



Legal requirements for acceptance and control during operation of landfills



**“Information Exchange Event on landfill of Waste“
Athens, 23-24 June 2008**



Basic requirements for landfill of waste

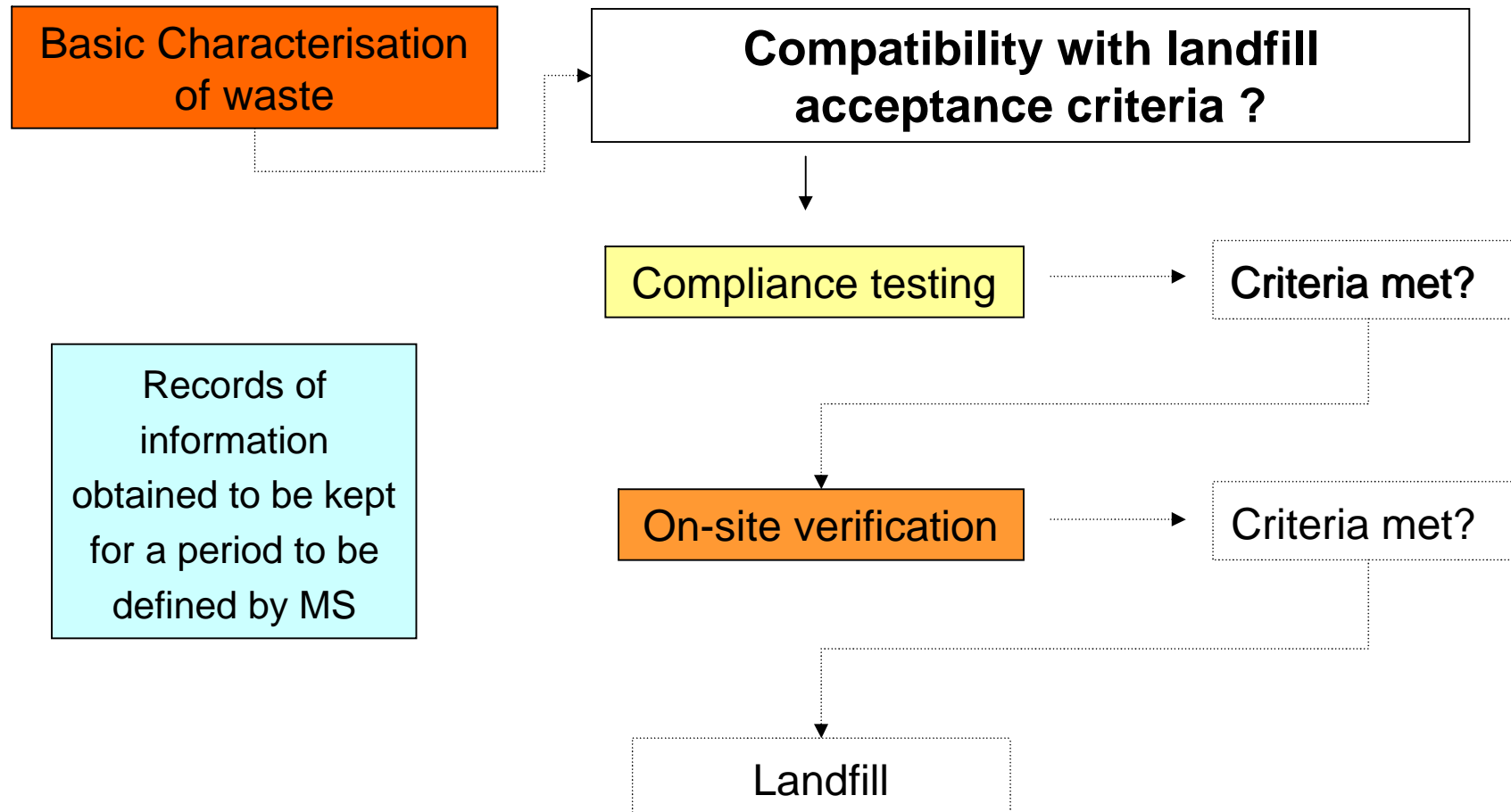
Waste may only be landfilled if compatible with the standards set for each landfill class!

