# ENVIRONMENTAL IMPACT STATEMENT

# FOR THE PROPOSED EXTENSION TO THE

# AES FACILITY

# AT

# KYLETALESHA, CO. LAOIS

# MAIN REPORT

# VOLUME 2 OF 3



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**July 2006**

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Abstract: The subject of this Environmental Impact Statement (EIS) is a proposed extension to the existing Advanced Environmental Solutions (AES) facility at Kyletalesha, Co. Laois. The existing facility consists of a waste transfer station and recycling centre operating under Waste Licence Register No. 194 - 1. The applicant proposes to extend the existing waste management facility from 0.8 ha to 4.7 ha with an additional 1.5 ha of screen/buffer.

The current AES facility accepts 40,000 tonnes per annum. It is intended that the proposed facility will deal with up to 99,000 tonnes per annum. It is proposed to extend the facility into adjacent lands for the establishment of a treatment facility for source separated and extraction and treatment of biodegradable waste from MSW. It is proposed to extend the existing waste transfer station building for the temporary storage of hazardous waste i.e. waste electrical and electronic equipment (WEEE).

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## PREAMBLE

*The Applicant*

Advanced Environmental Solutions Ireland (AES) intends to submit this document to Laois County Council as part of the Planning Application for the proposed extension to its waste management facility at Kyletalesha, Co. Laois.

AES is also seeking a waste licence review from the Environmental Protection Agency (EPA) for the operation of the proposed extension.

*Description of the Development*

The subject of this Environmental Impact Statement (EIS) is a proposed extension to the existing Advanced Environmental Solutions (AES) facility at Kyletalesha, Co. Laois. The existing facility consists of a waste transfer station and recycling centre operating under Waste Licence Register No. 194 - 1. The applicant proposes to extend the existing waste management facility from 0.8 ha to 4.7 ha with an additional 1.5 ha of screen/buffer.

AES proposes to extend the existing transfer facility with provision of infrastructure to treat biodegradable waste. Internal infrastructure will be built to manage and process the 99,000 tonnes which will include a mechanical biological treatment facility for the processing of 80,000 tpa mixed residual and source separated biodegradable waste. It is intended to accept both residual municipal waste and source separated waste and to process the streams separately at the facility

The current AES facility accepts 40,000 tonnes per annum. It is intended that the proposed facility will deal with up to 99,000 tonnes per annum. This will include an extension to the existing waste transfer station building for the temporary storage of hazardous waste i.e. waste electrical and electronic equipment (WEEE).

*The Consultants*

Fehily Timoney & Company (FTC) Core House, Pouladuff Road Cork is the lead consultant in the preparation of this EIS.

The odour report was prepared by Odour Monitoring Ireland, Odour & Environmental Engineering Consultants, Unit 32 De Granville Court, Dublin Rd, Trim, Co. Meath.

Traffic counts were completed by Abacus Transportation Surveys Ltd., 39a Connaught Street, Athlone, Co. Westmeath. The Traffic Impact Assessment was conducted by Traffic Wise, Bracetown Business Park, Clonee. Co. Dublin.

Keohane Geological and Environmental Consultancy carried out the Geology/Hydrogeology and Hydrology assessments.

*EIS Structure*

This EIS has been prepared using the "Grouped Format Structure" as recommended in the *Guidelines on the Information to be Contained in Environmental Impact Statements* published by the Environmental Protection Agency (EPA). Using the grouped format structure, an EIS is prepared in a format which examines each topic as a separate section referring to the existing environment, the proposed development, impacts and mitigation measures (i.e. ecology and the proposed development, ecology in the existing environment, impacts on ecology, mitigation measures for ecology, etc.).

The main EIS (Volume 2) is subdivided into the following sections:

- Section 1 is an introductory section, which delineates the policy on waste management infrastructure developments at national, county and local level, and outlines the need for the development

- Section 2 gives a description of the proposed development.

- Sections 3 through 12 describe the various impacts of the proposed development on the existing environment and outlines the measures proposed to mitigate these impacts.

Volume 3 contains the Appendices to the Main Report, providing additional technical back-up material. Volume 1 provides a non-technical summary of the EIS in accordance with the Act (Planning and Development Act, 2000).

# 1. INTRODUCTION

This section describes the main planning waste and legislative policies that relate to the proposed development site and surrounding area.

## 1.1. Site Location and Description

The application site is an extension to the existing AES Waste Transfer Station on the lands to the northeast of the existing facility and along the third class road (L-2117-0) approximately 600 m from the junction with the N80. The town of Portlaoise lies c.4 km to the south of the subject site, with Mountmellick c. 5 km to the north. The site location is illustrated in Figure 1.1. The applicant proposes to extend the existing waste management facility from 0.8 ha to 4.8 ha with an additional 1.4 ha of screen/buffer.

There are a number of commercial/infrastructural facilities located in the vicinity of the site. These include two knackeries to the south-west, a non-hazardous landfill (Kyletalesha landfill) to the west with a coniferous plantation across the road to the southeast. The current land use of the proposed extension area is degraded and dewatered peatland.

A tributary drain of the Triogue River divides the waste transfer station from the proposed extension. It is proposed to culvert this drain in order to join the landbanks.

Vehicular access to the site is achieved via a local road (L-2117-O) which runs along the south eastern boundary of the existing AES site and the proposed extension area.



## 1.2. The Applicant

AES was established in 1996 as Waste Recycling Ireland and commenced trading as AES Ltd in July 2001, through the acquisition of a number of waste facilities. The existing waste transfer station at Kyletalesha has been operating under a waste licence from the EPA since February 2005.

AES operates EPA waste licensed facilities in Navan (Waste Licence Register No. 131-02), Tullamore (Waste Licence Register No. 104-1) and Local Authority permitted facilities in Athlone and Nenagh. AES services customers throughout the Midlands Region. At present a two bin collection system is provided i.e. a dry recyclables bin and a residual bin. It is likely a third bin for the collection of source separated bio-degradable waste such as food and garden waste will be provided in the future. This service will be rolled-out in accordance with the targets set out in the 2005 - 2010 Midlands Waste Management Plan.

The policy of the company is to manage waste in a manner which maximises the reuse and recycling of materials while minimising the volume sent to landfill; this is achieved by utilising the most modern technologies, ensuring regulatory compliance and working in partnership with customers and organisations at international, regional and local levels.

## 1.3. The Proposed Development

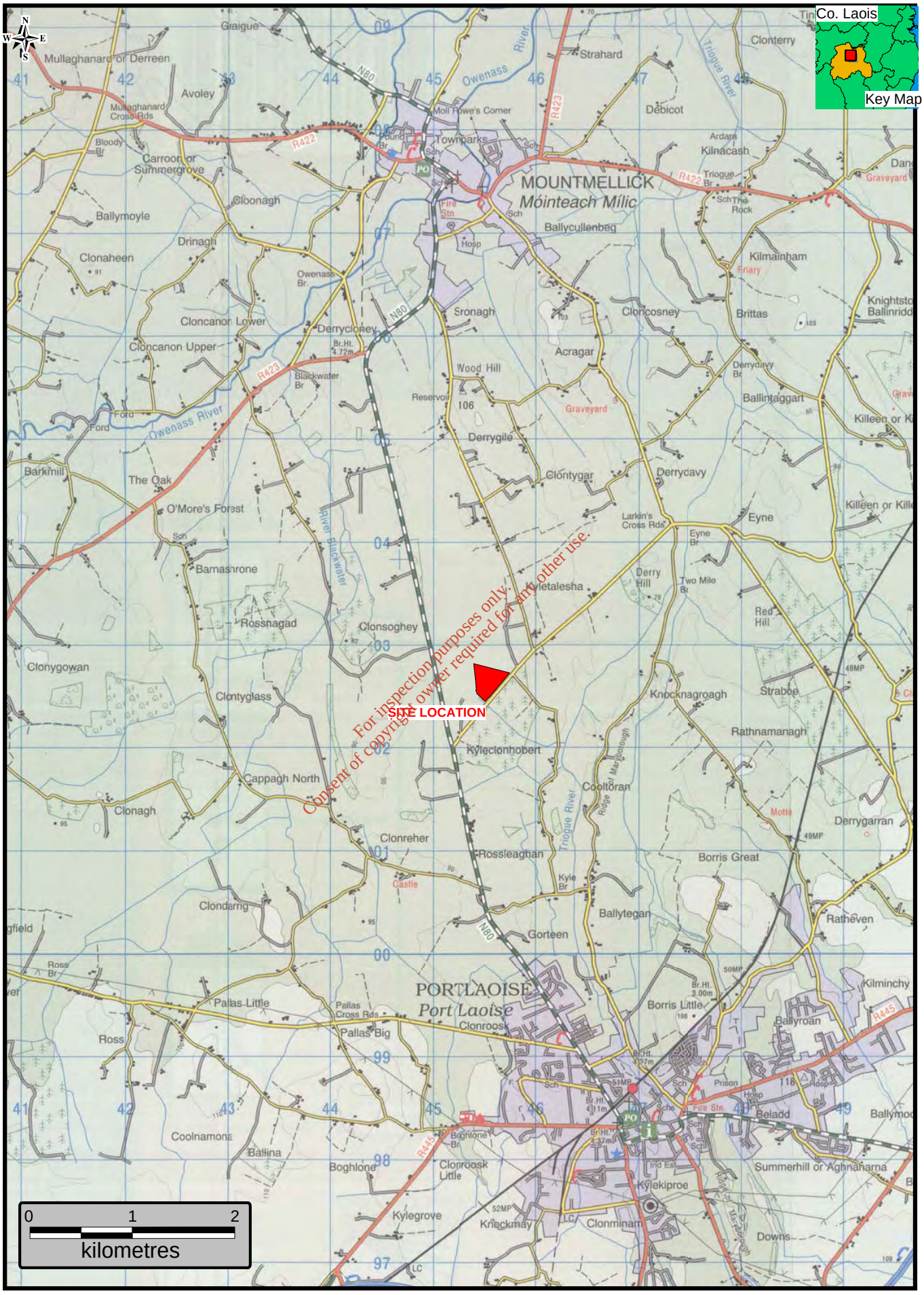
The proposed development will include the extension of the existing waste transfer station to accommodate an area for the acceptance of small quantities of hazardous waste. In addition, it is proposed to establish infrastructure for the treatment of mixed residual waste (i.e. grey bin) and source separated biodegradable waste (i.e. brown bin). These two wastes will be treated as separate waste streams using two separate process lines.



The facility currently accepts 40,000 tonnes per annum. It is intended that the proposed facility will deal with up to 99,000 tonnes per annum.

Source separated biodegradable waste will be treated in a Bedminster Digester followed by composting or by anaerobic digestion. Mechanical biological treatment, using a second Bedminster Digester, will be used to separate the biodegradable fraction from the residual municipal waste. The resulting fraction will then be processed by composting or by anaerobic digestion. The actual process to be undertaken will be dependant on the commercial viability of anaerobic digestion.

The existing building on the site will be used for storage of waste with potential for recovery (e.g. cardboard/paper, metals, glass, timber etc) The unit for storage of hazardous waste, such as waste electrical and electronic equipment (WEEE) will be able to accommodate 5,000 tonnes per annum.




# Site Location

**Figure 1.1**

**Fehily Timoney & Company**

## 1.4. Development Policy

The new County Development Plan for County Laois was adopted in January 2006 and covers the period 2006 - 2012. The Plan outlines a number of polices which are relevant to the proposed development. In particular Chapter 7 – *Environmental Management* outlines the specific polices for waste management and the protection of the environment.

The Plan sets out the overall aim of environmental management as "*To ensure a good quality of life for the citizens of Laois through maintaining and improving wastewater treatment and water supplies and to minimise the adverse impacts of development on the environment through policies on the management of wastes and emissions*".

To achieve these goals specific objectives have been set out for:

- Environment
- Waste Management
- Noise Pollution
- Air Pollution
- Energy from Biomass and Waste

These are outlined below.



***ENV 1 Environmental Policy***

*It is Council Policy to:*

- *Reduce quantities of waste produced*
- *Encourage re-use and recycling of materials*
- *Protect the natural and built environment from hazardous accidents.*

***ENV7 Waste Management***

*It is Council Policy to:*

- *Plan, organise, authorise and supervise waste operations in the County*
- *Secure the objectives of the Waste Management Plan for the Midlands Region made in September 2001 in so far as it relates to County Laois and the new plan to be adopted in 2006;*
- *Enforce the provisions of the Waste Management Acts 1996 – 2003;*
- *Maintain and develop its landfill site at Kyletalesha in accordance with E.U. Directives and Irish legislation;*
- *Facilitate recycling by providing 'bring' facilities throughout the county and civic amenity sites in accordance with the Waste Management Plan, these sites should be of high quality and in well maintained visible locations;*
- *Require new developments to have facilities to foster the recycling of waste material.*

***ENV8 Noise Pollution***

*It is Council Policy to:*

- *Carry out their statutory functions in relation to Noise Pollution.*

Section 3 of the EIS describes the potential impacts on noise from the proposed development.

***ENV9 Air Pollution***

*It is Council Policy to:*

- *Carry out their statutory functions in relation to Air Pollution.*

Section 4 of the EIS describes the potential air emissions from the proposed development.

**Energy from Biomass and Waste**

*The Council will seek to respond positively to applications for biomass or waste to energy projects, in the context of a sustainable energy policy with the exception of thermal treatment plant.*

The proposed facility has the potential to generate energy if anaerobic digestion is installed at the site.



***NH11 Peatlands***

*It is the Council's Policy to:*

- *Ensure that peatland areas which have been designated (or proposed for designation) as NHAs or SACs are conserved and managed appropriately.*

The proposed extension area is located on peatland which is largely degraded and dewatered. The site is not designated or proposed for designation as NHA or SAC. Section 8 on the EIS describes f the existing peatland and associated flora and fauna within the area identified for the proposed extension.

## 1.5. Policy and Legislation

### 1.5.1. Midlands Waste Management Plan 2005 – 2010

The Waste Management Plan for the Midland Region applies to the administrative areas of five Authorities, which have a combined population of 286,373 based on the 2002 Census. These five authorities are Offaly County Council, Longford County Council, Laois County Council, North Tipperary County Council and Westmeath County Council.

The Plan has set a recycling target of 46%, thermal treatment 37% and landfill disposal 17%. In 2003 the household recycling rate in the Region was 10% while 76% of the total household waste arisings was landfilled. Commercial recycling rates were significantly higher at 36% but 43% of the total commercial waste was still landfilled.

The Plan acknowledges that the establishment of a thermal treatment facility within the region "*could take a period in excess of 5 – 7 years. In the interim residual waste will be primarily landfilled*". Although Ireland has been granted a derogation of the EU Landfill Diversion targets for biodegradable waste, from 2006 - 2010 and 2009 -2013, it will be necessary for the Region to establish an interim solution to thermal treatment to divert waste away from landfill in order to meet these pending targets .

The Plan policy (Part 5) sets out specific objectives for the Region for the period 2005 – 2010 and in particular specific objectives for the establishment of:

- Biological treatment facilities for source separated organic waste
- Mechanical Separation of Mechanical Biological Treatment (MBT) facilities for the treatment of mixed residual waste (i.e. grey bin)

The Plan also promotes the extension of existing waste transfer stations which will include pre-treatment technology.

Suitable licensed facilities are needed to ensure the successful implementation of the Plan. In particular waste treatment facilities for source separated biodegradable waste as well as mixed residual waste are required for the region to meet the various mandatory National and European biodegradable diversion targets. The proposed development will provide such a facility and will therefore contribute to the successful implementation of the Plan.

A summary of the policies of Midlands Waste Management Plan relevant to this project are outlined below:

Section 16.3 – Waste Collection

This section outlines the Region's preferred policy for the collection of municipal and industrial waste using a three-bin system "*The requirement for the separate collection of biodegradable waste shall be introduced through the waste permitting system to all permit holders from 2006*".

Section 16.5 – Biological Treatment

This section sets out a specific policy of "*The Local Authorities shall reduce the quantity of biodegradable waste disposed of to landfill in accordance with the mandatory requirements of the EU Landfill Directive (1999) and the targets set out in the Draft National Biodegradable Waste Strategy (2004)".*

This section sets a target for 2010 for a minimum total capacity of 30,000 tonnes per annum for biological treatment within the Region. At present there are no biological treatment facilities within the Region.

