI or TOC, ANC

➤ For monolithic waste MS shall set criteria



Waste acceptance criteria

Leaching limits at Landfills for underground storage

Site specific safety assessment

- Geological assessment
- Geomechanical assessment
- Hydrogeological assessment
- Geochemical assessment
- Biosphere impact assessment
- Assessment of the operational phase
- Long-term assessment
- Assessment of the impact of all the surface facilities at the site

Inert waste → limit values according to landfill for inert waste

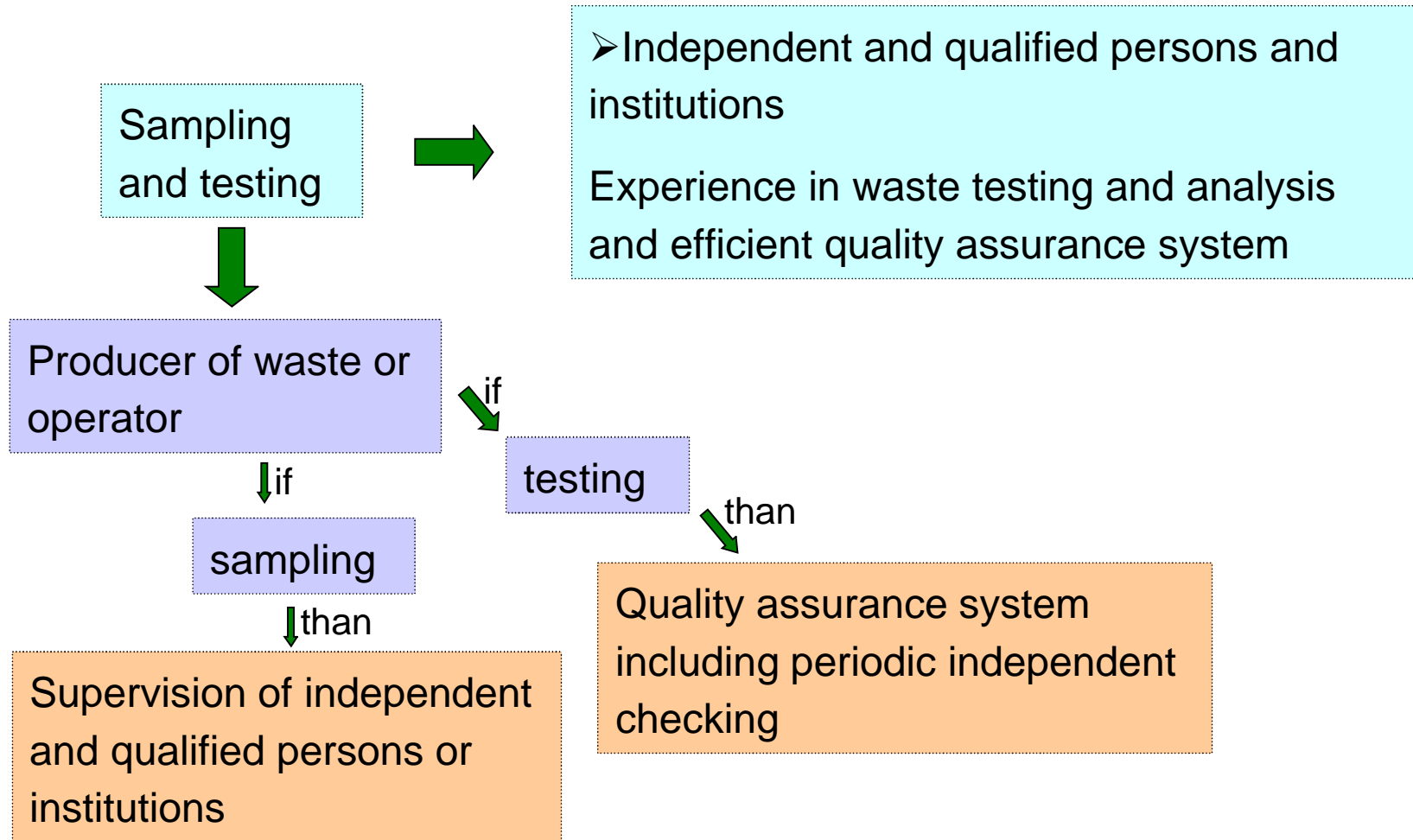
Non-hazardous waste → limit values according to landfill for non-hazardous waste

Hazardous waste → waste compatible with site-specific safety assessment

Excluded wastes: wastes that may undergo undesired physical, chemical or biological transformation after they have been deposited



