



**ATTACHMENTS IN SUPPORT OF  
AN APPLICATION FOR A WASTE LICENCE  
FOR  
WATERFORD CITY COUNCIL  
COMPOSTING FACILITY**

**ORIGINAL**

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**Prepared for:**  
Waterford City Council  
Department of Planning, Culture and Human Resources  
Wallace House, Maritana Gate  
Canada Street  
Waterford City

**Prepared by:**  
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Dublin 15



**November 2006**

**ATTACHMENTS IN SUPPORT OF  
AN APPLICATION FOR A WASTE LICENCE  
FOR  
WATERFORD CITY COUNCIL  
COMPOSTING FACILITY**

**User is Responsible for Checking The Revision Status Of This Document**

Rev. Nr.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
1	Issue to EPA	TR	BG	<i>[Signature]</i>	30-11-06

*Client:* Waterford City Council

*Keywords:* Waste licence application, attachments, composting facility, facility extension, in-vessel class 1 compost, tunnels, aerated static piles

*Abstract:* This document contains the attachments to the application for a waste licence to the EPA. The application is made by Fehily Timoney & Company on behalf of the facility owners Waterford City Council. The application is being made to extend the facility and bring it under the EPA regulatory system for waste facilities. The facility is currently operated on behalf of Waterford City Council by a third party. The current operation has a through-put of 9,000 t of separately collected household and commercial bio-waste and green waste. It is proposed to extend the facility to process 20,000 t per annum.

This document should be read in conjunction with Rpt001-1 Waste Licence Application Form

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## ATTACHMENT B.1

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The applicant is not a body corporate. This attachment is not applicable to the application being made.

The name and address of the applicant is that of the occupier. No drawing is required.

The site ownership plan is shown as 2006-289-01-Figure B1.1.

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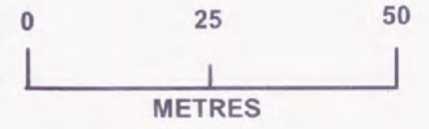


**NOTES:**

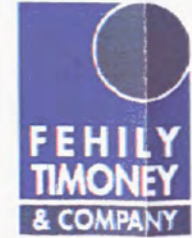
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Date of Revision A: 15/11/2006  
Saved in R:\Map Production\2006\289\01\Workspace\  
WCC-WLA\_Figure B.1.1 1:1000 SITE OWNERSHIP PLAN



Name of Client:	WATERFORD CITY COUNCIL	
Name of Job:	KILBARRY COMPOSTING FACILITY WASTE LICENCE APPLICATION	
Title of Drawing:	1:1000 SCALE SITE OWNERSHIP PLAN	
Dwg. No.:	2006-289-01-FIGURE B.1.1	Rev. A



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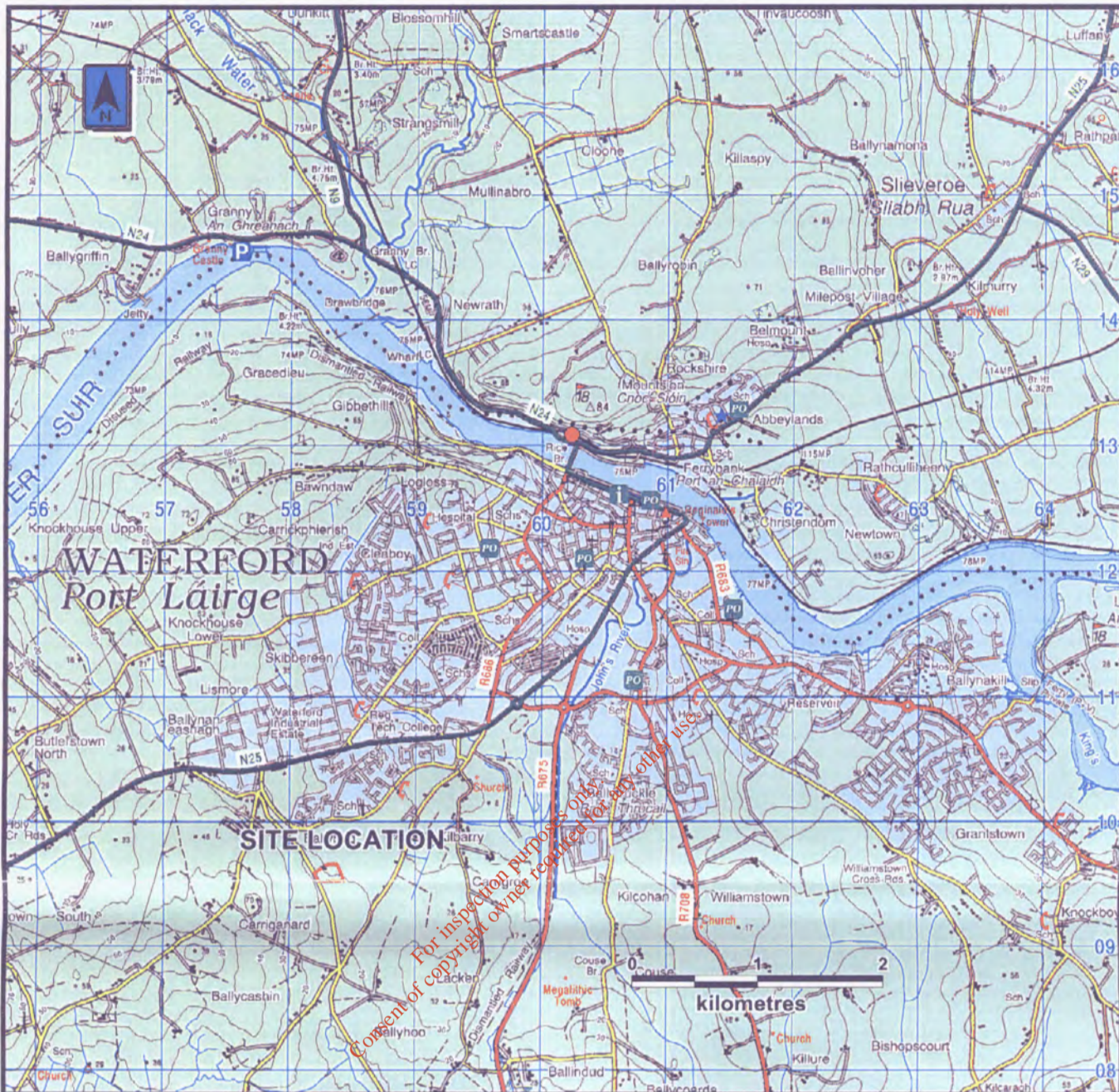
## ATTACHMENT B.2      LOCATION MAPS

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2006-289-01-Figure Number B.2.1 is a site Location Map (≤A3) with grid references. The licence boundary is outlined on the map in red. The licence boundary is the same as the ownership boundary shown on Figure B.1.1 and is also marked in red on Figure B.2.2 on the Site Services Plan.

2006-289-01-Figure B.2.2 Services, 250 m and 500 m boundary off-sets. There are no overhead power cables, rivers, canals, railways, public or private wells within 500m of the site boundary.

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**KEY MAP:**



Name of Client	WATERFORD CITY COUNCIL	
Name of Job	KILBARRICK COMPOSTING FACILITY WASTE LICENCE APPLICATION	
Title of Drawing	1:50,000 SITE LOCATION MAP	
Dwg. No.	2006-289-01-FIGURE B.2.1	Rev. A



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**LEGEND**

- Licence Application Boundary
- 250 m Buffer
- 500 m Buffer
- Underground Water Services
- 10 kV Overhead Line

**NOTES:**

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Date of Revision A: 14/11/2006  
 Saved in R:\Map Production\2006\289\01\Workspace\  
 WCC-WLA\_Figure B.2.2 Services Plan



Name of Client	WATERFORD CITY COUNCIL	
Name of Job	KILBARRY COMPOSTING FACILITY WASTE LICENCE APPLICATION	
Title of Drawing	SERVICES, 250m AND 500m SITE BOUNDARY OFFSETS	
Dwg. No.	2006-289-01-FIGURE B.2.2	Rev. A



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---

**ATTACHMENT B.3      PLANNING**

---

A Part 8 was granted for the site in 2003. An EIS was not required for the site. There are no waste licences or waste permits in force for the existing facility at this time. There is a certificate of registration, a copy of which is included in this attachment. The facility was granted an Animal By-Products licence in November 2006.

This attachment includes a copy of the Notice given to Local Planning Authority and a copy of the meeting minutes where the Part 8 was granted.

The licence application form poses the question – Has the Planning Authority been notified of this application? There is no requirement for Waterford City Council to notify the planning department in this instance.

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L. Mcg  
opens Part 8 file + also  
enter on S/S CC  
20/5

## WATERFORD CITY COUNCIL

09/03

### PART X1 PLANNING & DEVELOPMENT ACT, 2000 PART 8 (PLANNING & DEVELOPMENT) REGULATIONS 2001

#### NOTICE OF PROPOSED DEVELOPMENT Composting facility at Green Road, in the townland of Ballybeg, Waterford

In accordance with Part X1 of the Planning & Development Act, 2000 and Part 8 of the (Planning & Development) Regulations, 2001 (as amended) notice is hereby given that Waterford City Council propose to carry out the following development:

Provision of a composting facility of a capacity not exceeding 5000 tonnes per annum, including an enclosed waste reception facility, ten (10) enclosed composting containers, a weighbridge, public amenity area, site fencing and screening and ancillary works at Green Road, in the townland of Ballybeg, Waterford

Drawings and particulars of the proposed development will be available for inspection each day, Monday to Friday, exclusive of Public Holidays, during normal office hours at the Planning & Development Section, 6/7 Lombard Street, Waterford, during the period from 16<sup>th</sup> May. to 12<sup>th</sup> June, 2003.

Submissions or observations with respect to the proposed development, dealing with the proper planning and sustainable development of the area in which the proposed development would be situated, may be made in writing to Waterford City Council on or before the 26<sup>th</sup> June, 2003.

M. WALSH,  
DIRECTOR PLANNING & ENVIRONMENT,  
6/7 LOMBARD STRET,  
WATERFORD.

DATE : 16<sup>th</sup>, May, 2003.

L.McG  
Jong to Part 8 of Act 117

PLANNING AND DEVELOPMENT ACT 2000  
21 JUN 2003  
COUNCIL

## Part XI – Planning and Development Act, 2000

### Part 8 – Planning and Development Regulations 2001

#### Proposed Composting Facility at Green Road, Ballybeg, Waterford.

This proposal relates to the provision of a composting facility of a capacity not exceeding 5000 tonnes per annum, including an enclosed waste reception building, ten enclosed composting containers, a weighbridge, public amenity area, site fencing and screening and ancillary works. The facility is required for the processing of material from the three-bin collection system currently being implemented in the city and as such is an integral part of the Waste Management Plan. The use is in conformity with the industrial zoning objective for the area in the Waterford City Development Plan and is considered to be in accordance with the proper planning and sustainable development for the area.

The above development was advertised on the 16<sup>th</sup> May, 2003 and put on display for the period between May 16<sup>th</sup> and June 12<sup>th</sup>, 2003. The period up to and including the 26<sup>th</sup> of June was allowed for the receipt of submissions or observations in writing.

No written submissions or observations were received.

Screening of the site was an issue raised in a number of verbal observations by persons viewing the documents. Following further consideration, it is recommended that the proposal be modified from that circulated and placed on display to

- a) re-orientate the plant layout and reduce the site area in accordance with the site layout and site location maps attached, to facilitate future screening by industrial development and
- b) that full perimeter planting be provided.

**M. WALSH,  
DIRECTOR OF SERVICES,  
PLANNING AND ENVIRONMENT.**

X (a) Part 8 – Composting Facility – Completion of Process

The Director of Planning & Environment's Report circulated prior to the meeting refers. Mr. Walsh stated that the development was advertised on the 16<sup>th</sup> May and placed on display for the period between May 16<sup>th</sup> and June 12<sup>th</sup> 2003. He confirmed that submissions were accepted up to and including 26<sup>th</sup> June but that no submissions were received. Mr. Walsh stated following consideration of a number of verbal observations by persons viewing the documents it is recommended that the proposal be modified from that advertised.

On the proposition of Ald. P. Hayes, seconded by Ald. H. Quinlan, it was unanimously agreed to complete the process for the construction of a composting facility, as recommended by the Director of Planning & Environment in accordance with Part X1 of the Planning & Development act 2001 and Part 8 of the Planning & Development Regulations 2001.

Responding to questions the Director of Planning & Environment confirmed that the composting facility is a form of PPP but in operation only. He informed the meeting that City Council will own the facility and a private contractor will manage the facility. He confirmed that that a private contractor had been selected following a public tendering process.

**REVIEW OF NOMINEES TO LOCAL TRAVELLER  
ACCOMMODATION CONSULTATIVE COMMITTEE**

The Director of Housing & Corporate Affairs' Report dated 16<sup>th</sup> June 2003 circulated with the agenda refers. It was agreed that Ward Members would meet and revert to Mr. Power with the names of the nominees for each electoral area.

**CORRESPONDENCE:**

Questions were dealt with regarding the demolition of houses in Waterford City and the Johns River Drainage scheme.

It was agreed to write to Minister Tom ParLOUR seeking clarification on the commencement date of the Johns River Drainage Scheme.

The correspondence circulated with the agenda was noted.

Attendance at the following conferences was proposed by Ald. H. Quinlan and Cllr. D. Walsh:

1. L.A.M.A, 20<sup>th</sup> Annual Conference, Mount Errigal Hotel, Letterkenny, Co. Donegal.  
24<sup>th</sup> & 25<sup>th</sup> April 2003  
Ald. H. Quinlan, Ald. M. Cummins, Cllr. D. Walsh

## WATERFORD CITY COUNCIL

### ADJOURNED ANNUAL STATUTORY MEETING 30<sup>th</sup> JUNE 2003

#### **PRESENT:**

An Seanoir Tomás Ó Cunneagáin Meara,  
 An Seanoir Pádraig Ó hAodha,  
 An Comhairleoir Seán Ó'Dóbhair,  
 An Comhairleoir Daithí Breathnach,  
 An Seanoir Daithí Mac Domhnaill,  
 An Seanoir Hilary Ó Caoinnealain,  
 An Comhairleoir Mícheal Ivory,  
 An Comhairleoir Máire De Roiste,  
 An Seanoir Muiris Ó Cuimin,  
 An Comhairleoir Seamus Ó Riain,  
 An Comhairleoir Séan Hallagan,  
 An Comhairleoir Tomás Ó Murchu,  
 An Comhairleoir Labhras Ó Neill,  
 An Comhairleoir Liam Mac Carthaigh,

#### **OFFICIALS IN ATTENDANCE:**

Mr. E. Breen, City Manager,  
 Mr. P. Power, Director of Housing & Corporate Affairs,  
 Mr. E. Power, A/ Director of Transportation & Infrastructure  
 Mr. M. Walsh, Director of Planning & Environment,  
 Ms. C. Byrne, Director of Community & Enterprise,  
 Mr. J. Murphy, Head of Finance,  
 Mr. F. Galvin, Senior Executive Officer,  
 Mr. C. Kehoe, A/ Snr. Engineer,  
 Mr. J. Andrews, Senior Planner,  
 Mr. E. Ruane, Senior Executive Officer,  
 Ms. K. Hayes, Asst. Staff Officer,  
 Ms. O. O'Reilly, Senior Staff Officer.

#### **APOLOGY:**

An apology for inability to attend was received from Cllr. O. Clery.

#### **VOTES OF SYMPATHY:**

It was unanimously resolved that this Council extends its sympathy to:

Ald. T. Cunningham, Mayor on the death of his aunt Terlo.  
 Mr. Sean Kirby, Department of Education & Science on the death of his wife Peig.



Attention: Tanya Ruddy

<b>PLANNING FILE</b>	
NO.....	
RECD.	- 3 OCT 2005
<b>WATERFORD CITY COUNCIL</b>	



HEADQUARTERS  
JOHNSTOWN CASTLE ESTATE  
COUNTY WEXFORD, IRELAND  
PHONE: +353-53-60600  
FAX: +353-53-60699

**WASTE MANAGEMENT (PERMIT) REGULATIONS  
S.I. NO. 165 OF 1998**

**CERTIFICATE OF REGISTRATION**

Further to an application Register No. R1600 received on 16th September 2005, the Environmental Protection Agency (the Agency), in pursuance of the powers conferred on it by the Waste Management (Permit) Regulations, 1998, grants this Certificate of Registration under Article 21 of the said Regulations to Waterford City Council, The Mall, Waterford.

This Certificate of Registration is in respect of a Compost Facility by Waterford City Council for a site at Six Cross Roads, Kilbarry, Waterford. The registered classes of Waste Recovery Activity from the Fourth Schedule of the Waste Management Acts, 1996 to 2003 are:

<b>Class 2</b>	<b>Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).</b>
----------------	--

The following wastes may be recovered at the facility:

*Household food and garden waste, commercial catering waste, wood chip (Amendment material), commercial garden.*

The maximum amount of compost and waste (feedstock materials) held at the facility at any one time shall not exceed 1000t.

It is the responsibility of Waterford City Council to ensure that the registered waste activities are carried on in accordance with the following conditions specified in the Regulations:

- a) The activity concerned shall not cause, or be likely to cause, environmental pollution.
- b) Any emissions from the activity concerned will not result in the contravention of any relevant standard, including any standard for an environmental medium, or any relevant emission limit value, prescribed under any enactment.

In addition:

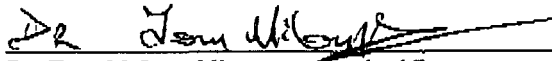
- c) The operator shall ensure that appropriate infrastructure for the composting of waste shall be established and maintained at the facility prior to any waste being composted.
- d) The operator shall provide, and maintain an impermeable concrete surface (or an alternative approved) in all areas of the composting.
- e) The operator shall provide for *aerobic* composting (indoor or outdoor), the operator shall provide the composting material with: a 5% minimum concentration of oxygen within the pore spaces, appropriate moisture levels, pH 6.0-9.0, and an appropriate C:N ratio.
- f) The operator shall ensure that there shall be no direct emissions to ground/surface water from leachate that comes from the composting process. All leachate produced on site should be used in the composting process or transferred off site to an approved facility.
- g) The operator shall ensure that noise, odours, dust, bioaerosols, litter, vermin, birds and flies, do not give rise to nuisance at the facility or in the immediate area of the facility.
- h) The operator shall ensure that while awaiting collection, mature compost shall be stored in areas protected against uncontrolled run-off and nuisance formation.



- i) The operator shall employ a suitably qualified manager to ensure that the facility does not cause harm to the environment or human health.

Sealed by the seal of the Agency on this the 30<sup>th</sup> day of September 2005.

Present when the seal of the Agency was affixed hereto:

  
Dr. Tom McLoughlin      Authorised Person

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No trade effluent or other matter other than domestic sewage from the hygiene facilities on site and storm water will be discharged to sewer.

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The development is not located within the Shannon Free Airport Development Company area.

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This attachment contains the site notice (the complete newspaper in which the site notice was placed in the case of the original waste licence application and a copy of the site notice in all copies of the application). The location of the site notice on site is shown on 2006-289-01-Figure B.1.1 Site Ownership Plan, see Attachment B.1.

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**SITE NOTICE  
APPLICATION TO  
THE ENVIRONMENTAL PROTECTION AGENCY  
FOR A WASTE LICENCE**

Notice is hereby given that Waterford City Council (Environment Department), having its principal offices at Lombard Street, Waterford City, is applying for a waste licence in respect of its existing composting facility - Waterford City Composting Facility, Green Road, Waterford City (National Grid Reference E 2582 N 1096, Ballybeg Townland).

The existing development involves the composting of approximately 9,000 tonnes per annum (tpa) of source-segregated biodegradable waste and green waste. Waste is composted in 2 no. stages involving in-vessel digestion in 20 no. digestion units and maturation on aerated static piles. The application also seeks approval for the extension of the facility. This will entail the up-grading of the existing composting facility in order to process up to 20,000 tpa of source-separated biodegradable municipal waste and green waste. It will involve in-tunnel composting and turned aerated static piles within a building. Plant used will comprise shredding, mixing equipment, screening and loading/pile turning machinery. Associated waste and compost storage infrastructure, site offices and vehicle parking will be provided.

The classes of activity applied for are as set out in the Third and Fourth Schedules to the Waste Management Acts 1996 to 2005:

**Third Schedule – Waste Disposal Activities**

**Class 7.** . Physico-chemical 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 8 to 10 of this Schedule (including evaporation, drying and calcination).

**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.

**Fourth Schedule – Waste Recovery Activities**

**Class 2.** Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes).

**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.

The principal activity proposed is Class 2 of the Fourth Schedule as given above.

A copy of this application and any such further information relating to it as may be furnished to the Environmental Protection Agency will, as soon as is practicable after its receipt, be available for inspection or purchase at the EPA's headquarters at Johnstown Castle Estate, Co. Wexford.



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 7**      **Physio-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcinations) which results in final compounds or mixtures which are disposed of by means of any activity referred to in Paragraphs 1 to 10 of this Schedule**

This activity is limited to the pre-treatment of leachate on-site for re-use or prior to its removal off-site for treatment and disposal.

**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**

This activity relates to the storage of waste which cannot be recovered, prior to disposal off site at an appropriate facility.

Oversized materials that were not degraded during the composting process such as plastics, large pieces of wood and metals are screened out of the final product. These materials are stored temporarily on site prior to disposal off-site at an appropriate facility.

Leachate is stored on site temporarily in a leachate storage tank prior to tankering off-site for appropriate treatment and disposal.



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

<b>Class 2</b> <b>This is the Principal Activity</b>	<b>Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes):</b>  This activity relates to the composting of source segregated organics and green waste.
<b>Class 13</b>	<b>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:</b>  This activity relates to the storage of green waste on site prior to shredding for use as amendment material in the composting process.  This activity relates to the temporary storage of surface water, stormwater and treated leachate on site for recirculation through the composting process.

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**ATTACHMENT B.8      NOT APPLICABLE**

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The European Communities (Control of Major Accident Hazards involving Dangerous substances) Regulations, 2000 (S.I. No. 476 of 2000) do not apply to the proposed activity.

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## ATTACHMENT C.1 TECHNICAL COMPETENCE AND SITE MANAGEMENT

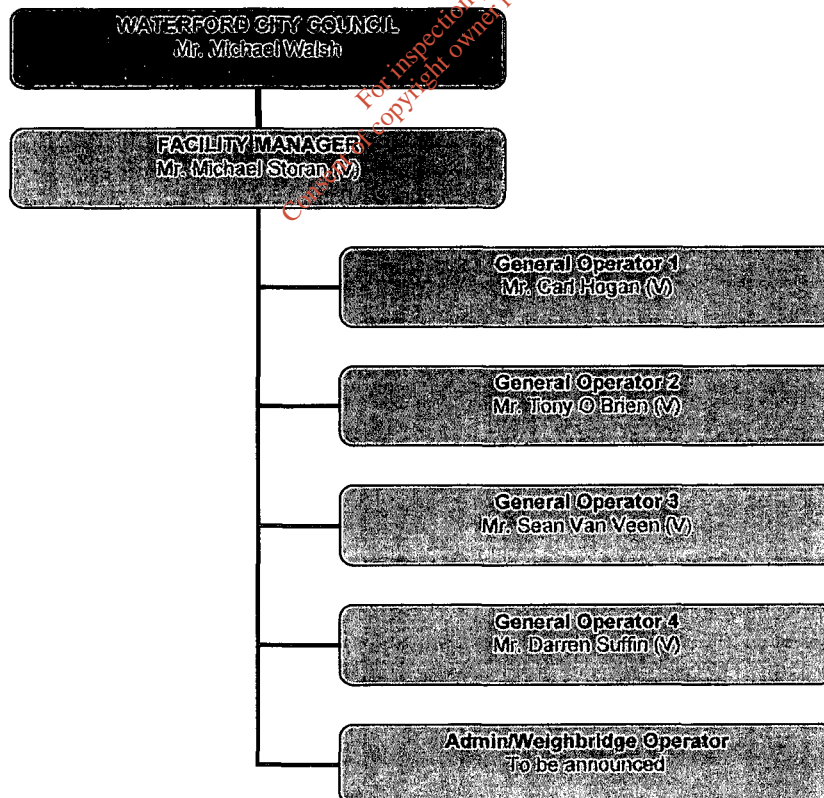
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The waste licence application is being made on behalf of Waterford City Council. The facility was constructed in 2003 and operations commenced in January 2004 in accordance with the Certificate of Registration.

Waterford City Council (WCC) is the owner of the site and equipment. The Council is responsible for construction and development, and for the financial development of the site. The site is currently operated by a private contractor on behalf of WCC. The Council, as the licensee, will have overall responsibility for the operation of the site and compliance with the conditions of the waste licence.

An organisational chart outlining the management and site staff of the facility is shown in Figure C.1.1. The organisational chart depicts the management of the existing facility. The Agency will be notified of any changes to the management of the facility. The position, duties and responsibilities and the experience and qualifications of each of the site staff is shown in Table C.1.1.

**Figure C.1.1: Compost Facility Management – Organisational Chart**



(V) Private contractor on behalf of WCC

**Table C.1.1: Staff Qualification List**

Name	Position	Experience/Qualifications
Michael Walsh	Director of Services	B.E. C.Eng., Dip. H.G.E., M.I.E.I.
Michael Storan	Facility Manager	<ul style="list-style-type: none"> <li>▪ 5 years waste management experience as Environmental Officer for Veolia</li> <li>▪ BSc Environmental and Biological Science.</li> <li>▪ FETAC National Skills Cert in Waste Management.</li> <li>▪ NIFAST Certificate Occupational Health &amp; Safety.</li> <li>▪ Certificate in First Aid.</li> <li>▪ 6 months on-site Compost Management Training received from Celtic Composting Systems Ltd. VALOBIO Veolia distance learning composting course</li> </ul>
Carl Hogan	General Operative	3 months on-site training from Celtic Composting Systems (CCS)
Tony O' Brien	General Operative	
Darren Suffin	General Operative	
Sean Van Veen	General Operative	

**Site Staff Duties and Responsibilities**

The licensee will be Waterford City Council (WCC). The nominated contact for the licence will be Mr. Michael Walsh, Director of Services, Waterford City Council. Any changes to the site staff will be notified to the Agency.

WCC will have overall responsibility for the operation of the site and compliance with the waste licence. WCC will be responsible for all contact with the Agency, submission of reports, notifications etc.

