



COMMISSION OF THE EUROPEAN COMMUNITIES

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Proposal for a
COUNCIL DIRECTIVE
on the landfill of waste

(presented by the Commission)

EXPLANATORY MEMORANDUM

I. INTRODUCTION

In 1996 the Commission adopted a Communication on the review of the Community Strategy for Waste Management¹. This Strategy confirmed the principles stated in the 1989 Strategy, while introducing additional means for improving waste management in the Union. The new Proposal on the landfill of waste takes into account both developments in the waste area as reflected in the review of the Community Strategy for Waste Management of 1996 and legislation or updated legislation adopted since the discussion of the original Proposal. Consequently, the present Proposal is an updated version of the original Proposal, which takes into account the main elements of the 1995 Common Position of the Council and the concerns expressed by the European Parliament.

II. BACKGROUND

The 1989 Commission Proposal for a Community Strategy for Waste Management focused on the need to harmonise standards for waste management facilities on the basis of a high level of environmental protection.

The Council of Ministers adopted the main guidelines of this strategy in a Resolution of 7 May 1990. An important element was the optimisation of the final disposal of waste. The strategy stressed as a key priority that the final disposal of waste should be applied as an option of last resort.

Consequently the Commission presented a Proposal for a Directive on the landfill of waste in order to ensure that the Member States should adopt a homogenous policy related to landfills and that standards should be harmonised throughout the Community. This Proposal was submitted to the Council on 22 July 1991.

Following lengthy discussions the Council adopted its Common Position on 6 October 1995.

However, the European Parliament did not find the level of environmental protection in the Common Position sufficiently high and therefore rejected it on 22 May 1996. The Parliament objected to the high number of derogations on the grounds that it severely limited the effect of the Directive. Parliament particularly objected to the exclusion of more than 50% of the European Community territory by the derogation for areas with a population density of less than 35 persons pr. square kilometre.

¹ COM(96) 399

The Council, aware that several Member States shared the view of the European Parliament, noted that it could not act and therefore invited the Commission to present a new Proposal as soon as possible². The present Proposal is the Commission's response to the invitation from the Council of June 1996.

III. ENVIRONMENTAL IMPACT FROM LANDFILLING

The 1996 Commission Communication on the review of the Community Strategy for Waste Management confirmed the hierarchy of waste principles established by the Communication of 1989. The principle of prevention of waste generation remains the first priority, followed by recovery and finally by the safe disposal of waste i.e. landfilling. In the Community Waste Strategy landfilling represents the option of last resort because it can have substantial negative impacts on the environment. The most important include emissions of hazardous substances to soil and ground water, emissions of methane into the atmosphere, dust, noise, explosion risks and deterioration of land. Landfilling as a waste management method has no effect on the prevention of waste and does not make use of waste as a resource, which has a higher priority in the Community Waste Strategy.

The severe problems connected with landfilling in Member States are reflected in numerous complaints. During 1995/96 alone, 38 petitions concerning landfills were sent to the European Parliament and forwarded to the Commission services for further examination. The petitions were mainly from Spain, Portugal, Italy and Ireland. In addition to the petitions the Commission has since 1989 received some 60 complaints concerning landfills. These related to landfills in Italy, Spain, Portugal, United Kingdom, Greece, Ireland, France, Germany and Belgium. An extreme example occurred on 10 September 1996 when 100.000 tonnes of waste from a municipal landfill in La Coruna (Spain) slid down the hillside killing one person. The destroyed landfill poses a serious threat to the nearby sea and to the 250,000 inhabitants of the city.

The numerous complaints concerning landfills are also related to the lack of implementation of existing Community legislation. The obligations of Member States concerning disposal of waste is already laid down in Directive 75/442/EEC, Article 4. However, Member States like Greece, Ireland and Portugal have not yet managed to prevent uncontrolled landfilling and do therefore not comply with Directive 75/442/EEC today.

Objectives of the Landfill Directive

Article 130 r (2) of the Treaty requires environmental policy to be based on a high level of protection. The main objective of the Proposal is to ensure high standards for the disposal of waste in the European Union and to stimulate waste prevention via recycling and recovery of waste. Of key importance is the objective of creating a level playing field for the cost of disposal which consequently will prevent the unnecessary transport of waste. Today in Member States the price charged for landfilling of waste does not appear to reflect the actual cost for the environment and for society in general. In the new Proposal, Member States are required to ensure that externalities are internalised when the cost for landfilling of waste is estimated.

The Community has adopted provisions for the incineration of waste in Directives 89/369, 89/429 and 94/67. Without Community provisions for landfills, there is a considerable risk that shipments of waste will increase in order to bring waste to landfill, which now - in the absence of appropriate

² SI (96) 605

environmental standards - is considerably less expensive. Such shipments would also go against the objective of Regulation 259/93 which seeks to reduce, as far as possible, all waste shipments.

Subsidiarity

The Proposal is compatible with the principles of subsidiarity. It seeks to introduce uniform standards for landfilling throughout the Union. Different national standards would not only increase the present divergence in environmental standards between certain regions of the Community but could also stimulate increased shipments of waste within Europe. This will not encourage sound waste management in those regions of the Community where it is most needed.

The introduction of limits for landfilling of biodegradable waste in the new Proposal also represents a high level of respect for the principle of subsidiarity. This Provision allows Member States to take account of local conditions. Thus, the Proposal will allow Member States flexibility in choosing which way the reduction targets for landfilling of biodegradable waste are to be achieved. This flexibility is incorporated in order to ensure that Member States can apply the best option to meet their particular national conditions.

IV. NEW ELEMENTS

Since the Commission adopted the first Proposal in 1991, the waste management sector has developed extensively. New technologies and new knowledge about products and substances have put the focus on the necessity of waste reduction and waste prevention. This has resulted in a change of waste management procedures in the majority of Member States. In the light of these developments and the comments of the European Parliament a number of new elements have been introduced in the Proposal. The most important elements are listed below.

