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Ireland

LANDFILL FOR INERT WASTE

PROPOSED DECISION

Waste Licence	76-1
Register Number:	
Applicant:	Limerick City Council
Location of Facility:	Longpavement, Monabraher, Limerick

INTRODUCTION

This introduction is not part of the licence and does not purport to be a legal interpretation of the licence.

This licence is for the orderly closure and restoration of areas previously landfilled at Longpavement, Monabraher, Limerick. Limerick City Council is required to restore and remediate the facility and to install infrastructure to monitor and manage landfill gas and leachate emissions and to cap previously filled areas using inert materials. The works are required to be completed within three years of the date of grant of this licence.

Limerick County Council must manage and operate the facility to ensure that the activities do not cause environmental pollution. Limerick County Council is required to carry out regular environmental monitoring and submit all monitoring results, and a wide range of reports on the operation and management of the facility to the Agency.

The licence sets out in detail the conditions under which Limerick City Council will operate and manage this facility.

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DECISION & REASONS FOR THE DECISION

Reasons for the Decision

The Environmental Protection Agency (the Agency) is satisfied, on the basis of the information available, that the requirements of Section 40(4) of the Waste Management Act, 1996 have been complied with in respect of the application for a waste licence for the activities listed hereunder in Part I.

In reaching this decision the Agency has considered the application and supporting documentation received from the applicant, all submissions received from other parties and the report of its inspector.

Part I Activities Licensed

In pursuance of the powers conferred on it by the Waste Management Act, 1996, the Agency proposes, under Section 40(1) of the said Act to grant this Waste Licence to Limerick City Council to carry on the waste activities listed below at Longpavement, Monabraher, Limerick subject to twelve conditions, with the reasons therefor and the associated schedules attached thereto set out in the licence.

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Act 1996

Class 4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons: This activity is limited to the storage of leachate.
Class 7	Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule: This activity is limited to physico-chemical treatment of leachate.

Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996

Class 4	Recycling or reclamation of other inorganic materials: This activity is limited to use of inert waste in the restoration of the facility.
Class 9	Use of any waste principally as a fuel or other means to generate energy: This activity is limited to future on-site utilisation of landfill gas.
Class 10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system: This activity is limited to use of inert waste in the landfill cap.

Part II: Activities Refused

In pursuance of the powers conferred on it by the Waste Management Act, 1996, the Environmental Protection Agency (the Agency) proposes, under Section 40(1) of the said Act to refuse the following classes of activity.

Refused waste disposal activities, in accordance with the Third Schedule of the Waste Management Act, 1996

Class 1	Deposit on, in or under land (including landfill): Reason: No details provided in application.
Class 10	Release of waste into a water body (including a seabed insertion): Reason: No details provided in application
Class 11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule: Reason: No details provided in application

INTERPRETATION

All terms in this licence should be interpreted in accordance with the definitions in the Waste Management Act, (the Act), unless otherwise defined in this section.

Aerosol	A suspension of solid or liquid particles in a gaseous medium.
Adequate lighting	20 lux measured at ground level.
Agreement	Agreement in writing.
Annually	At approximately twelve monthly intervals.
Attachment	Any reference to Attachments in this licence refers to attachments submitted as part of the waste licence application.
Application	The application by the licensee for this waste licence.
Appropriate facility	A waste management facility, duly authorised under relevant law and technically suitable.
Condition	A condition of this licence.
Construction and Demolition Waste	All wastes which arise from construction, renovation and demolition activities.
Containment boom	A boom which can contain spillages and prevent them from entering drains or watercourses.
Cover material	Bricks, crushed concrete, tarmac, earth, soil, sub-soil, stone, rock or other similar natural materials; or other cover material the use of which has been agreed with the Agency.
Daytime	0800 hrs to 2200 hrs.
Documentation	Any report, record, result, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this licence.
Drawing	Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this licence.
Emergency	Those occurrences defined in Condition 9.4.
Emission Limits	Those limits, including concentration limits and deposition levels established in <i>Schedule C: Emission Limits</i> , of this licence.
European Waste Catalogue (EWC)	A harmonised, non-exhaustive list of wastes drawn up by the European Commission and published as Commission Decision 94/3/EC and any subsequent amendment published in the Official Journal of the European Community.
Hours of Operation	The hours during which the facility is authorised to be operational. The hours of operation of a facility are usually longer than the hours of waste acceptance to facilitate preparatory and completion works.
Hours of Waste	The hours during which the facility is authorised to accept waste.

Acceptance

Inert waste	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, and in particular not endanger the quality of surface water and/or groundwater.
Intermediate Cover	Refers to placement of material (minimum 300mm if soil is used) for a period of time prior to restoration or prior to further disposal of waste.
Landfill	Refers to the area of the facility where the waste is disposed of by placement on the ground or on other waste.
Landfill Gas	Gases generated from the landfilled waste.
LEL (Lower Explosive Limit)	The lowest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at 25°C and atmospheric pressure.
Licence	A waste licence issued in accordance with the Act.
Licensee	Limerick City Council.
List I/II Organics	Substances classified pursuant to EC Directives 76/464/EEC and 80/68/EEC.
Liquid Waste	Any waste in liquid form and containing less than 2% dry matter. Any waste tankered to the facility.
Maintain	Keep in a fit state, including such regular inspection, servicing and repair as may be necessary to adequately perform its function.
Mobile Plant	Self-propelled machinery used for the emplacement of wastes or for the construction of specified engineering works.
Monthly	A minimum of 12 times per year, at approximately monthly intervals.
Night-time	2200 hrs to 0800 hrs.
Pre-1984 Landfill	The area labelled as such on Figure 2 Rev P1 submitted with the Remediation Options for Post-1984 Landfill.
Post-1984 Landfill	The area labelled as such on Figure 2 Rev P1 submitted with the Remediation Options for Post-1984 Landfill.
Quarterly	At approximately three monthly intervals.
Sample(s)	Unless the context of this licence indicates to the contrary, samples shall include measurements by electronic instruments.
Specified Emissions	Those emissions listed in <i>Schedule C: Emission Limits</i> , of this licence.
Specified Engineering Works	Those engineering works listed in <i>Schedule B: Specified Engineering Works</i> , of this licence.
Trigger Level	A parameter value specified in the licence, the achievement or exceedance of which requires certain actions to be taken by the licensee.

EPA Working Day Refers to the following hours: 0900 hrs to 1730 hrs Monday to Friday inclusive.