Section 16.6 - Material Recovery Facilities/Waste Transfer Stations

This section sets out the policy for the development of Material Recovery Facilities (MRFs) and Waste Transfer Stations. It's specific policy states "*The Local Authorities shall support the development of additional transfer facilities where they can be shown to be consistent with the overall objectives of he Plan and have regard to good principles of siting".*

Section 16.8 - Mechanical Separation and Mechanical Biological Treatment (MBT)

This section sets out the policy for the Region on the pre-treatment of residual waste. It states that "*in order to meet the requirements of the EU Landfill Directive (1999), the development of pre-treatment type facilities will be required to process mixed municipal waste".* It further states *"to reduce the level of biodegradable content of the residual waste stream being disposed of at landfill, it will be necessary to pre-treat the mixed residual municipal and industrial waste streams prior to landfilling. Reduction in the biodegradable content of the residual waste stream can be achieved through processes such as Mechanical Biological Treatment (MBT) of Mechanical Separation".*



Section 16.14 – Siting Guidelines

The Midlands Waste Management Plan sets outs policies for the siting of future waste management infrastructure and in particular biological treatment facilities. The policy states that the location of such a facility will need to have regard to the requirements set out in the:

- Draft EU Council Directive on the Biological Treatment of Biowaste
- Animal By-products Directive (1774/2002/EC).

These are discussed further in Section 1.6.

## 1.5.2. National Policy – Waste Management: Changing Our Ways

Government policy in relation to waste management is set out in the policy statement entitled *Waste Management: Changing Our Ways* published by the Department of the Environment and Local Government (DoELG) in September 1998. The policy statement incorporates the EU Waste Management hierarchy of waste prevention/minimisation/reuse/recycling/energy recovery/disposal as well as earlier policy statements including Government strategy documents such as *Recycling for Ireland* (July 1994) and *Sustainable Development: A Strategy for Ireland* (April 1997).

The DoELG policy statement highlights the need for major change in the planning, financing and operation of waste management by local authorities. It outlines a clear commitment to reduce dependency on landfill as a primary waste disposal route. It encourages the development of a smaller number of well-designed and managed landfills for the receipt of *residual* waste. Residual waste is waste which has undergone some form of treatment to remove recyclable material or to further process the waste in order to achieve a volumetric reduction.

The policy document *Waste Management: Changing Our Ways* outlines ambitious targets for waste management as follows:



- *a diversion of 50% of overall household waste away from landfill;*
- *a minimum 65% reduction in biodegradable wastes consigned to landfill;*
- *the development of waste recovery facilities employing environmentally beneficial technologies as an alternative to landfill, including the development of composting and other feasible biological treatment facilities capable of treating up to 300,000 tonnes of biodegradable waste per annum nationally;*
- *recycling of 35% of municipal waste;*
- *recycling at least 50% of construction and demolition (C & D) waste within a five year period, with a progressive increase to at least 85% over fifteen years;*
- *Rationalisation of municipal waste landfills, with progressive and sustained reductions in numbers, leading to an integrated network of some 20 state-of-the-art facilities incorporating energy recovery and high standards of environmental protection; and*
- *An 80% reduction in methane emissions from landfill, which will make a useful contribution to meeting Ireland's international obligations.*

The proposed extension to the AES waste transfer station will facilitate the collection, sorting and bulking of recyclable materials prior to onward shipment to appropriate recycling facilities as well as the processing of source separated biological waste and mixed residual waste. This development will contribute to a reduction in waste consigned to landfill and contribute to an increase in the recycling rates of municipal and industrial wastes within the Midlands Region.

### 1.5.3. Preventing and Recycling Waste – Delivering Change – a Policy Statement

A second policy statement was issued by the Minister for the Environment and Local Government in 2002. In this policy statement entitled 'Preventing and Recycling Waste - Delivering Change', the Government sets out objectives for developing biological treatment facilities. It states that *"a network of centralised biological treatment facilities is required to deal with organic and green wastes. This requirement is only now beginning to be addressed, but the provision of the necessary capacity is readily within the scope of local authorities and the private waste industry, once segregated collection services are implemented."*

This statement recognises that composting will be among the preferred biological treatments and that *"compost from municipal waste can have a widespread application as an organic mulch/fertilizer in many areas such as parks maintenance, landscaping, landfill restoration and site-remediation purposes… Ultimately however composting whether carried out by the private sector or public authorities, should generate a product with a clear market value. To do so it must be developed as a high quality product capable of competing with existing organic products in terms of price and quality."*

This policy statement incorporates the EU waste management hierarchy of waste prevention, minimisation, reuse, recycling, recovery and disposal as outlined in '*Waste Management: Changing our Ways'* published in September 1998, as well as earlier policy statements, including Government strategy documents such as "Recycling for Ireland" (July 1994) and 'Sustainable Development: A Strategy for Ireland' (April 1997).



The 'Delivering Change' policy document:

- highlights the necessary disciplines that must be imposed within waste management systems to secure real progress on waste prevention, reuse and recovery
- outlines a range of measures that will be undertaken in the interests of minimising waste generation and ensuring a sustained expansion in reuse and recycling performance and
- identifies issues and possible actions which require further systematic consideration

The government is committed to targets identified in *Changing Our Ways* and has undertaken to achieve the following objectives as set out in the '*Preventing and Recycling Waste, Delivering Change*' policy document:

- to draw up a national strategy on biodegradable waste in the municipal waste stream
- to support the provision of infrastructure for the biological treatment of organic waste
- to introduce product standards for compost derived from municipal waste
- to encourage the development of markets for these products
- to support the development of widespread home composting

## 1.5.4. The National Biodegradable Waste Strategy

The National Strategy on Biodegradable Waste was launched on 6th April 2006 by the Department of Environment, Heritage and Local Government, and clearly highlights the urgent need for waste facilities with infrastructure to deal with biodegradable waste. The amount of biodegradable waste that needs to be diverted to meet Ireland's first target deadline is estimated at 1.4 million tonnes. To put this into perspective, targets for the progressive diversion of biodegradable waste are based on the amount of biodegradable waste generated in the baseline year of 1995, when Ireland generated some 1.3 million tonnes. Therefore Ireland's first target is to divert more waste than was actually generated in the baseline year of 1995. At the launch of the Strategy, Minister Roche stated that "*The challenge involved in meeting these targets is great*" "*and will require a concerted effort on everyone's part if we are to succeed.*" AES wish to provide infrastructure at Portlaoise to treat source separated waste and to extract and treat the biodegradable fraction in MSW to divert residual biodegradable waste from landfill.

The National Biodegradable Waste Strategy focuses on biodegradable waste from municipal sources, such as from domestic dwellings and commerce. Table 1.1 illustrates that 75% (based on 2004 figures) of this waste is potentially biodegradable and indicates that there is a huge potential for the additional diversion of biodegradable wastes away from landfill sites. Surveys showed that the diversion rate for biodegradable waste in 2004 was 32%. Accordingly, the Report indicates that an increase in recycling and biological treatment capacity is needed to meet national and EU landfill-diversion targets.



**Table 1.1: Biodegradable Municipal Waste Generation in Ireland (2004)***

| Material (tonnes) | Gross Quantity Available | Landfill | Recovered |
|---|---|---|---|
| paper & cardboard | 821,903 | 446,306 | 375,597 |
| textiles | 157,521 | 146,986 | 10,535 |
| organic waste | 780,460 | 696,955 | 83,505 |
| wood | 175,330 | 14,180 | 161,150 |
| **Total** | **1,935,214** | **1,304,426** | **630,788** |

Table 1.2 illustrates the requirements, showing that the amount of biodegradable waste being landfilled must drop from approximately one million tonnes to 450,000 tonnes by 2016.

**Table 1.2: Ireland's Landfill Targets for Biodegradable Waste†**

| 1995 | Baseline Biodegradable Waste (BMW) Generation: | 1,289,911 tonnes |
|---|---|---|
| **Year** | **Target** | **BMW allowed in landfill (tonnes)** |
| 2010 | 75 % | 967,433 |
| 2013 | 50 % | 644,956 |
| 2016 | 35 % | 451,469 |

* Source: Strategy Report of the National Strategy on Biodegradable Waste, Table 2.2

† Source: Strategy Report of the National Strategy on Biodegradable Waste, Table 3.1

The requisite major reduction in biodegradable municipal waste passing to landfill in turn implies the development of alternative waste management capacity.

Table 1.3 illustrates the additional infrastructure required nationally. The capacity figures portrayed in this table also accommodate the very significant annual increases in waste generation per capita that has been a feature of waste management in Ireland in recent years. It shows that nationally over 1.8 million tonnes of waste will require treatment by alternative non-landfill technologies by 2016.

**Table 1.3: Total Biodegradable Waste Treatment Capacity Required to Meet Ireland's Targets**[‡]

| Year | Additional Treatment Capacity Needed (tonnes) |
|---|---|
| 2010 | 1,412,083 |
| 2013 | 1,729,585 |
| 2016 | 1,817,262 |

The Report identifies MBT as a waste treatment technology which can "*limit the quantity of biodegradable municipal waste which ultimately needs to be sent to landfill and capacity developed should be suitable for the treatment of source separated organics in the future*".



By 2016, the Strategy requires that approximately 1.82 million tonnes of BMW will need to be diverted annually from landfill if waste growth continues as anticipated. This will require a substantial provision of additional recovery capacity, compared to the current capacity of approximately 630,000 tpa.

Table 1.4 outlines the proposed national biodegradable municipal targets for 2016. It should be noted that the proposed landfill diversion level of 80.1% in Table 1.4 appears to exceed the target of 65% set by Landfill Directive for 2016. This is because the Directive's targets are based on the 1995 national level of usage of landfill for the disposal of biodegradable waste. Since then, economic growth and other factors have very significantly escalated the quantity of waste arising in Ireland, thereby causing additional challenges to the achievement of the Directive's targets.

**Table 1.4: Proposed National Biodegradable Municipal Waste Targets for 2016**[§]

| | Percentage of Biodegradable Municipal Waste | Tonnes Diverted from Landfill |
|---|---|---|
| Recycled | 38.6 % | 875,371 |
| Biological Treatment | 19.5 % | 442,129 |
| Residual Treatment | 22.0 % | 499,762 |
| Total Landfill Diversion | **80.1 %** | **1,817,262** |
| Remaining Landfill | 19.91 % | 451,469 |

[‡] Source: adapted from the Strategy Report of the National Strategy on Biodegradable Waste, Table 3.2. These figures assume a waste growth of 3 % per annum.

The National Strategy on Biodegradable Waste also sets down targets for individual waste streams. Each waste management plan is required to propose arrangements on how these targets are met:

- For paper and cardboard, the recycling targets for 2010 are set at 45% for households and 61% for commerce going up to 55% and 71% in 2013 and to 60% and 73% respectively in 2016. It is acknowledged that these levels will require significant investment in both kerbside collection arrangements, as well as "bring" facilities such as civic waste sites.
- A national home composting target of 20% of in urban households and 55% of rural households has been set.
- All of these initiatives will leave a fraction of residual waste. This is estimated by the Strategy Report from 308,904 tonnes to 499,762 tonnes per annum over the period 2010 to 2016. This material is required to be thermally treated and/or subjected to mechanical-biological treatment.

### 1.5.5. Landfill Directive

The Council Directive on the Landfill of Waste (1999/91) was required to be transposed into Irish law on 16 July 2001. Its overall objective is to tightly define and unify the nature of acceptable landfill usage, as well as promoting EU-wide standards for landfill site design, operation and post-closure. Overall, the purpose is to reduce and minimise the potential environmental impacts which may otherwise occur at any point in the life-cycle of a landfill.



The Directive requires that, with the exception of inert waste, all waste being landfilled must be pre-treated. For landfill projects which are started after 16 July 2001, this requirement applied immediately. For existing landfills, this must happen at the latest before July 2009.

Besides technical standards, the Directive also contains binding obligations for an EU-wide reduction of the use of landfill as an option for the disposal of biodegradable municipal waste (BMW). It contains explicit landfill use reduction targets which must be applied nationally. These targets are to be viewed against baseline BMW landfilled in each member state for the year 1995. These are shown in Table 1.5. Further derails on Ireland's projected diversion requirements are discussed in Section 1.5.4 above.

**Table 1.5: Landfill Directive Biodegradable Waste Diversion Targets**

| Target | Derogation |
|---|---|
| 75 % | 2010 |
| 50 % | 2013 |
| 35 % | 2016 |

### 1.5.6. Packaging Directive

The aim of Directive 94/62 on Packaging and Packaging Waste is to harmonise measures on the management of packaging waste across the EU. This is to preclude countries using packaging waste recovery laws and standards as barriers to free trade, as well as to encourage the reduction of the generation of packaging-related residuals. The Directive covers all packaging, including that from industry, commercial activities and householders.

The Packaging Directive required member states to have "recovered" between 50–65% by weight of packaging by 30th June 2001. Within this general target, between 25–45% of packaging must be "recycled", with individual minimum limits being set so that the recycling rate is to be no less than 15% for each packaging material. The Directive makes a distinction between "recovery" and "recycling": "Recycling" excludes combustion and subsequent energy recovery.

The Packaging Directive was significantly amended in 2005 with new and more onerous recovery and recycling targets being set. These require that, by 31st December 2008, no less than 60% of packaging waste is recovered or incinerated and that between 55% and 80% of packaging waste is recycled. Recycling targets are also set for a range of different types of packaging: glass 60%; paper and board 60%; metals 50%, plastics 22.5%; wood 15%. Again, the distinction between "recovery" and "recycling" described above applies in the respect of these percentages.

The Directive allows Ireland discretion to elect to postpone the achievement of these targets, setting down 31st December 2011 as the final deadline for compliance.

It should be noted also that the amended Packaging Directive contains provisions for the setting of further targets, beyond those described above and for a period ending in 2014. These are to be published before the end of 2007.



## 1.6. Animal By-Products Regulation

In 2003 the EU Regulation on Animal by-Products Regulation (1774/2002) came into force. The Animal By-Products Regulation (ABPR) is important in a waste context in that it regulates the disposal and use of animal by-products that are not intended for human consumption. The ABPR divides by-products into 3 categories, specifying the means of disposal for each category.

If catering waste or any other waste of animal origin is collected and processed in a composting or a bio-gas facility, the ABPR apply. ABPR are implemented in Ireland by the Department of Agriculture and Food. The Department of Agriculture and Food have proposed a two-stage approval process for composting or biogas facilities which use animal by-products. This comprises;

1. Notification to build
2. Formal application for approval when the facility is built

The requirements of the regulations with respect to the proposed facility extension are outlined in the following sections.

### 1.6.1. Compost Processing - Technical Standards

Under EU Regulation 1774/2002 there are three categories of animal by-product, with these being determined in accordance to the potential risk of animal-related disease being spread by inadequate processing or disposal methods. The proposed wastes to be accepted at the facility are classified as a *Category 3 material – low risk*. These include:

- catering waste; which is defined in the EU Regulation as meaning *"all waste food including used cooking oil originating in restaurants, catering facilities and kitchens, including central kitchens and household kitchens";*
- food factory waste and food-derived waste from supermarkets; which are defined as "*former foodstuffs of animal origin, or former foodstuffs containing products of animal origin, other than catering waste, which are no longer intended for human consumption for commercial reasons or due to problems of manufacturing or packaging defects or other defects which do not present any risk to humans or animals";*

Under EU Regulation Category 3 waste is permitted to be used as a feedstock in a biogas (anaerobic) or composting plant (aerobic). These facilities must be equipped with a number of features:

- **Biogas facility** – a pasteurisation/hygienisation unit which cannot be by-passed, continuous time and temperature monitors, an adequate safety system to prevent insufficient heating and adequate facilities for cleaning and disinfecting of vehicles and containers.
- **Composting facility** - a closed composting reactor which cannot be by-passed, continuous time and temperature monitors, an adequate safety system to prevent insufficient heating and adequate facilities for cleaning and disinfecting of vehicles and containers.



*Processing Standards*

EU Regulation 1774/2002 contains stringent processing criteria which apply when animal by-products are being used as a raw material in a biogas or composting plant. For the higher risk animal by-products these involve:

- Maximum particle size before entering the composting reactor: 12 mm
- Minimum temperature in all in the reactor/unit: 70°C
- Minimum time in the reactor at 70°C (all material): 60 minutes

However, in respect of catering waste passing to biogas and composting facilities, these provisions can be relaxed.

The mechanism for doing this is contained in paragraph 14 of Chapter II to Annex VI of Regulation 1774/2002. That paragraph states that "…*pending the adoption of rules in accordance with Article 6(2)(g), the competent authority may, when catering waste is the only animal by-product used as raw material in a biogas or composting plant, authorise the use of processing standardised in the Chapters provided that they guarantee an equivalent effect regarding the reduction of pathogens.*

The use of alternative operating parameters is taken up by the Department of Agriculture's Guidelines. Section 6.3 states "*In the case of a plant where catering waste is the only animal by-product to be used as a feedstock; other equivalent operating parameters may be accepted. The manufacturer/manager of a facility must produce documented evidence/research to guarantee an equivalent effect regarding the reduction of pathogens, unless the method employed is otherwise officially approved by the EU Commission as an acceptable alternative treatment method*".

This provision allows for alternative approaches to the treatment requirements set out in the EU Regulation to be adopted once the same level of reduction in pathogens can be achieved. For example, the Department of Agriculture has referenced the standards set out in the English Animal By-product Regulations 2005 (SI 2347/2005) as an alternative to the restrictive requirements specified in EU Regulation 1774/2002. These are outlined in Tables 1.6 and 1.7, being contained in Part II of Schedule 1 to the English legislation.



