

L.N. 168 of 2002

**ENVIRONMENT PROTECTION ACT  
(ACT NO. XX OF 2001)**

**Waste Management (Landfill) Regulations, 2002**

BY VIRTUE of the powers conferred by articles 9, 11(b) and 28 of the Environment Protection Act, hereinafter referred to as “the Act”, the Minister responsible for the environment has made the following regulations:—

1. (1) The title of these regulations is the Waste Management (Landfill) Regulations, 2002. Citation, commencement and objectives.

(2) (a) These regulations shall come into force on such a date as the Minister responsible for the environment may by notice in the Gazette appoint and different dates may be so appointed for the different provisions and different purposes of these regulations.

(b) A notice under paragraph (a) of this sub-regulation may take such transitional provisions as appear to the Minister to be necessary or expedient in connection with the provisions brought into force.

(3) These regulations provide additional measures, procedures and guidance to those in the Waste Management (Permit and Control) Regulations, 2001, to prevent or reduce as far as possible negative effects on the environment in particular the pollution of surface water, groundwater, soil and air, and the global environment, including the greenhouse effect, as well as any resulting risk to human health, from the landfilling of waste, during the whole life-cycle of the landfill.

2. In these regulations, unless the context otherwise requires: Interpretation.

“landfill” means a waste disposal site for the deposit of the waste onto or into land (i.e. underground), including:

- internal waste disposal sites i.e. landfill where a producer of waste is carrying out its own waste disposal at the place of production, and

- a permanent site i.e. more than one year, which is used for temporary storage of waste;

but excluding:

- facilities where waste is unloaded in order to permit its preparation for further transport for recovery, treatment or disposal elsewhere, and

- storage of waste prior to recovery or treatment for a period less than three years as a general rule, or

- storage of waste prior to disposal for a period less than one year;

“landfill operating permit” or “permit” means a permit to operate a landfill issued under the Waste Management (Permit and Control) Regulations, 2001;

“underground storage” means a permanent waste storage facility in a deep geological cavity such as a salt or potassium mine;

“leachate” means any liquid percolating through the deposited waste and emitted from or contained within a landfill;

“landfill gas” means all the gases generated from the landfilled waste;

“eluate” means the solution obtained by a laboratory leaching test;

“operator” means the natural or legal person responsible for a landfill; this person may change from the preparation to the after-care phase;

“biodegradable waste” means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard;

“liquid waste” means any waste in liquid form including waste waters but excluding sludge;

“competent authority” means the Malta Environment and Planning Authority as prescribed by the notice entitled Nomination of the Malta Environment & Planning Authority as the competent Authority, and such other body or person as the Minister responsible for the environment may by order in the Gazette prescribe and different bodies or persons may be designated as the competent authority for different provisions and different purposes of these regulations.

All other terms shall have the same meaning as that assigned to them in the Waste Management (Permit and Control) Regulations.

3. (1) These regulations shall apply to any landfill as defined in regulation 2. Exclusions.

(2) The following activities shall be excluded from the scope of these Regulations:

(a) the spreading of sludges, including sewage sludges, and sludges resulting from dredging operations, and similar matter on the soil for the purpose of fertilisation or improvement,

(b) the use of inert waste which is suitable, in development/restoration and filling-in work, or for construction purposes, in landfills,

(c) the deposit of non-hazardous dredging sludges alongside small waterways from where they have been dredged out and of non-hazardous sludges in surface water including the bed and its sub soil.

(d) The deposit of unpolluted soil or of non-hazardous inert waste resulting from prospecting and extraction, treatment, and storage of mineral resources as well as from the operation of quarries and which are deposited in a manner preventing environmental pollution or harm to human health are exempted from the provisions in Schedule 1, points 2, 3.1, 3.2 and 3.3 of these regulations.

4. There shall be three classes of landfill:

Classes of landfill.

- landfill for hazardous waste,
- landfill for non-hazardous waste, and
- landfill for inert waste.

5. (1) The Competent Authority shall, not later than 15 July 2003, set up a national strategy for the purpose of the reduction of biodegradable waste going to landfill. This strategy shall include measures to achieve the targets as set out in paragraph 2 including such measures as recycling, composting, biogas production or material and energy recovery.

Maximum quantities of biodegradable municipal waste to be landfilled.