- (1) Procedure for the acceptance of waste at landfills
- (2) Waste acceptance criteria
- (3) Sampling and test methods

To be applied since July 2005



Decision 2003/33/EC – Acceptance Procedures

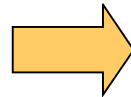




Acceptance procedure – basic characterisation

Basic characterisation

1. info on source and origin
2. source process
3. pre-treatment
4. composition
5. leaching behaviour
6. hazard properties
7. appearance
8. EWC,
9. recipient landfill category
10. precautionary measures
11. exclusion check recycling/recovery



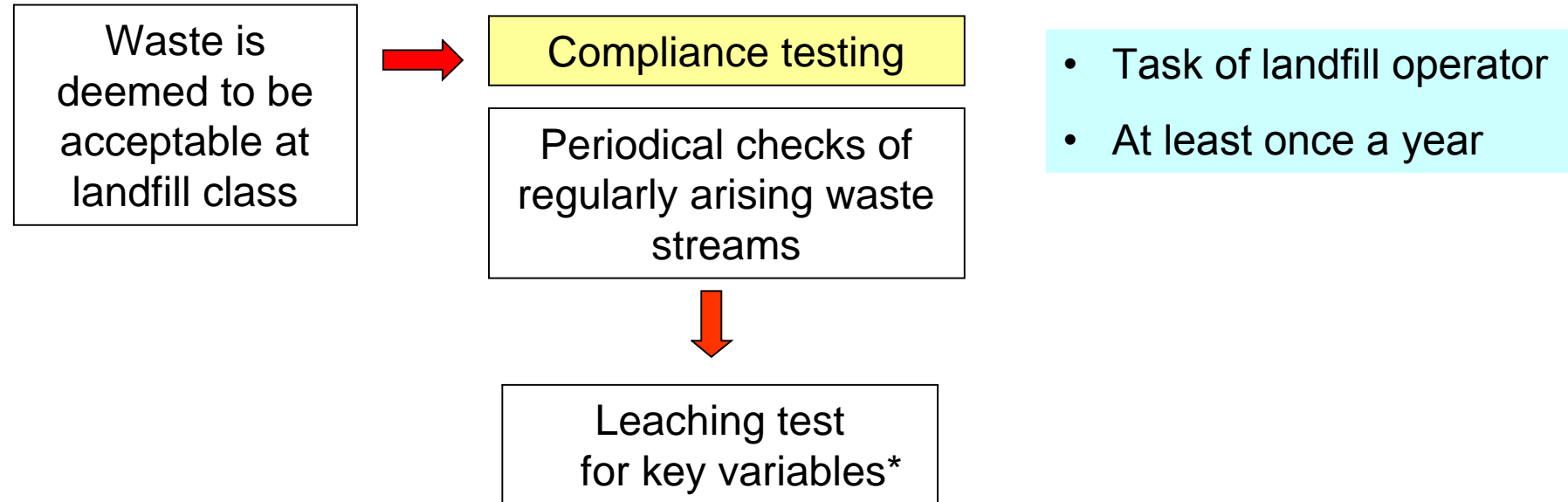
- Task of waste producer
Definition of **key variables**
- Full characterisation of waste; required for each type of waste

Chemical analysis

As general rule



Acceptance procedure – compliance testing



Tests methods as used for basic characterisation shall be applied
(* = critical parameters as identified during basic characterisation)



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



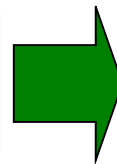
After one basic characterisation subsequently compliance testing of key variables may be sufficient

For these wastes the basic characterisation should especially contain:

compositional range

range and variability for characteristic properties

Wastes that are not regularly generated



Basic characterisation for each batch of waste



Acceptance procedure – on-site verification

For each load
delivered to a
landfill



On-site verification

Visual inspection before
and after unloading
Check of required
documents
Periodic sampling



- Task of landfill operator
- Testing requirements and rapid test methods determined by MS



Testing requirements for inert waste landfill (class A)

Acceptable without testing*:

Single waste streams (list) that are assumed to fulfil the criteria including:

Glass (101103, 150107, 170202, 191205, 200102)

Concrete (170101, 170107 selected only)

Bricks (170102, 170107 selected only)

Tiles and ceramics (170103, 170107 selected only)

Soil and stones (17050, 200202 selected only)

All other wastes have to be tested
(chemical analysis)
prior to be accepted

* Materials from a unique source;

in case of suspicion for contamination the waste should be tested or refused.



