CARBURY COMPOST LTD.

Drummin,
Carbury,
Co. Kildare

ENVIRONMENTAL IMPACT STATEMENT

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SECTION ONE

1 INTRODUCTION

1.1 OVERVIEW OF THE PROPOSED DEVELOPMENT

1.1.1 Introduction

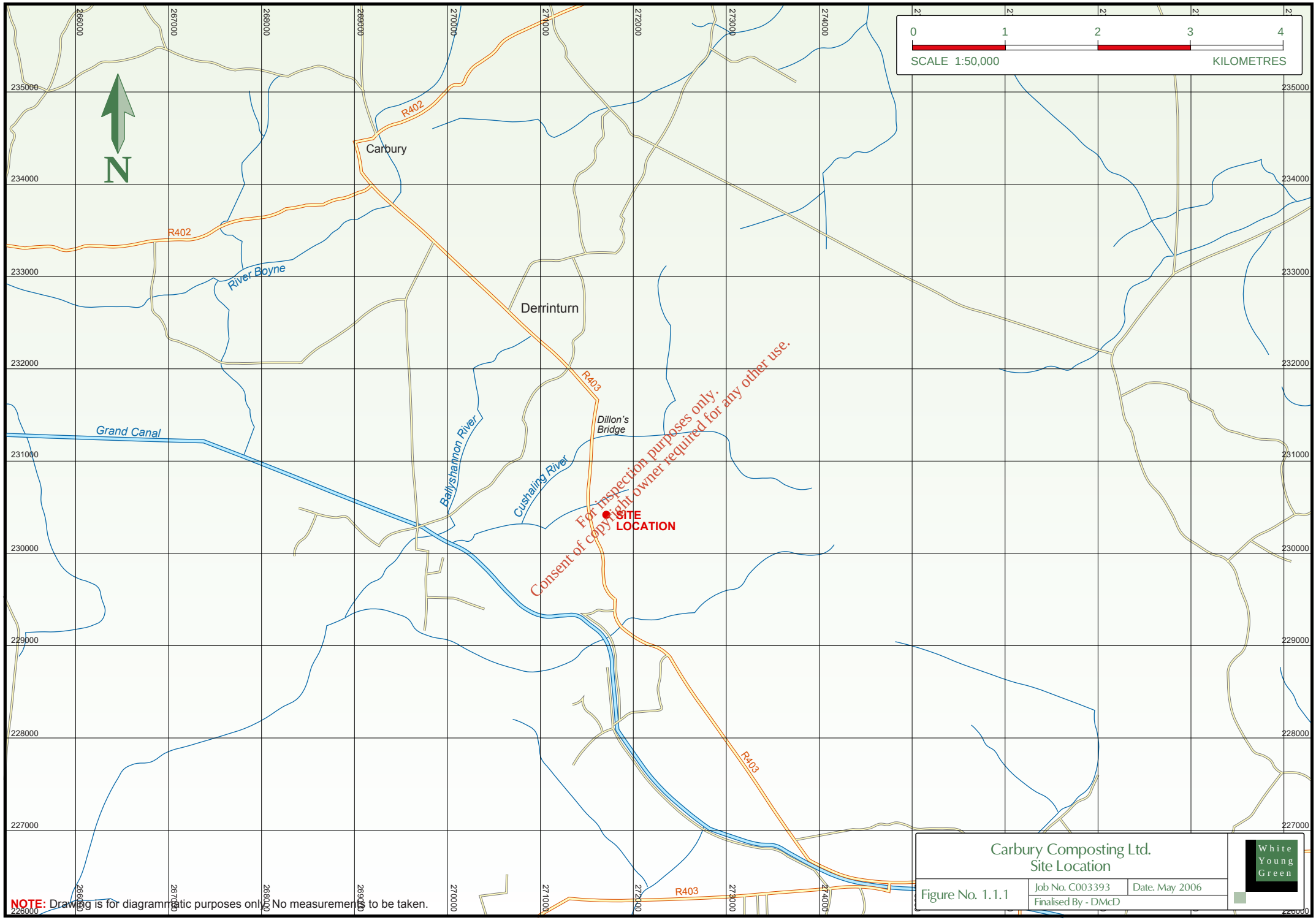
Carbury Compost Ltd. (CCL) propose to modernise and expand their composting facility at Drummin, Carbury, Co. Kildare. The site measures some 9.4 ha and is located approximately 2km south of Derrinturn village (Figure 1.1.1). The 9.4 ha site includes both the composting facility (5.03 ha) and the mushroom growing facility. The existing composting facility uses horse manure, poultry litter, gypsum and straw as the raw materials. The compost is used in the mushroom growing industry. There is a relatively large mushroom growing operation on site (c. 11,000 t/a) and a certain fraction of the compost produced is used in this operation. The proposed facility will include for the demolition of some existing buildings and the design and construction of new infrastructure including a raw materials reception hall and new phase I bunkers and phase II / III tunnel complex which will replace the existing open windrow composting process for phase I composting. The expanded facility will have the capacity to process some 160,000 t/a of raw materials.

1.1.2 Composting Facility Overview

A Plan of the existing facility is given in Figure 1.1.2. This shows the existing site infrastructure including the phase I compost area (open windrow system) and phase II / III compost tunnels. The existing composting process includes for the reception, storage and blending of raw materials in a designated area on the open yard. The first phase of composting entails stockpiling the blended materials for a period of time (7 days). This material is mixed/ turned every second day and then placed in open windrows, the windrows are turned every second day for a period of 6 days. After phase I is complete the compost is transported to the phase II / III compost tunnels.

It is proposed to radically alter the site infrastructure and phase I composting processes. This will include demolishing existing buildings and replacing these with modern purpose built compost bunkers and a reception hall designed in accordance with latest best practice. It is also proposed to increase the volume of compost produced at the site and this is reflected in the number of bunkers to be constructed at the site which entails forced aeration. This is necessary in order to maintain the economic viability of recovering organic raw materials (horse manure, poultry manure, gypsum, water and straw) and producing compost. The new reception hall and phase I bunker block will be located in the northeastern part of the site (see Figure 1.1.3). This will position the most odorous process furthest from the R403 road and from the nearest sensitive receptors. The modernisation and expansion of the proposed composting process will involve the demolition of some of the existing mushroom growing buildings on site and will entail a reduction of some 45% in the mushroom growing capacity at the site.

The new composting processes can be summarised as follows. The raw materials for the composting process consisting of horse manure, chicken litter, gypsum and straw are imported to



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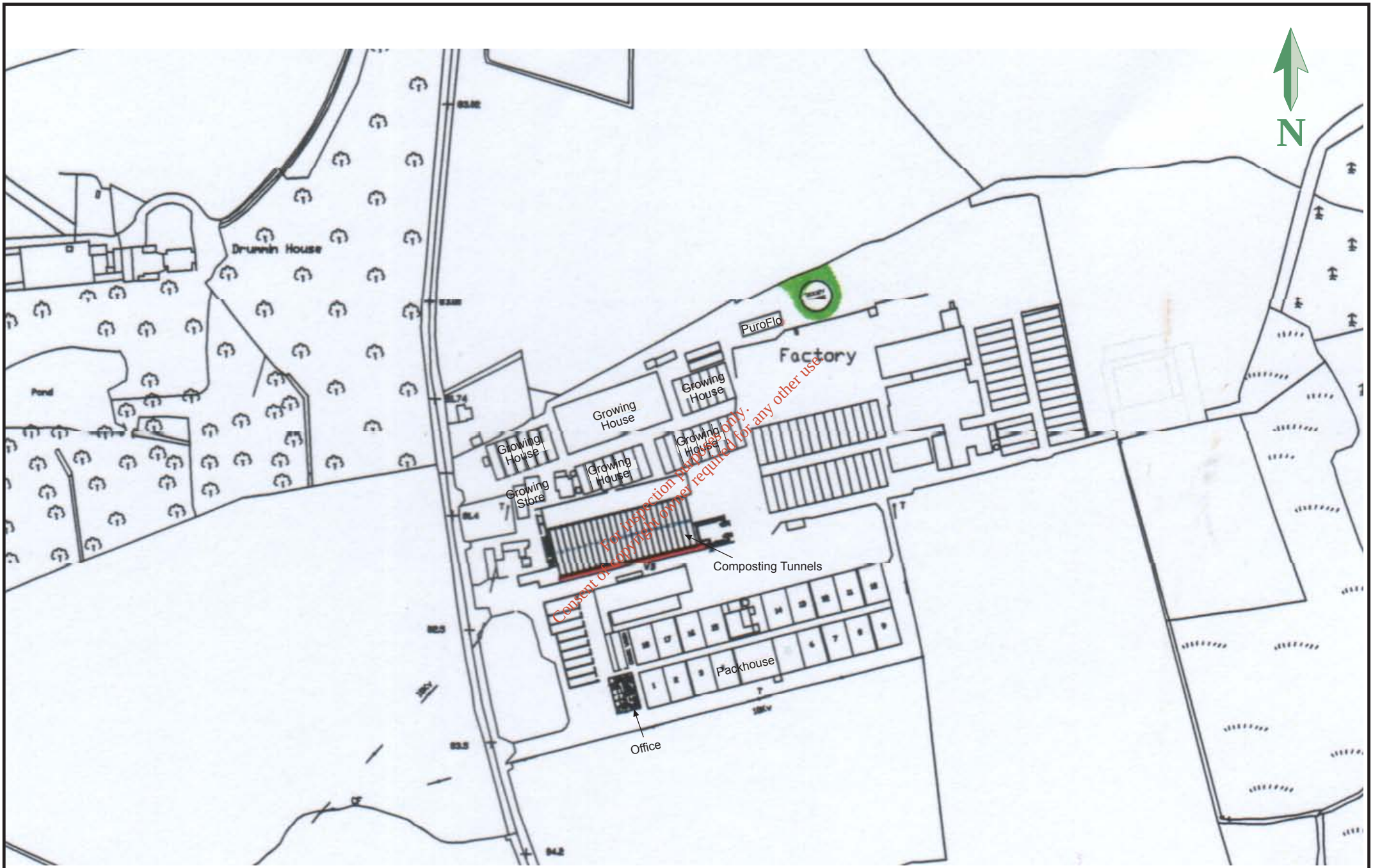

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NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Carbury Composting Ltd. Existing Site		
Figure No. 1.1.2	Job No. C003393	Date. May 2006
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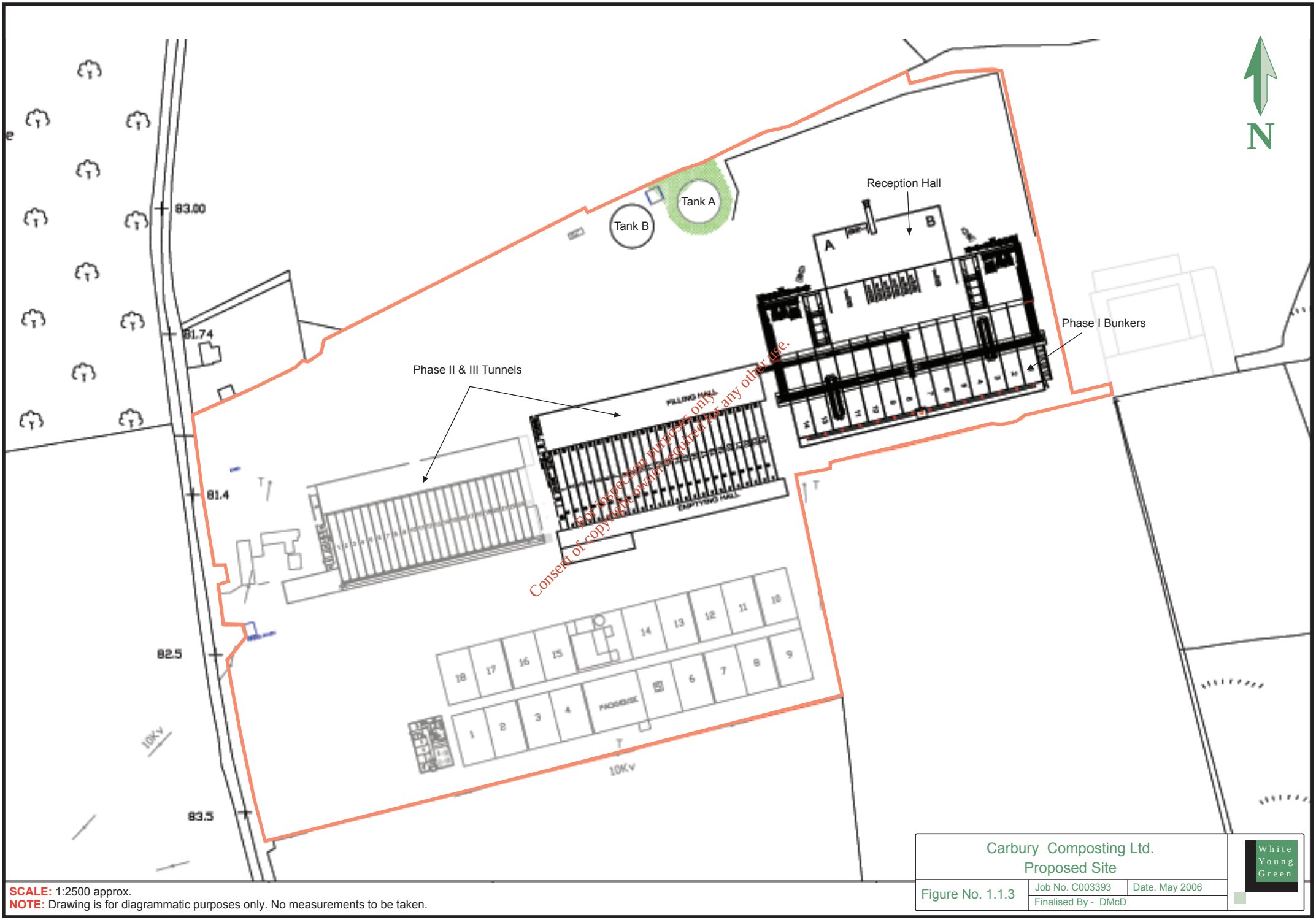

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NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Carbury Composting Ltd.
Proposed Site

Figure No. 1.1.3	Job No. C003393	Date. May 2006
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the site for processing. The source of the raw materials is almost exclusively from the agricultural sector. Straw is sourced from local farmers within a 30 mile radius. Horse manure is sourced from the equine sector including local farmers and studs in Kildare and also within a 30 mile radius. Chicken litter is sourced from chicken farms located in Counties Monaghan and Cavan and the gypsum is sourced from Kingscourt, Co. Cavan. The materials are received at the entrance where they are weighed and documented and their contents verified. The materials are then brought to the reception hall where they are stockpiled in dedicated bays prior to processing. The imported straw bales are stored outdoors in the northeastern corner of the site. The initial stage of processing comprises the wetting of the straw by dipping the large straw bales in a vat of water. The wet bales are then stored in a designated area just south of the dry bales and left for approximately 2 to 3 days to allow the heat/biodegradation process to start. The wet bales are then broken and placed on a conveyor belt and a percentage of chicken litter is blended in with the straw. This material is placed in the bunkers for 2 days. It is then taken out and the horse manure and extra chicken litter is mixed in via a hopper. The material is then placed back in the bunkers and left for 2 to 3 days. The material is then taken out, mixed, and replaced into the bunkers for a further 2 to 3 days. The material is then mixed for the final time, replaced in the bunkers and left for 4 days. On the 13th day, the material is transferred to the phase II / III tunnel complex. The bunkers comprise a facility for continuous forced aeration of the composting material. Air is forced from pipes and nodes built into the floor of the bunker up through the compost. The air in the bunkers is recirculated in this aeration system. A fraction of the air is extracted from the bunkers for discharge to the atmosphere at an elevated position via the stack. Water is also added on a regular basis during the phase I process.

The material from phase I is then removed and placed into the tunnels in the phase II / III complex. The material is left in the phase II tunnels for 6 days. Forced aeration is used in phase II though no water is added. Pasteurisation of the material occurs in phase II where the material is heated to 58 – 59.5º C for 8 – 10 hours

When phase II is complete the material is removed, spawned with mushroom spawn and placed back into the tunnels for the phase III process. The material is left in the phase III tunnels for 14 to 17 days. As in phase II forced aeration is used and no water added. The maximum temperature is controlled at 25º C.

There is a gradual though significant reduction in the volume of material as it moves from the pre phase I mixing cycle through the various phases to the finished product phase III. At this point the material has a moisture content of approximately 64% and is odour free. Approximately 2,100 tonnes of phase III mushroom compost will be produced each week (c. 109,200 t/a). Approximately 135 tonnes per week will be used in the on site mushroom growing operation. The remainder will be exported to satellite mushroom farms.

Most of the compost is handled and delivered as a bulk product though some small quantities are compressed into blocks and exported in this manner. It is proposed that a maximum of some 5 to 10% of the material will be blocked in the future.

Extensive measures are in place to ensure that the entire plant has minimal impact on the environment in terms of noise, traffic, water quality and in particular in terms of air quality including odours, aerosols and dust. The proposed new reception hall and bunkers will further serve to mitigate against any environmental impacts.

1.2 FACILITY DESIGN PARAMETERS

Composting will be carried out in specially designed bunkers (phase I) and tunnels (phase II / III). The phase I bunkers will be constructed of reinforced concrete and are located a minimum 280m from the nearest road and sensitive receptors. The phase II / III tunnels will be constructed of precast gas concrete panels.

The buildings will be designed to be visually unobtrusive and will be screened from local residents by the natural existing and proposed landscaping.

Key elements of the engineering design address soiled water management and the protection of soil and water. The entire site has a concrete base and therefore provides a fully contained structure for rainfall and soiled water run-off.

The design of the facility includes measures to minimise nuisances such as odours, dust, vermin and noise. The placing of the reception hall and phase I bunkers in the northeastern corner of the land holding provides the maximum distance available between these operations and the nearest sensitive receptor. The limited height of the structures and the preservation of many of the existing hedgerows provide natural relief from any potential intrusion into the local landscape and this will be supported by proposed planting and landscaping.

A wheel-wash facility will be provided to prevent dirt being carried onto public roads.

1.3 SITE FACILITIES

The administration centre will be located near the site entrance (see Figure 1.1.3) along with canteen, locker rooms and washroom facilities for the employees.

Access around the site will be along designated routes on concrete hardstand.

The facility will be securely fenced and there will be a lockable security gate at both entrances. New site entrances are to be constructed about midway along the road frontage of the site.

There will be two weighbridges located on site and an office provided to house the computerised telemetry system for each weighbridges.

Services and utilities are provided and include electricity supply and telecom connection. A back up generator will also be installed near the phase I bunkers. Potable water will be supplied from a private well (or wells) located on the property and there is also a connection to the public mains water supply.

The existing water tank (tank A - 400,000 gallon capacity) located on the northern boundary will be maintained. All clean run-off from the yards and roofs will be drained to this tank and used in the composting process. There will be a facility to allow roof drainage only to discharge to the local stream. This will comprise of clean rainwater only and will not impact on local water quality. As the process will require significant water supplies to be added to the compost, the bulk of the rainwater falling at the site will be used in the process. However, it is possible that excess rainfall may be generated during high rainfall events and on these occasions the roofwater may be directed to the local stream.

A new tank of 250,000 gallon capacity tank (tank B) will be constructed adjacent to the existing water storage tank (tank A). All drainage from the reception hall, composting tunnels, wheelwash and effluent from the septic tank will be directed to this tank for use in the composting process.

Both tanks will be fitted with aeration systems to ensure aerobic conditions in the storage tanks and process water.

1.4 TRAFFIC AND ACCESS

Vehicular access to the site will be via the R403 road.

It is envisaged that some 44% of traffic to the site will come from the north and 56% from the south. Some 72% of traffic exiting the site turns northward with the remainder going south. Much of the traffic to and from the site therefore will be from the Enfield direction along the N4 and/or M4 and from there along the R403 to the site. New entrances will be constructed about midway along the western boundary of the site. These will be designed to improve the sightlines and traffic movements into and out of the site.

The site will be open to the export of finished compost from 5am to 10pm. Raw materials will be imported between 6am and 8pm. This will allow the site associated traffic to be spread out over a longer time period in the day and therefore reduce the hourly traffic concentration. In particular, it will allow minimisation of truck movements during the morning and evening rush hours.

Traffic at the site will consist primarily of bulk haulage vehicles. Site traffic will be controlled by clearly marked signs and speed limits.

1.5 LOCATION AND SETTING

The location of the site is shown in Figure 1.1.1 and has a National Grid Reference of E 230500; N 271700 (middle of site)

The site is located in a rural setting in the townland of Drummin near Derrinturn in Co. Kildare. The property is bounded to the north, east and south by hedgerows and to the west by the R403 road. Adjoining properties on all sides are devoted to agriculture with pasturelands dominating. Further to the east is the Timahoe bog and the proposed new Drehid landfill (Licensed by Bord na Mona).

The topography is generally flat at the site with a general slope from south to north. A small stream runs from east to west along the northern boundary of the site and drains to the Cushaling river, a tributary of the river Barrow.

1.6 EXISTING LAND USE

The property holding is set in a rural environment and is presently used as a mushroom composting and growing facility. Adjacent lands are used for a combination of cattle and horse grazing, dairying and arable crops. The land further to the east comprises Timahoe bog and there is a proposal to construct a landfill on this site (Bord na Mona).

1.7 INFRASTRUCTURE

The road network is described in Section 2.9. Other infrastructure currently in place at and in the vicinity of the site includes the following:

- Electricity powerlines
- There are telecom phone lines servicing the houses along the R403 and the site
- All dwellings and the existing facility are served by a public mains water supply.

1.8 PLANNING CONTEXT

The site is located in the functional area of Kildare Co. Co.

1.8.1 Kildare County Development Plan

The current Kildare County Development Plan was produced in 2005. The area to which the Plan relates is the *"administrative area of the Council of the County of Kildare. The Plan sets out the strategic development policies of the Council for the County at large and the objectives whereby these are to be achieved. Separate development plans have been made or are being prepared for the towns of Newbridge (Droichead Nua), Kildare, Maynooth, Celbridge, Monasterevin, Leixlip,*

Kilcock, Clane, Kilcullen, Rathangan and Castledermot, of the villages of Kill, Johnstown, Ballitore, Straffan, Robertstown, Sallins, Ballymore Eustace, Athgarvan, Kilteel, Moone/Timolin and Prosperous."

The development is not located within the environs of any of these towns or villages and is therefore governed by aims and objectives for "the County at Large".

The aims of the development Plan are set out in Section 1.3 (of the Development Plan) and are as follows:

- *To promote balanced social, physical and economic development in County Kildare.*
- *To promote environmental sustainability.*
- *To ensure orderly and balanced use of the resources of the County.*
- *To preserve and improve the amenities of the County, both natural and man-made.*
- *To make maximum use of, and participate in, European Union initiatives.*

The proposed site is not located in any areas of Scenic Amenity, High Amenity or areas of Scientific Interest. It is not located in a pNHA or pSAC and does not impinge on any designated views or aspects.

The location, construction and operation of the facility have been designed in line with the aims of the development plan and national policy. In particular, the proposed facility will help to promote environmental sustainability by providing much needed management facilities for horse and poultry manure and will be designed in so far as is practicable to preserve and improve the amenities of the local environment.

The Waste Management Plan for County Kildare was adopted by the County Council in 1999 and was recently reviewed.

The Waste Management Plan (WMP) for County Kildare was widely consulted during the preparation of the EIS and the proposed facility fits in with the general aims, policies and requirements of the WMP and is discussed further in Section 1.9.2 below.

1.8.1.1 Policy

Section 2.9.2 of the Development Plan (Other Developments in the Rural Countryside) states *" Apart from one-off housing development, there are many uses which may take place in the rural countryside. Where an area of land is not within an identifiable settlement, and is not otherwise*

zoned as part of this development plan, or of the town Development Plans, the use of such land will be deemed to be primarily agricultural."

Section 2.12.2 of the Development Plan (Policy on Waste Disposal) states *"It is the Council's policy to encourage waste prevention, minimisation, reuse, recycling and recovery as methods of managing waste, and to examine the possibility of converting waste to energy. It is the policy of the Council that such strategies will take precedence over other forms of waste disposal such as landfill.*

The proposed facility will provide an outlet for the recovery of horse and poultry manure. These are the raw materials that will be used in the production of the compost. If not used in this way the raw materials would be considered waste and require disposal. The development will therefore play a role in waste prevention.

1.9 WASTE STRATEGIES

1.9.1 National Waste Management Policy

Ireland's national waste management policy is reflected in a number of policy statements issued by the Department of the Environment and Local Government including:

- Recycling for Ireland - July 1994
- Changing Our Ways - September 1998
- Delivering Change - March 2002
- Taking Stock and Moving Forward

Ireland relies extensively (c. 75%) on landfill disposal as its primary waste treatment option with approximately 25% of household, commercial and industrial wastes recycled. This situation has not changed significantly over the past 10 years though there has been a notable move towards recycling and away from landfill. The policy documents listed above demand a major shift from this position in line with EU policy and directives. This shift is from disposal to more favourable waste treatment options as follows :

Most Favourable	-	Prevention
↑		Minimisation
		Reuse
		Recycling
		Energy Recovery
Least Favourable	-	Disposal

Recycling for Ireland was the starting point for the shift from disposal to recycling. The document set targets for recycling different waste materials and focused in particular on packaging waste, organic waste and newsprint.

Changing Our Ways outlines the Government's policy objectives for managing waste from 1998 to 2013 and again the emphasis is on promoting recycling and reducing our reliance on landfill. The document also considers alternative waste treatment technologies such as anaerobic digestion, composting, waste to energy incineration and thermolysis. The following targets for waste treatment by 2013 are included in this policy statement:

- diversion of 50% household waste from landfill,
- 65% reduction in landfilled biodegradable wastes,
- development of waste recovery facilities employing environmentally beneficial technologies, as an alternative to landfill, including the development of composting and other feasible biological treatment facilities capable of treating up to 300,000 tonnes of biodegradable waste per annum,
- recycling of 35% of municipal waste,
- recycling at least 85% of construction and demolition (C&D) waste,
- reduction in landfill numbers to an integrated network of some 20 state-of-the-art facilities incorporating energy recovery and high standards of environmental protection, and
- an 80% reduction in methane emissions from landfill.