Reduction of the landfilling of biodegradable waste

The Landfill Proposal introduces provisions to reduce the landfilling of biodegradable waste and to ensure that the gases produced in new as well as existing landfills are collected, treated and used. Thus, a limit for the disposal of biodegradable waste has been introduced. This provision aims both at reducing the methane emissions from landfills and at encouraging the separate collection of biodegradable waste to reduce landfilling of waste in general. Thus, the reduction targets for the landfilling of biodegradable waste aims at promoting sorting in general, recovery and recycling. Several Member States have already introduced limits or guidelines for biodegradable waste going to landfills. These include Germany, Austria, Finland, France and the Netherlands.

A recent study³ estimates the average % of biodegradable waste in municipal waste in Europe at 20-50%. The introduction of a continuous phase out of biodegradable waste going to landfill will require Member States to start establishing other waste management systems for biodegradable waste. However, in accordance with the principle of subsidiarity, Member States will be allowed flexibility in choosing the way in which the reduction of landfilling of biodegradable waste is to be achieved. Biodegradable waste can be collected, sorted and then submitted to national composting facilities, biogas or incineration plants. Home-composting in rural areas can be introduced and

³ Cost-Benefit analysis of the different Municipal waste management systems: objective and instruments for the year 2000, Coopers and Lybrand, 1996

recycling systems for that proportion of the biodegradable waste which is paper can be implemented.

Since the political agreement on the Common Position was reached in 1995 focus has also turned to the problem of methane production in general, not least from landfills. Methane contributes to the increase of atmospheric and earth surface temperatures, and thus to the "global greenhouse effect". It is currently second to carbon dioxide in contributing to global warming. The main anthropogenic emission sources can be identified in the sectors of agriculture, waste and energy. Waste contributes 32 % the total amount of methane produced and most of that 32% comes from landfills.

In the context of the Community Strategy in relation to climate change the Commission adopted a Strategy Paper for reducing methane emissions. The overall conclusions relating to waste treatment and disposal in this Strategy are that reduced landfilling of waste is the most effective option at the lowest cost. It also recommends methane recovery and utilisation together with aerobic treatment of organic waste. The new Proposal for a Landfill Directive is fully in line with these recommendations, as composting and biogas treatment represent alternative options to landfilling of biodegradable waste. Composting represents an aerobic treatment of biodegradable waste which generates compost and carbondioxide and biogas plants represent the most efficient way to generate and utilise methane gas.

Pre-treatment of waste before landfilling

In line with the development and practices in several Member States and the overall Community Waste Strategy, a provision is introduced which requires waste to be treated before it is landfilled. The purpose of this treatment is to reduce the volume or hazardous nature of the waste and thus to facilitate its handling and enhance recovery. Pre-treatment is defined as "the physical, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery". This broad definition of pre-treatment has been introduced to encourage methods other than incineration prior to landfilling of waste.

Ban on disposal of used tyres

The disposal of used tyres (whole and shredded) will be prohibited. The Priority Waste Stream Working Group on used tyres, which was set up by the Commission in 1991, proposed a ban on landfilling of tyres in its final conclusions of September 1993. This has been taken into account in the Proposal in order to prevent landfilled tyres from making the sites unstable and to reduce the risk of fire. The ban on landfilling of both whole tyres and shredded tyres will encourage the recovery of tyres and thus save resources.

Increased cost of landfilling

As reflected in the review of the Community Strategy on Waste Management, Member States should ensure that the price charged for the disposal of any type of waste in a landfill covers at a minimum all costs involved in the setting up and operation of the site. The price, however, should also include the cost of the financial security as well as the estimated costs of the closure and aftercare of the site for a period of at least 50 years. This provision aims at restoring the balance between the costs of landfilling of waste, which at present tend to be too low, and the costs of other treatment methods, such as environmentally sound recovery operations, for which the costs are relatively high. In the Common Position it was stated that Member States had to ensure that the

price to be charged for the disposal of any type of waste in a landfill should cover all costs involved in setting up and operation of the site. In the new Proposal, Member States are required to ensure that the costs also cover the closure and aftercare of the site.

No joint-disposal of hazardous and non-hazardous waste

Joint-disposal of hazardous and non-hazardous waste will be prohibited by this Proposal. In the majority of Member States joint-disposal of hazardous and non-hazardous waste is no longer practised. Also, already in the Common Position of the Council of 1995 it was stated that joint-disposal should be phased out within the next five years. The benefits for the environment, will be a decrease in the contamination of soil and ground water and an improvement in the control of landfills.

General requirements for landfills

The general environmental requirements for all classes of landfills (Annex I) have been improved by introducing a minimum distance from landfills to residential areas, by emphasising the surface sealing of the sites, by prohibiting the spreading of dirt from sites onto public roads and the surrounding land and finally by requiring fencing and control of access to the sites for security reasons in order to avoid illegal dumping.

Stricter provisions for existing landfills

For existing landfills the provisions are made stricter. A conditioning plan is to be presented within 3 years after the entry into force of the Proposal and the plan is to be implemented five years after this date. As already mentioned, the provisions on the collection, treatment and use of the landfill gases apply also to existing landfills.

Remote areas

Small islands with only one landfill and isolated settlements with difficult access - for these notions objective criteria have been fixed - may be exempted from some provisions of the directive. Appropriate safeguards have been taken to ensure that exemptions are not used too widely and that the exempted areas are not being used for uncontrolled landfilling.

V. Economic considerations

The proposed directive is expected to generate significant environmental benefits in terms of reduced amounts of waste disposed in landfills and increased safety of landfills including lower methane emissions, reduced risk of leakages and less site disamenities. The achievement of these results will necessarily involve some economic consequences. These can be described in terms of static and dynamic costs. The Directive requires that landfill installations comply with a number of technical standards, regardless of the waste volume going to landfill. These costs of building and operating landfill sites in compliance with the proposed measures represent the static impact. However, the Directive also has a wider scope than simply regulating the current practice of landfill. In conformity with the European Waste Strategy, the Directive aims at diverting waste from the bottom to the top of the waste hierarchy, that is from landfilling towards prevention and recovery. The costs of displacing landfill with more environmentally friendly options represent the dynamic impact.

The static costs engendered by the Directive depend on the way landfill sites are actually operated. A landfill site that is already properly managed is likely to incur little or no compliance costs. On the contrary unregulated or illegal landfill sites, whose building and operating costs by definition are practically zero, are bound to demand some financial resources to comply with the proposed measures. According to a recent study⁴, the European average cost of landfill of municipal waste is about 32 ECU per tonne in urban sites and 20 ECU in rural sites (1993 prices). This difference is accounted for by the cost of land, which is by far the most important cost element.

