Draft BAT Guidance Note on Best Available Techniques for the Waste Sector: Transfer Activities

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Contents

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1 INTRODUCTION

1.1 GENERAL

This Guidance Note is one of a series issued by the Environmental Protection Agency (EPA) which provide guidance on the determination of Best Available Techniques (BAT) in relation to:

- applicants seeking Integrated Pollution Prevention and Control (IPPC) licences under Part IV of the Environmental Protection Agency Acts 1992 to 2007,
- existing Integrated Pollution Control (IPC) Licensees, whose licence is to be reviewed under the Environmental Protection Agency Acts 1992 to 2007,
- applicants seeking Waste licences under Part V of the Waste Management Acts 1996 to 2008,
- existing Waste Licensees, whose licence is to be reviewed under the Waste Management Acts 1996 to 2008.

This Guidance Note shall not be construed as negating the installation/facility statutory obligations or requirements under any other enactments or regulations.

1.2 BAT GUIDANCE NOTE STRUCTURE

This Guidance Note has been structured as follows:

Section	Details
1	Introduction
2	Interpretation of BAT
3	Sector Covered by this Guidance Note
4	Process Description, Risk to the Environment and Control Techniques
5	Best Available Techniques
6	BAT Associated Emission Levels
7	Compliance Monitoring
8	Decommissioning
Appendices	
Appendix 1	Environmental Quality Standards
Appendix 2	Supplementary References
Appendix 3	Glossary
Appendix 4	Abbreviations

Where relevant, references are made to other detailed guidance; such as the reference documents (BREF) published by the European Commission, Agency Guidance Notes for *Noise in Relation to Scheduled Activities*, and the determination of BAT should be made giving regard to these.

The information contained in this Guidance Note is intended for use as a tool to assist in determining BAT for the specified activities.

2. INTERPRETATION OF BAT

2.1 STATUS OF THIS GUIDANCE NOTE

This Guidance Note will be periodically reviewed and updated as required to reflect any changes in legislation and in order to incorporate technological advances as they arise.

Techniques identified in these Guidance Notes are considered to be current best practice at the time of writing. The EPA encourages the development and introduction of new and innovative technologies and techniques which meet BAT criteria and look for continuous improvement in the overall environmental performance of the sector's activities as part of sustainable development.

2.2 INTERPRETATION OF BAT

BAT was introduced as a key principle in the IPPC Directive 96/61/EC. This Directive has been incorporated into Irish law via the Protection of the Environment Act 2003. To meet the requirements of this Directive, relevant Sections of the Environmental Protection Agency Act 1992 and the Waste Management Act 1996 have been amended to replace BATNEEC (Best Available Technology not entailing Excessive Costs) with BAT.

Best available techniques (BAT) is defined in Section 5 of the Environmental Protection Agency Acts, 1992 to 2007, and Section 5(2) of the Waste Management Acts 1996 to 2008, as the "most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent or eliminate or, where that is not practicable, generally to reduce an emission and its impact on the environment as a whole", where:

B ***'best'*** in relation to techniques, means the most effective in achieving a high general level of protection of the environment as a whole

A ***'available techniques'*** means those techniques developed on a scale which allows implementation in the relevant class of activity under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced within the State, as long as they are reasonably accessible to the person carrying on the activity

T **'*techniques*'** includes both the technology used and the way in which the installation is designed, built, managed, maintained, operated and decommissioned.

The range of BAT associated emission level values specified in Section 6 indicate those that are achievable through the use of a combination of the process techniques and abatement technologies specified as BAT in Section 5. The licensee must demonstrate to the satisfaction of the Agency, during the licensing process, that the installation/facility will be operated in such a way that all the appropriate preventative measures are taken against pollution through the application of BAT and justify the application of other than the most stringent ELV in the range.

At the installation/facility level, the most appropriate techniques will depend on local factors. A local assessment of the costs and benefits of the available options may be

needed to establish the best option. The choice may be justified on:

- the technical characteristics of the facility;
- its geographical location;
- local environmental considerations;
- the economic and technical viability of upgrading the existing installation.

The overall objective of ensuring a high level of protection for the environment as a whole will often involve making a judgment between different types of environmental impact, and these judgments will often be influenced by local considerations. On the other hand, the obligation to ensure a high level of environmental protection including the minimisation of long-distance or transboundary pollution implies that the most appropriate techniques cannot be set on the basis of purely local considerations.

The guidance issued in this Note in respect of the use of any technology, technique or standard does not preclude the use of any other similar technology, technique or standard that may achieve the required emission standards and is demonstrated to the Agency to satisfy the requirement of BAT.

2.3 BAT HIERARCHY

In the identification of BAT, emphasis is placed on pollution prevention techniques rather than end-of-pipe treatment.

The IPPC Directive 96/61/EC and the Environmental Protection Agency Acts 1992 to 2007 (Section 5(3)), require the determination of BAT to consider in particular the following, giving regard to the likely costs and advantages of measures and to the principles of precaution and prevention:

(i) the use of low-waste technology,

(ii) the use of less hazardous substances,

(iii) the furthering of recovery and recycling of substances generated and used in the process and of waste, where appropriate,

(iv) comparable processes, facilities or methods of operation, which have been tried with success on an industrial scale,

(v) technological advances and changes in scientific knowledge and understanding,

(vi) the nature, effects and volume of the emissions concerned,

(vii) the commissioning dates for new or existing activities,

(viii) the length of time needed to introduce the best available techniques,

(ix) the consumption and nature of raw materials (including water) used in the process and their energy efficiency,

(x) the need to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it,

(xi) the need to prevent accidents and to minimize the consequences for the environment, and

(xii) the information published by the Commission of the European Communities pursuant to any exchange of information between Member States and the industries concerned on best available techniques, associated monitoring, and developments in them, or by international organisations, and such other matters as may be prescribed.

3 SECTORS COVERED BY THIS GUIDANCE NOTE

This Guidance Note covers the following waste transfer facilities and MRFs:

- Inert;
- Non-hazardous;
- Hazardous; and
- Clinical.

Hazardous Waste issues and arising BAT matters are set out in italics, as suggested by the IPPC Bureau for the Waste Treatment BREF.

Table 3.1 Prescribed Waste Transfer Activities

Waste Management Acts 1996 to 2008: Classes from 3rd and 4th Schedule covered by Guidance Note
3rd Schedule 11. Blending or mixture prior to submission to any activity referred to in this Schedule. 12. Repackaging prior to submission to any activity referred to in this Schedule. 13. Storage prior to submission to any activity referred to in this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced. **4th Schedule** 2. Recycling or reclamation of organic substances which are not used as solvents. 3. Recycling or reclamation of metals and metal compounds. 4. Recycling or reclamation of other inorganic materials. 13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

