

Nottinghamshire & Nottingham Waste Core Strategy & Development Control Policies

**Issues & Options
What do you think?**

Background Paper 4: Composting



Nottinghamshire
County Council



Nottingham
City Council

1. Introduction

- 1.1 Nottinghamshire County Council and Nottingham City Council are preparing a new set of waste planning policies for Nottinghamshire. These will replace the existing waste local plan and will be part of both councils' new local development frameworks. The new waste policies will be set out in three separate documents. The first of these, the waste core strategy and the development control policies are being prepared together and will set out future requirements, suitable location criteria and appropriate environmental controls. A site-specific document will follow.
- 1.2 As part of preparing these new planning policies for waste, the County Council and City Council have produced a series of background papers to provide more detail on the 'Issues and Options' consultation exercise (see below).

Purpose of this Background Paper

- 1.3 This background paper looks at composting. Other papers look at different waste management methods including recycling, energy recovery, landfill and the possible use of new technologies. Each paper sets out the number, location and capacity of current facilities, likely future needs, and the main planning issues in terms of site location and environmental controls. The general policies and principles of waste management are set out in Background Paper 1. Background Paper 2 provides a basic assessment of how much waste is produced in Nottinghamshire, how it is managed and possible future trends.

Further Information

- 1.4 For further information, copies of other background papers, or to join in the Issues and Options consultation please contact the Minerals and Waste Policy Team at the County Council. Details are shown on the back cover.

Please note that, unless stated otherwise, all references to Nottinghamshire within this paper include the City of Nottingham

2. The Process, Site Requirements, and Environmental Impacts

Why Compost?

- 2.1 Composting is a natural process that returns energy and nutrients back to the soil, helps to conserve natural resources and reduces the amount of organic waste that is disposed of to landfill¹. Composting sits alongside recycling in the 'waste hierarchy' as the most sustainable method of dealing with organic waste that cannot otherwise be re-used.
- 2.2 Historically, composting has been used in agriculture, parks and gardens but has only been exploited commercially in recent years. Landfill has traditionally been seen as a cheap solution but strict new targets to reduce the amount of waste landfilled mean that composting biodegradable waste is becoming more important. These targets are to be met through a combination of recycling, composting and energy recovery.
- 2.3 It is therefore likely that the number of composting sites will have to increase significantly if these future targets are to be met. A key issue for the Core Strategy will be to estimate how much biodegradable waste can be composted, the number and type of additional facilities needed and the types of site that are likely to be suitable. Although composting has mainly been used for biodegradable municipal waste, it may also have a role in dealing with some commercial wastes. Markets for compost have been limited in the past but improved quality and consistency now mean that markets are more diverse and reliable.

What is composting?

- 2.4 Composting is a natural biological process where micro-organisms convert organic material such as garden waste into a stable residue known as compost. This biological process depends on achieving the appropriate temperature, moisture and oxygen balance to allow decomposition to take place. Composting is suitable for 'green waste' such as plant and vegetable matter but can also include materials such as paper, cardboard and wood chippings. For health reasons, food waste that includes animal products (meat, fish, eggs etc.) can only be composted under very strict enclosed conditions and cannot be spread to land accessible by livestock or poultry.
- 2.5 There are three types of commercial composting that are carried out in the UK (see Panel 1 below):

¹ BSI PAS 100 (2002) defines composting as the 'process of controlled biological decomposition of biodegradable materials under managed conditions that are predominantly aerobic and that allow the development of thermophilic temperatures as a result of biologically produced heat'

Panel 1: Types of Composting

Open-air - most commercial schemes to date have relied on open-air 'windrows' where the waste is laid out in rows up to 3m high and turned regularly to ensure adequate air circulation (aeration). The natural build up of heat and the take up of oxygen create the biological conditions in which the waste degrades and matures into a stable final product over a period of between 8-12 weeks. Variations on this process can include 'vermiculture' – the use of worms to partially digest/breakdown the waste, which is then laid out in windrows to mature. Open-air processing is only suitable for green waste.

Enclosed – similar to open-air composting but the windrows are enclosed within a building which helps to contain dust and odour (if any) and provides protection from the weather. Again this is only suitable for green waste.