Article 5 of the proposed Directive requires that the landfilling of biodegradable waste is gradually reduced over a period of ten years. In order to achieve this objective, Member States have to divert biodegradable waste from landfill to other waste management systems, which for some Member States will require new investments and incur various operating costs. National waste policies and management strategies differ across the Community. While it therefore is difficult to predict precise costs of any combined waste treatment methods-as it depends on the particular strategy chosen, available information shows that many Member States already are succeeding in reducing not only the total volume of municipal waste going to landfill, but also the proportion of biodegradable waste going to landfill.

It is clear, however, that Member States presently relying almost entirely on landfilling will have to make more efforts to meet the targets set in Article 5. On the other hand, Member States, that already have reduced their use of landfilling will be in line with the Directive objectives and will therefore not incur any additional costs. Finally, there is a group of Member States that recently have introduced forward looking national waste management strategies to reduce the use of landfilling. For these the net costs that may result from the implementation of this Directive will only represent the difference between what the objectives of the Directive require and what the Member States have planned already.

The implementation of the Directive will generate several economic as well as environmental advantages. First, the diversion of waste away from landfill and into other waste treatment methods will reduce both ground water and soil pollution and restoration and clean up costs. This will also result in reduced resource costs and - with increased recycling - more opportunities for eco businesses. The investments in alternative waste treatment facilities such as composting plants, recycling and incineration will also create increased employment opportunities. Secondly, the Directive will result in a reduction of Methane emissions. As discussed above, the global warming potential of methane is significantly higher than the GWP for CO₂. Reduction of biodegradable waste is a cost effective way of contributing to the reduction of global warming. Moreover methane recuperation for energy generation is also encouraged by the Directive. Finally, the proposal will reduce the disamenities connected with current landfill practices.

⁴ Cost-benefit analysis of the different Municipal waste management systems: objectives and instruments for the year 2000, Coopers & Lybrand, 1996

VI. Explanation of the provisions of the proposal.

Article 1

The aim of the landfill Directive is to provide for measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, as well as the resulting risks to human health from landfilling of waste.

Article 2

This Article provides definitions. The different categories of wastes (incl. municipal, hazardous, non-hazardous, inert) and landfills are defined as well as definitions of treatment of waste, leachate, landfill gas, eluate, operator, biodegradable waste, holder, applicant, competent authority and liquid waste.

Article 3

This Article defines the scope of the Directive and excludes the spreading of sludges (including sewage sludge and sludges resulting from dredging operations), the use of inert waste (suitable in redevelopment/restoration and filling-in work or for construction purposes), the deposit of dredging sludges alongside small waterways and the deposit of unpolluted soil.

Article 4

The landfills are classified in 3 categories: for hazardous waste, for non-hazardous waste and for inert waste.

Article 5

In order to prevent risks for the environment a uniform waste acceptance procedure is defined, based on the classification procedure for waste acceptable in the different categories of landfill. The types of waste which are not acceptable for landfill are:

- all biodegradable waste (reduction targets are set for 2002, 2005 and 2010).
- liquid waste
- flammable or highly flammable waste
- explosive or oxidising waste
- infectious hospital or clinical waste
- used tyres (except bicycle tyres and tyres with a diameter of more than 1400 mm)
- other waste which does not fulfil the acceptance criteria in Annex II.

Also Article 5 states that dilution of waste in order to meet the acceptance criteria is prohibited, but waste may be treated for the purpose of consolidating or stabilising it.

Article 6

Article 6 states that Member States must ensure that:

- all waste has been subject to treatment before landfilling
- only hazardous waste that fulfils the criteria in Annex II is assigned to a hazardous landfill
- landfill for non-hazardous waste may be used for municipal and non-hazardous waste
- inert waste landfills are used only for inert waste.

Article 7

In accordance with the general licensing requirements already set down in Directive 75/442/EEC it is necessary to introduce a specific permit procedure. An application for a landfill permit must contain at least particulars of the following:

- the identity of applicant
- the types and quantity of wastes
- the capacity of landfill site
- a hydrogeological and geological description
- the methods for pollution prevention
- an operation plan
- a plan for closure and aftercare
- an impact assessment
- the financial security by the applicant.

Article 8

For the conditions of the permit Member States must ensure that:

- the landfill project complies with the requirements of the Directive
- the management of the site will be in hands of a technically competent person
- adequate provisions has been or will be made by the applicant
- the landfill project is compatible with the relevant waste management plan
- the competent authority inspect the site prior to the commencement of disposal operations.

Article 9

The permit shall include:

- a description of the class of the landfill
- a list of defined types and quantities of waste
- details of requirements for landfill preparations and landfilling operations
- details of monitoring and control procedures
- details of obligations on the applicant to report at least annually to the competent authority on types and quantities of waste
- the results of the monitoring programme.

Article 10

Article 10 states that the fixing of rates for waste disposal in landfill is to cover all the costs involved in the setting up and operation of the landfill, including the aftercare and site closure costs. As a result the rates fixed should reflect the true cost for the whole life-time of a landfill.

Article 11

For the waste acceptance procedures, Member States shall take measures in order to ensure that:

- the holder or the operator can show that the waste in question can be accepted at the landfill
- reception procedures are respected by the operator (checking of waste documentation, visual inspection of waste at the entrance, registration of quantities and characteristics)
- the operator always provide written certification
- if waste is not accepted at a landfill the operator shall notify the competent authority.

Article 12

This article recognises that common control and monitoring procedures are necessary in order to identify any possible adverse environmental effects of the landfill. To this end Member States shall take measures to ensure that:

- the operator of a landfill carries out a control and monitoring programme (as specified in Annex III)
- the operator notifies the competent authority of any significant adverse environmental effects revealed by the control and monitoring procedures
- analytical operations are carried out by competent laboratories.