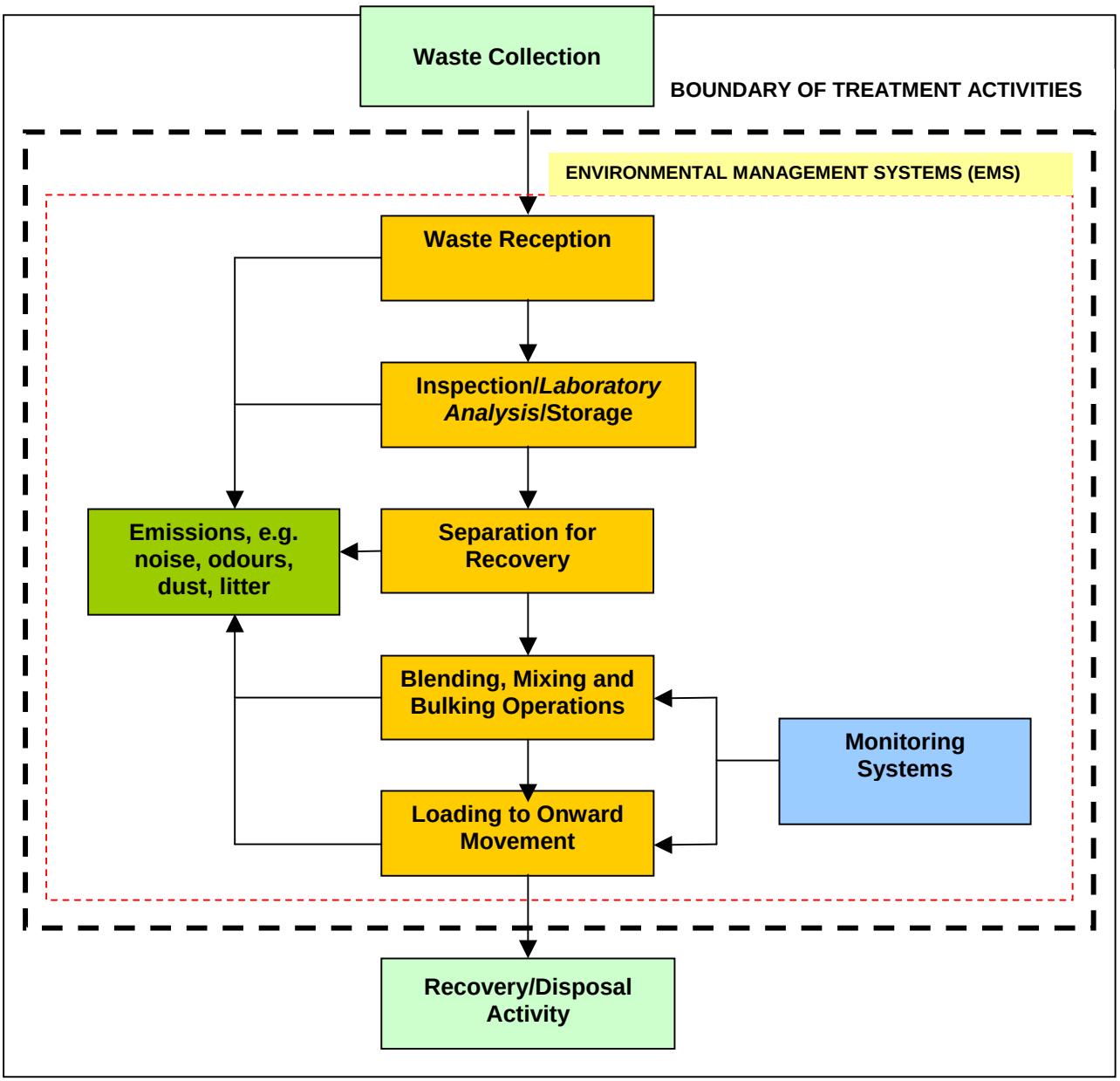
4 PROCESS DESCRIPTION, RISK TO THE ENVIRONMENT, AND CONTROL TECHNIQUES

4.1 DESCRIPTION OF PROCESS

4.1.1 Overview of Waste Transfer Activities

Waste Transfer and MRF activities covered by this Guidance Note are summarised in Figure 4.1.

Figure 4.1: Summary of Waste Transfer and MRF Activities



Waste transfer is essentially a bulking operation where waste forms the raw material for

processes. Materials entering the facility are delivered to a reception and handling area where, following checking and acceptance, they are bulked and mixed for onward movement to a waste treatment and/or disposal facility. Materials recovery involves the sorting and separation of recyclable and recoverable waste fractions from the waste received prior to their bulking for onward processing.

The standard of pre-treatment required for municipal waste prior to acceptance for disposal at landfill is set out in the *Draft* EPA technical guidance *Municipal Solid Waste – Pre-treatment & Residuals Management* (EPA, 2008).

For hazardous wastes a laboratory is often needed at the facility to determine waste chemistry and compatibility and the mixing/blending requirements at the facility. The acceptance of lab smalls from schools and universities, etc. requires special handling and pre-acceptance criteria as set out in BAT #24c of the BREF for Waste Treatments.

The determination of BAT will be dependent on the type of treatment processes being considered. Only guidance that is directly applicable to the facility under consideration should be applied and regard to be had to guidance issued by the Agency.

4.1.2 Key Issues for Waste Transfer Facilities

4.1.2.1 Site Location

In selecting a suitable location for a waste transfer facility or MRF the basic requirement is that the facility will not cause environmental pollution, taking into account the characteristics of the location, the waste types it will handle, the nature of the facility and the control measures to be employed. To determine the suitability of a location the applicant must:

- consider the distance from the boundary of the site to residential and recreational areas, waterways, water bodies and other agricultural or urban sites;
- take account of any relevant Waste Management Plans or Development Plans;
- identify any groundwater, coastal water or nature protection zones in the area;
- undertake a site investigation;
- identify the potential environmental effects and risks; and
- determine if emission control measures can prevent the developed site posing an environmental risk during its operation.

4.1.2.2 Design Considerations

The key design issues that need to be addressed when determining BAT are summarised in Table 2 below.

Consideration	Design Issue
Facility Location	Location of facility with respect to sensitive receptors; Housing; Access; Adjacent premises
Type of Facility	Land requirement; Layout; Site Services
Nature and Quantity of Waste	Environmental control measures; present and future storage requirements;
Odour Control	Capture, containment and treatment of odorous air.
Water Control	Rainfall; surface water run-off; groundwater protection; containment

Emergency Planning	Protection of sensitive receptors; Preparation and Routine review and Testing of Emergency Plan
Visual Appearance	Landscaping and visual aspect

4.1.2.3 Decommissioning

Decommissioning is the process that will return a site to the condition prevailing prior to waste management activities so that it will be suitable for the alternate use. The extent of decommissioning required will be dependent on the nature and degree of any residual contamination that resulted from the waste treatment activities at the site.

4.1.3 Environmental Management System (EMS)

- The manner in which a facility is managed is a critical element in ensuring emissions from the waste transfer activities are minimised. Therefore management of facilities must ensure that:
  - staff are competent to manage and operate the facility, i.e. a Fit and Proper Person;
  - operational procedures are in place to minimise the risk of odours having regard to the waste types being accepted and the waste processing activities at the facility;
  - all biodegradable/putrescible wastes are removed from the premises as soon as practicable; and
  - there is environmental management systems in place to ensure standards are maintained, including incident and complaints management procedures and which incorporates features specified in the Agency EMS Guidance.

4.1.4 Waste Acceptance

Controlling the waste input to a transfer station/MRF is an important operational matter that has a direct effect upon the pollution/nuisance potential of the facility. It is essential that measures be introduced to ensure that waste acceptance is restricted to those wastes for which the facility was designed, and which are permitted by the licence.