In-vessel - involves the enclosed composting of waste within a purpose built container. Air is forced through the material and the temperature is specifically regulated. This gives greater process control to produce a more consistent end product. This system can be quicker (7-21 days) although the material still has to be left for several weeks to mature. The complete enclosure of the process minimises problems such as odour and noise and may be suitable for catering and kitchen wastes as well as green waste.

- 2.6 Organic waste is received from kerbside collection schemes, household waste recycling centres, civic parks and gardens, private landscape contractors, nurseries/horticulture and supermarkets for example. The waste is delivered by vehicle to a concrete reception area where it is shredded ready for composting. It is then spread out in windrows or placed in an enclosed hall, silo, or polytunnel. The waste is turned regularly to improve the air circulation and prevent the process from becoming 'anaerobic' (without oxygen) which can cause odours. The oxygen levels, moisture and temperature are monitored closely and where necessary leachate or water is re-circulated through the waste to maintain the correct balance. The waste must maintain the right temperature (approx 55°C) for at least 21 days to kill off pathogens/bacteria. If too much leachate is produced this must be drained and stored separately for removal off-site or spread to land.
- 2.7 Once the compost is sufficiently stable it can be left to mature. It may then need to be screened to remove any small pieces of plastic or wood. The final product can be spread to adjoining land; taken for use in landscaping schemes; used as landfill cover, or bagged and sold commercially. The volume of usable compost is usually around half of the original waste volume.
- 2.8 New regulations on the use of animal by-products² mean that kitchen or catering waste can be only be composted in-vessel subject to stringent controls on both the process and how the resulting compost is used.

² Animal By-Products Regulations 2003

- 2.9 Probably the most recognisable form of composting is the home-compost heap for garden and vegetable waste but there are also many successful examples of community-based schemes. However, it is hard to estimate how much is composted as the material never enters the waste stream
- 2.10 Until recently, markets for commercially produced compost have been limited as there was no reliable certification scheme. This meant that the only outlets tended to be civic landscaping contracts and use as landfill cover. These initial uncertainties are being addressed and the benefits of compost as a peat substitute are being recognised. Commercial brands are now being sold in garden centres, more widely used in landscaping and on farmland, which minimises transport costs. This has led to greater demand for larger and more centralised composting sites, which may process up to 30,000 tonnes a year.

Site Requirements

- 2.11 The exact size, layout and equipment used will vary according to the process used but most sites will need some or all of the following:

- Suitable vehicular access to receive the waste (and possibly distribute the finished product)
- Concrete pad for receiving and shredding the waste
- Concrete area for storage
- Building for storage/processing
- Shredder
- Loading shovel to move and turn the waste
- Screening equipment
- A surface drainage system
- Lagoon for leachate storage
- Bagging plant

Environmental Impacts

- 2.12 Although the effects of composting are often minimised due to a remote rural location or enclosure within a building, there are common environmental issues that must be considered. These impacts will vary according to the process used, the size of the operation/site and the exact location.
- 2.13 The main impacts considered here are those caused by the operation itself e.g. odour, noise, dust and traffic. There are other important potential concerns such as the impact on wildlife, habitats and heritage but these are issues relating to the choice of site rather than the impact of a particular type of facility. These issues will therefore be covered under specific development control policies and are addressed as part of the ongoing sustainability appraisal of each of the plan documents.

- 2.14 Panel 2 is therefore intended to illustrate the possible impacts that a composting site may have on those living or working nearby. It summarises the typical issues that need to be considered but does not mean that they will apply in every case.
- 2.15 The key issue is whether these impacts are acceptable i.e. is there a risk of harm or disturbance? In many cases, environmental impacts can be minimised through careful site design and layout but there may be times where the potential impacts of a development mean that it should not be permitted at a particular location.

Panel 1: Environmental Impacts

Odour – if the process is not well controlled, odour can arise from the decomposition of the waste and leachate. Regular turning of the waste and removal of excess leachate should avoid odour problems. If they do occur it may be possible to mask the problem with deodorising sprays but the anaerobic material will normally have to be removed off site to a suitable disposal facility.

Water – there is a need to protect surface watercourses and groundwater from potentially harmful leachate. This can be achieved through surface drainage systems and separate leachate collection. Surplus leachate can be re-circulated through the compost to maintain the moisture content or removed off site.