Article 13

For closure procedures Member States shall ensure that:

- under the authorisation of the competent authority, at the request of the operator or by reasoned decision of the competent authority, a landfill only starts closure procedures when the relevant conditions stated in the permit are met
- a landfill may only be considered definitively closed after final on-site inspection by the competent authority
- after closure the operator is responsible for the maintenance of the site, for the monitoring and analysing of landfill gas emissions, for the control of leachate from the site and into groundwater as long as the competent authority considers that a landfill is likely to cause a hazard for the environment.

Article 14

For existing landfill sites Member States shall ensure that landfills which are already in operation may not continue to operate unless, within a period of three years after this Directive enters into force, the operator presents a conditioning plan for the site. Following the presentation of this plan the competent authorities shall take a definite decision on whether operations may continue. On the basis of the approved site-conditioning plan, the competent authority shall lay down a transitional period for completion of the plan and this plan shall be implemented within five years after entry into force of the Directive. For landfills for hazardous waste Articles 4,5,6 and 11 and Annex II shall apply within two years of transposition of this Directive.

Article 15

This Article defines the obligation of Member States to send a report on the implementation of the Directive to the Commission every three years.

Article 16

Any amendments necessary for adapting the Annexes to this Directive to scientific and technical progress and any proposal of standardisation in relation to the landfill of waste shall be adopted in accordance with the procedures laid down in Article 18 of Directive 75/442/EEC and in Article 17 of this Directive

Article 17

In this Article the Committee procedures are stated. The Committee procedures shall follow the procedures as referred to in the Council Decision 87/373/EEC, Article 2, Procedure III (a).

Article 18

The laws, regulations and administrative procedures necessary to comply with the Directive shall enter into force before 30 June 2000.

**PROPOSAL FOR A
COUNCIL DIRECTIVE**

on the landfill of waste

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130s(1) thereof,

Having regard to the proposal from the Commission⁵,

Having regard to the Opinion of the Economic and Social Committee⁶,

Acting in accordance with the procedure laid down in Article 189c of the Treaty⁷,

⁵ OJ

⁶ OJ

⁷ Opinion of the European Parliament of

Whereas the Council resolution of 7 May 1990 on waste policy welcomes and supports the Community strategy document and invites the Commission to propose criteria and standards for the disposal of waste by landfill;

Whereas the Council Resolution of 9 December 1996 on waste policy considers that, in the future, only safe and controlled landfill activities should be carried out throughout the Community;

Whereas the prevention, recycling and recovery of waste should be encouraged as should the use of recovered materials and energy so as to safeguard natural resources and obviate wasteful use of land;

Whereas, like any other type of waste treatment, landfill should be adequately monitored and managed to prevent or reduce potential adverse effects on the environment and risks to human health;

Whereas it is necessary to take appropriate measures to avoid the abandonment, dumping or uncontrolled disposal of waste; whereas, accordingly, it must be possible to monitor landfill sites with respect to the substances contained in the waste deposited there; whereas such substances should, as far as possible, react only in foreseeable ways;

Whereas both the quantity and toxicity of waste intended for landfill should be reduced where appropriate; whereas the use of pre-treatment processes should therefore be encouraged to ensure that landfill is compatible with the objectives of this Directive;

Whereas Member States should be able to apply the principles of proximity and self-sufficiency for the elimination of their waste at Community and national level, in accordance with Council Directive 75/442/EEC of 15 July 1975 on waste⁸; whereas the objectives of this Directive must be pursued and clarified through the establishment of an adequate, integrated network of disposal plants based on a high level of environmental protection;

Whereas disparities between technical standards for the disposal of waste by landfill and the lower costs associated with it might give rise to increased disposal of waste in facilities with low levels of environmental protection and thus create a potentially serious threat to the environment, owing to the transport of waste over unnecessarily long distances as well as to inappropriate disposal practices;

Whereas it is therefore necessary to lay down technical standards for the landfill of waste at Community level in order to protect, preserve and improve the quality of the environment in the Community;

Whereas it is necessary to indicate clearly the requirements with which landfill sites must comply as regards location, conditioning, management, control, closure and preventive and protective measures to be taken against any threat to the environment in the short as well as in the long-term perspective, and more specifically against the pollution of groundwater by leachate infiltration into the soil;

Whereas in view of the foregoing it is necessary to define clearly the classes of landfill to be considered and the types of waste to be accepted in the various classes of landfill;

⁸ OJ No L 194, 25.7.1975, p. 39. Directive as last amended by Decision 94/3/EC (OJ No L 5, 7.1.1994, p. 15).

Whereas measures must be taken to reduce the production of methane gas from landfills in order to reduce global warming, through the reduction of the landfill of organic waste and the requirements to introduce landfill gas control;

Whereas the measures taken to prevent the landfill of organic waste also aims at encouraging the separate collection of organic waste, sorting in general, recovery and recycling.

Whereas waste shall be treated before it is landfilled to reduce its volume, hazardous nature and to facilitate its handling or enhance recovery. Sorting is included in the definition of treatment;

Whereas, because of the particular features of the landfill method of waste disposal, it is necessary to introduce a specific permit procedure for all classes of landfill in accordance with the general licensing requirements already set down in Directive 75/442/EEC, and the general requirements of Directive 96/61/EC concerning integrated pollution prevention and control⁹; whereas the landfill site's compliance with such a permit must be verified in the course of an inspection by the competent authority before the start of disposal operations;

Whereas, in each case, checks should be made to establish whether the waste may be placed in the landfill for which it is intended;

Whereas, in order to prevent threats to the environment, it is necessary to introduce a uniform waste acceptance procedure on the basis of a classification procedure for waste acceptable in the different categories of landfill, including in particular standardised limit values; whereas to that end a consistent and standardised system of waste characterisation, sampling and analysis must be established in time to facilitate implementation of this Directive; whereas the acceptance criteria must be particularly specific with regard to inert waste;

Whereas, pending the establishment of such methods of analysis or of the limit values necessary for characterisation, Member States may for the purposes of this Directive maintain or draw up national lists of waste which is acceptable or unacceptable for landfill, or define criteria, including limit values, similar to those laid down in this Directive for the uniform acceptance procedure;

Whereas it is necessary to establish common monitoring procedures during the operational and aftercare phases of a landfill in order to identify any possible adverse environmental effect of the landfill and take the appropriate corrective measures;