**Table 1.6: Composting – Catering Waste**

| System | Composting in a closed reactor | Composting in a closed reactor | Composting in housed windrows |
|---|---|---|---|
| Maximum particle size | 40 cm | 6 cm | 40 cm |
| Minimum temperature | 60°C | 70°C | 60°C |
| Minimum time spent at the minimum temperature | 2 days | 1 hour | 8 days (during which the windrow shall be turned at least 3 times at no less than 2 days intervals) |

**Table 1.7: Biogas – Catering Waste**

| System | Biogas in a closed reactor | Biogas in a closed reactor |
|---|---|---|
| Maximum particle size | 5 cm | 6 cm |
| Minimum temperature | 57°C | 70°C |
| Minimum time spent at the minimum temperature | 5 hours | 1 hour |

In addition to the requirements set out in the above tables, the English legislation stipulates the following requirements for the treatment of catering waste at composting plants (see SI 2347/2005, Schedule 1, Part II, para 3):

*If the approval for a composting plant specifies one of the methods in the table, it shall specify which one and, in addition, shall have as a condition either that—*

*(a) measures shall be taken at source to ensure that meat was not included in the catering waste and that following treatment the material is stored for at least 18 days (storage need not be in an enclosed system), or*
*(b) following the first treatment, the material shall be treated again using one of the methods in the table and specified in the approval (not necessarily the same method as was used for the first treatment) except that, if the treatment is in a windrow, the second treatment need not be in a housed windrow.*

With respect to the proposed development at Kyletalesha, the incoming waste will consist of both mixed residual and source-separated food waste and will include meat. This means that sub-paragraph (a) above will not apply and that the process will fall within sub-paragraph (b). Accordingly, the Bedminster system will comprise of the first stage treatment, with the output from this system undergoing further treatment using static aerated piles. Although it is not required for these windrows to be housed, a purpose-built maturation hall will be constructed at the Kyletalesha site.

As an alternative, if the biogas processing route is selected, the following provisions of the English legislation are applicable. These are contained in Paragraph 4 to Part II to Schedule 1 of the English legislation. This requires that:

*The approval for a biogas plant shall specify one of the methods in the table and in addition require that either —*

*(a) measures were taken at source to ensure that meat was not included in the catering waste; or*
*(b) following treatment the material is stored for an average of 18 days*

If an anaerobic treatment technology is used in the biogas plant to be constructed at the Kyletalesha facility, the Bedminster system (aerobic) will again perform the first stage treatment, with the output passing to an anaerobic digester which will operate to conditions outlined in Table 1.7.

*Hazard Analysis and Critical Control Point Plan (HACCP)*

A Hazard Analysis and Critical Control Point (HACCP) plan must be prepared as part of an application to the Department of Agriculture to operate a composting or biogas plant. This plan must include the following information:

- Procedures at the plant for reception of by-products waste
- Processing of material to the relevant standards
- Hygiene controls – including cleansing and disinfection facilities, as well as arrangements to prevent cross-contamination of processed material with raw material through the use of flow diagrams

- Record keeping including laboratory results
- Details of corrective actions to be taken as necessary

AES will prepare a HACCP plan for the proposed facility for submission to the Department of Agriculture.

*Use of Output from Biogas and Composting Plants Ireland*

EU Regulation 1774/2002 place a number of restrictions on the use of the resultant compost from aerobic and anaerobic process, in particular its application to pasture land.

It is the intention of the applicant to market the end product for use in landscaping, restoration and other similar activities, all of which do not involve its application to pasture land. In the absence of standards, the output specification of the proposed EU draft (2nd version) working paper on biological treatment of biowaste will be used as a guideline for the quality of the end product. It is also expected that the EPA's waste licence will mandate that certain standards are to be achieved prior to the marketing of this material.



## 1.7. Need for the Development

The principal aim of the proposed development is to minimise the amount of biodegradable waste being consigned to landfill through recycling and recovery which specifically meet the needs identified in EU, national and regional polices on waste management. The government's "Delivering Change" document identifies a national infrastructural deficit of a network of centralised biological treatment facilities to deal with organic and green wastes.

In particular, the proposed development is very much in keeping with, and is to be purpose-built to meet the requirements for waste recovery, recycling and composting/anaerobic digestion identified in the:

- The Midlands Waste Management Plan 2005 - 2010
- Waste Management - Changing Our Ways
- Preventing and Recycling Waste - Delivering Change
- The National Strategy on Biodegradable Waste
- Landfill Directive

The proposed development is consistent with the policy objectives of the Waste Management Plan for the Midlands Region. It will provide infrastructure for treatment of biodegradable waste as well as recycling infrastructure for C&D and hazardous waste thus reducing reliance on landfill capacity in the Region.

The Waste Management Plan for the Midlands Region emphasises the need to divert waste from landfill to allow the region to meet the statutory diversion targets. The Plan identifies the need to increase the capacity of biological treatment facilities within the Region as well as establishing treatment facilities for residual waste streams. While the Plan does set out thermal treatment as the preferred process for this, it acknowledges that a facility of this type will not be in place for a least 5 -7 years.

The proposed extension to the AES facility at Kyletalesha will provide for treatment (composting or anaerobic digestion) of source separated organic waste and the extracted biodegradable fraction from mixed residual waste and non-hazardous sludges. The treatment of the biodegradable fraction will render it suitable for reuse, for instance, for landscaping applications on infrastructural projects, for parks maintenance, as a soil conditioner or for capping landfills.

## 1.8. EIS Requirements

AES is submitting this EIS in respect of the proposed waste management facility at Kyletalesha, in accordance with the following legislation:

- Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment
- S.I. 600 of 2001 - Planning and Development Regulations, 2001

With reference to the development, S.I. 600 of 2001 (Fifth Schedule, Part 11(b)) requires that an EIS be submitted as part of a planning application for "*Installations for the disposal of waste with an annual intake greater that 25,000 tonnes not included in Part 1 of this Schedule"*. The proposed development will accept approximately 99,000 tonnes of waste per annum.



The EIS was prepared having regard to guidelines issued by the Environmental Protection Agency, namely:

- 'G*uidelines on the information to be contained in Environmental Impact Statements',* (EPA, March 2002)
- *Advice notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003).*
- *Department of Agriculture Guidelines for Composting and Biogas Plants*

The document has been structured according to the grouped format structure, as described in (b) above. The guidelines recommend that EIS documents be kept as concise as possible.

The report is submitted in three volumes:

**Volume 1:** Non-Technical Summary
**Volume 2:** Main Report
**Volume 3:** Appendices.

## 1.9. Alternatives

### 1.9.1. Alternative Locations

The following factors were taken into consideration by AES when considering alternative locations:

1. The proposed facility to be located in an area which is not densely populated. An agricultural area would be preferable.
2. The site must offer sufficient land area to accommodate an enclosed building where all waste treatment will take place.
3. The site must offer sufficient land space to accommodate a biofilter to treat odorous air extracted from the building.
4. The building (existing or proposed) must be large enough ensure sufficient treatment capacity for approximately 80,000 tonnes of organic waste material.
5. The boundary of the facility must not be located within 250 metres from the nearest sensitive receptor.
6. The proposed development must not have a significant visual impact on local residents and must be in-keeping with the surrounding countryside as much as possible.
7. There must be good access roads and a good overall transport network in the area.
8. The site must be in proximity to counties in the Region where there are significant amounts of biodegradable waste arisings.



Based on the above, the alternative chosen by AES (Irl) ltd was to extend the existing waste transfer station at Portlaoise, which was found to satisfy all of the above requirements and will provide an optimum site location for the proposed treatment of biodegradable waste. This site is in operation under a waste licence from the EPA and it is the intention of AES to apply for a review of this licence to include the operation of the treatment of biodegradable waste at the facility.

## 1.9.2. Alternative Design/Processes

The following waste management treatment technologies are available for municipal biodegradable waste:

- incineration
- anaerobic digestion
- vermi-composting
- ethanol production
- gasification
- pyrolysis
- Composting

*Incineration*

Incineration is a well-known and widely used method of waste treatment. It has the advantage of generating heat which can be utilised either directly or to produce electricity.

However, its cost-effectiveness applies generally to large-scale operations, typically at a regional scale. It would not be likely to be cost-competitive at a more local level.



*Anaerobic Digestion*

Anaerobic digestion (AD) is the breaking down (or digestion) by bacteria of organic material, without the presence of oxygen.

Anaerobic digestion is a well established and widely used method for treatment of various types of waste. It is traditionally used by the agricultural and farming industry to process slurries, and by water companies to treat sewage sludge. This is an ideal technology for dealing with the organic part of municipal waste, for example paper, food and any garden waste, and as an alternative to landfill.

The AD digesters can be either horizontal or vertical depending on the technology and they can be mesophilic (approx. 35°C) or thermophilic (approx. 55°C). Processing times in digesters can vary from 2-4 weeks depending on parameters such as feedstock, temperature etc.

| **Advantages of Anaerobic Digestion** | **Disadvantages of Anaerobic Digestion** |
|---|---|
| • couples the treatment of waste and production of power<br>• reduces odour<br>• suited to small & large scale<br>• avoidance of fossil fuels, if energy recovery is undertaken | • high capital costs<br>• high operational costs<br>• sludge disposal is a problem in some location |

| Advantages of Anaerobic Digestion | Disadvantages of Anaerobic Digestion |
|---|---|
| • can recycle effluent 20 fertiliser<br>• generally reduces 1) chemical and biological oxygen demand, 2) total solids and 3) volatile solids of the input material<br>• coliform bacteria, pathogens, insect eggs and internal parasites can be destroyed, or reduced to acceptable levels | |

From a waste management point of view, anaerobic digestion offers a significant advantage over composting in that a smaller footprint is required for AD. In addition, AD produces a biogas which can be used to generate heat and electricity to supply the facility making it self-sufficient. Surplus energy can also be made available for the national grid.

*Vermi-Composting*

Vermi-composting is a system which uses worms to convert organic waste to compost. The end product is enriched by the presence of large amounts of 'worm casts' or 'castings'.



Advantages of Vermi-Composting

- minimal aeration is necessary, reducing labour and equipment costs
- under ideal conditions red worms double their population every four months
- vermin-composting produces a stable, non-toxic material with a high economic value as a soil conditioner
- low, medium and high-tech systems all work and are available
- as with composting, vermi-composting reduces the bulk of waste significantly
- using worms also reduces populations of pathogenic micro-organisms and increases nitrogen mineralisation
- worms could bring about a greater decrease of bio-available heavy metals
- there is evidence to suggest that the final product could contain hormone-like compounds which accelerate plant growth

Disadvantages of Vermi-Composting

- lack of experience at a commercial scale
- initial cost of worms could be high, and adequate supply, if required, could be uncertain
- requires a high level of monitoring and maintenance
- the market is less developed for worm castings than it is for regular compost
- this technique may not kill weed seeds or parasites

Vermi-composting is not widely established on a commercial scale. A commercial vermin composting facility established in Ireland ran into serious operational difficulties and subsequently closed. Therefore, the lack of experience at this level of operation, and concerns about costs and worm availability, raise considerable uncertainty about the suitability of this process at this time.

*Ethanol Production*

Ethanol can be made from any source that contains appreciable amounts of sugar, or materials that can be converted into sugar such as starch or cellulose. Micro-organisms can be used to break down this glucose source to produce alcohol. Alternatively, hydrolysis, followed by fermentation, can be used to produce a medium strength alcohol, with subsequent distillation producing a concentrated alcohol, such as ethanol.

The calorific value of ethanol is typically 60 % of that of petroleum. It also has combustion properties and may be in the future, be used to assist in delivering a solution to both energy and waste issues. At present, the technology is not commercially established and was therefore not considered suitable for the proposed development.



*Gasification*

After removal of any inorganic contaminants that will not breakdown easily with heat, such as glass and metals, waste is heated with a little oxygen to the point where it is turned into gas. There are a number of materials produced by this process including tars, inert chars and ash, but this can vary depending on the plant and the type of rubbish being treated. In general, however, emissions are low. The gas produced can be used as a fuel to generate electricity and heat. There are a number of small-scale operational plants, but as of yet gasification has not been established on a commercial scale.

*Pyrolysis*

Pyrolysis is the heating of material to between 250°C and 1,000°C, without the presence of oxygen. This process produces char and pyrolysis oil, although these residues are easily treated. Emissions are low, in general. Unlike incineration, dioxins and furans are unlikely to be formed. The process also produces a gas, which can be used to generate electricity and heat. There are a number of small-scale operational plants, but as of yet pyrolysis has not been established on a commercial scale.

*Composting*

Several techniques have been used to compost waste. Alternatives to the proposed composting methods are outlined below. Figure 1.2 shows alternative composting technologies, while Table 1.8 shows the advantages and disadvantages of each of the technologies considered.

Composting methods generally fall within the following categories:

- open systems
  - o windrow
  - o aerated static pile
  - o hangar systems
- contained systems
  - o vertical flow (continuous or intermittent)
  - o horizontal flow (continuous or intermittent)
  - o batch tunnel

**Table 1.8: Advantages and Disadvantages of Alternative Composting Systems**

| Process | Example | Advantages | Disadvantages |
|---|---|---|---|
| Open | • windrow<br>• aerated static pile | • simple design<br>• simple to operate<br>• low capital costs<br>• low operating costs<br>• flexible | • large space requirements<br>• no guarantee of sanitisation<br>• can be affected by weather<br>• can release odours, bioaerosols, or leachate<br>• slow (up to 20 weeks)<br>• labour requirements for turning or agitation |
| Contained | • tunnel<br>• silo<br>• rotary drum<br>• agitated bin/bay | • controlled process conditions<br>• lower space requirements<br>• no odour, bioaerosols, or leachate<br>• guaranteed sanitisation<br>• faster process<br>• end product control<br>• low labour requirement<br>• low operating costs | • moderate to high capital costs<br>• complex design<br>• need for ancillary equipment<br>• land could be required for post-compost stages |



*Conclusions on Alternative Biodegradable Waste Treatment Techniques*

Considerable research was carried out by AES on all the various options for biowaste treatment. After considering the engineering, potential environmental emissions, and the financial implications of introducing such a system, AES decided that the Bedminster Digester offered the best solution for stage 1 treatment of biodegradable waste, as it rapidly accelerates the breakdown of this waste fraction, with aerated static piles or anaerobic digestion being used for stage 2.

The Bedminster composting technology is described in Section 2 of the EIS. The Bedminster Technology and ancillary building, odour abatement technology was chosen by AES on the basis that:

- The Bedminster system offers a fully enclosed in-vessel composting system where biodegradable waste will be treated, in line with the requirements of the ABP Regulations.
- The Bedminster technology is well recognised as a suitable system for treating biodegradable waste across Europe, Australia and the US.
- The Bedminster technology will ensure high rate composting of the biodegradable waste in an aerated environment during the first stage of composting. Following which the material will be either matured in the aeration hall to produce a fully decomposed and stable compost product or processed in an anaerobic digester.
- The Bedminster systems allows for the screening of compost at intervals in the process to screen out contaminants that may be present.
- A fully enclosed building where waste reception and compost maturation, screening, refining etc. would take place would be required to prevent environmental nuisance in the area.