PART III CONDITIONS

CONDITION 1 SCOPE OF THE LICENCE

- 1.1. Waste activities at the facility shall be restricted to those listed and described in Part I: Activities Licensed and authorised by this licence.
- 1.2. For the purposes of this licence, the facility is the areas of land outlined in red on Figure 2 Rev P1 submitted with the document entitled “Remediation Options for Post-1984 Landfill” of the application. Any reference in this licence to “facility” shall mean the area thus outlined in red.
- 1.3. This licence is for the purposes of waste licensing under the Waste Management Act, 1996 only and nothing in this licence shall be construed as negating the licensee’s statutory obligations or requirements under any other enactments or regulations.
- 1.4. No waste shall be accepted for disposal at the landfill. Only inert wastes shall be accepted for the purposes of remediation and restoration of the landfill. Only those waste categories and quantities listed in *Schedule A: Waste Acceptance* of this licence shall be accepted at the facility. The total quantity of inert wastes to be accepted at the facility shall not exceed that required to achieve the Restoration and Aftercare Plan to be agreed under Condition 4.1 of this licence.
- 1.5. Waste Acceptance Hours and Hours of Operation
Waste may only be accepted at the facility for remediation and restoration of the landfill between the hours of 0800 hrs to 1800 hrs. Monday to Friday inclusive unless otherwise agreed with the Agency.
- 1.6. The following shall constitute an incident for the purposes of this licence.
 - a) An emergency.
 - b) Any emission which does not comply with the requirements of this licence.
 - c) Any trigger level specified in this licence which is attained or exceeded.
 - d) Any indication that environmental pollution has, or may have, taken place.
- 1.7. Where the Agency considers that a non-compliance with any condition of this licence has occurred, it may serve a notice on the licensee specifying.
 - 1.7.1 That only those wastes as specified, if any, in the notice are to be accepted at the facility after the date set down in the notice.
 - 1.7.2 That the licensee shall undertake the works stipulated in the notice, and/or otherwise comply with the requirements of the notice as set down therein, within the time-scale contained in the notice.
 - 1.7.3 That the licensee shall carry out any other requirement specified in the notice.When the notice has been complied with, the licensee shall provide written confirmation that the requirements of the notice have been carried out. No waste, other than that which is stipulated in the notice, shall be accepted at the facility until written permission is received from the Agency.
- 1.8. Every plan, programme or proposal submitted to the Agency for its agreement pursuant to any condition of this licence shall include a proposed timescale for its implementation. The Agency may modify or alter any such plan, programme or proposal in so far as it considers such modification or alteration to be necessary and shall notify the licensee in writing of any such modification or alteration. Every such plan, programme or proposal shall be carried out within the timescale fixed by the Agency but shall not be undertaken without the agreement of the Agency. Every such plan, programme or proposal agreed by the Agency shall be covered by the conditions of this licence.

CONDITION 2 MANAGEMENT OF THE FACILITY

2.1 Facility Management

- 2.1.1 The licensee shall employ a suitably qualified and experienced facility manager who shall be designated as the person in charge. The facility manager or a nominated, suitably qualified and experienced, deputy shall be present on the facility at all times during its operation.
- 2.1.2 Both the facility manager and deputy, and any replacement manager or deputy, shall successfully complete both the FAS Waste Management Training Programme (or equivalent agreed with the Agency) and associated on site assessment appraisal within twelve months of appointment.
- 2.1.3 The licensee shall ensure that personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and experience, as required and shall be aware of the requirements of this licence.

2.2 Management Structure

- 2.2.1 Within three months from the date of grant of this licence, the licensee shall submit written details of the management structure of the facility to the Agency. Any proposed replacement in the management structure shall be notified in advance in writing to the Agency. Written details of the management structure shall include the following information:-
 - a) The names of all persons who are to provide the management and supervision of the waste activities authorised by the licence, in particular the name of the facility manager and any nominated deputies.
 - b) Details of the responsibilities for each individual named under a) above.
 - c) Details of the relevant education, training and experience held by each of the persons nominated under a) above.

2.3 Environmental Management

2.3.1 The licensee shall establish and maintain

- a) **Schedule of Environmental Objectives and Targets**

The objectives should be specific and the targets measurable. The schedule shall address a three-year period as a minimum. The schedule shall include a time-scale for achieving the objectives and targets and shall comply with any other written guidance issued by the Agency.

- b) **Corrective Action Procedures**

The Corrective Action Procedures shall detail the corrective actions to be taken should any of the objectives and targets not be achieved.

- c) **Awareness and Training Programme**

The Awareness and Training Programme shall identify training needs, for personnel who work in or have responsibility for the licensed facility.

2.4 Communications Programme

- 2.4.1 The licensee shall establish and maintain a Communications Programme to ensure that members of the public can obtain information at the facility, at all reasonable times, concerning the environmental performance of the facility. This shall be established within three months of the date of grant of the licence.

REASON: *To make provision for the proper management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.*

CONDITION 3 FACILITY INFRASTRUCTURE

- 3.1 The licensee shall establish all infrastructure referred to in this licence as required by the conditions of this licence.

3.2 Specified Engineering Works

- 3.2.1 The licensee shall submit proposals for all Specified Engineering Works, as defined in *Schedule B: Specified Engineering Works*, of this licence, to the Agency for its agreement at least two months prior to the intended date of commencement of any such works. No such works shall be carried out without the prior agreement of the Agency.
- 3.2.2 All specified engineering works shall be supervised by a competent person(s) and that person, or persons, shall be present at all times during which relevant works are being undertaken.

3.3 Facility Security

- 3.3.1 The licensee shall secure the facility and ensure that there are measures in place to detect and discourage illegal dumping at the facility.

3.4 Facility Roads and Hardstanding

- 3.4.1 Effective site roads shall be provided and maintained to ensure the safe movement of vehicles within the facility.

3.5 Waste Inspection and Quarantine Areas

- 3.5.1 A Waste Inspection Area and a Waste Quarantine Area shall be provided and maintained at the facility.
- 3.5.2 These areas shall be constructed and maintained in a manner suitable, and be of a size appropriate, for the inspection of waste and subsequent quarantine if required. The waste inspection area and the waste quarantine area shall be clearly identified and segregated from each other.
- 3.5.3 Drainage from these areas shall be directed to either foul sewer or to the leachate holding lagoon.

3.6 Wheel Cleaning

- 3.6.1 The licensee shall establish and maintain a wheelwash/dry wheel shake at the facility at a location to be agreed with the Agency within three months of the date of grant of licence.

3.7 Tank and Drum Storage Areas

- 3.7.1 Design details of all tank and drum storage areas proposed to be located at the facility shall be submitted to the Agency for its agreement.

3.8 Leachate Management Infrastructure

- 3.8.1 Within six months of the date of grant of this licence, the licensee shall install leachate management infrastructure at the facility. The infrastructure shall provide for the abstraction and collection of leachate from the waste and its treatment either at the facility or at a suitable treatment works.

- 3.8.2 This infrastructure shall as a minimum comprise the following:

- (i) The installation of four appropriately sized abstraction/collection boreholes on the pre-1984 landfill for the active abstraction of leachate.
- (ii) The installation of seven abstraction and collection boreholes on the post-1984 landfill for the active abstraction of leachate.
- (iii) An appropriate sized leachate storage structure(s) to cater for abstracted leachate and contaminated surface water run-off.

- 3.8.3 Any infrastructure to be used for the abstraction/storage of leachate shall be agreed in advance with the Agency.

3.9 Surface Water Management.

- 3.9.1 Within twelve months of the date of grant of this licence, the licensee shall install appropriately sized surface water retention infrastructure at the facility at a location(s) to be agreed with the Agency.

- 3.9.2 As a minimum, the infrastructure shall be capable of the following:-

- a) The prevention of contaminated water and leachate discharges into surface water drains and courses.
- b) The collection/diversion of run off arising from capped and restored areas.

- 3.10 Any additional leachate management/surface water management infrastructure proposed to be installed at the facility shall be agreed in advance with the Agency.

3.11 Landfill Gas Management.

- 3.11.1 Within three months of the date of grant of this licence the licensee shall submit a report outlining the design details and location(s) of the landfill gas management infrastructure proposed for the facility. This report shall also include, as a minimum, details on the temporary remedial works deemed necessary prior to the installation of the permanent gas collection layer and a detailed timetable for installation works covering all areas previously landfilled.