Whereas it is necessary to define when and how a landfill should be closed and the obligations and responsibility of the operator of the site during the aftercare period;

Whereas the future conditions of operation of existing landfills should be regulated in order to take the necessary measures, within a specified period of time, for their adaptation to this Directive on the basis of a site-conditioning plan;

Whereas the operator should make adequate provision by way of a financial security or any other equivalent to ensure that all the obligations flowing from the permit are fulfilled, including those relating to the closure procedure and aftercare of the site;

⁹ *OJ No L 257, 10.10.96, p.26.*

Whereas under the polluter pays principle it is necessary, inter alia, to take into account any damage to the environment caused by a landfill; whereas, as a result, it shall be ensured that rates for waste disposal in a landfill are fixed in such a way as to cover all the costs involved in the setting up and operation of the facility, including as far as possible the financial security or its equivalent which the site operator must provide, the cost of closing the site and the cost of any necessary aftercare measures, so as to ensure that these rates reflect the true costs for the whole life-time of a landfill and that these costs are not borne by the public purse;

Whereas it is necessary to ensure the proper application of the provisions implementing this Directive throughout the Community, and to ensure that the training and knowledge acquired by landfill operators and staff afford them the necessary skills;

Whereas the Commission must establish a standard procedure for the acceptance of waste and set up a standard classification of waste acceptable in a landfill in accordance with the committee procedure laid down in Article 18 of Directive 75/442/EEC;

Whereas adaptation of the Annexes to this Directive to scientific and technical progress and the standardisation of the monitoring, sampling and analysis methods must be adopted under the same committee procedure;

Whereas the Member States must send regular reports to the Commission on the implementation of this Directive,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Overall objective of the landfill Directive

With a view to meeting the requirements of Directive 75/442/EEC, and in particular Articles 3 and 4 thereof, the aim of this Directive is to provide for measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, as well as the resulting risks to human health, from landfilling of waste.

Article 2

Definitions

For the purposes of this Directive:

- (a) "waste" shall mean any substance or object which is covered by Directive 75/442/EEC as amended by Directive 91/156/EEC;
- (b) "municipal waste" shall mean waste from households, as well as commercial, industrial, institutional and other waste which, because of its nature or composition, is similar to waste from households;
- (c) "hazardous waste" shall mean any waste which is covered by Council Decision 94/904/EC¹⁰ establishing a list of hazardous waste pursuant to Article 1 (4) of Council Directive 91/689/EEC on hazardous waste¹¹;
- (d) "non-hazardous waste" shall mean waste which is not covered by paragraph (c);
- (e) "inert waste" shall mean waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant;

¹⁰ OJ No L 356, 31.12.1994, p. 14

¹¹ OJ No L 377, 31.12.1991, p. 20. Directive as amended by Directive 94/31/EC (OJ No L 168, 2.7.1994, p. 28).

- (f) "landfill" shall mean a waste disposal site for the deposit of waste on to or into land, 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 excluding facilities where waste is unloaded in order to permit its preparation for further transport for recovery, treatment or disposal elsewhere, and temporary (i.e. less than one year) deposit of waste prior to recovery, treatment or disposal;
- (g) "treatment" shall mean the physical, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery;
- (h) "leachate" shall mean any liquid percolating through the deposited waste and emitted from or contained within a landfill;
- (i) "landfill gas" shall mean all the gases generated from the landfilled waste;
- (j) "eluate" shall mean the solution obtained by a simulated laboratory leaching test;
- (k) "operator" shall mean the natural or legal person responsible for a landfill in accordance with the internal legislation of the Member State where the landfill is located; this person may change from the preparation to the aftercare phase;
- (l) "Biodegradable waste" shall mean any waste that is capable of undergoing anaerobic or aerobic decomposition.
- (m) "holder" shall mean the producer of the waste or the natural or legal person who is in possession of it;
- (n) "applicant" shall mean any person who applies for a landfill permit under this Directive
- (o) "competent authority" shall mean that authority which the Member states designate as responsible for performing the duties arising from this Directive;
- (p) "liquid waste" shall mean any waste in liquid form including waste waters but excluding sludge;

Article 3

Scope

1. Member States shall apply this Directive to any landfill as defined in Article 2(f). The provisions of this Directive shall apply without prejudice to the provisions of the Directive 96/61/EC concerning integrated pollution prevention and control.
2. Without prejudice to existing Community legislation, the following shall be excluded from the scope of this Directive:
 - the spreading of sludges, including sewage sludges, and sludges resulting from dredging operations, and similar matter on the soil for the purposes of fertilisation or improvement;

- the use of inert waste which is suitable, in redevelopment/restoration and filling-in work, or for construction purposes;
 - the deposit of dredging sludges alongside small waterways from where they have been dredged out;
 - the deposit of unpolluted soil or of non-hazardous inert materials resulting from the extracting of mineral resources.
3. Without prejudice to Directive 75/442/EEC Member States may declare, at their own option, parts or all of Articles 6(4), 7(9), 8(1c), 10, 11 (1a, b & c) 12(1), 12(3), Annex I no. 3 and 4, Annex II (except point 3, level 3 and point 4) and Annex III no. 3 to 5 of this Directive not applicable
- a) to landfill sites for non-hazardous or inert waste with a total capacity of 10.000 tons, serving islands, where this is the only landfill on the island and where this is exclusively destined for the disposal of waste generated on that island;
 - b) to landfill sites for non-hazardous or inert waste in isolated settlements with difficult access, if the landfill site is destined for the disposal of waste generated only by that isolated settlement;
 “isolated settlement” shall mean a settlement
 - with no more than 500 inhabitants per municipality and no more than five inhabitants per square kilometer and,
 - with no access road that can be used by heavy goods vehicles of 3,5 tons above, and,
 - where the distance to the nearest urban agglomeration with at least 250 inhabitants per square kilometer is not less than 50 km.

Within two years after the entry into force of this Directive, Member States shall notify to the Commission the list of islands and isolated settlements that are exempted. The Commission shall publish the list of islands and isolated settlements.

Article 4

Classes of landfill

Each landfill shall be classified in one of the following classes:

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

Article 5

Waste and treatment not acceptable for landfill

- 1) Member States shall set up a national strategy for implementation of the reduction of biodegradable municipal waste going to landfills, at the entry into force of this Directive and notify the Commission of this strategy.