**Facility Manager, Mr. Michael Storan**

The duties and responsibilities of the facility manager are summarised as follows:

- management of the facility under the supervision of senior staff
- responsible for process and environmental controls
- appointment, supervision and management of operators
- tracking of materials through site and production of batch reports
- daily site inspections to identify and correct process control, material management, facility maintenance and environmental control issues
- supervision of equipment and site maintenance work
- compliance management with environmental conditions and reporting requirements, this will include waste licence compliance once licensed
- oversee financial management of facility
- oversee marketing and sales of final product
- assisting site operations as required
- education and waste awareness role
  - tours of the facility
  - development of promotional materials for the site and product
- participate on the project management team
- assisting with sourcing new feedstock materials and potential customers

The daily duties of the facility manager are listed below:

- conduct site inspection upon arrival at the site in the morning to check the operation of the process and environmental controls
- outline staff activities for day and manage work tasks throughout day
- coordinate equipment and services: roll-off, skip lift, shredder, hauling
- update pile logistics software, make process control adjustments, print out batch logs, update site process management and environmental log
- track daily tonnages by type of material and customer
- track facility expenses
- purchase parts and coordinate services for repair and maintenance work
- supervise repair and maintenance work
- respond to, record and manage complaints
- assist with product sales and drop off transactions
- liaise with the 3 concerned parties
- environmental monitoring and sample transfer to labs
- interpretation of monitoring results
- compliance reporting documentation
- give tours of the facility
- inspect the facility at the end of the day before closing

#### General Operatives –General Duties and Responsibilities

Quality control is the key element throughout the process to ensure the manufacture of a high quality product in accordance with regulations. All materials that pass through the site are pasteurised.

In relation to this particular process, the general operatives:

- attend to the biological process
- care for the microbes
- take responsibility and care for what they are doing
- carry out all tasks to completion
- keep the site clean and tidy
- have an understanding of the steps of the process
- question or ask for help if you do not understand or are unsure about what to do
- report any breach in process protocols, any accidents, damage or broken equipment immediately to site manager
- work as a team

The General Operator is responsible for the following site areas:

- Tipping Building
- Digester Pad
- Curing Area
- All outside concrete and tarmac areas

The processing duties of the General Operator are to:

- manage the material flow through the composting facility
- understand and manage process steps so adjustments can be made (e.g. compost mixing, digester protocol, curing pile management) when needed
- keep the site clean and tidy at all times.
- minimise environmental impacts (dust, odour, noise, water pollution, litter) during site operations
- operate site equipment in a safe and careful manner to minimise accidents and repairs

The specific job duties of the General Operator are to:

- supervise waste tipping in tipping building
- inspect waste on tipping floor, pull out gross contaminants
- staff the sorting line to remove contaminants
- mix feedstock materials in auger mixer
- manage bulking material pile, bulking material use and reuse
- load digesters with feedstock material
- level materials in digester and clean lid area before closing lid
- remove debris from exterior of digester before it leaves tipping building
- sweep digester pad when digesters are being filled in tipping building
- oversee digester placement on pad: one driver and one operative
- connect and disconnect digesters to and from the aeration system and the leachate drainage system
- keep digester pad clean of litter, debris and standing water
- understand the basic process control commands on system computer: turn on and off, monitor temperature piles, tract materials through site
- manage tipping of digesters on curing pad
- form curing piles evenly over grates, keep grates clear and clean
- shape piles and clean edges
- manage materials on curing system: aeration, watering, contaminant removal
- turn piles, add moisture if necessary, reshape and clean edges
- screen materials, remove contaminants, manage overs and final product piles, remove contaminants
- clean screening area after use for the day
- manage collection and removal of contaminants: wheelie bins, skips and roll-offs
- clean tipping floor at the end of each day
- keep site and access roads clean and litter free
- staff site on Saturdays as needed
- operate and care for equipment to minimise damage, down time and maintenance costs
- report damage, accidents, broken equipment immediately to site manager
- repair all site equipment as needed
- maintenance role
  - maintain all equipment on site
    - Mixer
    - Tractor
    - Loader
    - Hook Lift and Skip Lorries
    - Sorting system
    - Screen

- Digester System
- Curing System
- All other site equipment: power washer, trailers, collection bins, office utilities, etc.
- maintain drainage and odour control systems
- schedule and supervise routine preventative maintenance and repairs
- lubricate and grease mixer and screen and other equipment as needed
- maintain, keep clear and clean all drainage channels and drains for surface water and leachate on digester pad, tipping building, curing system, working areas and roads
- maintain and clean out leachate collection drain and aeration piping in digester and curing pad systems
- inspect bio-filters and wetland, and maintain and repair as necessary
- landscaping duties
  - maintain landscape and demonstration garden of the site
  - assist facility customers with drop-off of materials and compost/mulch sales
  - have responsibility for the
    - compost storage building
    - all non paved areas of site
    - maintain landscape around site and keep landscape weed and litter free
    - plant trees, shrubs and flowers around site as needed
    - apply mulch around plantings and maintain as necessary
    - water newly planted areas as needed
    - create demonstration area for facility products
    - assist drop-off customers with tipping of green waste
    - remove contaminants as needed
    - sweep green waste drop off area at the end of each day
    - collect tags from customers and track use
    - work with landscapers to encourage use of facility and products
    - assist customers with loading product into vehicles
    - bag compost for sale
    - sweep compost storage area and keep it free of litter

Consent to publish for other purposes is required for any other use.

An EMS will be prepared upon grant of licence in accordance with the conditions of the waste licence.

The following measures are in place for the ongoing assessment of environmental performance at the facility and are included in this document. The environmental management of the facility includes all aspects of facility operations, from receipt of waste material to production of a compost product and all impacts associated with that process:

- Processing Standards
- Sampling Procedures
- Cleaning Procedures
- Measures against vermin
- HACCP Plan
- Traceability Controls

The EMS will be prepared in accordance with the requirements specified in the European Commission's Eco Management and Audit Scheme (EMAS) and the EPA guidelines.

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## ATTACHMENT C.3 HOURS OF OPERATION

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- a) Proposed hours of operation
- b) Proposed hours of waste acceptance/handling
- c) Proposed hours of any construction and development works at the facility and timeframes
- d) Any other relevant hours of operation expected

These are the proposed hours of:

Waste acceptance	0700 to 2030 Mon-Fri 0700 to 1730 Saturdays and Bank Holidays
Operation	0700 to 2200 Mon-Fri 0700 to 1800 Saturdays and Bank Holidays
Construction	0700 to 2030 Mon-Fri

The waste acceptance and operation hours have been proposed for the following reasons:

- This facility will be a centralised facility for the South East Region, designed to accept all source segregated organics from household bins in Counties Carlow, Kilkenny, Wexford, and Waterford, from Waterford City and South Tipperary. The waste acceptance hours have been set on order to cater for waste being transported over large distances.
- It is proposed to operate the facility until 22:00 hours to facilitate the initial processing of waste that is delivered late from the most distant locations. This processing includes transferral of waste from the tipping floor, mixing and loading followed by the daily cleaning procedures at the facility, floor wash down etc.
- The construction period will be short term and details will be forwarded to the Agency prior to the commencement of works.

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## ATTACHMENT C.4 CONDITIONING PLAN

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A conditioning plan is not required for this facility (non-landfill activity).

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## ATTACHMENT D.1 INFRASTRUCTURE

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Details of site infrastructure as required in Table D.1 of the waste application form:

This application is being made to seek a licence for the existing composting facility in Waterford City. It is operated currently under the permission of a Certificate of Registration and Part 8 Planning. The licence application seeks permission to operate the existing facility processing 9,000 tpa. It also seeks approval in principle to extend the facility to process 20,000 tpa. Construction will commence upon approval from the agency based on SEWs submitted by Waterford City Council. The facility extension will be developed within the site boundary as shown in the drawings in Appendix 1:

Drawing Number 2006-289-01-101 Rev A	Existing Site Layout
Drawing Number 2006-289-01-102 Rev A	Existing Drainage Layout
Drawing Number 2006-289-01-103 Rev A	Existing Water Supply and Ducting Layout
Drawing Number 2006-289-01-104 Rev B	Proposed Conceptual Layout

The existing site infrastructure is as described in sections D.1 (a) – D.1 (u) and shown on Drawing Number 2006-289-01-101 Rev A. The proposed infrastructure (conceptual) is described in section D.1.2 of this attachment.

### D.1 (a) Site security arrangements including gates and fencing

The site is enclosed on all sides with 2.5 m high palisade fencing and the site entrance off Green Road consists of two gates 2.5 m high with closing bolts and locks. The distance between the fence uprights is 2.7 m which is closed with 2.5 m galvanised uprights at a distance of 100 mm. The uprights themselves are galvanised 4 inch channel iron buried in 0.5 m<sup>3</sup> of concrete. The main gate to the facility is the same height as the other fencing and consists of two gates with closing bolts and locks.

The gate of the site is locked during closed hours by the manager or appointee. The Material Reception Building is used for storing all vehicles overnight and is locked by the manager or appointee. The vehicles used in the 'clean area' is locked in the material reception building with the bucket removed and left in the compost storage shed. The main site office is locked when the facility is closed and the security alarm is activated. All office windows are covered with a protective mesh.

### D.1 (b) Design for site roads

There is one internal site road. It runs from the site entrance to the Compost Shed, after which the areas are deemed to be hardstanding areas. The site road is drained by two road gullies that discharge to 150 mm dia pipes flowing to the pump chamber located to the west of the site office.

### D.1 (c) Design of hardstanding areas

Hard standing areas within the site include the marshalling yard, the area to the east & west of the ASP pads and the area to the north & south of the digester pad.

The marshalling yard is drained by three drains located to the north of the Compost Shed and a strip gully that runs along the northern face of the Compost Shed. These drains flow to the north by gravity through a 150 mm pipe to the main drainage pipe that flows westwards towards the site entrance.

The hard standing area to the west of the westerly ASP drains to a road gully located adjacent to the weighbridge and the areas adjacent to the remaining pads drain to gullies situated to the south of the ASPs. Drainage channels constructed at the edge of each ASP pad prevent runoff from the pads flowing out onto the hardstanding areas. These drainage channels collect the ASP run-off and direct it to manholes located at the southern end of the ASPs.

Runoff from the hardstanding areas to the north and south of the digester pad are managed separately. Runoff from the area to the south of the pad flows to two road gullies located along the southern boundary of the site and flows by gravity through a 150mm dia pipe to where the site discharges to the main sewer. The runoff from the area to the north of the slab drains to two gullies located at the edge of the tarmac area and flows with gravity via the main site stormwater pipe to the stormwater sump located at the site entrance.

### D.1 (d) Plant

The plant used in the composting process is described below and in Attachment D2 (a).

#### Tractor with Hydraulics and PTO

A tractor with a power take-off unit is used to power the auger mixer. The tractor also has a hydraulic system to power the opening and closing of the digester lids.

#### Front-End Loader

A front-end loader is one of the most important pieces of machinery on the composting site. Two front end loaders are used at the facility. One loader (Senobogen) is used in the Materials Reception Building (dirty area) where it has a variety of uses, such as spreading out incoming materials in the tipping area to inspect them for large contaminants, loading the picking line and scraping the floor at the end of a days operation. Another loader (Manitou) is used for the outdoor (clean area) site operations. It is used to shape piles in the curing area as well as remove materials from the curing pad once the material has been fully processed. It is also used to load the screen and to move the screened compost to the storage area and the oversized materials to a storage pile or to the landfill for disposal (depending on the level of contamination). The handling capacity of the Material Reception loader is three cubic metres while the outdoor loader has a handling capacity of 2 cubic metres. It is anticipated that another front end loader will be obtained to move material within the composting, unloading the tunnels and turning the static piles.

### Roll-Off Truck

A roll-off truck commonly used for transporting and tipping large refuse containers is necessary for moving and unloading digesters. The roll-off truck used at the facility is an eight wheel truck capable of lifting up the 24 tonnes.

### Trommel Screen

Finished compost materials typically require screening to remove wood chips or other larger sized bulking materials. The screen used is a Doppstadt Trommel 12mm screen.

### **D.1 (e) Wheel-wash**

The wheelwash is located externally adjacent to the vehicle access door into the Material Reception Building. The wheelwash consists of a reinforced concrete slab 10m long x 5m wide. The slab is graded to fall to a central grit trap. Wheel washing is affected by an operative with a manual mobile steam wash. Wash water will drain by gravity from the grit trap to a pumping chamber, and from here will be pumped to the leachate storage tank.

### **D.1 (f) Laboratory facilities**

Not Applicable

### **D.1 (g) Design and location of fuel storage areas**

There is currently no fuel stored at the facility. A refuelling vehicle is brought to the site as required to re-fuel the existing plant. A bunded fuel storage area will be established as the facility is developed. It is shown on Drawing Number 2006-289-104 Rev B. Construction will not commence until approval has been granted by the EPA, based on SEW submissions by WCC.

### **D.1 (h) Waste quarantine areas**

The waste quarantine area is located inside the Waste Reception Building. The quarantine area is 2 m x 3 m and is marked out on the building concrete floor by a 100 mm wide yellow line. This quarantine area is designed for unsuitable items that are found in the waste stream e.g. batteries, metal containers. Any material deposited into the quarantine area will be transported to an appropriate waste facility for disposal. All runoff from the quarantine area is considered to be leachate and follows the same path as the leachate from the building floor to the leachate holding tank, prior to being transported off-site for disposal at an appropriate wastewater treatment plant.

In the event of a full load being delivered that is deemed to be unsuitable, the whole building floor will become the quarantine area. Any runoff generated will be collected as leachate as per the normal operations within the building. Quarantined loads will be immediately removed from the site and transported to an appropriate facility for disposal. Upon removal of a quarantined load, the building floor will be thoroughly washed down prior to composting operations re-commencing within the Waste Reception Building.

#### **D.1 (i) Waste inspection areas**

The floor of the Waste Reception Building is considered to be the waste inspection area. All loads are inspected prior to being placed in the mixer. Any material deemed unsuitable is removed to the quarantine area as described. Similarly, if a full load is deemed unsuitable, it is dealt with as outlined in the above section. Any runoff from the waste inspection area is stored in the leachate tank prior to removal off site for treatment.

#### **D.1 (j) Traffic control**

Traffic flow on the site will be managed by use of appropriate signage and road markings. The site is accessed by members of the public, landscaping contractors and Council vehicles.

Signs will be erected at the site entrance and at the south western corner of the westerly ASP directing all site users to their drop-off points for green waste and collection points for mature compost. 'No Entry Site Vehicles Only' signs will be erected adjacent to the ASPs and to the north of the Waste Reception Building to prevent non-site vehicles from travelling to the Digester Pad.

Members of the public and landscaping contractors will be directed to north western corner of the Compost Shed to off-load their green waste. They will also collect compost from the Composting Shed.

Road markings will indicate the correct flow of traffic and will also indicate areas that are only to be accessed by site vehicles.

Council vehicles delivering green waste will enter the site and be directed to the Waste Reception Building. They will enter by driving through the wheelwash slab and after depositing their load they will exit the building through the wheelwash and after being thoroughly cleaned will immediately exit the site.

The speed limit within the site will be limited to 15 km/h and speed warning signs will be located inside the facility entrance and also in the Marshalling Yard.

When leaving the site, a 'Stop' sign is located at the junction of the site and Green Road.

#### **D.1 (k) Sewerage and surface water drainage infrastructure**

See Drawing Numbers 2006-289-01-102 Rev A, Appendix 1.

##### **Sewerage Infrastructure**

Toilet facilities are provided in the staff changing room located adjacent to the control room and also in the site office and canteen building. The foul water from the staff changing room flows by gravity via a 150 mm and 225 mm pipe to a pumped sump located to the west of the site canteen. Foul water from the site office and canteen also flows by gravity to this pumped sump. The collected foul water is then pumped, with collected surface water run-off as described below, via a 100 mm pumped main to the south eastern corner of the site where it flows into the local sewer.

## Surface Water Drainage Infrastructure

Surface water runoff on the site can be divided into two zones: 1) south of the Digester Pad and 2) rest of the site.

The hardstanding area to the south of the Digester Pad (Zone 1) is drained by two road gullies that discharge into a 150 mm dia pipe. The collected water then flows from the site by gravity to the main sewer.

The remaining hard standing areas (Zone 2) of the site are drained by a series of road gullies located to the north of the Digester Pad, in the Marshalling Yard and adjacent to the ASPs and weighbridge/site office. The main surface water collection pipe runs approximately east to west along the centre of the site and increases from a 100 mm dia pipe in the eastern end of the site to a 225 mm dia pipe as it approaches the western end of the facility. Collected surface water from each area connects into the main site drain at various locations and flow by gravity to the pumped sump located to the west of the site canteen.

The collected surface water and foul water (as described above) in this sump are then pumped via a 100 mm pumped main along the southern boundary of the site. This pumped main connects with the surface water from Zone 1 and flows by gravity to the south eastern corner of the site where it flows into the sewer.

### **D.1 (I) All other services**

#### Water Service

The facility is serviced by a water main with the water distributed via a 100 mm dia uPVC pipe within the site. The existing composting operation uses 35 m<sup>3</sup> over a 5 day week. Water supply is provided in all staff facility buildings and the Waste Reception Building. There are also fire hydrants located in the Waste Reception Building, to the east of the Digester Pad, beside the ASPs and in the marshalling yard.

#### Telecommunications

The facility has 2 no. phone lines. Broadband facilities are not provided.

#### Electrical Power

The facility has a mains power connection and both single-phase and 3-phase power are available on site. The ASPs and the digester units are provided with both single-phase and 3-phase power, with single-phase power being provided to the remainder of the site.

## Leachate

Leachate production on site is confined to the Waste Reception Building, the wheelwash, the digestion units placed on the Digestion Pad and the ASPs. All leachate produced on the site is collected in a dedicated drainage system and stored on site in a bunded leachate storage tank, located on the eastern boundary of the facility.

The leachate produced in the Waste Reception Building flows to three drains in the building's concrete floor, exits the building to the south and flows by gravity through a 150 mm dia pipe to a manhole located in the south eastern corner of the site. The leachate then flows via a 150 mm dia leachate drain to a pumping chamber located to the south of the leachate storage tank. Leachate collected from the Digester Pad flows through a 150 mm dia pipe before connecting into the same drain that flows to the pumping chamber.

Leachate collected from the ASPs flows to a pumped sump located to the south of the western ASPs. Leachate is then pumped via a 90 mm dia pumped main to the leachate storage tank.

Run-off from the wheel-wash will be considered as leachate and flow from the grit trap of the wheel-wash via a 100 mm dia pipe to the pumping chamber located on the site's eastern boundary. The collected leachate from the wheel-wash, Waste Reception Building and Digester Pad will be pumped from the pumping chamber into the leachate storage tank.

Leachate is stored for tankering off-site to an appropriate facility.

### **D.1 (m) Plant sheds, garages and equipment compound**

There is no specific plant shed/garage/compound on the site. The trommel screen is stored in the Compost Shed when not in use. Both front loaders and the tractor are stored in the Waste Reception Building when the facility is not in use. In order to comply with the Animal By-Products Regulations, the bucket for the 'clean area' front loader is stored in the Composting shed when the facility is closed and the front loader employed in 'clean' operations is through cleaned in the wheel-wash each morning prior to commencing operations.

The roll-off truck used on site is hired in on a daily basis to the site and is removed from the site at the close of business each day.

### **D.1 (n) Site accommodation**

Two prefabricated office units are located adjacent to the weighbridge on the site. The unit situated beside the weighbridge holds the site manager's office, the weighbridge office, a small canteen area and a toilet. The second unit provides a further two separate toilets (one for staff & one for members of the public) and large canteen.

A staff changing room with toilet facilities is located adjacent to the Waste Reception Building.



**D.1 (o) Fire control, including water supply**

See Attachment E.6.4.

Security measures are described in Attachment D.1.

Emergency Response Procedures will be drawn up for the site. An on-site emergency co-ordinator will be trained to co-ordinate the implementation of the emergency plan should the need ever arise.

**D.1 (p) Civic amenity facilities**

There is no civic amenity facility proposed at the Composting Facility. However, there is the facility for members of the public, landscapers and the City Council Parks Department to deposit their green/landscaping waste. Bagged compost can also be purchased at the site for a small charge.

Opening hours for delivery of green waste/purchase of compost by members of the public and landscapers are:

Monday –Thursday: 0900 to 1600  
Friday: 0900 to 1530  
Saturdays: 0900 to 1530

Opening hours for delivery of green waste/collection of compost by City Council vehicles are:

Monday –Thursday: 0800 to 1600  
Friday: 0800 to 1530  
Saturdays: 0800 to 1530

**D.1 (q) Any other waste recovery facilities**

Not Applicable

**D.1 (r) Composting infrastructure**

Composting infrastructure is described in Attachment D2a Unit Operations in Attachment D.1.d.

**D.1 (s) Construction and Demolition waste infrastructure**

Not Applicable. There is no construction and demolition waste infrastructure existing or proposed.

**D.1 (t) Incineration Infrastructure**

Not Applicable. There is no incineration infrastructure existing or proposed.

## D.1 (u) Any other infrastructure

### Weighbridge

The weighbridge installed on site has a capacity of 50,000 kg and operates with a Genesys weighbridge record data system. The dimensions of the weighbridge are 16 m in length by 4 m in breadth.

### Leachate Storage Tank

The leachate holding tank has a storage capacity of 103 m<sup>3</sup> and has been sized for seven days storage while maintaining a 0.5 m freeboard. The holding tank has a diameter of 4.9 m with an approximate height of 6.2 m and stores contaminated run-off/wash-down from the ASP pads, digester pad, composting vessels, waste reception building and wheelwash. The tank is of glass lined steel construction, and is contained within a liquid-retaining concrete bund. The tank is vented, the vent fitted with a charcoal filter for odour control. Leachate is drawn off site periodically by tanker to appropriate facilities.

### Odour Control Units

The odour control units are Oscillating Atomising Units that force water through two spinning meshes to produce an ultra-fine mist of 280 billion droplets per litre. The mono-dispersed mist stays in the air and mix readily with dust particles and odour producing molecules pulling them down to the ground. It is not expected that the odour control units will be required following completion of the proposed works.

### Biofilter Units

There are two biofilters located on the Digester Pad on the site. The biofilter on the northern side of the pad treats the exhaust air from the ten digester units positioned on the northern side of the pad, with a similar operation on the southern side of the pad.

Each biofilter is 8.5 m x 7 m x 2 m in height and the filter media consists of six parts wood-chip to one part mature compost. Four 150mm dia perforated pipes enter the base of the biofilter and the discharged air is treated as it travels up through the filter media.

## D.1.2 Proposed Site Development & Infrastructure

Waterford City Council intend to extend the existing composting facility in order to increase the throughput to 20,000 tpa. It is proposed to extend the facility on a phased basis. It is proposed to construct a compost building and a tunnel system whereby the process from material reception, digestion phase, curing and screening will be carried out indoors. A conceptual design for the site development is presented in this application (see Drawing Number 2006-289-01-104, Rev B, Appendix 1). It is envisaged that these works will be carried out in the future. Waterford City Council is requesting that the Agency approve the extension in principle subject to the submission of relevant Specified Engineering Works Reports. No construction will be carried out without Agency approval.

The following is a list of infrastructural items that may be developed on site based on the conceptual design of the facility's future development. The exact future development and associated infrastructure will be agreed with the Agency prior to any works commencing:

- development and extension of the existing waste reception building to include high speed shutter doors and loading bays for the existing digester units with the building being placed under negative pressure
- construction of concrete composting tunnels
- construction of a portal frame composting building under negative pressure containing aerated flooring for the curing phase
- construction of a number of biofilters to treat air extracted from the above buildings
- infrastructure to pre-treat leachate prior to re-circulation on site or removal off site for further treatment and disposal.
- construction of stormwater holding tanks that would allow for the collection and storage of stormwater run-off. This water would then be used for the composting process to minimise the volume of water that the facility draws from the Waterford City water network
- construction of a dedicated reception/collection area for green waste and compost for use by members of the public and landscapers. This would remove these site users from the proximity of site operations.

The above is a non-exhaustive list of infrastructure that may be developed on site. The development of the site will be subject to preliminary and detailed design, prior to seeking approval from the Agency for the proposed extension to the existing facility. All information in relation to the proposed development will be submitted as SEWs for approval prior to commencement of the proposed extension.

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## ATTACHMENT D.2 FACILITY OPERATION

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Attachment D2 Facility Operations includes the following sections:

- D.2.a Unit Operations
- D.2.b Flow Diagram of the Process
- D.2.c Emissions
- D.2.f Standard Operating Procedures
- D.2.g HACCP for Maturity of Compost
- D.2.h HACCP for Pathogen Analysis
- D.2.i Proposed Facility Operations

### D.2.a Unit Operations

Drawing Number 2006-289-01-101 Rev A shows a plan of the site that indicates all existing activities, buildings and facilities. A flow diagram of the process is included as Figure D.2.2.

The existing Unit Operations at the facility are listed as follows:

- Waste Acceptance
- Material Reception
- Material Decontamination and Shredding
- Mixing with Amendment Material
- Loading into Compost Reactor Vessels
  - Temperature and profile measurement
- Outdoor Static Pile Aeration
  - Temperature and profile measurement
  - Compost sampling
  - Reporting
- Screening
- Compost Storage
  - Compost Sampling

#### Waste Acceptance

Waste is accepted at the facility in accordance with the Waste Acceptance Procedures, see Attachment H.2.

### Material Reception

Organic waste is delivered to the Waterford Composting Facility in two ways;

(a) Drop-off of green waste

Householders, landscaping contractors and the City and County Council Parks Departments use the facility to drop off green waste and collect compost. Green waste is usually brought to the facility in car or tractor trailers.

Green waste is stored under cover as shown on Drawing Number 2006-289-01-101-Rev A. Prior to use the material is shredded adjacent to the storage area. The shredded material is transferred to the reception hall where it is added to the auger mixer as amendment material.

(b) Delivery of wet organics

The compost facility is designed to receive "wet organics" in the form of source-separated domestic and commercial organic refuse within a covered tipping building. This material is currently delivered by refuse collection vehicles (RCVs) from the City Council and County Council areas. A private contractor delivers commercial source segregated organics to the facility. Following tipping, all organic is visually checked for contamination. Large objects are manually removed. The protocol for the facility is for the enclosure of the wet organics within the composting digesters within 24 hours of arrival to avoid vermin, odour and leachate issues.