Changing Our Ways recognises the role of private sector companies, such as CCL, in the provision of waste management infrastructure. Section 5.4.1 of the document states:

"There is considerable scope for increased participation by the private sector in all areas of waste management in Ireland, and authorities should encourage and facilitate business involvement in the provision of waste management services. Private participation can contribute much needed capital investment in infrastructure, specialist expertise in the application of alternative and emerging technologies, a better understanding of the dynamics of the marketplace, especially in relation to recyclables, and in some cases greater operational efficiency and flexibility."

Delivering Change builds on the policies presented in *Changing Our Ways* by outlining a range of measures that will be undertaken in the interests of minimising waste generation and ensuring a sustained expansion in re-use and recycling performance.

Section 3.1 of the document recognises the importance of providing recycling and reprocessing infrastructure and identifies *"the lack of available recycling and reprocessing facilities and lack of access to the facilities that do exist"* as one of the more significant constraints on recycling activity in Ireland.

The policy document '*Taking Stock and Moving Forward*' sets out 21 key points that together with the earlier policy documents provide a solid basis for ensuring speedier and more effective realisation of the underlying policy objectives. The proposed development at Drummin, Co. Kildare, as a recovery operation, complies with the relevant points as stated in this policy document.

Key Point 1 – "*The policy approach will remain grounded in the concept of **integrated waste management**, based on the internationally recognised waste hierarchy, designed to achieve, by 2013, the ambitious targets set out in Changing our Ways".*

The proposed development will provide an outlet to recover horse manure, chicken litter and straw. This will provide a means to recover these materials which will aid in achieving the target outlined in bullet point three above. This is one element of the integrated waste management approach required to manage all of our wastes.

Key Point 11 – *" Landfill, subject to rigorous licensing, will have a continued role as a waste management tool but it will progressively change to a residual role, in accordance with its place at the bottom of the waste hierarchy. Local Authorities, when updating their waste management plans, will need to ensure that a timetable for the provision of the range of integrated waste management infrastructure is provided so that an appropriate balance can be struck between –*

- *Having sufficient landfill capacity available in the short to medium term, pending the delivery of alternative 'higher-in-hierarchy' infrastructure, and*

- *Guarding against the overprovision of landfill which would be incompatible with its residual' role in the integrated waste management mix.*

In order to provide better information, one of the fact sheets to be produced as part of the Race Against Waste communications campaign in May 2004 will be devoted to landfill related issues".

The proposed development will recover materials that may otherwise have been landspread or landfilled. This complies with the objective of progressively changing landfills to a residual role and will help in freeing up capacity at existing landfills in the short to medium term.

Key Point 14 – *"The structure and operation of the waste market will be kept under close scrutiny in order to guard against any anti-competitive practices. In that context, an analysis of the structures and trends in the waste sector and an examination of the adequacy of existing regulatory tools will be initiated in Autumn 2004".*

The provision of a new outlet for the recovery of manures, litter and straw will add to this sector of the market and will increase competition in this area. The proposed development will therefore help in guarding against anti-competitive practices in this sector and complies with this key point.

It is clear that the proposed development will provide a facility for the recovery of potentially waste materials and remove the need for landfilling these materials. The project therefore fits in well with all Government Policies relating to waste management and in particular with the policy documents '*Changing Our* Ways' and '*Waste Management – Taking Stock and Moving Forward*'.

The proposed redevelopment of the CCL site will go a small way towards meeting many of the objectives outlined in the Policy documents and indeed in aiding the requirements of the Phospates directive and the Nitrates directive. By utililising organic materials such as horse and poultry manures and straw in the compost process the facility will prevent the materials from being considered as a waste. It is likely that these materials would otherwise be managed by landspreading or landfilling. This process will remove them from the waste stream and therefore prevent potential impacts on soils and waters and misuse of valuable landfilling capacity.

1.9.2 Kildare Waste Management Plan

Kildare County Council prepared a Waste Management Plan (WMP) for County Kildare and it was adopted by the County Council in 2000**.** The WMP was recently reviewed in 2006. The main objectives of the WMP are as follows:

- Comply with the principles of sustainable development;
- Offer the best available environmental option not involving excessive cost;
- apportion costs in an equitable fashion;
- promote participation in waste management by the public at large and private/commercial organisations; and
- comply with current and impending national and EU policy and legislation concerning waste management.

1.9.2.1 General Policy on Waste Management

The WMP reflects the policy objectives outlined in national policy. The document detailed the hierarchy of waste management as follows:

- Prevention
- Minimisation
- Reuse
- Recycling
- Energy recovery
- Disposal

The WMP gives the specific policy on each of these waste management objectives.

It is clear that the WMP plans to follow the national waste management policies and implement in so far as possible waste prevention, minimisation, reuse, recycling and residual waste disposal. The plan recognises the role played by the private sector and encourages private bodies to provide their own facilities.

It is considered that the proposed development by CCL to be in broad agreement with many of these policy objectives and will provide a significant facility to help implement the plan.

The proposed development incorporates plant and processes to minimise waste manures being consigned to landspreading or landfill.

1.9.2.2 The Proximity Principle

"The Council has always sought to implement the proximity principle in its management of waste and will continue to do so during the currency of the WMP."

CCL will apply the proximity principle by providing an outlet for locally generated horse manures and straw. The poultry litter will primarily be sourced from Counties Monaghan and Cavan some may be sourced more locally if poultry rearing facilities are constructed.

1.10 ALTERNATIVES

1.10.1 Alternative Waste Management Practices

Waste management practices are listed under the following heading:

- Prevention
- Minimisation
- Re-use
- Recycling
- Recovery
- Disposal

The alternatives to composting generally entail the landspreading of the horse and poultry manures or perhaps the landfilling of these materials. The proposed development will provide a facility whereby these materials will be composted and reused in the agricultural/horticultural industry. This is considered the best option as landspreading of these materials can lead to contamination of soils, surface waters and groundwaters if not carried out correctly and in accordance with a nutrient management plan. Landfilling of these materials is considered the least favourable option.

1.10.2 Alternative Sites

Composting has been carried on at this site since the 1960's. The facility has operated satisfactorily over that time and has not caused any significant contamination to the local environment. There are few recorded complaints regarding the plant or its operations on either the local authority or EPA files. Some complaints regarding odours have been recorded and it is expected that the new upgraded facility will address any potential odour issues. The substance of this proposal is to upgrade the facility and expand its capability to process 160,000 t/a of raw materials. The reality of operating a composting centre with all of the necessary health and safety measures and environmental controls is such that it is only economically viable using the economies of scale offered by the proposed development. It would not be economically viable to operate two separate facilities to produce the same volume of compost and it is not considered best practice to move the existing facility from its present location to a new location.

Therefore, it is considered that the proposed facility should be developed on the existing site and not on an alternative site.

1.10.3 The Do-Nothing Alternative

In the absence of the CCL facility, there will be less infrastructure available for recovery of horse and poultry manure and straw. It is likely that these materials would in that case be landspread or landfilled. Landfilling is the least favoured option for dealing with such materials. The materials

could be landspread but this has the potential for causing pollution to soils, surface waters and groundwaters.

In addition, producing compost from raw materials that would otherwise likely be deemed as waste will reduce the need for use of other natural resources.

It is considered that the proposed development will provide a significantly improved situation with regard to use of resources than would pertain in the do-nothing scenario.

1.11 REQUIREMENT FOR AN EIS

This Environmental Impact Statement has been prepared to accompany the planning application for permission for the expanded development. This EIS will also be submitted to the Environmental Protection Agency in support of a Review of Waste Licence Application in accordance with the Waste Management Act, 1996.

The EIS has been prepared in accordance with the requirements of the following statutory documents:

(i) The European Community Directive on Environmental Impact Assessment (No. 85/337/EEC), as amended by Directive 97/11/EC.

(ii) The European Communities (Environmental Impact Assessment) Regulations, 1989 to 1999 and Amendment Regulations 2000 (S.I. 450 of 2000).

(iii) The Local Government (Planning & Development) Regulations, 1994 (S. I. No. 86/1994), as amended.

(iv) The Local Government (Planning & Development) Regulations, 1999 (S. I. No. 92/1999).

(v) The Planning and Development Act 2000 (No. 30 of 2000).

1.12 STRUCTURE OF THE EIS

The EIS is presented in the "Direct Format Structure" as set down in the Draft Guidelines produced by the Environmental Protection Agency (EPA-1997). In general, it follows the framework presented in the EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements. The structure employed allows individual examination of the main components of the EIS, namely :

(i) the receiving (existing) environment (Section 2).
(ii) the proposed development (Section 3).

(iii) environmental impacts and mitigation measures (Section 4).

1.13 CONTRIBUTORS TO THE EIS

The members of the study team and their respective inputs are as follows:

White Young Green Ireland Ltd.- Project Management, Climate, Air Quality, Noise Environment, Ecology, Cultural Resources, Landscape, Geology & Soils, Groundwater, Surface Water, Human Beings and Material Assets.

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Blackthorn Road,
Sandyford,
Dublin 18.

TrafficWise Ltd. Roads and Traffic

Address: Bracetown Business Park.,
Clonee,
Co. Meath

In addition to the main contributors to the EIS a number of organisations provided services/information to the project as follows:

Enterprise Ireland – Dust Analyses
Met. Eireann – Meteorological Data
Alcontrol Laboratories - Water Analyses (inorganic)
Ordnance Survey – OS maps
Geological Survey of Ireland – Geological/Hydrogeological information

1.14 SCOPING OF THE EIS

In view of the nature of the proposed development it was decided that a comprehensive EIS would be prepared. It was considered that emphasis should be placed on certain aspects of the environment such as the air environment and traffic and that less emphasis would be required for other aspects such as archaeology, geology and landscape. This was considered appropriate as the entire site has already been developed by concrete hardstand and structures and that therefore the proposal would have a reduced potential for impact on either archaeology, geology or landscape at the site.

1.15 DATA NECESSARY TO IDENTIFY AND ASSESS ENVIRONMENTAL EFFECTS OF DEVELOPMENT

The data necessary to identify and assess the environmental effects of the development are:

- The existing environment, as described in Section 2 by the specialists in various fields,
- The characteristics of the development as described in Section 3, including its physical dimensions, volumes and nature of materials being handled, the processes involved and the emissions from the facility.
- The potential environmental effects of the project are assessed and proposed mitigation measures are presented in Section 4.

1.16 DIFFICULTIES COMPILING SPECIFIED INFORMATION

Baseline information for the development site and its environs was readily compiled by the EIS contributors.

No constraints or difficulties were encountered in the course of the investigations or compilation of the EIS.

1.17 FORECASTING METHODS USED TO ASSESS THE EFFECTS ON THE ENVIRONMENT

The methods employed to forecast the effects on the various aspects of the environment are standard techniques used in the professional disciplines. The general procedure employed was to describe the receiving environment in a dynamic fashion, to add to that a projection of the "loading" placed on all aspects of the environment by the development in its mitigated form and thereby arrive at the net likely significant effect of the development on the environment.

SECTION TWO

2. DESCRIPTION OF RECEIVING ENVIRONMENT

2.1 CLIMATE

Ireland lies in the middle latitudes and its climate is largely determined by the prevailing westerly winds and its position on the western seaboard of the European landmass. The main features of the Irish climate are mild winters and cool summers.

The climate of the Midlands Region is described by meteorological measurements collected by the national Meteorological Service at their network synoptic stations in the region and from rainfall observations recorded at nearby rainfall gauging stations.

2.1.1 Rainfall

The nearest rainfall station to the site is at Casement Aerodrome, which is approximately 34km north east of the Carbury facility. The annual average rainfall data for the Casement Aerodrome station is presented in Table 2.1.1. The average annual rainfall for Casement Aerodrome is 711 mm/annum for the thirty year period 1961 to 1990

Table 2.1.1 Average Rainfall Data for the Casement Aerodrome

RAINFALL *(mm)*	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec**	**Year**
mean monthly total	68.7	50.7	53.8	49.9	56.6	53.0	48.9	63.7	58.7	67.2	67.2	73.1	**711.4**
greatest daily total	31.4	42.8	30.0	35.3	34.3	108.6	41.4	73.0	32.1	48.5	58.4	42.9	**108.6**
mean no. of days with >= 0.2mm	18	14	17	14	15	14	14	14	15	16	16	17	**185**
mean no. of days with >= 1.0mm	13	10	12	10	11	10	9	10	10	11	11	12	**131**
mean no. of days with >= 5.0mm	5	3	3	3	4	3	3	4	4	4	4	5	**45**

Evaporation will be low as the existing site comprises of roofed area and a concrete yard and rainwater will rapidly flow to covered drains. There will be no transpiration from plants at the site. As such, the effective rainfall at the site will be close to the total rainfall.

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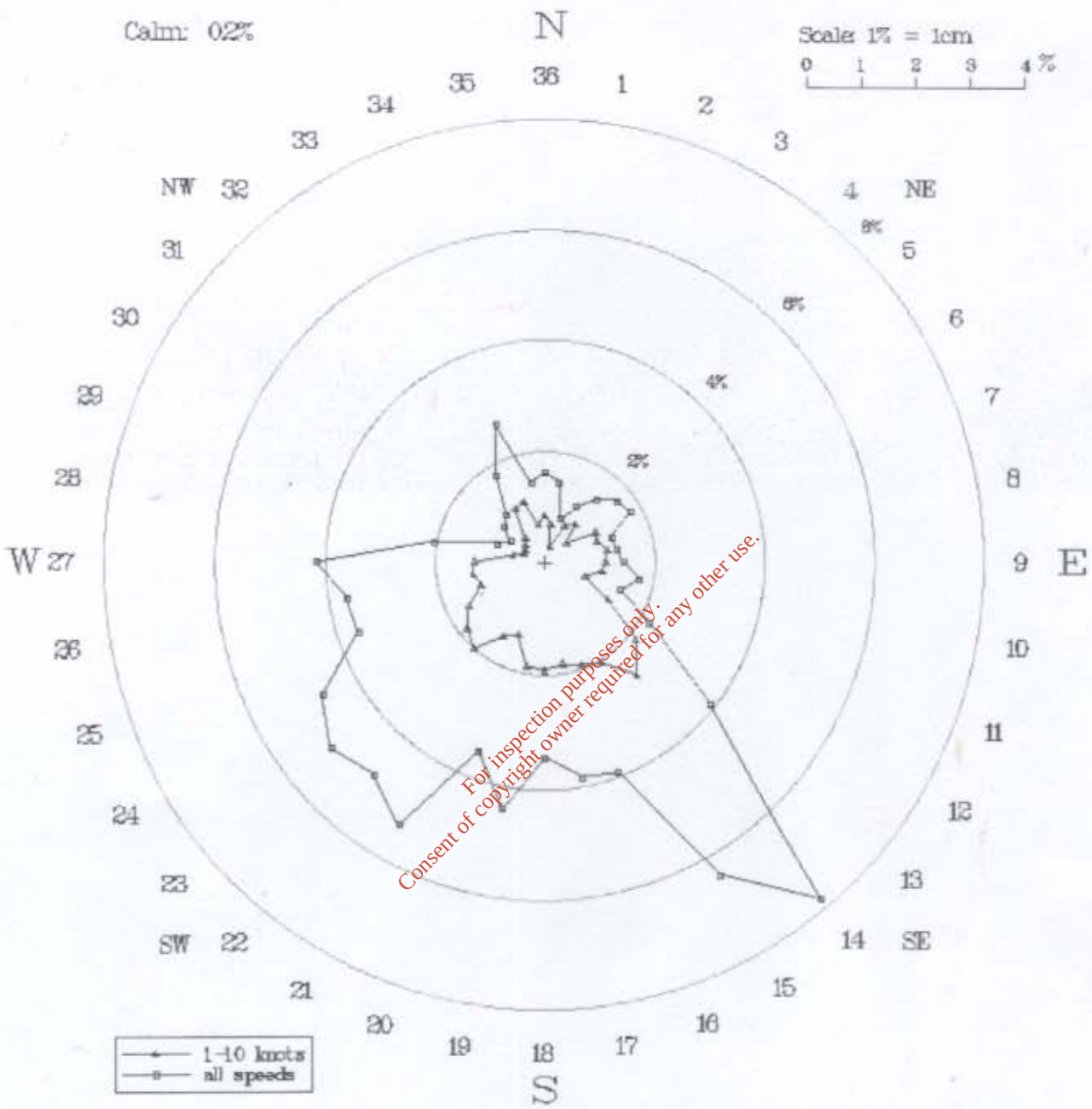
Percentage Frequency of Occurrence of Wind Directions



Percentage Frequency of Occurrence of Wind Speeds

+ less than 0.1

0	1-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	over 48	knots
02	8.5	13.2	21.6	29.8	13.8	8.5	2.7	1.2	0.3	0.3	%

mean wind speed: 12.8 knots standard deviation: 7.8 knots
anemometer height: 12m

Met Eireann, Glasnevin Hill, Dublin 9.

Carbury Composting Ltd. Percentage Frequency of Occurrence of Wind Direction from Met Eireann		
Figure No. 2.1.1	Job No. CE03393	Date. May 2006
	Finalised By -	

White Young Green

NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

CK(MX)

2.1.2 Wind

The strongest and most frequent winds are from the southwest and the second most frequent are from the west. Up to 60% of all winds are from these two directions at Casement. The least frequent wind directions are from the north and southeast. Figure 2.1.1 shows the frequency of occurrence of wind directions as a percentage.

2.1.3 Temperature

The climate of the area is temperate with mean daily temperatures in January and July of 6.8ºC and 15.9ºC respectively. The average annual temperature is approximately 10.0ºC. The mean temperatures are calculated based upon monthly and annual averages of air temperature for each hour of the day at Casement between 1961 and 1990.

2.2 AIR QUALITY

2.2.1 Introduction

This assessment of the existing air quality environment and anticipated impact on air quality from the proposed redevelopment of the composting plant has been undertaken in accordance with the *Directive (85/226/EEC)* amended by the *Council Directive 97/11/EC* and effected by the Statutory Regulations in Ireland (including *S.I. No. 349 of 1989 and SI No's. 92 & 93 of 1999*) and *Schedule 1 of the 1999 Regulations, (S.I. No. 93 of 1999)*. Cognisance has also been given to the following documents; *Guidelines on the Information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 2002) and also *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (Environmental Protection Agency, 2003).

To characterise the existing air quality at the proposed redevelopment site and assess the impacts of both the construction and operational phases of the proposed development, the following approach has been adopted:

- Identification of potential pollutants
- Monitoring of a selective number of relevant pollutants to determine existing baseline levels at the site boundary
- Discussion of the impacts of the proposed development for both the construction and operational phases
- Propose mitigation measures to minimise or ameliorate any identified impacts

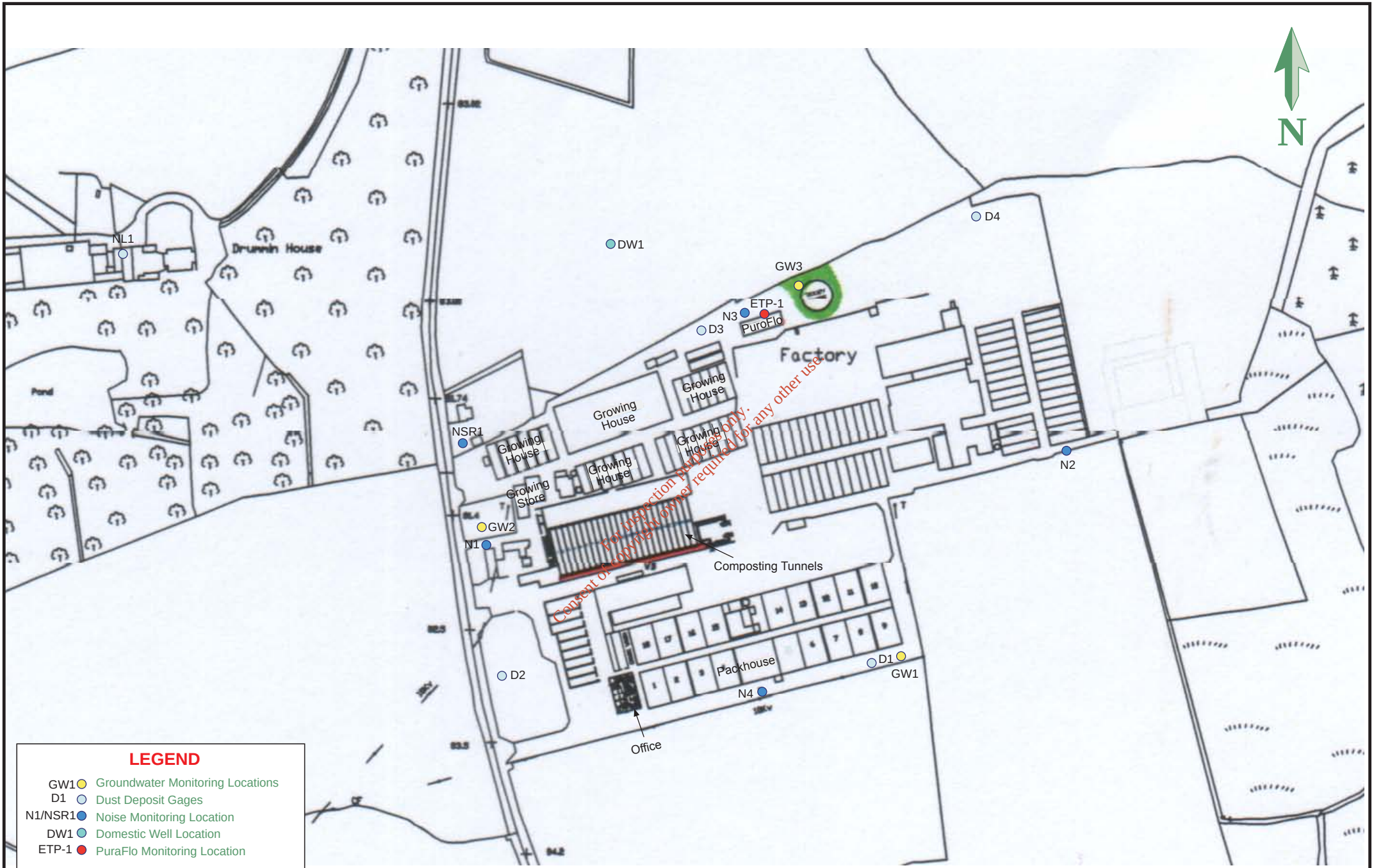
2.2.2 Survey Protocol

A limited baseline air monitoring survey was undertaken, the locations of which were selected to assess the current ambient air quality at the existing facility. Four monitoring locations were chosen at specific locations around the site. A description of the monitoring locations is presented in Table 2.2.1 and illustrated in Figure 2.2.1.

Table 2.2.1: Sampling Locations

Sample ID	Location	Sampling Parameters
D1	Southern Boundary	Dust deposition
D2	South-western Boundary	
D3	Northern Boundary	
D4	North-eastern Corner	

The air pollutants monitored are considered to be the main potential pollutants that may impact on air quality during the construction and operational phases of the proposed development.



LEGEND

GW1	Groundwater Monitoring Locations
D1	Dust Deposit Gages
N1/NSR1	Noise Monitoring Location
DW1	Domestic Well Location
ETP-1	PuraFlo Monitoring Location

SCALE: 1:3400 approx.

NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Carbury Composting Ltd.
Monitoring Location

Figure No. 2.2.1	Job No. C003393	Date. May 2006
	Finalised By - DMcD	

White Young Green

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Furthermore, the assessment allows for the determination of existing air quality arising from emissions from the proposed plant. The parameters outlined in Table 2.2.1 were identified as potential pollutants and were therefore included in the baseline assessment.

The ambient air quality at Carbury Mushrooms is considered to be typical of a rural environment. Levels of NO_2 and SO_2 are expected to be in the range of 0-19ppb and PM_{10} in the range 0-19µg/m^3. The predominant impact of the plant on the local air quality is potentially from odour that may arise as a result of activities from Phase I of the composting process.

2.2.3 Assessment Criteria

There is no national or EU guidelines for dust deposition. In this absence, the recognised guideline for total dust emissions is 350mg/m^2/day as detailed in the T A Luft Technical Instructions on Air Quality Control, 27 July 2001.

Odorous emissions may arise as a result of the production process at the plant. Commonly used odour annoyance criteria for the UK, Netherlands, Germany and Ireland are presented in Table 2.2.2 for different types of industry.

Table 2.2.2: Odour Annoyance Criteria for Dispersion Modelling

Odour Concentration Limit (ou_E/m^3)	Percentile Value	Application
UK (WWTP, ADMS Model) ≤5.0	98	Used as a planning guideline for the upgrade of WWTP
≤1.5	98	DEFRA Code of Practice on Odour Nuisance from Sewage Treatment Works, 2004
Germany ≤4.0	98	WWTP level at which odour nuisance experienced, Frenchen 1995
Netherlands ≤1.5	98	WWTP existing site, residential dwellings in area
≤3.5	98	WWTP existing site, rural area or industrial estate
Ireland (EPA) (pig, mushroom compost and tanning industry) ISC ST and Complex 1 Model ≤3.0	98	Limit Value for New Facilities
≤6.0	98	Limit Values for Existing Facilities

References: EPA 2001, Frenchen 1995, McInytyre et al. 2000, Newbiggin-by-the-sea planning appeal document

By definition, an odour threshold of $1ou_E/m^3$ is the level at which an odour is detectable by 50% of screened panellists. The recognition threshold is about 5 times this concentration i.e. $5ou_E/m^3$. Furthermore, odour concentration of between 5 and 10 ou_E/m^3 above background will give rise to a faint odour and concentrations greater than $10ou_E/m^3$ constitutes a distinct odour and are likely to give rise to nuisance complaints.