- 3.11.2 Infrastructure for the active collection, flaring of landfill gas shall be installed at the facility within six months of the date of grant of this licence unless otherwise agreed with the Agency. The flare shall be of an enclosed type design.

- 3.11.3 Flare unit efficiency shall be tested once it is installed and once every three years thereafter.

- 3.11.4 Within nine months of the date of grant of this licence, the licensee shall submit a report on the feasibility of the installation of a gas utilisation plant to the Agency for its agreement. This report shall also include design details and a timetable for its installation.
- 3.11.5 All buildings constructed on the facility shall have regard to the guidance given in the Department of Environment 1994 publication "Protection of New Buildings and Occupants from Landfill Gas" and any subsequent revisions.

3.12 Monitoring Infrastructure.

- a) Within three months from the date of grant of this licence, the licensee shall install a minimum of 12 landfill gas monitoring points at the perimeter locations indicated on Figure 5 P1 in the document "Remediation Options for the Post-1984 Landfill".
- b) Within three months of the date of grant of this licence the licensee shall submit to the Agency for its agreement details of the monitoring locations required in *Schedule D: Monitoring - Table D.1.1 Monitoring Locations* of this licence. The licensee shall clearly mark/tag these locations within two weeks of receiving agreement from the Agency.

3.13 Replacement of Infrastructure:-

- a) Monitoring infrastructure which is damaged or proves to be unsuitable for its purpose shall be replaced within three months of it being damaged or recognised as being unsuitable.

REASON: *To provide appropriate infrastructure for the protection of the environment.*

CONDITION 4 RESTORATION AND AFTERCARE

- 4.1. The licensee shall restore the facility on a phased basis. The licensee shall submit a Restoration and Aftercare Plan for the facility, which shall make reference to the relevant conditions and timeframes outlined in this licence. The licensee shall liaise with Dúchas in the preparation of this plan.
- 4.2. Final Capping
- 4.2.1. The final capping shall consist of the following:-
- Top soil (150 -300mm).
 - Subsoils, such that total thickness of top soil and subsoils is at least 1m.
 - Drainage layer of 0.5m thickness having a minimum hydraulic conductivity of 1×10^{-4} m/s or similar that provides equivalent protection.
 - Compacted mineral layer of a minimum 0.6m thickness with a permeability of less than 1×10^{-9} m/s or a geosynthetic material (e.g. GCL) or similar that provides equivalent protection.
 - Gas collection layer of natural material (minimum 0.3m) or a geosynthetic layer.
- 4.3. Within three months of the date of grant of this licence, the licensee shall submit a report on those areas of the landfill that have previously been restored. This report shall include details on (i) the areas that have been restored, (ii) the type of capping installed, (iii) the state of the restored areas and (iv) recommendations. Any recommendations arising from this report and a timetable for implementation shall be agreed with the Agency and implemented.
- 4.4. The restoration of the landfill facility shall be completed within thirty six months of the date of grant of this licence.

- 4.5. No material or object that is incompatible with the proposed restoration of the facility shall be present within one metre of the final soil surface levels.
- 4.6. Where tree planting is to be carried out above waste-filled areas, a synthetic barrier shall be used to augment the clay cap. Combined topsoil and subsoil depths shall be a minimum of 1m.
- 4.7. Soil Storage
- 4.7.1. All soils shall be stored to preserve the soil structure for future use.

REASON: *To provide for the restoration of the facility.*

CONDITION 5 FACILITY OPERATION AND WASTE MANAGEMENT

5.1 Waste Acceptance and Characterisation Procedures

The procedures provided in the draft Commission Decision (Brussels 01.05.2002) establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Council Directive 1999/31/EC on the landfill of waste shall be used unless otherwise instructed by the Agency.

- 5.2 Any wastes not suitable for acceptance shall be removed for recovery or disposal at an appropriate alternative facility. Such waste shall be stored in the Waste Quarantine Area only. No waste shall be stored in the Waste Quarantine Area for more than three months.

5.3 Intermediate Cover

Within six months of the date of grant of this licence, appropriate cover material shall be placed across the whole landfill as part of the reshaping works programme so that no waste, other than waste suitable for specified engineering works is exposed.

5.4 Operational Controls

- (i) Completed areas of the landfill shall be profiled so that no depressions exist in which water may accumulate. Any depressions arising after profiling shall be rectified by the emplacement of suitable capping or restoration materials.
- (ii) Scavenging shall not be permitted at the facility.
- (iii) Gates shall be locked shut when the facility is unsupervised.
- (iv) The licensee shall provide and use adequate lighting during the operation of the facility in hours of darkness.
- (v) There shall be no storage of flammable material on-site.
- (vi) All tanks and drums shall be labelled to clearly indicate their contents.
- (vii) No smoking shall be allowed on the facility other than in an on-site office with an installed functioning permanent gas monitoring system

5.5 Inert Waste

Inert waste accepted at the facility shall comply with the standards established in *Schedule A: Waste Acceptance*, of this licence. Analysis of such waste shall be in accordance with the requirements of that Schedule.

5.6 Leachate Management

- (i) The level of leachate in the installed pump sumps shall be continuously monitored.

- (ii) The frequency of leachate removal/discharge from the leachate lagoon shall be such that a minimum freeboard of 0.75m shall be maintained in the leachate lagoon at all times.
- (iii) Unless treated on the facility, leachate stored in the leachate storage lagoon shall be disposed of by tankering off-site in fully enclosed road tankers or by sewer following Sanitary Authority Consent.
- (iv) Recirculation of leachate or other contaminated water shall not be undertaken at the facility.

5.7 Maintenance

- (i) All treatment/abatement and emission control equipment shall be calibrated and maintained, in accordance with the instructions issued by the manufacturer/supplier or installer. Written records of the calibrations and maintenance shall be made and kept by the licensee.
- (ii) All lagoon structures on the facility shall be inspected and certified fit for purpose every three years by an independent and appropriately qualified chartered engineer.
- (iii) The licensee shall maintain and clearly label and name all sampling and monitoring locations.
- (iv) The wheel-wash shall be inspected on a daily basis and drained as required. Silt, stones and other accumulated material shall be removed as required from the wheel-wash and disposed of at the working face or to a skip.

REASON: *To provide for appropriate operation of the facility to ensure protection of the environment.*

CONDITION 6 EMISSIONS

- 6.1. No specified emission from the facility shall exceed the emission limit values set out in *Schedule C: Emission Limits* of this licence. There shall be no other emissions of environmental significance.
- 6.2. The licensee shall ensure that the activities shall be carried out in a manner such that emissions do not result in significant impairment of, or significant interference with the environment beyond the facility boundary.
- 6.3. Landfill Gas
 - 6.3.1. The following are the trigger levels for landfill gas emissions from the facility measured in any service duct or manhole on, at or immediately adjacent to the facility and/or at any other point located outside the body of the waste:-
 - a) Methane, greater than or equal to 1.0% v/v; or
 - b) Carbon dioxide, greater than or equal to 1.5% v/v.
 - 6.3.2. The concentration limits for emissions to atmosphere specified in this licence shall be achieved without the introduction of dilution air and shall be based on gas volumes under standard conditions of :-
 - a) In the case of landfill gas flare:
Temperature 273 K, pressure 101.3 kPa, dry gas at 3% oxygen; and
 - b) In the case of landfill gas combustion plant:

Temperature 273 K, pressure 101.3 kPa, dry gas; 5% oxygen.