Refuse vehicles (compacter trucks and roll-off trucks) enter the site at the gate at the western end of the site. They enter the tipping building by the western facing door and tip their contents on the floor in the location indicated in Drawing number 2006-289-01-101-Rev A.

### From tipping floor to mixer

Material is transferred from the tipping floor into the mixer using a low loader. It is tipped directly into the mixer. Amendment material (shredded green waste) is added to the mixer between loads of organic material.

### Material blending

An auger mixer is used to shred and blend materials for composting. The twin augers in the mixer are equipped with blades that chop brushy materials so they can be effectively blended with bio-waste for composting. The slow speed shredder/mixer has a blade separation of 140 mm. Consequently, all materials are reduced down to a particle size less than this figure. During the shredding process, additional bulking materials, inoculants and water is added to ensure that the subsequent biomass will effectively heat when air is introduced.

At the end of the blending process, the moisture of the blend is checked and if necessary water is added. This process is a vital stage in the process as it allows the material to be adjusted for moisture, nutrient ratio, microbial activity and porosity to ensure effective subsequent heating and optimal composting. This process is also an odour prevention technique as correctly blended material will be less likely to become anaerobic and odorous.

### Loading into Compost Reactors

There are 20 no. in-vessel digester units. These are located on an outdoor digester pad. The location of the digester pad is shown on Drawing Number 2006-289-01-101-Rev A. Each unit is mobile, allowing it to be towed from the digester pad to the reception hall. The blended "pre-compost" is transferred to the in-vessel digesters by a conveyor attached directly to the auger mixer. The conveyor helps break up any clumps of material and forms a homogenous well-structured compost pile within the container. The mixing and loading process takes about 2 hours per 30 cubic meter vessel. This stage is referred to as the 1<sup>st</sup> composting barrier.

### The Compost Reactor

The in-vessel composting system:

- is a closed composting reactor, which cannot be by-passed, i.e. it is completely sealed,
- has installations for monitoring temperature against time, and
- has an adequate safety system to prevent against insufficient heating.

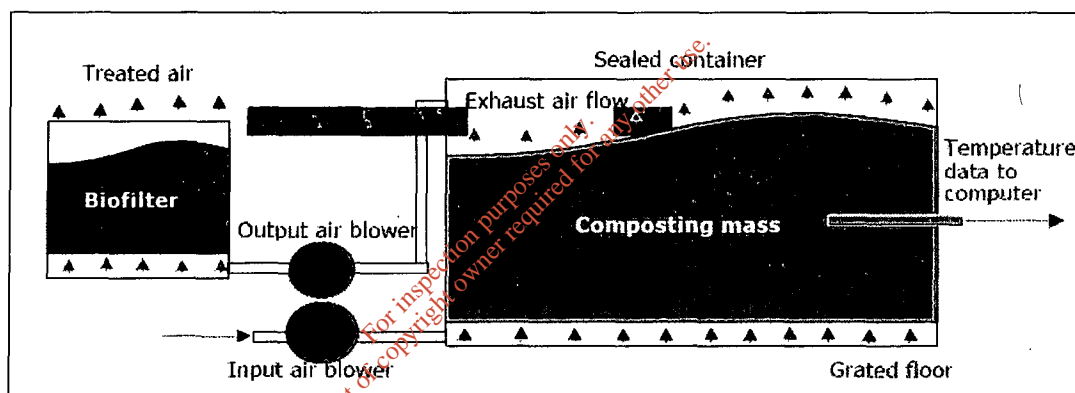
The system has the following environmental features:

- completely enclosed to allow complete heating of the composting material
- full capture of all exhaust air
- bio-filtration of exhaust air
- exclusion of vermin
- full capture of all leachate generated
- weather proof
- no wind blown litter
- full computer control
- temperature record
- neat and tidy appearance (outdoor digestion units)

The containerised system utilises 30 cubic meter roll-off compatible containers as composting vessels. The vessels are loaded through the top and come equipped with a hydraulically operated lid. To empty the vessels, they are picked up by a hook lift lorry, the back door is opened and the materials are tipped out. This process takes 5-10 minutes. The vessels contain a false perforated floor which allows air to be introduced into the bottom of the vessels. This also allows any liquids to be collected under the false floor without interfering with the aeration system. The bottom floor of the vessel is graded to a drain away from the door. A valve is opened daily to allow the leachate to be drained out for collection.

The composting process for the containers is managed by computer, which controls the airflow within the biomass. The flow of air is dictated by temperature and/or oxygen measurements of the composting mass (a one meter stainless steel temperature probe is inserted through a slot in the side of the vessel). In the beginning of the process, when the composting mass is heating up, the computer system is in "oxygenation" mode. Here the process control system is programmed to blow air into the vessels on a periodic basis to maintain adequate oxygen levels and stimulate the growth of aerobic bacteria. The system is also configurable for air recirculation and/or reversible airflow to optimize the process. The 14-day cycle allows enough time to pasteurise the material while removing its food value. This avoids any subsequent insect or vermin problems during the second phase of composting using the outdoor aerated static pile system. Using the basic arrangement, the containerised and tunnel in-vessel systems utilise two blowers for each vessel. One blower draws fresh air and forces it into the bottom of the vessel or tunnel and pushes it up through the composting mass. A second blower, with stainless steel blades and housing, pulls the process air out of the top of the vessel or tunnel and forces it through a bio-filter for odour removal and treatment.

**Figure D.2.1: Internal features of the in-vessel reactor illustrating the air-flow**



The in-vessel system utilises a process control system to regulate airflow through the composting biomass. The full enclosure of the biomass and the controlled aeration allows for even temperatures to develop within the container. Forced air allows aerobic conditions to prevail, which encourages the growth of thermophilic microbes.

The bio-degradation activity of the large thermophilic microbial community generates excess heat, which results in the thermal death of many mesophilic enteric pathogens. Moreover, the aerobic conditions generate an environment which is more favourable to the development of thermophiles over the facultative anaerobic species typical of faecal origin, e.g. *Salmonella*, *E.coli* etc. A retention time of 14 days in the vessels results in the removal of the hydrolysable fraction of the feedstock, i.e. the readily degradable carbohydrates, proteins and lipids. This results in a post-in-vessel material which has a low vector attraction potential. The result of this is that vermin and flies are not attracted to the curing piles on the ASP. This is a vital component of the process strategy and has been adopted from USEPA legislation called the "Vector Attraction Rule". In summary, the in-vessel containers provide a robust, auditable system of treating bio-waste containing meat and/or faecal material.

The containerised system utilises 30 cubic meter roll-off compatible containers. The 30 cubic meter vessel hold 18-20 tonnes per batch.

The process control system consists of the following components:

- industrial programmable logic controller (PLC)
- variable frequency drives for the blowers
- temperature probe, pressure, air flow and/or oxygen sensors
- personal computer with printer, ups and modem
- windows operating system software
- process control software
- pile logistics software

The PLC coupled with a windows based PC computer allows the operator to configure a temperature profile for the 14 days of composting. The computer and process control system is programmed to provide aeration on a periodic basis for oxygenation of the composting mass as well as for cool down when temperatures exceed established temperature set points. The process control system is connected to a set of variable frequency drives for each digester. These control the speed of the blowers and hence the amount of airflow that is pushed into and extracted from the digesters. The PC computer is loaded with proprietary software so it can interface with the process controller which allows the operator to configure or change operating parameters to meet time and temperature requirements. The computer is also loaded with database and spreadsheet software so that temperature data can be logged and reports can be generated for each batch of compost.

#### Time and Temperature Profile

The in - vessel system operates a protocol of 60°C for two consecutive days minimum over the 14 day in-vessel stage. This protocol is used as experience has shown 60 - 65°C is within the optimum temperature range for composting to occur. Temperatures of 70°C or more result in a die off of beneficial micro-organisms thereby inhibiting the composting process. This achievement of temperature set points at the in - vessel stage corresponds to the 'first barrier' of the twin barrier approach.

#### Calibration of Measuring Devices

It is necessary to ensure that temperature measurement is accurate. All temperature measuring devices i.e. digester probes, radio probes and hand held temperature probes are calibrated on an annual basis by an external body.



### Static Pile Aeration

The Aerated Static Pile (ASP) Modules are the second composting barrier. They are located as shown on Drawing Number 2006-289-01-101-Rev A, labelled as curing pad areas.

This second phase of composting occurs within four outdoor ASP bunkers with three pile turns over a 7-8 week period.

The ASP process has been adopted for the second composting barrier as the method to inhibit the re-growth of pathogens (typically facultative anaerobic bacteria) under aerobic conditions.

The facility currently operates by combining the contents of six containers into one primary pile. The emptying of the containers and pile forming equates to one turn. Subsequently, a temperature probe is inserted into the pile to monitor core temperatures. The pile is then monitored to achieve 60°C for two days. However, as exposed piles do not provide heat throughout the entire mass compared to the in-vessel phase, the pile is turned every 2 weeks to ensure that all parts of the pile are exposed to the hot core. The temperature probes are again inserted to document a third period of 60°C for two days. This combination of turning and data logging corresponds to the 'second barrier' of the twin barrier approach to temperature control.

The in-vessel composting process converts raw feed stocks into a pasteurised compost product that has most of its readily biodegradable material decomposed and stabilised. Consequently, it has a low attraction to disease vectors and other vermin. However, while this material can be described as being stable it is not yet mature enough for use as a soil amendment. An additional phase of maturation is therefore needed to allow the material to fully humify while reducing its fermentability further.

This phase, called "curing," is a mesophilic or medium temperature, aerobic process that eliminates organic plant phytotoxins, consumes fungal substrate and provides additional biological stabilisation, especially the decomposition of cellulose, hemicellulose and lignin (woody materials, including paper). It also provides maturity and begins a prolonged period of humification and mineralisation. Curing can be conducted in a number of ways: in static piles, turned windrows or in aerated static piles. Aerated static piles are used here because it speeds the curing process, it minimises the facility footprint, it maintains aerobic conditions and reduces the potential for generating odour.

Polyethylene pipes are buried in a concrete slab with upright pipes that are level with the curing pad floor. Air is drawn downward through the curing pile and exhausted through a separate bio-filter. This negative aeration process maintains the aerobic conditions needed for effective curing while further reducing the potential for odour. The material is typically maintained on the aerated pavement for six to eight weeks prior to screening. Temperatures will be monitored in each pile weekly. The air-flow to each zone is subsequently regulated by valves on the manifold pipe in response to temperature changes. During the curing process, the piles are turned 3 times. This turning breaks down compaction and allows for the introduction of water to moisten the biomass when necessary.

The curing system above consists of two large concrete bunkers into which the composting materials from the containers are discharged. Each curing bunker is divided into four cells or zones, which are aerated by a series of buried HDPE air lances with uprights that are level with the bunker floor (4 lances per zone). Each zone has been designed to handle five digester loads of material. A series of butterfly valves at the end of the buried lances controls airflow to each of these zones. The aeration system operates in negative aeration mode by drawing air through the curing pile and passing it through a bio-filter to remove any off-odours produced. Run-off from precipitation and condensate from the piles flows through the buried lances and is directed to the leachate collection system. Leachate is collected from the digester pad and directed to the leachate tank for storage on site prior to tankering off site to an appropriate facility.

### Screening and Storage

After 9-10 weeks in the process, when the materials are cured, they can be moved to the storage area for screening.

A trommel screen is used for this process. A trommel screen is a rotating cylinder on an incline. Composted materials are placed into the screen's hopper with the use of a bucket loader. The hopper then slowly feeds the rotating screen at the high end. As the materials are rotated within the screen and move to the lower end, small particles fall through the screen holes and fall below the screen onto the ground or onto a conveyor which piles the screened compost away from the screen.

Oversized undecomposed materials or inert contaminants fall out of the lower end of the rotating cylinder into a pile. Depending of the level of contamination, this larger fraction can be disposed of to an appropriate facility if it is highly contaminated. If contamination is low, the oversized materials, mostly undecomposed wood chip are reused in new batches of compost as an inoculant and structural material to add porosity. The level of the cylinder and the speed of rotation can be adjusted to facilitate movement of composted materials through the screen. Once the compost is screened, it is stored for a minimum of 21 days while pathogen tests are carried out. Following testing it is stored on site until it is sold or used by Waterford City Council.

### Compost Sampling

Currently compost sampling is carried out to provide documentary evidence of the pathogen reduction efficiency of the in- vessel/ASP 'twin barrier' technology for the Animal By-Products (ABP) application. There is a HACCP for the Maturity of Compost; it is included as Attachment D.2.h.

Computerised batch logistics follow the path of fresh bio-waste through the composting process until it produces finished compost. This program records:

- date of mixing
- weight of material
- in-tunnel/vessel start/finish date
- curing pad start date phase 1,2,3 & 4.
- screening date

When operating at full capacity and filling two digesters per day, 10 digesters are filled per week and consequently 10 digesters are emptied per week. These 10 digesters fill two zones on the curing pad. After 2 weeks, these two zones are turned and allowed to mature for another 2 weeks. At the end of the eight week curing stage, there are 10 digesters of material ready for screening. As each digester holds approximately 18 tonnes of material, a batch represents approximately 180 tonnes of raw bio-waste. It has been observed that the bio-waste loses approximately 50% (moisture) of its weight during the in-vessel and curing processes, giving approximately 90 tonnes of material before screening.

Typically screened material will give a 50/50 return of finished compost to oversized material that will be retained by the screen, giving between 40 and 50 tonnes of finished compost for ten initial digesters of biowaste. Therefore, each week a batch is screened to produce 40 – 50 tonnes of compost.

The finished compost is kept quarantined from any existing compost in the storage building until analysis results are received from the testing laboratory. This process normally takes two to three weeks. During this time, the material is agitated weekly to ensure any residual microbial activity has adequate oxygen to finish its life cycle.

When sampling, three sub-samples of approximately 5 kgs each are taken from three different locations in the pile and are combined to make one sample of 15 kgs which is required by the testing laboratory. The samples are taken using a dedicated stainless steel shovel and placed into a clean black sack. It is then placed into a cooler box with cooling blocks and couriered to the testing laboratory overnight. The sampling shovel is disinfected between sampling events and all reasonable precautions are taken to avoid cross contamination.

Analysis of compost is carried out for the following parameters:

- *Salmonella Sp.* absence in 25g
- *E.coli* 1,000c.f.u in 1g
- Maturity tests
  - Self Heating C
  - pH
  - Ammonia mg/l
  - Nitrate mg/l
  - Heavy Metals
  - H<sub>2</sub>O %

These are based on Department of Agriculture recommendations.

**D.2.b Flow diagram of the whole process along with a brief description detailing its management and maintenance plans.**

**Figure D.2.2: Unit Processes**

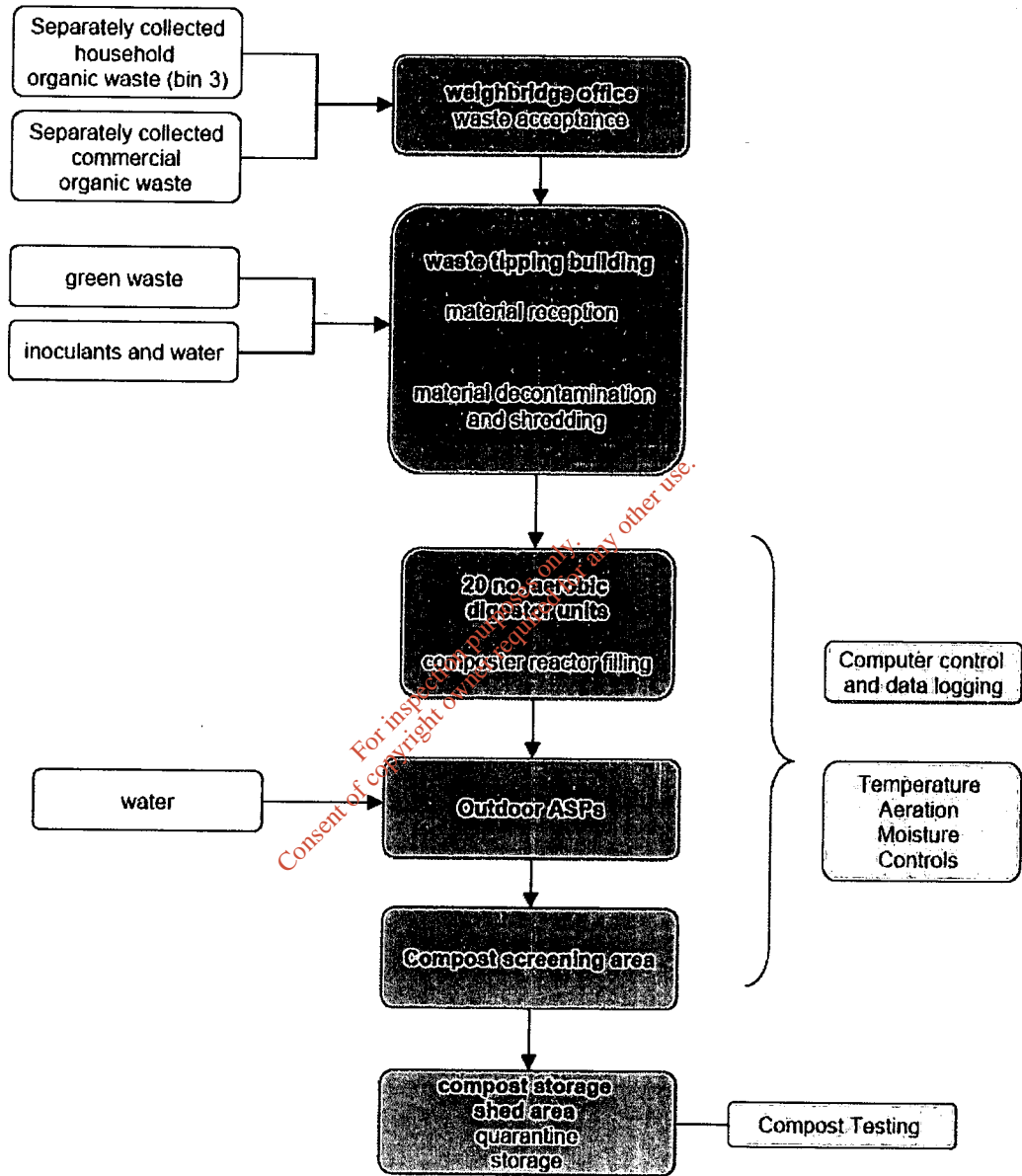
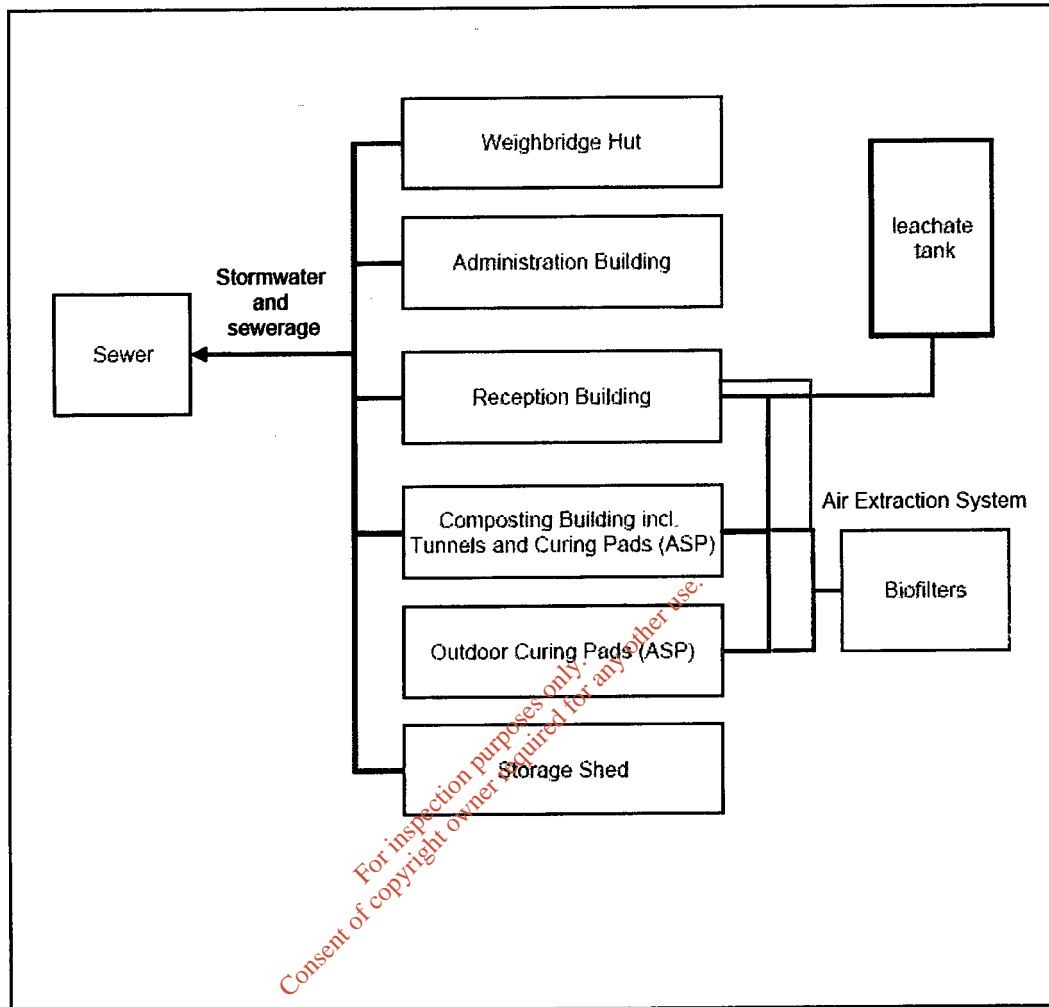


Figure D.2.3: Management and Maintenance System



Management and Maintenance Plans for the facility are listed in Table D.2.1 and referenced to their location within this application.

**Table D.2.1: Management/Maintenance Control Plans**

Management/Maintenance Plan or Control	Location within Application Document
Odour Control Plan	Attachment E.1
Noise Control	Attachment E.5
Dust and Bio-aerosol Control Plan	Attachment E.1
Surface Water Management Plan	Attachment E.2
Standard Operational Procedures	Attachment D.2.f and D.2.g
Process Control –reporting and auditing	Attachment D.2.b
Cleaning Procedures	Attachment D.2.b
Nuisance Control	Attachment E.6
Quality Control – Final Compost Product	Attachment D.2.b & D.2.h & D.2.i

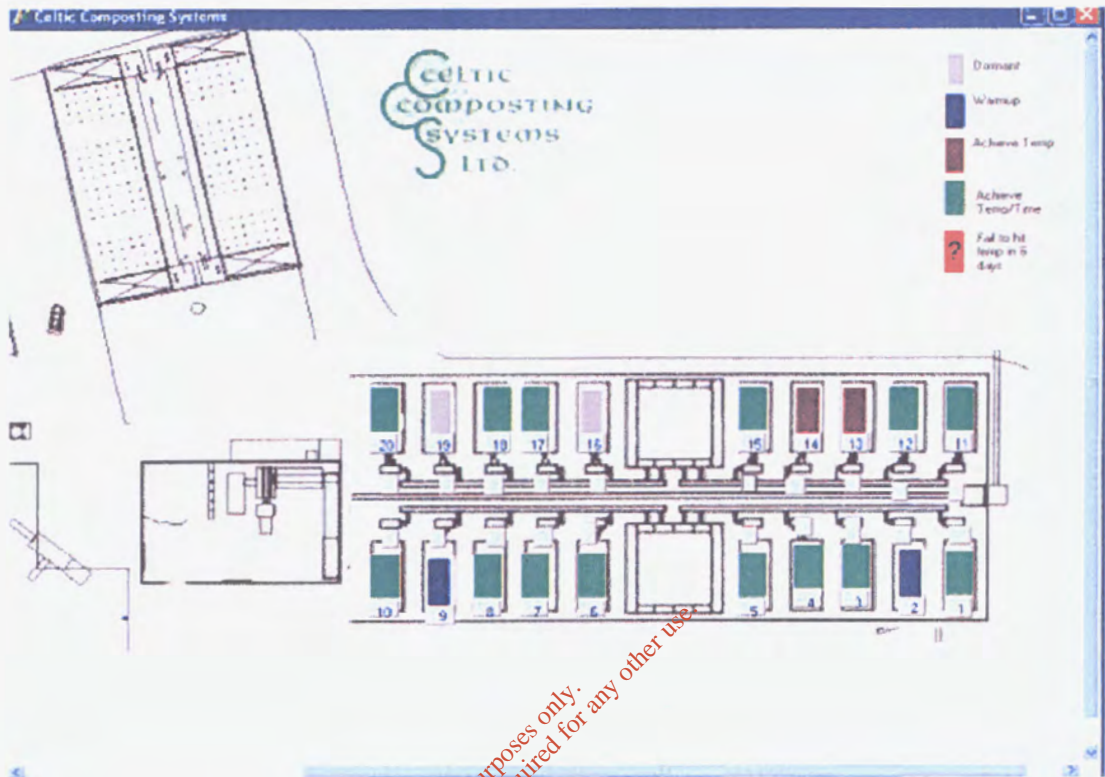
Process and Quality Control - reporting and auditing

In-vessel and curing temperatures are monitored and recorded for each batch. The combined systems will be subject to a strict quality control protocol with a traceable paper trail. In summary, every batch of compost has the following data:

- a batch code
- a life cycle report
- an in-vessel pasteurisation report (time/temp)
- curing pile time/temp/turns report
- a final compost laboratory testing and analysis report

A page from the process control software program for the existing setup with 20 no. compost reactors is illustrated in Figure D.2.4. The system will be updated to reflect the proposed infrastructure. The automatic colour coding depicts the current time/temperature status of each reactor batch.

Figure D.2.4 Main Page of Process Control Software



The time/temperature protocols for each composting reactor are set from the PC. This is shown in Figure D.2.5.

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Figure D.2.5: Time/Temperature Control

Profile 1

Load Current Values      Save New Values

Celtic COMPOSTING SYSTEMS LTD.