Waste licences will clearly state those wastes that may be accepted at the facility and may also detail those which are not permitted. Conditions will limit the quantity of waste that may be accepted and will make requirements for checking, sampling and recording of incoming waste and provisions for dealing with non-permitted wastes that are delivered.

Upon entry into the facility:

- all loads should be weighed;
- any description of the waste should be checked in a dedicated waste inspection/tipping area to confirm they comply with the licence, and
- a record made of the waste type, quantity, source and haulier.

Waste licences will normally require specific information regarding the types and quantities of waste handled by the facility to be forwarded to the EPA at quarterly intervals by the operator.

4.1.4.1 Waste Acceptance Procedures

Operators of waste transfer facilities and MRFs should base their waste acceptance procedures for wastes destined for disposal, on the waste acceptance procedures detailed in the Landfill Directive Annex II (3). See also the EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills. Annex II (3) of the Landfill Directive comprises:

- Level I: Basic Characterisation. Using standard analytical methods, the short and long-term leaching behaviour and/or characteristic properties of waste are determined by or on behalf of the waste producer/contractor. The possible risks involved when handling waste should be identified and included in the waste transfer document.
- Level II: Compliance Testing. This consists of periodical testing by standardised analysis methods, to determine whether a waste complies with licence conditions and/or specific reference criteria and is carried out by the facility operator. It focuses on key characteristics identified by the initial characterisation at Level I. This requirement will generally apply to chemical wastes and contaminated soils which are bulked at the Transfer Facility.
- Level III: On-Site Verification. Checks to confirm that a waste:
    - is the same as that which has been subjected to compliance testing;
    - is the same as that which is described in any accompanying documents that may be required.

On-site verification may consist of a visual inspection of a load of waste before and after unloading at the facility. More detailed testing may be required if a visual inspection does not enable the facility operator to make a conclusive verification.

The standard of pre-treatment required for municipal waste prior to acceptance for disposal at landfill is set out in the *Draft* EPA technical guidance *Municipal Solid Waste – Pre-treatment & Residuals Management* (EPA, 2008).

4.2 RISK TO THE ENVIRONMENT

Emission is defined in the Environmental Protection Agency (EPA) Acts 1992 to 2007, Section 3, to mean:

- an emission into the atmosphere of a pollutant within the meaning of the Air Pollution Act, 1987;
- a discharge of polluting matter, sewage effluent or trade effluent within the meaning of the Local Government (Water Pollution) Act 1977, to waters or sewers within the meaning of that Act;
- noise (note that the definition of noise includes vibration).

The definition of emission in the IPPC Directive (96/61/EC) includes “the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in the installation into the air, water or land”.

The underlying objective of BAT is to eliminate or reduce emissions from processes. Emissions, and hence environmental pollution, can be eliminated or reduced by:

- proper design of the facility;
- effective management of the facility; and
- the selection of appropriate processes, technologies and facility operations.

The following sections examine the potential emissions from waste treatment activities to air, water and land. Each section is sub-divided into potential emissions from inert, non-hazardous, hazardous and clinical waste facilities.

Wastewaters at waste transfer and materials recycling facilities originate from roof run-off, and from ancillary activities and site infrastructure, such as foul drainage, facility wash-down/cleaning water, road drainage, wheel wash and hard standing.

BAT will be related to discharges to water for effluents either discharged directly to surface waters or to sewer as trade effluents. The treatment required will be dependent on the permitted emission consent limits specified in the waste licence. Treatment provisions would typically include silt traps/oil interceptors for surface run-off but may require biological or physico-chemical treatments for the removal of specific contaminants, dependent on facility operations and the discharge receptor.

4.2.1 Potential Emissions to Air

4.2.1.1 Inert Waste Transfer and MRF Facilities

Potential emissions to air arising from inert waste transfer and MRF facilities include:

- Dust from operational activities;
- Vehicle emissions;
- Noise from fixed plant;
- Noise and vibration from vehicles and machinery used in waste operations; and
- Noise and vibration during handling and removal of wastes offsite.

4.2.1.2 Non-Hazardous Waste Transfer and MRF Facilities

Potential emissions to air arising from non-hazardous waste transfer and MRF facilities include:

- Odours from waste;
- Dust from waste;
- Dust from operational activities;
- Litter;
- Vehicle emissions;
- Noise from fixed plant;
- Noise and vibration from vehicles and machinery used in waste operations; and
- Noise and vibration during handling and removal of wastes offsite.

4.2.1.3 Hazardous Waste Transfer and MRF Facilities

Potential emissions to air arising from hazardous waste transfer and MRF facilities include:

- Odours from waste;
- Dust from waste;
- Dust from operational activities;
- Vehicle emissions;
- Gaseous emissions from the reaction of incompatible materials;
- Noise and vibration from fixed plant;
- Noise and vibration from vehicles and machinery used in waste operations; and
- Noise and vibration during handling and removal of wastes offsite.

4.2.1.4 Clinical Waste Transfer and MRF Facilities

Potential emissions to air arising from clinical waste transfer and MRF facilities include:

- Vehicle emissions; and
- Infectious organisms/pathogens.

4.2.2 Potential Emissions to Water (including Groundwater) and Land

4.2.2.1 Inert Waste Transfer and MRF Facilities

Potential emissions to water (including groundwater) and land arising from inert waste transfer and MRF facilities include:

- Run-off – during construction;
- Run-off – during operations;
- Fuels/oils;
- Effluents; and
- Mud.

4.2.2.2 Non-Hazardous Waste Transfer and MRF Facilities

Potential emissions to water (including groundwater) and land arising from non-hazardous waste transfer and MRF facilities include:

- Run-off – during construction;
- Run-off – during operations;
- Fuels/oils;
- Litter; and
- Effluents.

4.2.2.3 Hazardous Waste Transfer and MRF Facilities

Potential emissions to water (including groundwater) and land arising from hazardous waste transfer and MRF facilities include:

- Run-off – during construction;
- Run-off – during operations;
- Fuels/oils;
- Emissions from the reaction of incompatible materials; and
- Effluents.

4.2.2.4 Clinical Waste Transfer and MRF Facilities

Potential emissions to water (including groundwater) and land arising from clinical waste transfer and MRF facilities include:

- Run-off – during construction;
- Run-off – during operations;
- Fuels/oils;
- Infectious organisms/pathogens; and
- Effluents.

4.3 CONTROL TECHNIQUES

4.3.1 Techniques for Prevention and Minimisation of Resource Consumption

4.3.1.1 Use of Energy

Energy Efficiency

The WMAs 1996 to 2008 require that permitted installations should be operated in such a way that energy is used efficiently. Waste transfer facilities and MRFs use energy on a smaller scale than large process industries. However, the applicant still needs to demonstrate that energy efficiency has been considered.

The main uses of energy on a waste transfer facility are:

- heating, lighting and power in facility buildings;
- power to facility equipment such as wheel wash, waste processing weighbridge, pumps, treatment processes, lighting, etc.; and
- fuel to power vehicles.

The operator should quantify the energy consumption at the facility by the source of energy, i.e. electricity, gas and fuel. An example breakdown of energy consumption is as follows:

Energy Source	**Annual Quantity Used (KWh)**	**% of Total**
Electricity		
Gas		
Oil		
Energy from waste		
Other		
	Annual Quantity Used (litre)	
Vehicle Fuel		

The applicant should demonstrate that in the design of the facility and in any treatment processes it contains, energy efficiency has been considered, including measures such as:

- the use of basic, low cost physical energy efficiency techniques, e.g. gravity feed systems; and
- the consideration of energy saving opportunities in process buildings, control rooms and offices required for the activity, e.g. insulation.