(2) The Strategy shall ensure that by:

(a) 15 July 2010 biodegradable waste going to landfill is reduced to 75% of the total amount by weight of biodegradable municipal waste produced in 1995;

(b) 15 July 2013 biodegradable waste going to landfill is reduced to 50% of the total amount by weight of biodegradable municipal waste produced in 1995;

(c) 15 July 2020 biodegradable waste going to landfill is reduced to 35% of the total amount by weight of biodegradable municipal waste produced in 1995.

Wastes not accepted in a landfill.

6. The following wastes shall not be accepted in a landfill:

- liquid waste;
- waste which, in the conditions of landfill, is explosive, corrosive, oxidising, highly flammable or flammable as defined in Schedule 2 of the Waste Management (Permit and Control) Regulations;
- hospital and other clinical waste arising from medical or veterinary establishments, which are infectious as defined by property H9 of Schedule 2 of the Waste Management (Permit and Control) Regulations;
- from 15 July 2003, whole used tyres, excluding tyres used as engineering material;
- from 15 July 2006, shredded used tyres;
- any other type of waste which does not fulfil the acceptance criteria determined in accordance with Schedule 2;
- any other type of waste which the Competent Authority declares as not acceptable in a landfill.

Dilution of mixture of waste prohibited.

7. The dilution or mixture of waste solely in order to meet the waste acceptance criteria is prohibited.

Waste acceptance criteria.

8. (a) Only waste that has been subject to treatment shall be landfilled. This provision does not apply to inert waste for which treatment is not technically feasible, nor to any other waste for which such treatment does not contribute to the objectives of these Regulations, by reducing the quantity of the waste or the hazards to human health or the environment;

(b) Only hazardous waste that fulfils the criteria set out in accordance with Schedule 2 shall be landfilled in a hazardous waste landfill;

(c) Only the following types of non-hazardous waste shall be landfilled at a non-hazardous waste landfill:-

(i) municipal waste;

(ii) non-hazardous waste of any other origin, which fulfils the criteria for the acceptance of waste at landfill for non-hazardous waste set out in accordance with Schedule 2;

(iii) stable, non-reactive hazardous waste (e.g. solidified, vitrified), with leaching behaviour equivalent to those of the non-hazardous wastes referred to at sub-paragraph (ii) which fulfils the relevant acceptance criteria set out in accordance with Schedule 2. These hazardous wastes shall not be deposited in cells destined for biodegradable non-hazardous waste.

(d) inert waste landfill sites shall be used only for inert waste.

**9.** Without prejudice to the Waste Management (Permit and Control) Regulations, the application for a Landfill Operating Permit must contain at least the following particulars:

Application for a  
Landfill Operating  
Permit.

(a) the identity of the applicant and of the operator when they are different entities;

(b) the description of the types and total quantity of waste to be deposited;

(c) the proposed capacity of the disposal site;

(d) the description of the site, including its hydrogeological and geological characteristics;

(e) the proposed methods for pollution prevention and abatement;

(f) the proposed operation, monitoring and control plan;

(g) the proposed plan for the closure and after-care procedures;

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(h) where an impact assessment is required under the Environment Impact Assessment Regulations, a copy of the Environment Impact Assessment Report;

(i) the financial security by the applicant, or any other equivalent provision under Regulation 10(a)(iv) of these Regulations.

Following a successful application for a permit this information shall be made available to the competent national statistical authority when requested for statistical purposes.

Conditions of  
Landfill Operating  
Permit.

**10.** (a) Without prejudice to the Waste Management (Control and Permit) Regulations, the Competent Authority shall not issue a landfill permit unless it is satisfied that:

(i) the landfill project complies with all the relevant requirements of these Regulations;

(ii) the management of the landfill site will be in the hands of a natural person who is technically competent to manage the site, and that professional and technical development and training of landfill operators and staff are provided;

(iii) the landfill shall be operated in such a manner that the necessary measures are taken to prevent accidents and limit their consequences;

Financial security of  
operator.

(iv) adequate provisions, by way of financial security or any other equivalent, to the satisfaction of the Competent Authority, have been or will be made by the applicant prior to commencement of disposal operations to ensure that the obligations (including after-care provisions) arising under the Landfill Operating Permit are discharged and that the closure procedures required under Regulation 16 are followed. This security or its equivalent shall be kept as long as required by maintenance and after-care operation of the site in accordance with Regulation 16(d).