Temperature C	Duration (mins)	in Manual/auto	out Manual/auto	Manual out	Diff in/out speed
60	2880	0	0	30	20
65	2880				
60	2080				
58	2880				
58	2080				

Nominal speed: 60

On line Minutes: 5

Off line Minutes: 10

inc time: 50

inc Speed: 10

Extra on duration for 20-30 degrees: 0 Seconds

Extra on duration for 30-40 degrees: 0

Extra on duration for 40-50 degrees: 0

Extra on duration for 50 degrees: 0

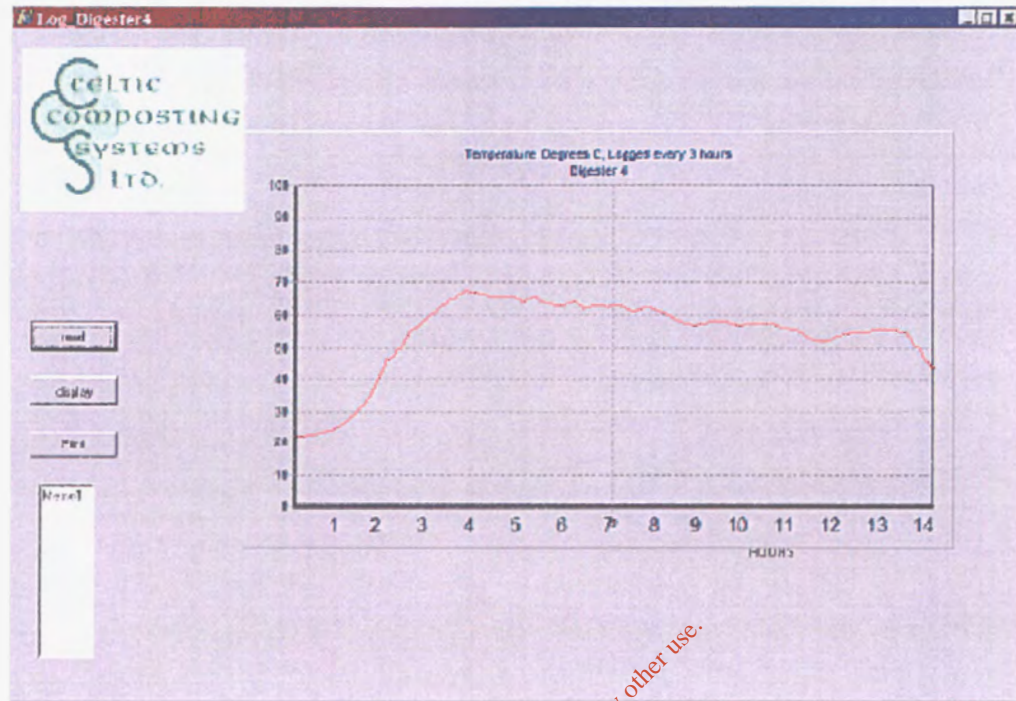
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The standard setting is an initial requirement to achieve 60°C for 2,880 minutes (48 hours) and to maintain temperatures above 60°C for >six days over the 14 day cycle. Typically, it takes the reactor between 24 and 72 hours to reach the first set point.

Once these set-points are chosen and the full reactor is switched on, the blowers will force air into the interstitial spaces in the biomass, thus providing the aerobic microbes with the oxygen they need to multiply in the presence of excess nutrients and water. This population growth is monitored via the temperature development within the biomass and the computer then uses the blowers to maintain temperatures within the defined ranges illustrated in Figure D.2.5. A typical time/temperature graph that is produced by the system is illustrated in Figure D.2.6.



Figure D.2.6 Typical time/temperature graph for a composting reactor batch



#### Cleaning Procedures

The cleaning protocol is as follows:

The Material Reception Building is subject to a daily wash down procedure to ensure that the following day operations start with a clean work area. The loading shovel and all concrete areas are washed down with a hot wash Karcher power washer that is located in the reception building. If material is being stored overnight it is covered with overs material to suppress odours and the area around it is washed down. This wash down procedure is documented on a standard reporting form. Any full digester leaving the Reception Building is washed down to remove any residual bio-waste from the external surfaces. All vehicles that are used in the Material Reception building are washed down at the end of a day's operation in the Reception building. All delivery vehicles exit the material reception building via a wheelwash (sterilisation of the wheels is an ABP requirement). All wash down water flows to the gullies in the floor of the reception building and is treated as leachate. All vehicles used in the outdoor 'clean' area are subject to a weekly wash down. All hard covered outdoor surfaces are subject to a minimum of a once weekly road sweeping which is documented. The Digester and Curing Pad are subject to daily checks and the findings are documented on standard reporting forms.

Any litter/standing water/leachate spillages are cleaned up immediately on discovery. All leachate on site is collected in a leachate storage tank and is tankered off site to an appropriate facility.

#### Nuisance Control

Details of nuisance control are included as Attachment E.6 of this document.

### D.2.c Emissions

Details of any aspects of the facility that can cause emissions to the environment during normal operations and also in the event of a malfunction of interruption of services.

Please refer to Attachment E for information on the following:

- Noise
- Odour
- Dust and Bioaerosols
- Surface Water, Storm Water and Leachate

For each of the above environmental parameters, there is a discussion of:

- Existing Environment
- Potential Impacts
- Proposed Mitigation Measures
- Monitoring
- Control Outside of Normal Operating Conditions

### D.2.d Laboratory Activities - Not Applicable

Details of activities carried on in laboratory facilities are not relevant to this waste licence application.

### D.2.e Incineration Facilities – Not Applicable

This is not applicable to this waste licence application.

Sections D3 to D7 should only be completed for Landfill Applications. These sections are not applicable to this application.

### D.2.f Standard Operating Procedures

Documented Standard Operational Procedures (SOP's) for Waterford Composting Facility

#### Mixing Building SOP's

##### **Operation 1**

Organic waste is tipped out in the Materials Reception building from the back of the collection vehicle which currently comes from Waterford City, Waterford County or Veolia Environmental collection. Category 3 material and some Category 2 material (manure) will be accepted at the facility. When (commercial bio-waste) is being unloaded, a bed of woodchip is layered on the floor to soak up any excess liquid.

### **Operation 2**

Each load is checked by the facility manager or an appointee and a Raw Material Inspection sheet is filled in recording the date, origin of load, weight, approximate age, odour levels and contamination level.

### **Operation 3**

Required ingredients and water are loaded into one of two mixers (orgamix) and allowed blend until a homogenous blend achieved. During operations at least one retractable door will remain closed.

### **Operation 4**

Material is loaded from the mixer into a digester unit. The operation is repeated until the digester unit is full. The digester is closed and sealed and power hosed down before being picked up and placed back in position on the Digester Pad.

### **Operation 5**

Any materials being kept overnight are piled in a corner and covered with overs. Concrete walls and floors are power washed down at end of day. The Daily Material reception building cleaning checklist is recorded.

## Digester Phase SOP's

### **Operation 1**

The clean digester is lifted from the material reception building and placed in an available place on the Digester pad. An air hose and a temperature probe are connected to the digester. Air blowers are started via process control. Leachate is drained from digester upon startup until empty.

### **Operation 2**

The aeration settings are set to maintain aerobic conditions in the digester in the preferable range of 12 – 16% but not below 10%. Aeration settings are set with a minimum of 10-15% differential between the input and output blowers to maintain a negative pressure in order to prevent the escape of foul air.

### **Operation 3**

Daily Digester Checks are carried out on the digester yard and documented. These include draining of the leachate/condensate, cleaning of any dirty surfaces and checking of seals. Oxygen levels in the active digesters are determined and recorded to ensure that the correct oxygen levels and continuous time/temperature relationship (60°C for 2 days, 40°C + for 12 days) are monitored.

### **Operation 4**

Airflow in the digesters is to be reversed for a minimum of two days during the 14 day in-vessel stage to ensure temperature achievement throughout the whole composting mass. This will show a corresponding temperature drop on the time/temperature relationship.

### **Operation 5**

Batch logistics record residence time, start/end date, and airflow reversal.

#### **Operation 6**

Foul air from the digesters is passed through manifold piping leading to two bio-filters. These bio-filters are checked weekly for performance and sampled bi-annually and these checks are documented.

#### **Operation 7**

All digesters must be kept in good operating condition and a regular servicing procedure is followed. A Digester maintenance schedule is recorded.

#### **Operation 8**

Upon emptying of the digester, blowers are turned off via process control and temperature probes and air hoses are removed.

### Curing Phase SOP's

#### **Operation 1**

Before emptying digester, aeration pipes and grates are cleaned and a layer of woodchip is placed over grates being covered to optimise air flow.

#### **Operation 2**

The digester is emptied and the moisture level is determined by a manager or an appointee. If the moisture level is deemed to be too low (<50%), water is added. A moisture level of 40 - 50% is to be maintained at all times.

#### **Operation 3**

A symmetrical loaf is formed over the grates to ensure even aeration through the pile. Piles are to be neatly formed at edges with a distance of at least 1.5 m between pile edge and an air grate is maintained to avoid short circuiting.

#### **Operation 4**

Correct aeration settings are maintained by process control and a valving system to ensure oxygen concentrations of between 12 - 16% but not below 10%.

#### **Operation 5**

All formed piles are covered with a layer of overs to reduce fugitive emissions.

#### **Operation 6**

Temperatures are to be measured weekly and are recorded.

#### **Operation 7**

Piles are turned every fortnight to ensure the heating of the external pile surfaces and to enable the determination of moisture levels. Water is added if levels are deemed too low.

#### **Operation 8**

Residence times, number of turns and start/end dates are recorded with batch logistics software.

#### **Operation 9**

Negative air is drawn down through the composting mass and is passed through a bio-trickling filters and bio-filter. A weekly check on the bio-filter performances is required as is bi-annual sampling and these are to be documented.

### **Operation 10**

The thermometer probes are calibrated annually by an external body. All calibrations are recorded.

### Screening Phase SOP's

#### **Operation 1**

Daily Maintenance checks are carried out before turning on the screener machine.

#### **Operation 2**

Aeration valves are closed when moving material for screening. Screening movements are recorded with batch logistic software.

#### **Operation 3**

Screened compost is quarantined while awaiting the results of analysis.

Quarantined compost must attain:

- 0 MPN Salmonella in 25 g product
- <1,000c.f.u. E.Coli in 1g

### Compost Storage SOP's

#### **Operation 1**

Freshly screened material is turned every two days minimum, for a minimum of two weeks. Older material is turned once weekly (minimum). Batches are kept segregated until the results of analysis are received.

#### **Operation 2**

Finished compost batch movements are recorded with batch logistic software.

### General Housekeeping SOP's

#### **Operation 1**

All surfaces are swept once a week at a minimum and documented.

#### **Operation 2**

Any leachate spillages, condensate spillages, loose waste or rubbish lying on surface is disposed of upon discovery.

### Documentation (Hard/Soft copy) Required

1. Material Inspection Check (Daily)
2. Material Reception Wash down (Daily)
3. Bio-filter performance log (Weekly/Bi Annually)
4. Digester Maintenance Checklist (Daily)
5. Digester Yard Checklist (Daily)
6. Digester Maintenance Checklist (Daily)
7. Time/Temperature Feedback for Digesters (Continuous)
8. Oxygen Record for Digesters ( Weekly)
9. Batch logistics for batches in Digester, Curing and Compost storage phase (Continuous)
10. Temperature Feedback for Curing piles (Continuous)
11. Compost Analysis results (Periodically)
12. Maintenance checklist (Daily/Weekly/ Monthly)
13. Calibration of temperature probes

### **D.2.g HACCP for Maturity of Compost**

#### Hazard Analysis

- non attainment of required temperature levels over required time
- non attainment of desired O<sub>2</sub> levels for duration of process
- non attainment of required process time
- non attainment and maintenance of required moisture level
- non attainment and maintenance of porosity levels

#### Principal control mechanisms

- O<sub>2</sub> levels to be maintained by aeration and agitation
- temperature levels to be achieved and maintained by correct mixing procedure, aeration schedule and agitation
- moisture levels and porosity to be achieved by correct mixing procedure and watering
- duration of process time achieved by proper retention and turning schedules

#### Identification of critical control points (CCPs)

- In vessel (1st barrier) for 14 days
- 1st phase ASP (2nd barrier)
- 2nd phase ASP (2nd barrier)
- Recording of batch composition data
- Recording of temperatures
- Recording of pile logistics
- Recording of pile O<sub>2</sub> concentrations

Establishment of critical limits for each CCP – Digester phase – 60°C for two days over 14 days minimum

- curing phase – 60° C for two days over eight weeks minimum
- O<sub>2</sub> to be maintained at level of not less than 10% at any stage during process
- Initial moisture levels to be maintained at between 50 and 60%
- Compost to be quarantined for two weeks minimum after screening with intermittent turning
- Analysed compost to attain standard suitable for beneficial re-use

Establish critical control point monitoring requirements – Inspection of all mixes before filling digester by facility or appointee:

- Electronic recording of in vessel temps wrt time for all in vessel batches
- Electronic recording of all curing phase temps for combined batches
- Batch logistics to record residence time, temperatures and number of turns and recording of these logistics
- O<sub>2</sub> levels to be measured with hand held probe during aeration and just before aeration every second day
- Manual recording and electronic recording of O<sub>2</sub> levels in curing phase once temperature set point is reached. O<sub>2</sub> levels to be measured with hand held probe during aeration and just before aeration every second day until turning and every week thereafter
- Moisture levels to be ascertained by facility manager or appointee upon tipping of digesters

Establish corrective actions – remixing of initial mixes with incorrect degree of porosity and moisture

- remixing of batches that do not achieve temperature setpoints in either digester phase or curing phase
- process control variation to maintain desired O<sub>2</sub> levels
- process management to maintain desired process time

## D.2.h HACCP Analysis Pathogens

Waterford City Composting Facility has a current operational capacity of ~9,000 tpa including:

- Domestic Bio-waste (Food and green) 7,500 tpa
- Commercial Bio-waste (Food) 1,500 tpa
- Green waste drop off 800 tpa
- Wood waste 200 tpa

The facility includes the following components:

- Enclosed tipping, mixing and in-vessel loading building
- Containerised in-vessel composting system (barrier #1)
- Vacuum aerated piles with turning (barrier #2)
- Bunded compost screening and storage area

The Seven HACCP Principles are:  
(Hazard analysis)

- Hazard Analysis
- Identify critical control points (CCPs)
- Establish critical limits for each critical control point
- Establish critical control point monitoring requirements
- Establish corrective actions
- Establish record keeping procedures
- Establish procedures for verifying the HACCP system is working as intended

#### Principle 1: Hazard Analysis

Principal Pathogen Hazards:

- The principal source of human and animal pathogens is associated with the domestic and commercial bio-waste
- Some plant pathogens and weed seeds will be associated with both bio-waste and green waste sources
- Bioaerosols from handling and processing
- Contaminated liquors from reception and processing areas

Principal Control Mechanisms:

- Category 2 material banned from all collections
- No control possible on general pathogen content of bio-waste received
- The imposition of a twin-barrier composting system (heat attenuation of pathogens and competitive inhibition of pathogen re-growth)
- Bioaerosols are controlled through operational procedures
- Liquors from dirty and clean areas are collected separately

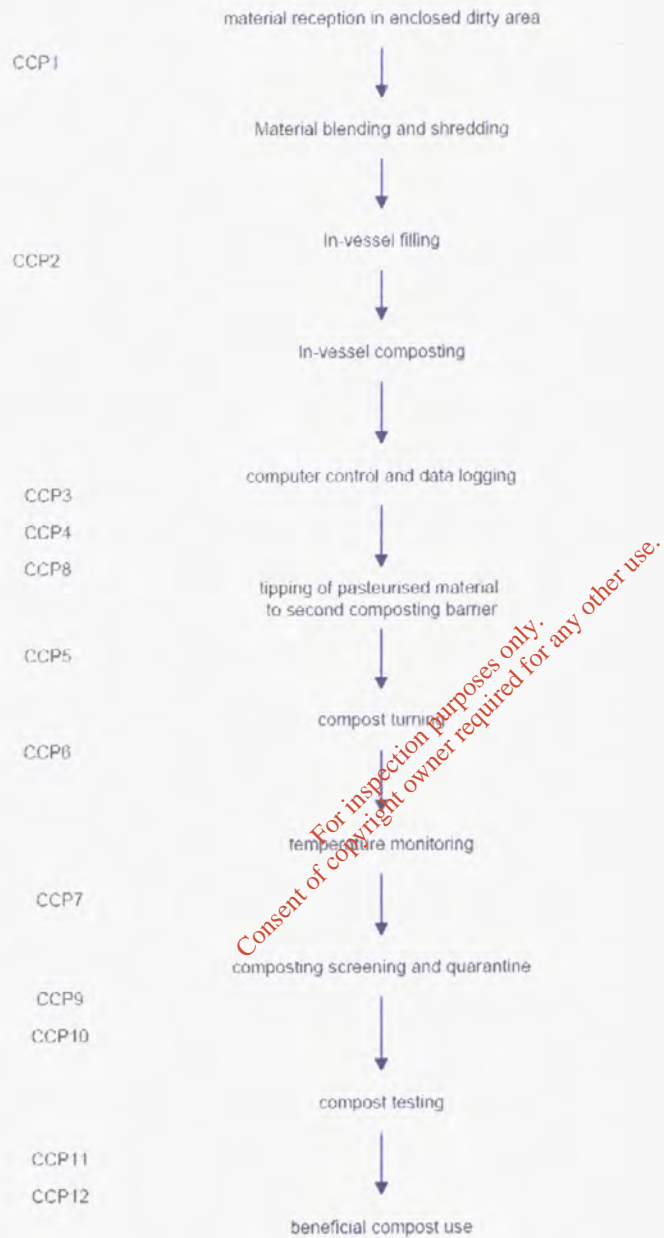
#### Principle 2: Identify critical control points (CCPs)

The principal CCPs for the facility are as follows:

- CCP1 Rejection of material which falls into Category 1 or Category 2 under ABP regulations
- CCP2 The sealing of in-vessel system (barrier #1) to avoid vector access
- CCP3 The recording of temperatures to document pasteurisation
- CCP4 The abortion of in-vessel batches that do not reach temperature followed by the return of such batches to the start of the process
- CCP5 The tipping of in-vessel process material into the second "clean" composting system, i.e. the banded aerated pile system (barrier #2)
- CCP6 The turning of piles to ensure heating of external pile surfaces
- CCP7 The continuous recording of temperatures in the aerated pile system using radio transmitter temperature probes
- CCP8 The recording of pile logistics for batch traceability
- CCP9 The quarantine of screened compost while pathogen analysis is being performed
- CCP10 The reintroduction of failed batches into compost process
- CCP11 The release of compost which has reached the required pathogen control standards
- CCP12 The record keeping of batch data



**Figure D.2.7 Flow Diagram of Composting Process at the Waterford Composting Facility**



Principle 3: Establish critical limits for each critical control point.

- Limit input level of non-catering waste ABPs = 0
- Minimum processing protocol for material containing catering waste: Twin barrier in-vessel and agitated aerated pile composting
- Minimum processing protocol for material free from catering waste or other ABPs, e.g. green waste: agitated aerated pile composting
- The facility will operate with a pasteurisation set-point of 60°C for two days as a minimum for the in-vessel batch.
- Batches which fail to attain these criteria will be dumped out, re-mixed and restarted
- All post-in-vessel material must be transferred to the second barrier (the aerated composting area) for subsequent processing
- The material tipped from the containers must be immediately mixed with a clean loader to introduce the material at the container edge to the central hot zone. This material must be turned at least twice while the core temperature is > 60°C
- The temperature recorded by the thermometer must be recorded to document core temperatures > 60°C for a minimum of two days following turning
- Quarantined compost must attain the following standards to allow release
- 0 MPN Salmonella spp. in 25g of product
- <1,000 c.fu E.Coli in 1g of product
- A batch shall be representative of one months production

Principle 4: Establish critical control point monitoring requirements.

- Inspection of all in-coming loads by facility manager or appointee
- Electronic and hard copy documentation of tonnage input
- Electronic recording of in-vessel temperatures for all batches
- Time/temperature reports for all in-vessel batches
- Electronic recording of aerated pile core temperatures for combined batches of 4-6 in-vessel batches
- Batch logistics record keeping (software package) to record residence times, temperatures achieved and number of turns performed per batch in both barriers
- Laboratory analyses for pathogen content and maturity of finished compost as per defined batch

#### Principal 5: Establish corrective actions

- Refuse non-catering waste ABPs in reception area
- Tip out and re-start batches that fail to meet time-temperature set-points in in-vessel process and record in Batch Logistics software and on hard copy the relevant information
- Reintroduce material that has become contaminated with raw catering waste into start of process and record in Batch Logistics software and on hard copy the relevant information
- Re-introduce compost that has failed the compost pathogen standards into the start of the process and record in Batch Logistics software and on hard copy the relevant information

#### Principal 6: Establish record keeping procedures

- Copy of HACCP plan to be kept at site office at all times.
- Batch coding system for facility
- Tonnage input of all waste streams processed, rejected etc. to be kept in digital and hard copy format
- Digital and hard copy reports of time-temperature for every in-vessel batch
- Digital and hard copy reports of time-temperature for each aerated pile batch
- Pile logistics report for batch progression through the facility including residence times in each barrier and turning frequency
- Compost quality report for final product batches
- Monthly batch reports summarising CCP compliance and remediation actions taken

#### Principle 7: Establish procedures for verifying the HACCP system is working as intended

- Annual review of HACCP plan
- Annual review of microbial data from final compost
- Calibration of temperature measuring devices
- Use of CCS data logging buttons to verify temperature probe data for both in-vessel and aerated pile systems
- Periodic microbial assessment of intermediate barriers, i.e. log reductions after in-vessel phase and during aerated pile phase

### **D.2.i Proposed Facility Operations**

It is proposed to extend the facility to increase the throughput capacity to 20,000 tpa. A brief description of the proposed process is included in this section. Proposed operational details will be forwarded to the Agency as Specified Engineering Works (SEW) for approval prior to development works.

Figure D.2.8: Unit Processes– Proposed Operations

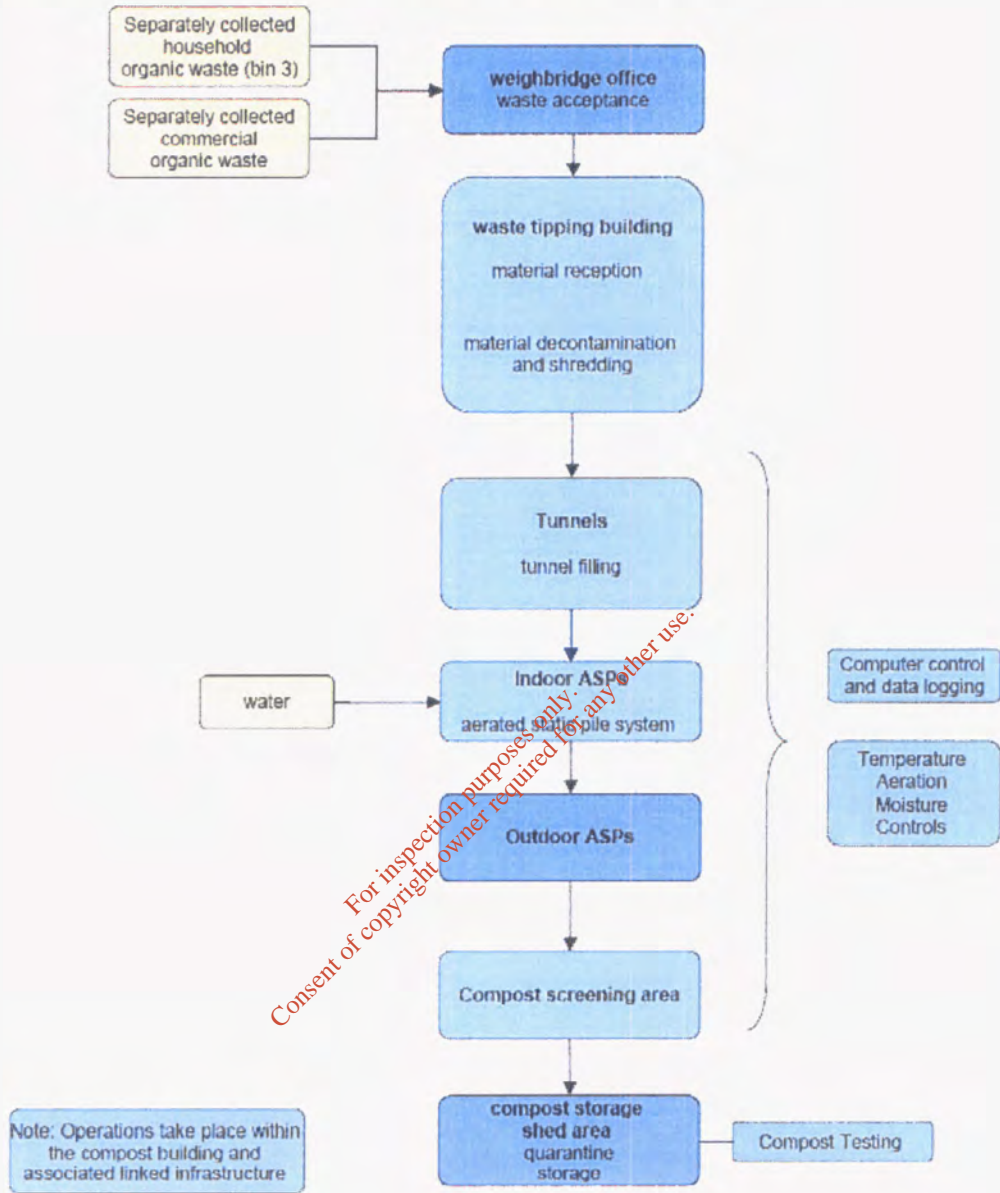
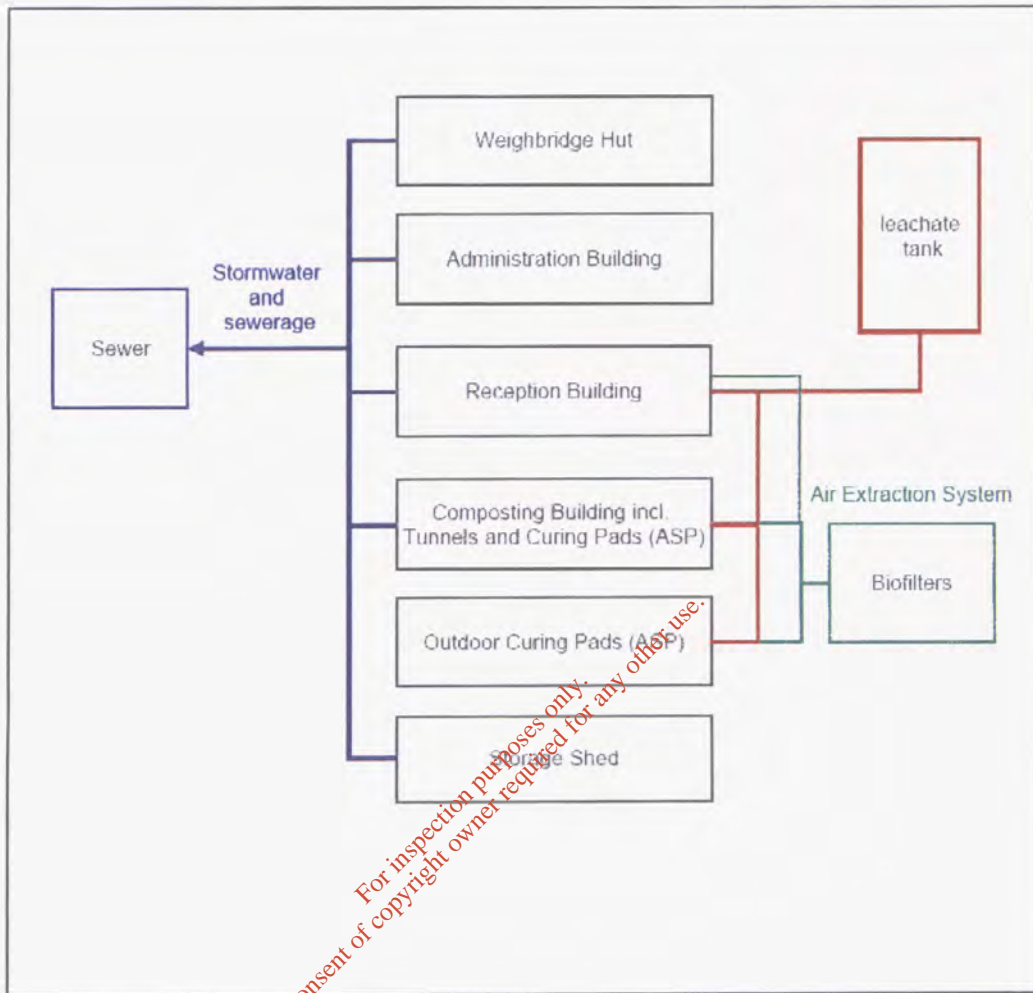


Figure D.2.9: Management and Maintenance System – Proposed Operations



The existing facility with 20 no. digester units does not have the capacity to treat the quantities of bio-waste that are predicted to be collected in the future. For this reason it is proposed to make some adjustments to the existing process. The proposed extension plan for the facility involves the installation of in-vessel tunnels and a composting building. This proposed layout is shown on Drawing Number 2006-289-01-104-Rev A.