The Environmental Protection Agency published a document in 2002 entitled 'Review of Odour Control Technologies in Mushroom Compost Production'. This document proposed the use of the following odour guidelines with regard to odour sensitive locations adjacent to a mushroom composting plant:

- Target value: $C_{98,\ 1\text{-Hour}} \leq 1.5ou_E/m^3$ (1-hour average, 98%-ile)
- Limit value for new composting units $C_{98,\ 1\text{-Hour}} \leq 3ou_E/m^3$
- Limit value for existing composting units $C_{98,\ 1\text{-Hour}} \leq 6ou_E/m^3$

For the purposes of the modelling assessment, the odour guideline value of $C_{98,\ 1\text{-Hour}} \leq 6ou_E/m^3$ will be adopted at the nearest noise sensitive receptor.

2.2.4 Sampling Methodologies

The methodology for each parameter monitored is presented below:

2.2.4.1 Dust Deposition

The sampling was carried out in accordance with the Bergerhoff method, German Standard VDI 2119, Part 2. This consists of a collecting jar (between 1L and 2.5L volume capacity) placed within a cage positioned at 1.5m above ground. Prior to sampling, the collecting vessels were carefully cleaned with laboratory detergent and rinsed with distilled water. Sampling involved placing the labelled vessels in the protected cages. Following exposure (31st August 2005 to 5th October 2005) the vessels were sealed and sent to Geotesting Ltd. for gravimetric analysis for total (soluble and insoluble) dust. The results are expressed in $mg/m^2/day$.

2.2.5 Results

The results of the baseline dust deposition monitoring survey are presented in Table 2.2.3. The monitoring locations are illustrated in Figure 2.2.1.

Table 2.2.3: Dust Deposition Results

Sample ID	Sampling Location	Sampling Date and Times	Dust Deposition ($mg/m^2/day$)
D1	North East Boundary	14th July – 14th August 2005	15.6
D2	Eastern Boundary		46.7
D3	Western Boundary		36.3
D4	Northern Boundary		15.6
Waste Licence Limit			***350***

The results of the flue gas monitoring of boiler A1-1 is presented in Table 2.2.4. The monitoring was undertaken on 27th October 2005.

Table 2.2.4: Flue Gas Monitoring of Emission Point A1-1

Parameter	Concentration (mg/Nm^3)		
	Low Fire	High Fire	IPC Emission Limits
Oxides of Sulphur	<4.29	107.1	1700
Nitrogen Oxides (as NO_2)	369.4	413.7	750
CO	6.25	10.0	200

2.2.6 Discussion of Results

2.2.6.1 Dust Deposition

The dust deposition results are presented in Table 2.2.4. Its existing Waste Licence, Register No. 124-1 granted on 20th August 2004, stipulates a limit value of $350mg/m^2/day$ at all locations monitored. The recorded results at each location are well below this limit value.

2.2.6.2 Boiler Emission Results

The results recorded for emission point A1-1 are within its Waste licence limits for all parameters monitored.

2.3 NOISE AND VIBRATION

2.3.1 Introduction

This assessment of the existing noise and vibration has been undertaken in accordance with the *Draft Guidelines on the Information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 2002), *S. I. 93 of 1993, European Communities (Environmental Impact Assessment) (Amendment) Regulations 1999* and also *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (Environmental Protection Agency, 2003).

2.3.2 Existing Noise Environment

A baseline noise survey was carried out to determine the current noise climate at the site boundary and nearest sensitive receptors to the proposed facility on 14th and 15th July 2005. Noise monitoring was undertaken at four boundary locations and the nearest sensitive receptor as outlined in Waste Licence Ref 124-1.

2.3.2.1 Existing Noise Sources

The existing facility is situated in a rural area about 5 kilometers south of Carbury Village. The predominant noise sources in the vicinity of the site comprise of plant and machinery operating within the facility and traffic on the R403 road.

2.3.2.2 Measurement Locations

The noise monitoring locations were chosen according to the guidelines in *ISO 1996: Acoustics – Description and Measurement of Environmental Noise* and the EPA *Environmental Noise Guidance Document* and were selected in order to characterise the existing noise climate in the local vicinity. Both site boundary locations and nearest noise sensitive receptors were included as part of the baseline survey. A noise sensitive receptor (NSR) is defined in the EPA Environmental Noise Survey Guidance Document 2003 as "*any dwelling, house, hotel or hostel, health building, educational establishment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*". In total, the existing noise climate was determined at five locations. Four of the noise monitoring locations was situated along the site boundaries. The remaining noise monitoring location was situated at the nearest noise sensitive receptor to the proposed development. The monitoring locations are illustrated in Figure 2.2.1.

2.3.2.3 Instrumentation

The measurements were made using a Cirrus 831A Data logging integrating sound level meter fitted with 1:1 and 1:3 Octave Band Filters. The instrument was calibrated *in situ* at 94dB prior to and after use using a Cirrus CR 513A acoustic calibrator. Factory calibration certificates for the noise level meter and acoustic calibrator, detailing equipment serial numbers, calibration traceability and re-calibration dates are presented in Appendix 2.3.1 of this report. The sound level meter was orientated towards the noise source during all measurement surveys. This instrument is a Type 1 instrument in accordance with IEC 651 regulations. The Time Weighting used was Fast and the Frequency Weighting was A-weighted as per IEC 651. A glossary of noise related terms is presented in Appendix 2.3.1 as well.

In all cases, the sound level meter (SLM) was mounted on an outdoor microphone stand, which in turn was mounted on a tripod at 1.5m above ground level and at least 2m away from any sound reflecting objects. A windshield was placed on the microphone to reduce any wind interference during measurements.

2.3.2.4 Survey Implementation

The daytime and night-time survey was conducted by White Young Green personnel on the 14th and 15th July 2005. The measurement parameters included meteorological observations of prevailing conditions at the time of the survey. The primary measurement parameter was the equivalent continuous A-Weighted Sound Pressure level, $L_{Aeq,\ T}$, over 30-minute measurement intervals for the duration of the daytime monitoring survey and 15-minute measurement intervals for the duration of the night-time monitoring survey. A statistical analysis of the measurement results was also completed so that the percentile levels, $L_{AN,\ T}$, for N = 90% and 10% over 30-minute measurement intervals were also recorded. The percentile levels represent the noise level in dB(A) exceeded for N% of the measurement time. L_{A10} values are used to describe intermittent, high-energy noise events whereas L_{A90} values are representative of background noise levels.

In addition, frequency was measured in the 1/3-octave band at each of the five noise monitoring locations to assess the potential tonal components of ambient noise generated in the vicinity of the proposed development. All sources of noise were noted, recorded and where possible, identified during the course of this survey.

2.3.2.5 Meteorological Conditions

Weather conditions during the surveys were dry and overcast. Wind speed did not exceed 5 meters per second.

2.3.2.6 Results

The noise measurement results for the day-time and night-time noise monitoring survey are reported in Tables 2.3.1 and 2.3.2 respectively. A graphical representation of noise measurement spectra, including octave band frequency analysis is presented in Appendix 2.3.2

Table 2.3.1: Daytime Noise Survey Results

Monitoring Location	Survey Date & Start Time	$L_{Aeq,\ 30\ mins}$ dB	$L_{A90,30\ mins}$ dB	$L_{A10,30\ mins}$ dB	Description of Sources
N-1	14/07/05 17:01	62	52	66	Traffic on R403. Tractor in nearby field. Occasional reversing alarm. Bus at bus stop opposite plant.
N-2	14/07/05 15:32	54	50	56	Fans. Forklift reversing.
N-3	14/07/05 18:59	53	47	58	Fan noise from windrow turner. Forklift operating nearby. Crows in nearby hedgerow.
N-4	14/07/05 16:18	58	49	55	Cars passing measurement location. Fan on nearby building roof. Traffic on R403.
NSR-1	14/07/05 17:41	67	48	73	Traffic on R403. Nearby compressor. Overhead aircraft.

Table 2.3.2: Night time Noise Survey Results

Monitoring Location	Survey Date & Time	$L_{Aeq,\ 30\ mins}$ dB	$L_{A90,30\ mins}$ dB	$L_{A10,30\ mins}$ dB	Description of Sources
N-1	15/07/05 07:05	64	47	70	Traffic on R403. Forklift. Background fan noise. Tractor and trailer with hay. Distant dogs barking.
N-2	15/07/05 06:08	46	43	62	Aeration fans. Traffic on R403. Reversing alarm. Fans and coolers from tunnels.
N-3	15/07/05 06:23	52	45	74	Reversing alarms. Forklift. Traffic on R403 road. Crows.
N-4	15/07/05 07:53	48	43	48	Cooler fans in tunnels. Traffic on R403. Cars passing measurement location. Distant reversing alarms.
NSR-1	15/07/05 07:26	57	46	62	Traffic on R403. Occasional reversing alarms. Faint generator noise barely audible in lulls in traffic noise.

2.3.2.7 Discussion

Boundary Locations (Daytime)

N1

N1 was located along the western boundary of the site. The dominant noise source at this location was traffic on the nearby R403. An approximate traffic count was undertaken at this location. 205 cars and 30 HGV's were counted during the survey and none were related to the plant. The sound pressure level graph illustrates an erratic pattern resulting from traffic noise. The L_{A90} is an indicator of background noise and is elevated because of the high volume of traffic on the R403. Other minor sources audible at this location included a tractor operating in a nearby field, a bus

collecting passengers at the bus stop opposite the plant and infrequent reversing alarms from machinery at the plant. A low frequency tone was detected at 250Hz. This can be attributable to the passing traffic on the R403

N2

N2 was located along the north eastern boundary of the site. The main source influencing the noise level at this location was fan noise from the mushroom tunnels. This accounts for the higher noise levels detected at this location. Similar L_{Aeq} and L_{A90} levels of 54dB and 50dB indicate a single source as well as the corresponding steady sound pressure level graph with occasional peaks. A forklift operating nearby contributed briefly to the noise level. Tonal character was not detected at this location.

N3

N3 was located at the north eastern boundary of the proposed development. Background fan noise and wind in the vegetation behind the measurement location were the main influences on the noise level at this location. The erratic noise pattern on the corresponding sound pressure level graph illustrates the fluctuating noise level at this location. No tonal element was detected at this location.

N4

N4 was located at the eastern boundary of the site. The main noise sources noted at this location included employees cars passing the measurement location, a fan on a nearby building and traffic on the R403. The sound pressure level graph is relatively steady reflecting the relatively constant noise sources during the survey. The peaks present represent passing traffic on the access road adjacent to the measurement location and also on the Carbury road. A tonal element was detected at 40Hz, 630Hz and 1.25kHz. The lower frequency tones can be attributable to the fan and the higher frequency tones to passing traffic.

Noise Sensitive Receptor (Daytime)

NSR 1

NSR 1 is located adjacent to the western boundary of the site and is approximately 10 meters from the R403. Traffic on the busy R403 is the dominant noise source at this location. A traffic count was undertaken at this location and 135 cars were counted passing the measurement location during the survey. The sound pressure level graph is highly fluctuating illustrating high volumes of passing traffic. Tonal elements were recorded at 100Hz, 630kHz and 4kHz. These tones can be attributable to the passing traffic and possibly a generator which was faintly audible at a mushroom tunnel nearby.

Boundary Locations (Night-time)

N1

The dominant noise source during the night time survey was traffic on the R403. Other minor contributors included a forklift, a tractor and trailer and distant dogs barking. The sound pressure level graph illustrates an irregular noise pattern with peaks caused by passing traffic. A tonal element was detected at 63Hz, 160Hz, 315Hz, and 4kHz. These can be attributed to passing traffic.

N2

The main noise sources at this location were the aeration fans attached to the back of the aeration pads. The noise level was low and steady at this location but was elevated briefly by the reversing alarm of a loader used by the farmer who owns the neighbouring land. The sound pressure level graph illustrates a very steady noise pattern interrupted by a loud noise event i.e. the reversing alarm. The L_{Aeq} level of 46dB and an L_{A90} level of 43dB are similar, reflecting the impact of a single dominant noise source. Tonal character was detected at 100Hz, 160Hz, 1kHz, 1.6kHz, and 3.15kHz. These tones are likely to be attributable to the fans and the higher frequency tones are likely to be attributable to the reversing alarms.

N3

The main influences on the noise levels at this location included background traffic noise on the R403, crows in nearby trees and engine noise from a front loader. The sound pressure level graph illustrates an irregular noise pattern caused by the intermittent nature of the sources outlined above especially the crows. Tonal character was detected at 100Hz, 400Hz, and 4KHz. These tones can be attributed to the front loader.

N4

The noise level at this location was influenced by a number of contributing noise sources including the cooler fans from the mushroom tunnels, traffic on the R403 and birdsong. The noise level was briefly elevated by an employees car passing the measurement location during the survey. This can be seen as an isolated peak on an otherwise low and steady noise level illustrated in the sound pressure level graph. No tonal character was detected at this location.

Noise Sensitive Receptor (Night-time)

NSR 1

Traffic on the busy R403 was the dominant noise source at this location. As with the daytime survey the sound pressure level graph is highly fluctuating illustrating high volumes of passing traffic. Tonal elements were recorded at 100Hz, 630kHz and 4kHz. These tones can be attributable to the passing traffic.

2.4 SOILS AND GEOLOGY

A hydrogeological investigation of the area was carried out as part of the EIS by White Young Green Ireland. The investigation involved the examination of regional information, which was available from the Geological Survey of Ireland in the form of geology maps and from other projects conducted by White Young Green Ireland in the Mid-Kildare area.

2.4.1 Regional Geology

2.4.1.1 Solid Geology

The 1:100,000 Bedrock Geology Map from the Geological Survey of Ireland (Sheet 16, 1992) interprets the regional geology of the Carbury Area as a pair of former shallow water shelves (the Edenderry and Kildare shelves respectively) separated by a northeast southwest trending structural trough of Carboniferous rocks known as the Portarlington Trough that lies adjacent to the Leinster Granite to the east. It is likely that this complex syncline initially formed a depositional basin between the two shelf areas.

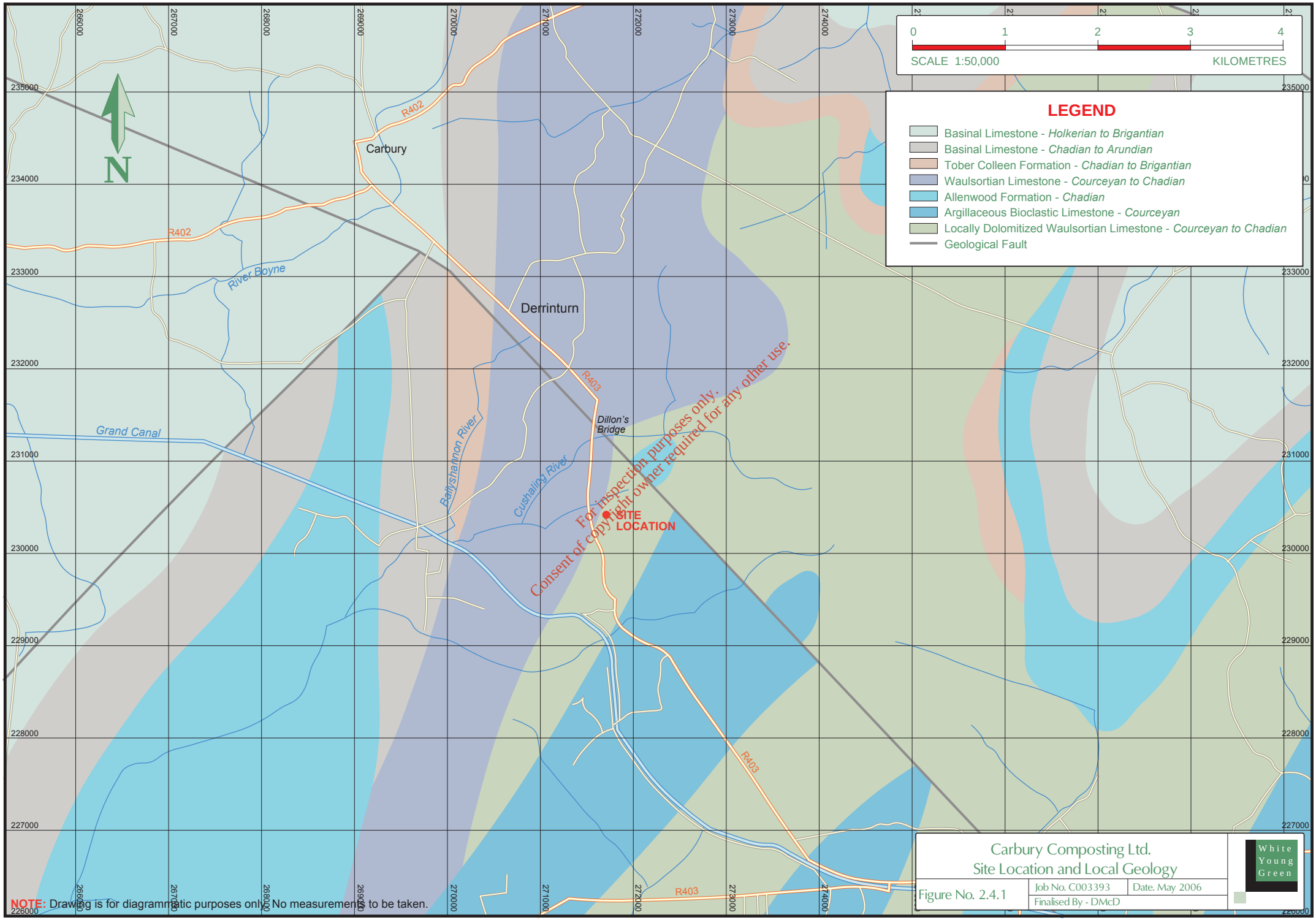
Several smaller folds with strike parallel and cross cutting faults are superimposed on the underlying structure, however most of the faults shown on Figure 2.4.1 are tentatively identified as there is a general lack of certainty in many areas.

The rocks of Northwest Kildare consist of sediments ranging in age from Devonian Old Red Sandstones to Brigantian limestones of the Calp and Clogrennan formation. Lack of outcrop of the lower to middle Carboniferous rocks with the exception of the upland area of the Castlecomer Plateau to the south make the poorly known areas of the map, where exploration for base metals is not prevalent, appear geologically simpler. However this is a function of the drilling and the fact that base metals tend to occur in complex faulted situations.

2.4.1.2 Unconsolidated Geology

Nineteen soil series and six soil complexes have been recognised and mapped in the Soils of County Kildare (An Foras Taluntais, 1970).

Soils of the Allenwood complex and gleys of the Kilpatrick series are dominant in the area around the site. To the east are the raised bogs of the Clonsast complex. Soils of the Allenwood complex are generally poorly drained as might be expected of a soil typical of marginal peat locations and are usually only suitable for poor permanent pasture. The gleys of the Kilpatrick series are of



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similar character to the more prevalent Fontstown series found elsewhere in the county although it typically occurs on undulating to flattish topography at a more lowlying position in the landscape.

2.4.2 Local Geology

2.4.2.1 Solid Geology

Based on the Geological Survey of Ireland the study area is underlain by Waulsortian Limestones. The Waulsortian consists of pale grey biomicrite. The sediments commonly form individual or coalesced mounds typically tens of metres high. They pass laterally into thinner time-equivalent sediments which near the reef are often clearly reef related. The Waulsortian is commonly dolomitised and this process may be so effective as to render the Waulsotian undistinguishable from other dolomitised local formations such as the Allenwood formation.

2.4.2.2 Unconsolidated Geology

The soils of the Allenwood complex and Kilpatrick series' which underlie the site are generally associated with the margins of bog land or peats. They are poorly drained (Allenwood) to moderately well drained (Kilpatrick) although when adequately drained can be productive for agricultural enterprises.

White Young Green records from previous investigations within the north west Kildare area recorded quarternary deposits of variable thicknesses. The deposits consisted of sands and gravels interbedded with less permeable material in this region. The low permeablility material protects the underlying bedrock aquifers, restricts recharge and where sufficiently thick may confine them.

2.5 GROUNDWATER/HYDROGEOLOGY

The following sources were used to describe the existing hydrogeological conditions within the environs of the Carbury site.

- Published Geological Survey of Ireland (GSI) data from the Kildare-Wicklow area
- Information from previous work conducted by White Young Green Ireland within the Kildare area.

2.5.1 Regional Hydrogeology

The site is situated in the catchment of the Cushaling River, which is a tributary of the Figile River and would suggest that the predominant regional groundwater flow direction is towards the southwest.

Two distinct units including the overburden and the underlying bedrock control the hydrogeology beneath the site and therefore contribute significantly to the hydrogeological assessment of the site.

2.5.2 Overburden Hydrogeology

Clays and tills are generally not considered to be major aquifers due to their low permeability and there is no evidence to suggest that the overburden at this site is any different. Clays tend to act mainly as protective and confining layers therefore often act as an aquitard to groundwater flow beneath the site. Therefore, these have the effect of limiting the downward percolation of surface water to the underlying bedrock at the site.

2.5.3 Bedrock Hydrogeology

The site is underlain by rocks of the Waulsortian Formation, which is characterised by reef or clean shelf-type limestones. Slightly lower intensities of dolomitisation of these strata in comparison to the Waulsortian to the south of Kildare leads to lower porosity and permeabilities and therefore these rocks are classified as poor aquifers. In the presence of faults dolomitisation can be more intense and large yields have been recorded from the Athy and Newbridge areas of Co Kildare.

The Geological Survey of Ireland (GSI) have devised a system for classifying bedrock aquifers based on a number of parameters, including the areal extent (km^2), well yield (m^3/d), specific

capacity (m^3/d/m) and throughput (Mm^3/d). There are 3 main classifications; Regionally Important, Locally Important and Poor Aquifer. Where an aquifer has been classified as Regionally Important, it is further sub-divided according to the main groundwater flow regime within it. This sub-division includes Regionally Important Fissured Aquifers (Rf) and Regionally Important Karstified Aquifers (Rk). Locally Important and Poor Aquifers are sub-divided according to their productivity. Locally Important Aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are productive only in local zones (Ll). Similarly, Poor Aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

Table 2.5.1 Hydrogeological Characteristics of the Carboniferous in Kildare

	Aquifer Present	Distribution	Principle Rock types	Approximate Thickness (m)	Typical Well Yield (m^3/day)	Specific Capacity (m^3/d/m)
Lower Carboniferous	Dolomitised Limestones: Part of the Milford, Rickardstown, Allenwood, Edenderry Oolite, Waulsortian and Ballysteen	Throughout the Western Half Of Kildare (Sheet 16)	Mainly clean shelf Limestones that have been dolomitised	The individual permeable units are likely to be less than 150m	300-1500	15-100

Geological Survey of Ireland, 1994 – Geology of Kildare-Wicklow

The GSI have classified the underlying Waulsortian limestones as a locally (Ll) important aquifer (generally moderately productive only in local zones).

2.5.4 Vulnerability of Aquifers

Vulnerability of groundwater is the term defined by the Geological Survey of Ireland (GSI) to represent "the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities."

The main factors in defining vulnerability are:

- the type and thickness of the subsoil that overlie the groundwater;
- the recharge type - whether point or diffuse;

- in the case of unconfined sand and gravel aquifers, the thickness of the unsaturated zone below the point at which the contaminant is introduced."

The GSI divide vulnerability into four categories - Extreme (E), High (H), Moderate (M) and Low (L) depending on the hydrogeological conditions at a site. Table 2.5.2 provides a summary of the vulnerability classification scheme as compiled by the GSI. The vulnerability of a groundwater body to contamination is determined by the type and thickness of the overburden, the depth to the water table and the nature of the recharge. While these are only guidelines, they provide a useful basis on which to describe the general vulnerability of both the aquifer as a whole and individual abstractions to point and diffuse sources of contamination.

The level of data on which to base a detailed vulnerability map is rarely available except where site specific detailed investigations have been completed, such as a programme of trial pits or drilling. However, a working vulnerability can be tentatively compiled using information collected from historical maps and data which may be reviewed as additional data becomes available.

White Young Green records from previous investigations within the mid Kildare area (Naas, Osberstown) recorded deposits of clayey material greater than 15m in thickness which would indicate a low vulnerability. However GSI records from the Kildare Groundwater Protection Scheme indicate a high vulnerability for the Waulsortian in the area around the Carbury facility. Information from the EIS on the proposed Bord Na Mona Landfill Facility in nearby Drehid indicates, given the nature of the subsoil, highly variable overburden thicknesses in the area but generally in the range of moderate to low vulnerability.

Table 2.5.2 Vulnerability Classification

Vulnerability Rating	Hydrogeological Requirements				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Recharge Type
	high permeability (sand/gravel)	moderate permeability (sandy till)	low permeability (clayey till, clay, peat)	(sand & gravel aquifers only)	
Extreme	0-3.0m	0-3.0 m	0-3.0m	0-3.0m	point (>30 m radius)
High	>3.0	3.0-10.0m	3.0-5.0m	>3.0m	diffuse
Moderate	N/A	>10m	5.0-10.0m	N/A	diffuse
Low	N/A	N/A	>10.0m	N/A	diffuse
Notes: i)N/A =not applicable ii) Precise permeability values cannot be given at present iii) Release point of contaminants is assumed to be 1-2 m below ground surface					

GSI Vulnerability Mapping Guidelines, (from Daly & Warren 1997)

2.5.5 Groundwater quality

Four samples were obtained from groundwater wells located within and near to of the CCL facility. Three of these wells GW1-GW3 were sampled, by Carbury staff, on the 6th of September 2005. The fourth private well located on land just to the north of the site was sampled on the 10/10/05. Monitoring locations can be found in Figure 2.2.1

Table 2.5.3 Groundwater Monitoring Results

Sample	pH	TOC	NH4-N	NO3-N	SO4	Conductivity	Total Coliforms	Faecal Coliforms	Temp. °C
MAC	6.5-9.5	N.A.C.	0.3	50	-	2500	0	0	-
Midland Well GW1	7.29	35.5	0.20	0.7	11.3	502	**Present per 100ml**	0 per 100ml	-
Drummin Well GW2	7.32	19.1	0.11	7.2	38.2	716	**Present per 100ml**	0 per 100ml	-
GJM Well GW3	7.26	28.7	**0.42**	0.7	24.6	534	**Present per 100ml**	0 per 100ml	-
Private Well	7.30	38.5	0.012	7.9	27.3	682	0 per 100ml	0 per 100ml	14.6

Chemical analysis for a range of inorganic and bacteriological parameters showed generally good chemical quality in all wells with the exception of levels of ammonia at GW3(0.42 mg/l). Ammonia levels at all other boreholes were lower than the MAC of 0.3mg/l. Total organic carbon was slightly elevated at all locations but this is probably related to infiltration of the groundwater through the underlying peats to the boreholes.