The applicant should demonstrate that they are using purchasing, operating and maintenance procedures to optimise the energy use in the facility by:

- ensuring energy efficient equipment is purchased, including lighting, pumps, etc.;
- ensuring equipment is serviced and maintained regularly;
- ensuring equipment is switched off, if safe to do so, when not in use;
- ensuring on-site vehicle movements are minimised and engines are switched off when not in use;
- considering using electric or liquid petroleum gas-powered vehicles;
- reviewing equipment requirements on a regular basis;
- setting time of operation of high-energy equipment to off-peak periods, where possible; and
- setting key performance indicators on an annual basis.

The applicant should review energy consumption on an annual basis and examine options for:

- optimisation of energy supply; and
- optimising/reducing energy consumption.

Many of the aspects of energy efficiency are likely to be delivered through management techniques, operating and maintenance procedures, which overlap and form part of the EMS for the activity.

4.3.1.2 Raw Materials

The WMAs 1996 to 2008 require that permitted installations should be operated in such a way that materials are used efficiently.

Materials and Products

As part of the facility design, the applicant must ensure that current best practice is applied in its construction including selection and use of material.

Material Substitution

The applicant should demonstrate that procedures are in place to determine the most suitable material for use, thus preventing use of materials that may have an unacceptable environmental impact in their manufacture, end-use and ultimate disposal.

4.3.2 Techniques for the Prevention and Minimisation of Emissions

4.3.2.1 Minimisation of Emissions to Air

Dust/Fine Particulates (PM_{10}, $PM_{2.5}$) and Bioaerosols

Dust emissions from waste handling and other operational activities have the potential to cause nuisance to site neighbours and could be a health hazard for site workers, neighbours and visitors.

Management Techniques

At the EIS and design stage the operator will use the Risk Assessment process to identify particularly sensitive receptors in the event of dust generation. The same process will also identify high-risk areas that may give rise to dust generation, e.g. site roads, waste types.

The operational procedures and the working plan should set out the design and operational considerations and requirements to minimise and control potential nuisance from dust.

Detailed procedures of the receipt and handling of hazardous dusty waste (including asbestos) should be drawn up and used when a facility will be permitted to accept such waste.

The effectiveness of the design and operational provisions should be reviewed as part of the site monitoring; the annual environmental review report and the site's EMS procedures.

Control Techniques

- High standard of construction, including enclosed waste handling and storage areas, and cleanliness of site roads.
- Pre-treatment of wastes, e.g. wetting, solidification, encapsulation.
- Acceptance of bagged waste only.
- Water sprinklers operated in waste handling areas.
- Regular sweeping of access roadways and area of hard-standing and main transfer station area.
- Transfer loading of potentially dusty wastes within a building.
- Use dust extraction system to remove dust and particulates from working areas/ buildings.

Odour

Odours may arise from the handling of waste on site which can cause nuisance to site neighbours.

Management Techniques

- The location of the facility with regard to off-site receptors should be considered during the design stage.
- At the design stage consideration should be given to the requirement for the capture, containment and treatment of odorous air.
- The operational procedures, having regard to the waste types being accepted and the waste processing activities at the facility, should seek to minimise the risk or odours. All biodegradable/putrescible wastes should be removed from the premises as soon as practicable and, in any case, within 48 hours of arrival.
- Appropriate procedures should be developed for dealing with malodorous waste. Vehicles delivering and removing waste should be enclosed or covered. All putrescible/biodegradable wastes should be removed from the premises within 48 hours of arrival.

Control Techniques

- Restrict acceptance of wastes known to be malodorous.
- Any handling or treatment of malodourous waste is to be carried out in an enclosed area suitable for the capture, containment and treatment of odours.
- Use of appropriate odour abatement equipment.
- Conduct regular inspections, monitoring and maintenance of waste handling areas and abatement equipment.
- Use of odour neutralizing sprays and additives where necessary.

4.3.2.2 Minimisation of Emissions to Water

Surface Water

Handling and storage of waste should be conducted in a way that does not result in damage to surface water systems. This can be achieved by suitable construction of the site to prevent direct discharges into surface water and establishing suitable operational control techniques.

Management Techniques

- Consider the location and vulnerability of surface watercourses at the site design stage. The site should be designed so that the surface water drainage system contains adequate protection from potential pollution sources and does not drain directly into a surface watercourse without interception. The system must be designed to cope with storm water flows whilst preventing uncontrolled discharges to surface water.
- Surface water run-off from areas of the site not used for waste storage can be directed into the surface water system. The surface water should pass through a silt trap and oil interceptor before final discharge.
- Waste handling and storage areas and vehicle washing areas should drain into the foul sewer. The foul sewer should pass through a silt trap and oil interceptor prior to discharge to the foul water drainage or treatment system.
- Roads and hardstanding areas should be impermeable (i.e. a recognised sealed surface, e.g. asphalt or concrete, that is not readily permeable to liquids) and designed

to direct rainfall/surface run-off to a surface water drainage system with an interceptor before the drainage point. Where there are permeable areas such as grass or landscaping adjacent to impermeable surfaces, there should be kerbing to prevent run-off from the impermeable surfaces onto this ground.

- The site should be operated so as to prevent spillage or escape of substances that could pollute the surface water system, suitable emergency procedures should be provided. In particular the storage of fuel/oil should be provided. The EPA Guidance Note on Storage and Transfer of Materials for Scheduled Activities, 2003 should be referred to.

Control Techniques

- Provision of oil interceptors and silt traps to safeguard against potential pollution from oil/chemical spillage and vehicle washing.
- Surface water drainage– any direct discharges to surface water or sewer must pass through a silt trap and oil interceptor beforehand. (European Standard prEN 858 – Installations for the separation of light liquids).
- Regular interceptor cleaning.
- Surface water monitoring at discharge points.
- Regular inspection of adjacent surface water courses.

Groundwater

Management Techniques

- Prohibit direct emissions to groundwater of effluents containing certain hazardous substances (List I), and to strict controls to prevent indirect emissions of substances scheduled in List II of the Directive.
- Maintain an inventory of authorisations given for direct discharge of List II substances to groundwater.

Control Techniques

- Remove risks of emissions to groundwater through appropriate controls such as containment, bunding, etc. as described in Sections 4.3.3.2, 4.3.3.8, etc.
- Provide groundwater monitoring to enable early detection of any contamination of groundwater that may arise from the facility and the setting of its upper limits.

4.3.3.2 Fuel/Oil

Spillage of fuel or oil from fixed or mobile storage tanks at a transfer station could result in significant contamination of the soil, surface or groundwater.

Management Techniques

Transfer station design and MRFs should take account of the need to protect fuel storage tanks from damage (both accidental and vandalism) and ensure that any above ground storage tanks are suitably bunded.

Bunds should be designed in accordance with CIRIA Report 163 (1997), The Construction of Bunds for Oil Storage Tanks, which incorporates BS 8007: 1987 Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids. The EPA Guidance Note on Storage and Transfer of Materials for Scheduled Activities, 2003 should also be referred to.