The total amount of biodegradable municipal waste going to landfills must not exceed the following targets:

By 2002, biodegradable municipal waste going to landfills must - as far as possible - be reduced to 75% of the total amount (by weight) of biodegradable municipal waste produced in 1993.

By 2005, biodegradable municipal waste going to landfills must be reduced to 50% of the total amount (by weight) of biodegradable municipal waste produced in 1993.

By 2010, biodegradable municipal waste going to landfills must be reduced to 25% of the total amount (by weight) of biodegradable municipal waste produced in 1993.

The year of reference for the reduction will be 1993 as this is the latest year for which standardised EUROSTAT data is available. Member States shall establish systems for monitoring both the total amount of municipal waste going to landfills and the proportion of this waste which is biodegradable, within two years of the entry into force of this Directive. This information shall be made available to the competent National and Community statistical authorities when requested for statistical purposes.

- 2) Member States shall ensure that the following wastes are not accepted in a landfill:
 - a) liquid waste, unless authorised under Article 6(4); The Commission, acting in accordance with the procedure laid down in Article 16, shall within two years of entry into force of this Directive establish sampling and analytical methods for liquid waste;
 - b) waste which, in the conditions of landfill, is explosive, corrosive, oxidising, highly flammable or flammable, as defined in Annex III to Directive 91/689/EEC;
 - c) hospital and other clinical wastes arising from medical or veterinary establishments, which are infectious as defined (property H9 in Annex III) by Directive 91/689/EEC on hazardous waste, and waste falling within category 14 (Annex I.A) of that Directive;
 - d) whole used tyres from two years from the date of entry into force of this Directive and shredded used tyres five years from this date (excluding in both instances bicycle tyres and tyres with an outside diameter above 1400 mm);

- e) any other type of waste which does not fulfil the acceptance criteria determined in accordance with Annex II;

Member States shall ensure that:

- 3) the dilution or mixture of waste solely in order to meet the waste acceptance criteria is prohibited.
- 4) with the authorisation of the competent authority and in accordance with Article 2(3) of Directive 91/689/EEC, hazardous waste may be treated for the purpose of consolidating or stabilising it.

Article 6

Waste to be accepted in the different classes of landfill

Member States shall ensure that:

- 1) only waste that has been subject to treatment is landfilled;
- 2) only hazardous waste that fulfils the criteria set out in accordance with Annex II is assigned to a hazardous waste landfill;
- 3) landfill for non-hazardous waste may be used:
 - (a) for municipal waste;
 - (b) for non-hazardous waste of any other origin;
- 4) inert waste landfill sites shall be used only for inert waste.

Article 7

Application for a permit

Member States shall ensure that the application for a landfill permit must contain at least particulars of the following:

- 1) the identity of the applicant and of the operator when they are different entities;
- 2) the description of the types and total quantity of waste to be deposited;
- 3) the proposed capacity of the disposal site;
- 4) the description of the site, including its hydrological and geological characteristics;

- 5) the proposed methods for pollution prevention and abatement;
- 6) the proposed operation, monitoring and control plan;
- 7) the proposed plan for the closure and aftercare procedures;
- 8) where an impact assessment is required under Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment¹³, the information provided by the developer in accordance with Article 5 of that Directive;
- 9) the financial security by the applicant, or any other equivalent provision, as required under Article 8(1)(c) of this Directive.

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

Article 8

Conditions of the permit

Member States shall ensure that:

- 1) The competent authority does not issue a landfill permit unless it is satisfied that:
 - (a) the landfill project complies with all the requirements of this Directive, including the Annexes;
 - (b) the management of the landfill site will be in the hands of a technically competent person; professional and technical development and training of landfill operators and staff are provided;
 - (c) adequate provisions, by way of a financial security or any other equivalent (e.g. bank guarantee), on the basis of modalities to be decided by Member States, have been made by the applicant at the time of receiving the permit to ensure that the obligations (including aftercare provisions) arising under the permit issued under the provisions of this Directive are discharged and that the closure procedures required by Article 13 are followed. This security or its equivalent shall be kept as long as required by maintenance and aftercare operation of the site in accordance with Article 13 para 4;
 - (d) the landfill project is compatible with the relevant waste management plan or plans referred to in Article 7 of Directive 75/442/EEC;
- 2) prior to the commencement of 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.

¹³ OJ No L 175, 5.7.1985, p. 40.

Article 9

Content of the permit

Specifying and supplementing the provisions set out in Article 9 of Directive 75/442/EEC, the landfill permit shall state at least the following:

- (a) the class of the landfill;
- (b) the list of defined types and quantities 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 (Annex III (4) (B)), as well as provisional requirements for the closure and aftercare 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 in Articles 12 and 13 of, and Annex III.

Article 10

Cost of the landfill of waste

Member States shall ensure that the minimum price to be charged by all public and private landfill operators for the disposal of any type of waste in a landfill shall cover at least all costs involved in the setting up and operation of the site, including as far as possible the cost of the financial security referred to in Article 8 (1)(c), and the estimated costs of the closure and aftercare of the site for a period of at least 50 years. Member States shall ensure transparency in the collection and use of any necessary cost information.

Article 11

Waste acceptance procedures

- 1) Member States shall take measures to ensure that, prior to accepting the waste at the landfill site:
 - 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 can 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 Annex II;

b) the following reception procedures are respected by the operator:

- checking of the waste documentation, including those documents required by Article 5(3) of Directive 91/689/EEC and, where they apply, those required by Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community¹⁴;
- visual inspection of the waste at the entrance and at the point of deposit and, as appropriate, verification of conformity with the description provided in the documentation submitted by the holder. If representative samples have to be taken in order to implement Annex II, (3) level 3, the results of the analyses shall be kept and the sampling shall be made in conformity with Annex II,(5). These samples shall be kept at least one month;
- keeping a register of the quantities 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. This information shall be made available to the competent national and Community statistical authorities when requested for statistical purposes;

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

d) notwithstanding the provisions of Regulation (EEC) No 259/93, if waste is not accepted at a landfill the operator shall notify the competent authority of the non-acceptance of the waste;

2. For landfill sites which have been exempted from provisions of this Directive by virtue of Article 3(3), Member States shall take the necessary measures to provide for

- regular visual inspection of the waste at the point of deposit in order to ensure that only non-hazardous or inert waste from the island or the isolated settlement is accepted at the site; and
- a register on the quantities of waste that are deposited at the site be kept.