Bacteriological analysis of water quality showed no faecal coliform contamination in any of the groundwater wells monitored. However, results indicated three of the four water wells with the exception of the private well had a presence of coliforms indicating possible organic contamination.

2.6 SURFACE WATER

2.6.1 Surface Water Features

The site is drained by a small tributary of the Cushaling river which runs along the northern boundary. The tributary joins with the Cushaling about 600m to the west of the site. The Cushaling flows south west towards to confluence with the Figile river itself a tributary of the river Barrow. The Grand Canal is located about 1.2km to the south of the site. The western part of the Timahoe bog lies to the east of the site.

2.6.2 Drainage Systems

The entire site is either concreted or roofed and all precipitation at the site is contained and collected and controlled by the various drainage systems at the site. These are described below.

2.6.2.1 Mushroom Growing Areas

Surface water from the mushroom growing areas in the southern and western parts of the site drain to a 3 chamber settlement tank (FMW1) located in the northwestern corner of the site.

Surface water from the mushroom growing areas in the eastern part of the site drain to a 3 chamber settlement tank (FMW2) located adjacent to the existing water storage tank (tank A).

This water may contain slightly elevated levels of suspended solids and peat which are allowed to settle out in the tanks. The settled water is pumped from both the settlement tanks to the existing water storage tank (tank A) for reuse in the composting system.

On rare occasions, during high rainfall events when tank A is full, the settled water from either or both of the settlement tanks (FMW1 and FMW2) is discharged to the stream under a discharge licence granted by the local authority.

2.6.2.2 Composting Areas

Surface water drainage from the composting areas including the open windrow areas is currently collected and pumped to the dunking tank located adjacent to the existing water storage tank (tank A). The dunking tank is a contained underground tank with an open top and is used for wetting the straw bales by dunking the bales in the tank prior to being used in the composting process. Water from the dunking tank is also used in the blending process. Water from the dunking tank can be pumped to tank A for storage and drained back from tank A to the dunking tank as required.

Drainage from the composting areas would be considered soiled water and is used entirely in the composting process. None is discharged off site.

2.6.2.3 Sewage Effluent Management

Sewage generated in the offices, canteens and toilets in the southern part of the site is collected and pumped to a septic tank located in the northwestern corner of the site (adjacent to FMW1 settlement tank). From here the effluent is pumped to the main septic tank located midway along the northern boundary and near to the puraflo wastewater treatment plant.

Sewage effluent generated in the offices located in the existing mushroom growing houses located in the eastern part of the site is collected and pumped directly to the main septic tank on the northern boundary.

Effluent from the main septic tank is pumped to the puraflo wastewater treatment plant where it is treated and discharged to the small stream that drains along the northern boundary (tributary of the Cushaling river). The puraflo treated effluent discharge is carried out under discharge licence granted by the local authority and is designed to treat the effluent to such a degree that there will be no significant impact on the local receiving waters.

2.6.3 Quantity and Rate of Discharges

Existing Situation

As there is no transpiration and very low evaporation from the concrete surface the volume of water generated at the Carbury site can be estimated from the precipitation and surface area of the site. If we assume the surface area to comprise 9.4 ha (to include the mushroom growing complex) and the average annual rainfall at 711mm/annum then the volume of run-off will equate to some 67,000 m^3 per year (this excludes totally evaporation, transpiration and percolation). The vast bulk of this water is reused in the composting process. A relatively small percentage of the settled surface water drainage (from the mushroom growing areas) is discharged to the local surface water network under a discharge licence during heavy rainfall events.

2.6.3.1 Composition and Level of Discharges

Surface Water

Surface water quality has been monitored at four locations including the discharge from the puraflo wastewater treatment plant (ETP-1), the outfall of the drain that flows along the northern boundary

to the Cushaling river (SW1) and at two stations on the Cushaling river 30m upstream of the outfall (RW2) and 30m downstream of the outfall (RW1). The monitoring locations are shown in Figure 2.2.1 and Figure 2.6.1. The results are provided in Appendix 2.6.1.

Monitoring at ETP-1 was carried out on four occasions between 4/10/04 and 10/01/06. The results have been compared to the emission limit values stipulated in their waste licence (ref: 124-1). The results indicated elevated levels of total ammonia (ranging from 3.31 to 47 mg/l), orthophosphate (ranging from 1.4 to 4.82 mg/l) and total phosphorous (ranging from 2.65 to 4.3 mg/l) on three of the four sampling events. There were no exceedances on sampling event 11/07/05 and no exceedances of pH or BOD on any occasion. The puraflo treatment plant appears to be operating satisfactorily in reducing the levels of some parameters but is not effectively treating others. It is planned that the system will be given an overhaul and be regularly serviced in the future to ensure that its performance meets the requirements of the Waste Licence. It should be noted that the proposed new development includes for reuse of all effluent generated on site in the composting process and no discharges to the local surface water network.

The results from SW1 indicated slightly elevated levels of total nitrogen ranging from 18.6 to 36 mg/l on the two sampling occasions and orthophosphate (1.54 mg/l) on 10/10/05. It is expected that maintenance and improvements to the wastewater treatment plant will improve the quality at SW1.

The results from the receiving water (Cushaling river) indicated that the outfall was not impacting on water quality in the river. There were no exceedances of the elv's and the quality of the water was very similar both upstream (RW2) and downstream (RW1) of the outfall. This indicates that the discharge from the site was not impacting on the Cushaling river. The proposed improvements to the treatment plant will ensure no impacts in the future.

N

Cushaling River

Drummin House

RW2

RW1

SW1

1 Km from Site

Kilpatrick House

KILPATRICK

LEGEND

- Site Boundary
- SW/RW 1 — Surface Water Monitoring Location
- Drain

0 200 400 600

Scale 1 : 15,000 approx.
Scale 1 : 10,560 or 6" = 1 mile @ A3

METRES

NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Carbury Composting Ltd.
Surface Water Monitoring Location

Figure No. 2.6.1 | Job No. C003393 | Date. Jan. 2006 | Finalised By - DMcD

White Young Green

JF(10)

2.7 FLORA AND FAUNA

2.7.1 Environmentally Designated Sites

The site is located in a low lying area (approximately 80 metres above sea level) and is situated approximately 5km north east of the Bog of Allen and just to the west of Timahoe Bog. The Cushaling River rises approximately 2km east of the site and runs towards the west then southwest to within approximately 400m of the site. The Cushaling runs southwest into Offaly and joins the Figile River. The Figile river is a tributary of the River Barrow which is a proposed SAC (approximately 20km away). It supports many species protected under the EU Habitats Directive including Salmonids, lamprey, otter and freshwater crayfish.

There are two designated pNHA's in the region. Carbury Bog is listed as an NHA in the County Development plan. The Grand Canal is also a proposed Natural Heritage Area and is located 1.2km from the site. It is considered that given the distance from the site to these NHAs, that site activities will not pose a threat to these important ecological areas.

2.7.2 Regional Ecology

The site is regarded as being within the eastern edge of the Bog of Allen and is sited on the periphery of a landbank owned by Bord na Mona, which was formerly the site of commerical peat harvesting. Intensive peat production ceased approximately 13 years ago but it should be noted that some small scale harvesting continues. The long term commercial harvesting of peat has resulted in the depletion of much of the bog vegetation and much of the area no longer resembles a raised bog.

It is reported in the EIS for the proposed Bord na Mona Drehid landfill (to be located to the east of the CCL site) that rare species of opposite leaved pondweed and bog orchid have been recorded in proximity to the proposed landfill (3km). The species Frangula Alnus, Alder Buckthorn described as very rare in "An Irish Flora" (Webb et al., 1996) have been recorded from the banks of the Cushaling (8km).

2.7.3 Local Ecology

The site itself comprises constructed buildings and a concrete slab over the entire site with the result that there are no features of ecological importance on the site. The site boundaries however, are made up of substantial hedgerows, shrubs and trees. These mainly comprise native

species and are deemed to be of high local importance as they provide potentially important habitats for local fauna. The surrounding land use is almost entirely given to agriculture usage with pasturelands predominating. Timahoe bog is located to the east and the main Bog of Allen to the southwest. The local pasturelands generally comprise grasslands and field boundaries composed of native hedgerows, trees and shrubs.

A small mainly deciduous woodland area exists directly west of the R403 at a distance of approximately 250m. A small lake lies within this woodland. Natural woodland also exists approximately 350m to the south east of the site.

A culverted drain runs along the northern boundary and forms a small tributary of the Cushaling river. It is reported that the vast bulk of the site drainage water is collected on site and reused in the composting process. However, on some occasions (during high rainfall events when there are high flows in the local streams) the site drainage undergoes settlement in a 3 chamber settlement tank and is discharged to the local stream under a discharge licence granted by the local authority. These occasional outfalls are nearly always carried out during high rainfall events when there is maximum dilution available in the receiving waters.

The local ecological setting is typical of similar agricultural areas near peat bogs found in this part of central Ireland and is not considered unusual in any way. A composting facility has been operational at the site since the 1960's and has not impacted on the flora or fauna in any discernible way on either a local or regional basis.

2.8 HUMAN BEINGS AND LOCAL POPULATION

In accordance with the EPA 'Advice Notes on Current Practice (in the preparation of an Environmental Impact Statements'), 2003, this chapter has considered the 'existence, activities and well being of people' with respect to 'topics which are manifested in the environment such as new land uses, more buildings or greater emissions'. Issues examined in this section include:

- Socio economics (Human beings baseline study)
- Economic Activity
- Social Consideration
- Land Use
- Health and Safety
- Employment

2.8.1 Land Use

The immediate receiving environment is predominantly an agricultural one, with sparse residential housing and agricultural land located nearby. The Carbury facility is situated just south of Derrinturn village and the primary activities are cereal farming, pasturelands and horse related industries.

2.8.2 Housing Density

In total there are 21 dwellings within 1kilometre of the site. Greater numbers of houses are located nearer to Derrinturn Village which is approximately 2 to 3 kilometres from the site.

2.8.3 Population Statistics

Co. Kildare experienced the second highest percentage increase in population per county during the period 1996-2002 increasing by 21.4% since 1996, bringing the number of people residing within the county to its highest ever level on record of 163,944.

The CCL site is located in the Edenderry No.2 rural area District Electoral Division (DED). Table 2.8.1 shows the population densities, and trends in the surrounding districts from 1996 to 2002 and shows that there has been a significant increase in population (17.9% and 42.9% respectively) in the Carbury and Windmill Cross Rural areas from 1996 to 2002.

Table 2.8.1 Population Statistics

District Electoral Division	1996 Population	2002 Population	Change in population 1996-2002
Carbury	1,399	1650	17.9%
Windmill Cross	464	663	42.9%

2.8.4 Employment

Employment is provided locally by the Carbury Compost and Mushroom growing facility itself, farming and equine industry. The local Bord na Mona Bogs provided large employment opportunities in the past and continue to do so at a lower level. Employment is also provided in the service industries located in the nearby villages of Derrinturn, Carbury and Allenwood. This area would also be considered within the commuter belt for Dublin and it is likely that some employment for the local populace is found in the greater Dublin area.

2.8.5 Human health and Safety

There are no aspects of the existing environment that provide any extraordinary issues with regard to human health and safety.

2.8.6 Other Potential Impacts

The potential impacts on human beings derived from traffic, noise, air and water quality are defined elsewhere in this EIS report.

2.9 ROADS AND TRAFFIC

2.9.1 Introduction

A traffic survey of the R403 and existing site was carried out by **Traffic***wise* Ltd. at the existing Carbury Mushroom site in Kilpatrick near Derrinturn, Co. Kildare on 29 March 2006. This survey was undertaken to quantify the existing traffic, transportation and access issues relating to the site. The Applicant had previously carried out a survey of traffic volumes on the R403 in April 2005. In addition to these surveys **Traffic***wise* Ltd. has held discussions with the Applicant regarding the existing traffic characteristics of the site.

2.9.2 Existing Conditions

2.9.2.1 Road Access

The site at Kilpatrick has direct vehicular access to the R403 via four separate priority accesses located along the western boundary of the site. The R403 is a regional road connecting Carbury to Clane via Allenwood, and operates as a single carriageway with an average width of 6.0 metres in the vicinity of the site. The current site has a frontage of approximately 215 metres onto the R403. There is no overtaking permitted on the R403 in the vicinity of the site.

In the interest of clarity **Traffic***wise* Ltd. has numbered the four accesses at the site. Access No.1 is the most northerly whilst Access 4 is the most southerly. For ease of reference these are shown in Figure 2.9.1 below. Of the four accesses, three were observed to be fully operational. Access No.2 which serves a residential dwelling is currently redundant. The majority of vehicle movements were observed at access numbers 1 and 4.

Although these are existing accesses which currently cater for all traffic including HGV movements they are all considered sub-standard in terms of the visibility requirements of the Design Manual for Roads and Bridges (DMRB).

From a set-back of 'x' distance of 2.4m Access 1 has approximately 50m visibility to the south and approximately 90m to the north, towards Carbury, whilst Access 4 has approximately 40m visibility to the south and approximately 60m visibility to the north. Access 2 also has insufficient visibility with approximately 40m to the south and approximately 70m to the north.

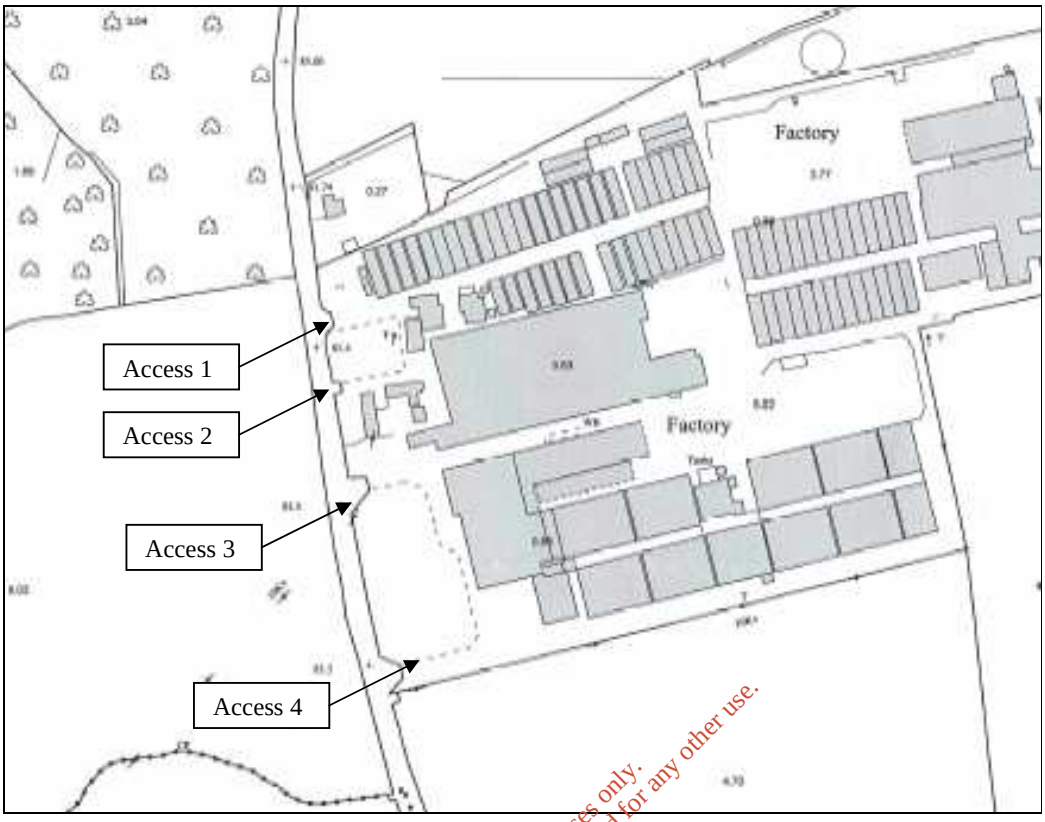


Figure 2.9.1 Current Access Arrangements

2.9.2.2 General Location in Relation to Roads Network

In relation to the national primary roads network, the area in which the existing facility is located on the R403 Regional Road is considered well served by existing roads infrastructure with connection to the N4 at the junction of the R402 with the Carbury Bypass which is located approximately 12.5km to the north of the site, and connection to the N7 via the R403 and R415, approximately 27km to the south of the site.

The site has good access to the public transport network with two bus stops located directly adjacent to Access 3. These stops are part of Bus Eireann Route 120 which serves Edenderry to Dublin and were observed to be used by staff at the existing site.

2.9.2.3 Current Local Authority Policy and Roads Objective

In summarising the current transport policies for County Kildare reference has been made to The National Development Plan 2000-2006 and the Kildare County Development Plan 2005-2011. Under Section 3 'Physical Infrastructure Strategy', as part of the overall National Roads development programme, it is an objective of Kildare County Council to carry out a number of specific projects during the plan period.

Projects which will enhance movement throughout the county include the following in relation to National Primary Roads and Motorways.

RP 1 To complete the M4 from Kilcock to the County boundary.

RP 2 To complete the M7 by pass of Monasterevin.

RP 5 To facilitate provision of an additional interchange along the N7 Naas by-pass to provide access to the Millennium Park.

RP 6 To plan for the improvement of the N7 Newhall interchange to allow for future increased capacity through the interchange through identification of an interchange footprint and its preservation free from development.

RP 7 To proceed with development of the third lane in each direction along the N7 including improvement of interchanges as the need arises.

RP 10 To investigate in conjunction with the relevant authorities, the long term potential for a relief motorway to the existing National Primary Route between Naas and the Dublin County Boundary.

RP 13 To identify and provide a bypass of Johnstown Bridge to divert traffic travelling from the N4 to Allenwood and vice versa in the interest of safety for pedestrians in the village.

As part of the roads development programme, it is also and an objective of the Local Authority under policy RP14 to improve the Regional Road network. The regional roads serving the existing site are included within the regional roads listed for improvement under policy RP14 of the County Development Plan.

The local authority has also identified the section of the R403 from Carbury to Allenwood with the following objective:

RR 1 To avoid the premature obsolescence of identified regional roads through the creation of excessive levels of individual entrances and to secure the recent investments in non-national roads, it is the policy of the Council to restrict new accesses onto these roads where the 100km per hour speed limit currently applies (proposed to be changed to 80km/h).

Exceptions will be considered on their merits in the following circumstances:

- Developments of a strategic, local, regional or national importance, particularly where there is a significant gain to the County through employment creation or other economic benefits.
- Where it is proposed to demolish an exiting dwelling and replace with a new dwelling.

2.9.3 Quantification of Current Traffic Flows

2.9.3.1 Threshold for Traffic Assessment

In establishing the scope of a traffic impact assessment the Institution of Highways and Transportation recommends the following:

> *"Although most TIAs relate to large or extensive developments it should be recognised that the movement of two milk tankers to a remote farm down a country lane may, in certain circumstances, be deemed to be unacceptable by the planning authority. In contrast, some city centre developments may attract a large proportion of their trips by public transport. This is often ignored because, whilst car trips form a much lower relative trip proportion, their impact often requires more detailed analysis."* *(Reference - IHT Guidelines for Impact Assessment: para 7; page 5)*

> *"It is, therefore, not possible to provide any hard and fast rules as to what constitutes a significant traffic impact and hence one for which a full traffic impact assessment should be undertaken. The Guidelines therefore recommend that a TIA should normally be produced where one or other of the following thresholds are exceeded:*
> *(Reference - IHT Guidelines for Impact Assessment: para 8; page 5)*
>
> - *Traffic to and from the development exceeds 10% of the two-way traffic flow on the **adjoining highway***
> - *Traffic to and from the development exceeds 5% of the two-way traffic flow on the **adjoining highway** where traffic congestion exists or will exist within the assessment period or in other sensitive locations*
>
> *These thresholds should be applied in the absence of alternative guidelines from the highway (roads) authority in the form of approved or adopted policy."*
> *(Reference- IHT Guidelines for Impact Assessment: para 9; page 6)*

> *"It is recommended that the threshold approach should also be used to establish the area of influence of the development. Hence the study should include all links and associated junctions where traffic from the development will exceed 10% of the existing traffic (5% in congested or other sensitive locations) or such other threshold as may have been adopted by the highway (roads) or planning authority."*
> *(Reference - IHT Guidelines for Impact Assessment: para 13; page 6)*

In accordance with the above advice we have included in our assessment locations on the local roads network considered as having the 'potential' to experience increases in traffic flow of +10% as a direct result of traffic generated by the proposed development.

2.9.3.2 Data Collection - Traffic Surveys

2.9.3.2.1 Extent of Traffic Surveys

In establishing the scope of the study, given the proposed nature of development at the site, it was thought that the influence of any additional traffic generation manifest on the local roads network was not likely to be significant beyond the immediate vicinity of the existing site.

In order to establish traffic volumes on the road network in the vicinity of the proposed development, the Applicant surveyed traffic volumes on the R403 in April 2005. This survey was undertaken prior to the opening of the M4 Motorway.

In addition to this data, **Traffic***wise* Ltd. has undertaken a separate classified traffic turning count survey to establish the volumes of traffic turning to and from the site. The latter traffic survey was carried out on Wednesday 29 March 2006 from 16:00 to 19:00hrs, to encompass traffic generated by the site at network peak hour identified from the former 2005 survey.

It is normal practice that traffic surveys are carried out on a 'neutral' day of the week. Wednesday was selected as the traffic flows manifest on this 'neutral' day of the week are normally representative of typical traffic conditions on the local roads network. It is proposed that the two sets of survey data will be used to identify any changes in daily traffic patterns on the R403 Regional Road, since the opening of the M4 Motorway.

A summary of the results obtained in the 2005 traffic survey is shown below in Table 2.9.1.

Table 2.9.1 Vehicle Movements on R403 (AM and PM Peak 2005)

Movement			AM Peak Hour 08:00-09:00hrs	PM Peak Hour 17:30-18:30hrs
1	Carbury to Allenwood (R403)	Cars	280	165
		HGV	19	11
2	Allenwood to Carbury (R403	Cars	155	328
		HGV	22	22
Total		Cars	435	493
		HGV	41	33

For the 2006 classified turning count survey there was a total of 14 possible vehicle movements at the site. These are as follows:

Movement 1 – Carbury to Allenwood (R403)
Movement 2 – Allenwood to Carbury (R403)
Movement 3 – Access 1 to Carbury
Movement 4 – Access 1 to Allenwood
Movement 5 – Allenwood to Access 1
Movement 6 – Carbury to Access 1
Movement 7 – Access 3 to Carbury
Movement 8 – Access 3 to Allenwood
Movement 9 – Allenwood to Access 3
Movement 10 – Carbury to Access 3
Movement 11 – Access 4 to Carbury
Movement 12 – Access 4 to Allenwood
Movement 13 – Allenwood to Access 4
Movement 14 – Carbury to Access 4

No vehicles were observed to carry out the following movements during the survey for the PM peak hour: Movements 5, 6, 7, 9, 10, 13, and 14.

The PM peak hour results obtained from the 2006 traffic survey are shown below in Table 2.9.2.

Table 2.9.2 Vehicle Movements to/from site and R403 (PM Peak 2006)

Movement			17:30	17:45	18:00	18:15	PM Peak Hour Total
1	Carbury to Allenwood (R403)	Cars	31	47	30	34	142
		HGV	10	3	1	2	16
2	Allenwood to Carbury (R403)	Cars	71	81	62	58	272
		HGV	2	2	3	3	10
3	Access 1 to Carbury	Cars	-	2	1	-	3
		HGV	-	-	-	-	-
4	Access 1 to Allenwood	Cars	-	2	-	-	2
		HGV	-	-	-	-	-
8	Access 3 to Allenwood	Cars	-	-	-	-	-
		HGV	-	1	-	-	1
11	Access 4 to Carbury	Cars	2	3	-	-	5
		HGV	1	-	-	-	1
12	Access 4 to Allenwood	Cars	-	-	1	-	1
		HGV	-	-	-	-	-

2.9.3.2.2 Identification of the Road Network (R403) Peak

From the 2005 traffic survey, the peak hour accumulative two-way traffic flow on the R403 in the morning shows 435 car movements and 41 HGV movements. Of these vehicles 280 cars and 19 HGVs travelled southbound, whilst 155 cars and 22 HGVs travelled northbound.

The peak hour accumulative two-way traffic flow on the R403 as recorded in the evening for the 2005 survey shows 493 car movements and 33 HGV movements. Of these vehicles 165 cars and 11 HGVs travelled southbound, whilst 328 cars and 22 HGVs travelled northbound.

The 2005 traffic survey indicates that the R403 network peak hour occurs in the evening.

Following on from this **Traffic***wise* Ltd carried out a classified turning count survey to evaluate any changes in network peak hour flow volumes and to establish how existing site generated traffic impacts upon this peak hour flow.

From the 2006 survey, the evening peak hour period on the R403 past the site was recorded as being 17:30-18:30hrs. The peak hour two-way traffic flow on the R403 in the evening shows 440

movements, 414 of which are cars and light vans and 26 of which are HGVs. Of these vehicles 272 cars and 10 HGVs travelled northbound towards Carbury, whilst 142 cars and 16 HGVs travelled southbound towards Allenwood.

Comparing data from both surveys, the two-way traffic flow on the R403 has decreased from 526 vehicles in 2005 to 440 vehicles in 2006 for the PM peak hour flow (-16%). This observation is contrary to general traffic patterns on most roads in the Greater Dublin Region, whereby traffic volumes have been growing at a steady rate, and is explained by the recently opened M4, which has re-configured traffic patterns in Kildare County, encouraging transfer of road users from regional roads to a motorway environment.

The 2006 survey highlights the low level of traffic generated by the site whilst operating under its current license.