As a minimum, storage tanks/containers should be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance which could be stored within the bunded area.
- The design of fuel/oil storage areas should ensure that all valves and pipework when not in use are contained, within the bunded area.
- Bunded storage areas should also be covered to prevent ingress of rainwater, which, if it accumulates, would reduce the capacity of the bund to contain tank losses and also complicate the possible recovery of any losses from the bund.
- Bund and tank integrity should be monitored on a regular basis to protect against leakage.
- Ensure adequate emergency procedures, e.g. Provision of oil spillage kits, absorbent materials or containment booms and staff training in spillage procedures.
- Tank level indicators should be calibrated and regularly checked to minimise risks of overfilling.
- All tanks and containers should be clearly labelled to indicate contents.
- All tanks and containers should be secured against unauthorised access.

Control Techniques

- Where practical, avoid the on site storage of fuel or oil.
- Inspect and integrity test bunds and tanks regularly to check for leaks.
- Lock valves when tanks are not in use.
- Empty bunds on a regular basis.

4.3.3 Minimisation of Nuisances

4.3.3.1 Litter

Litter can create a negative visual impact and cause a nuisance to site neighbours. Litter can be generated from poor site operational practice and the escape of waste during transit.

Management Techniques

Enclosed areas will be required for activities with the potential for litter generation. The location of sensitive areas adjacent to the site should be identified during the design stage. Site design will allow for potential exposure from wind. Avoid site construction in a particularly exposed location.

Operational procedures should include monitoring of litter generation and control of potential nuisance.

Control Techniques

- Carry out all transfer and waste handling activities including tipping, shredding, compacting, etc. within a building or an enclosed area.
- Maintenance of site roads.
- Acceptance of waste in sealed or covered vehicles only.
- Provision of perimeter planting, fencing and landscaping where necessary to reduce wind impacts

4.3.3.4 Noise & Vibration

Noise and vibration can arise from the operation of fixed or mobile plant used in waste

handling and treatment or when delivering waste to site. This can potentially create a nuisance to site neighbours and the environment. Noise can either be continuous or intermittent depending on the operation of equipment or frequency of waste delivery at a site.

Management Techniques

- Identifying site neighbours that are likely to be sensitive to high noise levels. Noise baseline monitoring and impact predictions in accordance with BS 5228, or ISO 9613-2 should be carried out prior to the development commencing, in order to assess the affect noise will have on sensitive locations. Fixed plant should be installed using techniques to minimise noise and vibration during operation. Buildings may need to be constructed with acoustic cladding insulation.
- Adequate maintenance of plant and equipment which will contribute to minimising noise levels;
- Ensuring that noisy plant and equipment are not used for long periods of time and at inappropriate times;
- Monitoring of patterns of waste delivery to ensure that vehicle movements are avoided during specific periods;
- Locating noisy plant and equipment away from residential areas and are enclosed where possible;
- Regular monitoring of noise levels is carried out;
- Investigation and recording of noise complaints;
- Carrying out of noisy activities indoors where possible;
- Ensuring that building doors are kept closed.

Control Techniques

- Maintain site roads to reduce noise and vibration from vehicle movements.
- Use of acoustic screens around fixed/mobile plant and equipment.
- Fit silencing equipment to plant, e.g. baffles/muffles.
- Selection of equipment that conforms to EU Noise Standards.

4.3.3.5 Vehicles

Vehicles are integral to the operation of a Transfer Station or MRF. However, diesel-fuelled engines give rise to emissions such as carbon dioxide, carbon monoxide, oxides of nitrogen, hydrocarbons and particulates. Vehicle movements can also generate noise and vibration and vehicle refueling presents a risk of fuel/oil spillages.

Management Techniques

- At the site design stage consideration could be given to choosing the most fuel efficient and low emission vehicles, e.g. considering alternative fuel technologies such as LPG or Fuel Cells.
- Vehicles operated by the licensee (on-site and off-site) should be subject to regular maintenance and service programmes to ensure that vehicles are running as efficiently as possible. Procedures for assessing fuel use on site could also be implemented in order to monitor efficiency.

Control Techniques

- Regular servicing and maintenance of vehicles.
- Switching off of vehicle engines when not in use (both on site and visiting vehicles).

- Minimising on-site vehicle movements.

4.3.3.6 Mud

Mud dropped by vehicles using the site can cause a nuisance to road users.

Management Techniques

- The site should be designed to reduce the risk of mud generation on access roads. Where the potential exists to generate mud on on-site roads a wheel wash should be provided at the site entrance/exit.
- Site roads should be surfaced and well maintained to avoid mud generation and deposit on public roads. Ensure that vehicles entering or leaving the site are clean. Inert waste and non-hazardous waste tipping areas should be kept clear of loose waste that might be picked up by vehicle tyres.

Control Techniques

- Provision of wheel cleaning facilities.
- Regular inspection of site roads and public highways.

4.3.3.7 Vermin and Insects

Vermin and insects may be present in or be attracted to the waste. This can have an adverse effect on the local environment and lead to complaints from site neighbours.

Management Techniques

- The design should consider whether all waste handling and processing can be carried on indoors. Operational activities should include regular site inspection to check for vermin and insects. Written records of all inspections and any actions taken should be monitored.
- All litter accumulating on or around the site to be removed and disposed on a regular basis.
- A vermin control plan should be established, ensuring that vermin control measures do not cause environmental harm.
- Waste handling and acceptance procedures should ensure that waste is covered and avoid storage of waste for longer than necessary. All biodegradable waste to be removed from the facility within 48 hours of its arrival.

Control Techniques

- Ensure that all biodegradable wastes are removed within 48 hours of arrival.
- Treatment of problem areas with insecticide.
- Use pest-control specialists to control vermin levels if they become a problem.

4.3.3.8 Chemical Storage

Handling and storage of incompatible chemical waste should be conducted in a way that does not provide the potential for incompatible materials to come into contact. This can be achieved by suitable construction of the storage site to provide segregation between incompatible material and bunding. Suitable operational control techniques should be established to ensure wastes are stored in designated areas.

Management Techniques

- Transfer station and MRF design should take account of the need to keep certain

chemicals apart, for example oxidising and toxic substance. Separate dedicated storage areas/bays should be provided for different classes of dangerous substances, including physical barriers such as walls, bunds, etc. The building materials used for the construction of the storage areas/bays should be consistent with the materials to be stored. For example buildings for the storage of dangerous substances should:

  - be constructed of non-combustible materials;
  - for highly flammable liquids, consider the need for fire resistant buildings;
  - have impermeable surfaces provided in all storage areas;
  - be ventilated if required, if flammable substances are to be handled, to prevent the build-up of flammable vapours. Exhaust air from the building or storage tanks should pass through VOC-removal processes prior to discharge to atmosphere;
  - Have bunds which are designed in accordance with CIRIA Report 163 (1997), The Construction of Bunds for Oil Storage Tanks, which incorporates BS 8007: 1987 Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids. The EPA Guidance Note on Storage and Transfer of Materials for Scheduled Activities, 2003 should also be referred to.