Article 12

Control and monitoring procedures in the operational phase

Member States shall take measures in order that control and monitoring procedures in the operational phase meet at least the following requirements:

- 1) the operator of a landfill shall carry out during the operational phase a control and monitoring programme as specified in Annex III;
- 2) 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

¹⁴ OJ No L 30, 6.2.1993, p. 1. Regulation as amended by Decision 94/721/EC (OJ No L 288, 9.11.1994, p. 36.).

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.

At a frequency to be determined by the competent authority, and in any event at least at the end of each calendar year, the operator shall report, on the basis of aggregated data, all monitoring results to the competent authorities for the purpose of demonstrating compliance with permit conditions and increasing the knowledge on waste behaviour in the landfills.

- 3) the quality control of the analytical operations of the control and monitoring procedures and/or of the analyses referred to in Article 11(2)b are carried out by competent laboratories.

Article 13

Closure procedure

Member States shall ensure that, in conformity with the permit:

- 1) a landfill or part of it shall start the closure procedure:
 - (a) when the relevant conditions stated in the permit are met, or
 - (b) under the authorisation of the competent authority, at the request of the operator, or
 - (c) by reasoned decision of the competent authority;
- 2) a landfill or part of it may only be considered as definitively 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 authorisation for the closure. This shall not in any way reduce the responsibility of the operator under the conditions of the permit;
- 3) after a landfill has been definitively closed, the operator shall be responsible for its maintenance, monitoring and control in the aftercare 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 procedures and shall follow the decision of the competent authority on the nature and timing of the corrective measures to be taken;

- 4) for as long as the competent authority considers that a landfill is likely to cause a hazard to the environment, the operator of the site shall be responsible for monitoring and analysing landfill gas and leachate from the site and the groundwater regime in the vicinity of the site in accordance with Annex III.

Article 14

Existing landfill sites

Member States shall ensure that landfills which have been granted a permit, or which are already in operation at the time of transposition of this Directive, may not continue to operate unless the steps outlined below are accomplished as soon as possible and within five years after the entry into force of this Directive at the latest.

- 1) within a period of three years after this Directive enters into force, the operator of a landfill shall prepare and present to the competent authorities, for their approval, a conditioning plan for the site including the particulars listed in Article 8 and any corrective measures which the operator considers will be needed;

If the competent authority determines that, as a consequence of an evaluation of the effects of the landfill on the environment, the landfill complies with the objectives of this Directive as defined in Article 1, it may be unnecessary to implement corrective measures;

The operator of a landfill shall take the necessary measures to comply with the requirements of Annex I(4) of this Directive. The measures shall be implemented within five years from the entry into force of this Directive;

- 2) following the presentation of the conditioning plan, the competent authorities shall take a definite decision on whether operations may continue on the basis of the said conditioning plan and this Directive. Member States shall take the necessary measures to close down as soon as possible, in accordance with Articles 7(7) and 13, sites which have not been granted, in accordance with Article 8, a permit to continue to operate;
- 3) on the basis of the approved site-conditioning plan, the competent authority shall authorise the necessary work and shall lay down a transitional period for the completion of the plan. This plan shall be implemented within five years after the entry into force of the Directive;
- 4) within **two** years from the entry into force of this Directive, Articles 4, 5, 6, 11 and Annex II shall apply to landfills for hazardous waste.

Article 15

Obligation to report

At intervals of three years Member States shall send to the Commission a report on the implementation of this Directive. The report shall be drawn upon the basis of a questionnaire or outline drafted by the Commission in accordance with the procedure laid down in Article 6 of Directive 91/692/EEC¹⁵. The questionnaire or outline shall be sent to Member States six months

¹⁵ OJ No L 377, 31.12.1991, p. 48.

before the start of the period covered by the report. The report shall be sent to the Commission within nine months of the end of the three-year period covered by it.

The Commission shall publish a Community report on the implementation of this Directive within nine months of receiving the reports from the Member States.

Article 16

Committee

Any amendments necessary for adapting the Annexes to this Directive to scientific and technical progress and any proposals for the standardisation of control, sampling and analysis methods in relation to the landfill of waste shall be adopted by the Commission, assisted by the Committee established by Article 18 of Directive 75/442/EEC and in accordance with the procedure set out in Article 17 of this Directive. Proposals for the standardisation's of control, sampling and analysis methods in relation to the Annexes of this Directive shall be adopted by the Commission, assisted by the Committee, within two years after entry into force of this Directive.

The Commission, assisted by the Committee, will adopt provisions for the harmonisation and regular transmission of the statistical data referred to in Articles 5, 7 and 11 of this Directive, within two years after the entry into force of this Directive, and for the amendment of such provisions when necessary.

Article 17

Committee Procedures

The Commission shall be assisted by a Committee composed of the representatives of the Member States and chaired by the representative of the Commission. The representative of the Commission shall submit to the Committee a draft of the measures to be taken. The Committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the EC Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the Committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the Committee. If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If on the expiry of a period to be laid down in each act to be adopted by the Council under this paragraph but which may in no case exceed three months from the date of referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

Article 18

Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive before 30 June 2000. They shall forthwith inform the Commission thereof.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such a reference shall be laid down by Member States.

2. Member States shall communicate the texts of the provisions of national law which they adopt in the field covered by this Directive to the Commission.

Article 19

Entry into force

This Directive will enter into force on the day of its publication in the Official Journal of the European Communities.

Article 20

This Directive is addressed to the Member States.