6.3.3. Emission limits for emissions from landfill gas flare/combustion plant to atmosphere in this licence shall be interpreted in the following way:-

6.3.3.1. Continuous monitoring

- a) No 24 hour mean value shall exceed the emission limit value.
- b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.
- c) No 30 minute mean value shall exceed twice the emission limit value.

6.3.2.2. Non-Continuous Monitoring

- a) For any parameter where, due to sampling/analytical limitations, a 30 minute samples is inappropriate, a suitable sampling period should be employed and the value obtained therein shall not exceed the emission limit value.
- b) For all other parameters, no 30 minute mean value shall exceed the emission limit value.
- c) For flow, no hourly or daily mean value shall exceed the emission limit value.

6.4. Emissions to Surface Water

6.4.1. No untreated leachate or contaminated surface water from the facility shall be discharged to the River Shannon catchment.

6.4.2. No substance shall be discharged in a manner, or at a concentration which, following initial dilution causes tainting of fish or shellfish.

6.4.3. Within three months of the date of grant of this licence, the applicant shall submit to the Agency for its agreement proposals for continuous monitoring of water in the surface water/groundwater retention ponds. These proposals shall include the criteria/trigger levels which will determine when the outlet from these ponds shall be closed. Such continuous monitoring shall, as a minimum, include conductivity, pH and TOC and shall be carried out on the inlet to the stormwater retention pond.

6.5. Disposal of Leachate

6.5.1. Leachate or contaminated water may be discharged to sewer following the agreement of the Sanitary Authority and the Agency.

6.5.2. Leachate or contaminated water may be tankered from the facility to an agreed Waste Water Treatment Plant and disposed of there.

6.5.3. In the event that an on-site leachate treatment plant is installed and maintained at the facility, treated leachate may be discharged to the River Shannon, subject to the emission limit values set out in this licence, at a location to be agreed with the Agency

6.6. Trigger Level for PM₁₀

6.6.1. The trigger level for PM₁₀ from the facility measured at any location on the boundary of the facility is:-

- a) PM₁₀ greater than 50µg/m³ for a daily sample.

6.7 Emission limit values for emissions to sewer or waters (where appropriate) in this licence shall be interpreted in the following way:-

- a) Continuous monitoring.

No flow value shall exceed the specified limit

- b) Non-Continuous monitoring.
Eight out of ten consecutive results, calculated as daily mean concentration or mass emission values on the basis of flow proportional composite sampling shall not exceed 1.2 times the emission limit value.
- c) No grab sample shall exceed 1.2 times the emission limit value.

REASON: To control emissions from the facility and provide for the protection of the environment.

CONDITION 7 NUISANCE CONTROL

- 7.1 The licensee shall ensure that vermin, birds, flies, mud, dust, litter and odours do not give rise to nuisance at the facility or in the immediate area of the facility. Any method used by the licensee to control any such nuisance shall not cause environmental pollution.
- 7.2 Within three months of the date of grant of this licence, the licensee shall submit details to the Agency, for its agreement of a programme of works to be undertaken by a competent pest control company to reduce the rodent vermin population in the facility. This programme of works shall take measures to prevent movement of vermin from the facility to habitated areas such as the Longpavement Halting Site and other dwelling houses in the locality.
- 7.3 The road network in the vicinity of the facility shall be kept free from any debris caused by vehicles entering or leaving the facility. Any such debris or deposited materials shall be removed without delay.
- 7.4 Litter Control
 - 7.4.1 All loose litter or other waste, placed on or in the vicinity of the facility, other than in accordance with the requirements of this licences, shall be removed, subject to the agreement of the landowners, immediately and in any event by 1000 hrs of the next working day after such waste is discovered.
 - 7.4.2 The licensee shall ensure that all vehicles delivering waste to and removing waste and materials from the facility are appropriately covered.
- 7.5 Dust Control
 - 7.5.1 In dry weather, site roads and any other areas used by vehicles shall be sprayed with water as and when required to minimise airborne dust nuisance.
- 7.6 Prior to exiting the facility, all waste vehicles shall use the wheelwash upon its installation.
- 7.7 Bird Control
 - 7.7.1 Birds shall be prevented from gathering on and feeding at the facility by the use of birds of prey and/or other bird scaring techniques.

REASON: To provide for the control of nuisances

CONDITION 8 MONITORING

- 8.1 The licensee shall carry out such monitoring and at such locations and frequencies as set out in *Schedule D: Monitoring* of this licence and as specified in this licence. Unless otherwise specified by this licence, all environmental monitoring shall commence no later than three months after the date of grant of this licence.
- 8.2 The licensee shall amend the frequency, locations, methods and scope of monitoring as required by this licence only upon the written instruction of the Agency and shall provide such information concerning such amendments as may be requested in writing by the Agency. Such alterations shall be carried out within any timescale nominated by the Agency.
- 8.3 Monitoring and analysis equipment shall be operated and maintained in accordance with the manufacturers' instructions (if any) so that all monitoring results accurately reflect any emission, discharge or environmental parameter.
- 8.4 The licensee shall provide safe and permanent access to all on-site sampling and monitoring points and to off-site points as required by the Agency.
- 8.5 All landfill gas monitoring equipment, other than permanent monitoring systems within buildings, shall be certified as being intrinsically safe.
- 8.6 Within three months of the date of grant of this licence the following information shall be submitted to the Agency for its agreement: the names, qualifications and a summary of the relevant experience of all persons that will carry out all sampling and monitoring as required by this licence and who carry out the interpretation of the results of such sampling and monitoring. Any proposed changes to the above shall be submitted to the Agency for its agreement
- 8.7 Groundwater Monitoring
- 8.7.1 Subject to the agreement of the well owners, all private wells within 250m of the facility shall be included in the monitoring programme set out in *Schedule D: Monitoring* of this licence.
- 8.8 Meteorological Monitoring
- 8.8.1 The licensee shall obtain monitoring details for the parameters listed in *Schedule D6: Meteorological Monitoring* of this licence.
- 8.9 Topographical Survey
- 8.9.1 A topographical survey shall be carried out within three months of the date of grant of this licence and shall be submitted to the Agency within four months of the date of grant of this licence. It shall be repeated annually thereafter. The survey shall be in accordance with any written instructions issued by the Agency
- 8.10 Stability Assessment
- 8.10.1 Within three months of the date of grant of this licence, the licensee shall carry out a stability assessment of the side slopes of the facility. This assessment shall be submitted to the Agency within four months of the date of grant of this licence. It shall be repeated annually thereafter.
- 8.11 Nuisance Monitoring
- 8.11.1 Within three months of the date of grant of this licensee shall, at a minimum of one week intervals, inspect the facility and its immediate surrounds for nuisances caused by litter, vermin, birds, flies, mud, dust and odours.

REASON: To ensure compliance with the conditions of this licence by provision of a satisfactory system of monitoring of emissions.

CONDITION 9 CONTINGENCY ARRANGEMENTS

9.1. In the event of an incident the licensee shall immediately:-

- a) Identify the date, time and place of the incident.
- b) Carry out an immediate investigation to identify the nature, source and cause of the incident and any emission arising therefrom.
- c) Isolate the source of any such emission.
- d) Evaluate the environmental pollution, if any, caused by the incident.
- e) Identify and execute measures to minimise the emissions/malfunction and the effects thereof.
- f) Provide a proposal to the Agency for its agreement within one month of the incident occurring to:-
 - a) Identify and put in place measures to avoid reoccurrence of the incident.
 - b) Identify and put in place any other appropriate remedial action.