Testing requirements for inert waste landfill (class 0)

- 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

* In case of soil the allowed limit value can be higher



Testing requirements for non-hazardous waste landfill (class B) - I

Acceptable without testing:

- Municipal waste (household, similar to household) that is classified as non-hazardous in EWC (20)
- Separately collected non-hazardous fractions of household or same material from other origin

But only if :

- subjected to prior treatment or
- if not contaminated to an extent which increases the associated risk sufficiently to justify disposal in other facilities

- Construction material containing asbestos and other suitable asbestos waste (if stable & non-reactive, no other hazardous substances, not with biodegradable, separate cell, daily coverage, final topping)



Testing requirements for non-hazardous waste landfill (class B) - II

Limit values for:

Granular non-hazardous waste accepted in same cell as stable non-reactive hazardous waste	wastes to be landfilled together with gypsum-based (no biodegradable)	Leaching limit values for granular hazardous waste acceptable at class B landfills
Heavy metals, chloride, fluoride, sulphate, DOC, TDS (alternative to sulphate, chloride)	TOC 5% DOC 800 mg/kg d.m.	Heavy metals, chloride, fluoride, sulphate, DOC, TDS (alternative to sulphate, chloride)

➤ For monolithic waste MS shall set own criteria



Testing requirements for hazardous waste landfill (class C)

- All wastes have to be tested prior to acceptance
- 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

- For monolithic waste MS shall set criteria

Other criteria:

LOI* (lost on ignition)	10%	* Either LOI or TOC must be used
TOC* (total organic carbon)	6% **	** a higher limit value might be accepted if the DOC is ≤ 1 000mg/kg



Acceptance procedure for underground landfills (class D)