As previously stated, there are still a number of operational difficulties associated with anaerobic digestion and therefore the application of this technology on a commercial scale is limited. If these problems are overcome, anaerobic digestion would be the preferred technology for this development. Consequently, AES's application sets out a proposal for two options:

1. The Bedminster process for the first stage treatment with composting (aerated static piles for the second stage of treatment
2. The Bedminster process for the first stage treatment with a biogas plant for the second stage treatment



## 1.9.3. Alternative Internal Layouts

Various layout options were assessed, with regard to selecting the site layout which represented the 'best fit' in the surrounding area. A number of factors formed part of this assessment, including:

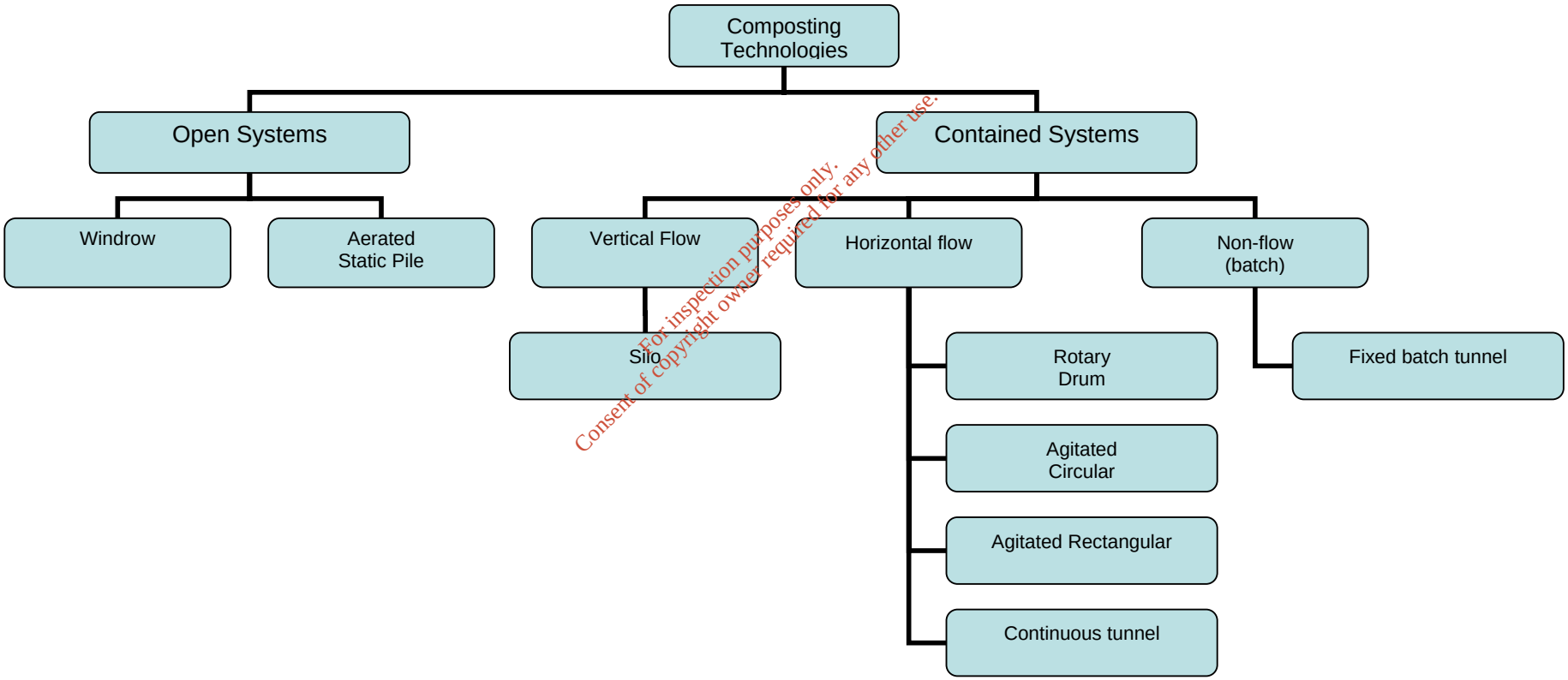
- Orientation of the building within the site
- Screening of the building
- Material requirements
- Roof heights
- Construction materials
- Location of the biofilters
- Provision of services
- Provision of adequate car parking, welfare facilities, etc
- Landscaping of the site

AES took considerable care to ensure that the building was integrated as much as possible into the surrounding landscape. Various options for building orientation were assessed and the proposed orientation was chosen so as to minimise the visual impact of the building.

Screening of the building was also another principal concern. Various options were considered, including berms, significant planting, etc. In order to maximise the screening of the building, the existing vegetation which runs along the L- 2117-0 and along the north western boundary of the site will be left in-situ. This will be completed with additional planting within this area and thus will largely screen the development from the surrounding area.

The location of the biofilters was also assessed to minimise impact. Options for locating the biofilters on the roof of the building as well as elsewhere within the site were all considered. Following this assessment, it was decided to locate the biofilters on the north-western side of the building, shielded from the prevailing south-westerly winds and screened from view.

**Figure 1.2: Alternative Composting Systems**



### 1.9.4. Do-Nothing Alternative

The primary objective of the proposed facility is the recovery and treatment of biodegradable waste materials, thus minimising the volumes of biodegradable waste disposed to landfill. The Midland Waste Management Region currently depends largely on landfill for waste disposal. Therefore, there is considerable pressure in the Region to establish alternative treatment capacity for municipal biodegradable and residual waste in order for the region to meet the statutory diversion targets.

In the event that the facility is not constructed at Kyletalesha there will be a deficit in the waste management infrastructure in the Midland Region for the treatment of source separated biodegradable and mixed residual waste. This is likely to result in delays in the implementation of national, regional and local waste policy objectives in relation to increasing the recovery of waste materials and minimising the volumes of treated waste disposed to residual landfill.

In effect, the do-nothing scenario will mean that:

- biodegradable waste will continue to be landfilled– this is contrary to national and local waste policy objectives
- there will be no provision for the recycling/recovery of source separated biodegradable waste in the Region

This is in breach of:

- EU Landfill Directive (99/31/EC)
- Waste Management Strategy for the Midlands (2005 – 2010)
- Waste Management – Changing Our Ways
- Preventing and Recycling Waste – Delivering Change– a Policy Statement
- National Strategy on Biodegradable Waste



## 1.10. Technical Difficulties

There were no technical difficulties encountered during the environmental assessment conducted at the proposed site. The determination of potential impacts was facilitated by the review of previous studies carried out at the adjacent Kyletalesha Landfill as well as the planning application and Environmental Impact Statement for the existing transfer station.

## 1.11. Scoping

The scoping process determines the areas or aspects, which are likely to be important during the EIA and eliminate those that are less so. The level of work carried out for each topic reflects the potential impact on that aspect of the environment, as identified during the scoping process.

An initial scoping of possible impacts of the proposed development was carried out in accordance with the Sixth Schedule of the Planning & Development Regulations 2001.

The schedule lists 11 areas, which should be addressed in the EIS:

- Landscape and visual impact
- Noise
- Hydrology
- Air and climate
- Geology/Hydrogeology
- Traffic
- Cultural heritage
- Ecology
- Land use
- Material assets
- Interaction of the foregoing

The scoping process was based on:

- Consultation with interested parties, including a meeting with Laois County Council and the Environmental Protection Agency
- Examination of environmental impact statements for developments in similar circumstances, which were deemed to be of an acceptable standard by the relevant authorities.
- Experience of the consultants in preparing environmental impact statements for waste management facilities

The areas identified during the scoping process as being the most significant issues were air quality, traffic, visual impact and amenity. However all the topics listed above are addressed within the EIS.



### 1.11.1. Impact Description

This EIS provides for an assessment of a range of potential impacts from the proposed development. In accordance with Schedule 6 of S.I. No. 600 of 2001, Planning and Development Regulations, these include:

- Direct impacts
- Indirect impacts
- Secondary impacts
- Cumulative impacts
- Short-term impacts
- Medium-term impacts
- Long-term impacts
- Permanent impacts
- Temporary impacts
- Positive impacts
- Negative impacts

For the purposes of this EIS the following is applied:

- A significant effect is one that will cause substantial adverse change in an ecosystem, society or economy. The changes would be outside the range of natural variation and if allowed to recover unassisted then repair/recovery could be prolonged.
- A moderate impact results in a moderate change in an ecosystem, society or economy. The potential for recovery over a long time period is good although a low level of impact may remain.

- A minor impact results in minor changes to an ecosystem, society or economy. Changes fall within the range of normal variation and the effects are typically short lived.
- A negligible impact results in changes to an ecosystem, society or economy that are unlikely to be noticeable.
- A positive impact results in desirable or beneficial effects to an ecosystem, society or economy.

Descriptions of potential impacts and relevant and appropriate mitigation measures are presented within the individual sections. A summary of impacts, both positive and negative based on the findings of the impact assessments is presented within Section 12.

## 1.12. Contributors

FTC retained the services of a number of specialist sub-consultants in the preparation of the EIS. These included:

- Traffic wise
- Southern Scientific Laboratories
- Abacus Transportation Surveys
- Geotech
- Odour Monitoring Ireland
- Traffic Safety Assessment
- Analysis of air samples
- Traffic Counts
- Site Investigations
- Odour & Bio-aerosol Assessment

# 2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

## 2.1. Introduction

The AES waste transfer station is located approximately 5 km north of Portlaoise and 4 km south of Mountmellick. The site is located just off the N80. The site is located adjacent to Laois County Council's Kyletalesha landfill and two knackeries.

The facility was licenced in 2003 (Licence Reg. No 194 -1) by the Environmental Protection Agency (EPA) and accepts 40,000 tonnes per annum of household, commercial, industrial and construction and demolition (C&D) wastes.

There is a critical need to provide infrastructure for the treatment of biodegradable waste diverted from landfill in accordance with EU and national requirements. AES proposes to extend the existing transfer facility with provision of infrastructure to treat biodegradable waste. It is intended to accept both residual municipal waste and source separated waste and to process the streams separately at the facility.

Source separated biodegradable waste will be treated in a Bedminster Digester followed by composting or by anaerobic digestion. Mechanical biological treatment, using a second Bedminster Digester, will be used to separate the biodegradable fraction from the residual municipal waste. The resulting fraction will then be processed by composting or by anaerobic digestion. The actual process to be undertaken will be dependant on the commercial viability of anaerobic digestion.



It is proposed to increase the maximum tonnage accepted at the facility to 99,000 tonnes per annum.

The following sections describe the existing facility and the proposed facility expansion.

## 2.2. Existing Site Infrastructure

*Site Access*

The site is accessed from the local road the L-2117-0. The entrance to the waste transfer station is some 600 m for the national secondary route – the N80.

*Site Security*

The entrance of the site is bound by a 3 m high concrete wall which extends along the western boundary (between the AES facility and the adjacent knackery) to the back of the site. The remainder of the site is bounded by a chainlink fence. Access to the site outside of operational hours is restricted by a steel gate.

A CCTV system has been installed at the site and this is used to monitor the perimeter and main yard area.

Monitoring, logging and supervision of all visitors is carried out. Every visitor to the site is required to log in at the site office, which is adjacent to the site entrance.

*Site Accommodation*

Portacabins located adjacent to the site entrance are used as the site office, a canteen storage and toilet facilities. An additional portacabin is located adjacent to the weighbridge.

*Site Roads, Parking and Hardstanding*

There are no internal site roads. The entire site is finished with a hardstanding area that consists of concrete foundation on piles.



*Plant*

The following items of mobile and stationary plant are used at the facility:

- 1 No. shredder
- 1 No. loading shovel
- 2 No. track mounted excavator

*Weighbridge*

The existing weighbridge is located adjacent to the weighbridge office near the site entrance. The weighbridge has a 15 m x 3 m surface mounted platform consisting of a steel frame with reinforced concrete infill. The weighbridge is linked to an I-200B Digital Weight Indicator. The software records information required by the waste licence, such as the gross weight, tare weight, vehicle registration, name of haulier, waste type, waste permit number and waste source. This information is relayed to the central computer system in the main site office.

*Wheel Wash*

Since the entire site has a hardstanding finish, there is not a need for a wheel wash in the existing facility. Also the bulk of the waste processed is a dry, inorganic type.

*Laboratory Facilities*

Offsite laboratories facilities are used if and when required.

*Fuel Storage*

One 50,000 litre diesel tank has been installed on-site for the storage of diesel fuel. This tank is located within a reinforced bunded tank in accordance with BS8007-1987. A paved area is provided around the storage tank for re-fuelling of on-site machinery. This area is kerbed for the collection of spillages. Run-off collected within this kerb area is directed to an oil interceptor prior to discharge to the nearby stream.

*Waste Quarantine & Waste Inspection Areas*

A dedicated area has been established within the yard for waste inspection and quarantine.



*Traffic Control*

All traffic entering the waste transfer station must pass over the weighbridge. Similarly trucks are weighed when exiting the site. The entrance to the facility is 10 m wide to allow trucks to pass each other. Traffic flow within the site is controlled by passing over the weighbridge.

Staff and visitor car parking has been provided adjacent to the site office.

*Sewerage and Surface Water Infrastructure*

Foul water generated from the site office is treated on-site by a *Puraflo* wastewater treatment system. The outflow from the treatment plant discharges to a percolation area in the north-west corner of the site.

A leachate holding tank has been installed to the northeast of the site which drains the waste inspection/quarantine area as well as the main building. *Aco-drains* have been installed across the doors of the main waste transfer building to ensure that any leachate or spill which occurs within this building is fully contained.

Surface water run-off from the hardstanding areas is collected within the drainage channels that are located across the site. All surface water is discharged via an oil interceptor to the stream that flows along the eastern boundary of the site. Leachate containment provision ensures that waters that have come in contact with the waste are not discharged into the surface water.

*Site Services*

The site is serviced by electricity from a 20 kV line. The site is connected to the telephone network, and a public water main.

*Facility operation*

The site is licensed to accept 40,000 tonnes of waste per annum. Table 2.1 details its breakdown.

**Table 2.1: Waste Categories and Quantities**

| Waste Type | Maximum (tonnes per annum) |
|---|---|
| Household, commercial & C&D waste | 38,990 |
| Non-hazardous industrial sludges | 1,000 |
| Hazardous waste | 10 |
| Total | 40,000 |



There is currently 12 staff operating the site.

The transfer station building is approximately 10 m high and 22 m x 75 m in plan. The exterior of the building is finished in green cladding. There are three rolling doors to allow truck to reverse into the building and tip their loads.

*Waste Acceptance & Handling*

All waste accepted at the facility is subject to waste acceptance measures, which have been approved by the EPA. Only waste from permitted haulers is accepted at the site. When waste arrives on-site, visual inspection of loads is conducted by one of the weighbridge officers at the weighbridge. If the waste is deemed acceptable, the drivers directed to the waste recycling/transfer building for sorting. Waste delivered to the site is tipped onto the floor of the waste transfer building where it is inspected by AES personnel. If the waste is deemed suitable, the waste is sorted for recycling or disposal. All waste deemed unsuitable for recycling/recovery is transported off-site for disposal at an appropriate facility.

Wastes that are deemed suitable for recycling include metals, timber, glass, paper and cardboard, C&D waste and glass. The categories of waste suitable for segregation and recycling are very much dependent on the availabilities of end markets at the time of processing.

## 2.3. Proposed Development

### 2.3.1. General Layout

The extended site is roughly triangular in shape, to the east of the existing facility. For screening purposes, part of the site, an approximate 20 m wide corridor parallel to the road, will be retained as is. The resulting development area is irregular in shape, currently comprising of approximately 4.8 ha of rough peat land. An additional 1.4 ha will be retained as a buffer area.

The existing buildings on site will be used for storage of wastes suitable for further recovery e.g. glass, cans, metals etc. The existing building will be extended and the additional area will be used for storage of hazardous waste collected from civic waste facilities and any hazardous waste items quarantined from households. In general it is expected that this will be waste electrical and electronic equipment (WEEE goods). Storage areas within the building will be bunded.



As outlined earlier, it is proposed to accept source separated waste, which will be processed by composting or anaerobic digestion. Residual MSW residuals will be treated by mechanical biological treatment with the biodegradable fraction extracted for further processing by either anaerobic digestion or composting. The source separated fraction and extracted biodegradable fractions will be processed independently.

Infrastructure for anaerobic digestion and composting for the treatment of the extracted biodegradable fraction are described, however it is intended to put in place only one such treatment process. The actual process to be implemented will be determined at detailed design stage, when all issues can be economically appraised, including infrastructure cost, operational cost, available grants and price for electricity/gas generated from the anaerobic digestion plant.

### 2.3.2. Nature and Sources of Waste

The proposed extension to the Kyletalesha facility will increase the annual throughput tonnage from 40,000 tpa (as per the existing waste licence) to 99,000 tpa.

The breakdown of the types and quantities to each element of the development are detailed in Table 2.2.

**Table 2.2: Types and Quantities of Waste**

| Existing WL | | Proposed | | |
|---|---|---|---|---|
| **Waste Type** | **Max Tonnes per Annum** | **Waste Type** | **Max Tonnes Per Annum** | **EWC Code** |
| Household, Commercial & C&D | 38,990 | Household, Commercial & Industrial | 80,000 | 15 01 06 - mixed packaging |
| | | | | 20 02 01 – compostable waste |
| | | | | 20 03 01 – mixed municipal waste |
| | | | | 20 02 01 - biodegradable waste |
| | | | | 20 03 01 - mixed municipal wastes |
| | | | | 20 03 03 - street-cleaning wastes |
| | | | | 19 12 12 - other waste (including mixtures of materials) from mechanical treatment of waste other than those mentioned in 19 12 11 |
| | | | | 20 01 08 – biodegradable waste |
| Non-Hazardous Industrial Sludges | 1,000 | Non-Hazardous Industrial Sludges | 3,000 | 19 08 14 – sludges from other treatment of industrial waste water other than those mentioned in 19 08 13 |
| | | | | 19 02 06 – sludges from the physico/chemical treatment other than those mentioned in 19 02 05 |
| | | | | 19 08 04 – Sludges from the treatment of industrial waste water |
| Hazardous Waste | 10 | Hazardous Waste | 5,000 | |
| | | | | 17 01 01 - Concrete |
| | | | | 17 01 02 - bricks |
| | | | | 17 01 03 – tiles & ceramics |
| | | | | 17 01 04 – gypsum based construction materials |
| | | | | 17 02 01 - wood |
| | | | | 17 02 02 - glass |
| | | | | 17 02 03 - plastic |
| | | | | 17 04 07 – mixed metals |
| | | | | 20 01 27 – paints, inks, adhesives & resins containing dangerous substances |
| | | | | 20 01 33 – mixed batteries & accumulators included in 16 06 01, 16 06 02 or 16 06 03 |
| | | | | 20 01 21 – fluorescent tubes & other mercury-containing waste |
| | | | | 20 01 35 – Discarded equipment other than those mentioned in 20 01 21 & 20 01 23 containing hazardous components |
| | | | | 20 01 36 – discards equipment other than those mentioned in 20 01 21, 20 01 23 & 20 01 35 |
| | | C & D | 5,000 | 17 09 04 – mixed construction & demolition wastes other than those mentioned in 17 09 01, 17 09 02 & 17 09 03 |
| | | Sewage Sludge | 6,000 | 19 08 05 – Sludges from the treatment of urban waste water |
| | | | | 20 03 04 septic tank sludges |
| **Total** | **40,000** | **Total** | **99,000**[Note 1] | |

Note 1: During facility construction it will be necessary to raise the existing ground levels up to formation level. It is estimated that approximately 100,000 tonnes of infill will be required. The infill will be accepted prior to the facility extension from 40,000 to 99,000 tpa.