9.2. The licensee shall, within three months of the date of grant of this licence, submit a written Emergency Response Procedure (ERP) to the Agency for its agreement. The ERP shall address any emergency situations which may originate on the facility and shall include provision for minimising the effects of any emergency on the environment. This shall include a risk assessment to determine the requirements at the facility for fire fighting and fire water retention facilities. The Fire Authority shall be consulted by the licensee during this assessment.

9.3. The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the facility. Once used the absorbent material shall be disposed of at an appropriate facility.

9.4. Emergencies

9.4.1. All significant spillages occurring at the facility shall be treated as an emergency and immediately cleaned up and dealt with so as to alleviate their effects.

9.4.2. No waste shall be burnt within the boundaries of the facility. A fire at the facility shall be treated as an emergency and immediate action shall be taken to extinguish it and notify the appropriate authorities.

9.4.3. In the event that monitoring of local wells indicates that the facility is having a significant adverse effect on the quantity and/or quality of the water supply this shall be treated as an emergency and the licensee shall provide an alternative supply of water to those affected.

9.4.4. In the event that monitoring of the slide slopes of the facility indicate that there may be a risk of slope failure this will be treated as an emergency.

REASON: *To ensure compliance with the conditions of this licence by provision of a satisfactory system of monitoring of emissions.*

CONDITION 10 RECORDS

10.1 The licensee shall keep the following documents at the facility office:-

- a) The current waste licence relating to the facility.
 - b) The previous year's AER for the facility.
 - c) All written procedures produced by the licensee, which relate to the licensed activities.
- 10.2 The licensee shall maintain a written record for each load of waste arriving at the facility. The licensee shall record the following:-
- a) The date.
 - b) The vehicle registration number.
 - c) A description of the waste including the associated EWC codes.
 - d) The quantity of the waste, recorded in tonnes.
 - e) Where loads or wastes are removed or rejected, details of the date of occurrence, the types of waste and the facility to which they were removed.
- 10.3 Written Records
- The following written records shall be maintained by the licensee:-
- a) The types and quantities of waste recovered and disposed of at the facility each year. These records shall include the relevant EWC Codes.
 - b) All training undertaken by facility staff.
 - c) Results from all integrity tests of bunds and other structures and any maintenance or remedial work arising from them.
 - d) Details of all nuisance inspections.
 - e) The names and qualifications of all persons who carry out all sampling and monitoring as required by this licence and who carry out the interpretation of the results of such sampling and monitoring.
- 10.4 The licensee shall maintain a written record of all complaints relating to the operation of the facility. Each such record shall give details of the following:-
- a) Date and time of the complaint.
 - b) The name of the complainant.
 - c) Details of the nature of the complaint.
 - d) Actions taken on foot of the complaint and the results of such actions.
 - e) The response made to each complainant.
- 10.5 A written record shall be kept of each consignment of leachate removed from the facility. The record shall include the following:-
- a) The name of the carrier.
 - b) The date and time of removal of leachate from the facility.
 - c) The volume of leachate, in cubic metres, removed from the facility on each occasion.
 - d) The name and address of the Waste Water Treatment Plant to which the leachate was transported.
 - e) Any incidents or spillages of leachate during its removal or transportation.

REASON: *To provide for the keeping of proper records of the operation of the facility.*

CONDITION 11 REPORTS AND NOTIFICATIONS

11.1 Unless otherwise agreed by the Agency, all reports and notifications submitted to the Agency shall:-

- a) Be sent to the Agency's headquarters.
- b) Comprise one original and three copies unless additional copies are required.
- c) Be formatted in accordance with any written instruction or guidance issued by the Agency.
- d) Include whatever information as is specified in writing by the Agency.
- e) Be identified by a unique code, indicate any modification or amendment, and be correctly dated to reflect any such modification or amendment.
- f) Be submitted in accordance to the relevant reporting frequencies specified by this licence, such as in *Schedule E: Recording and Reporting to the Agency* of this licence.
- g) Be accompanied by a written interpretation setting out their significance in the case of all monitoring data.
- h) Be transferred electronically to the Agency's computer system if required by the Agency.

11.2 In the event of an incident occurring on the facility, the licensee shall:-

- a) Notify the Agency as soon as practicable and in any case not later than 1000 hrs the following working day after the occurrence of any incident.
- b) Submit a written record of the incident, including all aspects described in Condition 9.1(a-e), to the Agency as soon as practicable and in any case within five working days after the occurrence of any incident.
- c) In the event of any incident which relates to discharges to surface/sewer water, notify the Shannon Regional Fisheries Board/Sanitary Authority as soon as practicable and in any case not later than 1000 hrs on the following working day after such an incident.
- d) Should any further actions be taken as a result of an incident occurring, the licensee shall forward a written report of those actions to the Agency as soon as practicable and no later than ten days after the initiation of those actions.

11.3 Reports relating to Facility Operations

11.3.1 The licensee shall submit to the Agency for its agreement, three months prior to the active abstraction of leachate at the facility, leachate handling procedures for the handling of leachate on the facility and during removal from the lagoon and subsequent transport/discharge to the Waste Water Treatment Plant.

11.3.2 The licensee shall submit to the Agency for its agreement, within three months of the date of grant of this licence, procedures for the capping and restoration works at the facility as required by this licence.

11.4 Annual Environmental Report

11.4.1 The licensee shall submit to the Agency for its agreement, within thirteen months from the date of grant of this licence, and within one month of the end of each year thereafter, an Annual Environmental Report (AER).

11.4.2 The AER shall include as a minimum the information specified in *Schedule G: Content of Annual Environmental Report* of this licence and shall be prepared in accordance with any relevant written guidance issued by the Agency.

CONDITION 12 CHARGES AND FINANCIAL PROVISIONS

12.1 Agency Charges

12.1.1 The licensee shall pay to the Agency an annual contribution of €19,458 or such sum as the Agency from time to time determines, towards the cost of monitoring the activity or otherwise in performing any functions in relation to the activity, as the Agency considers necessary for the performance of its functions under the Waste Management Act, 1996. The licensee shall in 2004 and subsequent years, not later than January 31 of each year, pay to the Agency this amount updated in accordance with changes in the Public Sector Average Earnings Index from the date of the licence to the renewal date. The updated amount shall be notified to the licensee by the Agency. For 2003, the licensee shall pay a pro rata amount from the date of this licence to 31st December. This amount shall be paid to the Agency within one month of the date of grant of this licence.

12.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased the licensee shall contribute such sums as determined by the Agency to defraying its costs.

12.2 Financial Provision for Closure, Restoration and Aftercare

12.2.1 The licensee shall by 1st January 2004 establish and maintain a fund, or provide a written guarantee, that is adequate to assure the Agency that the licensee is at all times financially capable of implementing the Restoration and Aftercare Plan required by Condition 4. The type of fund established and means of its release/recovery shall be agreed by the Agency prior to its establishment.

12.2.2 Any fund established shall be maintained in an amount always sufficient to underwrite the current Restoration and Aftercare Plan.

12.2.3 The licensee shall revise the cost of restoration and aftercare annually and any details of the necessary adjustments to the fund or guarantee must, within two weeks of the revision, be forwarded to the Agency for its agreement. Any adjustment agreed by the Agency shall be effected within four weeks of said written agreement.