Traffic – Small-scale sites may not generate much traffic but larger sites will need regular HGV access. This could lead to noise and/or congestion problems if the site access and surrounding roads are not suitable for the volume of traffic.

Noise – vehicle deliveries and the use of mobile plant to shred, turn and screen the waste are the main causes of noise. The typically remote location tends to minimise noise problems but it is also possible for operations to take place within a building and to control the number of vehicles, hours of operation and quantities of waste to reduce any potential noise impact.

Air – dust and bioaerosols (minute airborne particles) can travel up to 250m from the site and could contain plant pathogens, which may be linked to respiratory problems. As a precaution the Environment Agency advises a 'stand-off' of up to 250m for open air composting sites. Enclosed sites or in-vessel systems can minimise these difficulties through the use of filtration systems.

Visual impact – this should be less of an issue at open windrow sites, as the process is similar to normal agricultural practices. However, if a building is required for storage or processing or the process is 'in-vessel' this could give a more 'industrial appearance'.

Litter – there is the possibility of small fractions of plastic, paper etc. but due to the nature of the waste, and the screening process this is not likely to cause any problems off-site.

What types of site might be suitable?

- 2.16 For open air composting, the primary concerns of odour and dust mean that there is a need to keep sites a minimum distance away from sensitive land uses such as housing, some workplaces and schools. Subject to a detailed risk assessment, the Environment Agency will specify a 'stand-off' of up to 250m. The similarity to existing agricultural practices also make open air compost schemes compatible with more remote, rural locations. This is particularly true for small-scale sites, which do not generate large volumes of traffic. Larger scale sites are more likely to need more plant, buildings and equipment and will generate more traffic. These more intensive operations are therefore likely to be seen as more industrial and therefore less suited to open rural areas.
- 2.17 Existing policies, in the adopted Waste Local Plan, limit composting proposals to employment areas, waste disposal sites and small-scale on-farm schemes. The plan also regards composting as being inappropriate within the Green Belt but given the rural nature of many composting schemes some sites have been permitted as 'departures' from the plan. This approach reflects national policy in PPG2³, which allows uses that do not harm the open character of the area. PPS10⁴ also recognises that there may be circumstances where waste development in the Green Belt may be appropriate.
- 2.18 Sites where the composting process is fully enclosed within a building and 'in-vessel' systems are more likely to have a greater visual impact. As they are likely to be large scale they may also generate more traffic. They will therefore usually need to be sited close to similar industrial type buildings or operations and have good road access. Whilst alternative forms of transport such as rail or water may be a possibility, this will depend on the scale and exact location of the site. Enclosed or 'in-vessel' schemes are therefore more likely to be appropriate in existing industrial areas or on sites that are already proposed for similar employment uses. In rural areas, opportunities to re-use existing buildings could be considered.
- 2.19 Composting facilities can also be combined with other waste management processes. For example it may be possible to include temporary schemes alongside existing or proposed landfill sites, waste transfer stations and recycling facilities subject to the environmental considerations listed above.