13No. vehicles exited the site during the peak hour, with no vehicles entering. Of these 13No. vehicles, 7No. exited via Access 4, 5No. exited via Access 1 and 1No. via Access 3. Of these 13No. vehicles only two were HGVs, which suggests the majority of traffic was composed of staff leaving at the end of their shifts, which the Applicant has confirmed usually occurs between 16:00-18:00hrs.

A copy of the survey data together with a network diagram of the junctions surveyed is provided in Appendix 2.9.1

2.9.3.2.3 Traffic Generation of the Existing Site

In order to estimate the daily levels of traffic generation at the site we have based our calculations on data provided by the Applicant. Carbury Mushrooms Ltd. has supplied information relating to quantities of incoming and outgoing materials, directional distribution of current deliveries and working hours and staff numbers.

Table 2.9.3, as shown below, outlines for each material processed at, or exported from, the site, the total annual tonnage, average weight per load and number of loads per week and per day, which yields a traffic generation rate for HGVs. Also shown is a likely traffic generation rate for light vehicles.

Traffic Generation - Commercial HGVs

The applicant currently operates a fleet of three rigid vehicles which are solely used to bring horse manure to the site. A separate fleet of seven vehicles, operated by a freight company in Monaghan, transports the majority of exports from the site.

The opening hours of the site are 05:00-22:00hrs for each day of the week. However for traffic related matters, HGV movements are limited to weekdays as no raw material deliveries come into the site at the weekend. Therefore the average daily traffic generation rates for the site have been based on a five day week.

From the data provided by the applicant, it is estimated that approximately 45% of all incoming HGV traffic accesses the site from the north with 55% coming from the south and 72% of all outgoing HGV traffic turns north onto the R403 with 28% turning south.

The quantities of some materials required in processing are affected by seasonal factors i.e. the facility accepts approximately 38 loads per week of horse manure in the winter months and 25 loads in the summer months. However in our assessment we have taken the upper bound quantity and assumed a conservative weekly average of 38 loads.

Phase 1 Compost and Phase 2 Compost when produced on site, are transported internally through the site and associated vehicles do not usually access the adjoining road network, unless there is a surplus of material, which is exported. For the purpose of this report and in the interest of a robust assessment, we have assumed that an excess of 4No. loads of each material per week is exported externally.

Carbury Mushrooms Ltd has provided a likely range of weights according to each type of vehicle and payload that is currently arriving or departing the site. For the purposes of this assessment, in order to carry out a 'robust' analysis of traffic impact we have assumed a conservative estimate of the average payload for each vehicle type.

As outlined above, the figures shown in Table 2.9.3 can be considered robust due to the assumptions listed above. As explained this has been done in the interests of a thorough assessment in order to provide the planning authority with a level of confidence that fluctuations in traffic volumes to the site have been taken into account.

Traffic Generation - Light Vehicles and Staff

In addition to HGVs, clearly there are other sources of traffic generation at the site. This traffic arises primarily from staff, sundry visitors etc.

Carbury Mushrooms Ltd. currently employs 133 staff. Working hours are staggered and change on a weekly basis in accordance with demand, but shifts generally start every hour from 05:00 to 08:00hrs.

From observation there are currently 43 cars staff and visitor cars parked at the site. Observed car occupancy during the 2006 traffic survey is equivalent to 2-3 persons per car.

During the evening peak, **Traffic***wise* Ltd. also observed a total of 10 staff members waiting for a bus to Edenderry over the course of the afternoon of the traffic survey. This suggests that approximately 10% of staff use public transport to get to the site and that car sharing amongst colleagues is popular.

In the interests of a robust assessment, we have assumed that each staff car would generate 1.5 trips per day, to account for journeys to nearby towns and villages for commercial purposes at lunchtime. Taking this factor into account we have calculated the existing traffic generation of the site with the results presented in the Table 2.9.3 below.

Table 2.9.3 Existing Traffic Generation Arising from Composting Operations

Material	Type of vehicle	Existing Quantity (t/yr)	Average Weight per HGV (tonnes)	Average HGVs per Week	Average HGVs per Day	Total Trips per Day
Incoming						
Horse Manure	Rigid Truck	23,000	11.5	38	7.7	-
Poultry Litter	Artic & Semi Trailer	15,000	24	12	2.4	-
Straw	Artic & Semi Trailer & Tractor & Trailer	28,600 bales per annum	30 bales per load	18	3.7	-
Gypsum	Artic & Semi Trailer	2,185	24	2	0.4	-
Fuel	Rigid Truck	-	-	2	0.4	-
Peat	Artic & Semi Trailer	-	-	4	0.8	-
Sundry	Mixed (Rigid/Articulated)	-	-	1	0.2	**15.6**
Outgoing						
Phase 3 Compost	Artic & Semi Trailer	38,270	23	32	6.4	**-**
Phase 1 Compost		-	-	4	0.8	**-**
Phase 2 Compost		-	-	4	0.8	**-**
Spent Compost	Tractor & Trailer	11,230	12	18	3.6	**-**
Mushrooms	Artic & Semi Trailer	3,690	7.1	10	2	**13.6**
Total HGVs	Mixed Rigid & Articulated	-	-	-	-	**29.2**
Staff	Private Car	-	-	-	-	**64.5**

(Note: Figures were provided by the Applicant.)

From Table 2.9.3, it is clear that the site currently generates a low volume of traffic with a total of 94 trips per day. Of these 94 trips, 65 are private vehicles (staff) and 29 are HGV (commercial deliveries). On the basis of a peak hour factor of 10 percent, the existing composting facility generates typical peak hour volumes of about nine vehicles to/from the site, consisting of six private vehicles and three HGV. This analysis complements and validates observed movements during the 2006 survey where in the PM peak hour 13 vehicles (11 cars and 2 HGVs) were seen to enter/exit the site.

Following on from this and after discussions with the Applicant we consider that the peak hour site generated traffic coincides with the peak hour on the road network. Elsewhere throughout the off-peak periods of the day, trips are expected to be relatively well distributed, with typical hourly traffic volumes to/from the site of approximately five vehicles, during the off peak period between 09:00 to 21:00hrs.

2.10 LANDSCAPE AND ASSESSMENT

2.10.1 Scope and Methodology

The methodology is based on the *EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (EPA, 1995) and EPA *Waste Licensing Guidance Notes* (EPA, 2000).

The assessment involves a description of the visibility of the development and an assessment of the development on the landscape character of the area.

The visibility of the site is assessed in terms of its visibility from a number of features including roads, residences, designated tourism routes and viewing points.

The landscape character of the area is defined by a number of both natural and man-made features including topography and drainage, landform, land use, habitats, enclosures, built environment and traffic.

The assessment included a desk study comprising the following elements:

- A review of the Kildare County Development Plan 2000.
- A review of relevant Ordnance Survey maps
- A review of relevant literature and reports

A field study was conducted on 19th January 2006 to assess land use, landscape character, and visibility.

A photographic record was also compiled. Photoplates are contained in Appendix 2.10.1.

2.10.2 General Landscape Character

The site is located on the regional R403 road which serves Derrinturn village directly to the north as well as acting as a link road to neighbouring towns and villages including Allenwood, Carbury, Edenderry, Prosperous and Clane. Adjacent land use is composed predominantly of agricultural land with cereal crops, pasturelands and equine pursuits. The Timahoe bog lies to the east and the Bog of Allen to the southwest. There is a proposal for a large landfill to be constructed at Drehid to the northeast (Bord na Mona). The general topography in the immediate vicinity of the site is low-lying and generally flat at an elevation of approximately 80m O.D. There is a rise in elevation approximately 5km northwest of the site, at Carbury, reaching a peak of 142m.

Two 10Kv ESB transmission lines run along the southern boundary of the site and along the road frontage (western boundary) of the site. The Allenwood North power station which is now disused is located 4km southeast of the site.

The Cushaling River runs in a southwest direction approximately 400m to the north of the site.

The visual character in the direct vicinity of the development is agricultural. The site is bounded to the east and south by agricultural fields while to the north and west are residential dwellings including Drummin House which is surrounded by woodland. The agricultural land is typical of this type of environment with fields divided by generally mature hedgerows, trees and shrubs.

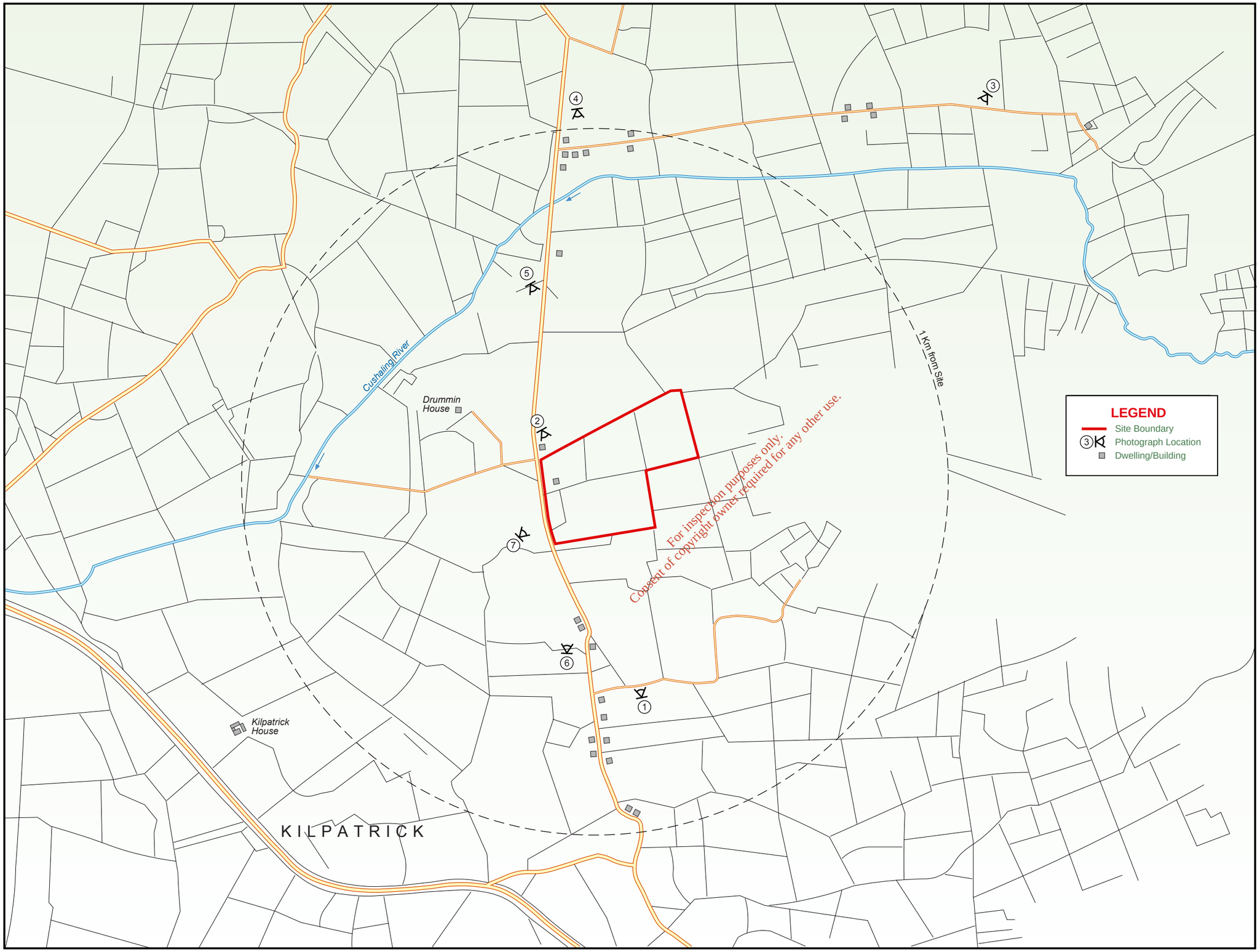
There are 22 residential dwellings within 1km of the site (as shown in Figure 2.10.1) although there are no housing estates nearby other than those in Derrinturn village.

2.10.3 The Existing Site

The existing site comprises an composting facility and mushroom growing facility and is approximately 9.4 ha in extent. The entire site is currently covered by a concrete slab and there are a number of buildings on site including composting tunnels and mushroom growing tunnels as well as bagging plants and administration buildings. The majority of these structures were erected in the 1950's and 1960's and have an outward expression of bare concrete blocks, concrete and some plastering with tegral type roofing. The age of the buildings is very evident with many exhibiting a worn and in some cases a dilapidated appearance. It is proposed to demolish many of these and replace some of them with new custom built structures (reception hall and composting tunnels). The existing and proposed layouts are shown on Figure 1.1.2 and Figure 1.1.3.

The existing site is surrounded on all sides by fencing and/or hedgerows. There are relatively strong and mature hedgerows located along the northern boundary. The western and southern boundaries are moderately strong with hedgerows and trees though are a little gappy. The eastern boundary has relatively low quality screening though there are no dwellings with views of the site from this direction.

The existing site boundaries provide strong screening for the facility particularly from the north and west. The existing facility has been operating since the 1960's and has to some extent become embedded in the local landscape.



0 200 400 600

Scale 1 : 15,000 approx.
Scale 1 : 10,560 or 6" = 1 mile @ A3
METRES

NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Carbury Composting Ltd.
Photo Point Locations & Housing Survey

Figure No. 2.10.1 | Job No. C003393 | Date. Jan. 2006
Finalised By - DMcD

White Young Green

JF(10)

2.10.4 Visibility

There are limited views of the site from most directions with the exception of the view from the R403 which runs along the west of the site. The low chainlink fence and hedgerow with a sparse row of trees at the front of the site leave the front of the site relatively open however there are no dwellings located within this view.

Views from the nearest sensitive receptor (PP2.10.1) are as might be expected from a dwelling which has a boundary with the site. The house which is occupied by workers on site looks out onto the R403 but would have views directly into the site from the side and rear though are reasonably well screened by a hedgerow.

There are limited views of the site (PP 2.10.2) from the access road to Drummin House directly across the R403. These views are confined to the first 50m of the access road and consist predominantly of a portion of the yard where the tops of windrows can be observed. The site is largely screened by more densely planted trees on the grounds of Drummin House.

There are very limited views of the site from the south as can be seen on PP 2.10.3 which shows the views from the third class road running east west within approximately 700m of the site. The views are well screened by mature trees along the road and trees along intervening field boundaries. The tops of the main processing buildings are just visible over the tree tops.

There are almost no views of the site from the third class road (PP 2.10.4 and PP 2.10.5) which runs approximately 900m to the north of the site. A number of rows of hedgerows and trees along the intervening field boundaries provide substantial screening to the site.

Therefore there are very limited views from the residential dwellings on the third class roads north or south of the site.

2.10.5 Site vegetation

There are no natural or semi-natural habitats on the site. A line of sparse trees and hedgerows is located along the boundary at the western boundary of the site.

2.10.6 Landscape Planning

2.10.6.1 Kildare County Development Plan 2005

A review of the Kildare County Development Plan 2005-2011 was undertaken with respect to visual/landscape designations.

It is the councils policy "To continue to permit development that can utilise existing infrastructure, whilst taking account of local absorption opportunities provided by the landscape, landform and prevailing vegetation." The proposed expansion of the Carbury Facility will reuse much of the existing site infrastructure and compliment this with some new development. The surrounding landscape, landform and prevailing vegetation although mainly made up of low hedgerows and scattered trees provides good screening of views from almost all sensitive receptors in the environs of the proposed facility as described in section 2.10.5.

2.10.6.2 Designated Views & Aspects

The site is not covered by any environmental designations. It is not located in an area of high scenic amenity and there are no designated views or aspects at or in the vicinity of the site.

2.10.7 Photographic Record

The attached photoplates (Appendix 2.10.1) provide a photographic record of the proposed site, surrounding areas, landscape character, views and features. The photographs were taken using a digital camera. The points from which each of the photographs was taken have been recorded. Photopoint locations are illustrated in Figure 2.10.1.

2.11 CULTURAL HERITAGE

2.11.1 Site location

The proposed development is located in the townland of Drummin, near Derrinturn, Co. Kildare.

2.11.2 Characteristics of the Proposed Development

The site is an existing facility and covers an area of 9.4 ha to include both the composting (5.03 ha) and the mushroom growing operations. There are a number of large buildings and the entire site is covered with a concrete slab. The proposed expansion involves the demolition of many of the existing buildings and replacing some of these with new buildings. The new development will be contained within the existing boundaries and will not entail any ground disturbance outside of the existing site footprint.

2.11.3 Baseline Archaeological Data

For the purpose of setting the proposed development within its wider archaeological and cultural heritage landscape, and to assess the archaeological potential of the site, an outline search of all available archaeological, historical and cartographic sources was undertaken. It should be noted that none of the monuments referenced below will be directly affected by the proposed development.

2.11.3.1 Recorded Archaeological Sites and Monuments

A search was undertaken of the record monuments protected under S12 of the National Monuments (Amendment) Act 1994. This is a list of archaeological sites known to the National Monuments Service. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, OPW Archaeological Survey notes and other relevant publications. There are no known sites of archaeological importance on or in the immediate vicinity of the site. Table 2.11.1 below gives a brief description of the nearest archaeological features to the site.

Table 2.11.1 Archaeological Features within the Surrounding Area

Number	Nat Grid Ref.	Townland	Classification	Distance from Site
1	E27122 N22966	Kilpatrick (Kilpatrick E.D.)	Graveyard	600m
19	E27063 N23112	Rathmore (Windmill Cross E.D.)	Rectangular enclosure site	1020m

2.11.3.2 Recorded Archaeological Finds

It is reported in the EIS for the proposed Bord na Mona landfill facility located at nearby Drehid, Co Kildare (within 3km of the site) that a number of archaeological artefacts have been recovered within its proposed development site. These sites were identified as toghers, simple planked, gravelled or flagstone pathways used to cross the bog. These trackways are reported to suggest human activity from as early as the Neolithic period (4000-2000BC).

2.11.4 Archaeological significance of the site

There are no records of any archaeological features at the site. In addition, if any were in evidence it is likely that the earlier development of the site in the 1960's including the construction of the existing buildings and concreting the site will have removed these traces. The proposed development area will be contained within the existing site boundaries and will not include any ground disturbance or visual impact outside of the existing footprint.

2.12 MATERIAL ASSETS

2.12.1 Introduction

The CCL site is located in the townland of Drummin, approximately 2km south of Derrinturn village, Co Kildare along the regional R403 road. This road is one of the main arteries in north Kildare acting as a link road between roads serving Edenderry, Enfield, Kinnegad, Robertstown Prosperous, Clane and Naas as well as serving the local villages and towns of Derrinturn, Carbury and Allenwood.

The site is located in an agricultural setting along the R403 with little other industrial/commercial activities in its environs. Material Assets in the area consist of infrastructure, industry, agriculture and tourism. Housing in the immediate area is low density, the nearest residential dwelling is located directly adjacent to the site to the north west. Otherwise the area is characterised by scattered rural housing along the R403 and third class roads.

2.12.2 Industry

Local industry is predominantly confined to agricultural activities and bloodstock. A survey of the immediate vicinity shows that the surrounding environment is dominated by farm land and bog land with cereals, pastures and horse rearing the predominant agricultural practices.

The site is located between Derrinturn and Allenwood on the R403 and is therefore close (approximately 11.5km) to one of Ireland's busiest routes, the N4. The largest towns in the vicinity are Enfield and Edenderry and these are small to medium sized towns where small industrial estates and the services industry are in place providing employment to the locality. However significant proportions of the population commute to work in the electronic, computing and manufacturing industries of the surrounding towns and west Dublin City.

There are no quarries located in the vicinity of the site.

2.12.3 Infrastructure

Infrastructure within the region includes the M4 motorway which is located approximately 11.5km to the north of the site. The main Dublin and Sligo railway line is also located a similar distance to the north and runs along the M4. Other road infrastructure in the area consists of regional and third class roads. The Cushaling river flows from east to west to the north of the site and joins the Figile River to the south of the site. The Grand Canal is located 1.2km south of the site.

2.12.4 Tourism

The site is located in a rural area approximately 10km east of the nearest town being Edenderry. The surrounding area which does not possess dominant features such as mountains or lakes has a limited appeal to tourists although several small villages including Carbury, Nurney and nearby Robertstown have been designated “Special Villages” due to their overall special amenity character and quality. Fishing is also a popular activity on the counties many rivers and water courses including the nearby Grand Canal. There are many horse stables and stud farms in the county and some relatively small commercial stables in the locality.

SECTION THREE

3.0 DESCRIPTION OF SITE

3.1 GENERAL

This section of the Environmental Impact Statement contains a description of the development, specifically the physical attributes of the site and the nature and extent of the processing facilities and procedures. Other non-physical attributes such as employment and hours of opening are also addressed. A complete set of Engineering Drawings is provided in Section 6 of the EIS. These are referenced as Drawings 3154 CPL-'06 1.01 to 3154 CPL-'06 3.04 and show the site layout, plans, elevations and sections.

3.1.1 Current Position

CCL currently operate a composting facility at their site located at Drummin, Carbury, Co. Kildare (see Figure 1.1.1 location map, Drawing 3154CPL-'06 1.01 Site Location Plan and Drawing 3154CPL-'06 1.02 Site Layout Plan 1). The existing site processes straw, horse manure, poultry litter, water and gypsum to produce compost and the site also incorporates a mushroom growing operation. Approximately 22% of the compost produced is used in the on-site mushroom growing operation and the remainder is exported off site to other mushroom farms. The existing facility was granted planning permission from Kildare Co. Co. and has operated under a Waste Licence issued by the EPA since August 2004. The raw materials comprising of horse manure, poultry litter and gypsum are collected from horse stables, poultry farms and Gypsum Industries Ltd. and delivered to the site. Straw is sourced from a variety of sources within the region.

The processes carried out at the existing site comprise 3 phases of composting and use of open windrow and tunnel composting methods. In summary, the raw materials are imported and stored on site in the reception area. The straw bales are wetted by dunking the bales in water. These are then broken up and blended with the manure, litter and gypsum, placed in stacks on aerated pads for 6 – 7 days and then put in windrows for the remainder of the process. The windrows are turned by specialised turning machines about every second day and the material is kept moist by adding water if required. The entire site is concreted and all drainage from the yard is contained and collected into a storage tank located along the northern boundary. All of this drainage water is reused on site in keeping the compost moist during the composting process. Phase I takes approximately two weeks to complete and then the material is moved to phase II. Here the material is composted in tunnels with forced aeration from the floors of the tunnels. When phase II is complete, the material is taken from the tunnel, spawned with mushroom spawn and replaced into another tunnel for the phase III process, which is similar to the phase II process. The weight and volume of the material reduces considerably during the entire composting process.

The finished compost is then ready for use. All of the compost is used in the mushroom growing industry. Approximately 22% is used in the mushroom houses currently located on the site and the remainder is exported to other mushroom farms. The bulk of the compost is exported in bulk loads. A small percentage is moulded into small blocks and either used on site or exported.

3.1.2 Proposed Development

The Company intends to expand its operations to process up to 160,000 tonnes of raw materials per annum. Key to this proposal will be the complete restructuring of the site infrastructure and upgrading of facilities on site. Many of the existing compost and growing buildings will be demolished and replaced by new structures. (See Figure 1.1.3, Drawing No. 3154 CPL-'06 1.02 Site Layout Pan 1 and Drawing No. 3154 CPL-'06 1.03 Site Layout Pan 2. The main features of the proposed restructuring are as follows:

- The demolition of many of the existing buildings.
- The construction of a new raw material reception hall building in the northeast of the site. This building will be used for the importation and storage of the raw materials used for composting. The building will be completely contained with concrete base, walls, roof and roller shutter doors. The raw materials will be stored in designated bays located within the building. The bays will consist of low concrete walls dividing one from the other and will store poultry litter, horse manure and gypsum.
- The construction of a new bunker composting facility for the phase I composting process to be located adjacent to the southern wall of the reception building. This will consist of a building containing 14 enclosed concrete bunkers each with access from the northern (internal) side.
- The installation of modern mixing/blending plant. This will be located in the reception building and will provide an efficient method of blending the raw materials prior to composting. This will be connected to a new state of the art distribution system. The distribution system provides a controlled and mechanised method for depositing the mixed material into the new phase I bunkers. The material will be distributed evenly in the designated bunker from the distribution system at the top (roof area) of the bunker. The bunkers will incorporate a forced aeration system from the floor of each bunker.
- The design of a new straw storage and wetting area in the northeast corner of the site.
- The construction of new phase II / III composting tunnels located just to the west of the new phase I bunkers.
- Installation of wheelwash facilities near the site entrances
- Installation of oil tank complete with bunding.
- Installation of a new 250,000 gallon water storage tank (tank B) for the storage of drainage water from the reception hall, floor drainage from the composting bunkers and tunnels and effluent from the site offices, canteens, toilets and washrooms.

- Installation of two new site entrances along the western (road) boundary and closure of the three existing entrances.

Ancillary facilities such as site roads and surface drainage infrastructure are proposed to service the upgraded facility and are outlined on Engineering Drawing 3154CPL-'06 1.03 Site layout Plan 2.

CCL recognise that in order to carry out their activities in an environmentally sound manner and to operate competitively in the present economic market that the viability of their operation is dependent on an economy of scale at the Carbury plant. The increased capacity and production of compost will be necessary to facilitate the complete restructuring and modernisation of the site as detailed in this proposal.

3.2 FACILITY DESIGN

3.2.1 Infrastructure

The existing and proposed site layouts are shown on Figure 1.1.2 to Figure 1.1.3 from Section 1 of the EIS and on Drawings No. 3154CPL-'06 1.02 Site Layout Plan 1 and 3154CPL-'06 1.03 Site Layout Plan 2. Details of all infrastructure currently on the site and proposed in the expansion are given in the following Sections (3.2.1.1 to 3.2.1.18).

3.2.1.1 Facility Security Arrangements

All perimeters are surrounded by fencing, hedgerows or walls. Steel gates will be located at the proposed new site entrances. The gates are locked between 10pm and 5am.

3.2.1.2 Designs for Facility Roads

Access to the facility is from the R403 Road linking Allenwood to Carbury. This road is used by both incoming and outgoing vehicles. The internal route surfaces in the facility comprise concrete paving.