12.2.4 Unless otherwise agreed any revision to the fund shall be computed using the following formula:-

$$\text{Cost} = (\text{ECOST} \times \text{WPI}) + \text{CiCC}$$

Where:-

Cost = Revised restoration and aftercare cost

ECOST = Existing restoration and aftercare cost

WPI = Appropriate Wholesale Price Index [Capital Goods, Building & Construction (i.e. Materials & Wages) Index], as published by the Central Statistics Office, for the year since last closure calculation/revision.

CiCC = Change in compliance costs as a result of change in site conditions, changes in law, regulations, regulatory authority charges, or other significant changes.

REASON: *To provide for adequate financing for monitoring and financial provisions for measures to protect the environment.*

SCHEDULE A : Waste Acceptance

A.1 Waste Acceptance

Table A.1.1 Waste Categories and Quantities

Waste Type	Maximum (Tonnes Per Annum)
Inert Waste	To be agreed with the Agency in conjunction with the Restoration and Aftercare Plan to be submitted under Condition 4.1

A.2 Acceptable Waste

Unless otherwise agreed with the Agency, only inert wastes listed in Table A.2.1 are acceptable for recovery at the facility without testing. If there is a doubt that the waste fulfils the definition of inert waste testing must be applied.

Table A.2.1 Wastes acceptable for Landfill Restoration

EWC Code	Description	Exclusions
10 11 03	Waste glass based fibrous materials	Only without organic binders
15 01 07	Glass Packaging	
17 01 01	Concrete	Selected C& D Waste Only*
17 01 02	Bricks	Selected C& D Waste Only*
17 01 03	Tiles and Ceramics	Selected C& D Waste Only*
17 01 07	Mixtures of concrete, bricks, tiles and ceramics	Selected C& D Waste Only*
17 02 02	Glass	
17 05 04	Soil and Stones	Excluding soils and stones from contaminated sites
19 12 05	Glass	
20 01 02	Glass	Separately collected glass only
20 02 02	Soil and Stones	Only from Parks and Gardens

*Selected C&D waste: with low contents of other types of materials (like metals, plastic, soil, organics, wood, rubber etc.). The origin of the waste must be known.

A.3 General Procedures for Characterisation, Testing and Sampling of Waste

The general characterisation and testing must be based on the three level hierarchy laid out in Annex II of the Landfill Directive (99/31/EC).

Sampling and testing shall be carried out by independent and qualified persons and institutions. Laboratories shall have proven experience in waste testing and analysis and shall have an efficient quality assurance system in operation. The methods provided in the draft Commission Decision (Brussels 01.05.2002) establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Council Directive 1999/31/EC on the landfill of waste shall be used unless otherwise instructed by the Agency.

A.4 Limit values for pollutant content for inert waste landfills

Unless otherwise instructed in writing by the Agency, the following leaching limit values apply. The leaching limit values are calculated at liquid to solid ratios (L/S) of 2 l/kg and 10 l/kg for total release and directly expressed in mg/l for C₀ (the first eluate of percolation test at L/S = 0.1 l/kg).

Parameter	L/S = 2 l/kg	L/S = 10 l/kg	C ₀ (percolation test)	Total Pollutant Content
	Mg/kg dry substance	mg/kg dry substance	mg/l	mg/kg dry substance
Arsenic (as As)	0.1	0.5	0.06	
Barium (as Ba)	7.0	20.0	4.0	
Cadmium (as Cd)	0.03	0.04	0.02	
total Chromium (as Cr)	0.2	0.5	0.1	
Copper (as Cu)	0.9	2.0	0.6	
Mercury (as Hg)	0.003	0.01	0.002	
Molybdenum (as Mo)	0.3	0.5	0.2	
Nickel (as Ni)	0.2	0.4	0.12	
Lead (as Pb)	0.2	0.5	0.15	
Antimony (as Sb)	0.02	0.06	0.01	
Selenium (as Se)	0.06	0.1	0.04	
Zinc (as Zn)	2.0	4.0	1.2	
Chloride	550.0	800.0	450.0	
Fluoride	4.0	10.0	2.5	
Sulphate ^{Note 1}	560.0	1000.0	1500.0	
Phenol index	0.47	1.0	0.3	
Dissolved Organic Carbon (DOC) ^{Note 2}	240.0	500.0	160.0	
Total Dissolved Solids (TDS) ^{Note 3}	2500.0	4000.0		
Total Organic Carbon (TOC) ^{Note 4}				30,000.0
BTEX Compounds				6.0
PCB (7 congeners)				1.0
Mineral Oil (C10 – C40)				500.0
Total PAH ^{Note 5}				2.0

Note 1: If the waste does not meet these values for sulphate, it may still be considered as complying with the acceptance criteria if the leaching does not exceed either of the following values: 1500 mg/l as Co at L/S = 0.1 l/kg and 6000mg/kg at L/S = 10 l/kg. It will be necessary to use a percolation test to determine the limit value at L/S = 0.1 l/kg under initial equilibrium conditions, whereas the value at L/S = 10 l/kg may be determined either by a batch leaching test or by a percolation test under conditions approaching local equilibrium.

Note 2: If the waste does not meet these values for dissolved organic carbon (DOC) at its own pH value, it may alternatively be tested at L/S = 10 l/kg and a pH between 7.5 and 8.0. The waste may be considered as complying with the acceptance criteria for DOC, if the result of this determination does not exceed 500 mg/l. (A draft method based on prEN 14429 is available).

Note 3: The values for TDS (Total Dissolved Solids) can be used alternatively to the values for Sulphate and Chloride.

Note 4: The TOC limit value is complied with as long as the loss on ignition does not exceed 5% per weight. In the case of soils a higher limit value may be admitted by the Agency, provided the Dissolved Organic Carbon at pH 7 (DOC7) value of 500 mg/kg is achieved.

Note 5: For determining the total of PAH, the following six compounds must be added to a sum: flouranthene, benzoic(a)pyrene, benzoic(b)flouranthene, benzoic(k)flouranthene, benzoic(g,h,i)perylene, indenoic(1,2,3,-c,d)pyrene.

SCHEDULE B : Specified Engineering Works

Specified Engineering Works
Final capping.
Installation of Landfill Gas Management Infrastructure.
Installation of Leachate Management Infrastructure.
Installation of Groundwater Control Infrastructure.
Installation of Surface Water Management Infrastructure.
Any other works notified in writing by the Agency.

SCHEDULE C : Emission Limits

C.1 Noise Emissions:

(Measured at the noise sensitive locations indicated in *Table D.1.1*)

Day dB(A) L _{Aeq} (15 minutes)	Night dB(A) L _{Aeq} (15 minutes)
55	45

C.2 Landfill Gas Concentration Limits:

(Measured in any building on or adjacent to the facility).

Methane	Carbon Dioxide
20 % LEL (1% v/v)	1.5 % v/v

C.3 Dust Deposition Limits:

(Measured at the monitoring points indicated in *Table D.1.1*)

Level (mg/m ² /day) ^{Note 1}
350

Note 1: 30 day composite sample with the results expressed as mg/m²/day.

C.4 Surface Water Discharge Limits:

Measured at the outlet from the stormwater lagoon

Level (Suspended Solids mg/l)
35

C.5 Emission Limits Values for Landfill Gas Plant

Emission Point Reference numbers: (To be agreed with Agency in advance).