The tunnel in-vessel systems can be large immobile containers or fixed concrete tunnels. They will be loaded and unloaded by a front-end loader. Waste material will be moved from the tipping hall (following mixing in the auger) into a tunnel reactor and emptied out into the composting building onto an aerated slab. 2 no. dedicated front-end loaders will be used for loading and unloading, one dedicated to the tipping hall area (and raw waste), the other to the composting building (1<sup>st</sup> phase digested waste). The tunnels will be sized to accommodate the daily volume of materials to be processed by the facility. The tunnel system comes with a sophisticated process control system using both temperature and oxygen feedback systems to control aeration within the tunnels.

The mobile compost reactors will be retained on site for additional capacity at peak times.

The compost building will contain indoor ASP pads working on the same principal as above. Following the indoor stage, the material will be transferred to the existing outdoor pads for storage. The material will be transferred into the compost building for screening before being placed in the compost storage shed. The provision of the composting building will mitigate potential odour, dust and noise impacts that may arise due to the intensification of activities on site.

The facility has an Animal By-products licence.

Monitoring of the compost will be carried out in accordance with the conditions of the EPA licence. The compost is and will continue to be produced to a standard suitable for beneficial re-use.

#### Monitoring

WCC will carry out sampling of the compost as required by the conditions of the licence. Prior to commencement of the composting in the proposed process, details of the sampling protocol, methods of analyses and sample numbers will be submitted to the Agency.

#### Environmental Control

The material reception building, the tunnels and the composting building will be kept under negative pressure. Air extracted from these buildings will be treated by bio-filters.

A bio-filter is simply a bed of organic material (medium), typically a mixture of compost and wood chips or shreds. As air passes through the bio-filter the microbes on the organic material convert odorous gases to carbon dioxide and water. The effectiveness of the bio-filter is primarily a function of the amount of time the odorous air spends in the bio-filter (contact time) and the moisture content of the filter material. Contact time is part of the bio-filter design while moisture content is a function of good management. The size (footprint) of the bio-filter depends primarily on the amount of air needing treatment.

Detailed information on the proposed air handling system will be forwarded to the Agency for approval as part of the SEW prior to any extension works.

Further details of proposed abatement systems are included in Attachment E.

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**ATTACHMENT D3-D7    NOT APPLICABLE**

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The Sections D3 to D7 should only be completed for Landfill Applications. They are not applicable to this application.

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## ATTACHMENT E EMISSIONS

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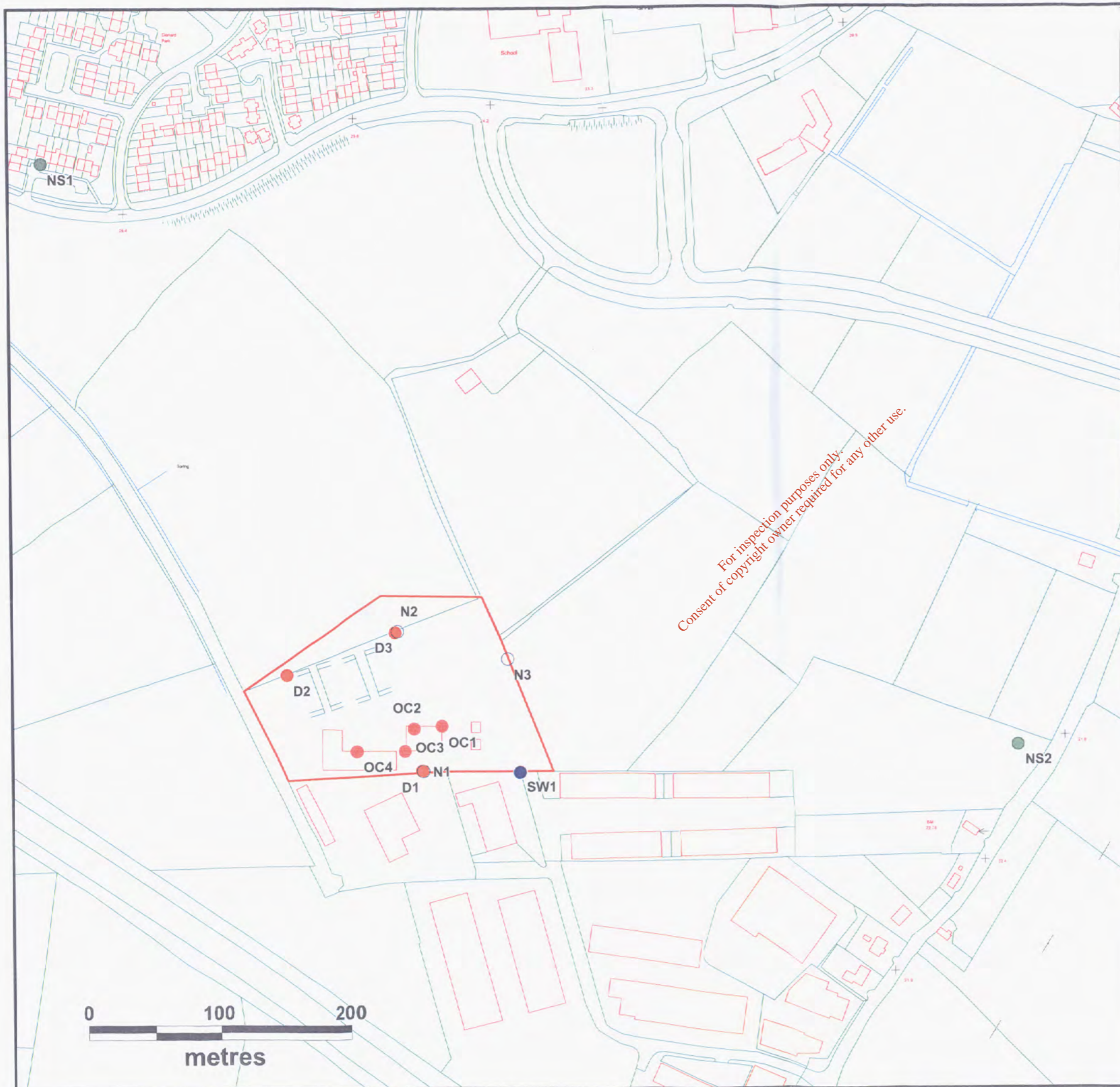
Figure Number E.1 is a scaled plan of the facility showing environmental monitoring points.

The following sections are included as Attachment E:

<b>Attachment E.1</b>	<b>Emissions to Atmosphere</b>
<b>Attachment E.2</b>	<b>Emissions to Surface Water</b>
<b>Attachment E.3</b>	<b>Emissions to Sewer</b>
<b>Attachment E.4</b>	<b>Emissions to Groundwater-Not applicable</b>
<b>Attachment E.5</b>	<b>Noise Emissions</b>
<b>Attachment E.6</b>	<b>Environmental Nuisance</b>

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**LEGEND**

- Dust Monitoring Location (3)
- Noise (Sensitive) Monitoring Location (2)
- Noise Monitoring Location (3)
- Odour Control Unit Location (4)
- Surface Water Discharge Location (1)

**NOTES:**

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Date of Revision A: 14/11/2006  
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WCC-WLA\_Figure E.1 Environmental Monitoring Points



Name of Client	WATERFORD CITY COUNCIL	
Name of Job	KILBARRY COMPOSTING FACILITY WASTE LICENCE APPLICATION	
Title of Drawing	ENVIRONMENTAL MONITORING LOCATION MAP	
Dwg. No.	2006-289-01-FIGURE E.1	Rev. A



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## ATTACHMENT E.1 EMISSIONS TO ATMOSPHERE

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The following potential emissions to atmosphere are discussed in Attachment E1:

- Dust (Section E.1.1)
- Bioaerosols (Section E.1.1)
- Odour (Section E.1.2)

### E.1.1 Emissions to Atmosphere (Dust and Bioaerosols)

#### E.1.1.1 Dust and Bioaerosols in the Existing Environment

Dust is defined as small solid particles, generally taken to be < 75  $\mu\text{m}$  in diameter which settle out under their own weight, but which may remain suspended for some time. Bioaerosols include micro-organisms, particles, gases, vapours and fragments of bacterial origin. Dust is not technically a bio-aerosol but it may carry microbial constituents. Control of conditions that result in dust generation can play a significant role in minimising bioaerosol generation (Cre, 2004<sup>1</sup>). Therefore a combined control plan for dust and bioaerosols was drawn up to include mitigation measures that address both parameters. There are some controls that are only specific to one or the other parameter.

#### Dust in the Existing Environment

Dust monitoring was carried out in January 2006 at the existing facility. The three monitoring points, D1, D2 and D3 are shown on Figure E.1.

The co-ordinates of the dust monitoring points and results of monitoring carried out in January 2006 are listed in Table E.1.1.

**Table E.1.1: Dust Monitoring Locations**

Monitoring Point	Dust Levels $\text{mg}/\text{m}^2/\text{day}$	Easting	Northing
D1	403.5	258343	109524
D2	408.4	258240	109597
D3	251.3	258323	109629

Dustfall at monitoring points D1 and D2 exceeded the standard dust deposition limit of  $350 \text{ mg}/\text{m}^2/\text{day}$  (for a 30 day composite sample). The levels recorded were 403 and  $408 \text{ mg}/\text{m}^2/\text{day}$  respectively. Dustfall at monitoring point D3 was below the standard dust deposition limit.

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<sup>1</sup> Bioaerosols and Composting, A Literature Evaluation. Cré 2004

### Dust Monitoring Point D1

This monitoring point is located on the southern boundary of the site. In January 2006 when monitoring was carried out, the entrance to the composting facility was located directly adjacent to D1. The composting facility did not have its own entrance, WCC were making use of the entrance and weighbridge at the Veolia Environmental Ltd. WTS. The entrance on the southern boundary was thus the internal roadway between the two sites. High dust levels at D1 are attributed to dust generated by internal site traffic.

A new entrance and weighbridge has been installed at the composting facility. The entrance beside D1 is now closed off.

### Dust Monitoring Point D2

This monitoring point is located adjacent to the curing pads on the northern boundary of the facility at the western end. Analysis of dust samples showed elevated levels of dust at D2. This is attributed to turning of the compost on the curing pads. There are no receptors within 300 m of this monitoring point.

### Dust Monitoring Point D3

This monitoring point is located on the northern boundary of the site to the east of the curing pads.

### Bioaerosols in the Existing Environment

The British Occupational Health Society has reported that dust may be a good indicator of exposure to micro-organisms, with good correlations between dust levels and total micro-organisms. As dust levels will be carefully controlled on site, the risk will be significantly reduced, both for on-site operatives and nearby communities.

In addition, as all processes are to be located under cover, within buildings, the risk of aerosol formation via wind activation etc is reduced. The use of bio-filters will also help to contain and filter out bioaerosols, thus further limiting potential releases to the wider environment.

Research has shown that concentration levels of spores of fungus are likely to be reduced to background levels within a distance of 250 m from the source. As the nearest residence to the facility is at a distance of some 400 m from the boundary, the risk to nearby residents is not considered significant. The nearest commercial/industrial units to the facility are both 10m from the facility.

### E.1.1.2 Potential Impacts of Dust and Bioaerosols from the Development

This is addressed as part of the Dust and Bio-aerosol Control Plan (Section E.1.1.6 of Attachment E1).

### E.1.1.3 Proposed Measures to Mitigate Impacts from Dust and Bioaerosols

This is addressed as part of the Dust and Bio-aerosol Control Plan (Section E.1.1.6 of Attachment E1).

### E.1.1.4 Monitoring of Dust and Bioaerosols

This is addressed as part of the Dust and Bio-aerosol Control Plan (Section E.1.1.6 of Attachment E1).

### E.1.1.5 Dust and Bio-aerosol Control outside of Normal Conditions

This is addressed as part of the Dust and Bio-aerosol Control Plan (Section E.1.1.6 of Attachment E1).

### E.1.1.6 Dust and Bio-aerosol Control Plan

A dust and bio-aerosol control plan was developed for the facility. It includes an assessment of potential impacts and control measures to mitigate those impacts. The dust and bio-aerosol control plan is relevant to both the existing facility and the proposed extension of the process.

#### Normal Operations

#### Potential Impacts relating to Dust from the Development

Potential impacts may arise from the generation of dust and bioaerosols as a result of:

- material reception operations
- shredding operations
- mixing & filling operations
- tunnel or digester operations
- turning aerated piles (outdoors)
- screening operations
- compost storage and handling
- general housekeeping

#### Proposed Measures to Mitigate Impacts from Dust

The principal control mechanisms during normal operations are:

#### Shredding Operations

- Shredding is carried out during favourable wind conditions and within the shelter of the compost storage shed (3 sided building open to the marshalling yard).

#### Material Reception Operations and Mixing & Filling Operations

- all tipping of material is carried out within the enclosed tipping building

#### Digester Operations

- the digestors are a fully sealed system

#### Turning Aerated Piles (Outdoors)

- correct process control and pile management
- air is drawn through the piles to a bio-filter which removes dust
- in dry weather conditions, the piles are sprayed with water to minimise windblown dust
- turning not to be carried out during Northerly or North-westerly winds due to sensitive receptors to the south and south-east

#### Screening Operations

- correct operational procedures
- screening is not be carried out during Northerly or North-westerly winds due to sensitive receptors to the south and south-east

#### Compost Storage and Handling

- correct operational procedures

#### General Housekeeping

- training of all staff in methods of dust control
- general dust is minimised by good housekeeping procedures
- all operations take into account dust sensitive receptors and meteorological conditions

#### Identification of operational and engineering controls

The principal control mechanisms for dust and bioaerosols generated from the following processes are:

#### Material reception, mixing, blending and filling

- daily wash-down of the reception building
- monthly cleaning of any visible mould growths on walls or machinery, ledges etc.
- daily thorough cleaning of interiors and exteriors of operational vehicles
- being aware of dust sensitive receptors and meteorological conditions

### Digester Phase

- efficiently working bio-filters
- addition of water to process
- lids are kept closed during the ~ 2 week in-vessel process
- monthly cleaning of any visible mould growths on walls, floor, ledges, doors etc.

### Curing Phase (outdoor)

- minimal turning of piles
- wetting of outdoor piles in dry weather conditions to prevent windblown dust and bioaerosols
- taking into account of dust sensitive receptors and meteorological conditions
- piles are turned only during favourable wind conditions. Piles are not during Northerly or North-westerly winds due to sensitive receptors to the south and south-east.

### Screening phase

- all operators working in the screening area to wear gloves and dust-mist masks
- screening only during favourable wind conditions. Screening is not carried out during Northerly or North-westerly winds due to sensitive receptors to the south and south-east.

### Compost storage and handling

- all operators working in the compost shed to wear gloves and dust-mist masks
- the turning of compost in the compost storage building should be governed by good operational practice
- movement and handling times will take into account sensitive receptors and meteorological conditions
- cleaning of any visible signs of mould growth on the walls or floor of the composting shed

### General housekeeping

- immediate cleanup of any accidental spillages of bio-waste, or amendment materials from outdoor areas
- weekly road sweeping of traffic surfaces with wetting in dry conditions
- clean up of any visible signs of mould growth
- regular and thorough cleaning of the interior and exterior of operational vehicles

### Establishment of limits for each control mechanism

The following limits have been set to measure the engineering and operational controls.

#### Material reception building

- a clean floor to be presented at the end of each working day
- no visible growth of mould off walls or structures in the building at monthly inspections

#### Digester Phase

- floors, walls and roofs to be cleaned following the removal of each digester load
- doors/lids to be kept closed during the digestion phase

#### Curing Phase

- the addition of moisture as required. The piles should always be maintained above 40% moisture to maintain active microbial activity.
- inspection of biofilter performance
- sampling of biofilters for dust abatement performance

#### Screening Phase

- material to be screened in semi enclosed shed
- screening times determined by wind direction

#### Compost Handling

- all pile turning to take into account dust sensitive locations and meteorological conditions

### General housekeeping

- all surfaces to be roadswept once weekly (minimum)
- any compost, biowaste or amendment material spillages to be cleaned up immediately. Any loose waste lying on a surface to be disposed of upon discovery
- site traffic is minimal, drivers are instructed to drive slowly to prevent dust generation
- daily cleaning of interior and exterior of operational vehicles

Establish record keeping procedures

Material reception

- cleaning records
- quarantine records
- rejected load records

Digester Phase

- process control records

Curing Phase

- process control records
- record of turning and wind conditions

Screening and compost handling phase

- record of turning and wind conditions

General Housekeeping

- hard copy record of road sweeping frequency
- hard copy of road wetting frequency
- weather data, wind speed and direction
- sampling data
- electronic copies of results of analysis and reports

Establish procedures for verifying that the dust and bio-aerosol control system is working as intended

- annual review of the dust and bio-aerosol control plan
- monthly review of complaints
- bi-annual review of biofilter performance data
- monthly review of weather station data
- results of dust analysis

Dust and bio-aerosol control in the event of a malfunction, interruption of service or outside normal operations

All of the mitigation measures to prevent dust and bio-aerosol generation are carried out manually (operational procedures, wind direction and watering). Dust and bio-aerosol control will not be affected by power loss.

#### E.1.1.7 Proposed Operations

It is proposed to extend the facility to increase the throughput to 20,000 tpa. It is proposed to construct a compost building and a tunnel system whereby the process from material reception, digestion phase, curing and screening will be carried out indoors. The building will have an air extraction system. The existing material reception building has 2 no. doors, one on the western side of the building opening into the marshalling yard.



RCVs enter and exit through this door to deliver biowaste. Amendment material is brought in through this door. The second door is located on the southern wall. The digestors are brought in and out through this door to the digester pads. It is proposed to close off the door on the southern wall. This will mitigate the creation of wind tunnels through the building and thus wind blown dust.

Following the final design of the extension, WCC will forward details of operations, potential impacts and mitigation measures to the Agency. The following is a brief summary of the likely impacts and mitigation measures.

#### Potential Impacts from Proposed Activities

Potentially impacts may arise from the generation of dust and bioaerosols as a result of intensification of the following activities:

- material reception operations
- shredding operations
- mixing & filling operations
- tunnel operations
- turning aerated piles (indoors)
- turning aerated piles (outdoors)
- screening operations
- compost storage and handling
- general housekeeping

or impacts to operators working in the environment.

#### Proposed Mitigation Measures

It is proposed to carry out the following activities within enclosed buildings with an air extraction system:

- material reception operations
- shredding operations
- mixing & filling operations
- tunnel operations
- turning aerated piles (indoors)
- screening operations

indoor operations

The process air will be directed through biofilters for cleaning.

## Indoor Operations

- It is proposed that all operators working within the reception building and composting building will be provided with a dust-mist class (NIOSH Class N-95) mask.
- All door seals and structures of the operational vehicles will be sufficiently airtight.
- Regular and thorough cleaning of the operational vehicles interiors.
- All air extracted from the buildings to be expelled through biofilters.
- Turning of ASPs within the building will be carried out according to good operational practices and the piles will be constantly watered.
- Training of all staff in methods of dust and bio-aerosol control.
- General dust within the buildings will be minimised by good housekeeping procedures.

## Curing Phase (Outdoors)

The curing phase will be nearly completed within the composting building. The outdoor curing pads will act as spare capacity, or if some extra maturation is required and as temporary storage.

- The secondary curing phase is carried out outdoors on ASPs. Dust will be minimised by correct process control and pile management compliance. Air is drawn through the piles to a biofilter which will remove some dust. The outdoor curing phase is not covered, in dry weather conditions, the piles will be wetted to minimise windblown dust.
- No turning will be carried out outdoors

## Compost Handling and Storage

- Dust generation from compost handling is minimised by correct operational procedures.
- All operations take into account dust sensitive receptors and meteorological conditions.
- Compost will be stored within the compost storage shed, a roofed, 3 sided building.

## **Establish procedures for verifying that the dust and bio-aerosol control system is working as intended**

- Increase number of air changes in reception building in response to elevated dust levels within the building or dust complaints.
- Keep all doors closed during processing.
- Replace biofilter media if poor performance reported.
- All systems will have duty and stand-by.

#### E.1.1.8 Control outside normal operations

##### **Dust and bio-aerosol control in the event of a malfunction, interruption of service or outside normal operations**

#### 1. Power loss or mechanical plant failure

The only mitigation measure that is dependant on mechanical parts and power is the air extraction system. All mechanical parts will have duty and stand-by. In the event of a loss of power:

- immediate action by maintenance crew
- immediate call to ESB if power cut off, to inform them of loss of supply and to get an estimated return supply time or date
- all building doors to remain closed during air extraction system shut down

#### 2. Dust control during construction phase

Expansion of the facility will include the construction of:

- composting
- biofilters
- installation of ancillary infrastructure
  - some additional site fencing
  - air extraction system including pipework and blowers
  - slab drainage

There is potential for dust generation during all construction phases and from vehicle movements associated with delivery of supplies and construction vehicles and earth extraction or movement.

Construction will commence following approval from the Agency based on submitted SEWs. If the construction period occurs during the summer months, standard practices to suppress dust will be employed such as spraying and road sweeping. It is not expected that the construction phase will generate a significant dust problem.

## **E.1.2 Emissions to Atmosphere -Odour**

### **E.1.2.1 Odour in the Existing Environment**

The facility is located in an area zoned for industrial development. It is adjacent to a business park which has a number of industrial and commercial units and is adjacent to a Waste Transfer Station operated by Veolia Environmental. The waste transfer station handles mainly dry wastes from bin 1 and 2. The putrescible fraction is very low.

An odour impact assessment was carried out in May 2005. Potential odour sources were identified from a site-specific odour measurement survey. The results were used in a modelling assessment. A summarised version of the results is included below.

It is predicted that the odour impact will be perceived by the industrial units located in the vicinity of the current facility while the composting process is in operation. 12 no. industrial facilities would be impacted with odour concentrations between 3.0 and 38.0  $O_{UEM}^{-3}$  at the 98<sup>th</sup> percentile in a worst case meteorological year. All other receptors in the vicinity will perceive an odour concentration less than 3  $O_{UEM}^{-3}$ . The main contributors to the odour impact at this time, was considered to be turning/tipping, building door opening and bio-filter operation.

Following this report, mitigation measures were put in place to address these impacts. It is proposed to extend the composting operations to bring the bulk of the process indoors. An air extraction system within the building will mitigate potential odour impacts.

### **E.1.2.2 Potential Odour Impacts from the Development**

Please refer to the Odour Control Plan (Section E2.6).

### **E.1.2.3 Proposed Measures to Mitigate Odour Impacts**

Please refer to the Odour Control Plan (Section E2.6).

### **E.1.2.4 Odour Monitoring**

Please refer to the Odour Control Plan (Section E2.6).

### **E.1.2.5 Odour Control outside of Normal Conditions**

Please refer to the Odour Control Plan (Section E2.6).

### **E.1.2.6 Odour Control Plan**

During normal operations potential odour impacts are managed in accordance with the Odour Control Plan for the facility.