The bulk of the 80,000 tonnes of household, commercial and industrial waste will consist of mixed residual waste from AES customers. The facility will be able to process 40,000 tonnes of source separated organic waste (brown bin) if required. Both of these waste streams will be handled and treated as separate streams.

Non-hazardous industrial sludges and sewage sludges will be accepted at the facility. These wastes will be mixed with either the mixed residual waste and/or the source separated organic waste.

It is proposed to establish an area for the temporary storage of household and commercial hazardous wastes e.g. waste electrical and electronic equipment (WEEE).

In accordance with the Third and Fourth Schedules of the Waste Management Acts, 1996 to 2003, it is proposed to carry out the following classes of activity at the facility:

**Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Acts 1996 to 2003**

| | |
|---|---|
| **Class 6.** | **Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 7 to 10 of this Schedule.**<br>This activity refers to the small proportion of residues from the proposed composting/anaerobic digestion facility which may need to be disposed of at an authorised facility. |
| **Class 11.** | **Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.**<br>This activity refers to the blending or mixing of wastes, which cannot be recycled or recovered, prior to disposal at an authorised facility. |
| **Class 12.** | **Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.**<br>This activity refers to the repackaging of wastes, which cannot be recycled or recovered, prior to disposal at an authorised facility. |
| **Class 13.** | **Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.**<br>This activity relates to the storage of waste which cannot be recycled or recovered prior to disposal off site. |

**Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Acts 1996 to 2003**

| | |
|---|---|
| **Class 2. This is the Principal Activity** | **Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes):** This activity relates to the recycling of organic substances including composting and biological treatment of waste at the facility. |
| **Class 3.** | **Recycling or reclamation of metals and metal compounds:** This activity relates to the recycling or reclamation of metals and metal compounds prior to further recovery off-site. |
| **Class 4.** | **Recycling or reclamation of other inorganic materials:** This activity relates to the recycling or reclamation of inorganic materials prior to further recovery off-site. |
| **Class 9.** | **Use of any waste principally as a fuel or other means to generate energy:** It is proposed that any biogas generated from an anaerobic digester may be used to generate electricity |
| **Class 11.** | **Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule:** This activity relates to the re-use of inorganic materials (inert fill) to bring ground levels to required foundation level. |
| **Class 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:** This activity relates to the storage of waste prior to further recovery off-site. |



Amendments of classes of waste activity to that provided in existing Waste Licence Reg. No. 194-1, are addition of Class 6 of the Third Schedule and Class 9 of the Fourth Schedule to reflect proposed waste activities. Class 12 of the Fourth Schedule, which is covered in Waste Licence Reg. No. 194-1 has been omitted as this waste activity will not be undertaken at the facility.

## 2.3.3. Plant & Waste Processing

The plant and process of treating source separated waste and the extraction and treatment of biodegradable waste is described in the sections below. Existing standard operating procedures for the acceptance, handling and processing of waste will be further developed prior to commencement of the additional waste operations at the facility. The infrastructure proposed is described in the following sections and is as indicated on Figures 2.1 and 2.2.

## The Waste Reception Building

The waste reception building will be constructed with lower walls of block/concrete (2m) and cladding to upper walls and roof. During normal weekday operation, waste will be tipped onto the floor. Source separated waste, residual MSW and sludges will each have separate dedicated areas within the building. Any oversize items will be manually removed prior to the waste being loaded onto dedicated conveyors for each waste stream. The waste will pass through bag splitters, which will enable the Animal By-Products Regulation particle size requirement of 400 mm to be achieved, as well as ferrous and non-ferrous separators prior to loading into the Bedminster Digesters. Towards the end of the week, waste will be stockpiled in the Waste Reception Building to allow continuous processing over the weekend when there are no deliveries. The storage area would have sufficient capacity for 1 to 2 days waste, therefore the facility will accept deliveries over 6 days per week.

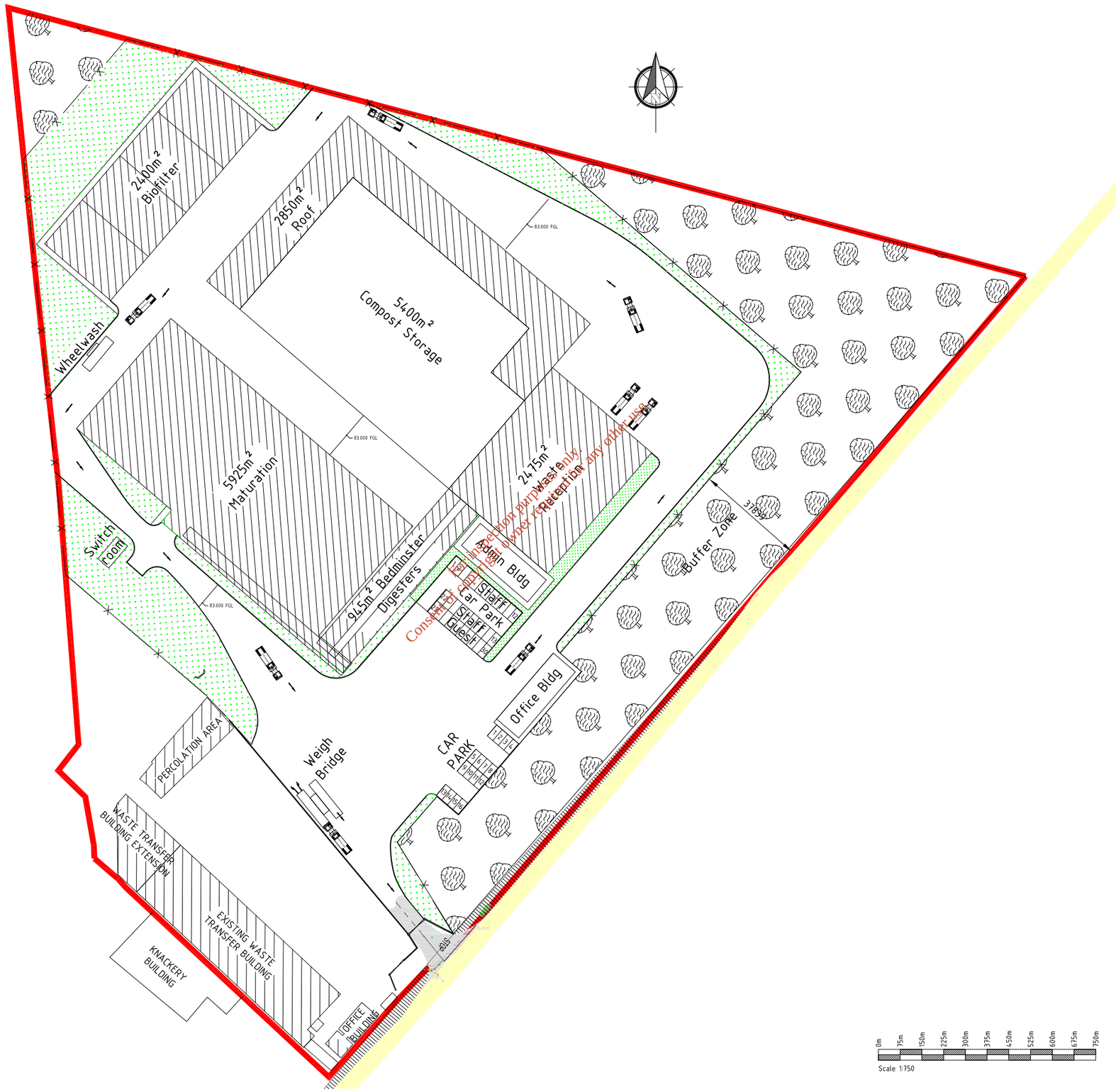
The waste reception building will be maintained under negative air pressure and the delivery entrances will be provided with automatic roller shutter doors.

## Bedminster Digester

The core of the Bedminster process is the 'Eweson Digester', a revolving compartmentalised aerobic drum that accelerates the natural process of biological decomposition. Solid waste and sludges are fed into the digester in optimum balance. Two digesters will be provided, with one dedicated to the processing of source separated waste and the other for residual municipal waste. Temperature and moisture are controlled to encourage a dense and varied microbial population. All of the waste in the Eweson Digester is constantly turned and aerated to ensure total waste sanitation. The digester will be turned at a rate of approximately 1 rpm by hydraulic motors. The patented Eweson Digester contains three separate compartments with the waste material being retained for 1 day in each section. A time temperature regime of 1 hour at greater than 70°C can be achieved. Eweson Digesters (rotating composting drums) of approximately 5.4 m diameter and 70 m in length will be provided.



Within three days, the organic fraction is transformed into a new product. The rough compost is automatically unloaded onto a conveyor and is screened through a trommel screen to remove large residues, which will go for further recycling or disposal to an appropriate facility. The cleaned rough compost will then be transferred to the aeration hall for maturation or to the anaerobic digester. Both processes are described below but only one will be implemented. In the case of source separated waste, the rough compost will be transported directly from the digester to the aeration hall for maturation.




0m 75m 150m 225m 300m 375m 450m 525m 600m 675m 750m
Scale 1:750

| Rev. | Drawn | Chk'd | App'd | Date | Description |
|---|---|---|---|---|---|
| A | KL | ME | DOS | 28.07.06 | ISSUE FOR PLANNING |

**Name of Client**
AES

**Name of Job**
EXTENSION TO
KYLETALESHA SITE

**Title of Drawing**
PROPOSED SITE
LAYOUT PLAN
AEROBIC COMPOSTING PROCESS

**Scales Used**
1:750 A1 1:1500 A3

**Dwg. No.** 2006/081/01/Figure 2.1
**Rev.** A
**Cork**

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Drawing name: O:\ACAD\2006\081\01\b-mbt_Fig21.dwg

ORIGINAL DRAWING SIZE A1 - (841 x 594)
NATURAL SCALE 10 0 10 20 50 100mm




0m 75m 150m 225m 300m 375m 450m 525m 600m 675m 750m
Scale 1:750

| Rev. | Drawn | Chk'd | App'd | Date | Description |
|---|---|---|---|---|---|
| A | KL | ME | DOS | 28.07.06 | ISSUE FOR PLANNING |

**Name of Client**
AES

**Name of Job**
EXTENSION TO KYLETALESHA SITE

**Title of Drawing**
PROPOSED SITE LAYOUT PLAN ANAEROBIC SYSTEM

**Scales Used**
1:750 A1 1:1500 A3

**Dwg. No.** 2006/081/01/Figure 2.2 — **Rev.** A Cork

Q:\ACAD\2006\081\01\Figure 2.2

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Drawing name: O:\...\ACAD\...\2006\...\081\...\01\...\b-mbt_Fig22.dwg

ORIGINAL DRAWING SIZE A1 - (841 x 594)

10 0 10 20 50 100mm NATURAL SCALE

Compost Process

*Compost Process - Maturation Area*

For approximately three weeks, the product undergoes controlled secondary composting and curing in the aeration hall before final screening. The material will be turned frequently, ensuring that aerobic conditions are maintained within the enclosed windrows. The temperature and moisture content levels of the composting material will be monitored and adjusted to obtain optimum maturation.

The maturation hall will comprise a steel framed and cladded building approximately 10 m high. As with the waste reception building there will be a 2 m high reinforced concrete wall around the perimeter of the building. The floor of the building will be divided into bays using portable concrete or steel material-separation blocks. The floor will be fitted with ventilation pipes so that air can be forced up or down through the compost heaps. Air will be supplied from an air blower gallery running the entire length of the building. The building will be 110 m long by 50 m wide and, its roof will be approximately 10 m high. A dedicated area will be provided for the maturation of source separated waste. As with the waste reception building, the maturation area will be maintained under negative air pressure and will be provided with automatic roller shutter doors.

The process requires water to keep the conditions at an optimum. Any water generated during the composting process will be recirculated through the compost. Therefore, generally, no wastewater has to be treated or discharged. Only a buffer tank for the process water is required.



The air from the maturation hall will be conveyed to an air treatment system comprising a cooler/condenser, wet scrubber (to remove dust particles) and a biofilter which is located adjacent to the building. The air abatement technology for this development is summarised in Section 4 of the EIS.

The purpose of the cooler/condenser is to cool the process air to a maximum temperature level of 35 $^{o}$C, to de-dust the air and also to humidify the air to almost maximum saturation. These conditions assist in extending the lifetime of the biofilter.

*Compost Process – Storage Area*

This will comprise open sheds separated into bays located around two sides of a flat slab. The building will be open at the side facing the flat slab and, as with the other buildings enclosed sides will be finished with a 2 m reinforced concrete wall. The building will be divided into bays approximately 6 m wide to accommodate storage of final product. Air will be pulled/forced through the compost piles to prevent odour emissions.

*Compost Process – Biofilter*

The biofilters will comprise of four discrete cells in a concrete box, approximately 1 - 2 m in depth. The total area of the biofilters will be approximately 2,400 $m^2$. This concrete box will be filled with wood chips or similar material. The air from the building will be passed through the biofilter, evenly distributed into each of the cells by a manifold discharge system underneath the biofilters.

The efficiency of the biofilters to reduce odours is high because of the optimal distribution of the process air passing the biofilter material. A drainage system, which will drain to a holding tank with the liquid being used in the composting process, will be installed at the base of the biofilters to prevent the filter material from becoming saturated. The biofilters will be monitored to ensure optimum conditions are maintained. A front-end loader will be able to access the biofliters to replace biofilter material when required.

*Anaerobic Digestion Process*

If the preferred process is anaerobic digestion rather than compost maturation of the extracted biodegradable fraction, the proposed layout of the process will be as detailed in Figure 2.3. In general, anaerobic digester reactors can be either horizontal or vertical. It is proposed in this case to use a reactor, with a height of approximately 10 m high, to minimise the visual impact on the surrounding environment.

Anaerobic digestion (AD) transforms the carbon in the waste, into carbon dioxide ($CO_2$) and methane ($CH_4$) some of which can be used to produce external energy through a gas engine and steam boiler.

In addition to this biogas, solid digestate and nutrient rich wastewater are produced.

Four stages of digestion have been recognised. These are:

1. The hydrolysis phase whereby complex organic molecules are broken down into simple sugars, amino acids, and fatty acids with the addition of hydroxyl groups.
2. The second stage is acidogenesis phase where a further breakdown of material occurs producing ammonia, carbon dioxide and hydrogen sulphide.
3. The acetogenesis phase produces carbon dioxide, hydrogen and acetates.
4. The fourth stage is methanogenesis where methane, carbon dioxide and water are produced.

There are three principal by-products of anaerobic digestion:

Biogas - is a gaseous mixture comprising mostly of methane and carbon dioxide, but also containing small amounts of hydrogen. Biogas can be burned to produce electricity. The gas is often used in a co-generation arrangement, to generate electricity and use waste heat for the digester itself or to heat buildings.

Excess electricity can be sold to national grid. Since the gas is not released directly into the atmosphere and the carbon dioxide comes from an organic source with a short carbon cycle, biogas does not contribute to increasing atmospheric carbon dioxide concentrations.

The second by-product is a liquid that is rich in nutrients and can be an excellent fertilizer or soil conditioner depending on the quality of the material being digested.

The third by-product is a stable organic material comprised largely of lignin and chitin, and resembles domestic compost and can be used as a soil conditioner.

Digestion can be either *wet* or *dry*. Dry digestion refers to mixtures which have a solid content of 30% or greater, whereas wet digestion refers to mixtures of 15% or less.

The two main types of reactors are continuous and batch. Batch is the simplest, with the feedstock added to the reactor at the beginning and sealed for the duration of the process. In the continuous process, which is the more common type, feedstock is constantly added to reactor and the end products constantly removed, resulting in a much more constant production of biogas.

A conservative estimation of biogas production in an AD processes is 40 $m^3$ of biogas per tonne of waste processed. The yield is very much dependent of the composition of waste being treated. For every $m^3$ of biogas produced there is an electricity and heat generating potential of 1.7 kWh and 2.5 kWh respectively.