Volume to be emitted: 3000m³/hr (unless results from modelling suggests otherwise)

Minimum discharge height: 5m (unless results from modelling suggests otherwise)

Parameter	Flare (enclosed) Emission Limit Value ^{Note 1}	Utilisation Plant Emission Limit Value ^{Note 1}
Nitrogen oxides (NO _x)	150 mg/m ³	500 mg/m ³
CO	50 mg/m ³	1400 mg/m ³
Particulates	Not applicable	130 mg/m ³
TA Luft Organics Class I ^(Note 2)	Not applicable	20 mg/m ³ (at mass flows > 0.1 kg/hr)
TA Luft Organics Class II ^(Note 2)	Not applicable	100 mg/m ³ (at mass flows > 2 kg/hr)
TA Luft Organics Class III ^(Note 2)	Not applicable	150 mg/m ³ (at mass flows > 3kg/hr)
Total organic carbon (TOC)	10 mg/m ³	Not applicable
Hydrogen Chloride	50 mg/m ³ (at mass flows > 0.3 kg/h)	50 mg/m ³ (at mass flows > 0.3 kg/h)
Hydrogen Fluoride	5 mg/m ³ (at mass flows > 0.05 kg/h)	5 mg/m ³ (at mass flows > 0.05 kg/h)

Note 1: Dry gas referenced to 5% oxygen by volume for utilisation plants and 3% oxygen by volume for flares.

Note 2: In addition to the above individual limits, the sum of the concentrations of Class I, II and III shall not exceed the Class III limits.

C.6 Emission Limits for Leachate Being Discharged to Sewer

Parameter ^{Note 1}	Emission Limit Value
Methane	0.14mg/l

Note 1: ELVs for other parameters to be agreed with the Sanitary Authority

C.7 Emission Limits for Treated Leachate Discharged to Surface Water

Emission Point Reference No: to be agreed with the Agency.

Parameter	Limit
(all units in mg/l except pH)	
PH	6-9
BOD	25
COD	125
Suspended Solids	35
Total P (as P)	2
Total Nitrogen (as N)	15

SCHEDULE D : Monitoring

D.1 Monitoring Locations

Monitoring locations shall be those as set out in Table D.1.1

Table D.1.1 Monitoring Locations

Landfill Gas within Waste and Boundary Locations	Landfill Gas Flare/ Utilisation Plant	Dust Deposition/ Odour	PM ₁₀	Noise	Surface Water	Ground Water	Leachate
Stations		Stations		Stations	Stations	Stations	Stations
Existing Locations BH1-BH6 (see Note 1)	See Note 2	See Note 3	Note 3	N2, N3, N4, N5 Note 4	WS1 to WS7 inclusive	BH 1 to BH6 (shallow & deep) inclusive	All Leachate Abstraction Boreholes in Waste
Proposed Locations SP01-SP12 (see Note 1)					Note 5		Note 6

Note 1: Perimeter locations indicated on Figure 5:P1 in the document "Remediation Options for the Post-1984 Landfill of the waste licence application.

Note 2: Exact locations to be agreed with the Agency prior to installation.

Note 3: Four boundary locations to be agreed with the Agency within three months of the date of grant of this licence.

Note 4: Noise Sensitive Locations indicated on Dwg. No. TF4 "Noise Monitoring Location Map".

Note 5: At two locations: Inlet and Outlet to surface water retention pond.

Note 6: All leachate abstraction boreholes to be monitored on a daily basis for levels/volume. Three locations to be agreed with the Agency for leachate compositional analysis. Additional locations to be agreed with the Agency prior to their installation depending on the method of leachate discharge from the facility.

D.2 Landfill Gas

Table D.2.1 Landfill Gas Monitoring Parameters, Frequency and Technique

Parameter	Monitoring Frequency			Analysis Method ^{Note1} /Technique ^{Note2}
	Perimeter Boreholes Note 3	Other Boreholes/ Vents/Wells	Site Office	
Methane (CH ₄) % v/v	Weekly	Monthly	Weekly	Infrared analyser/flame ionisation detector
Carbon dioxide (CO ₂) %v/v	Weekly	Monthly	Weekly	Infrared analyser/ flame ionisation detector
Oxygen(O ₂) %v/v	Weekly	Monthly	Weekly	Electrochemical cell
Atmospheric Pressure	Weekly	Monthly	Weekly	Standard
Temperature	Weekly	Monthly	Weekly	Standard

Note 1: All monitoring equipment used should be intrinsically safe.

Note 2: Or other methods agreed in advance with the Agency.

Note 3: Weekly for first two months upon installation and monthly thereafter.

D.3 Dust/PM₁₀ Monitoring

Table D.3.1 Dust Monitoring Frequency and Technique

Parameter (mg/m ² /day)	Monitoring Frequency	Analysis Method/Technique
Dust	Three times a year ^{Note 2}	Standard Method ^{Note 1}
PM ₁₀	Quarterly	See ^{Note 3}

Note 1: Standard method VDI2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). Any modifications to eliminate interference due to algae growth in the gauge should be reported to the Agency.

Note 2: Twice during the period May to September.

Note 3: As described in prEN12341 or an equivalent agreed with the Agency.

D.4 Noise

Table D.4.1 Noise Monitoring Frequency and Technique

Parameter	Monitoring Frequency	Analysis Method/Technique
L(A) _{EQ} [30 minutes]	Bi-Annual	Standard ^{Note 1}
L(A) ₁₀ [30 minutes]	Bi-Annual	Standard ^{Note 1}
L(A) ₉₀ [30 minutes]	Bi-Annual	Standard ^{Note 1}
Frequency Analysis(1/3 Octave band analysis)	Bi-Annual	Standard ^{Note 1}

Note 1: "International Standards Organisation. ISO 1996. Acoustics - description and Measurement of Environmental noise. Parts 1, 2 and 3."

D.5 Surface Water, Groundwater and Leachate

Table D.5.1 Water and Leachate - Parameters / Frequency

Parameter ^{Note 1}	SURFACE ^{Note 2}	GROUNDWATER	LEACHATE ^{Note 3}
	WATER ^{Note 2}	Monitoring Frequency	Monitoring Frequency
Visual Inspection/Odour ^{Note 2}	Weekly	Quarterly	Quarterly
Groundwater Level	Not Applicable	Monthly	Not Applicable
Leachate Level	Not Applicable	Not Applicable	Continuous
Ammoniacal Nitrogen	Quarterly	Quarterly	Annually
BOD	Quarterly	Not Applicable	Annually
COD	Quarterly	Not Applicable	Annually
Chloride	Quarterly	Quarterly	Annually
Dissolved Oxygen	Quarterly	Quarterly	Not Applicable
Electrical Conductivity	Quarterly	Quarterly	Annually
PH	Quarterly	Quarterly	Annually
Total Suspended Solids	Quarterly	Not Applicable	Not Applicable
Temperature	Quarterly	Quarterly	Quarterly
Metals / non metals ^{Note 3}	Annually	Annually	Annually
Cyanide (Total)	Not Applicable	Annually	Annually
Fluoride	Not Applicable	Annually	Annually
List I/II organic substances ^{Note 4}	Once off ^{Note 5}	Annually ^{Note 5}	Once off ^{Note 5}
Mercury	Annually	Annually	Annually
Sulphate	Annually	Annually	Annually
Total Alkalinity	Annually	Annually	Not applicable
Total P/orthophosphate	Annually	Annually	Annually
Total Oxidised Nitrogen	Annually	Annually	Annually
Total Organic Carbon	Not Applicable	Quarterly	Not Applicable
Residue on evaporation	Not Applicable	Annually	Not Applicable
Biological Assessment	Annually ^{Note 6}	Not Applicable	Not Applicable

Note 1: All the analysis shall be carried out by a competent laboratory using standard and internationally accepted procedures.