## Potential Odour Impacts from the Development

Potential odours may be generated as a result of:

- material reception operations
- shredding operations
- mixing & filling operations
- digester phase operations
- indoor curing phase operations
- outdoor curing phase operations
- screening operations
- general housekeeping

## Measures to Mitigate Odour Impacts

The principal control mechanisms during normal operations are listed below:

- The material reception hall odour is minimised by conducting all tipping of potentially odorous material within the tipping building. Transfer of the biowaste from the floor to the mixers commences immediately after delivery. The building is fitted with 2 no. odour control units\* that emit an odour control mist. One is located in the material reception building where tipping is carried out and the other is located on the outside of the building at the western door. These are shown on Figure Number E.1.
- Shredding takes place within the confines of the compost storage shed and is carried out during favourable wind conditions. The outdoor is that of green waste and may be considered a nuisance by some.
- The digester phase is a sealed system. There is an odour control unit fitted on the eastern wall of the material reception hall to mitigate potential odours from the digester pad.
- The curing phase is carried out outdoors on ASPs. Odour is minimised by correct process control and pile management compliance combined with an efficiently working biofilter.
- The screening phase odour is minimised by correct operational procedures and pile management compliance. There is an odour control unit fixed to the roof of the compost storage shed to mitigate potential odours in this area.
- Compost handling odour is minimised by correct operational procedure.
- General odour is minimised by good housekeeping procedures.
- The maintenance of aerobic conditions throughout the composting process is fundamental to odour control. Regular oxygen monitoring is vital.
- All operations take into account odour sensitive receptors and meteorological conditions.

### \*Odour Control Units

The odour control units are Oscillating Atomising Units that force water through two spinning meshes to produce an ultra-fine mist of 280 billion droplets per litre. The mono-dispersed mist stays in the air and mix readily with dust particles and odour producing molecules pulling them down to the ground.

## Critical Control Points (CCPs) for Odour

The principal CCPs for each of the identified odour hazards are:

### Material Reception, Mixing, Blending and Filling

- any material remaining overnight material is covered with overs
- daily wash-down of the reception building
- taking into account of odour-sensitive receptors and meteorological conditions

### Digester Phase

- maintenance of aerobic conditions within the digesters at all times
- efficiently working biofilters
- keeping the digester yard free of organic material and leachate
- maintenance of 10-15% minimal differential between input and output blowers
- effective discharge of leachate to storage tank
- washing of digesters before being placed in position
- maintaining of digesters in good operating condition i.e. seals
- taking into account of odour sensitive receptors and meteorological conditions

### Curing Phase

- maintenance of aerobic conditions at all times
- efficiently working biofilter
- well formed piles to allow free movement of air through the composting mass i.e. correct porosity, clear air grates, correct moisture etc
- correct aeration settings
- covering of the primary piles with overs as they are formed
- minimal turning of piles
- piles are turned only during favourable wind conditions. For example, piles should not be turned during Northerly or North-westerly winds due to sensitive receptors to the south and south-east.

### Screening Phase

- checks to ensure the material has undergone the correct maturation process, including maturity, moisture levels etc.
- screening only during favourable wind conditions. For example, screening should not be carried out during Northerly or North-westerly winds due to sensitive receptors to the south and south-east.

### General housekeeping

- immediate cleanup of any accidental spillages of biowaste, leachate or condensate from outdoor areas.
- weekly road sweeping of traffic surfaces

## Establishment of critical limits for each CCP

The critical limits for each of the CCPs are:

### Material reception building

- A clean floor to be presented at the end of each working day.
- Weekly inspection of biofilter for performance.
- Sampling of biofilter for odorous compounds.

### Digester phase

- each digester to be washed down before being placed on pad
- correct aeration settings to maintain aerobic conditions
- the weekly check on oxygen concentrations in active digesters during aeration and during blower off times to ensure levels are kept > 10% with a preferable range of 12 – 16%.
- maintaining of negative air pressure in digesters to ensure non escape of foul air
- the discharge of all leachates to storage tank
- the daily cleaning of dirty surfaces on the digester pad
- the maintaining of all digesters in good operating condition (seals etc)
- weekly inspection of biofilter for performance
- sampling of biofilter for odorous compounds

### Curing Phase

- the cleaning of grates and piping before each digester emptying
- the correct layering of woodchip over grates to optimise air flow
- the formation of symmetrical loafs over the grates to ensure even aeration throughout the pile
- the maintenance of at least 1.5m from any pile surface to an air grate to avoid short-circuiting
- correct aeration settings
- the measurement of oxygen in each pile weekly to ensure levels are kept > 10% with a preferable range of 12 – 16%
- the addition of moisture as required. the piles should always be maintained above 40% moisture to maintain active microbial activity
- the covering of all primary piles with a layer of overs to reduce fugitive emissions from the pile surfaces
- weekly inspection of biofilter for performance
- sampling of biofilter for odour abatement performance

### Screening Phase

- materials screened in semi enclosed shed
- pile management with respect to wind direction and strength with respect to sensitive receptors

## Compost Handling

- freshly screened material to be turned every two days for a minimum of two weeks
- older material to be turned once weekly (minimum)
- batches to be kept segregated until analysis results received
- all pile turning to take into account odour sensitive locations and meteorological conditions

## General Housekeeping

- all surfaces to be roadswept once weekly (minimum)
- any leachate spillages, condensate spillages or loose waste lying on a surface to be disposed of upon discovery

## Establish critical control point monitoring requirements

CCP monitoring requirements have been identified for each phase of the operation where there is potential for odour nuisance.

## Material reception building

- All incoming loads to be inspected by the manager or appointee for age, odour and contamination and information to be recorded
- Documentation of biofilter performance and sampling

## Digester phase

- Electronic recording of in vessel aeration and temperatures with respective time for all in vessel batches
- recording of O<sub>2</sub> levels in digester phase which are to be measured every second day
- Documentation of digester maintenance cleaning schedule
- Documentation of weekly biofilter performance and sampling

## Curing phase

- All batches to be inspected by manager or appointee for moisture levels upon placement of material from digester unit/tunnel
- The cleaning of grates, layering of woodchip, covering of piles with overs and formation of piles to be carried out by a capable appointee
- recording of O<sub>2</sub> levels in curing phase which are to be measured every second day in phase 1 curing and every week in phase 2 curing
- Batch logistics to record residence time, temperatures and number of turns and recording of these logistics
- Documentation of biofilter performance and sampling



#### Screening and Compost handling phase.

- Batch logistics to record origin of batch, number of turns and quarantine status and electronic recording

#### General Housekeeping

- Documenting of roadsweeping frequency

As part of nuisance monitoring on site, daily sniff-tests are carried out. This and a procedure for recording odour complaints will be integrated into the overall management system to ensure that any incidents are recorded and dealt with promptly and efficiently.

#### Establish corrective actions

The corrective actions in the event of odour at each of the following operational phases are:

#### Material Reception building

- use of odour mist units in reception building and at door

#### Digester Phase

- change aeration settings on digesters/tunnels in response to odour occurrences
- remixing of batches that do not achieve temperature setpoints
- replace biofilter media if poor performance reported

#### Curing Phase

- if possible remixing of batches that do not achieve temperature setpoints
- if possible water addition to batches that do not achieve moisture setpoints
- in the event that the above is not possible, the batch would be re-entered into the composting system at step 1 -mixing

#### Screening and Compost Handling Phase

- use of odour control units
- if possible all screening and compost handling operations to cease immediately in response to an odour complaint until meteorological conditions are favourable

#### Establish record keeping procedures

The following records will be kept:

#### Material reception

- incoming load inspection log
- odour mist unit log (times of operation)

### Digester Phase

- reports of time – temp – moisture for all in vessel batches
- biofilter performance log
- digester/tunnel maintenance log
- pile logistics report for batch progression through the digester/tunnel phase
- hard copy reports of O<sub>2</sub> measurement

### Curing Phase

- reports of time – temp – moisture for all aerated pile batches
- biofilter performance log
- hard copy reports of O<sub>2</sub> measurement
- pile logistics report for batch progression through curing phase

### Screening and compost handling phase

- pile logistics to record batch, number of turns and quarantine status of material
- compost analysis results per batch

### General Housekeeping

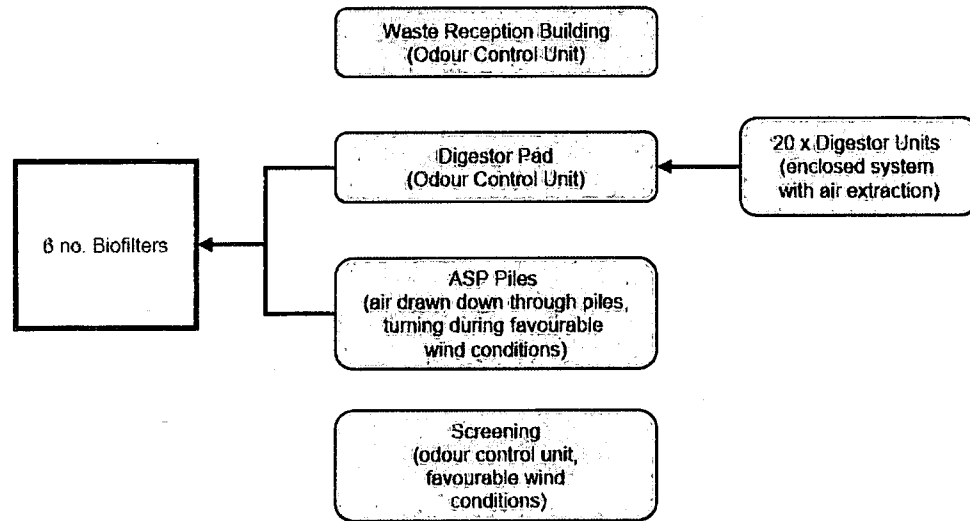
- hard copy record of road sweeping frequency

Establish procedures for verifying the HACCP system is working as intended. The HACCP system has been implemented at the facility in accordance with ABP requirements.

- annual review of the HACCP plan
- monthly review of odour complaints
- annual review of microbial data from final compost
- monthly review of time- temperature- moisture data for in- vessel and aerated pile phase
- bi-annual review of biofilter performance data
- monthly review of weather station data
- annual calibration of temperature measuring devices
- use of data logging buttons to verify probe data for both in vessel and aerated pile systems
- periodic microbial assessment of intermediate barriers i.e. log reduction after in vessel phase and during aerated pile phase

A flow diagram showing odour abatement controls at the existing facility is shown in Figure E.1.1.

**Figure E.1.1: Odour Abatement –Flow Diagram**



**E.1.2.7 Odour control outside normal operations**

Management of Odour in the event of a malfunction or outside normal operations

In the event of a failure of the odour mist units in the material reception building and marshalling yard, good operational practices will be followed to take into account sensitive receptors. A repair crew will be called immediately. Regular maintenance of the units will mitigate the likelihood of breakdown.

**E.1.2.8 Proposed Operations**

It is proposed to extend the facility to increase the throughput to 20,000 tpa. It is proposed to construct a compost building and a tunnel system whereby the process from material reception, digestion phase, curing and screening will be carried out indoors. The building will have an air extraction system. The existing material reception building has 2 no. doors, one on the western side of the building opening into the marshalling yard. RCVs enter and exit through this door to deliver biowaste. Amendment material is brought in through this door. The second door is located on the southern wall. The digestors are brought in and out through this door to the digester pads. It is proposed to close off the door on the southern wall. This will mitigate the creation of wind tunnels through the building and thus wind blown odour.

Following the final design of the extension, WCC will forward details of operations, potential impacts and mitigation measures to the Agency. The following is a brief summary of the likely impacts and mitigation measures.

Potentially impacts may arise from the generation of odour as a result of:

## Potential Odour Impacts from the Development

- material reception operations
- mixing & filling operations
- digester phase operations
- tunnel phase operations
- indoor curing phase operations
- outdoor curing phase operations
- screening operations
- general housekeeping

## Proposed Measures to Mitigate Odour Impacts

It is proposed to carry out the following activities within enclosed buildings with an air extraction system:

- material reception operations
- mixing & filling operations
- tunnel operations
- turning aerated piles (indoors)
- screening operations

indoor operations

Air extracted from the buildings will be directed through biofilters.

### Indoor Operations:

- odour will be minimised by conducting all tipping, mixing, filling, digestion, curing and screening odour will be minimised by the air extraction system and efficiently working biofilter.
- The maintenance of aerobic conditions throughout the composting process is fundamental to odour control. Regular oxygen monitoring is vital.

### Other Operations:

- The secondary curing phase is carried out outdoors on ASPs. Odour will be minimised by correct process control, pile management compliance and an efficiently working biofilter. Compost handling odour will be minimised by correct operational procedure. The final product compost does not have a significant odour.
- General odour is minimised by good housekeeping procedures.
- All operations take into account odour sensitive receptors and meteorological conditions.

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## ATTACHMENT E.2 EMISSIONS TO SURFACE WATERS

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### E.2.1 Surface Water in the Existing Environment

The Lower River Suir is north west of the facility. The St. John's River is east of the facility. This is shown in Figure B.2.1, see Attachment B.2. All domestic, commercial and industrial foul water and surface water in the city are discharged to the River Suir and St. John's River with the exception of some larger industries. The EPA Report on Water Quality in Ireland 1998-2000, reports that "...the lower reaches of the St. John's River has seriously depleted quality and widely varying oxygen saturation resulting from organic waste inputs. This problem has persisted for several decades"

Surface water, stormwater and foul water is discharged from the facility to sewer. The discharge point is shown on Drawing Number 2006-289-01-102-Rev A, SEE Appendix 1. Waterford does not have a wastewater treatment plant (WWTP). The sewer discharges to the St. John's River. It is believed that there will be an operational WWTP in 2 to 3 years to service Waterford City.

The following processes lead to the generation of storm water:

- Wetting of roads in dry weather for dust suppression
- Cleaning of marshalling yard
- General housekeeping

This is collected in a stormwater collected system and discharged sewer. Storm water collected by this system does not come in contact with waste or leachate. Sewerage is generated from hygiene facilities (p.e of 7) on site only and is discharged to sewer. Surface water from roof areas is directed to sewer.

The discharge of surface water, storm water and sewerage (p.e. 7) is not considered to impact negatively on the receiving sewer or in turn the St. Johns River due to the small volumes and quality of the discharge.

Leachate is collected on site and directed to a storage tank for tankering to a wastewater treatment plant. The following processes lead to the generation of leachate:

- A medium strength wash down is generated in the reception building from daily hosing of the walls and floor and vehicles.
- Leachate is manually released from the digester units as required. There are 20 no. digester units on a digester pad.
- Composting material is transferred from the digester units to outdoor ASPs. These are sprayed regularly, primarily to add moisture to the process and secondly to prevent windblown dust. Leachate is produced from the ASPs and discharged to the leachate collection system.
- Contaminated water from the wheel wash which is used to sterilise the wheels of delivery vehicles as they leave the material reception building.

Grab samples of effluent from the digestors and from the ASPs discharge pipe work were taken in October 2005. Estimates were also made of the hydraulic flow of effluent from the digestors and from the ASPs at daily intervals over a three week period

The results are presented in Table E2.1.

**Table E.2.1 Mean parameters for effluent discharged from primary and secondary composting**

Parameter	Flow m3/day	BOD mg/l	Ammoniacal N mg/l	COD mg/l	Suspended Solids mg/l
Digestors	1.2	13,600	785	34,560	6,730
ASPs	2.85	610	238	1,780	423

No leachate will be discharged to sewer.

**E.2.2 Potential Impacts to Surface Water**

The activities and processes to be conducted or likely to occur, at the site that could potentially impact upon surface water are as follows:

- generation of leachate on site
- storage of hydrocarbons on site

**E.2.3 Measures to Mitigate Potential Impacts to Surface Water**

The measures proposed include avoidance, reduction and mitigation and include:

- Hydrocarbons are not stored on site currently but it is proposed to install fuel tanks within a fully enclosed bounded area in the near future. The fuel will be used to re-fuel site machinery.
- Leachate generation will be kept to a minimum, all waste handling activities, unloading, storage and processing is carried out under cover so rainfall does not result in leachate generation. The only activity that is carried out outdoors which generates leachate is the maturation pads (ASPs). This area is kerbed off to contain leachate within that zone. All leachate will be collected and directed to a leachate storage tank for tankering off site to an appropriate facility.
- Woodchip is spread on the floor prior to tipping of commercial biowaste to soak up excess leachate.
- The material reception building floor is cleaned at the end of each day and all washdown is collected as leachate.

Leachate will continually be generated at the site and hydrocarbons will be stored at the site. These present a risk to surface water quality. However with the storage and handling precautions, the risk to surface water quality is negligible.

#### **E.2.4 Surface Water Monitoring**

As assessed in the sections above on potential impacts and proposed mitigation measures, the risk of contamination of surface water is negligible. The receiving water, the St. John's River is polluted. Emissions to sewer will be measured quarterly at the discharge point. Parameters to be monitored include; BOD, COD, Suspended Solids, Total P, Total N and TOC.

It is proposed to sample the leachate in the leachate storage tank bi-annually.

#### **E.2.5 Establish record keeping procedures**

- hard copy of tank levels
- record of cleaning
- record of inspection
  - tank
  - hardstanding areas
  - curing pads
  - digester pads
  - building floors
- leachate quality

#### **Establish procedures for verifying that the contaminated surface water and leachate control system is working as intended**

- annual review of the management plan
- all areas clear of ponding or pools of contaminated water

Contaminated surface water and leachate control in the event of a malfunction, interruption of service or outside normal operations:

1. Malfunction of the leachate collection system
  - immediate action by maintenance crew
  - if required leachate could be collected from certain points by bowser and transported to the leachate tank
2. Malfunction of the storage tank-highly unlikely
  - immediate action by maintenance crew
  - tankering of leachate to wastewater treatment plant
3. Malfunction of the drainage network for contaminated surface water
  - immediate action by maintenance crew
  - cease all washdowns
  - collection of contaminated surface water where practical by bowser for transfer stormwater tank

### **E.2.6 Surface Water Control Outside of Normal Conditions**

The pipe networks on site and the leachate tank are sized for a 30 year storm event. The risk of running out of storage capacity in a storm event is considered negligible. The tank will be emptied regularly.

All leachate pumps on the site will have duty and stand-by. In the event of a power failure, leachate generation will cease on site due to the cessation of all other operations. The drainage network has been designed to retain leachate within specific zones.

### **E.2.7 Proposed Operations**

It is proposed to extend the facility to increase the throughput to 20,000 tpa. To facilitate this extension the surface water and leachate management systems will be upgraded to incorporate the proposed composting building housing the tunnels and indoor ASP pads. The existing system will be reviewed to consider whether it is necessary to install a third collection system, to divert clean storm water from the roofs of buildings directly to the surface water discharge point. Leachate treatment will be kept under continuous review.

The potential impacts and mitigation measures for proposed operations are as have been assessed for existing operations.

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## ATTACHMENT E.3 EMISSIONS TO SEWER

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Stormwater, surface water and sewerage are discharged to sewer. Further details of the sources of stormwater, surface water and foul are included in Attachment E.2. The discharge point is shown on Drawing Number 2006-289-01-102-Rev A, see Appendix 1. Waterford City does not have a WWTP, the sewer discharges to the St. Johns River in line with all other discharges from the City. Impacts of emissions from the site are therefore discussed in Attachment E.2 Emissions to Surface Water.

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## ATTACHMENT E.4 EMISSIONS TO GROUNDWATER

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There are no emissions to groundwater from the existing facility.  
There will be no direct emissions to groundwater from the proposed facility.

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## ATTACHMENT E.5 NOISE EMISSIONS

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### E.5.1 Noise in the Existing Environment

Noise monitoring was carried out in January 2006. This is the report of results:

#### Methodology

##### Noise monitoring

The noise survey was conducted to be representative of both the daytime and night-time periods. This comprised of a noise survey that was conducted during the night-time noise monitoring period (22:00 – 08:00), and the daytime noise monitoring period (08:00 – 22:00). Noise measurements were taken over appropriate sampling times i.e. 30-minutes during the daytime and nighttime noise survey. A number of acoustical parameters were noted for each sample period namely, the  $L_{Aeq}$ ,  $L_{A10}$ ,  $L_{A90}$ ,  $L_{AMax}$  and the  $L_{AMin}$ . One-third octave band analysis was recorded at each noise monitoring location, to determine the presence of tonal components.

The noise monitoring was carried out using cirrus CR800A Sound Level Meter. The instrument was calibrated in accordance with ISO 1996-1: 1982<sup>Note2</sup> prior to commencing the survey using the recommended calibration procedure and a known pure tone noise source. The unit was again calibrated on completion of the survey to record drift during the course of the day. Drift is normally associated with battery fade and temperature. The unit had not drifted. All measurements were taken in accordance with ISO 1996-1, under suitable weather conditions.

- $L_{Aeq}$  Is the A-weighted equivalent continuous sound level during the sample time period and effectively represents an average value i.e. the average level recorded over the sampling period. The closer the  $L_{Aeq}$  value is to either the  $L_{AF10}$  or  $L_{AF90}$  value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of noise on the background.
- $L_{AF10}$  Refers to those levels in the top 10 percentile of the sampling interval; it is the level that is exceeded for 10% of the measurement period. It is used to determine the intermittent high noise level features of locally generated noise.
- $L_{AF90}$  Refers to those levels in the lower 90 percentile of the sampling interval; it is the level that is exceeded for 90% of the measurement period. It is used to estimate a background level.

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<sup>Note2</sup> ISO 1996-1:1982 (Description and Measurement of Environmental Noise: Part 1 – Guide to quantities and procedures).

**1/3 Octave** One-third octave band analysis is a method of analysing the detailed structure of a noise, i.e. the frequency spectrum of a noise. As the name suggests, these are bands of frequency, which are a third of the width of an octave band. A single-octave band is described by its "centre frequency", (which is the geometric mean of the upper and lower frequency limits). The centre frequencies of the one-third octave bands are 25 Hz, 31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125Hz, 160

**A-weighting** is the process by which noise levels are corrected to account for the non-linearity of human hearing.

**dB(A)** A logarithmic noise scale (decibel). The "A" indicates that a frequency weighting has been applied to take account of the variation in the sensitivity of the human ear as a function of frequency.

### Noise Monitoring Locations

Noise measurements were recorded at the Southern (N1), Northern (N2) and Eastern (N3) site boundaries and at 1 location outside of the facility to the Southeast of the site, as outlined in Table E5.1. The locations of the noise monitoring points are shown on Figure E.1. Noise levels at the site boundary monitoring positions were compared to the 55 dB(A) daytime and 45 dB(A) night-time sound pressure, which are the levels usually specified in EPA Waste Licences .

**Table E.5.1 Noise Monitoring Locations**

Measurement No.	Reference No.	Monitoring Period	Description
1	N1	Night-time	Southern Site Boundary
2	N2	Night-time	Northern Site Boundary
3	N3	Night-time	Eastern Boundary
4	NS2	Night-time	South East of Site

Measurement No.	Reference No.	Monitoring Period	Description
1	N1	Day-time	Southern Site Boundary
2	N2	Day-time	Northern Site Boundary
3	N3	Day-time	Eastern Boundary
4	NS2	Day-time	South East of Site

### Monitoring Conditions

Noise monitoring was carried out at three boundary positions (N1, N2 and N3 as specified in Table E5.1) at the site and also at one noise sensitive location to the South East of the Facility. Monitoring was carried out representative of both the night time and daytime noise monitoring periods. There are no operations carried out at the waste transfer station during the night. The weather conditions during the monitoring period were dry and cool with a slight breeze from a south-easterly direction.

### Night-time Noise Monitoring Locations

#### Southern Site Boundary (N1)

Noise monitoring at N1 was conducted at the southern site boundary, (see Figure E.1), which is delineated by a palisade fence and is bounded by Veolia Environmental Ltd. Waste Transfer and Recycling Facility (WTS). There were no operations at either of the sites during the monitoring period.

#### Northern Site Boundary (N2)

The noise measurement at N2 was conducted at the Northern site boundary. This monitoring point is bounded by a palisade fence and an area of disused land. Ballybeg Housing Estate is located approximately 500-600 meters to the north of this land.

#### Eastern Site Boundary (N3)

The noise measurement at N3 was conducted at the Eastern site boundary, which is delineated by a palisade fence and is bounded by other industries, such as DHL and Michael Thorpe Building Contractors.

#### NS2 – South East of Site (Noise Sensitive Locations)

The noise measurement at NS2 was conducted on the Kilbarry Road, at the entrance to the industrial estate, to the South East of the Veolia Environmental Ltd. WTS.

### Daytime Noise Monitoring Locations

#### Southern Site Boundary (N1)

The N1 daytime monitoring position was the same as the position at N1 during the night-time survey. Site activities had commenced and waste handling and processing had commenced at the composting facility. Waste activities had also commenced at the adjacent Veolia Environmental Ltd. WTS.

#### Northern Site Boundary (N2)

The N2 daytime monitoring position was the same as the position at N2 during the night time survey. Waste handling activities were operational at the site during the daytime noise monitoring period at N2. Operational activities were also in progress at the adjacent industrial units to the east and the south of the Veolia Environmental Ltd. WTS during the noise survey.

#### Eastern Site Boundary (N3)

The N3 daytime monitoring position was the same as the position at N3 during the night time survey. Waste handling activities were also operational at the site during the daytime noise monitoring period at N3 and there were also activities ongoing at the adjacent industrial units during monitoring.

NS2 – South East of Site (Noise Sensitive Location)

The NS2 daytime monitoring position was the same as the position at NS1 during the night time survey. The main activity was from passing traffic on the Kilbarry Road and construction traffic passing nearby. There were also activities in the adjacent industrial units during monitoring.

*Results*

The noise levels recorded at each monitoring location, including noise sensitive locations for night-time and daytime monitoring requirements are presented in Table E5.2.

A noise source is considered tonal if a particular frequency is clearly audible or if a 5 dB(A) or greater noise level exists between flanking frequencies. In accordance with ISO 1996-1:1982 "Description and Measurement of Environmental Noise", a 5 dB(A) penalty is added to the measured ambient noise level ( $L_{Aeq}$ ) when assessing noise impacts, if a tonal component is determined. The penalty of 5 dB(A) has been added to the ambient noise levels recorded during baseline noise survey where tonal components were determined.

The results of the monitoring event are summarised in Tables E.5.2 and E.5.3.