(b) The landfill project shall be in line with the relevant national waste management strategy and implementation plan.

Site inspection prior  
to start of disposal  
operations.

(c) Prior to the commencement of the disposal operations, the Competent Authority shall inspect the site in order to ensure that it complies with the relevant conditions of the permit. This will not reduce in any way the responsibility of the operator under the conditions of the permit.

**11.** Without prejudice to the Waste Management (Permit and Control) Regulations, the landfill permit shall state the following: Content of Landfill Operating Permit.

- (a) the class of the landfill;
- (b) the list of defined types and the total quantity of waste which are authorised to be deposited in the landfill;
- (c) requirements for the landfill preparations, landfilling operations and monitoring and control procedures, including contingency plans, as well as provisional requirements for the closure and after-care operations;
- (d) the obligation on the applicant to report at least annually to the Competent Authority on the types and quantities of waste disposed of and on the results of the monitoring programme as required by Regulations 15 and 16 and Schedule 3.

**12.** All the costs involved in the setting up and operation of a landfill site, including as far as possible the cost of the financial security or its equivalent referred to in Regulation 10(a)(iv), and the estimated costs of the closure and after-care of the site for a period of at least 30 years shall be covered by the price to be charged by the operator for the disposal of any type of waste in that site. Cost of landfill of waste.

**13.** Collection and use of information related to costs of the landfill operation shall be carried out in a transparent way and according to the provisions of Regulations on the Access to Information on the Environment. Regulation on the access to Information on the Environment.

**14.** (a) Before or at the time of delivery or of the first in a series of deliveries, provided the type of waste remains unchanged, the holder or the operator shall show, by means of the appropriate documentation, that the waste in question can be accepted at that site according to the conditions set in the permit, and that it fulfils the acceptance criteria set out in Schedule 2. Waste acceptance procedures.

(b) Moreover, to ensure that reception procedures are in accordance with the provisions of these regulations the operator shall:

- (i) Check the waste documentation, including those documents required by the Waste Management (Permit and Control) Regulations, and where applicable those required by the Environment Protection (Control of Transboundary Movement of Toxic and other Substances) Regulations.

(ii) Visually inspect the waste at the entrance and at the point of deposit and, as appropriate, verify conformity with the description provided in the documentation submitted by the holder.

(iii) If applicable, take samples and analyse same in compliance with Schedule 2 point 3 level 3. The operator shall ensure that quality control of such sampling and analytical operations shall be carried out by a competent agency to the satisfaction of the Competent Authority and in accordance with Schedule 2. These samples shall be kept for at least one month.

(iv) Keep a register of the qualities and characteristics of the waste deposited, indicating origin, date of delivery, identity of the producer or collector in the case of municipal waste, and, in the case of hazardous waste, the precise location on the site, and make this information available to the Competent Authority on request;

(c) the operator of the landfill shall always provide written acknowledgement of receipt of each delivery accepted on the site;

(d) without prejudice to the Environment Protection (Control of Transboundary Movement of Toxic and other Substances) Regulations, if waste is not accepted at a landfill the operator shall notify without delay the Competent Authority of the non-acceptance of the waste.

Control and monitoring procedures in the operational phase.

15. (a) The operator of a landfill shall in the operational phase of a landfill carry out a control and monitoring programme as specified in Schedule 3.

(b) The operator shall notify the Competent Authority of any significant adverse environmental effects revealed by the control and monitoring procedures and follow the decision of the Competent Authority on the nature and timing of the corrective measures to be taken. These measures shall be undertaken at the expense of the operator.

The Competent Authority, shall determine the frequency which shall at least be a year, whereby the operator shall report, on the basis of aggregated data, all monitoring results to the Competent Authority for the purpose of demonstrating compliance with permit conditions and increasing the knowledge on waste behaviour in the landfills.



(c) The operator shall ensure that quality control of analytical operations related to the control and monitoring procedures are carried out by a competent agency to the satisfaction of the Competent Authority.

Quality control of analytical procedures related to control and monitoring procedures.

16. (a) The operator shall start closure procedures of the landfill or part of it:

Closure and after-care procedures.

(i) when the relevant conditions stated in the permit are met; or

(ii) following authorisation by the Competent Authority at the request of the operator; or

(iii) following an order to this effect by the Competent Authority.