Processing time within the reactor can vary between 15 - 30 days depending on parameters such as feedstock, temperature, technology etc.

Once the digestate is removed from the reactor some further processing will be required. This may include belt pressings to reduce the moisture content to ensure optimum temperatures for aerobic maturation.

The separated solids which are often referred to as fibres can be directly applied to land or can be matured to compost with the liquid removed re-used into the reactor.

Any additional wastewater generated at the site will be tankered off-site to an approved wastewater treatment plant.

The digestate will be stored on an enclosed slab operating under negative aeration to prevent odour emissions.



## 2.3.4. Additional Site Infrastructure Proposed

*Security*

The existing site is secured with a chainlink fence on concrete posts. The entire extended site will be fenced to uniform standard with green chainlink fencing on steel posts or equivalent. The extended main gate will be similar to the existing gate.

The entire site including a portion of the road outside the main gate will be under constant surveillance by a CCTV system. The site will be equipped with an integrated intruder/fire alarm system monitored on a 24 hour basis.

Figure 2.3 illustrates the security fencing and the upgraded site entrance.

*Access Roads & Hard Standing Areas*

The extended site will use the existing access to the local road via a widened entrance. As with the existing facility all internal access roads will be in hardstanding.

As with the access roads, all hard standing areas will be of impervious material. The hardstanding area will fall generally in a northeast/southwest direction. Drainage will be to two oil interceptors and aquacell units ultimately discharging to the stream that runs outside the eastern perimeter of the existing site.

*Weighbridge*

A weighbridge is proposed at the location shown in Figures 2.1 and 2.2. The weighbridge will be 15 m in length with a weighing capacity of up to 40 tonnes (refer to Figure 2.4). The weighbridge will be a modern load-cell type with all weights (incoming and outgoing) being recorded on a data logger that will be integrated with the site's SCADA system. Recorded information will include:

- Truck registration
- Permit number
- Source of waste
- Pay load
- Tare
- Other information as may be deemed necessary by the operators or required by the EPA



*Wheel Cleaner*

The entire site will be hardstanding, and as such, it is not envisaged that wheel cleaning will be a major issue. However, it is proposed to install a drive-through combination wheel bath/rumble cleaner. From time to time depending on the degree of contamination in the wheel bath, the contents will be removed and sent off-site for appropriate disposal (treated as leachate). The wheel cleaner will be fitted with two connections to a vacuum tanker, one of which decants the supernatant and the other of which removes any build up of sludge. Heavier solids can be removed periodically using a small excavator.

The wheel cleaner is detailed on Figure 2.4.

*Laboratory Facilities*

There will be a designated room within the administration building to accommodate instrumentation associated with processing (temperature probes etc.) and sampling/packaging material. In general, compliance samples of final products will be sent to an external accredited laboratory for analysis.

*Fuel Storage*

Any fuels stored on site will be kept in appropriately bunded areas.

*Waste Inspection and Quarantine Area*

The most appropriate location for waste inspection is in the waste reception building (tipping floor). If waste is deemed unacceptable it will either be reloaded, in the case of a full load, or picked out in the case of specific non conforming wastes, for removal from the facility. There will be a designated area within the waste reception area for the storage of such items (waste quarantine area). A daily inventory of any materials placed in quarantined will be maintained.



*Traffic Control*

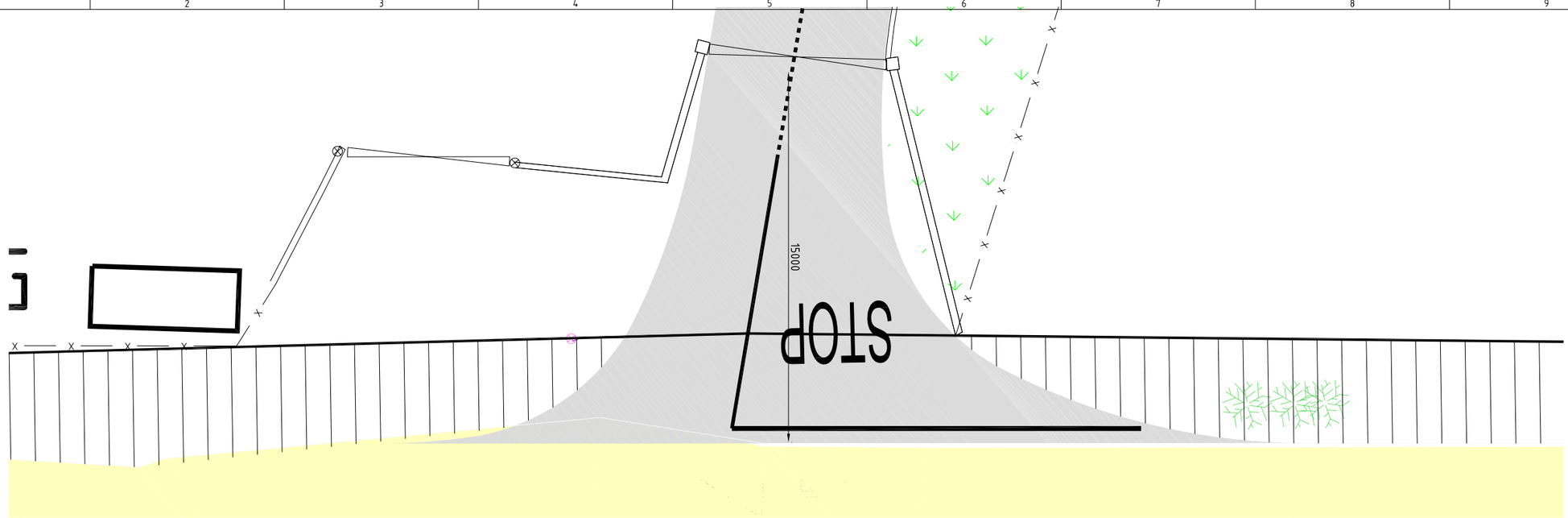
The weighbridge has been located so as to permit the queuing of six trucks without encroaching on the public road. Site management will control traffic around the facility, with traffic signs used for route designation. The designated routes are shown on Figure 2.1 & 2.2. Car parking will be provided for visitors and for staff, with capacity of up to 36 vehicles.

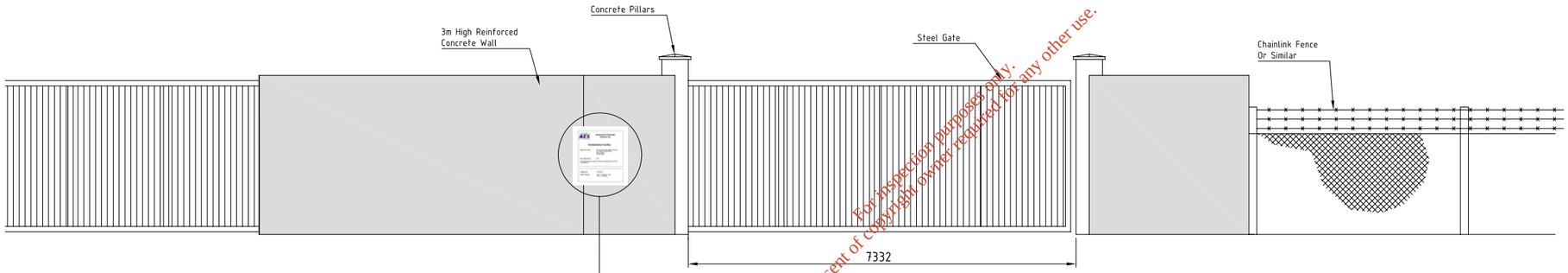
*Services*

Power for the site will be supplied via dedicated ESB substation/step-down transformer. The main control room will incorporate switchgear to facilitate the use of an independent electricity generator. In the event that anaerobic digestion with electricity generation is incorporated, the switchgear will allow for its use on site and (subject to an agreement with the ESB) the export of power to the national grid.

It is estimated that the extension will require an additional 30 $m^3$/day of water. The site will be connected to the local water supply scheme primarily to serve the office and staff welfare facilities.

In keeping with modern practice, the site will be contactable using telephone, fax, internet (broadband) etc.




SITE ENTRANCE DETAILS

Scale 1:50



**Advanced Environmental Solutions Ltd.**

## Kyletalesha Facility

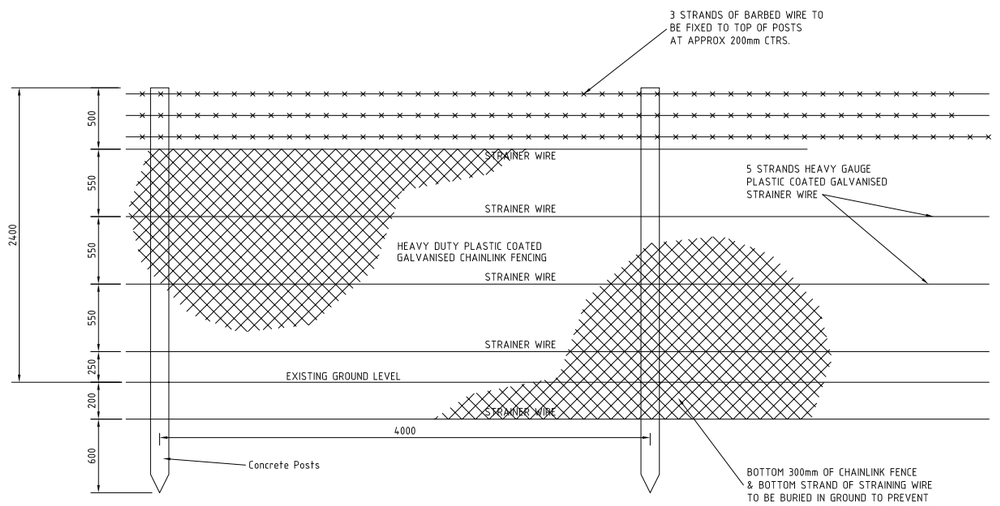
**Waste Licence Holder:** Advanced Environmental Solutions (Ireland Ltd)
Unit 1, Monread Commercial Park,
Naas, Co Kildare,
Tel: (045) 843800

**EPA Licence Reg. No:** 194-2

Environmental information relating to this facility can be obtained from the Site Office upon appointment.

**Emergency No:** 087 2997296.

**Hours Of Opening:** 08.00 – 17.30 Monday – Friday.
08.00 – 13.00 Saturday.




CHAINLINK FENCING DETAILS

Scale 1:25

| Rev. | Drawn | Chk'd | App'd | Date | Description |
|---|---|---|---|---|---|
| A | KL | ME | DOS | 28.07.06 | ISSUE FOR PLANING |

**Name of Client**
AES

**Name of Job**
EXTENSION TO
KYLETALESHA SITE

**Title of Drawing**
SITE ENTRANCE
AND CHAINLINK FENCE
DETAILS

**Scales Used**
AS SHOWN

**Dwg. No.** 2006-081-01-Fig2.3 — **Rev.** A

O:\ACAD\2006\081\01\b-mbt_Fig2.3

Cork

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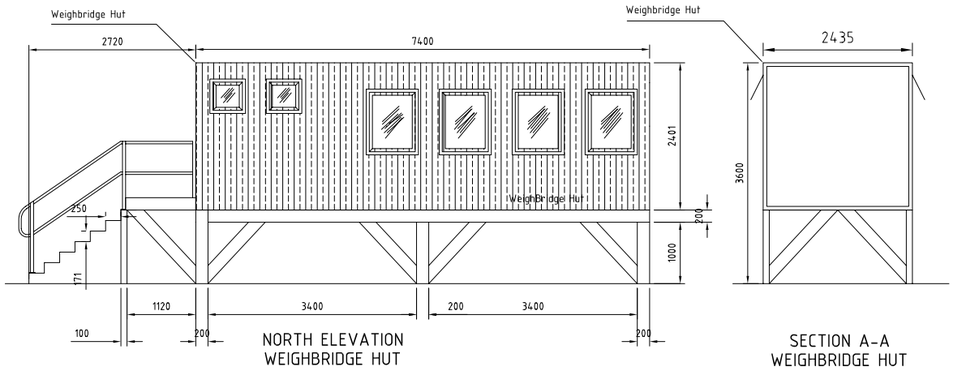
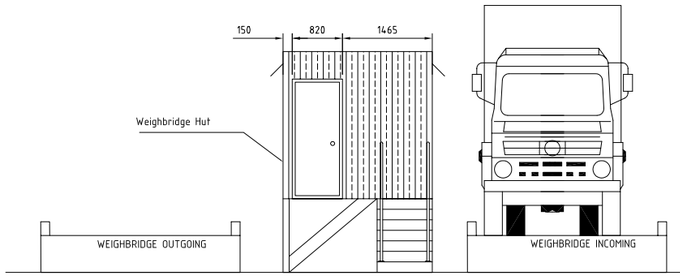
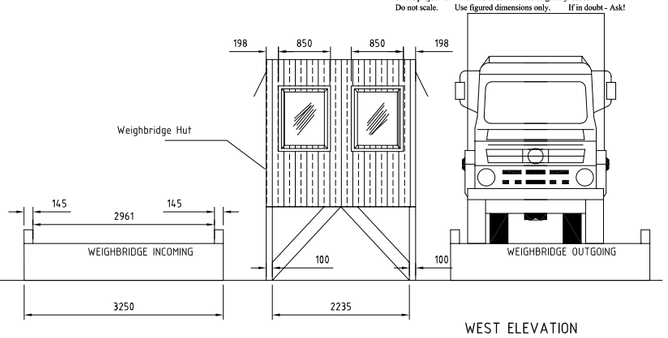