- As a minimum, storage be bunded to a volume not less than the greater of the following:
  - 110% of the capacity of the largest tank or drum within the bunded area; or
  - 25% of the total volume of substance which could be stored within the bunded area.
- The design of fuel/oil storage areas should ensure that all valves and pipework are contained within the bunded area when not in use and that storage areas are covered to prevent water ingress where possible.
- The tank and bund should also be covered to prevent ingress of rainwater, which, if it accumulates, would reduce the capacity of the bund to contain tank losses and also complicate the possible recovery of any losses from the bund.
- Drainage from bunded areas should be diverted for separate collection and disposal.
- Ensure there are written procedures for the acceptance and storage of waste, which clearly set out the selection of suitable storage areas for wastes. Ensure adequate emergency procedures, e.g. provision of spillage kits, absorbent materials or containment booms and staff training in spillage management procedures and that all tanks are clearly labelled to indicate contents and the appropriate storage area
- A Risk Assessment should be carried out on-site to assess the risks to workers and the health and safety protection measures required. The Risk Assessment should be reviewed regularly.
- Bund integrity should be monitored on a regular basis to protect against leakage and tanks should be regularly tested for integrity.

Control Techniques

Ensure only compatible wastes are stored within the same storage area/bay (See UK HSE – Chemical Warehousing – the storage of packaged dangerous substances, HSG71).

Only one type of material/substance should be transferred/decanted at any one time.

4.3.3.9 Infection Control

The potential for infection is only applicable in the case of clinical waste transfer stations. Due to the nature of some of the waste handled there is a potential infection hazard for site workers. The risk of infection will be minimal as long as appropriate packaging is used by the waste producer, appropriate handling measures are undertaken and direct contact with waste is avoided at the transfer station.

Management Techniques

- The site design must take into account the waste type to be handled and the site.
- Ensure that site operational procedures are designed to deal with clinical waste and that staff are trained in the relevant Health and Safety procedures. Important issues include:
    - All clinical waste should be packaged in UN-approved containers;
    - Suitable personal protective clothing and equipment to be used by site workers;
    - Waste should be transported in a fully enclosed vehicle body or container, with lockable doors;
    - Rigid containers to be used for transport to a transfer station or final treatment or disposal facility;
    - Infectious waste should be clearly labelled with the appropriate labels.
    - Operational procedures must also cover procedures for dealing with accidents, incidents and spillage, e.g. the appropriate first aid measures for sharps injuries, use of spillage kits and disinfectants.
    - Any containers found on delivery to be breached or suspected of breach must be over-drummed and quarantined.
    - Waste storage areas should be marked and suitably constructed.
    - A Risk Assessment should be carried out on site to assess the risks to workers and the protection measures required. The Risk Assessment should be reviewed regularly.

Control Techniques

- Onsite personnel should wear suitable personal protective equipment, e.g. heavy duty gloves, boots or shoes with protection in the soles and roof, industrial apron or leg protectors, face visors.
- Carry out a site risk assessment and review regularly.
- Provide washing facilities for those handling waste.
- Provide worker immunisation and health monitoring, e.g. for Hepatitis B and tetanus.
- Provide suitable training and information for site workers.

5. BEST AVAILABLE TECHNIQUES FOR WASTE TRANSFER AND MATERIALS RECOVERY FACILITIES

As explained in Section 2, this Guidance Note identifies BAT but obviously does so in the absence of site-specific information. Accordingly, it represents the requirements expected of any new activity covered by the Note, and ultimately the requirement expected of existing facilities, but exclude additional requirements, which may form part of the granting of a licence for a specific site.

The technical feasibility of the measures listed below has been demonstrated by various sources. Used singly, or in combination, the measures represent BAT solutions when implemented in the appropriate circumstances. These circumstances depend on nature of process, plant scale, fuels used, etc.

5.1 PRIMARY REQUIREMENTS

The key environmental issues for the Waste Transfer station sector are air emissions and soil contamination (BREF 2004). The following primary measures are considered BAT for the handling and disposal of waste at a transfer station:

- An EMS that incorporates the following features:
- Management and Reporting Structure.
- Schedule of Environmental Objectives and Targets.
- Annual Environmental Report (AER).
- Environmental Management Programme (EMP)
- Documentation System
- Corrective Action Procedures
- Awareness and Training Programme
- Communications Programme;
- Waste acceptance procedure;
- Waste management system for all incoming wastes and wastes on-site;
- Appropriate storage and handling;
- Wastewater management;
- For hazardous waste processing, the use of an extractive vent system linked to abatement equipment;
- The provision of an impermeable surface across the entire facility and the minimisation of underground tanks and pipework.

5.2 AIR

Emissions to air at transfer stations generally occur as fugitive emissions from materials movements/treatment/processing on site, and vehicles. BAT guidance seeks to regulate these by site operations management.

BAT is to carry out the management and control techniques outlined in Section 4.3.2.1.

5.3 WATER

5.3.1 Discharges to Surface Water

BAT is to ensure that:

- only uncontaminated water such as roof-water is appropriate for direct discharge to surface waters.
- foul water is discharged to surface water only following appropriate treatment.
- For other surface water discharges they must be passed through an interceptor (I.S. EN 585-2:2003 Part 2; effective 7 March 2003).

5.3.2 Discharges to Sewer/by Tanker to Sewer

For discharges to foul sewer, BAT is to ensure that foul water/final effluent quality must meet standards set by the receiving sewage treatment works to adequately treat the wastewaters it receives. The Urban Wastewater Treatment Regulations, SI 214/1994, place specific conditions regarding emission limits from sewage treatment works. They also specify discharge quality conditions on dischargers to sewer to protect the sewer collection systems. The regulations prevent discharges of harmful substances that may be injurious to the health of sewer workers and to the sewer condition.

5.3.3 Discharges to Groundwater

BAT for discharges to groundwater is to:

- Prohibit direct emissions to groundwater of effluents containing certain hazardous substances (List I), and to have strict controls to prevent indirect emissions of substances scheduled in List II of the Directive.
- Maintain an inventory of authorisations given for direct discharge of List II substances to groundwater.
- Remove risks of emissions to groundwater through appropriate controls such as containment, bunding, etc. as described in Chapter 4.
- Provide groundwater monitoring to enable early detection of any contamination of groundwater that may arise from the facility and the setting of its upper limits.

6. BAT ASSOCIATED EMISSION LEVELS

6.1 EMISSION LEVELS FOR DISCHARGES TO WATER

The following table sets out emission levels that are achievable using BAT for wastewater treatment. However establishing emission limit values within a licence for direct discharges to surface water from wastewater treatment plant and stormwater discharges must ensure that the quality of the receiving water is not impaired or that the current Environmental Quality Standards (EQS) are not exceeded.

Table 6.1: BAT associated emission level values for emissions to surface water

Parameter/ Determinand Note 1	Emission Level Value
Total Ammonia	10 mg/l as N
BOD5(at 20°C without nitrification)	70 – 90% removal, or 25mg/l O_2 Note 2
Chemical Oxygen Demand (COD)	>75 % removal or 125 mg/l O_2 Note 2
Total Nitrogen	>80% removal, or 15mg/l Note 2
Total Phosphorus	>80% removal, or 2mg/l Note 2
pH	6 - 9
Suspended solids (total)	>90% removal, or 35 mg/l Note 2
Other parameters	EPA to decide Note 3, Note 4

Note 1: Trigger levels may be put on surface water discharge from settling ponds for parameters such as pH, TOC and conductivity in an EPA licence.

Note 2: Removal/ reduction means removal or reduction in relation to the load of the influent.