(b) A landfill or part of it may only be considered as definitely closed after the competent authority has carried out a final on-site inspection, has assessed all the reports submitted by the operator and has communicated to the operator its approval for the closure. This shall not in any way reduce the responsibility of the operator under the conditions of the permit.

Approval by Competent Authority for closure of landfill.

(c) After a landfill has been definitely closed, the operator shall be responsible for its maintenance, monitoring and control in the after-care phase for as long as may be required by the competent authority, taking into account the time during which the landfill could present hazards.

The operator shall notify the competent authority of any significant adverse environmental effects revealed by the control and monitoring procedures and shall follow the decision of the competent authority on the nature and timing of the corrective measures to be taken.

(d) The competent authority shall as long as it considers that a landfill is likely to cause a hazard to the environment and without prejudice to any liability of the waste holder, oblige the operator of the site to be responsible for monitoring and analysing landfill gas and leachate from the site and the ground and surface water regime in the vicinity of the site in accordance with Schedule 3.

Duration of monitoring period.

17. Landfills which are in operation shall not continue to operate unless the steps outlined below are accomplished as soon as possible and until 15 July 2009 at the latest:

Existing landfills.

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(a) the operator shall, by 15 July 2003, prepare and present to the competent authority, for its approval, a conditioning plan for the site including the particulars listed in Regulation 11 and any corrective measures which the operator considers will be needed in order to comply with the requirements of these Regulations with the exception of the requirements in Schedule 1 point 1;

(b) following the presentation of the conditioning plan, the competent authority shall take a definite decision on whether operations may continue on the basis of the said conditioning plan and these Regulations.

Transitional period.

(c) On the basis of the approved conditioning plan, the Competent Authority shall authorise the necessary work and shall lay down a transitional period for the completion of the plan by 15 July 2009.

(d) In the case of an existing landfill receiving hazardous waste, Regulations 4, 5, 6, 7 and 14 and Schedule 2 shall enter into force on 1 January 2004. Regulation 8 shall enter into force on 15 July 2004.

Offences against these Regulations.

**18.** Any person shall be guilty of an offence under these regulations if:

(a) he fails to comply with any provision of these regulations or fails to comply with permit conditions or with any order lawfully given in terms of any provision of these regulations; or

(b) he contravenes any restriction, prohibition or requirement imposed by or under these regulations; or

(c) he acts in contravention of any of the provisions of these regulations; or

(d) he conspires or attempts, or aids, or abets, any other person by whatever means, including advertising, counselling or procurement to contravene the provisions of these regulations or to fail to comply with any such provisions (including any order lawfully given in terms of any of the provision of these regulations) or to contravene any restriction, prohibition or requirement imposed by or under the said regulations.

Penalties.

**19.** Any person who commits an offence against these regulations shall, on conviction, be liable:

(a) on a first conviction to a fine (*multa*) of not less than five hundred Maltese liri but not exceeding one thousand Maltese liri;

(b) on a second or subsequent convictions, to a fine (*multa*) of not less than one thousand Maltese liri, but not exceeding two thousand Maltese liri or to imprisonment for a term not exceeding two years, or to both such fine and imprisonment:

Provided that whenever any person is found guilty of committing an offence under these regulations by means of a vehicle, the owner of the said vehicle, where applicable, is held liable in the same manner and degree;

Provided further that the court shall order any person who has been found guilty of committing an offence against these regulations to pay for the expenses incurred by the Competent Authority as a result of the said offence, the revocation of the permit issued by the Competent Authority and the confiscation of the *corpus delicti*, including the vehicle, if applicable.

**20.** (1) The provisions of sections 23 and 30 of the Criminal Code shall, *mutatis mutandis*, apply to proceedings in respect of offences against these regulations, so however that the disqualification from holding or obtaining a licence, permit or authority shall in no case be for less than one year. Applicability of  
Cap. 9.

(2) Notwithstanding the provisions of section 370 of the Criminal Code, proceedings for an offence against these regulations shall be held before the Court of Magistrates (Malta) or the Court of Magistrates (Gozo), as the case may be, and shall be in accordance with the provisions of the Criminal Code regulating the procedure before the said courts as courts of criminal judicature.