NORTH ELEVATION
WEIGHBRIDGE HUT
Scale 1:75

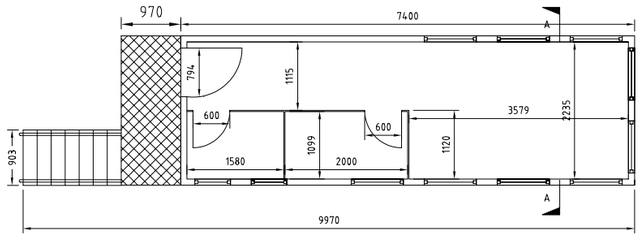
SECTION A-A
WEIGHBRIDGE HUT
Scale 1:75



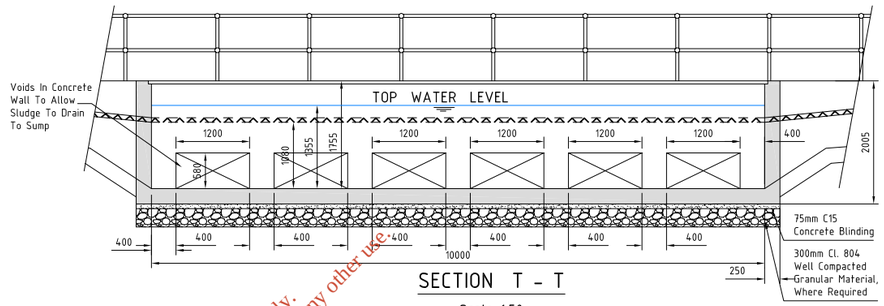

EAST ELEVATION
WEIGHBRIDGE HUT
Scale 1:75



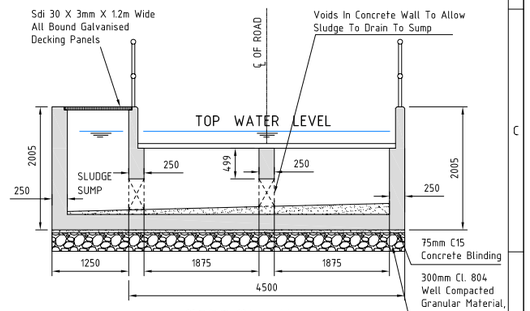

WEST ELEVATION
WEIGHBRIDGE HUT
Scale 1:75




PLAN
WEIGHBRIDGE HUT
Scale 1:75

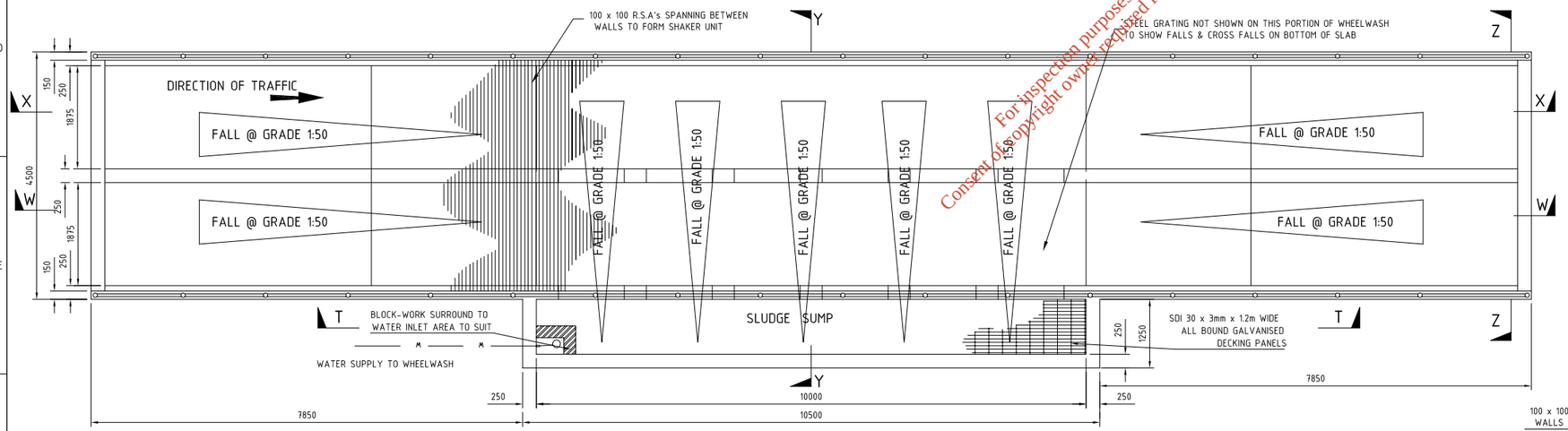



SECTION T - T
Scale 1:50

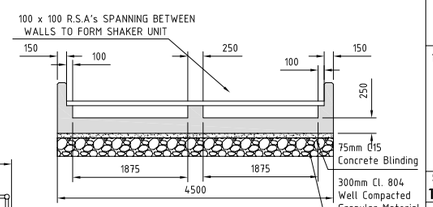



SECTION Y - Y
Scale 1:50

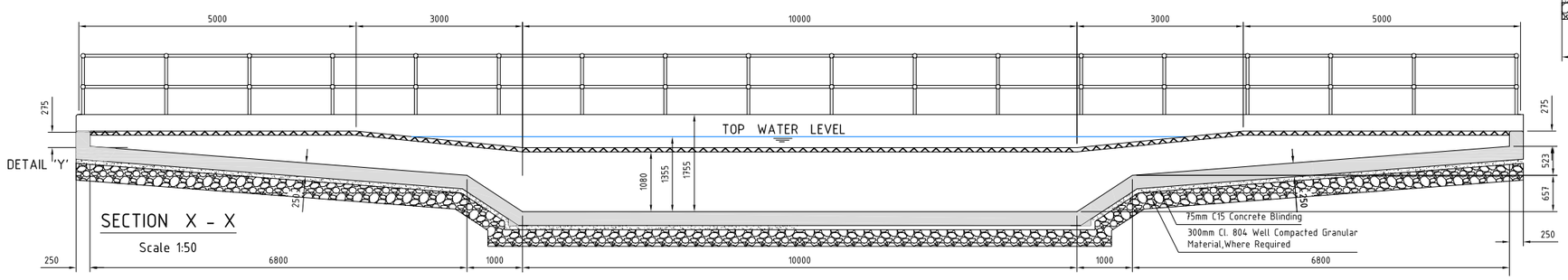





WHEEL SHAKEOUT BATH PLAN
Scale 1:50




SECTION Z - Z
Scale 1:50




SECTION X - X
Scale 1:50

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| A | KL | ME | DOS | 28.07.06 | ISSUE FOR PLANING |

**Name of Client**
AES

**Name of Job**
EXTENSION TO
KYLETALESHA SITE

**Title of Drawing**
WEIGHBRIDGE AND
WHEEL SHAKEOUT OR SIMILAR
TYPICAL DETAILS

**Scales Used**
1: 50 A1 1:100 A3

**Dwg. No.** 2006-081-01-Fig 2.4 — **Rev.** A — Cork

O:\ACAD\2006\081\01\b-mbt_Fig2.4

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Drawing name: O:\ACAD\2006\081\01\b-mbt_Fig24.dwg

ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE

*Sewerage and Surface Water Drainage*

Drainage of the entire site will be strictly controlled.

An early construction item will be to pipe the existing open drain that runs along the north-eastern perimeter of the existing facility. There will be three drainage zones:

1. Uncontaminated roof water that will be discharged to the culverted stream via an 'aquacell' attenuation system.
2. General hard standing surface water which will be directed to an oil-water separator and aquacell before discharging to the drain
3. Potentially contaminated water (stage 3 slab) and drainage from cut-off drains inside the doors of all process areas that will be treated as leachate

Leachate generated on-site will be tankered off-site for treatment at an approved waste water treatment plant.

Sewage will arise from the administration/welfare building. All sewage will be directed to an appropriate packaged biological waste water treatment plant and a constructed percolation area in keeping with EPA Guidance Wastewater Treatment Manuals-Treatment Systems for Small Communities, Businesses, Leisure Centres and Hotels.



*Site Accommodation*

There will be two administration buildings. The main administration will comprise of:

- Entrance/reception
- Switch room/scada room
- Toilets
- Locker rooms
- Canteen
- Offices

The second administration building will act as an office block for AES employees.

There will be a small building located between the weighbridges to accommodate the weighbridge clerk. The offices will be interlinked with state of the art communication system.

## 2.4. Waste Acceptance Hours and Hours of Operation

Waste will be accepted at the Facility Monday to Friday inclusive between the hours of 07.00 to 20.00 and on Saturdays 07.00 to 18.00. Waste handling (sorting, mixing etc) will be from the hours of 07.00 to 20.00 hours Monday to Friday inclusive and 07.00 to 18.00 on Saturdays. The plant for the treatment of biodegradable waste will be operated continuously.

Only waste from permitted haulers will be accepted at the site. There will be no acceptance of waste delivered by individual householders. Details of all wastes accepted (type, nature, weight, origin etc) at the site will be recorded by the weighbridge operator and directed to the appropriate location on site e.g. MSW to the biodegradable waste treatment facility. The waste will be visually inspected at the tipping floor. If the waste is deemed suitable, it will be processed at the facility. All waste deemed unsuitable or not in compliance will be quarantined for off-site recovery or disposal at an authorised outlet.

## 2.5. Nuisance Control

Figures 2.5 and 2.6 illustrate potential emissions from the composting and anaerobic digestion processes. This section however describes the procedures and mitigation measure that will be put in place at the proposed facility to minimise potential operational nuisance. In addition, there may be short-term nuisance i.e. dust, mud, noise, traffic etc during the construction of the facility. The controls for nuisances arsing from construction activities are discussed in Sections 3 and 4 of this EIS.



### 2.5.1. Dust Control

All processes will take place within the confines of dedicated buildings, which will also minimise the potential for dust emissions.

The air from the waste acceptance hall will be discharged through a dust filter, where a considerable reduction of dust emissions will be achieved.

Within the maturation hall, a sprinkler system will ensure that the windrows are kept moist, thus minimising dust emissions.

The compost storage area will be operated under negative pressure.

### 2.5.2. Odour Control

All material being transported to the site will be in enclosed or covered vehicles and the unloading of this material will be carried out within the waste reception hall which will be operated under negative pressure.

*Controls of Odour in Aerobic composting process*

The first stage treatment of the waste will be carried out within the Bedminster system. This system is fully enclosed under controlled operating temperatures to achieve maximum degradation of the input waste. Process air arising from this system will be conveyed into the maturation halls. Air from the maturation halls will pass through a wet scrubber and biofilter prior to discharge to the atmosphere.

Within this process there are three primary areas in the composting facility where odour emissions can potentially occur; the tipping area, the maturation hall and the compost storage area.

Extracted air from the tipping area and composting section will be used for aeration in the aerated static piles/maturation hall. Normally doors of the building will be kept closed, and the building will be operated under a slight negative pressure. The doors of the building which will provide access for the vehicles will be rapid response roller shutter doors, so as to maintain the negative pressure within the building at all times. Therefore, there is only one potential source of odour emissions, namely the biofilters.

The odour removal efficiency of the biofilters is a minimum of 95%, based on biofilter operations of existing composting facilities and manufacturer specifications. Thus, it is anticipated that a maximum of 5% of the odour produced within the composting building will be released to the atmosphere through the biofilters. This is not expected to have a significant impact on the surrounding area and is dealt with in detail in Section 4 – Air and Climate.



*Control of Odour in Anaerobic Process*

If the second stage process is anaerobic digestion, the output from the Bedminster system will be conveyed to an anaerobic digester. The biogas that will be produced as a by-product of the anaerobic digestion phase will be used to generate electricity and therefore will not be a significant odour source. Composting and storage will be enclosed and will operate under negative air pressure. Process air from this stage will be conveyed to the biofilter.

## 2.5.3. Emissions to Soil and Groundwater

Impermeable concrete floors in the buildings and asphalt/macadam and concrete pavements around the buildings will prevent emissions to soil and groundwater. All floors and pavements will drain to the leachate and/or surface water collection system.

## 2.5.4. Vermin Control

Vermin and insects can potentially be a nuisance at waste management facilities. However, at the proposed facility, all operations will be carried out within dedicated building.

Both the aerobic and anaerobic treatment systems will be fully enclosed. Strict hygiene procedures will be put in place which will require the regular cleaning of all plant and waste acceptance/composting areas.

As a precautionary measure, AES will retain a vermin control specialist to implement vermin control measures on site. The facility will be regularly inspected and the required measures will be taken if evidence of vermin is found on site.

### 2.5.5. Birds

Birds can be a considerable nuisance in waste management facilities if there is source of food present for scavenging. Birds can even represent a hazard, if the facility is located near any flight paths. However, the proposed development is a considerable distance (approximately 80 km) from Dublin Airport.

Waste activities at the facility will be carried out within the buildings. Doors to the building will be open for a limited amount of time, just sufficient to allow the vehicles enter and leave the building.

In addition, all vehicles entering and exiting the site will be completely covered. This will minimise the potential for birds scavenging on site.



### 2.5.6. Litter

Litter will be controlled at the proposed facility as all waste being delivered to the site will be in enclosed or covered refuse collection vehicles. In addition all waste acceptance and processing activities will be conditioned within dedicated buildings i.e. waste transfer station and the waste acceptance halls (facility for treatment of biodegradable waste).

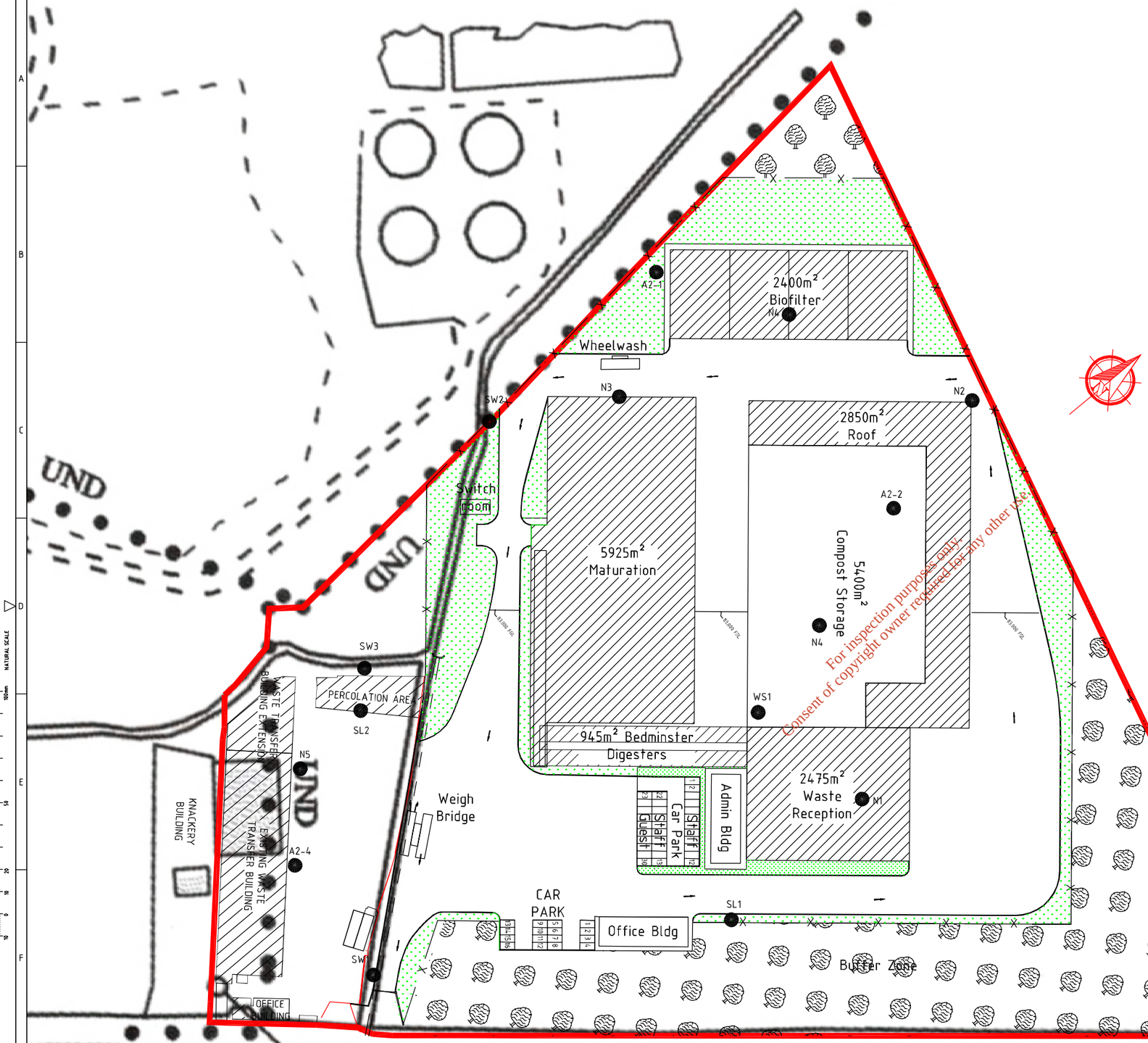
As a precaution regular litter patrols of the site perimeter and access road will be undertaken.

### 2.5.7. Fire Control

In general, fires will be prevented by operating best practice including:

- Inspection of loads at the weighbridge
- Control of loads to ensure no burning or smouldering loads enter the facility
- Designation of smoking/non smoking areas
- Security.

All buildings will be equipped with heat and smoke sensors so that in the event of a fire both the site management and emergency services can be quickly alerted. There will be fire hydrants located at the entrances of each of the buildings and connected to the public main.






## Legend

A2-1 Air Emission Point
N1 Noise Emission
WS1 Leachate
SW1 SWater
SL1 Soil/Ground

| Rev. | Drawn | Chkd | Appd | Date | Description |
|---|---|---|---|---|---|
| A | KL | ME | DOS | 28.07.06 | ISSUE FOR APPROVAL |

Name of Client
AES

Name of Job
EXTENSION TO KYLETALESHA SITE

Title of Drawing
POTENTIAL EMISSION POINTS AEROBIC COMPOSTING PROCESS

Scales Used
1:750 A1 1:1500A3

Dwg. No. 2006-081-01-FIG 2.5
Rev. A

D:\ACAD\2006\081\01\b-mbt_FIG 2.5

0m 75m 150m 225m 300m 375m 450m 525m 600m 675m 750m
Scale 1:750



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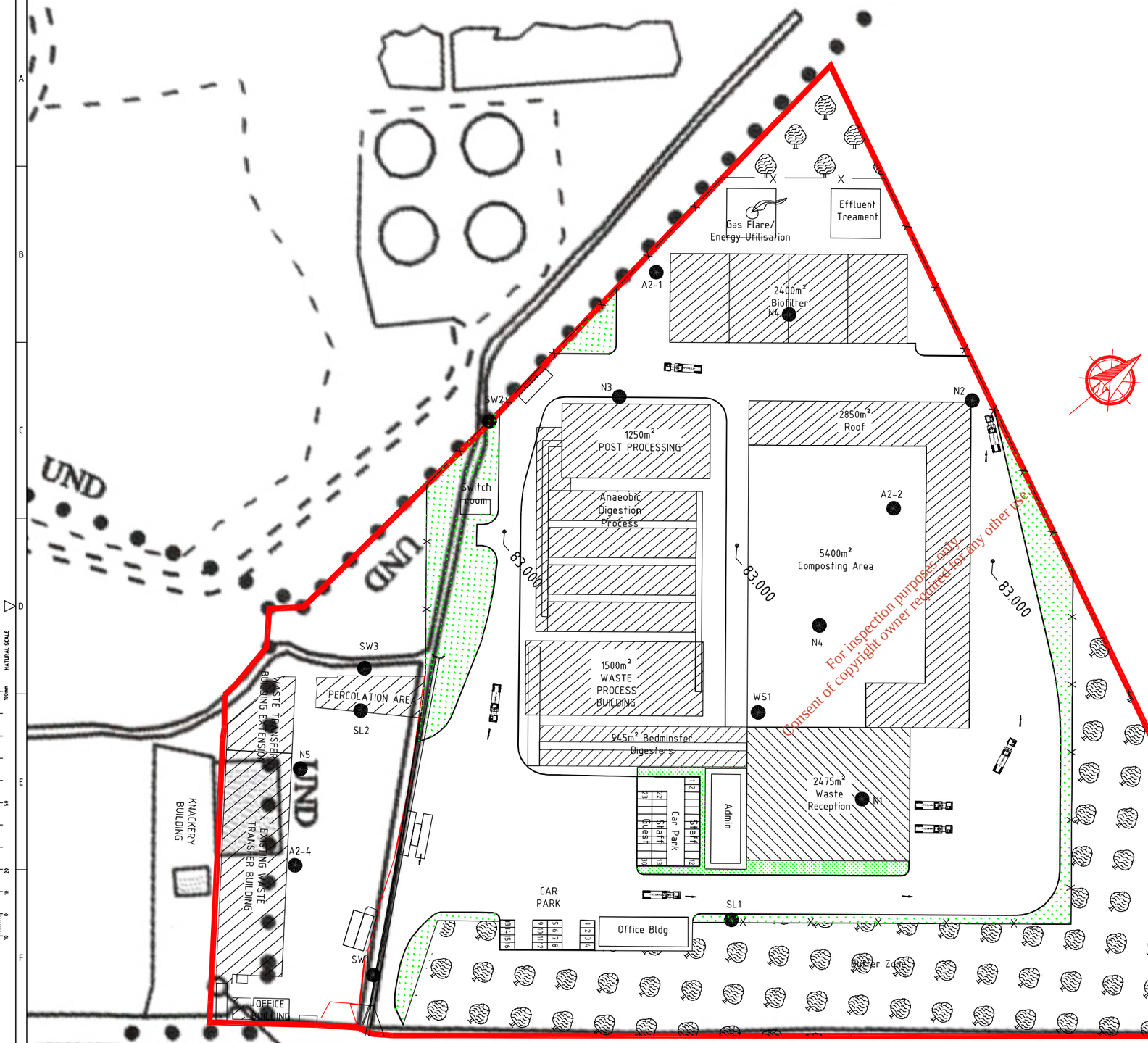