**Table E.5.2 Results of Night-time Noise Monitoring**

Reference No.	N1	N2	N3	NS2	
Description	Southern Site Boundary	Northern Site Boundary	Eastern Site Boundary	South East of Site	
Measurement	00.08 – 00.38	22.37 – 23.07	23.34 – 00.04	00.40 – 01.10	
	30 mins	30 mins	30 mins	30 mins	
Frequency A-Weighted	31.5	58	55	58	48
	63	50	63	54	47
	125	62	58	55	46
	250	46	54	49	48
	500	42	53	43	52
	1k	41	50	39	46
	2k	39	46	38	40
	4k	40	40	38	41
	8k	39	38	39	39
	$L_{Aeq}$	45	43 (48)	49	51
		No Tonal Components	Tonal @ 31 Hz	No Tonal Components	No Tonal Components
	$L_{A10}$	58	46	57	57
	$L_{A90}$	45	44	45	45

**Table E.5.3 Results of Day-time Noise Monitoring**

Reference No.		N1	N2	N3	NS2
Description		Southern Site Boundary	Northern Site Boundary	Eastern Site Boundary	South East of Site
Measurement		14.39 – 15.09	15.20 – 16.10	12.19 – 12.49	11.27 – 11.57
		30 mins	30 mins	30 mins	30 mins
Frequency A- Weighted	31.5	74	67	63	66
	63	84	63	59	69
	125	64	51	51	55
	250	64	43	43	54
	500	69	40	43	61
	1k	55	40	45	59
	2k	49	38	44	54
	4k	42	40	42	51
	8k	38	38	38	52
L <sub>Aeq</sub>		66 (71)	48 (53)	55	70 (75)
		Tonal @ 315 Hz	Tonal @ 40 Hz	No Tonal Components	Tonal @ 250 Hz & 6.3 KHz
	L <sub>A10</sub>	69	71	56	74
	L <sub>A90</sub>	60	47	48	53

Note 1: The penalty of 5 dB has been added to the L<sub>Aeq</sub> level and the resultant rating level is indicated in brackets where applicable

**Discussion**

Night-time and daytime sound pressure levels and third octave (tonal) measurements were recorded at three site boundary positions, (N1, N2 and N3) at the Onyx Ireland Ltd./Waterford City Council compost facility at the Six Cross Roads Business Park and two additional locations to the South East and North West of the Site. The noise levels measured at the monitoring locations N1, N2 and N3 and the two noise sensitive locations are compared to the noise emission limits of 55 dB(A) daytime and 45 dB(A) night-time off, which are the emission limits usually specified in EPA Waste licences.

Night-Time Noise Monitoring

**Southern Site Boundary (N1)**

The LAeq monitored at N1 during the night time was 45 dB(A). There were no tonal aspects detected during monitoring. The main source of noise at this location was traffic noise from the adjoining industrial premises, DHL. There were no operations at the compost facility or the adjacent Veolia Environmental Ltd. WTS during the period of monitoring. A background noise level of 45 dB(A) was recorded at this point.

#### Northern Site Boundary (N2)

The LAeq monitored at N2 during the night time was 43 dB(A). However, tonal aspects were detected during monitoring at 31Hz and thus the LAeq was subject to a penalty of addition of 5 dB in accordance with ISO 1996 – 1:1982. As a result, the actual LAeq at N2 was thus 48 dB (A).

No operational noise sources were audible at this location and the only noise source at this location was noise from the nearby Ballybeg Housing estate. A background level of 44 dB(A) was recorded at this location.

#### Eastern Site Boundary (N3)

The LAeq monitored at N3 during the night time was 49 dB(A) but there were no tonal components determined. The main noise source at this location was due to a faulty door on one of the composting vessels, which vibrated when the air blowers commenced operating. This fault has now been rectified and should lead to a reduction in noise levels at this location. Traffic movements at the adjacent DHL industrial unit were also audible during monitoring and would have contributed to the noise levels recorded at this location. A background level of 45 dB(A) was recorded at this monitoring point.

#### South East of site (NS2)

The LAeq measured at noise sensitive location NS2 during the night time was 51 dB(A) but there were no tonal components determined. This monitoring point is located at the entrance to the Six Cross Roads Industrial estate, to the south east of the facility. The main noise source at this location was road traffic noise from the Kilbarry road. There were no audible noise sources from the compost Facility during the monitoring period.

#### Daytime Noise Monitoring

#### Southern Site Boundary (N1)

Noise levels monitored at N1 during the daytime monitoring period were influenced by a number of different noise sources. The LAeq measured at N1 during the daytime was 66 dB(A). However, tonal components were detected at a frequency of 315 Hz and thus the LAeq was subject to a penalty of addition of 5 dB in accordance with ISO 1996 – 1:1982. The actual LAeq at N1 was thus 71 dB(A). A background level of 60 dB(A) was recorded at this location.

The main noise sources audible during monitoring were due to waste delivery and collection vehicles in both the Veolia Environmental Ltd. WTS and the compost site. Front end loading machines were also operating in both sites during monitoring. Reversing sirens from the front end loading machines, forklift and waste delivery vehicles were clearly audible during monitoring and may have been the cause of the tonal component detected during monitoring.



#### Northern Site Boundary (N2)

The LAeq monitored at N2 during the daytime was 48 dB(A). However, tonal components were detected at frequency of 40 Hz and hence the LAeq was subject to a penalty of addition of 5 dB in accordance with ISO 1996 – 1:1982. The actual LAeq at N2 was thus 53 dB(A). A background level of 47dB(A) was recorded at this location.

#### Eastern Site Boundary (N3)

The LAeq monitored at N3 during the daytime was 55 dB(A). There were no tonal components detected at this monitoring point. The noise level recorded at N3 was influenced mainly by noise sources at the adjoining industrial units, such as traffic movements and reversing sirens from delivery vehicles in the DHL premises. A background level of 48 dB(A) was recorded.

#### South East of site (NS2)

The LAeq monitored at N2 during the daytime was 70 dB(A). However, tonal components were detected at frequencies of 250 Hz and 6.3 kHz and thus the LAeq was subject to a penalty of addition of 5 dB in accordance with ISO 1996 – 1:1982. The actual LAeq at N2 was thus 75 dB(A).

The noise level monitored at NS2 during the daytime was influenced mainly by traffic on the Kilbarry Road. A traffic count was conducted during the monitoring period and a total of 199 vehicles were found to pass by this location, including a large volume of articulated vehicles. A construction site was located approximately 100 meters to the North of the monitoring point, which may be the source of the tonal component detected, as heavy construction machinery, with reversing sirens were clearly audible during monitoring.

### Summary

#### Night-time

Night time noise levels were found to slightly elevated at N3 monitoring location, with a level of 49 dB(A) recorded. It is likely that this level was due to a noise caused by the vibration of a faulty composting bin door. This fault has since been rectified and is no longer a source of noise. Activities at the adjacent DHL unit were also audible during monitoring. A noise level of 45dBA was recorded at monitoring location N1. Noise levels at N2 were found to be 43 dB(A), but due to the detection of a tonal aspect at 31 Hz and a 5dB(A) penalty, the actual reading at N2 is 48 dB(A). There were no clearly audible operational noises from the Compost facility during monitoring, but the tonal aspect may have been due to the operation of the blowers. There were no other activities at the site during this period.

An LAeq of 51 dB(A) was recorded at the noise sensitive location, NS2. This exceeds the noise levels recorded at the compost site and is due mainly to traffic noise from the Kilbarry Road and the Waterford Ring Road. Operations from the compost site were not audible from the noise sensitive location.

## Daytime

The noise levels monitored at N1 during the daytime were both found to be slightly elevated with levels of 66 recorded at this location. However as a tonal aspect was detected at 315 Hz, the final noise level reading at this location was 71 dB(A). A tonal aspect was also detected at location N2, which recorded a noise level of 48 dB(A). The resultant noise level, including 5 dB(A) penalty, was 53 dB(A).

Noise sources at N1 were caused mainly by waste delivery and collection vehicles in both the Veolia Environmental Ltd. WTS and the compost site. A front end loading machine and forklift were also operating in the adjoining transfer facility adjacent to the monitoring location and may be the cause of the tonal aspect detected at this location.

The LAeq detected at N2 were 48 dB(A), which is below recommended levels. However a tonal aspect was also detected at this location during monitoring, resulting in a 5 dB(A) penalty, which brings the final noise level to 53 dB(A). Noise levels at this location were due to operational activities at the compost site, such as waste delivery vehicles, mixing and sorting operations. Activities at the adjacent Ballybeg Housing Estate and road traffic noise were also audible at this location, though not a significant source of noise. The LAeq detected at N3 was 55 dB(A).

The LAeq determined at the noise sensitive location, NS2 was 70 dB(A) and was subject to a 5 dB(A) penalty due to the detection of a tonal component. This reading exceeds all noise levels detected at the compost site and was attributable to traffic noise on the Kilbarry Road and Waterford ring road. Operations from the industrial units were also audible at this location. Activities at the compost site were not audible from this location during monitoring.

## Conclusion

Night time noise levels were slightly elevated at location N3, due to a faulty composting vessel on-site. Operational activities at a neighbouring industrial unit were also audible during monitoring. Daytime noise levels were elevated at monitoring location N1. Tonal components were detected at locations N1, N2 and noise sensitive location NS2.

Noise levels recorded at the compost site were influenced by operational activities at the adjoining industrial premises, in addition to operational activities at the compost site. Daytime and night-time noise readings at NS2 were mainly influenced by road traffic noise from the Kilbarry road and Waterford Ring Road.

Although the daytime noise levels determined at N1 were slightly elevated, it is unlikely that the noise levels recorded at the site would give rise to nuisance at noise sensitive locations in the area or the adjacent facilities. The noise levels recorded at the noise sensitive location exceeded levels recorded at the site during both daytime and night time monitoring and were not influenced by activities at the compost site.

## E.5.2 Potential Noise Impacts

Potential impacts from existing operations include delivery trucks on the site and the outdoor operation of plant, such as wheeled loaders, screening equipment and blowers.

### Night-time

The composting process is a 24 hour operation. During night-time hours (22.00-08.00) (in the normal operational phase), digestion is the only activity carried out, therefore the potential noise impact is the blowers.

However, since December 2005 some operations have been carried out at night. These hours are 4.30pm to 11.00pm as required from Monday to Friday. It is expected that once the facility is extended to incorporate indoor composting operations that odours will be significantly reduced and will result in less need for night time operations. The increased number of buildings on the site will also act to absorb sound.

### Day-time

During day-time hours the noise sources associated with the operation of the facility include:

- the deliveries of material to the site for treatment
- shredding of green waste
- loading of waste within the reception hall
- transfer of waste material via the mixer to a digester unit
- movement of digestors on site
- aeration system
- unloading of digestors to ASPs
- turning of material on ASPs
- screening of compost
- collection of final product from the site

### Unloading and Mixing

There are approximately 8 RCV deliveries per week. Noise due to 16 no. RCV movements per week is not significant.

The amendment material is transferred from the green waste storage point in the compost storage shed, across the marshalling yard using a Senobogen low loader.

There is no operational stationary mechanical plant within the material reception hall. Material is tipped onto the floor and following inspection of the waste, the biowaste and amendment material is loaded alternately into a mixer with a manitou telescopic loader. The biowaste and amendment materials are mixed and loaded via a conveyor into a digester unit placed alongside the mixer.

Once the digester unit is filled it is towed outside to the digester pad.

There is a potential noise impact from shredding of green waste.

The noise sources from unloading and mixing are:

- the Senobogen low loader transferring green waste
- the Manitou telescopic loader used to move the waste within the reception area
  - engine noise
  - reversing siren
- the mixer in operation
  - engine noise
- the tractor used to move the digester in and out of the reception building
  - engine noise
  - reversing siren

#### Digestion

The digester units (20 no.) at this site operate on a 24-hour basis. Air is drawn through the digester units as part of the process. The air fans (blowers) that move the air are a noise source.

As each batch (in one digester unit) completes the digestion process, the unit is towed by roll on/roll off vehicle (roro) to the maturation pads. The material is emptied onto the maturation pad ASP and is turned at regular intervals and moved along the pad until composting is complete. The noise associated with this process is:

- the roro used to move the digester in and out of the reception building
  - engine noise
  - reversing siren
- the plant machinery used to turn the material on the pads
  - engine noise
  - reversing siren

The finished compost is then moved into the compost storage shed. The material is screened in the composting storage area (3 sided building-open to the yard area).

There is a potential noise impact from the engine running the screen.

#### E.5.3 Proposed Mitigation Measures

The operating hours are such that the majority of activities that have the potential to cause noise are carried out within day time hours.

Engine (low loaders, turners, shredder, screener) and Reversing Siren Noise.

Noise monitoring did not record any significant noise levels from plant machinery. This plant machinery operates within a cordon of buildings to the south, east and west. They help mitigate potential noise impacts.

## Air Fan Noise

The digester units (20 no.) at this site operate on a 24-hour basis. The compost process requires air to be drawn through the digester. The air fans that move the air are a noise source. No elevated noise levels were recorded from the blowers. Regular inspection and maintenance of the blowers is carried out to ensure good working order. Noise monitoring is carried out to check such noise sources.

The existing development does not have a significant impact on the noise environment and it is expected that the proposed development will not have a significant impact on the noise or vibration environment. An assessment of the existing noise conditions was carried out. The existing noise is in an industrial area, with locations close to roads and industrial units. This is due mainly to traffic levels.

### E.5.4 Noise outside Normal Conditions

All equipment will be inspected and maintained regularly to prevent breakdown. In the event that there was a malfunction that caused a noise impact, it would be recorded during the morning inspection of the site and a plan put in place for mitigation.

### E.5.5 Noise Monitoring

Noise monitoring will be carried out annually at the locations listed in Table E.5.4 and as shown on Figure E.1.

**Table E.5.4 Noise Monitoring Locations (grid references)**

Measurement No.	Reference No.	Grid Reference		Description
		N	E	
1	N1	109524	258344	Southern Site Boundary
2	N2	109630	258325	Northern Site Boundary
3	N3	109609	258408	Eastern Boundary
4	NS1	109985	258058	North West of Site
5	NS2	109543	258794	South East of Site

### E.5.6 Noise and the Proposed Extension

#### Construction Phase

The proposed extension to the facility will involve the construction of a composting building. Normal construction working hours will be limited to the daytime, and it is not anticipated that night-time construction works will be necessary on this project. As the exact construction methods and approach are not known at this stage, details will be forwarded to the Agency as part of the SEW. The impacts will be limited in duration; it is not considered that the construction will result in significant impacts at the noise sensitive locations. There may be short-term, temporary noise level increases. To mitigate the impacts of construction noise the site will implement normal construction management practices to manage noise.

During the construction phase of the development, the noise on the site will be managed so as to reduce any impacts on the local noise sensitive locations. The site operations will be conducted using best practice methods (e.g. BS 5228:1997 Noise and Vibration Control on Construction and Open Sites). Control of construction noise will include measures to control noise from construction plant, equipment, and activities at source. Particularly noisy activities will be carefully planned and times to cause the least impact. Noise monitoring will be carried out as necessary during construction phase to ensure the site is operating without undue noise impact.

Construction plant and equipment used during the construction phase will comply with noise regulations on outdoor plant and machinery. It is anticipated that the site will be a licensed facility. This will require that the noise levels at any noise sensitive location does not exceed 55 dB(A) LAeq (30-minutes) during daytime.

#### *Operational Phase*

The proposed changes to the facility will result in an intensification of activities but will bring the majority of site operations indoors. The increase in traffic will be minor and will not contribute significantly to traffic noise due to the existing volumes of HGV traffic in the vicinity.

The facility will be required to meet the waste licence limit requirements at the noise sensitive locations.

For night-time operations, all of the activities at the site will be contained indoors and the main sources of noise will be the air handling units on the reception/composting building and the motors and fans associated with the digestion tunnels.

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**E.6.1 Vermin Control**

Vermin and insects can potentially be a nuisance at waste management facilities. However, all operations involving raw waste are carried out within the material reception building. The digestion phase is fully enclosed. Strict cleaning procedures are in place, which require the regular cleaning of all plant and waste acceptance/composting areas.

As a precautionary measure, there is pest control on site. The site is inspected monthly and a number of bait points have been set up internal and external to the facility. There is a 1-2 working day follow up upon discovery of infestation until two clear site visits have been recorded.

**Flying Insect Control**

All internal walls from a height of 2 m to ceiling height are sprayed with Fendona or Quapy with a motorised blower 6 times per annum.

**E.6.2 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 development is a considerable distance from Waterford Airport.

Waste activities at the facility are carried out within the buildings.

In addition, all vehicles entering the site with biowaste are either fully enclosed RCVs or are completely covered. This minimises the potential for birds scavenging on site.

**E.6.3 Litter**

Litter is not a problem at the site due to the nature of the waste delivered to the site and the fact that it arrives in enclosed or covered refuse collection vehicles. In addition unloading and mixing of incoming raw waste is carried out within the material reception building.

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

#### **E.6.4 Fire Control**

In general, fires are 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
- staff training in fire prevention and control
- the provision for fire extinguishers at key location throughout the site which are checked regularly
- sufficient clearing to allow the fire brigade clean access to all buildings, site infrastructure and areas of the site

The site is serviced by a 100mm dia watermain and there are fire hydrants located in the material reception building, beside the ASP pads, in the marshalling yard at the compost shed and to the east of the digester pad.

#### **E.6.5 Traffic Control**

##### **Traffic in the Existing Environment**

The site location is shown on Figure No. B.2.1. It is 2 km from Waterford City centre. The area is zoned for industrial and commercial development. A major new link road was opened in late 2005. Vehicles accessing the site do so via the Green Road off the link road or the N25. The Green Road is a Cul-de-Sac used only by vehicles accessing the Composting Facility and the adjacent WTS. There is sufficient capacity on the road if queuing for the facility did occur. The road is wide enough for 2 no. HGVs to pass each other.

The proposed facility is accessed by a minor road –Green Road. RCVs entering the facility will be directed across the weighbridge by the weighbridge office to the materials reception building. Members of the public coming to drop off green waste can do so adjacent to the weighbridge at the green waste reception area, therefore the public do not need to access the site.

There are currently approximately 8 no. RCV deliveries per week resulting in 16. no. truck movements to and from the site. Members of the public and landscapers delivering green waste total approximately 200 movements to and from the site each week. Green waste delivery and compost collection is seasonal, they are lower numbers of movements in the winter.

Only approved vehicles are permitted to enter the compost facility.



## Potential Impacts of the Development on Traffic

Potential impacts from traffic to the existing facility include:

These potential impacts are negligible. The Green Road services only one other facility, the adjacent WTS. It has significantly higher volumes of traffic than the compost facility.

There is potential for spoiling of the road by waste. The likelihood of this occurring is extremely low as all commercial vehicles delivering waste to the facility are fully enclosed or covered.

### Proposed Operations

At a maximum capacity of 20,000 tpa, the traffic movements will be approximately 10% of the traffic volume on Green Road. Veolia Environmental Ltd. has a waste licence (Register Number W0177-03) for the operation of the adjacent WTS. The licence permits the processing of 80,000 tpa. The majority of traffic on the road (90%) will be bound for the WTS. The impact of traffic from the compost facility will be negligible.

### Road Cleansing

The entire site is hardstanding including the internal floors of the buildings. Vehicles will arrive at the facility via the public network. All delivery vehicles wheels will be power washed before exiting the materials reception hall. Road cleaning control measures will not be required at this facility. Internal roadsweeping will be employed as part of general housekeeping measures as required.

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## ATTACHMENT F CONTROL & MONITORING

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### Attachment F.1 Emissions and Abatement

#### To Atmosphere

Please refer to Attachment E1 for details of dust and odour abatement. A flow diagram of abatement in operation is shown in Figure E.1.1 and of proposed abatement is shown in Figure D.2.9.

#### To Surface Water/Sewer/Groundwaters

Please refer to Attachment E2 for details of emissions to surface water. There are no emissions to groundwater. Emissions to sewer, along with the leachate management system is shown on Figure D.2.9.

#### F.2 – F.9 Monitoring and Sampling Points

The parameters to be monitored at the site include noise and air quality (dust and odour). The monitoring methods and frequencies proposed in Attachment E are for those monitoring points shown on Figure Number E.1.

Environmental monitoring will be undertaken by WCC staff or a competent environmental scientist(s) contracted by the applicant. This person(s) will be responsible for ensuring that sampling is undertaken in compliance with EPA protocols. The results and interpretative report will be prepared on a basis specified by the licence for the facility and submitted in a manner suitable for presentation to the EPA.

Sampling protocols including Standard Operating Procedures (SOP) and QA/QC data will be supplied to the Agency as part of the monitoring programme. Where laboratories are used for analysis, the methods, SOPs, Chain of Custody Information and QA/QC information will be submitted to the EPA as part of the reporting procedure.

All existing have been identified and located in Figure E.1 Environmental Monitoring Points.

Prior to the facility extension to cater for the increased tonnage, any additional proposed monitoring points will be forwarded to the Agency for approval.

**Attachment F.2 Air**

Refer to Attachment E.1 of this document.

**Attachment F.3 Surface Water**

Refer to Attachment E.2 of this document for relevant information.

**Attachment F.4 Sewer Discharge**

Refer to Attachments E.2 and E.3 of this document.

**Attachment F.5 Groundwater**

Not applicable. There are no discharges to groundwater.

**Attachment F.6 Noise**

Refer to Section E.5 of this document.

**Attachment F.7 Meteorological Data**

A wind vane is located on site. Wind direction is recorded daily and is checked prior to turning of outdoor curing piles and screening. These activities are not carried out during Northerly or North-westerly winds due to sensitive receptors to the south and south-east.

Records of wind direction and strength are kept on site.

**Attachment F.8 Leachate**

Not Applicable. This is not a landfill application.

**Attachment F.9 Landfill Gas**

Not Applicable. This is not a landfill application.

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## ATTACHMENT G. RESOURCE USE AND ENERGY EFFICIENCY

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### Attachment G.1 Raw Materials and Product

Table G.1 outlines the raw materials and energy which are consumed at the composting facility on an annual basis.

**Table G.1: Raw Material Consumption per Annum – Composting Facility**

Resource		Quantities
Diesel Oil		14 m <sup>3</sup>
Lubricant Oil		0.15 m <sup>3</sup>
Coolant/Antifreeze		0.15 m <sup>3</sup>
Electricity		600 kW
Water		21,250 m <sup>3</sup>
Urea		2,000 kg
Cleaning Chemicals		0.20 m <sup>3</sup>
Insect repellent	Fendona	0.15 m <sup>3</sup>
Rat bait	Klerat or Confrac	50 kg

### Material Safety Data Sheets

The cleaning chemicals used have been selected from the Department of Agriculture and Food approved list for facilities falling under the Animal By-Products Regulations. The facility has an Animal by-Products Licence, issued in October 2006.

Diesels, lubricant and hydraulic oils are brought to site as required. It is proposed to construct a bunded tank for storage of fuels and cleaning chemicals on site as part of the extension works.

### Attachment G.2 Energy Efficiency

An energy audit will be conducted annually to ensure energy is being used efficiently.

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## ATTACHMENT H MATERIALS HANDLING

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### Attachment H.1 Waste Types and Quantities

#### Waste Handled For Recovery

The existing facility accepts source separated household organic waste, green waste and commercial source segregated organics. The main activity/process for each of these waste streams is composting. The composting process is described in detail in Attachment D2.a. The capacity of the facility will be extended to process 20,000 tpa of source separated organics and green waste.

#### Waste Handled For Disposal

The source separated organic waste is tipped onto the floor in the materials reception building where it is sorted to remove contaminants that are not compostable or may damage equipment. This material is removed off-site for disposal at an appropriate facility.

At the end of the composting process the mature compost is screened to remove oversize items and contaminants such as wood chips, plastics etc. The oversizes are used as a successful bulking agent and in particular as an inoculant in cold winter weather. The only disadvantage of this practice as determined by the operators is that it can lead to a build up of small contaminants in the compost that are not removed during screening. In the case that a batch of mature compost did not reach the criteria for contaminants or pathogens, it would be disposed of to an appropriate facility. To date the quantity of overs removed off site for disposal at a suitable facility has been very low. The licence application seeks permission to dispose of up to 2,500 tpa for the existing operations and up to 5,000 tpa for proposed operations. It is anticipated that improved technology will be installed at site to reduce quantities of overs. Waterford City Council will investigate the requirements for landfill cover and will endeavour to produce a product of this standard from what would otherwise be regarded as overs.

#### Hazardous Waste Handling

Hazardous waste will not be accepted at the facility.

Small quantities of hazardous waste will be generated on site from daily operations. These include; waste oil, fluorescent light bulbs, oil filters and batteries. Any hazardous waste generated on site will be transported to an appropriate licensed facility.

### Attachment H.2 Waste Acceptance Procedures

The waste acceptance procedure in use at the facility is shown in Form H.1.

Form H1: Waste Acceptance Procedures

<b>STANDARD OPERATING PROCEDURE</b>	<b>PROCEDURE NUMBER SOP 006 EP 007 VERSION 1</b>
<b>WASTE ACCEPTANCE AT THE COMPOST FACILITY</b>	
UPDATED BY: Michael Storan	ISSUE DATE: 05 Sept 06
APPROVED BY: Michael Storan	REPLACES VERSION: N/A
<b>PERSONNEL INVOLVED:</b> Compost Facility Manager/Loading Shovel Operators/Compost Operators.	
<b>PROCEDURE PURPOSE:</b> To ensure that only suitable material is acceptable at the facility for the composting process.	
<b>SCOPE OF PROCEDURE:</b> Applies to all waste types received at the facility.	
<b>DESCRIPTION OF TASKS:</b> <ul style="list-style-type: none"> <li>• All waste loads received at the facility shall be recorded over the weighbridge system.</li> <li>• Each waste vehicle shall be directed to the Waste Reception Building.</li> <li>• The waste handlers, the teleporter operator and the compost facility Manager shall be familiar with the waste types that are acceptable at the facility.</li> <li>• Waste loads shall be deposited onto the waste mixing area of the Waste Reception Building floor.</li> <li>• The waste handlers and/or the teleporter operator shall inspect each load of waste.</li> <li>• If unacceptable or hazardous waste items are identified, the waste handlers or teleporter driver will notify the Compost Facility Manager and place the waste in the waste quarantine area.</li> <li>• The Compost Facility Manager will identify the driver of the vehicle and the source of the waste.</li> <li>• The customer responsible for the waste item will be informed and given the option to collect the waste from the facility and arrange for the correct disposal. Alternatively the company will arrange for the collection and disposal of the waste in question and invoice the customer responsible.</li> <li>• Details of the waste types and the disposal used will be recorded in the Unacceptable Waste Report Form.</li> <li>• In the event that a waste load is deemed unacceptable due to the level of contamination (non-hazardous) material present, the operator shall inform the Compost Facility Manager.</li> <li>• The manager will make arrangements for the load to be removed off-site to an appropriate facility immediately by an appropriate waste contractor.</li> <li>• Records of these events will also be recorded in the Unacceptable waste Report Form.</li> </ul>	
<b>EXPECTED RESULTS AND ACTIONS FOLLOWING DEPARTURE FROM THIS PROCEDURE</b> Failure to follow this procedure may result in processing of unacceptable or hazardous waste items at the facility which may cause injury to staff, damage to equipment or have a detrimental impact to the receiving environment.	
<b>RELATED DOCUMENTATION:</b> Unacceptable Waste Register Form.	
<b>DATE OF PROCEDURE REVIEW:</b> September 07	
<b>PERSON RESPONSIBLE FOR UPDATING THIS PROCEDURE:</b> Michael Storan	

### **Attachment H.3 Waste Handling**

#### **Waste Handling**

Waste handling procedures outlined in this section describe in principal the operational procedures implemented on behalf of Waterford City Council to effectively operate the composting facility. The procedures reflect current practice and may evolve once the newly extended elements of the facility come on line.