3.2.1.3 Design of Hard Standing Areas

Practically the entire site is covered with concrete paving. All hardstandings for the proposed upgraded areas will consist of reinforced concrete, which will accommodate the proposed drainage system as detailed in Drawing No. 3154CPL-'06 1.03 Site Layout Plan 2. New and upgraded concrete areas are a minimum 200mm specification.

3.2.1.4 Weighbridge

Two weighbridges will be installed at the site, each will have a capacity to weigh up to 60 tonnes and measure some 18m X 4m. All incoming raw materials and outgoing compost loads are weighed and docketed with the relevant information including the material type and quantity, origin/destination of the material, date, time, haulier and vehicle registration.

3.2.1.5 Wheel Wash

Wheelwash facilities will be installed near the site entrances. All trucks exiting the site will be required to pass through a wheelwash. Water discharges will be passed through an interceptor incorporated in the wheelwash and directed to the water storage tank (tank B) for reuse in the composting process.

3.2.1.6 Fuel Storage

There are two 46,500 L gas oil storage tanks located at the southern side of the site. These are used for the generators, boilers and site plant such as wheel loaders. The tanks will be fully inspected and tested to ensure that they comply with all regulations and requirements for oil storage tanks and bunds.

It is proposed to install a 37,500 L derv tank with bund at the western perimeter of the site. This will be used to store road going fuel for the site trucks. The tank will be enclosed in a fully contained concrete bund with a minimum capacity of 110% of the volume of the tank contained and an inspection procedure will be formatted to deal with rainwater etc. The tank will also be surrounded by a ramped concrete apron such that any spillages that may occur during loading/unloading of the tank will be contained in a controlled manner and can be dealt with by site operatives.

All inlets, outlets, vent pipes and valves associated with the fuel/oil tanks will be contained within the bunded area. The bund will be covered with a canopy to prevent rainfall ingress to the bund.

3.2.1.7 Materials Inspection

The raw materials used at the facility are in most cases imported from longstanding client sources who are fully aware of the type of material acceptable at the facility. There are very few cases of unacceptable loads arriving at the facility. Notwithstanding the above all material brought to the facility will be tipped out onto the floor of the relevant bay in the reception building and inspected thoroughly at this point. Unacceptable material, if present, will be reloaded and sent back to the supplier. If this is not possible then the material will be stored in a designated bay located in the reception building awaiting export. The reception bays will be designed with concrete floor and surrounded by concrete walls on three sides.

3.2.1.8 Traffic Control

The existing access road to the facility is in excess of 7 m wide. Vehicles entering and leaving the facility will have adequate sight distances in both directions. Traffic control within the site boundaries will be provided by appropriate signage and a 10 km/h speed limit to be enforced internally.

Adequate car parking facilities for staff and visitors will be provided at the site near the main site offices.

3.2.1.9 All Services

The facility is supplied with electricity, telecommunications and mains water. These services will be upgraded on site for the new proposals as required.

3.2.1.10 Sewerage and Surface Water Drainage Infrastructure

Foul Water Management

Sewage effluent from the site toilets, and effluent from the canteens and washrooms will be collected and sewered to the septic tank located along the northern boundary of the facility. The effluent will be pumped from here to the new water storage tank (tank B) for use in the composting process.

The internal floor drainage from the reception hall and composting bunkers and tunnels will be directed by drainage to the new storage tank (tank B) for reuse in the composting process. There will be a requirement to sterilise two of the tunnels in the phase II building once per week. These will be washed down once per week and this will form part of the internal drainage from the tunnel buildings.

It is expected that there will be some 115 staff working on site to include the composting and mushroom growing businesses. Based on a maximum usage of 80 L/hd/day this will generate some 9.2m^3 of effluent per day. Internal drainage from the floors of the reception hall and composting tunnels can not be predicted accurately at this stage. However, as there is no potential for rainfall to gain access to the materials it will comprise solely of seepage from the processes and floor washdown. It is considered that a notional volume of 2m^3 per day would be ample to cover this item at present. Records will be maintained from the first few months of operation to confirm the exact volumes of internal drainage.

Surface Water Management

Surface water discharges are generated by precipitation falling on the roof of the Buildings and the hardstanding areas of the site. As the entire site will be either roofed or concreted then the entire site will be considered for the management of surface water drainage.

All surface water drainage is contained and controlled on site by the concrete base that covers the site. Surface water drainage from many parts of the site presently comprises soiled water as much of the rainfall is in contact with the open windrows and raw material storage areas. All surface water is collected and stored in the existing water storage tank (tank A) and is reused in the composting process.

The new facility will include for all raw materials (apart from straw) to be received and stored inside the reception building. The open windrows will be replaced by bunkers which are covered in. In this way the vast bulk of drainage water from the site will be of significantly improved quality and should comprise clean rainfall. It is planned to collect all run-off from the yard areas by falls and drains and direct it to the existing water storage tank (tank A) for use in the composting process. Roof drainage will comprise clean rainfall and will be collected in separate drains and directed to the clean water storage tank (tank A). There will also be a facility to route the roof drainage directly to the local stream network. This may be required during heavy rainfall periods when the storage tanks are full. This clean rainfall will not impact on quality of the local stream network.

As part of the proposed expansion two wheel washes will be constructed at the facility. All waste water from the proposed wheel washes will be directed to the new water storage tank (tank B) via a silt trap and oil interceptor that will be incorporated into the wheel wash structures.

3.2.1.11 Aeration Equipment

The composting process is greatly enhanced by maintaining aerobic conditions within the materials. This is effected by forced aeration through the compost while it resides in the bunkers. Electrically driven fans force air through nozzles located in the floor of the bunkers and the air moves upwards through the compost. Air in the bunkers is re-circulated through the compost on a continuous basis. The compost is monitored regularly for temperature and oxygen and the amount of air added to the compost regulated.

An aeration system will be installed in both the existing water storage tank (tank A) and the new water storage tank (tank B). Liquid in the new storage tank will comprise of potentially soiled water drainage from the floors of the reception hall, bunkers and tunnels and effluent from the septic tank. This water will likely be soiled and potentially odorous liquid. The tank aeration systems are

designed to ensure that anaerobic conditions will not develop in the tanks and that there will be no odours from this potential source. Providing aerated water to the bunker composting process will also aid the maintenance of aerobic conditions here and help in reducing odours at this potential source.

3.2.1.12 Facility Accommodation

The site accommodation comprising offices, canteen and wash rooms are located near to the site entrance. Additional toilets and washroom facilities are provided in the Phase II / Phase III tunnel buildings. See Engineering Drawings 3154CPL-'06 1.03 Site Layout Plan 2.

3.2.1.13 Fire Control System

Fire alarms and fire extinguishers will be installed throughout the facility. Contact numbers for emergency services, including fire brigade will be clearly posted adjacent to all telephones on site. Smoke detection alarms will be employed in all buildings. The CCL facility will be fully serviced by a mains water supply and there are also a number of water wells that can be used to provide a water supply. Water stored in both water storage tank A (400,000 gallons) and the proposed new water storage tank (tank B - 250,000 gallons) will also provide fire fighting capability and could be used in an emergency situation.

3.2.1.14 Generators

A new generator will be located adjacent to the reception hall building. The existing generator at the phase III building will be retained.

3.2.1.15 Boilers

A boiler (light fuel oil) will be installed at the site for office heating purposes. There is one existing small boiler located adjacent to the phase II building. This may be retained or replaced by a single (bigger) boiler. The boiler is used for approximately 12 hours each week to sterilise tunnels in the phase II building.

3.2.1.16 Other Infrastructure

Adequate lighting will be provided on site.

3.3 FACILITY OPERATION

3.3.1 Overview

CCL has been operating a composting facility at the site for the over 45 years. The plant serves to produce compost in a three phase process for use in the mushroom growing business.

3.3.2 Raw Materials

The raw materials used on site to produce compost consist of straw, horse manure, poultry litter, gypsum and water. All materials apart from the straw are delivered to the facility by covered trucks (horse manure trucks are covered with a net). On arrival, the materials will be weighed and documented and directed to the reception hall where they will be deposited in the relevant bay area. The reception hall has designated storage bays for poultry litter, horse manure and gypsum. Straw is stored outside the reception hall (to the northeast).

3.3.3 Facility Processes

The main processes carried out at the facility are as follows:

Phase I

The straw will be stored in a designated area outdoors in the northeast corner of the site. Prior to preparing a batch for composting the straw bales will be dunked in a large vat containing water from the new water storage tank (tank B). The bales are dunked for approximately one minute to allow full wetting. The wet bales are then stored in a designated area adjacent to the vat. This starts a heating process in the bales which is allowed continue for up to three days. At this point the bales are loaded onto the blender, strings are removed and the bales are then broken up. The horse manure is added in proportion as is the pre-mixed poultry litter and gypsum (these are pre mixed in one of the bays in the reception hall). A portion of water from the new water storage tank (tank B) will be added to the blended materials.

The straw and horse manure provide the carbon and structural fibre for the process. The poultry litter provides the bulk of the nitrogen and a certain amount of very degradable carbohydrates. The gypsum reduces the greasiness which occurs in the mix and also has a big influence on the pH levels.

The blended materials are then deposited in the phase I compost bunkers. This is carried out by an automatic conveyor system from the blender and the mixed material is deposited evenly in each

bunker in the phase I complex. Not all bunkers are in use at any one time (max 12 out of 14). The bunkers are modern and of concrete construction and measure some 8.5m wide by 7.6m high by 42m long (internal dimensions). There will be 14 bunkers located side by side in the phase I complex. The bunkers incorporate a forced aeration system through the floor of the bunkers. Air is provided by electric fans which force re-circulated air through nozzles located in the bunker floor. The compost is monitored regularly for temperature and oxygen by remote telemetry and controlled by modern computerised systems. In this way more or less air can be added as required and this in turn regulates the temperature. For the first 6 – 7 days, it is planned to remove the compost from a bunker every 2 to 3 days, turn and mix it (add water from tank A if required) and put it back into an empty bunker. This aids the process of aeration and composting and ensures that there are no isolated hot (or cold) spots in the material. Additional horse manure and/or chicken litter may be added during the first two mixes. Water is added as required on the conveyor line and during the mixing/transfer process. After the final mixing/transfer process is complete (c. 6 - 7 days), the material is placed in the bunkers and left for 4 to 5 days. It is estimated that the material will be composted in the phase I complex and emptied on the 13th day.

The bulk of the odour generation at the site comes from the phase I process. When phase I is complete there are significantly reduced odours from the materials. By receiving and storing the raw materials in the reception building, enclosing the phase I composting process in the new bunkers and using aeration during this process odour production and emissions will be controlled and there will be a significant reduction in odours from the facility compared to the existing situation. The air pressure system will be designed to remove odorous air from the buildings and vent it through a stack located along the southern wall of the phase I building.

All of the post phase I compost will be transported to the phase II / III composting complex on site.

Phase II – Tunnel Pasteurisation

The phase II / III complex comprises some 24 tunnels located side by side and measuring some 4m wide by 4m high by 40m long each. These incorporate a computerised forced air delivery system to regulate oxygen and temperature in the tunnels. The air is filtered to prevent contamination by pests and weed moulds. The compost undergoes the following processes:

- Levelling - This equalises the temperature and brings the temperature under control;
- Warm up – this involves the controlled rise in temperature and control of the oxygen content, up to pasteurisation temperature;
- Pasteurisation – This kills off unwanted weeds and competitor organisms (58 – 59.5ºC for 8 – 10 hours).
- Conditioning – This is a selective phase in the process where microbial biomass grows and available carbohydrates are utilised and ammonia converted to protein;

- Cool down – Once ammonia is clear, temperatures are reduced so that mushroom spawn can be added.

The materials undergo phase II composting for approximately 6 days. This compost is then ready for the addition of mushroom spawn to the compost and phase III composting to begin.

Phase III

The phase II compost is seeded with mushroom spawn and then refilled into the tunnels for the phase III process. These tunnels are aerated and allow the spawn to grow prior to its use on the mushroom growing farms. The phase III process takes approximately 14 to 17 days to complete.

3.4 MATERIALS MANAGEMENT

3.4.1 Waste Acceptance and Handling

3.4.1.1 Hours of opening

The facility will be operational 24 hours a day and 7 days a week as composting is a continuous process. However, the bulk of the site works including the reception of raw materials, the mixing, blending, turning of compost is carried out during the hours of 6am to 8pm. Some finished compost is exported off site outside these hours (between 5am and 10pm). This will allow for greater flexibility at the facility and will also serve to reduce the average hourly traffic volumes that will be associated with the expanded facility. Raw materials are imported to the site from 0600 to 2000 hrs. Monday to Friday and from 0800 to 1300 hrs. Saturday. Mushrooms are exported from the site seven days a week.

3.4.1.2 Staffing

It is estimated that there will be some 115 staff required to operate the proposed facility and the mushroom growing operation.

3.4.2 Existing Materials Types and Quantities

CCL presently operate their composting facility under Waste Licence from the EPA (Licence No. 124-1). The waste licence stipulates the volumes of raw materials that can be processed at the site as follows:

i Horse Manure – 41,600 t/a
ii Poultry Manure – 15,000 t/a

Quantities of straw and gypsum are not stipulated. Given an approximate 33% reduction in weight/volume of the materials during the composting process it is estimated that some 49,500 t/a of compost is produced at the facility. Up to 22% of this is used in the adjoining mushroom growing tunnels and the remainder is exported to satellite mushroom farms.

3.4.3 Proposed Quantities of Materials

The expanded facility will have sufficient capacity to produce a significantly greater volume of compost. The increase in volumes of compost produced is necessary in order to provide the economies of scale required to compete in the marketplace and to provide the state of the art technologies and infrastructure that are necessary to comply with the high environmental standards required at the facility. The revamped facility will have the capacity to process the following amounts of materials (or a variation of tonnes of each material according to availability) :-

i Horse manure – 45,000 t/a
ii Poultry manure – 36,000 t/a
iii Straw – 36,000 t/a
iv Gypsum – 5,000 t/a
v. Water - Balance

It is planned that some 160,000 t/a of raw materials (including manure, litter, straw, gypsum and water) will be used and given an approximate reduction in weight/volume resulting from the composting process (circa 33%) this indicates that some 109,200 t/a of compost will be produced. It is estimated that approximately 6.5 % of this will be used in the adjoining mushroom growing farm and the remainder will be exported off site to the mushroom growing industry.

3.4.4 Materials Acceptance Procedures

The bulk of the raw materials are sourced from longstanding suppliers who are well versed in the types of materials acceptable at the facility. This will continue to be the case and new suppliers will be informed as to the types of material that is acceptable and the types that are not. In this way there have been only a few rare cases where unacceptable loads arrived on site and on each occasion these were reloaded and sent back to the supplier (a load of very old semi decayed straw was one example). Materials (apart from straw) are transported to the site in enclosed or covered in trucks (the horse manure trucks are covered with a net).

On arrival at the facility, all truck drivers report to the site office. The following details are documented for all incoming waste:

- Date
- Time
- Haulier
- Vehicle registration number
- Material source/origin
- Customer/ Producer/supplier
- Weight
- Type of material
- Name of person checking the load

Once the load has been accepted, the driver is directed to the new reception hall where it is tipped in the appropriate bay area. The load is then carefully inspected and if acceptable remains in the bay ready for processing.

Unacceptable Materials

Any unacceptable materials will be identified by the operatives while it is being inspected in the tipping bay. On identification, the first option is to reload the material onto the vehicle and return it to the supplier. The operative will inform management as soon as this occurs and Management will contact the supplier to seek clarification. If unacceptable materials are unloaded at the site and cannot be immediately returned to the supplier, it will be stored in a designated area awaiting export. Records of unacceptable materials will be recorded on an Unacceptable Material Form. Any such material will be diverted to an appropriately licensed treatment/disposal facility as soon as possible.

3.4.5 Materials Handling

Materials delivered to the facility are processed as described in Section 3.3.3 above. All site operatives are provided with the necessary safety clothing and equipment. The materials are rarely handled by individuals but are moved and managed by dedicated machinery, loaders, forklifts etc.

3.5 OTHER RAW MATERIALS & ENERGY

Estimates of fuel and other products used on site are as follows:

- It is estimated that up to 10,000,000 kw of electricity will be required at the proposed development to include both the composting and mushroom growing operations.

- It is estimated that some 400,000 l of light fuel oil will be used

- It is estimated that some 265,000 l of gas oil will be used for site wheel loaders, forklifts etc.

- All rainwater falling on the site will be collected and reused in the composting process. Even with this, it is expected that there will still be a water deficit over the course of a year. There are three on site water wells and two of these will be used to supply the remaining water requirements. The facility is also connected to the mains water supply network provided by the local authority. Any water usage from the wells or mains water supply will be metered to record monthly water usage at the facility. Records of rainfall will be obtained on an annual basis.

It is not possible to accurately predict the exact energy and raw materials requirements at the proposed facility. The figures provided above are estimates and will be verified during the early stages of the development when detailed records of usage become available.

3.5.1 Plant used on Site

- 5 No. wheel loaders
- 3 No. forklifts
- 2 No. bale breakers
- Materials blending plant
- Automated materials conveyancing and distribution system
- Electric fans for forced air distribution system and negative pressure system (reception hall).
- 2 No. back up generators
- 2 No. Wheelwashers
- 2 No. Weighbridges

If additional plant, other than described above, is proposed in the future details of such plant will be forwarded to the regulatory authorities.

3.6 ENVIRONMENTAL NUISANCES AND EMISSIONS

3.6.1 Aerosol Control

There is a small potential for aerosol production at the site. The main sources of this will be handling of the raw manures, the mixing and blending process, delivery of mixed materials to the phase I bunker complex and aeration of the new water storage tank (tank B) and the existing water storage tank (tank A). These will be controlled by handling all materials in enclosed conditions. Trucks delivering the materials to site will be enclosed or covered in. Once on the site the materials are stored and handled in the enclosed reception hall. The doors to the reception hall will be kept closed between deliveries. In addition the distribution system including conveyors will be enclosed in perspex casing. Once the materials have been composting in the phase I bunkers for a few days the risk of aerosol production is very low. The proposed aeration system for the new water tank (and the existing water storage tank – tank A) will comprise a low energy system and will entail minimal agitation of the water with the result that there will be minimal potential for aerosol emissions from this source.

3.6.2 Bird Control

The materials handled on site will not attract scavenging birds.

3.6.3 Dust Control

There is a small potential for dust generation at the site. The main sources of this may come from handling the dry straw, the gypsum and perhaps fugitive emissions from the yard. The straw is imported and stored in bales and this reduces the potential for dust generation. The bales are stored in the northeast corner of the site removed from any sensitive receptors and it is considered that the dust generation from this source will be relatively minor. The gypsum is imported in enclosed or covered trucks and is stored in the reception hall. Therefore any dust generated by the gypsum will be contained to a large extent. The mixing and blending process is carried out with the addition of water and therefore this process is kept moist and dust free. After the facility has been upgraded there will be no need for any storage or processing of raw materials in the open yards (apart from the straw bales) and therefore the yards will be maintained in a clean condition. The yards will be power swept when required. All trucks exiting the site will be required to pass through the wheelwash and this will prevent any mud from being distributed around the site or the access roads.

These measures will ensure that dust emissions from the facility will be kept to a minimum and will not impact on the surrounding environment.

3.6.4 Fire Control

Fire and smoke detection alarms will be installed throughout the facility. The phone numbers of all emergency services including the fire brigade will be clearly posted adjacent to each phone on site. A mains water supply is available on site. There will be a large storage capacity of water in the existing water storage tank (tank A) and new water storage tank (tank B) amounting to some 650,000 gallon capacity and there are two production water wells located on site. Fire hoses and fire extinguishers will be installed throughout the site.

3.6.5 Odour Control

There is a potential for odour generation at the site. This will arise from the raw materials used (horse manure, poultry manure) and the composting processes. The main odour generating events include the mixing and blending of materials in the reception hall and the turning of compost in the phase I bunkers (i.e. when the compost is being brought from one bunker in phase I and redistributed to another bunker in phase I). Operations subsequent to the phase I operations (i.e. phase II composting) is a low odour generating process and phase III composting is almost odour free.

All materials brought to the site will be in enclosed or covered in trucks (the horse manure trucks are net covered). The raw materials will be stored in the reception hall. The new reception hall is to be located in the northeast corner of the site at the most removed point from sensitive receptors. This is an enclosed building and will be sufficiently vented to allow the mixing of fresh air into the building. The new phase I bunker complex will be enclosed and will provide for the control of gases with a negative air pressure system. The main significant improvement to the control of odours at the upgraded facility will come from the forced aeration of the compost in the phase I bunkers. This will maintain the compost in an aerobic state and will significantly reduce odours that were prevalent in the old system where anaerobic conditions would sometimes develop. It is also proposed to provide aeration to the water stored in the existing water storage tank (tank A) and the new water storage tank (tank B). This will reduce potential odour production in the tanks and also will increase the aerobic conditions in the composting process as the addition of water from these tanks will be more aerobic than heretofore. It is proposed that any soiled water generated on site such as effluent from the offices and internal floor drainage from the bunkers and tunnels will be drained to the new water storage tank (tank B). This water will be used in the composting process only in the first materials mixing process. Thereafter, any water added to the compost will be

sourced from the existing tank (tank A) which will comprise clean water from roof and yard drainage.

The reception hall will be operated under a negative air pressure system and air from the phase I bunkers will be vented to the atmosphere via a 17.5 m high stack located midway along the southern side of the phase I bunker building.

The nearest sensitive receptor is located adjacent to the northwestern corner of the site some 280m distant and generally upwind (west) from the reception hall and phase I building. The prevailing winds in the locality are from the southwest and there are no sensitive receptors to the northeast of the facility. Air dispersion modelling carried out on the proposed stack emissions have confirmed that there will be no significant impact at the site boundaries or further out in terms of air quality.

3.6.6 Roads Cleansing

All trucks entering the facility will be directed along the designated route to the reception hall. It is proposed to inspect the road and yards regularly and have them power swept when required. This will maintain the yard in a clean and dust free condition. All trucks exiting the facility will be required to pass through a wheelwash. This will ensure that no dirt or dust is brought out onto the main road. Notwithstanding the above the road will be inspected daily and will be power swept should it be required.

3.6.7 Traffic Control

The site is accessed from the R403 road. Vehicles entering and exiting the site will have adequate room and sight distances. The traffic impact assessment in Section 2.9 of the EIS states that in the opinion of the traffic consultant (TrafficWise Ltd.) the R403 road is operating well within the thresholds of its design parameters.

Traffic signage will be erected and will limit traffic movements within the site to 10 km/h. Trucks entering the site will be directed to the relevant area by road signage.

3.6.8 Vermin Control

The materials used at the site are not the type that attract vermin. However, rodent control specialists will be contracted to inspect and control rodent populations at baseline levels.

3.6.9 Emissions to Groundwater

The site will be fully concreted and therefore there will be no pathway for effluents to gain access to groundwater. The surface water run-off from the concreted base will be collected and directed to the existing water storage tank (tank A - 400,000 gallon capacity) or the proposed new water storage tank (tank B - 250,000 gallon capacity).

Any leachate generated in the reception hall and the compost bunkers and tunnels will be contained by the concrete base, collected by drains and directed to the new water tank (tank B) for reuse in the composting process.

Sewage effluent from the site toilets and effluent from the canteens and washrooms will be collected and sewered to the septic tank located along the northern boundary of the facility. The effluent will be pumped from here to the new water storage tank (tank B) for use in the composting process.

The internal floor drainage from the reception hall and composting bunkers and tunnels will be directed by drainage to the new water storage tank (tank B) for reuse in the composting process. There will be a requirement to sterilise two of the tunnels in the phase II building once per week. These will be washed down once per week and this will form part of the internal drainage from the tunnel buildings.

It is expected that there will be some 115 staff working on site to include the composting and mushroom growing businesses. Based on a maximum usage of 80 l/hd/day this will generate some 9.2m^3 of effluent per day. Internal drainage from the floors of the reception hall and composting bunkers and tunnels can not be predicted accurately at this stage. However, as there is no potential for rainfall to gain access to the materials it will comprise solely of seepage from the processes and floor wash down. It is considered that a notional volume of 2m^3 per day would be ample to cover this item at present. Records will be maintained form the first few months of operation to confirm the exact volumes of internal drainage.

The composting process requires the addition of substantial quantities of water at various stages during the process. The existing plant uses practically all of the water available from rainfall collected on the hard surfaces of the entire site. The upgraded facility will require additional water

supplies and these will be provided by two of the site water wells (and/or the public mains system) in addition to the collected rainfall.

This indicates that all liquids generated on site from either rainfall or other sources will be completely contained on site and reused in the composting process. There will be no emissions to groundwater.

3.6.10 Emissions to Surface Water

The bulk of the site is covered with a concrete base both inside and outside the site buildings. All roof and yard drainage is therefore fully contained and is collected by drains and directed to the existing water storage tank (tank A) via either of the two 3 chamber settlement tanks. Practically all of the water generated on site by rainfall is presently used in the composting process. Therefore, there are few occasions when surface water discharges to the local surface water network. There are some occasions during particularly heavy rainfall events during Winter when there is an oversupply of water and the on site storage tanks are full. On these occasions, the excess water is settled in either of two 3 chamber settlement tanks and discharged to the local stream network under a discharge licence granted by the local authority. The discharge point consists of a drain running from east to west along the northern boundary and is a small tributary of the Cushaling river.

It is expected that at the upgraded facility that all water from the site will be reused in the composting process. This will consist of all rainfall collected on site, any drainage or leachate from the composting processes and reception hall, excess water from the wheelwashes and the effluent from the site offices, canteens, toilets, washrooms etc. It is likely that this will need to be augmented by the water from the on-site water wells (or public mains supply). Therefore, it is envisaged that there will be no emissions to the local surface water network from the site. However, in order to cover the possibility of an oversupply of site water it is planned to provide a facility for roof water drainage to be drained directly to the local drains. This will comprise clean rainfall and will not impact on the water quality in the local stream network. The water levels in the water storage tanks)tanks A and B) will normally be kept at a low level in order to provide storage capacity for rainfall runoff.