Note 2: Where there is evident gross contamination of leachate, additional samples should be analysed.

Note 3: Metals and elements to be analysed by AA/ICP should include as a minimum: boron, cadmium, calcium, chromium (total), copper, iron, lead, magnesium, manganese, nickel, potassium, sodium and zinc.

Note 4: Samples screened for the presence of organic compounds using Gas Chromatography / Mass Spectrometry (GC/MS) or other appropriate techniques and using the list I/II Substances from EU Directive 76/464/EEC and 80/68/EEC as a guideline. Recommended analytical techniques include: volatiles (US Environmental Protection Agency method 524 or equivalent), semi-volatiles (USEPA method 525 or equivalent, and pesticides (USEPA method 608 or equivalent).

Note 5: 2 surface water locations, 3 groundwater locations and 2 leachate locations to be agreed with the Agency for these parameters.

Note 6: Appropriate biological methods (such as EPA Q-Rating System) to be used for the assessment of rivers and streams.

D.6 Meteorological Monitoring

Table D.6.1 Meteorological Monitoring

To be obtained from Shannon Airport or an agreed location.

Parameter	Monitoring Frequency	Analysis Method/Technique
Precipitation Volume	Daily	Standard
Temperature (min/max.)	Daily	Standard
Wind Force and Direction	Daily	Standard
Evaporation	Daily	Standard
Evapotranspiration ^{Note 1}	Daily	Standard
Humidity	Daily	Standard
Atmospheric Pressure ^{Note 1}	Daily	Standard

Note 1: Monitoring frequency for these parameters may be decreased with the agreement of the Agency.

D.7 Landfill Gas Combustion Plant/Enclosed Flare

Location: Utilisation plant and enclosed flare

Table D.7.1 Landfill Gas Utilisation Plant/Enclosed Flare Parameters and Monitoring Frequency

Parameter	Flare (enclosed) Monitoring Frequency	Utilisation Plant Monitoring Frequency	Analysis Method ^{Note1} /Technique ^{Note2}
Inlet			
Methane (CH ₄) % v/v	Continuous	Weekly	Infrared analyser/flame ionisation detector/thermal conductivity
Carbon dioxide (CO ₂)% v/v	Continuous	Weekly	Infrared analyser/ thermal conductivity
Oxygen (O ₂) % v/v	Continuous	Weekly	Electrochemical/thermal conductivity
Total Sulphur	Annually	Annually	Ion chromatography
Total Chlorine	Annually	Annually	Ion chromatography
Total Fluorine	Annually	Annually	Ion Selective Electrode
Process Parameters			
Combustion Temperature	Continuous	Quarterly	Temperature Probe/datalogger
Outlet			
CO	Continuous	Continuous	Flue gas analyser/datalogger
NO _x	Annually	Annually	Flue gas analyser
SO ₂	Annually	Annually	Flue gas analyser

Parameter	Flare (enclosed) Monitoring Frequency	Utilisation Plant Monitoring Frequency	Analysis Method ^{Note1} /Technique ^{Note2}
Particulates	Not applicable	Annually	Isokinetic/Gravimetric
TA Luft Class I, II, III organics	Not applicable	Annually	Adsorption/Desorption /GC/GCMS ^{Note 3}
TOC	Annually	Not applicable	Flame ionisation
Hydrochloric acid	Annually	Annually	Impinger / Ion Chromatography
Hydrogen fluoride	Annually	Annually	Impinger / Ion Chromatography

Note 1: All monitoring equipment used should be intrinsically safe.

Note 2: Or other methods agreed in advance with the Agency.

Note 3: Test methods should be capable of detecting acetonitrile, dichloromethane, tetrachlorethylene and vinyl chloride as a minimum.

D.8 Monitoring of Emissions to Sewer

Emission Point Reference No: To be agreed with the Sanitary Authority and the Agency

Table D.8.1 Sewer Monitoring - Parameters/Frequency

Parameter	Monitoring Frequency	Analysis Method/Technique ^{Note 1}
Methane	Continuous	Dissolved Methane Probe /Headspace methane monitor

Note 1: To be agreed in advance with the Agency.

D.9 Monitoring of Emissions from On-Site Leachate Treatment Plant to Surface Water

Emission Point Reference No: To be agreed with the Agency

Table D.9.1 Monitoring Emissions from On-Site Leachate Treatment Plant - Parameters/Frequency

Parameter	Monitoring Frequency	Analysis Method/Technique ^{Note 1}
Flow	Continuous	Flow meter / recorder
pH	Continuous	pH meter / recorder
Biochemical Oxygen Demand	Twice Weekly	Standard Method ^{Note 2}
Chemical Oxygen Demand	Weekly	Standard Method ^{Note 2}
Total Nitrogen	Twice Weekly	Standard Method ^{Note 2}
Total P (as P)	Monthly	Standard Method ^{Note 2}
Suspended Solids	Weekly	Gravimetric

SCHEDULE E : Recording and Reporting to the Agency

Report	Reporting Frequency ^{Note1}	Report Submission Date
Annual Environment Report (AER)	Annually	Thirteen months from the date of grant of licence and one month after the end of each year thereafter.
Record of incidents	As they occur	Within five days of the incident.
Bund, tank and container integrity assessment	Every three years	Six months from the date of grant of licence and one month after end of the three year period being reported on.
Specified Engineering Works reports	As they arise	Prior to the works commencing.
Monitoring of Landfill gas	Quarterly	Ten days after end of the quarter being reported on.
PM₁₀ Monitoring	Quarterly	Ten days after end of the quarter being reported on.
Monitoring of Surface Water Quality	Quarterly	Ten days after end of the quarter being reported on.
Monitoring of Groundwater Quality	Quarterly	Ten days after end of the quarter being reported on.
Monitoring of Leachate	Quarterly	Ten days after end of the quarter being reported on.
Meteorological Monitoring	Annually	One month after end of the year being reported on.
Dust Monitoring	Three times a year	Ten days after the period being reported on
Noise Monitoring	Bi-Annually	One month after end of the period being reported on.
Any other monitoring	As they occur	Within ten days of obtaining results.

Note 1: Unless altered at the request of the Agency.

SCHEDULE F : Content of the Annual Environmental Report

Annual Environmental Report Content

Reporting Period.

Report on restoration of completed cells/ phases.

Waste activities carried out at the facility.

Summary of results and interpretation of environmental monitoring.

Volume of leachate produced and volume of leachate transported / discharged off-site.

Site survey showing existing levels of the facility at the end of the reporting period.

Estimated annual and cumulative quantities of landfill gas emitted from the facility.

Report on the progress towards achievement of the Environmental Objectives and Targets contained in previous year's report.

Schedule of Environmental Objectives and Targets for the forthcoming year.

Reported incidents and Complaints summaries.

Review of Nuisance Controls.

Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information.

Any other items specified by the Agency.

Signed on behalf of the said Agency
on the 7th day of January, 2003

Patrick J. Nolan, **Authorised Person**