(3) Notwithstanding the provisions of the Criminal Code, the Attorney General shall always have a right of appeal to the Court of Criminal Appeal from any judgement given by the Court of Magistrates

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(Malta) or the Court of Magistrates (Gozo) in respect of proceedings for any offence against these regulations.

Language of  
schedules.

**21.** The Schedules 1, 2, and 3 to these regulations are being published in the English language with the English text of these regulations.

The observations must be evaluated by means of control charts with established control rules and levels for each down gradient well. The control levels must be determined from local variations in groundwater quality.

5. Topography of the site: data on the landfill body

## SCHEDULE 1

### GENERAL REQUIREMENTS FOR ALL CLASSES OF LANDFILLS

#### 1. Location

1.1. The location of a landfill must take into consideration requirements relating to:

- (a) the distances from the boundary of the site to residential and recreation areas, waterways, water bodies and other agricultural or urban sites;
- (b) the existence of groundwater, coastal water or nature protection zones in the area;
- (c) the geological and hydrogeological conditions in the area;
- (d) the risk of flooding, subsidence, landslides or avalanches on the site;
- (e) the protection of the nature or cultural patrimony in the area.

1.2. The landfill can be authorised only if the characteristics of the site with respect to the above mentioned requirements, or the corrective measures to be taken, indicate that the landfill does not pose a serious environmental risk.

#### 2. Water control and leachate management

Appropriate measures shall be taken, with respect to the characteristics of the landfill and the meteorological conditions, in order to:

- control water from precipitations entering into the landfill body,
- prevent surface water and/or groundwater from entering into the landfilled waste,
- collect contaminated water and leachate. If an assessment based on consideration of the location of the landfill and the waste to be accepted shows that the landfill poses no potential hazard to the environment, the competent authority may decide that this provision does not apply,
- treat contaminated water and leachate collected from the landfill to the appropriate standard required for their discharge.

The above provisions may not apply to landfills for inert waste.

#### 3. Protection of soil and water

3.1. A landfill must be situated and designed so as to meet the necessary conditions for preventing pollution of the soil, groundwater or surface water and

ensuring efficient collection of leachate as and when required according to Section 2. Protection of soil, groundwater and surface water is to be achieved by the combination of a geological barrier and a bottom liner during the operational/active phase and by the combination of a geological barrier and a bottom liner during the operational/active phase and by the combination of a geological barrier and a top liner during the passive phase/post closure.

3.2. The geological barrier is determined by geological and hydrogeological conditions below and in the vicinity of a landfill site providing sufficient attenuation capacity to prevent a potential risk to soil and groundwater.

The landfill base and sides shall consist of a mineral layer which satisfies permeability and thickness requirements with a combined effect in terms of protection of soil, groundwater and surface water at least equivalent to the one resulting from the following requirements:

- landfill for hazardous waste: K less than or equal to  $1.0 \times 10^{-9}$  m/s<sup>1</sup>; thickness greater than or equal to 5 m,

- landfill for non-hazardous waste: K less than or equal to  $1.0 \times 10^{-9}$  m/s; thickness greater than or equal to 1 m,

- landfill for inert waste: K less than or equal to  $1.0 \times 10^{-7}$  m/s; thickness greater than or equal to 1 m,

Where the geological barrier does not naturally meet the above conditions it can be completed artificially and reinforced by other means giving equivalent protection. An artificially established geological barrier should be no less than 0.5 metres thick.

3.3. In addition to the geological barrier described above a leachate collection and sealing system must be added in accordance with the following principles so as to ensure that leachate accumulation at the base of the landfill is kept to a minimum:

*Leachate collection and bottom sealing*

Landfill category	Non-hazardous	Hazardous
Artificial sealing liner	Required	Required
Drainage layer greater than or equal to 0.5m	Required	Required

The Competent Authority may set general or specific requirements for inert waste landfills and for the characteristics of the above mentioned technical means.

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<sup>1</sup> m/s: metre/second.

If the Competent Authority after a consideration of the potential hazards to the environment finds that the prevention of leachate formation is necessary, a surface sealing may be prescribed.