Note 3: BAT associated emissions levels are highly dependent on production process, wastewater matrix and treatment. These parameters shall be considered on a site-specific basis when setting emission limit values.

Note 4: Any relevant polluting substances as specified in Schedule to S.I. No. 394 of 2004: EPA (Licensing)(Amendment) Regulations, 2004.

6.2 EMISSION LEVELS FOR DISCHARGES TO SEWER

All discharges to sewer are subject to approval from the Water Services Authority. Compliance with the Water Framework Directive (2000/60/EC) is required where relevant, in particular Article 16.

7. Compliance Monitoring

7.1 MONITORING GUIDANCE

It is essential that the activity and operation of a waste transfer facility and MRF be monitored to an agreed programme throughout the entire life of the facility. Useful background information on the monitoring of emissions and potential nuisance is available in the EPA Landfill Manuals – Landfill Monitoring.

Monitoring scope for waste transfer and MRFs may include:

Requirement	**Examples of Monitoring Parameters** (refer to the EPA Landfill Manuals – Landfill Monitoring for detailed lists)
Surface Water	Chemical parameters; temperature; dissolved oxygen; chemical oxygen demand; ammoniacal nitrogen Biological parameters: aquatic invertebrate populations; aquatic toxicity test
Groundwater	See surface water examples in addition to VOC,TOC, PAH, TPH
Meteorological Data	Temperature; humidity; rainfall; atmospheric pressure
Noise	Statistical (LAeq, (30 mins))& Frequency analysis at selected locations
Odour	olfactory measures
Dust	PM_{10}, Dust Deposition

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8 Decommissioning

8.1 Purpose

The purpose of decommissioning is to return the facility on surrender of the waste licence to a condition suitable for the selected afteruse. To do this the operator will need to demonstrate that following decommissioning the condition of the facility will not cause or be likely to cause environmental pollution.

The extent of the decommissioning/restoration will be dependent on the types of materials accepted, the design of the facility and the selected afteruse.

8.2 Cessation of Waste Transfer and Materials Recycling Activities

The cessation of waste acceptance at a facility initiates a review of the waste licence. This review allows the licence to be surrendered or amended to reflect the change in activities on site. If the site continues to be used for waste management the licence amendments will reflect the Agency's assessment of the licensee's requirements to ensure that the site continues to be properly managed.

If the site will no longer be used for waste management purposes, the licence may be surrendered once the EPA is satisfied the facility will not cause environmental pollution.

8.3 Decommissioning Requirements

For a transfer facility to be decommissioned it must be:

- free of contamination from waste: the facility should be clear of deposited residues, waste and any contamination resulting from the waste transfer activities and MRFs. The land should be decontaminated to restore it to a state established prior to licensing in agreement with the EPA. For existing facilities the standards for decontamination must be agreed with the EPA; and
- free from Continuing Emissions: there should be no releases from the site that require to be managed by the operator, for example surface water run off, dust, odour, etc.

Appendix 1

Environmental Quality Standards

- BREF 2004. European Commission. BREF note on waste treatment - final draft. See: http://eippcb.jrc.es/pages/FActivities.htm

Legislation

- Environment Protection Agency Acts, 1992 to 2007
- Protection of the Environment Bill, January 2003
- Local Government (Water Pollution) Act 1977
- Council Directive *80/68/EEC* on the protection of groundwater against pollution caused by certain dangerous substances. (*OJ L20, 26/01/80*). [amended by 85/208/EC (*OJ L89, 29/03/85*); 87/144/EC (*OJ L57, 27/02/87*); 2000/60/EC (*OJ L 327, 22/12/00*)].
- Protection of Groundwater Regulations 1999 *(SI 41/1999*')
- Local Government (Water Pollution) (Amendment) Regulations 1999 *(SI No. 42 1999)*
- European Community (1980). European Communities (Quality of Salmonid Waters) Regulations, 1988. (*SI 293/1988*)
- European Communities (Quality of Surface Water Intended for the Abstraction of drinking Water) Regulations, 1989. *SI 294/1989*
- Local Government (Water Pollution) Act 1990
- Environment Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations, 1994. *SI 419/1994*
- Council Directive *78/659/EEC* on the quality of fresh waters needing protection or improvement in order to support fish life. *(OJ L327, 22/12/00)*
- Water Quality (Dangerous Substances) Regulations, 2001. *SI 12/2001*
- Air Pollution Act No.6 of1987
- Air Pollution (Air Quality Standards) Regulations, 2002 (*SI 271 of 2002* –replaces *SI 244 of 1987)*

- European Community (1996) Council Directive *96/62/EC* on ambient air quality assessment and management *(OJ: L296/55/96)* & Daughter Directives *1999/30/EC and 2000/69/EC*

- European Community (1991). Council Directive *91/689/EEC* on hazardous waste. (*OJ L377, 31/12/91*)

- Waste Management Act 1996 to 2008

- European Community (1999). Council Directive *1999/31/EC* on the landfill of waste. *(OJ L182, 16/7/99)*

- European Communities (Amendment of Waste Management (Licensing) Regulations 2000), 2002), *SI 337 of 2002.*

- European Community (1996). Council Directive *96/61/EC* concerning integrated pollution prevention and control. *(OJ L257, 10/10/96)*

- Wildlife Act 1976 and Wildlife (Amendment) Act 2000, and Regulations made there under

- European Communities (Natural Habitats) Regulations,1997(*SI 94/1997*) & Amendments

- European Communities (Conservation of Wildbirds) Amendment Regulations, 1997. (*SI 210/1997*)

EPA Publications

- EPA (Environmental Protection Agency) 1995 *Waste Prevention – Solving the Growing Waste Problem*

- EPA (Environmental Protection Agency) 1998 *Waste Recovery/Disposal Activities (Other than Landfill) – Application form*

- EPA (Environmental Protection Agency) 1999 *Waste Licensing – Draft Guidance on Environmental Management Systems and Reporting to the Agency*

- EPA (Environmental Protection Agency) 2000 *Landfill Manuals – Waste Acceptance [DRAFT]*

- EPA (Environmental Protection Agency) 2000 *Waste Licensing – Waste Recovery/Disposal Activities (other than landfill) Guidance Note for Applicants*

- EPA (Environmental Protection Agency) 2003 *Guidance Note on Storage and Transfer of Materials for Scheduled Activities*
- EPA (Environmental Protection Agency) 2008. *Draft* Technical Guidance on *Municipal Solid Waste – Pre-treatment & Residuals Management*
- EPA (Environmental Protection Agency) 1995 *Guidance Notes for Noise in Relation to Scheduled Activities*
- EPA (Environmental Protection Agency) 1996 *Integrated Pollution Control BATNEEC Guidance Note for the Chemical Sector*
- EPA (Environmental Protection Agency) 2001 *Parameters for Water Quality, Interpretation and Standards*
- EPA (Environmental Protection Agency) 1997 *Environmental Quality Objectives and Environmental Quality Standards - The Aquatic Environment – A Discussion Document.*