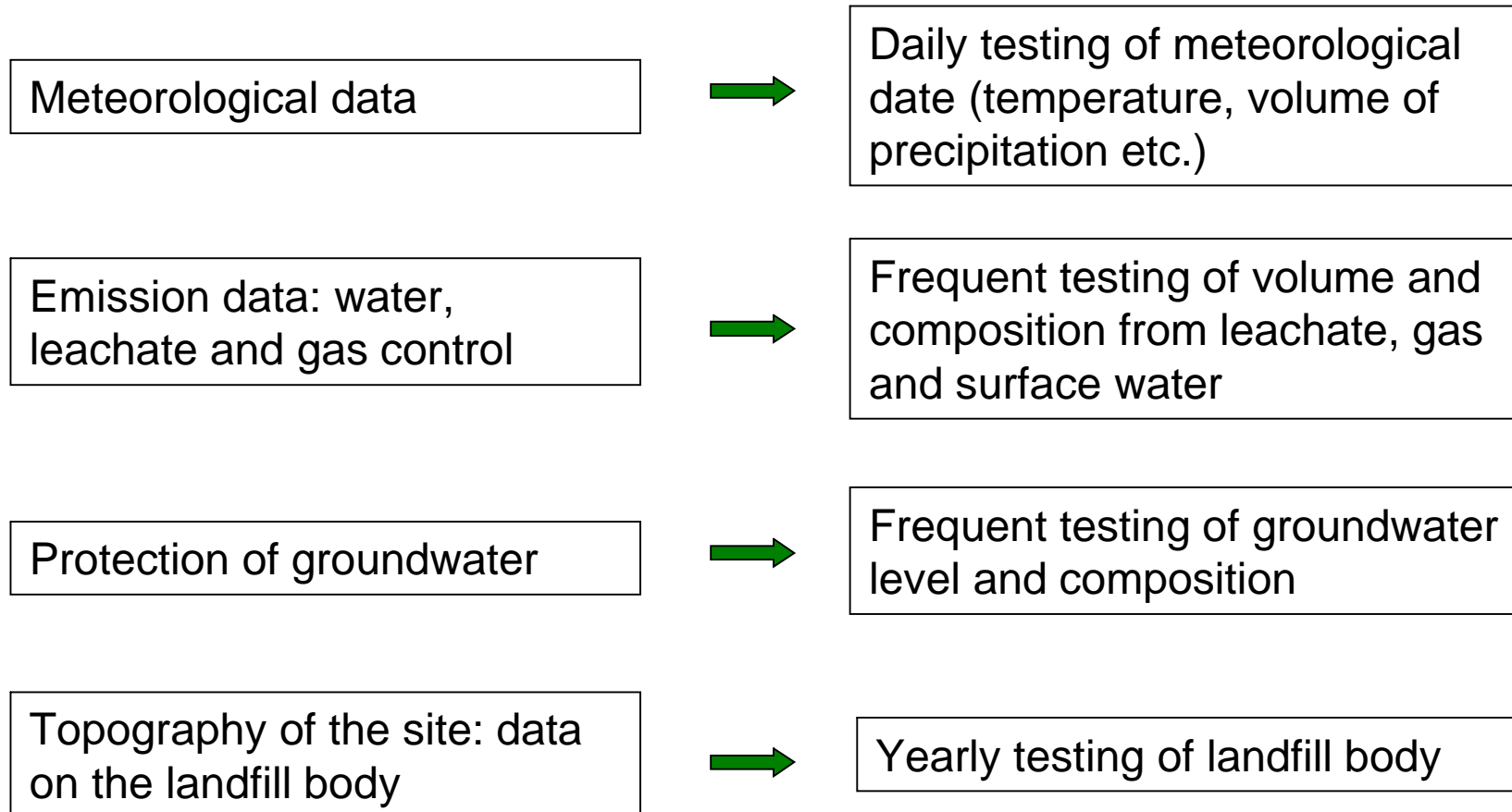
Sampling and test methods



Sampling and testing according to methods listed in Annex III of Decision 2003/33/EC (developed by CEN)

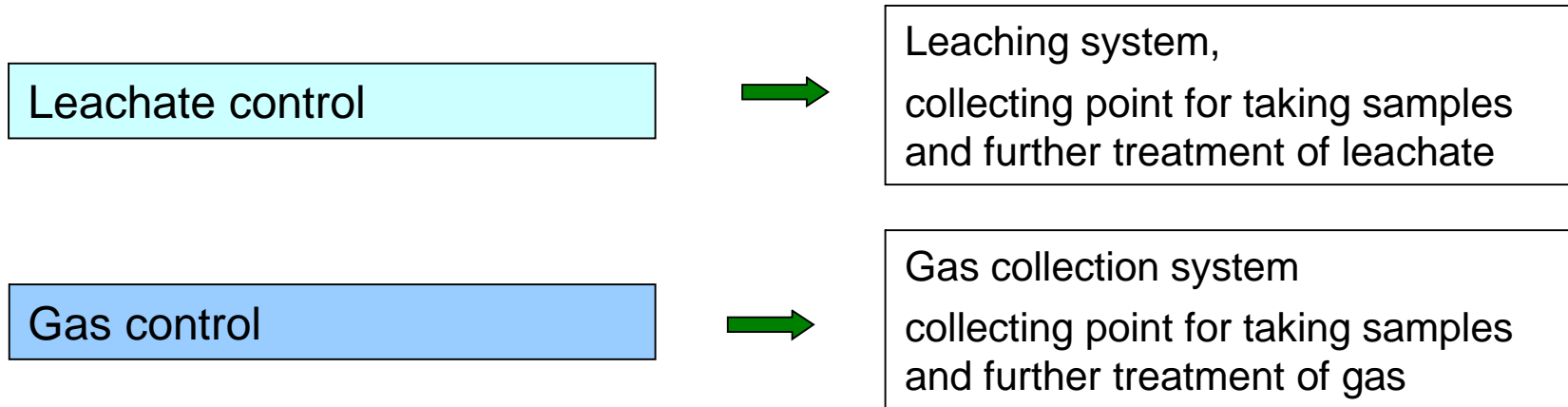


Control and monitoring procedures acc. Annex III of Landfill Directive





Control and monitoring procedures acc. Annex III of Landfill Directive



| | Operating phase |
|--|-----------------|
| Leachate volume | Monthly |
| Leachate composition | Quarterly |
| Volume and composition of surface water | Quarterly |
| Potential gas emissions and atmospheric pressure (CH ₄ , CO ₂ , O ₂ , H ₂ S, H ₂ , etc) | Quarterly |

Specific details which are described underneath the table in the Annex have to be taken into consideration

The parameters to be measured and the substances to be analysed as well as the frequency of measuring must be laid down in the permit document