#### **Waste Handling On Site**

Waste Acceptance at the facility is discussed in Attachment H.2. Incoming loads are inspected in the materials reception hall (tipping floor).

There is a detailed description of unit operations at the facility in Attachment D2.a.

The unit operations are:

- waste acceptance
- shredding operations
- material reception
- material decontamination and shredding
- mixing with amendment material
- loading into tunnels or compost reactor vessels
- static pile aeration
- screening
- compost storage

Waste handling procedures are in place for these unit operations in the form of Standard Operating Procedures. Further details of the process are included as Attachment D2.a Unit Operations.

The key element of waste handling on site is the separation of materials in various zones as per the Animal By-Products Licence requirement. Handling procedures are strictly adhered to, in order to prevent cross contamination.

### **Attachment H.4 Waste Arisings**

Not Applicable. The facility will not accept contaminated soil.

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**ATTACHMENT I      EXISTING ENVIRONMENT AND IMPACT OF THE  
ACTIVITY**

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**Attachment I.1      Assessment of Atmospheric Emissions**

Attachment E1 of this document assesses the existing air quality and the potential impacts of the proposed environment.

**Attachment I.2      Assessment of impacts of surface water discharges on the receiving waters**

Attachment E2 of this document assesses the existing quality of receiving surface waters in the vicinity of the site and the potential impacts of the proposed environment.

**Attachment I.3      Assessment of Impact on receiving sewer**

Refer to Attachment E.3.

**Attachment I.4      Assessment of impact of groundwater and soils**

Not applicable.

**Attachment I.5      Ground and/or groundwater contamination**

Not applicable.

**Attachment 1.6      Noise Impacts**

Attachment E5 of this document assesses noise levels in the existing environment and the potential noise impacts of the proposed environment.

**Attachment I.7      Assessment of Ecological Impacts and Mitigation Measures**

Not Applicable



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## ATTACHMENT J ACCIDENT PREVENTION AND EMERGENCY RESPONSE

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### Attachment J.1 Accident Prevention and Emergency Response

The operation of the facility has not presented any danger to the public nor is it expected to in the future. Access to the operational areas of the site is restricted to employees, hauliers and pre-arranged visitors. All visitors, once on site, are accompanied by a member of staff at all times. Procedures are in place to ensure the health and safety of all persons entering the site.

The public area for the drop off of green waste and the collection of compost will be moved to a location as shown on Drawing Number 2006-289-01-104 Rev A, see Appendix 1 adjacent to the weighbridge area.

During the construction of the extension to the facility, all site workers will be required to have a FÁS Safe Pass.

The existing site operations are very well run. The operations are well managed, organised and documented. There is a high level of process control. Details of site operations are included as Attachment D.2.

Details of site security, fuel storage including bunding, waste quarantine, waste inspection, traffic control and services are included in Attachment D.1 of this document.

Details of competence and site management including staff qualifications and site staff duties and responsibilities are included in Attachment C.1 of this document.

An EMS will be prepared for the site and further details on the proposed content is included in Attachment C.2 of this document.

#### Fire

The nature of the operation does not pose a major risk of fire. The following steps are in place to ensure an acceptable level of fire safety:

- Training of all site operatives and employees in fire prevention and control
- Prominent posting of emergency response contact numbers (fire service, Gardaí, ambulance and other agencies)
- The provision of on-site water supply
- The provision of fire fighting equipment in the site office
- There is no long term storage of waste on-site. If waste overs are stored on site the volumes are not significant

There are two enclosed buildings on site, the canteen offices and the material reception building. The administration building is equipped with 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. In addition, a sump will be created at the inlet to the piped stream to facilitate the extraction of water for fire fighting purposes.

In general, fires are 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
- staff training in fire prevention and control
- provision for fire extinguishers at key location throughout the site which are checked regularly
- sufficient clearing to allow the fire brigade clean access to all buildings, site infrastructure and areas of the site
- volume of overs (waste) held on-site is kept to a minimum

Fire hydrants are located in the material reception building, beside the ASP pads and in the marshalling yard at the compost storage building.

The nature of materials on site, separately collected organic waste and green waste mean that the risk of spills and contamination is negligible.

#### **Operational Failure of Plant and Equipment/Emergency breakdown**

Breakdown of equipment is handled by prompt repair and/or replacement of equipment. Equipment on-site is maintained on a regular basis. The existing composting process is carried out in 20 no. digester units. If one or more were to breakdown, material can be moved to another or re-entered into the material reception hall to commence the composting process again. There are a number of ASP pads to allow for stand-by in the event of a short term breakdown. In the event of long-term breakdown (48 hours) of vital equipment or plant, waste will be diverted to an appropriate licensed facility.

The proposed extension of the facility will include duty and standby for all key mechanical plant. In the event of a breakdown in the proposed tunnel system, the digester units can act as standby. The proposed system will have indoor and outdoor ASP pads, thus providing sufficient back-up. In the event of long-term breakdown (48 hours) of vital equipment or plant, waste will be diverted to an appropriate licensed facility.

**Responses outside of normal working hours (night time, weekends and bank holidays)**

Key staff are on-call to respond to any emergency situation outside of normal working hours, that is:

22:00-07:00	Mon-Fri
18:00-07:00	Saturdays and Bank Holidays

**Spill or emergency containment measures**

Due to the nature of waste being handled on site, a spill event is considered unlikely. The composting facility is entirely hardstanding.

Please refer to Drawing Number 2006-289-01-102 Rev A, see Appendix 1. Potential spills include leachate or diesel. Leachate is stored on site in a leachate storage tank for tankering off site to an appropriate facility. Fuel is stored in bunded tanks on site. It is delivered to the site by tanker. In the event of a spill, the drainage system will collect it and it can be contained on site for transport off-site for appropriate treatment. Absorbent booms will be stored on site to mitigate the extent of a spill area.

**Potential for groundwater contamination in the event of fire on-site**

In the event of a fire on site, fire water that falls to the hard standing will be collected by the drainage system. It will be collected appropriately managed.

**Public Liability**

A copy of Waterford City Councils' public liability insurance certificate is included in this attachment (J.1).

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**Irish Public Bodies Mutual Insurances Ltd**

MAN CLERK  
WATERFORD CITY COUNCIL  
CITY HALL  
WATERFORD

Account No.....: 101305  
File No.....: 0003873  
Effective date.: 15/11/2005  
Invoice No.....: 092966

**ENDORSEMENT / INVOICE**

Ins. Co.	Period of Cover	Policy No.	Class
I P B	01/01/2006 31/12/2006	X/010190/052	Public Liability

Premium 1,138,150.00 Govt. Levy: 22,763.00 Total EURO 1,160,913.00

**PLANNING FILE**  
NO.....  
RECD. 06 OCT 2006  
WATERFORD CITY COUNCIL

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**Particulars:**

RENEWAL  
LIMIT OF INDEMNITY 12,700,000  
EXCESS 6,300  
PREMIUM BASIS RETRO RATED  
EXTENSIONS.

1. NEG OF CONTRACTORS MAX VALUE ANY ONE CONTRACT €127,000
2. IND TO FIRE SERVICES COUNCIL/LOCAL AUTHORITIES IN RESPECT OF FIRE BRIGADE TRAINING COURSES
3. IND TO GROUPS USING KILBARRY SPORTS HALL
4. Flooding €318,000 aoa/aop subject to €6,300 excess
5. Waterford Theatre Royal Society Ltd
6. SKATEBOARD FACILITY AT SPORTS CENTRE/PUBLIC PARK SUBJECT TO €10,000 EXCESS

COVER PARTICULARS ABOVE SUBJECT TO ACTUAL POLICY DOCUMENT.

ENDORSEMENT NO 40

IT IS NOTED THAT THE PREMIUM FOR THE PERIOD 01/01/06 - 31/12/06 IS CALCULATED IN ACCORDANCE WITH THE TERMS AND CONDITIONS AS SET OUT UNDER ENDT. ENDT. 1 OF THE POLICY, SUBJECT TO THE FOLLOWING ALTERATIONS:-

DEPOSIT PREMIUM	€1,138,150
MINIMUM PREMIUM	€1,138,150
MAXIMUM PREMIUM	€1,400,800

SUBJECT OTHERWISE TO THE TERMS, CONDITIONS, EXCEPTIONS AND ENDORSEMENTS OF THE POLICY.

**Comhar Árachais Comhairlí Éireann Teo**

## PUBLIC LIABILITY

Policy Number X/010190/052

This policy covers the legal liability of the Council for accidental bodily injury to third parties and damage to third party property caused by the negligence of the Council or its employees.

Cover is on a claims made basis relating to incidents occurring since 1/1/1990. Incidents occurring prior to that date are covered under your previous policy on an occurrence basis.

A personal indemnity to employees is also provided.

The limit of indemnity provided is €12,700,000 any one accident, inclusive of all damages, costs and expenses.

The Council is responsible for the first €10,000 of each and every claim relating to the Sports Centre/Public Park and the first €6,300 of all other claims reported from 1/1/2001.

The policy also covers the liability of the Council for employees property up to a limit of €1,270 any one employee.

Cover has been extended to provide an indemnity to the Council in respect of liability arising from the negligence of contractors engaged by you, where the contract price does not exceed €127,000.

The policy covers liability arising from flooding up to a limit of €318,000 any one accident/any one period of insurance. The Council is responsible for the first €6,300 of claims for flooding.

The policy also indemnifies the Council in respect of liability relating to accidents arising in Playgrounds or Playcentres, subject to the following conditions:

1. The Playgrounds/Playcentres are operated directly under the control and management of the Council
2. The Council is responsible for the maintenance and upkeep of the Playgrounds/Playcentres and all equipment therein.

The policy includes the following, subject to the terms and conditions as set out in the relevant endorsement:

Liability in the joint names of the Council, FÁS and their agents in connection with the sponsorship of Community Employment Schemes, Supported Employment Programmes, External Training Courses, Supported Employment Schemes and Social Economy Programmes organised by the Council.

An indemnity to Groups, Organisations, Clubs and Associations who use Kilbarry Sportshall and who pay the appropriate premium to the Council.

Liability arising from the use of four rowing boats at Knockaderry Reservoir.

The Liability of Waterford Theatre Royal Society Limited in connection with its official activities.

Liability arising from a skateboard facility operate by the Council at Sports Centre/Public Park, Waterford.

Liability relating to accidents arising from the use of self-propelled vehicles in a non-road traffic act situation.

Liability arising from the negligence of consultants engaged on construction contracts, where the Council accepts a lower limit of indemnity on the consultant's professional indemnity policy, than the limit under the Council's public liability policy.

The title of the Insured is extended to include the Fire Services Council and any other fire authority involved in fireman's training courses for the Council's fire brigade personnel.

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## ATTACHMENT K REMEDIATION, DECOMMISSIONING, RESTORATION AND AFTERCARE

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### Attachment K.1 Cessation of Activity

It is anticipated that the plant will be operated indefinitely. However if the facility should close for some unforeseen reason, all waste and all equipment will be removed from the facility. Waste would be removed to authorised facilities. Equipment would be recycled where possible. The building where waste activities are proposed would remain and would likely be used again. There is no equipment on site that is likely to result in environmental pollution; therefore a Residuals Management Plan is not applicable to this application.

An Environmental Liabilities Risk Assessment will be prepared for the existing composting facility. This plan will be revised to include the proposed extension area. This Plan will be re-submitted to the Agency according to the timeframe set by the waste licence.

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## ATTACHMENT L STATUTORY REQUIREMENTS

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### Attachment L.1 Statutory Requirements

The applicant is Waterford City Council, a local authority. Attachment L1 is not applicable to local authority applicants.

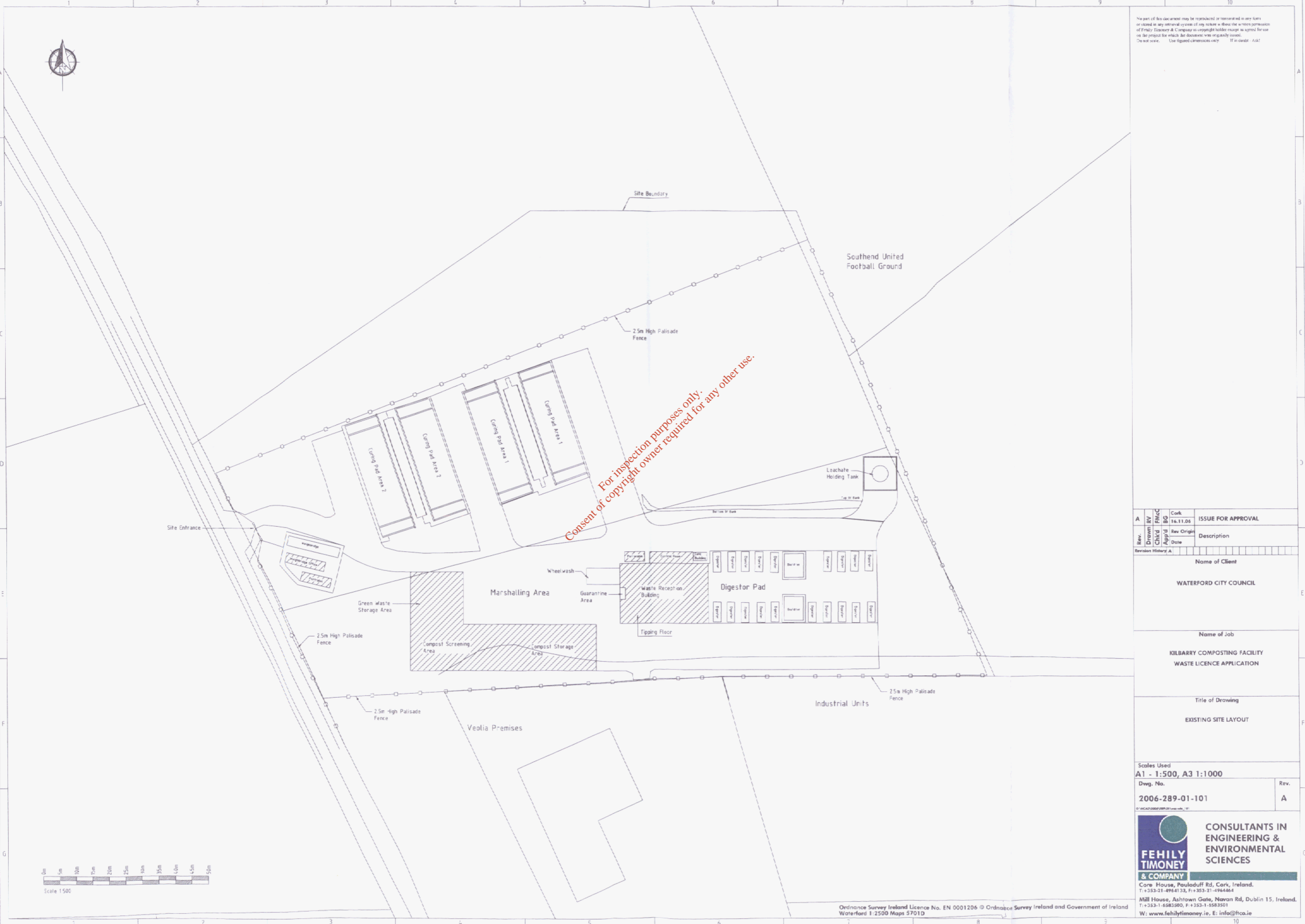
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**APPENDIX 1**  
**Drawings**

2006-289-01-101 Rev A  
2006-289-01-102 Rev A  
2006-289-01-103 Rev A  
2006-289-01-104 Rev A

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Rev.	Drawn	RV	Chkd	FM	BC	Cork	16.11.06	ISSUE FOR APPROVAL
								Description

Revision History A

Name of Client  
**WATERFORD CITY COUNCIL**

Name of Job  
**KILBARRY COMPOSTING FACILITY  
WASTE LICENCE APPLICATION**

Title of Drawing  
**EXISTING SITE LAYOUT**

Scales Used	
A1 - 1:500, A3 1:1000	
Dwg. No.	Rev.
2006-289-01-101	A

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**LEGEND:**

- LS — Leachate Gravity Sewer
- LH — Leachate Pumped Main
- SS — Foul & Surface Water Gravity Sewer
- S — Foul & Surface Water Pumped Main
- Access Chamber
- Pump Chamber



NATURAL SCALE



Rev.	Drawn	Checked	FMCC	App'd	Date	Rev. Origin	Issue
A	RV	BC	BC	BC	15.11.06	Cork	ISSUE FOR APPROVAL

Name of Client  
**WATERFORD CITY COUNCIL**

Name of Job  
**KILBARRY COMPOSTING FACILITY  
WASTE LICENCE APPLICATION**

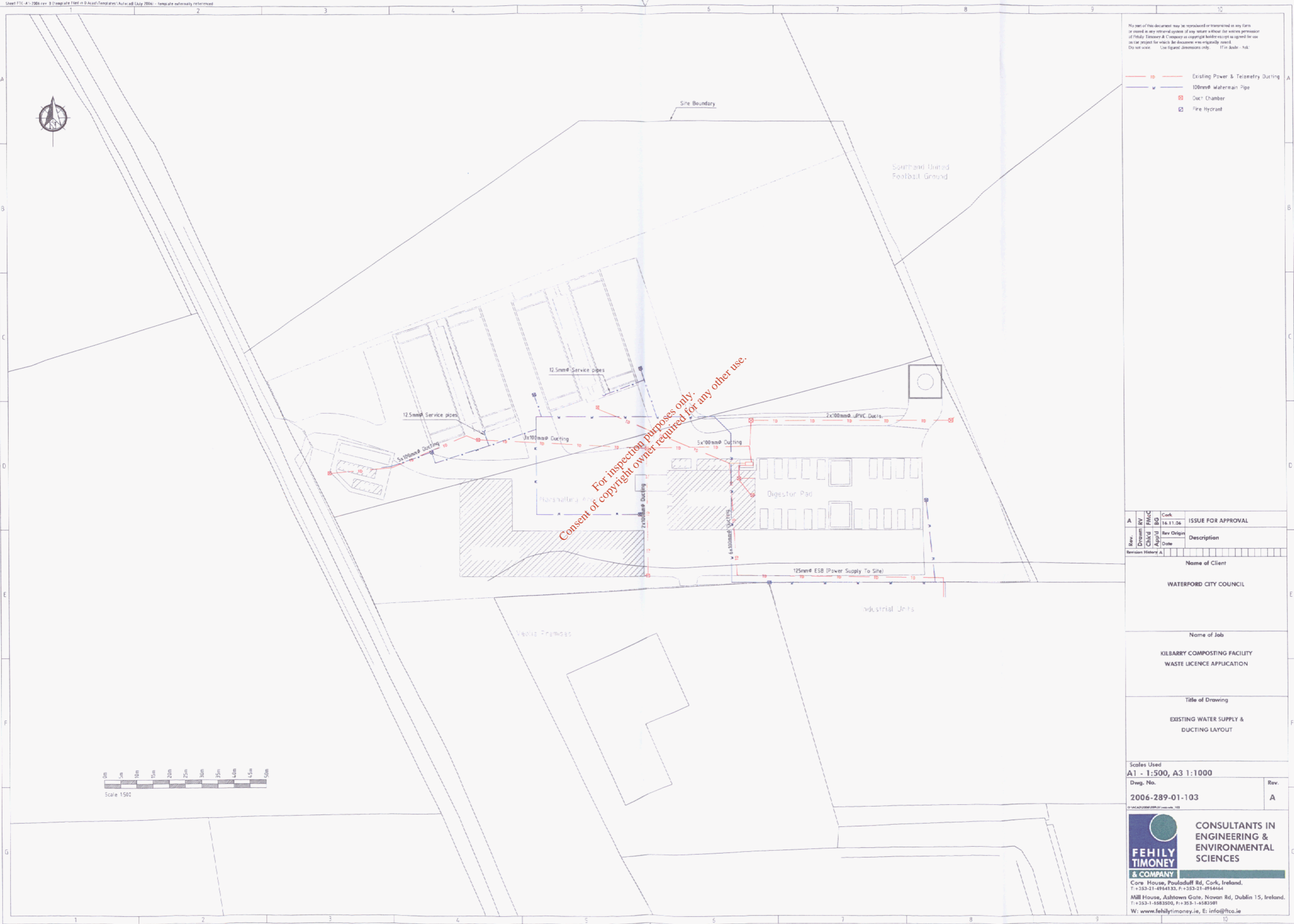
Title of Drawing  
**EXISTING DRAINAGE LAYOUT**

Scales Used	
A1 - 1:500, A3 1:1000	Rev.
Dwg. No.	A
<b>2006-289-01-102</b>	

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- Existing Power & Telemetry Ducting
- 100mm Watermain Pipe
- Duct Chamber
- Fire Hydrant



Rev.	Drawn	Checked	Rev. Origin	Date	Description
A	RV	FMCC	Cork	16.11.06	ISSUE FOR APPROVAL

Name of Client  
**WATERFORD CITY COUNCIL**

Name of Job  
**KILBARRON COMPOSTING FACILITY  
WASTE LICENCE APPLICATION**

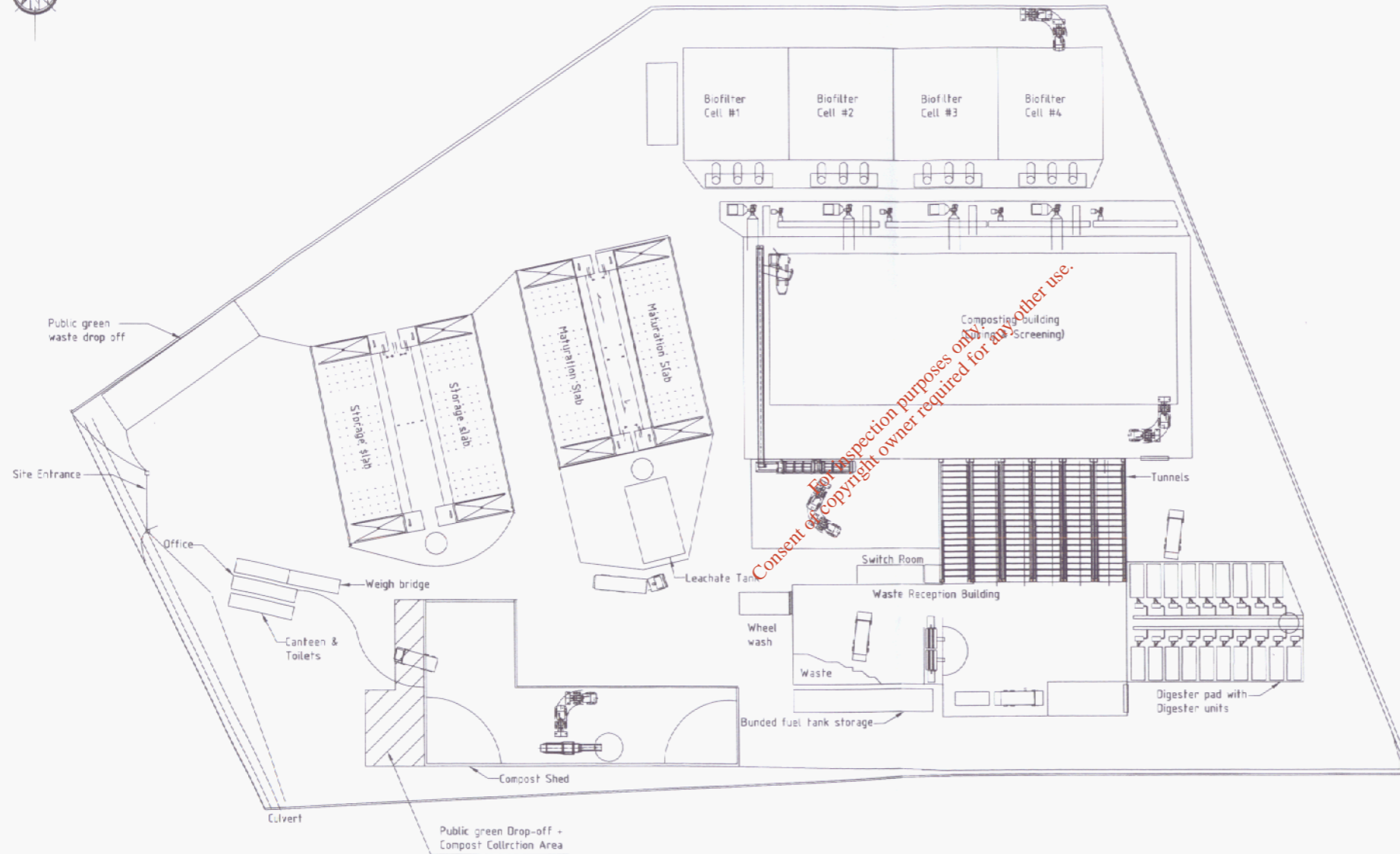
Title of Drawing  
**EXISTING WATER SUPPLY &  
DUCTING LAYOUT**

Scales Used  
A1 - 1:500, A3 1:1000  
Dwg. No. **2006-289-01-103**

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Rev.	Drawn By	Checked	Approved	Rev Origin	Date	Description
B	RV	FM/C	EG	Cork	29.11.06	ISSUE FOR APPROVAL

Name of Client  
**WATERFORD CITY COUNCIL**

Name of Job  
**KILBARRICK COMPOSTING FACILITY  
WASTE LICENCE APPLICATION**

Title of Drawing  
**CONCEPTUAL  
FUTURE SITE LAYOUT**

Scales Used  
**NOT TO SCALE**

Dwg. No.	Rev.
<b>2006-289-01_104</b>	<b>B</b>

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