Site specific safety assessment

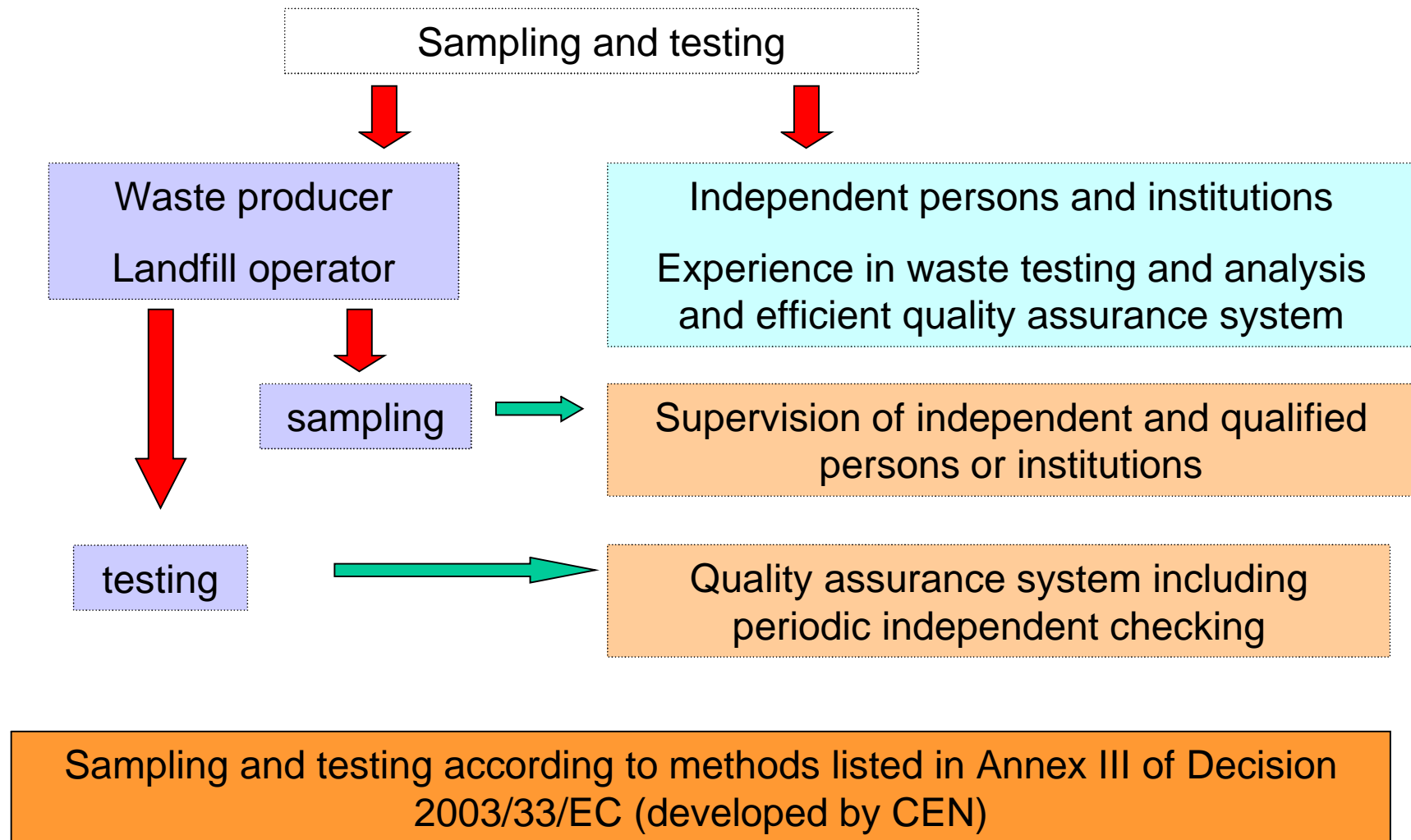
- Geological assessment
- Geomechanical assessment
- Hydrogeological assessment
- Geochemical assessment
- Biosphere impact assessment
- Assessment of the operational phase
- Long-term assessment
- Assessment of the impact of all the surface facilities at the site

Excluded from underground landfill:

- Waste covered under article 5 (3) of the landfill directive
- Waste which can react with water or with the host rock and which could change in volume or where gases could be generated
- Biodegradable waste
- Waste with insufficient stability
- Autoflammable waste
- Waste which contains or generates pathogenic germs



Decision 2003/33/EC – Sampling and test methods





Decision 2003/33/EC – Sampling and test methods

- **EN 14899: Framework for the application and preparation of a Sampling Plan**

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- EN 123137: Determination TOC
 - EN 14429: Determination DOC
 - prEN 14405, EN 12457/1-4 : Leaching
 - prEN 14346: Calculation dry matter
 - EN 13657, EN 13656: digestion of raw waste
 - ENV 12506, ENV 13370, prEN 14039: analysis
- etc.



Problems and Deficits in Implementation of EN 14899

- (1) What sampling regime is needed to reliably assess characteristics and variability of a waste stream?
- (2) How is it possible to generate a sample representative for a certain period of time?
- (3) How to manage aspects of storage until test result are available?
- (4) What is the required frequency for the compliance testing?
- (5) What kind of test methods and standards are used?
- (6) What limit values are used?
- (7) How is the visual inspection guaranteed?



High uncertainty
Cost and feasibility aspects
Diverging interpretation





Joint actions & constructive discussions



- Meetings at local, regional, national level
- TAC meetings
- IMPEL Working Group



IMPEL Cluster 1 – “Comparison programme for landfill inspection and monitoring”

- Consistent level of enforcement;
- Exchange of information, knowledge and practical experiences
- Informal network of inspectors
- Improved collaboration

➤ First priority: harmonised testing plan

Lead country: Austria

Project start January 2008

Project Manager

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Ministry of Agriculture, Forestry, Environment and Water Management



Aspects to discuss

1. How do you perform basic characterisation for inert, municipal and hazardous waste?
2. How is compliance testing assured?
3. How is on-site verification performed?
4. Where are difficulties encountered?
5. What solutions have been developed?



Thank you for your attention