It is proposed that all sewage effluent generated on site and all internal drainage from the floors of the reception hall and composting bunkers and tunnels will be collected and directed to the new water tank (tank B) for reuse in the composting process. Therefore, it is planned that there will be no emissions to surface waters from the site. However, there is provision to allow for the controlled release of clean roof drainage water to the local stream network should it be required.

3.6.11 Noise Emissions

The main sources of noise emissions associated with the existing facility are from vehicles loading and unloading materials and from plant and equipment operating on site including the wheel loaders and electric fans. As part of the proposed expansion the bulk of the materials handling activities will be confined within the reception hall and within the phase I compost bunkers and the phase II / III compost tunnels. Therefore, the bulk of the noise generating activities will be carried out inside contained buildings.

While some materials are transported to/from the site between the hours of 5am and 10pm the bulk of the site activities are carried out between 6am and 8pm. The import/export of materials are spread out over a longer day in order to allow for maximum flexibility for site operations and to reduce the hourly concentration of traffic movements

It is considered that the mitigation measures proposed at the upgraded facility will reduce the overall noise emissions at the site compared to the present situation and will not have a significant impact on local sensitive receptors.

3.7 ENVIRONMENTAL MONITORING

It is planned to carry out monitoring of environmental media on a regular basis at the site. Monitoring programmes are proposed in the sections below, however, it should be noted that all monitoring programmes in terms of station locations, frequency, parameters etc. will only be carried out with the agreement of the regulatory authorities.

3.7.1 Dust Monitoring

Dust emissions are not considered a significant issue at the existing site for the reasons given in Section 3.6.3 above. After expansion it is considered that there will be a general improvement in the potential for dust emissions at the site. The Company propose to monitor dust emissions from the site in both Summer and Winter months after the expansion of the facility is completed and operational. It is proposed that dust will be monitored at four stations on site at locations agreed with the EPA.

3.7.2 Ecological Monitoring

Section 4.7 of the EIS suggests that the potential impact of the facility on the flora and fauna of the area is low and for this reason it is not considered necessary to monitor ecology at the site.

3.7.3 Groundwater Monitoring

As described in Section 3.6.10 above, there is little risk of emissions to groundwater at the site. However, it is proposed to monitor groundwater at the three on site wells on a bi-annual basis.

3.7.4 Odour Monitoring

It is proposed that odour monitoring be carried out on an annual basis. The exact nature and monitoring locations will be agreed with the regulatory authorities.

3.7.5 Meteorological Data Monitoring

It is proposed to install a weather station on site to monitor wind speed and direction, atmospheric pressure and temperature. The data will be compiled on a quarterly basis.

3.7.6 Noise Monitoring

It is proposed to carry out noise monitoring at the site on an annual basis. Noise monitoring stations will include three site boundaries and the nearest sensitive receptor (house located adjacent to the northwestern corner of the facility)

3.7.7 Surface Water Monitoring

As explained in Section 3.6.11 above the Company proposes to install a new surface water collection system as shown on Drawing 3154 CPL-'06 1.03 Site Layout Plan 2. Surface water run-off will be collected and directed to the water storage tank (tank A).

Samples will be collected on the Cushaling river upstream and downstream of the site to ensure that the quality of the surface water in the area is not impaired.

3.8 DECOMMISSIONING AND AFTERCARE

3.8.1 Decommissioning

Operations at the facility are ongoing with an open-ended lifespan and to date a closure plan has not been developed. In the event of a decision to close the facility a closure plan will be developed. This plan will allow for removal of all raw materials, intermediate materials and compost from the site and cleaning of all surfaces where materials/compost had been handled or stored. A monitoring programme will be carried out on environmental media including air and water to ensure that all emissions from the facility have ceased.

It is assumed that upon closure of the site, the premises will be suitable for industrial or other use and will have a re-sale value, which will cover the costs of removal of materials/compost, site cleaning and monitoring.

3.8.2 Aftercare Management Plan

As stated in Section 3.8.1 above, operations at the facility are ongoing with an open-ended lifespan. To date, an aftercare management plan has not been developed. Potential nuisances at the site are limited to operational emissions such as odour, dust and noise. After closure and cleaning of the site as described in Section 3.8.1, there will be no potential for environmental emissions or nuisances and for this reason an aftercare management plan is not considered necessary at the site.

3.9 CONTINGENCY PLANNING

In the unlikely event of an emergency the procedures outlined in the Emergency Response Plan will be followed. The plan outlines the actions to be taken in emergencies relating to health and safety, spills, equipment breakdown and fire. The Emergency Response Plan for the CCL site is provided below.

3.9.1 Emergency Response Procedure

3.9.1.1 Purpose:

To address emergency situations and minimise potential impacts on the environment.

3.9.1.2 Responsibility:

The Site Manager is responsible for ensuring this procedure is implemented.

3.9.1.3 Procedures:

The emergency response procedures are predicated by the types of emergency that may occur at this facility and are discussed individually below.

3.9.2 Health and Safety

In the event of any serious injury or health incidents to personnel on site the emergency number for the ambulance service is clearly posted adjacent to all telephones on site. The site manager and or assistant manager will be notified of any incidents immediately and will assume charge in order to handle the emergency as swiftly and efficiently as possible. For minor injuries the number of the local doctor who is on call will be posted beside the telephone in the site office. In addition, first aid kits are available in the site offices. Certain members of staff will be given appropriate first aid training.

3.9.3 Oil Spill/Leachate spill

All oil and diesel storage tanks will be located in containment bunds. However, in the unlikely event of an oil spill the following procedure will be followed:

a) The source of the spill will be closed off immediately if possible. The site manager or assistant manager will be notified immediately.

b) The liquid will be contained as far as is practicable by employing absorbent booms and mats around drainage gullies and in the spill liquid itself.

c) A waste oil tanker (or tankers) will be contracted immediately to pump liquid from interceptors and/or sediment traps.

d) The following Agencies will be notified by telephone at the earliest opportunity: EPA; Kildare County Council; Eastern Regional Fisheries Board.

e) All oil will be removed from the surface by either pumping or use of absorbent mats. All waste oils and materials will be disposed to an appropriate facility.

f) Specialist firms or consultants will be retained to manage larger or difficult spills.

Spill Kits including absorbent booms, mats and materials will be stored on site. All staff will be informed as to the location and use of the absorbent materials.

3.9.4 Breakdown of Equipment

In the event of breakdown of essential equipment all incoming materials destined for that piece of equipment will be stored on site in the reception hall. The staff fitter will be notified immediately and will effect the necessary repairs. If this is not possible then contract mechanics will be brought in at the earliest opportunity to carry out the repairs. In some cases, alternative plant can be hired from local plant hire companies. As composting processes largely do not rely on mechanical plant and equipment it is unlikely that a breakdown of any pieces of equipment will cause a cessation of the activities.

3.9.5 Fire

Smoke detection and fire alarms will be employed in the office buildings and the new buildings where appropriate. Fire extinguishers and fire hoses will be located in all buildings. It is proposed that the facility be manned 17 hours a day, six days a week and 8 hours on Sunday and therefore staff will be present on site for long periods during the week.

The emergency telephone number for the fire brigade will be clearly posted adjacent to all site telephones.

In the unlikely event of a fire the following procedure will be employed:

a) The alarm will automatically sound or will be switched on manually by a break glass switch by the person who first notices the fire.

b) All staff will be evacuated from the site buildings.

c) The fire brigade will be notified immediately.

d) The site manager or assistant manager will be informed immediately.

e) All incoming vehicles will be directed to an alternative facility and the site entrance kept clear of traffic and machinery.

f) The EPA, Kildare County Council and the Eastern Regional Fisheries Board will be notified at the earliest opportunity.

It may be possible for site staff to extinguish small fires using the fire extinguishers and fire hoses. This procedure will be restricted to small fires only and the decision will be made by the site manager/assistant manager.

3.9.6 Other Emergencies

All other emergencies will be notified to the site manager/assistant manager and dealt with as speedily and efficiently as possible.

3.10 CONDITIONING PLAN

The proposed expansion and redevelopment of the facility will provide a modern, technologically advanced facility and by its nature will significantly improve environmental standards at the site.

- CCL will process a higher volume of material and therefore will provide much higher recovery rates for straw, horse and poultry manures.

- The site infrastructure and processes will be improved in a way that will reduce both actual emissions and the potential for emissions from the site.

3.10.1 Improvements to Infrastructure

The features of the proposed expansion that will have environmental benefits include the following:

- All raw materials (apart from straw) brought to the site will be stored and handled indoors in the new reception hall.

- The new phase I bunker complex will provide an improved, more efficient and less odorous method for phase I composting and will eliminate the existing system of open windrows for phase I composting.

- New mixing, blending and distribution systems will be employed for the handling of the raw materials.

- Forced aeration will be employed at all phases of the composting process. This will provide fully aerobic conditions, will speed up the composting process and will contribute to significantly reduced odour emissions.

- A negative air pressure system will be provided in the reception hall and a forced aeration system in the new phase I bunkers. These systems will minimise the odours and the excess air will be vented to the atmosphere by a new 17.5m high stack.

- All hydrocarbon tanks will be located within concrete bunded areas. This will reduce the potential of fugitive emissions to water.

- Both water storage tanks (tanks A and B) will be provided with an internal aeration system. This will improve the overall efficiency of the composting process and will contribute to the reduction of odours both from the tank and from the composting materials.

SECTION FOUR

4.0 POTENTIAL IMPACTS AND MITIGATIONS MEASURES

4.1 CLIMATE

The Carbury facility will have no significant impacts on the micro-climate of the area or on the global climate and no future impacts are predicted. There may be a minor benefit to the global climate by promoting the recycling and recovery of the materials used in the composting process (horse and chicken litter) and thereby replacing the need for use of other natural resources for compost production and avoiding the need for disposal of these materials as waste products. No mitigation measures are proposed regarding climate.

4.2 AIR QUALITY

There are two phases of this development that have the potential to impact on local air quality. These are:

- Construction Phase
- Operational Phase

4.2.1 Construction Phase

4.2.1.1 Generation of Dust

During the construction phase, the main potential impacts on air quality will arise from the generation of dust caused by the movement of construction traffic at the site.

The main sources of dust that may potentially be generated during the construction phase include:

- Upgrade of new and existing roads including the site access road and entrance/exit areas
- Demolition of existing buildings
- Construction of Phase I and Phase II/III buildings, a new water storage tank (Tank B) and car parking areas
- Use of equipment including hymac excavators, dumper trucks, JCB excavators, and a mobile crane

The impacts of fugitive dust emissions generated from these operations will, to a certain extent depend on surface characteristics, wind direction, wind speed and other meteorological conditions such as rainfall. Dust generation will be greatest during dry windy weather and least during calm wet conditions. Furthermore, the dust effects will be localised and implementation of a dust mitigation plan will ensure any potential impacts will be minimised beyond the site boundary.

4.2.1.2 Construction Related Traffic

The movement of machinery, construction vehicles and the use of generators during the construction phase will generate exhaust fumes and subsequently contribute to potential emissions of SO_2, NO_x, CO, particulate matter (PM_{10}), Volatile Organic Compounds (VOCs) and polyaromatic hydrocarbons (PAHs). While the concentrations of these pollutants are expected to increase during the construction phase, strict adherence to 'good site/engineering practices' will minimise the generation of any unnecessary air emissions. Furthermore, emissions from construction traffic

will be localised. Notwithstanding this, the level of air pollution generated will not be of significance and will be of short duration i.e. 24 months.

4.2.2 Operational Phase

4.2.2.1 Proposed Facility

4.2.2.1.1 Main Potential Emissions

The predominant source and type of air emissions from the proposed facility during the operational phase, is presented in Table 4.2.1

Table 4.2.1: Source and Type of Emissions at the Proposed Facility

Parameter	Source of Emissions
Odour	Phase I Emission Point

To predict the impact of the above emissions from the proposed facility during the operational phase, air dispersion modelling techniques were used.

It should be pointed out at this stage that there are potentially 4 other odour sources that should be mentioned at this stage. These include:

- Tank A
- Tank B
- Wetted bales
- Emissions from Phase II and Phase III Composting tunnels

These potential odour sources are considered minor and have not been included in the dispersion modelling assessment for the following reasons:

- Tank A will collect surface water run-off from the yard and roof drainage. A diffuse aeration system will be installed to prevent potential anaerobic conditions occurring
- Tank B – a new water storage tank will be installed and will collect water from toilet effluent, drainage from the yard and Phase I/II and III washings and the reception building. A diffuse aeration system will be installed to prevent the run-off from Phase I turning anaerobic thereby minimising odour emissions from this tank
- Water from the Tank B will be used to wet the bales located at the north-east corner of the site. As the water from Tank B will have been aerated, there will be extremely low levels of odour associated with the bale wetting process

- Odour emissions from the Phase II/Phase III composting process is a low odour generating process and hence considered to be a minor source

AERMOD Dispersion Modelling Package Description

The AMS/EPA Regulatory Model (AERMOD) is the current US EPA regulatory model used to predict pollutant concentrations from a wide range of sources that are present at typical industrial facilities.

The model estimates the concentration or deposition value for each source and receptor combination for each hour of input meteorology and calculates user-selected short term averages. Since most air quality standards are stipulated as averages or percentiles, AERMOD allows further analysis of the results for comparison purposes.

Percentile analysis for emissions is calculated for the maximum averages using the AERMOD-percent post-processing utility. This utility calculates the maximum concentration of a pollutant from all receptors at a specific percentile, for a specific period. Employing the percentile facilitates the omission of unusual short-term meteorological events that may cause elevated pollutant concentrations and hence a more accurate representation of the likely average pollutant concentrations over an averaging period.

The following information was input into the model for the prediction of maximum ground level ambient concentrations of specific pollutants from the proposed facility.

Meteorological Data

Five years of hourly sequential meteorological data (Casemount Aerodrome/Mullingar, 2000 - 2004) was used for the AERMOD dispersion modelling assessment. This allows for the determination of the predicted worst case overall impact of emissions from the proposed facility.

Site Map and Cartesian Grid

The site layout map was supplied by the client in dwg format and converted to a shp format for import into the model. The map included the site boundary and all relevant buildings and tanks. The boundary, all relevant structures were traced and emission sources were included. The site map was grid referenced (tagged), imported into the model and a 100m x, y Cartesian grid receptor constructed with south-west corner co-ordinates 270500Easting, 229350Northing. The total constructed grid size was 2.5km x 2.5km.

Sources

The site layout map was used as a template for the source locations, all relevant structures and the boundary of the facility. The only on-site source was modelled as a point source as described above.

Point Sources

A point source is one that releases pollutants from a limited opening, such as a stack or vent. The AERMOD package uses the steady state Gaussian plume equation for a continuous elevated point source. All proposed sources at the proposed facility were modelled as point sources.

When one or more buildings in the vicinity of a point source interrupt wind flow, an area of turbulence known as a building wake is created. Pollutants emitted from a relatively low level can be caught in this turbulence, affecting their dispersion. This phenomenon is called building downwash. In order to conduct an extensive analysis of downwash effects of all point sources, the dimensions (including heights) of all significant buildings on-site were obtained from drawings supplied by the client and inputted into the model. The downwash effects are determined using the building profile input programme (BPIP-Prime) which is run prior to all modelling runs.

Emission Rate Calculations

The rate of production of a pollutant emission is best quantified as an emission rate. For a chimney or vent, this is equivalent to the odour concentration (ou_E/m^3) multiplied by the air flow rate (m^3/s). It is the mass of odorous pollutant emitted from a source per second and often expressed in ou_E/second.

All input parameters including mass emission rates, volume flows, temperatures, concentrations were supplied by the client.

Input Data

Table 4.2.2 details the input data for each emission point modelled:

Table 4.2.2: Modelling Input Data

Parameter	Phase I Emission Point	
	Daytime	Night-Time
Stack Temperature (^{0}C)	40	60
Stack Height (m)	17.5	
Stack Diameter (m)	1.8	
Efflux Velocity (m/s)	19.1	5.46
Odour Emission Rate (ou_E/sec.)	22,750 Note 1	
Periods of Operation	Continuous	

Note 1: The odour emission rate is based on an odour concentration determined from extensive odour monitoring studies undertaken by Professor Ralph Noble et al. of emissions from eleven Phase 1 Mushroom Composting sites (Atmospheric Pollutants and Trace Gases, Olfactory Response to Mushroom Composting Emissions as a Function of Chemical Concentration, R. Nobel, P.J. Hobbs et al, Journal of Environmental Quality, 30:760-767 (2001)). A mean odour concentration of 1,638ou_E/m^3 was determined for aerated compost only. This figure was used for the night-time scenario (20:00-06:00) where air from the Phase I aeration bunkers only. During the day (06:00-20:00), it is proposed to extract air from the entire Phase 1 building (the bunkers and the storage areas). Assuming that the stored horse manure and chicken litter has a rapid throughput thereby preventing these raw materials from becoming anaerobic, the odour loading from the Phase I emissions point is not expected to change to any significant degree (Pers. Comm., Professor Ralph Noble). In summary, while the efflux velocity varies from day to night, the overall odour loading is not expected to vary, assuming anaerobic conditions do not occur.

Results of Dispersion Modelling Assessment

The results of the air dispersion modelling assessment for Phase 1 emission point is presented in Table 4.2.3:

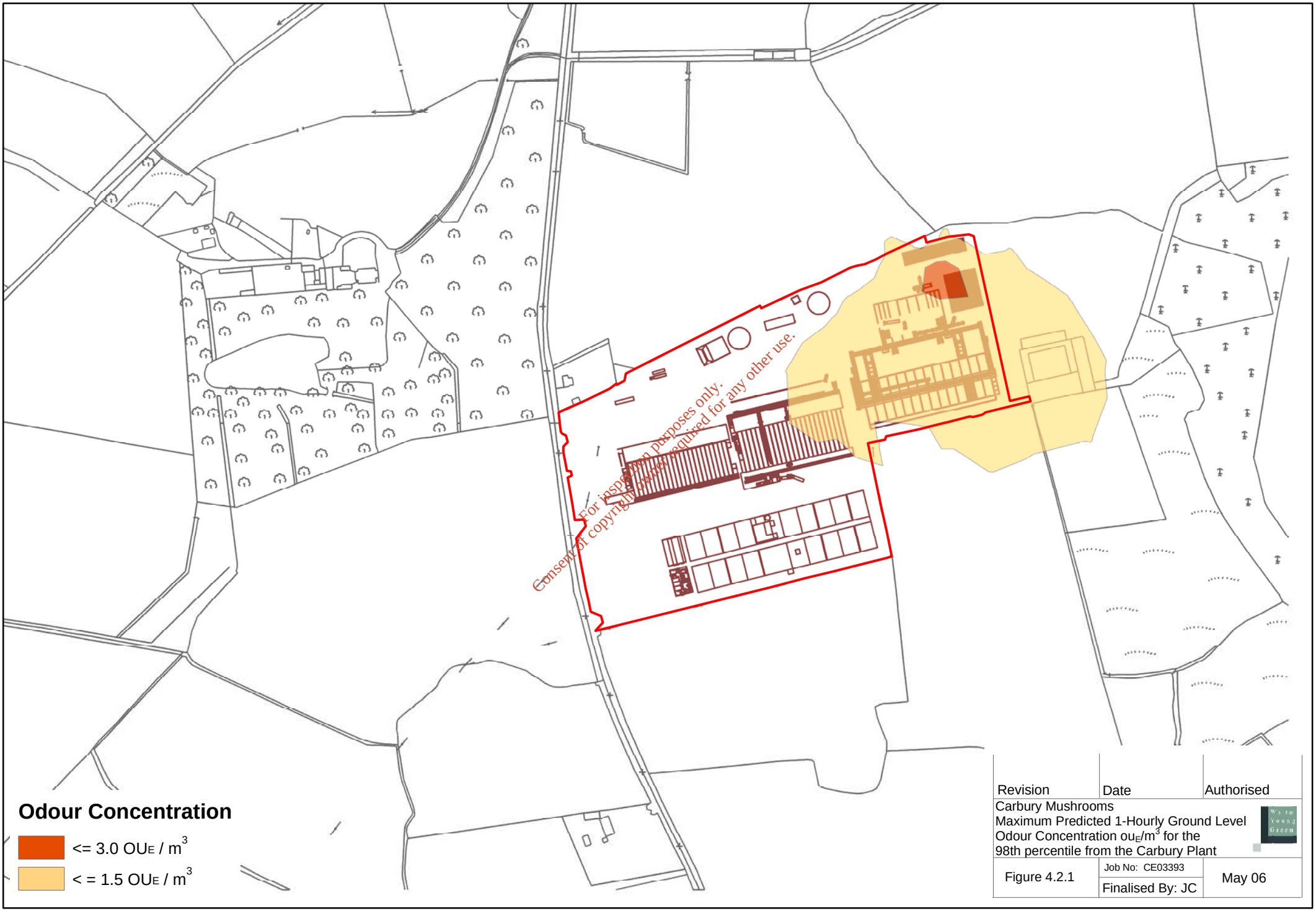
Table 4.2.3: Air Dispersion Modelling Results for the Phase I Emission Point

Parameter	Averaging Period	Maximum Predicted Ground Level Concentration (GLCs) ou_E/m^3	Maximum Predicted GLC Locations (Grid Reference Points)
Odour	1-Hour, 98%.	3.76	271900, 230650

Discussion of Modelling Results

Odour

The maximum 1 hour ground level odour concentration of 3.76ou_E/m^3 for the 98th percentile is predicted to occur at the north east of the existing site. This maxima occurs within the site boundary. There is no ≤6.0ou_E/m^3 contour as the maximum predicted odour concentration is predicted to be below this level. The odour impact on the receiving environment therefore meets the ≤6.0ou_E/m^3 odour annoyance criterion for the 98th percentile at all sensitive receptors. Furthermore, the ≤3.0ou_E/m^3 criterion for the 98th percentile specific to new facilities is not exceeded at the sensitive receptors. As illustrated in Figure 4.2.1, the maximum plume spread is approximately 62m and 310m respectively for the odour contour plots of ≤3.0ou_E/m^3 and ≤1.5ou_E/m^3. The dispersion modelling assessment has demonstrated that the adopted odour annoyance criterion of ≤6.0ou_E/m^3 for the 98th percentile will not be perceived at any sensitive



Revision	Date	Authorised
Carbury Mushrooms Maximum Predicted 1-Hourly Ground Level Odour Concentration ou_E/m^3 for the 98th percentile from the Carbury Plant		
Figure 4.2.1	Job No: CE03393 Finalised By: JC	May 06

receptor beyond the plant boundary including the nearest receptor approximately 270m to the north-west of the site. In summary, the impact of odorous emissions from the proposed Phase I composting process will not be of significance.

4.2.2.1.2 Minor Potential Emissions

Minor emissions from the following sources have the potential to occur during the operational phase of the development:

Odour may arise from the following sources

- Potential emissions from Tanks A and B
- Potential emissions from the Phase II and Phase III tunnels
- Potential emissions from the wetted bales

For the reasons described in Section 4.2.2.1.1, these potential sources are not considered to be of significance.

Dust may arise from the following sources:

- Fugitive dust emissions from handling the non-wetted bales at the north-east corner of the site
- Handling of gypsum

Aerosols may arise from the following sources:

- Aeration of the goody water tank
- The mixing, handling, blending and delivery of raw materials to the Phase I bunkers
- During delivery of mixed/blended raw materials to Phase I bunkers

Low level of combustion gases (CO, NOx, SO_2 and Volatile Organic Compounds (VOCs)) will be emitted from the following on-site sources:

- 3 boilers fired on liquid fuel oil
- 2 back up generators

The diesel-fired generators will be tested once a month for 30 minutes at full load on line and are only used as a back-up in the event of a power failure. Low levels of CO, NOx, SO_2 and Volatile Organic Compounds (VOCs) will be emitted during this period

A boiler will be used for approximately 2 hours per week for each of the Phase II/III buildings. The third boiler will be used for office heating purposes.

Emissions from the above sources will be low and confined locally. With the implementation of proposed mitigation measures, they are considered to be of little significance and will have no impact on the surrounding environment.

4.2.2.2 Development Related Traffic

When considering the likely environmental effects that an increase in traffic will have on the existing environment, guidelines are provided by the Institute of Environmental Management and Assessment (IEMA). The IEMA Guidelines indicate that a significant impact on the perceptible environment is only likely to occur if there is an increase of 30% in the opening year as a result of the development traffic.

The traffic impact assessment has indicated that with development traffic there will be a negligible increase in traffic volumes on the R403 resulting from the proposed development. Based on this assessment, it is not considered necessary to undertake modelling of air emissions from traffic. In summary, the proposed development will not result in an adverse impact at the nearest sensitive receptors arising from on-site traffic emissions. In conclusion, there will be no significant adverse impact on the receiving environment from site related or traffic emissions as a result of the proposed development.

The traffic consultant has provided Annual Average Daily Traffic (AADT) figures for both existing year (2006) and the year when the redeveloped facility is fully operational (2008) along the R403. The figures are presented in Table 4.2.4 below:

Table 4.2.4: Predicted Annual Average Daily Traffic (AADTs) along the R403 Road

Scenario	AADTs	% HGVs	Percentage Increase from Development
2006 Existing	4,800	7.5	-
2008 Base	5,095	7.5	0.50
2008 Base plus Redevelopment	5,120	7.5	

The locations where the receptors are most likely to be potentially impacted upon include residents along the R403. The traffic impact assessment report has predicted traffic increases on the R403 of 0.5% in 2008 when the proposed redevelopment is fully operational.

The increase in development traffic for the 2006 to 2008 period is considered to be well below the 30% significance threshold and therefore predictive modelling is not considered necessary. In

summary, the proposed development will not result in an adverse impact at the nearest sensitive receptors arising from the redevelopment traffic emissions.
In conclusion, there will be no significant adverse impact on the receiving environment from development related traffic emissions as a result of the proposed development.

4.2.3 Mitigation Measures

To ensure that any impacts arising from the proposed development will not have an adverse affect on the receiving environment, the following mitigation measures for both the construction and operational phases have been proposed.