Recommendations for the surface sealing are as follows:

Landfill category	Non-hazardous	Hazardous
Gas drainage layer	Required	Not required
Artificial sealing liner	Not required	Required
Impermeable mineral layer	Required	Required
Drainage layer greater than 0.5m	Required	Required
Top soil cover greater than 1m	Required	Required

3.4. If, on the basis of an assessment of environmental risks, the competent authority has decided, in accordance with Section 2 ("Water control and leachate management"), that collection and treatment of leachate is not necessary or it has been established that the landfill poses no potential hazard to soil, groundwater or surface water, the requirements in paragraphs 3.2 and 3.3 above may be reduced accordingly. In the case of landfills for inert waste these requirements may be adapted by national legislation.

3.5. An approved method for the determination of the permeability coefficient for landfills, in the field and for the whole extension of the site, shall be used.

#### 4. Gas control

4.1. Appropriate measures shall be taken in order to control the accumulation and migration of landfill gas (Schedule 3).

4.2. Landfill gas shall be collected from all landfills receiving biodegradable waste and the landfill gas must be treated and used. If the gas collected cannot be used to produce energy, it must be flared.

4.3. The collection, treatment and use of landfill gas under paragraph 4.2 shall be carried on in a manner which minimises damage to or deterioration of the environment and risk to human health.

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#### **5. Nuisances and hazards**

Measures shall be taken to minimise nuisances and hazards arising from the landfill through:

- emissions of odours and dust,
- wind-blown materials,
- noise and traffic,
- birds, vermin and insects,
- formation and aerosols,
- fires.

The landfill shall be equipped so that dirt originating from the site is not dispersed onto public roads and the surrounding land.

#### **6. Stability**

The emplacement of waste on the site shall take place in such a way as to ensure stability of the mass of waste and associated structures, particularly in respect of avoidance of slippages. Where an artificial barrier is established it must be ascertained that the geological substratum, considering the morphology of the landfill, is sufficiently stable to prevent settlement that may cause damage to the barrier.

#### **7. Barriers**

The landfill shall be secured to prevent free access to the site. The gates shall be locked outside operating hours. The system of control and access to each facility should contain a programme of measures to detect and discourage illegal dumping in the facility.



## SCHEDULE 2

### WASTE ACCEPTANCE CRITERIA AND PROCEDURES

#### 1. Introduction

This Schedule describes general principles for acceptance of waste at the various classes of landfills.

#### 2. General principles

The composition, leachability, long-term behaviour and general properties of a waste to be landfilled must be known as precisely as possible. Waste acceptance at a landfill can be based either on lists of accepted or refused waste, defined by nature and origin, and on waste analysis methods and limit values for the properties of the waste to be accepted.

The Competent Authority shall set national lists of waste to be accepted or refused at each class of landfill, or define the criteria required to be on the lists. In order to be accepted at a particular class of landfill, a type of waste must be on the relevant national list or fulfil criteria similar to those required to be on the list.

These lists or acceptance criteria should be used to establish site specific lists, i.e. the list of accepted waste specified in the permit in accordance with Regulation 11.

The criteria for acceptance of waste on the reference lists or at a class of landfill may be based on other legislation and/or on waste properties.

Criteria for acceptance at a specific class of landfill must be derived from considerations pertaining to:

- protection of the surrounding environment (in particular groundwater and surface water),
- protection of the environmental protection systems (e.g. liners and leachate treatment systems),
- protection of the desired waste-stabilisation processes within the landfill,
- protection against human-health hazards.

Examples of waste property-based criteria are:

- requirements on knowledge of total composition,
- limitations on the amount of organic matter in the waste,
- requirements or limitations on the biodegradability of the organic waste components,

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- limitations on the amount of specified, potentially harmful/hazardous components (in relation to the above mentioned protection criteria),
- limitations on the potential and expected leachability of specified, potentially harmful/hazardous components (in relation to the above mentioned protection criteria),
- ecotoxicological properties of the waste and the resulting leachate.

The property-based criteria for acceptance of waste must generally be most extensive for inert waste landfills and can be less extensive for non-hazardous waste landfills and least extensive for hazardous waste landfills owing to the higher environmental protection level of the latter two.

### 3. General procedures for testing and acceptance of waste

The general characterisation and testing of waste must be based on the following three-level hierarchy:

**Level 1: *Basic characterisation.*** This constitutes a thorough determination, according to standardised analysis and behaviour-testing methods, of the short and long-term leaching behaviour and/or characteristic properties of the waste.