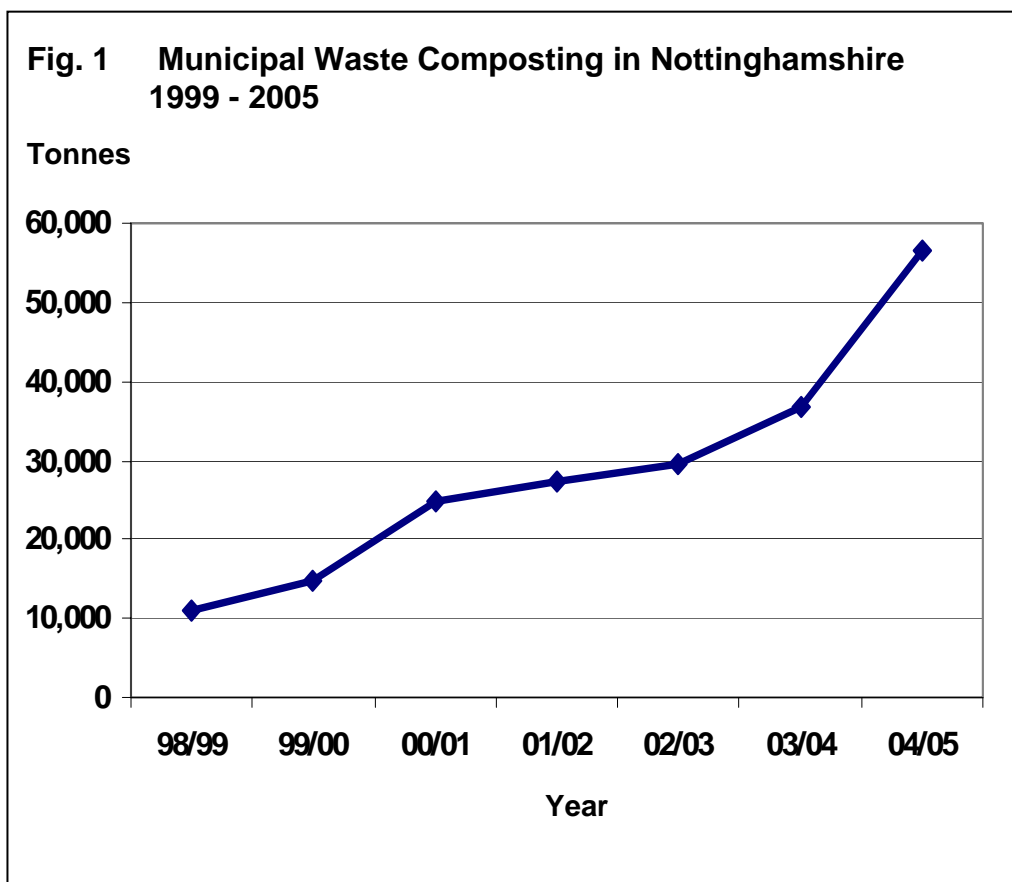
³ Planning Policy Guidance Note 2: Green Belts

⁴ Planning Policy Statement 10: Planning for Sustainable Waste Management

3. Current Position and Future Needs

What is the current situation?

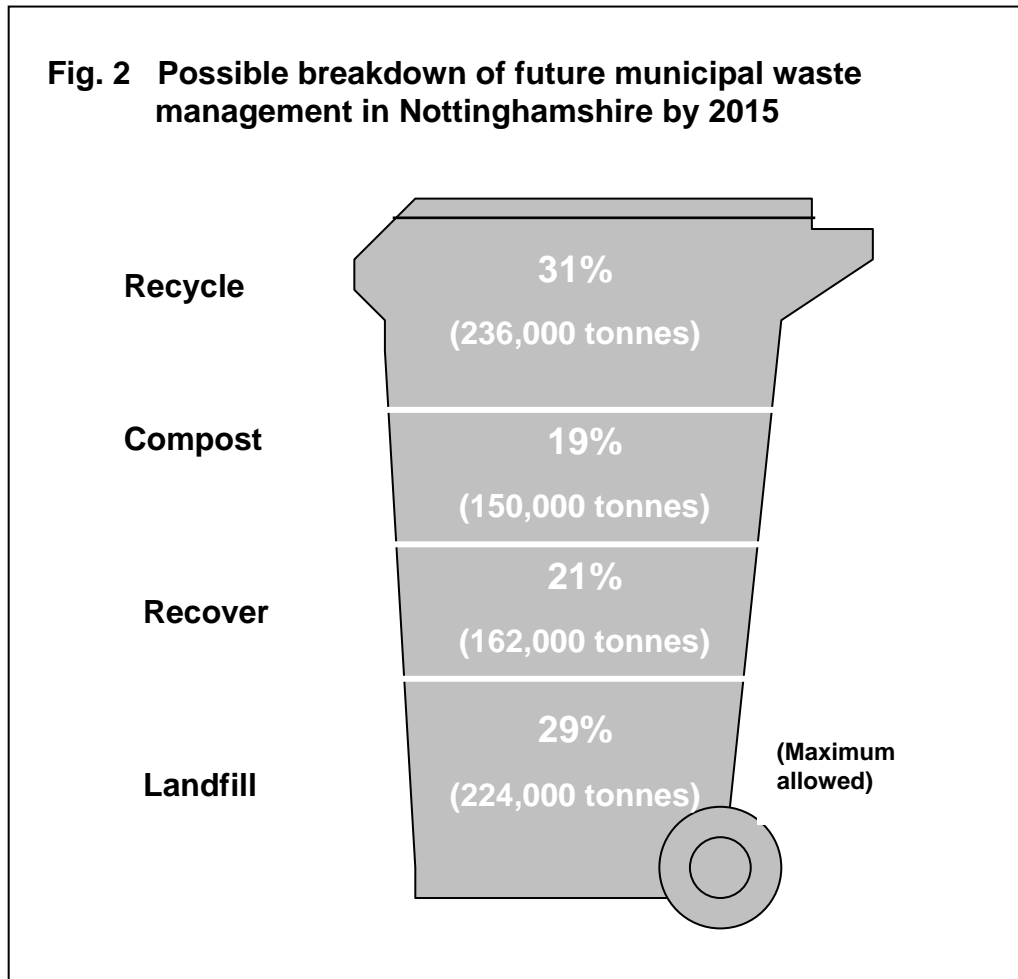
- 3.1 To date, most commercial composting schemes in the UK have been on-farm but there are also sites within industrial areas, at landfill sites, material recovery facilities, transfer sites and at civic amenity sites. Home composting is becoming more established, with many local councils offering discounted compost bins or free trials, but there are no exact figures on how much garden waste is treated this way. As this waste is not collected, it does not contribute to the municipal recycling targets. Similarly, as home composting does not require planning permission it does not raise any issues for the waste development documents.
- 3.2 Commercial composting in Nottinghamshire has expanded rapidly in recent years from 15,000 tonnes in 1999 to around 60,000 tonnes in 2005. This is in response to increasing disposal costs and the need to meet Government recycling and composting targets.