Done at Brussels,

For the Council
The President

ANNEX I

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 and waterways, water bodies and other, agricultural or urban sites ensuring a minimum separation of
0,5 km in the case of municipal waste landfills and 2 km
in the case of hazardous waste landfills from residential
areas.
 - (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 natural or cultural patrimony in the area.
- 1.2. The landfill can be authorised only if, following an environmental impact assessment if required under Directive 85/337/EEC, 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 surfacewater 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 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 (k) 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:

$$K \leq 1,0 \times 10^{-9} \text{ m/s. ;thickness} \geq 5 \text{ m.}$$

– Landfill for non-hazardous waste:

$$K \leq 1,0 \times 10^{-9} \text{ m/s. ;thickness} \geq 1 \text{ m.}$$

– Landfill for inert waste:

$$K \leq 1,0 \times 10^{-7} \text{ m/s. ;thickness} \geq 1 \text{ m.}$$

m/s = metre/second

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 ³ 0,5 m	required	required

Member States may set general or specific requirements for inert waste landfills and for the characteristics of the above mentioned technical means.

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	require d
Impermeable mineral layer	required	require d
Drainage layer ³ 0,5 m	required	require d
Top soil cover ³ 1 m	required	require d

3.4. If, on the basis of an assessment of environmental risks taking into account, in particular, Directive 80/68/EEC¹⁶, 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 2 and 3 above may be reduced accordingly.

3.5. The method to be used for the determination of the permeability coefficient for landfills, in the field and for the whole extension of the site, is to be developed and approved by the committee referred to in Article 16 of this Directive.

4. Gas control

1. Appropriate measures shall be taken in order to control the accumulation and migration of landfill gas (Annex III).
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.

¹⁶ OJ No L 20, 26.1.1980, p. 43. Directive as last amended by Directive 91/692/EEC (OJ No L 377, 31.12.1991, p. 48.).

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.

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 of 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. Fencing

The landfill shall be surrounded by fencing sufficient 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.

WASTE ACCEPTANCE CRITERIA AND PROCEDURES

1. Introduction

This Annex describes:

- general principles for acceptance of waste at the various classes of landfills. The future waste classification procedure should be based on these principles;

guidelines outlining preliminary waste acceptance procedures to be followed until a uniform waste classification and acceptance procedure has been adopted. This procedure will, together with the relevant sampling procedures, be developed by the Technical Committee referred to in Article 16 of this Directive.

This work by the technical committee shall be completed within three years after adoption of the Directive and must be carried out having regard to the objectives set forth in Article 1 of this Directive.

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 future waste acceptance procedures described in this Directive shall as far as possible be based on standardised waste analysis methods and limit values for the properties of waste to be accepted.

Before the definition of such analysis methods and limit values, Member States should at least 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 the equivalent criteria, and the analysis methods and limit values shall be sent to the Commission within six months of the transposition of this Directive or whenever they are adopted at national level.

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 Article 9 of the Directive.

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;
- 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 of testing, to unavailability of appropriate testing procedures and acceptance criteria or to overriding legislation.

4. Guidelines for preliminary waste acceptance procedures

Until this Annex is fully completed only level 3 testing is mandatory and level 1 and level 2 applied to the extent possible. At this preliminary stage 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 as defined in Article 2(e) can be accepted on the list.

non-hazardous waste landfills: In order to be accepted on the list a waste type must not be covered by Directive 91/689/EEC.

hazardous waste landfills: A preliminary list for hazardous waste landfills would consist of only those waste types covered by Directive 91/689/EEC. 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 this standard is approved by Member States in accordance with Article 16 of this Directive, the Member States may apply national standards and procedures.

**CONTROL AND MONITORING PROCEDURES
IN OPERATION AND AFTER-CARE PHASES**

1. Introduction

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

that waste has been accepted for 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

Under their reporting obligation (Article 15), Member States should supply data on the collection method for meteorological data. It is up to Member States to decide how the data should be collected (in situ, national meteorological network, etc.).

Should Member States 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 Article 13(3) of this Directive:

		Operation phase	Aftercare phase
1.1	Volume of precipitation	Daily	Daily, added to monthly values
1.2	Temperature (min., max., 14.00h CET)	Daily	Monthly average
1.3	Direction and force of prevailing wind	Daily	Not required
1.4	Evaporation (lysimeter) ⁽¹⁾	Daily	Daily, added to monthly values
1.5	Atmospheric humidity (14.00h CET)	Daily	Monthly average

(1) 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.

		Operating phase	Aftercare phase ⁽³⁾
2.1	Leachate volume	Monthly ⁽¹⁾⁽³⁾	every six months
2.2	Leachate composition ⁽²⁾	Quarterly ⁽³⁾	every six months
2.3	Volume and composition of surface water ⁽⁷⁾	Quarterly ⁽³⁾	every six months
2.4	Potential gas emissions and atmospheric pressure ⁽⁴⁾ (CH ₄ , CO ₂ , O ₂ , H ₂ S, H ₂ etc.)	Monthly ⁽³⁾⁽⁵⁾	every six months ⁽⁶⁾
(1) 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.

(2) 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 wastes.

(3) 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.

(4) These measurements are related mainly to the content of organic material in the waste.

(5) CH₄, CO₂, O₂ regularly, other gases as required, according to the composition of the waste deposited, with a view to reflecting its leaching properties.

(6) Efficiency of the gas extraction system must be checked regularly.

(7) On the basis of the characteristics of the landfill site, the competent authority may determine that these measurements are not required, and will report accordingly in the way laid down in Article 15 of the Directive.

2.1 and 2.2 apply only where leachate collection takes place (see Annex I(2))

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.

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 quality¹⁷.

	Operation phase	Aftercare phase
Level of groundwater	Every six months ⁽¹⁾	Every six months ⁽¹⁾
Groundwater composition	Site-specific frequency ⁽²⁾⁽³⁾	Site-specific frequency ⁽²⁾⁽³⁾
<p>(1) If there are fluctuating groundwater levels, the frequency must be increased.</p> <p>(2) The frequency must be based on possibility for remedial actions between two 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.</p> <p>(3) 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.</p>		

C. Trigger levels

Significant adverse environmental effects, as referred to in Articles 12 and 13 of this Directive, 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.

¹⁷ Recommended parameters: pH, TOC, phenols, heavy metals, fluoride, AS, oil/hydrocarbons.

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

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

		Operating phase	After-care phase
5.1	Structure and composition of landfill body ⁽¹⁾	Yearly	
5.2	Settling behaviour of the level of the landfill body	Yearly	Yearly reading
(1) 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.			

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