**Level 2: *Compliance testing.*** This constitutes periodical testing by simpler standardised analysis and behaviour-testing methods to determine whether a waste complies with permit conditions and/or specific reference criteria. The tests focus on key variables and behaviour identified by basic characterisation.

**Level 3: *On-site verification.*** This constitutes rapid check methods to confirm that a waste is the same as that which has been subjected to compliance testing and that which is described in the accompanying documents. It may merely consist of a visual inspection of a load of waste before and after unloading at the landfill site.

A particular type of waste must normally be characterised at Level 1 and pass the appropriate criteria in order to be accepted on a reference list. In order to remain on a site-specific list, a particular type of waste must at regular intervals (e.g. annually) be tested at Level 2 and pass the appropriate criteria. Each waste load arriving at the gate of a landfill must be subjected to Level 3 verification.

Certain waste types may be exempted permanently or temporarily from testing at Level 1. This may be due to impracticability to testing, to unavailability of appropriate testing procedures and acceptance criteria or to overriding legislation.

### 4. Guidelines for preliminary waste acceptance procedures

Only Level 3 testing is mandatory and Level 1 and Level 2 applied to the extent possible. Waste to be accepted at a particular class of landfill must either be on a restrictive national or site-specific list for that class of landfill or fulfil criteria similar to those required to get on the list.

The following general guidelines may be used to set preliminary criteria for acceptance of waste at the three major classes of landfill or the corresponding lists.

*Inert waste landfills:* only inert waste can be accepted on the list.

*Non-hazardous waste landfills:* in order to be accepted on the list a waste type must not be hazardous waste.

*Hazardous waste landfills:* a preliminary rough list for hazardous waste landfills would consist of only those waste which are hazardous. Such waste types should, however not be accepted on the list without prior treatment if they exhibit total contents or leachability of potentially hazardous components that are high enough to constitute a short-term occupational or environmental risk or to prevent sufficient waste stabilisation within the projected lifetime of the landfill.

##### **5. Sampling of waste**

Sampling of waste may pose serious problems with respect to representation and techniques owing to the heterogeneous nature of many wastes. A European standard for sampling of waste will be developed. Until a European standard is approved, national standards and procedures may be applied.

**SCHEDULE 3****CONTROL AND MONITORING PROCEDURES IN OPERATION  
AND AFTER-CARE PHASES****1. Introduction**

The purpose of this Schedule is to provide the minimum procedures for monitoring to be carried out to check:

- that waste has been accepted to disposal in accordance with the criteria set for the category of landfill in question,
- that the processes within the landfill proceed as desired,
- that the environmental protection systems are functioning fully as intended,
- that the permit conditions for the landfill are fulfilled.

**2. Meteorological data**

The operator shall supply information on the methodology used to collect meteorological data (in situ, national meteorological network, etc.).

Should the Competent Authority decide that water balances are an effective tool for evaluating whether leachate is building up in the landfill body or whether the site is leaking, it is recommended that the following data are collected from monitoring at the landfill or from the nearest meteorological station, as long as required by the competent authority in accordance with Regulation 16(d):

	<b>Operation phase</b>	<b>After-care phase</b>
<b>1.1 Volume of precipitation</b>	Daily	Daily, added to monthly values
<b>1.2 Temperature (min., max., 14.00h CET)</b>	Daily	Monthly average
<b>1.3 Direction and force of prevailing wind</b>	Daily	Not required
<b>1.4 Evaporation (lysemeter)<sup>2</sup></b>	Daily	Daily, added to monthly values
<b>1.5 Atmospheric humidity (14.00h CET)</b>	Daily	Monthly average

<sup>2</sup> Or through other suitable methods

**3. Emission data: water, leachate and gas control**

Sampling of leachate and surface water if present must be collected at representative points. Sampling and measuring (volume and composition) of leachate must be performed separately at each point at which leachate is discharged from the site. Reference: general guidelines on sampling technology, ISO 5667-2 (1991).

Monitoring of surface water if present shall be carried out at not less than two points, one upstream from the landfill and one downstream.

Gas monitoring must be representative for each section of the landfill. The frequency of sampling and analysis is listed in the following table. For leachate and water, a sample, representative of the average composition, shall be taken for monitoring.

The frequency of sampling could be adapted on the basis of the morphology of the landfill waste (in tumulus, buried, etc). This shall be specified in the permit.