## Legend

A2-1 Air Emission Point
N1 Noise Emission
WS1 Leachate
SW1 SWater
SL1 Soil/Ground

| Rev. | Drawn | Chkd | Appd | Date | Description |
|---|---|---|---|---|---|
| A | KL | ME | DOS | 28.07.06 | ISSUE FOR PLANNING |

Name of Client
AES

Name of Job
EXTENSION TO
KYLETALESHA SITE

Title of Drawing
POTENTIAL EMISSION POINT
AEROBIC COMPOSTING PROCESS

Scales Used
1:750 A1 1:1500 A3

Dwg. No. 2006-081-01-FIG 2.6
Rev. A

D:\ACAD\2006\081\01\b-mbt_FIG 2.6

0m 75m 150m 225m 300m 375m 450m 525m 600m 675m 750m
Scale 1:750

Drawing name: G: \ACAD\2006\081\01\b-mbt_Fig26.dwg



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ORIGINAL DRAWING SIZE A1 - 1841 x 594

NATURAL SCALE 10 0 10 20 50 100mm

A sump will be created at the inlet to the culverted stream to facilitate the extraction of water for fire fighting purposes.

## 2.6. Environmental Monitoring Programme

AES intends to implement a comprehensive environmental monitoring programme on site to monitor and control all elements of the process and emissions. This programme will be dependent on the conditions of the Waste Licence granted by the EPA.

The monitoring programme will monitor, at a minimum:

- Emissions to surface water
- Noise
- Odour
- Dust deposition
- Digestion Residues and Compost

Figure 2.7 outlines the proposed monitoring locations for the AES site (subject to agreement with the Agency).



### 2.6.1. General

All environmental monitoring for the waste transfer station is currently carried out under a licence for the facility issued by the Environmental Protection Agency (EPA). This situation will continue under the revised waste license. Emission Limit Values (ELV) have been set by the EPA for many of the parameters monitored, and breaches of these ELVs will be considered non-compliance with the Waste Licence and appropriate action will be taken by the Agency. The monitoring regime is detailed in the following sections for both the existing monitoring regime and proposals made for the expanded monitoring regime, as deemed necessary.

AES personnel and/or an external consultancy will carry out the sampling and monitoring programme. The site manager is responsible for the implementation of the monitoring programme. Samples are collected and transported under chain-of-custody to a laboratory. Results are tabulated in standard forms for submission to the Agency as part of the on going monitoring requirement.

The following monitoring is proposed taking into consideration site specific details and waste licences granted for similar type waste facilities. Locations of monitoring points and frequency of monitoring are provided.

## 2.6.2. Parameters/Media to be Monitored

Figure 2.7 details the proposed monitoring locations for the extended facility. Table 2.3 summarises the proposed monitoring locations and frequency for the different media to be monitored.

**Table 2.3: Proposed Monitoring Locations and Frequencies**

| Parameter | Location | Monitoring Frequency |
|---|---|---|
| Dust Deposition | D1 (E245434 N202801) | Three times a year Note 1 |
| | D2 (E242688 N202621) | Three times a year Note 1 |
| | D3 (E245,461 N202542) | Three times a year Note 1 |
| | D4 (E245555, N202469) | Three times a year Note 1 |
| $PM_{10}$ | $PM_{10}$ (E245601 N202760) | Annually |
| Noise | N1 (E245467 N202544) | Annually |
| | N2 (E245534 N202460) | Annually |
| | N3 (E245936 N203087) | Annually |
| | N4(E246059 N202099) | Annually |
| | N5 (E246143 N203176) | Annually |
| Biofilter | (E 245481 N202747) | Refer to Table 2.4 |
| Surface Water | SW1 (E245489 N202585) | Biannually |
| | SW2 (E245491 N202577) | Biannually |
| | SW4 (E245573 N202483) | Biannually |
| | SW6(E245385 N202407) | Biannually |
| Treated Effluent | TE (E245489 N202556) | Biannually |
| | TE (E245637 N202608)) | Biannually |
| Meteorological Monitoring | Nearest synoptic station | Refer to Table 2.5 |
| Compost quality monitoring | Final Compost | Monthly |
| Gas Flare | E245447 N202759 | Refer to Table 2.9 |
| Gas Utilisation Plant | E245447 N202759 | Refer to Table 2.9 |

Note 1 Twice during the period May to September.



## 2.6.3. Air Monitoring

Dust monitoring is currently conducted at 4 locations within the boundaries of the waste transfer station (A1 – A4) using Bergerhoff dust gauges. It is proposed to remove the two monitoring locations (A1 and A2) and establish a further two monitoring points along the northern boundary of the extension site as per Figure 2.7.

PM10 monitoring will be carried out on an annual basis for a period of 24-hours at one location as indicated on Figure 2.7.

Monitoring of the biofilter will be carried out as per Table 2.4.

**Table 2.4: Schedule of Monitoring for the Biofilter** [Note 1]

| Parameter | Monitoring Frequency | Analysis - Method/Technique |
|---|---|---|
| **Bed Media** | | |
| Odour assessment [Note 2] | Daily | Subjective Inspection |
| Condition and depth of biofilter [Note 3] | Daily | Visual Inspection |
| Moisture content | Bi-annually | Standard laboratory method |
| pH | Bi-annually | pH probe |
| Ammonia | Bi-annually | Standard laboratory method |
| Total viable counts | Bi-annually | Standard laboratory method |
| **Inlet and Outlet Gas** | | |
| Ammonia | Bi-annually | Colourimetric Indicator Tubes |
| Hydrogen sulphide | Bi-annually | Colourimetric Indicator Tubes |
| Mercaptans | Bi-annually | Colourimetric Indicator Tubes |

Note 1: A competent laboratory using standard and internationally acceptable techniques shall carry out the analyses.
Note 2: This subjective assessment to be carried out by a staff member immediately upon arriving on-site
Note 3: The biofilter shall be examined to ensure that no channelling is evident, and that moisture content is adequate.



## 2.6.4. Meteorological Monitoring

The following data is to be obtained from the nearest weather station.

**Table 2.5: Meteorological Monitoring**

| Parameter | Monitoring Frequency |
|---|---|
| Precipitation Volume | Monthly |
| Wind Force and Direction | Daily |

## 2.6.5. Noise Monitoring

Noise is monitored at 5 locations around the perimeter of the existing site on an annual basis. It is proposed to remove the existing locations N1 and N4 as these will be located within the centre of the new site. It is proposed to monitor noise at 5 on an annual basis – two boundary locations and three sensitive receptors (i.e. the nearest dwellings). The locations of the proposed monitoring points are indicated on Figure 2.7.

## 2.6.6. Surface Water Monitoring

Surface water quality monitoring is carried out on a biannual basis in accordance with the current waste licence at SW-1, SW-2, SW-4 and SW-6. It is proposed to continue monitoring at these locations in accordance with the parameters and frequency set out in Table 2.6.

**Table 2.6: Surface Water Monitoring**

| Parameter | Monitoring Frequency | Analysis Method/Technique |
|---|---|---|
| pH | Biannually | Electrometry |
| Biochemical Oxygen Demand | Biannually | Standard Method |
| Suspended Solids | Biannually | Standard Method |
| Total Nitrogen | Biannually | Standard Method |
| Total Ammonia | Biannually | Standard Method |
| Total Phosphorus (as P) | Biannually | Standard Method |
| Chemical Oxygen Demand | Biannually | Standard Method |
| Electrical Conductivity | Biannually | Standard Method |
| Temperature | Biannually | Standard Method |
| Fats oils, & grease | Biannually | Standard Method |



## 2.6.7. Discharge of Treated Effluent to Percolation Area

Emissions from the discharge point of the on-site wastewater treatment plant to the percolation area at the waste transfer station will be continued to be monitored in accordance with Schedule D.5 of the existing licence (refer to Table 2.7). This monitoring regime will also be applied to the new wastewater treatment plant within the extended site.

**Table 2.7: Monitoring of Discharge to Percolation Area**

| Parameter | Monitoring Frequency | Analysis Method/Technique |
|---|---|---|
| Biological Oxygen Demand | Biannually | Standard Method |
| Ammonia | Annually | Standard Method |

## 2.6.8. Groundwater

At present Laois County Council monitors groundwater at a number of locations within the vicinity of the site which includes a monitoring well within the proposed extension area. This well will be lost during the construction of new buildings on site. AES will, if required, install a groundwater well at a location to be agreed by the Agency.

## 2.6.9. Compost Quality Monitoring

Compost quality shall be monitored for the parameters listed in Table 2.8. The trace element concentration limits shall apply to the compost quality. It is envisaged that the frequency of monitoring of compost quality will be monthly.

**Table 2.8: Monitoring of Compost Quality**

| Parameter (mg/kg, dry mass) | Compost Quality Standards Note 1 | | Stabilised Biowaste Note 1 |
|---|---|---|---|
| | Class 1 | Class 2 | |
| Cadmium (Cd) | 0.7 | 1.5 | 5 |
| Chromium (Cr) | 100 | 150 | 600 |
| Copper (Cu) | 100 | 150 | 600 |
| Mercury (Hg) | 0.5 | 1 | 5 |
| Nickel (Ni) | 50 | 75 | 150 |
| Lead (Pb) | 100 | 150 | 500 |
| Zinc (Zn) | 200 | 400 | 1500 |
| PolyChlorintated Biphenyls (PCB's) | - | - | 0.4 |
| Polycyclic Aromatic Hydrocarbons (PAH's) | - | - | 3 |
| Impurities >2mm Note 5 | <0.5% | <0.5% | <3% |
| Gravel and Stones >5mm Note 5 | <5% | <5% | - |

Note 1: Normalised to 30% organic matter content



## 2.6.10. Gas Flare and Gas Utilisation Plant

A gas flare and gas utilisation plant may be installed if anaerobic digestion is installed at the site. These plants will be monitored in accordance with Table 2.9.

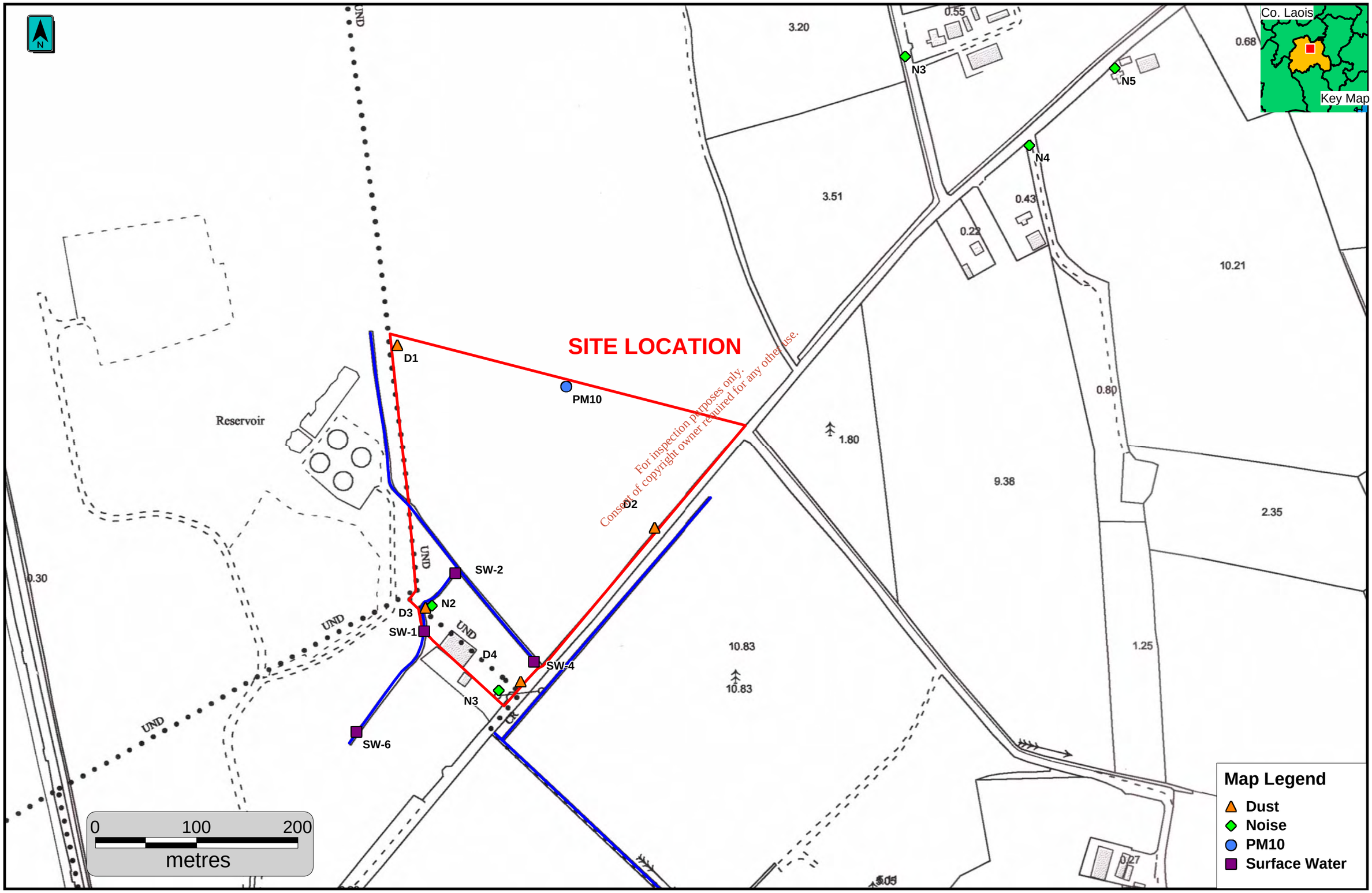
**Table 2.9: Monitoring of Gas Flare and Gas Utilisation Plant**

| Parameter | Flare ELV ($mg\ m^{-3}$)[1, 3] | Gas Compression Engine ELV ($mg\ Nm^{-3}$)[1, 3] |
|---|---|---|
| CO | 100 | 650 |
| $NO_X$ ($NO_2$ and NO) | 200 | 500 |
| $SO_2$ | - | - |
| TOC | 10 | 20 |
| THC | - | 1000 |
| HF | 5 (at mass flows > 0.05 kg/hr) | 5 (at mass flows > 0.05 kg/hr) |
| HCL | 30 (at mass flows >0.30 kg/hr) | 30 (at mass flows >0.30 kg/hr) |
| Formaldehyde | 60 | 60 |
| Total Particulates ($PM_{10}$)[2] | - | 80 |

**Notes:** [1] denotes BAT guidance for the waste sector: Waste treatment activities, Draft, Nov 2003. EPA, Johnston Castle, Wexford, Co. Wexford. Also taken from existing waste licences published by the EPA.

[2] denote that assumed Total particulates are $PM_{10}$ to allow comparison with SI 271 of 2002. This will facilitate the assessment of a worst-case scenario.

[3] denotes emission limit values are expressed at standard conditions of 273 Kelvin and 101.3 kPa. Oxygen reference for flare is 3% & for gas compression engine is 5%.



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**Proposed Environmental Monitoring Locations**

Figure 2.7