Standards

- British Standards Institute. BS 1722: *Fences (40 parts, not all active)*
- British Standards Institute (1987). BS8007:1987 *Code of Practice for design of Concrete Structures for Retaining Aqueous Liquids.* British Standards Institute Milton Keynes, UK
- British Standards Institute (1993). BS EN25667-2:1993, BS6068-6.2:1991 (or ISO 5667-2:1991). *Water Quality Sampling. Guidance on sampling techniques*
- British Standards Institute BS 6068-6.11:1993, ISO 5667-11:1993. *Water Quality Sampling. Guidance on sampling of groundwaters.*
- British Standards Institute (1996). BS EN ISO14001:1996, *Environmental management systems – specification with guidance for use.*
- British Standards Institute (1990). BS4142:1990 *Rating Industrial Noise Affecting Mixed Residential and Industrial Areas.*
- British Standards Institute (1997). BS 5228:1997: Part 1 *Noise and vibration control on construction and open sites.*
- British Standards Institute (1993). BS 7385:Part 2 1993 *Evaluation and measurement for vibration in Buildings Part 2: Guide to damage levels from groundborne vibration.*

- British Standards Institute (1992)BS 6472: 1992 *Guide to Evaluation of Human exposure to vibration in Buildings (1Hz to 80Hz)*

Appendix 2

Supplementary References

Legislation

- European Community (1975). Council Directive 75/442/EEC on waste. *(OJ L194 25/07/75)* (as amended by Council Directive 91/156/EEC *(OJ L78 26/03/91)*)
- Waste Management (Hazardous Waste) Regulations 1988. *(SI 163/1998)*
- European Community (1991). Council Directive 91/271/EEC concerning urban waste-water treatment. *(OJ L135 30/05/91)*
- Waste Management (Farm Plastics) Regulations 1997. *(SI No 315 of 1997)*
- Waste Management (Licensing) Regulations 1997. (*SI 133/1997)*
- Waste Management (Packaging) Regulations 1997. (*SI 242/1997)*
- Waste Management (Planning) Regulations 1997. (*SI 137/1997)*
- Waste Management (Register) Regulations 1997. (*SI 183/1997)*
- European Communities (Amendment of Waste Management Act, 1996) Regulations 1998. *(SI 166/1998)*
- Waste Management (Amendment of Waste Management Act, 1996) Regulations 1998. *(SI 146/1998)*
- Waste Management (Licensing) (Amendment) Regulations 1998. *(SI 162/1998)*
- Waste Management (Miscellaneous Provisions) Regulations 1998. (*SI 164/1998)*
- Waste Management (Movement of Hazardous Waste) Regulations 1998. *(SI 147/ 1998)*
- Waste Management (Packaging) (Amendment) Regulations 1998. (*SI 382/ 1998)*
- Waste Management (Permit) Regulations 1998. (*SI 165/1998)*
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998. (*SI 149/1988)*

- Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998. (*SI 148/1988)*
- Waste Management (Water Pollution) (Nutrient Management Planning Consultation) Regulations 1998. (*SI 257/1998)*
- Waste Management (Hazardous Waste) (Amendment) Regulations 2000. *(SI 73/2000)*
- Waste Management (Licensing) Regulations 2000. (*SI 185/2000)*
- Waste Management (Licensing) Regulations 2000. *(SI 185/2000)*

EPA Publications

- EPA (Environmental Protection Agency) 1995 *Environmental Impact Statements* – 2-volume set of Guidelines and Advice Notes Environmental Protection Agency, Wexford
- EPA (Environmental Protection Agency) 1995 Waste Prevention – Solving the Growing Waste Problem
- EPA (Environmental Protection Agency) 1996 Integrated Pollution Control Licensing – *BATNEEC Guidance Note for the Waste Sector* Environmental Protection Agency, Wexford
- EPA (Environmental Protection Agency) 1996 National Waste Database Report 1995
- EPA (Environmental Protection Agency) 1998 Household Hazardous Waste
- EPA (Environmental Protection Agency) 1998 Waste Management Licensing – Guide to Implementation & Enforcement in Ireland
- EPA (Environmental Protection Agency) 1999 Proposed National Hazardous Waste Management Plan
- EPA (Environmental Protection Agency) 2000 National Waste Database Report 1998
- EPA (Environmental Protection Agency) 2000 Waste Management Licensing – Aspects of Licensing Procedures: Objections, Oral Hearings

Appendix 3
Glossary

Terms

Baseline monitoring: monitoring in and around the location of a proposed facility so as to establish background environmental conditions prior to any development of the proposed facility.

BAT: Best Available Technique as defined in Section 5 (2) of the WMA.

Biochemical oxygen demand (BOD): is a measure of the rate at which micro-organisms use dissolved oxygen in the bacterial breakdown of organic matter (food) under aerobic conditions. The BOD, test indicates the organic strength of a waste water and is determined by measuring the dissolved oxygen concentration before and after the incubation of a sample at 20ºC for five days in the dark. An inhibitor may be added to prevent nitrification from occurring.

Biodegradable waste: any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.

Borehole: a shaft installed for the monitoring of and/or the extraction of groundwater. Established by placing a casing and well screen into the boring

Chemical oxygen demand (COD): is a measure of the amount of oxygen consumed from a chemical oxidising agent under controlled conditions. The COD is generally greater than the BOD as the chemical agent will often oxidise more compounds than is possible under biological conditions.

Construction/demolition waste: masonry and rubble wastes arising from the demolition or construction of buildings or other civil engineering structures.

Direct discharge: introduction into groundwater of substances in Lists I or II without percolation through the ground or subsoil.

Decommissioning: works carried out on a waste transfer facility or MRF to allow planned afteruse.

Effluent: a liquid, which flows from a process or system.

Emission: as defined in the EPA Act, 1992 to 2007.

Greenhouse effect: the accumulation of gases in the upper atmosphere which absorb heat –radiated from the earth's surface, resulting in increase in global temperature.

Groundwater: water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

Indirect discharge: introduction into groundwater of substances in Lists I or II after percolation through the ground or subsoil.

List I/II substances: substances referred to in the EU Directives on Dangerous Substances (76/464/EEC) and Groundwater (80/68/EC).

MRF: Materials Recovery Facility: a specialist plant which separates, processes and stores recycled materials that have been collected with waste, either separately (a 'clean MRF') or co-mingled (a 'dirty MRF').

Waters: (a) any (or any part of any) river, stream, lake, canal, reservoir, aquifer, pond, watercourse, or other inland waters, whether natural or artificial;

(b) any tidal waters, and

(c) where the context permits, any beach, river bank and salt marsh or other area which is contiguous to anything mentioned in paragraph (a) or (b), and the channel or bed of anything mentioned in paragraph (a) which for the time being is dry,

but does not include sewer.

Total organic carbon (TOC): mass concentration of carbon present in the organic matter, which is dissolved or suspended in water.

Trigger level: is a value which when encountered requires certain actions to be taken.

Waste Transfer Station: a facility where waste is re-loaded, sometimes sorted or segregated, compacted or baled, with the intention of recovering materials for reuse or making savings on the cost of transport to a disposal or treatment facility as well as the cost of disposal itself.

Appendix 4

Abbreviations

BAT	Best Available Techniques
BATNEEC	Best Available Techniques Not Entailing Excessive Cost
BREF	BAT reference – sector notes being produced by the European Commission
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELV	Emission Limit Value
EMP	Environmental Management Programme
EMS	Environmental Management System
EPA	Environmental Protection Agency
EQO	Environmental Quality Objective
EQS	Environmental Quality Standard
IPPC	Integrated Pollution Prevention and Control
WMA	Waste Management Act