- 3.3 Nottinghamshire now has 7 permitted composting sites although not all of these are operational (see Plan 1). Sites at Langar and Bilsthorpe are not currently being used. All of these sites are open air and almost all are on agricultural land. Only the Langar site is on industrial land.

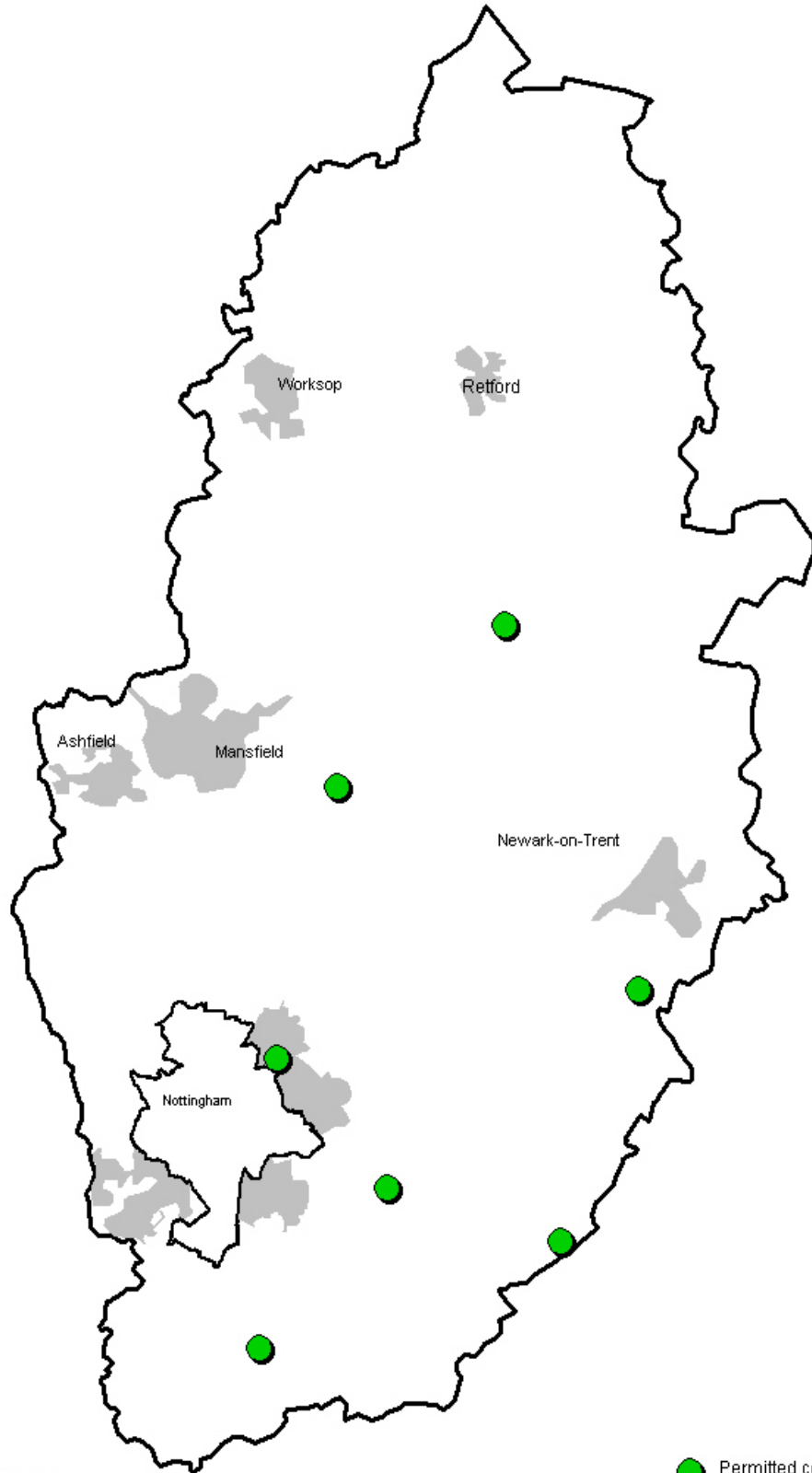
How much will we need in future?