	Operating phase	Aftercare phase <sup>4</sup>
2.1 Leachate volume	Monthly <sup>3 4</sup>	Every six months
2.2 Leachate composition <sup>5</sup>	Quarterly <sup>4</sup>	Every six months
2.3 Volume and composition of surface water <sup>6</sup>	Quarterly <sup>4</sup>	Every six months
2.4 Potential gas emissions and atmospheric pressure <sup>7</sup> (CH <sub>4</sub> , CO <sub>2</sub> , O <sub>2</sub> , H <sub>2</sub> S, H <sub>2</sub> , etc.)	Monthly <sup>4 8</sup>	Every six months <sup>9</sup>

2.1 and 2.2 apply only where leachate collection takes place.

#### 4. Protection of groundwater

##### A. Sampling

The measurements must be such as to provide information on groundwater likely to be affected by the discharging of waste, with at least one measuring point in the groundwater inflow region and two in the outflow region. This number can be increased on the basis of a specific hydrogeological survey and the need for an early identification of accidental leachate release in the groundwater.

<sup>3</sup> The frequency of sampling could be adapted on the basis of the morphology of the landfill waste in tumulus, buried, etc. This has to be specified in the permit.

<sup>4</sup> If the evaluation of data indicates that longer intervals are equally effective, they may be adapted. For leachates, conductivity must always be measured at least once a year.

<sup>5</sup> The parameters to be measured and the substances to be analysed vary according to the composition of the waste deposited; they must be laid down in the permit document and reflect the leaching characteristics of the waste.

<sup>6</sup> On the basis of the characteristics of the landfill site, the competent authority may determine that these measurements are not required.

<sup>7</sup> These measurements are related mainly to the content of organic material in the waste.

<sup>8</sup> CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub> regularly, other gases as required, according to the composition of the waste deposited, with a view to reflecting its leaching properties.

<sup>9</sup> Efficiency of the gas extraction system must be checked regularly.

Sampling must be carried out in at least three locations before the filling operations in order to establish reference values for future sampling. Reference: Sampling Groundwaters, ISO 5667, Part 11, 1993.

#### *B. Monitoring*

The parameters to be analysed in the samples taken must be derived from the expected composition of the leachate and the groundwater quality in the area. In selecting the parameters for analysis account should be taken of mobility in the groundwater zone. Parameters could include indicator parameters in order to ensure an early recognition of change in water quality. Recommended parameters are: pH, TOC, phenols, heavy metals, fluoride, AS, oil/hydrocarbons.

	<b>Operation phase</b>	<b>After-care phase</b>
<b>Level of groundwater</b>	Every six months <sup>10</sup>	Every six months <sup>10</sup>
<b>Groundwater composition</b>	Site-specific frequency <sup>11 12</sup>	Site-specific frequency <sup>11 12</sup>

#### *C. Trigger levels*

Significant adverse environmental effects, as referred to Regulations 15 and 16, should be considered to have occurred in the case of groundwater, when an analysis of a groundwater sample shows a significant change in water quality. A trigger level must be determined taking account of the specific hydrogeological formations in the location of the landfill and groundwater quality. The trigger level must be laid down in the permit whenever possible.

The observations must be evaluated by means of control charts with established control rules and levels for each down gradient well. The control levels must be determined from local variations in groundwater quality.

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<sup>10</sup> If there are fluctuating groundwater levels, the frequency must be increased.

<sup>11</sup> The frequency must be based on possibility of remedial actions between samplings if a trigger level is reached, i.e. the frequency must be determined on the basis of knowledge and the evaluation of the velocity of groundwater flow.

<sup>12</sup> When a trigger level is reached (see C), verification is necessary by repeating the sampling. When the level has been confirmed, a contingency plan (laid down in the permit) must be followed.

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**5. Topography of the site: data on the landfill body**

	<b>Operating phase</b>	<b>After-care phase</b>
<b>5.1 Structure and composition of landfill body</b> <sup>13</sup>	Yearly	
<b>5.2 Setting behaviour of the level of the landfill body</b>	Yearly	Yearly reading

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<sup>13</sup> Data for the status plan of the concerned landfill: surface occupied by waste, volume and composition of waste, methods of depositing, time and duration of depositing, calculation of the remaining capacity still available at the landfill.