- 3.4 The Regional Waste Strategy sets a specific target for composting or recycling 50% (or almost 400,000 tonnes) of municipal waste by 2015. How much of this can be achieved through composting is uncertain but, assuming that all the green waste that can be composted is collected, this gives a theoretical maximum of about 150,000 tonnes⁵ per annum (more than double current rates). Figure 2 below shows a possible future breakdown of composting and recycling rates. As part of its new municipal waste management contract the County Council's preferred bidder Veolia has indicated it intends to expand composting of municipal waste to around 100,000 tonnes. The City Council are also considering options to increase green waste composting.



⁵ Assumes organic fraction of municipal waste is 20%

Plan 1: Composting Sites in Nottinghamshire



- 3.5 At present, none of the approximately 200,000 tonnes of tonnes of food waste from the commercial and industrial waste stream⁶ produced in Nottinghamshire is composted. It is possible that a large proportion of this could be composted if suitable in-vessel schemes come forward. This would significantly reduce landfill requirements but is likely to depend on there being a suitable market for the compost. It may also be possible to compost a proportion of the paper and card found in the municipal, commercial and industrial waste streams, particularly where this is poor quality and unsuitable for recycling.
- 3.6 Within Nottinghamshire, the City Council and 4 of the District Councils currently either operate, or are carrying out trials for, a green waste collection service and all of the Household Waste Recycling Centres sites accept garden waste. If these schemes are expanded there may be a need for new facilities and it is likely, in any case, that composting will have a significant role in meeting current and future waste management targets.
- 3.7 The type and scale of provision is likely to depend on the type of waste to be composted with domestic green waste, and potentially agricultural waste, more suited to open air sites, and commercial kitchen and catering waste for example requiring more sophisticated in-vessel facilities.

⁶ Table 2.4 of the Strategic Waste Management Assessment East Midlands: 2000, Environment Agency


4. Conclusions

- 4.1 In practice, there is unlikely to be a single option that will meet all future needs. The need to treat food wastes separately is likely to mean different types of facility for different organic waste streams. Food waste from the commercial and industrial sectors, and potentially also household kitchen waste, will need specialised and probably centralised facilities. More traditional green garden and landscaping waste is more likely to continue as smaller scale, more dispersed open-air facilities.
- 4.2 Much is likely to depend on the scale of municipal green waste collection and whether the processing of food waste from the commercial and industrial sector is seen as economically viable.

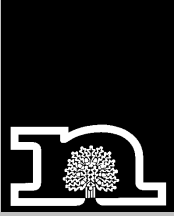
Further Information

- 4.3 For further information please contact the composting association at the address shown below. See also the Composting Industry Code of Practice published by the Composting Association in 2005 and the ODPM research study 'Planning for Waste Management Facilities: A Research Study' August 2004.

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