4.2.3.1 Construction Phase

4.2.3.1.1 Generation of Dust

During the construction phase the following dust minimisation measures will be implemented to reduce the potential for dust migration from the site and from construction traffic using public roads. This will involve the following good site/management practices:

- Implementation of a dust minimisation plan to be agreed by all parties prior to commencement of site works
- The use of construction equipment designed to minimise dust generation
- A truck wheel wash will be installed at the entrance/exit to the construction site and all trucks exiting the site will have their wheels and undercarriage washed down to avoid leaving any soil etc. onto the public road system
- A mobile bowser/dust suppression spray will be used during dry periods to dampen vehicle route ways
- During dry periods, stockpiles of soil and hardcore will be kept moist using rotary sprinkler heads
- Public roads will be regularly inspected for cleanliness and cleaned as necessary
- The use of site speed limits to prevent the unnecessary generation of fugitive dust emissions
- Lorries/trucks will be properly covered or enclosed during transportation of friable construction materials and debris to prevent their escape along public roads
- Hoarding will be erected around the site to reduce dispersion of fugitive dust
- All plant machinery will be regularly maintained and comply with all relevant legislation relating to emissions

- Adherence to good site engineering practices which will assist in reducing dust generation

4.2.3.1.2 Traffic Emissions

Good site practices will be implemented to minimise the emissions from vehicles and include:

- All site vehicles and machinery will be switched off or throttled down to a minimum when not in use to eliminate any unnecessary emissions
- All plant machinery will be regularly maintained and comply with all relevant legislation relating to emissions

4.2.3.2. Operational Phase

4.2.3.2.1 Emissions from the Plant

- Odour generated from Phase I composting and the storage of chicken litter and horse manure will be vented through a 17.5m stack to aid dispersion and eliminate odour annoyance at the nearest sensitive receptors
- All Phase I odorous activities will be housed inside
- All conveyors transporting raw materials or blended raw materials will be enclosed in perspex covered conveyors to prevent the release of odour and aerosol emissions
- A diffuse aeration system will be installed in Tanks A and B to prevent anaerobic conditions occurring
- Water from the Tank B will be used to wet the bales thus reducing potential odour production
- All raw materials brought to the site will be enclosed or covered in trucks to prevent odour or aerosol emissions
- The new reception hall will be located at the north-east corner of the site where it is further away from sensitive receptors
- Continuous forced aeration of the compost in the Phase I bunkers indoors will ensure anaerobic conditions do not occur and emissions are vented throughout one emission point
- There will be a rapid throughput of horse manure and chicken litter in the storage areas to prevent anaerobic conditions occurring
- To control aerosol emissions, the handling, mixing, blending and delivery of raw materials will be carried out in enclosed conditions

- Emissions from the existing boiler (A1-1) are governed by the existing Waste Licence emission limit values (ELVs). In accordance with this licence, periodic monitoring is undertaken to verify compliance with ELVs
- Implementation of a regular and documented maintenance and inspection programme for all plant equipment and storage tanks
- On-site good housekeeping and raw material handling practices will be stringently controlled through agreed protocols
- Implementation of regular patrols to detect fugitive dust and odour emissions
- Implementation of a regular maintenance plan of the boilers and generators to ensure emissions to air is not significant.

4.2.3.2.2 Traffic Emissions

The proposed development will include the following measures to ensure traffic emissions are minimised. These are

- Adherence to site speed limits
- Switching off idling engines or throttling down to a minimum
- Excess or unnecessary revving of engines will not be permitted

In summary, the air quality at the proposed site boundary is good as borne out by the low levels of pollutants recorded as part of the baseline survey. Dispersion modelling, used to assess the impact of odorous emissions from on-site sources, on the receiving environment has predicted ambient ground level odour concentrations below the $\leq 6.0 ou_E/m^3$ odour annoyance criterion for the 98th percentile. At these predicted levels and in conjunction with proposed mitigation measures, the impact of the proposed facility on sensitive receptors will not be of significance.

4.2.4 Interactions

Air emissions from the proposed plant have the potential to interact with both human beings and ecological habitats. However, emissions from the proposed redeveloped plant are predicted to be extremely low and will have no adverse impact on either human beings or ecological habitats. There is a potential risk of negative impact on human beings and habitats from dust generation during the construction phase. However, the implementation of stringent mitigation measures will ensure that any impact will be minimised. Interactions of air emissions with other elements addressed in the environmental impact statement are not relevant.

4.2.5 References

Environmental Protection Agency (2003). *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.* EPA, Wexford, Ireland.

Environmental Protection Agency (2002). *Draft Guidelines on the information to be contained in Environmental Impact Statements.* EPA, Wexford, Ireland.

Ireland's Environment – a Millennium Report. Environmental Protection Agency, April 2000

Determination of Dust Precipitation with Collecting Pots made of Glass (Bergerhoff Method) or Plastic VDI 2119 Part 2

Annex 1 of Volume 11, Section 3 Part I of the UK Department of Transport and Design Manual for Roads and Bridges (DMRB), 2003.

Institute of Environmental Management and Assessment (IEMA) Guidelines

Review of Odour Control Technologies in Mushroom Compost Production, OdourNET UK Ltd., 28 July 2002

Atmospheric Pollutants and Trace Gases, Olfactory Response to Mushroom Composting Emissions as a Function of Chemical Concentration, R. Nobel, P.J. Hobbs et al, Journal of Environmental Quality, 30:760-767 (2001)

4.3 NOISE

4.3.1 Potential Impacts during the Construction Phase

4.3.1.1 Noise Impact

The construction of the proposed development may generate noise and vibration impacts upon the surrounding properties, depending upon the actual construction methods employed. The significance of the effect of the various activities will depend on the duration of each particular construction activity, the particular items of plant used and the time at which the activity occurs. In the absence of a detailed construction plan, it is not possible to accurately model construction noise levels. It is estimated that the construction phase will occur over an 24 month period. The main features of the proposed restructuring are as follows:

- The demolition of many of the existing buildings.
- The construction of a new raw material reception building in the northeast of the site. This building will be used for the importation and storage of the raw materials used for composting. The building will be completely contained with concrete base, walls, roof and roller shutter doors. The raw materials will be stored in bays located within the building. The bays will consist of low concrete walls dividing one from the other.
- The construction of a new bunker composting facility for the Phase 1 composting process to be located adjacent to the southern wall of the reception building. This will consist of a building containing 14 enclosed concrete bunkers each with access from the northern (internal) side.
- The installation of modern mixing/blending plant. This will be located in the reception building and will provide an efficient method of blending the raw materials prior to composting. This will be connected to a new state of the art distribution system. The distribution system provides a controlled and mechanised method for depositing the mixed material into the new Phase 1 bunkers. The material will be distributed evenly in the designated bunker from the top of the bunker. The bunkers will incorporate a forced aeration system from the floor of each bunker.
- The design of a new straw storage and wetting area in the northeast corner of the site.
- The construction of a new Phase II and Phase III composting tunnels located just to the west of the new Phase 1 bunker and reception hall building.
- Installation of a two Wheel Washes at the new site entrances
- Installation of a storage bund in the southwest corner of the site

The United States Environmental Protection Agency (USEPA) has published significance criteria that may be used to define the level of impact construction activities will have on ambient noise levels. Table 4.3.1 presents these criteria:

Table 4.3.1: Significance Criteria for Construction Noise Effects

Duration of Works	>200 sensitive receptors within 50m of worksite boundary	100-200 sensitive receptors within 50m of worksite boundary	<100 sensitive receptors within 50m of worksite boundary
<2 years	HIGH Impact	MODERATE Impact	MINOR Impact
2-3 years	HIGH Impact	MODERATE Impact	MINOR Impact
>3 years	HIGH Impact	HIGH Impact	MODERATE Impact

To qualitatively discuss the significance of effects associated with the construction works on ambient noise levels, the following assumptions have been made:

- Noise sensitive receptors are predominantly classed as residential receptors
- There is one existing sensitive receptors within 50m of the site boundary Based upon information supplied, the duration of works on-site is anticipated to be of the order of 18 months

The proposed construction schedule is based on typical site operation hours of 08:00 to 18:00 Monday to Friday and from 08:00 to 13:00 Saturday. However, certain work activities may need to be undertaken at night or outside the normal working hours due to weather constraints; the availability of specialist equipment; health and safety considerations; and/or subcontractor availability. Where normal working hours need to be temporarily extended, consultation will be sought with Kildare County Council and all noise mitigating measures will be adhered to.

International practice dictates that noise exposure in the range $L_{Aeq,\ 1\ hour}$ of 65 to 75dB at sensitive receptors are generally acceptable for daytime construction activities.

4.3.1.2 Vibration Impact

No piling will take place on site and rock breaking is not anticipated. Potential vibration sources could include the use of plant machinery involved in earthworks, dump trucks, bulldozers and compacting equipment. It is noted; however, that potential vibration impacts from such sources will only be experienced in the immediate vicinity of the operation itself. If during construction, rock is encountered vibration monitoring will be undertaken in order to verify that appropriate vibration criteria set out in the following standards are not exceeded.

- BS 7385: parts 1 and 2:1990 and 1993 respectively, provide guidance on the measurement and evaluation of vibration and its effects on buildings, and a guide to damage levels from ground borne vibration
- Building Research Establishment (BRE) Digest 353(July 1990): Damage to structures from ground borne vibration
- BS 5228:1997 - Noise and Vibration Control on Construction and Open Sites Part 1

Table 4.3.2 presents guidance on allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive receptor for construction activities.

Table 4.3.2: Allowable Peak Particle Velocity at the Closet Part of Any Sensitive Receptor

Frequency (Hz)	Peak Particle Velocity (mm/s)
Less than 10	8
10 to 50	12.5
50 to 100 (and above)	20

4.3.1.3 Potential Impacts from the Operational Phase

It is proposed to modernise and expand the composting side of the plant. This will entail the demolition of existing buildings on site and the reduction in the mushroom growing capacity by some 45%. The proposed facility will include for the demolition of some existing buildings and the design and construction of new infrastructure including a raw materials reception hall and a new Phase I bunker complex and Phase II / Phase III composting tunnel complex which will replace the existing open windrow composting process for Phase 1 composting.

The main sources of noise emissions associated with the existing facility are from vehicles loading and unloading materials and from plant and equipment operating on site including the wheel loaders, bale blender and electric fans. As part of the proposed expansion the bulk of the materials handling activities will be confined within the reception hall and within the compost bunkers and tunnels. Therefore, the bulk of the noise generating activities will be carried out inside contained buildings. The bunkers will be constructed of reinforced concrete and will be located a minimum of 250m from the road and sensitive receptors. The tunnels will be constructed of pre cast concrete panels. There will be a reduction in current noise levels due to the noise attenuation properties of the housing of the Phase I and Phase II composting processes.

The main noise sources associated with the composting operations are outlined in table 4.3.3 below.

Table 4.3.3: Main noise sources associated with operational phase

Operation	Associated Noise Sources
Arrival and stockpiling of raw ingredients	Delivery trucks
Rough mixing of horse manure and chicken litter	Front loaders (x2)
Blending of wet bales with horse manure, poultry litter and gypsum	Blender
Transferring from blender to composting bunkers	Conveyor belt
Aeration within bunkers and tunnels	Forced aeration system through floor of bunker/tunnel using electric fans.
Pasteurisation	Cooler used during summer months only
Bulk export off site	Delivery trucks
Bagging on site and export	Bagging machine/ Delivery trucks
Use of compost on site for mushroom growing	Generators/ Fans used for aerating mushroom tunnels

Other minor contributing noise sources include boilers and pumps associated with the collection and distribution of water, however noise emissions from these sources are considered to be low and of minor significance.

The EPA stipulates in Schedule E of Waste Licence 124-1 that, if the total noise level from all sources is taken into account, the noise level at the sensitive location, NSR 1, should be kept below an $L_{(A)eq}$ limit value of 55dB by daytime (08:00 to 22:00) and a limit value of 45dB by night-time (22:00 to 08:00).

The EPA recommended target noise control limit is supported by consideration of other relevant standards such as the World Health Organization (WHO). The WHO recommends guideline levels for dwellings, where the critical effects of noise are on sleep, annoyance and speech interference. To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB $L_{(A)eq}$ for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB $L_{(A)eq}$. At night, sound pressure levels at the outside facades of the living spaces should not exceed 45 dB $L_{(A)eq}$ and 60 $L_{(A)eq}$ so that people may sleep with bedroom windows open.

As discussed previously noise levels of 67 and 57 dB $L_{(A)eq}$ were recorded at the nearest noise sensitive receptor as per Waste Licence 124-1, during the day and night time survey respectively. Although the noise levels as stipulated by the waste licence were exceeded, noise levels recorded at NSR 1 were dominated by vehicle noise unrelated to site activities on the R403. The $L_{(A)90}$ which is indicative of background noise was below the day time noise level and exceeded the night time level by only 1dB. The EPA generally allows for a 2dB 'leeway' for short term exceedances of the

noise limits as an increase in noise levels up to 3dB(A) is considered imperceptible by the human ear.

The design of the facility includes measures to minimise nuisances including noise. The placing of the reception hall and Phase I bunkers in the northeastern corner of the land holding provides a minimum distance of 270m to the nearest neighbouring residence. As detailed in the baseline noise description in section 2.3, the noise levels at NSR1 are predominantly influenced by traffic unrelated to site activities, on the R403 road. Presently baseline measurements indicate that the nearest noise sensitive receptor is not impacted upon adversely by operations at the facility and it is reasonable to conclude that the proposed restructuring of the facility which will incorporate noise minimisation into the design will further reduce any potential for noise nuisance at the nearest sensitive receptors.

Development Related Traffic

For a detailed description of the impact of redevelopment traffic see section 2.9. The traffic assessment outlines that the proposed development will increase the daily traffic generation rate from a total of 93 trips per day to 142 trips per day. It follows that a marginal increase in traffic noise will occur as a result of this development. In reality, a doubling of road traffic volumes would give rise to a 3dBA increase in traffic noise. The perceptible noise from this increase in the traffic volume will be negligible. In general, any action which results in an increase or decrease in the sound pressure level by less than 3 dB will not have a significant effect on how humans hear or perceive the noise. In summary, the proposed development will not result in an adverse impact at the nearest sensitive receptors arising from on-site traffic noise.

4.3.2 Mitigation Measures

4.3.2.1 Noise

Construction Phase

To ensure no adverse impacts resulting from the construction of the proposed development, all best practicable means will be used to minimise noise generation during the construction phase in accordance with recommendations outlined in British Standard BS 5228, Noise Control on Construction and Open Sites – 1997. The following parts of this British Standard are applicable:

Part 1: Code of Practice for basic information and procedures for noise and vibration control

Part 2: Guide to noise and vibration control legislation for construction and demolition including road construction and maintenance.

In particular, the operator shall comply with the following requirements for the control of noise from plant machinery:

It is recommended that "Best Practice Means" should be employed to minimise construction impacts. These include:

- Working hours during site development and construction will be restricted as outlined.
- Where practicable the use of quiet working methods will be selected and the most suitable plant will be selected for each activity, having due regard to the need for noise control.
- All contractors will employ the best practicable means to minimise noise emissions and will be obliged to comply with the general recommendations of BS 5228, 1997. To this end all contractors will use "*noise reduced*" plant and/or will modify their construction methods so that noisy plant is unnecessary.
- Where possible, position potentially noisy plant or operations as far as possible from a noise sensitive receptor (NSR) to minimise the transmission of sound. Similarly, where practicable, all machines and/or noisy equipment will be positioned so that the quietest side faces the NSR.
- All mechanical plant used on site will be fitted with effective exhaust silencers and will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
- All compressors will be of the *"noise reduced"* variety and fitted with properly lined and sealed acoustic covers. In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use.
- All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufacturers. Where practicable all mechanical static plant will be enclosed by acoustic sheds or screens unless they are likely to have negligible impact upon NSRs.
- Where practicable the number of machines in simultaneous operation will be minimised.
- Plant and machinery used on-site will comply with the EC (Construction Plant and Equipment) Permissible, Noise Levels Regulations, 1988 (S.I. No. 320 of 1988).
- All noise producing equipment will comply with S.I. No 632 of 2001 European Communities (Noise Emission by Equipment for Use Outdoors) Regulations 2001.
- Machines in intermittent use shall be shut down in the intervening period between works or throttled down to a minimum
- Where particular 'noisy' work is expected to occur, these will be scheduled between the hours of 9.00 – 17.30. Enclosures to usually noisy activities will be provided where these works cannot be scheduled for the hours 9.00 – 17.30

Employees working on the construction site will be informed about the requirement to minimise noise and will undergo training on the following aspects:

- The proper use and maintenance of tools and equipment
- The position of machinery on-site to reduce the emission of noise at the nearest sensitive receptors
- Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment
- The use and maintenance of sound reduction equipment fitted to power pressure tools and machines
- Reporting defective noise control equipment

It is also recommended that periodic noise monitoring be undertaken during the initial construction phase to determine levels at noise sensitive receptors, in particular during 'noisy' activities. Where the community noise exposure levels are exceeded further mitigation measures will be employed including temporary enclosures or screens around particularly 'noisy' plant.

Operational Phase

To ensure that noise levels at the noise sensitive receptors are not adversely impacted upon by activities at the plant the following mitigation will be adhered to:

- The new composting process will be relocated to the northeast corner of the site. This places the noisiest on site sources, i.e. bale blender and front shovel loaders as far as possible from the nearest noise sensitive receptor.
- While some materials are transported to/from the site between the hours of 5am and 10pm the bulk of the site activities are carried out between 6am and 8pm. The import/export of materials are spread out over a longer day in order to allow for maximum flexibility for site operations and to reduce the hourly concentration of traffic movements
- The interior plant layout and design, where possible will be constructed to minimise noise output from plant machinery. By enclosing the phase I composting process in the new bunkers there will be a significant reduction in noise emissions fro the facility.
- Machines in intermittent use shall be shut down in the intervening period between works or throttled down to a minimum
- A regular maintenance programme will be implemented for all plant items to ensure they are operating effectively
- All vehicle engines will be switched off when not in use.

4.3.2.2 Vibration

Construction Phase

Cognisance will be taken of the following guidance and standards during the construction phase:

- BS 7385: Parts 1 & 2: 1990 and 1993 respectively, provide guidance on the measurement and evaluation of vibration and its effects on buildings, and a guide to damage levels from ground borne vibration.
- Building Research Establishment (BRE) Digest 353 (July 1990): Damage to structures from ground borne vibration
- BS 5228:1997 – Noise and Vibration Control on Construction and Open Sites Part 1.
- BS 5228:1997 – Noise and Vibration Control specifically applicable to piling operations Part 4

Operational Phase

The following mitigation measures will be implemented to ensure vibration levels are minimised and not of significance at the nearest sensitive receptor.

- A regular maintenance programme will be implemented for all plant items to ensure they are operating effectively
- It will be requested that all HGVs entering/leaving the site will undergo regular maintenance

4.3.3 Residual Impact

In summary with mitigation measures implemented, it is anticipated that noise emissions from the proposed development will be less than existing levels.

4.3.4 Interactions

The main interaction of noise and vibration is likely to be with human beings. Noise levels recorded at the nearest noise sensitive receptor ranged from 67 to 57 dB $L_{(A)eq}$ during the day and night respectively and traffic noise was noted as the dominant noise source at this location. There will be a marginal increase in traffic arising from the proposed development. It follows that a marginal increase in traffic noise will occur as a result of this development. Therefore, there will be negligible impact caused by the increased operational traffic. This is not considered to be of significance and will be barely perceptible at these locations. Vibration impacts may occur during the construction phase and will be minimised by adherence to guideline values.

Interaction of noise or vibration with animals or ecological habitats will be minimal and not significant.

Interactions of noise with other elements addressed in the environmental impact statement are not relevant.

4.3.5 References

British Standard 5228, Noise Control on Construction and Open Sites – 1997, Part 1, 2 and 4

EPA *Environmental Noise Guidance Document, 2004*

Environmental Protection Agency (2003). *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.* EPA, Wexford, Ireland.

Environmental Protection Agency (2002). *Draft Guidelines on the information to be contained in Environmental Impact Statements.* EPA, Wexford, Ireland.

Environmental Protection Agency (1995). *Guidance Note for Noise in relation to scheduled activities.* EPA, Wexford Ireland.

Guidelines for Community Noise, 1999 - World Health Organisation (WHO)

ISO 1996: Acoustics – Description and Measurement of Environmental Noise Parts 1, 2 and 3

BS 7385: parts 1 and 2:1990 and 1993 respectively, provide guidance on the measurement and evaluation of vibration and its effects on buildings, and a guide to damage levels from ground borne vibration and

Building Research Establishment (BRE) Digest 353(July 1990): Damage to structures from ground borne vibration.

4.4 SOILS AND GEOLOGY

4.4.1 Potential Impacts

There are no geological features of scientific interest within the confines of the site. The development of the facility may involve some excavation of the existing concrete and subsoil for facility foundations and drainage infrastructure. Excavation of these relatively small volumes is not considered to be a significant impact on the overburden geology of the area.

The overburden deposits and the underlying bedrock are both physically stable geological materials. No impact on their structure is expected as a result of the development of the existing facility. The concrete floors and drainage system proposed for the development will prevent any contaminants from the waste materials migrating into the underlying overburden and therefore, no impact on soil quality in the area is predicted.

4.4.2 Mitigation Measures

To mitigate against the possibility of contamination of soil from a hydrocarbon spill, the Company propose to locate all fuel tanks within bunds. The bunds will have the capacity of at least 110% the volume of the largest tank. All inlets, outlets, vents and pipes will be contained within the bunded area.

Spill kits will be maintained on site during the construction and the operational phases. These will be used in the unlikely event of an oil spill. The kits comprise oil absorbent mats and booms and will be used to contain any oil spills should they occur on site. In this event specialist contractors and consultants will be employed to deal with any significant spills/leakages.

4.4.3 Likely Significant Effects

With the proposed mitigation measures there will be no likely significant effects on the soils and geology of the area.

4.5. GROUNDWATER

4.5.1 Sources of Contamination

Potential sources of groundwater contamination at the proposed site are as follows:

- Soiled water from the composting process
- Washdown from the floors of the building,
- Sewage Management
- Spills from the oil and fuel storage tanks,

4.5.2 Mitigation Measures and Likely Significant Effects

All raw materials (horse manure, poultry litter and gypsum) will be transported to the site in covered trucks (the horse manure trucks will have a net covering). It will be deposited directly into the reception hall and will be processed in covered tunnels during all three phases of composting. Therefore, there will be no potential for ingress of rainfall to the materials and consequently little soiled water generated. However, some of the materials will be wet on arrival and will be wetted by the addition of water during the composting process. This has the potential for the drainage of soiled water from the materials either in the reception hall or the composting bunkers and tunnels. All of these areas are fully contained with concrete floors and side walls and therefore any soiled water generated at the facility will be contained, collected and drained to the new water storage tank (tank B) for reuse in wetting the compost.

There will be a requirement to sterilise two of the tunnels in the Phase II / Phase III building once per week. These will be washed down once per week and this will form part of the internal drainage of soiled water from the tunnel buildings and will be directed to the new water tank (tank B).

Sewage effluent from the site toilets, and effluent from the canteens and washrooms will be collected and sewered to the septic tank located along the northern boundary of the facility. The effluent will be pumped from here to the new water (tank B) for use in the composting process.

It is expected that there will be some 115 staff working on site to include the composting and mushroom growing businesses. Based on a maximum usage of 80 l/hd/day this will generate some 9.2m^3 of effluent per day. Internal drainage from the floors of the reception hall and composting bunkers and tunnels can not be predicted accurately at this stage. However, as there is no potential for rainfall to gain access to the materials it will comprise solely of seepage from the processes and floor washdown. It is considered that a notional volume of 3m^3 per day would be ample to cover this item at present. Records will be maintained from the first few months of operation to confirm the exact volumes of internal drainage.

All oil storage tanks will be positioned in contained concrete bunds with a capacity of 110% of the largest tank contained within. All pipes, valves and connections will be located inside the bund. A ramped concrete apron will be provided adjacent to each bund such that any spillages during loading/unloading of oils will be contained in the apron. Oil spill kits will be stored at the site and these will contain oil absorbent mats and booms and will be used to clean up minor spillages. The bunds will be covered in by a canopy that will prevent rainfall from accessing and filling up the bunds.

Given the complete containment of the site with concrete and the proposed control measures and reuse of all liquids generated on site it is expected that there will be no impact on groundwater quality from the redeveloped site.

4.6 SURFACE WATER

4.6.1 Potential impacts

Potential sources of contamination at the proposed CCL facility include:

- Storage and processing raw materials and compost
- the fuel tanks
- Foul water management system
- Site vehicles
- rainfall run-off

4.6.2 Potential Surface Water Receptors

The receptor for any potential off-site drainage is the small tributary of the Cushaling river that drains along the northern boundary of the site.

4.6.3 Mitigation

The entire site is either concreted or roofed and therefore all rainfall and liquids generated on the site are contained and controlled by the impervious concrete slab.

All raw materials apart from the straw will be imported in covered trucks (horse manure will have a net cover) and deposited in the reception hall which is an enclosed structure. All composting (Phases I, II and III) will be carried out in contained and roofed concrete bunkers and tunnels. In this way there will be no potential for rainfall to gain access to compost materials and therefore seepage or leachate from these materials will be limited. It is proposed to collect any seepages from the materials onto the drained floors of the reception hall or bunkers and tunnels and direct it to the new water storage tank (tank B) which will have a 250,000 gallon capacity. Here it will be stored, aerated and reused in the composting process. All open yard drainage will consist of relatively clean rainfall and will be collected and directed to the existing tank A (400,000 gallon capacity). All roof drainage that is comprised of clean rainfall will be collected and directed to the existing water storage tank (tank A).

The existing process uses practically all of the water generated and collected on site from rainfall. The proposed development will require almost double the amount of water and therefore it is envisaged that all rainfall at the site, and all liquids generated on site will be collected and directed

to either of the storage tanks for reuse in the composting process. Additional water may be required and this will be supplied by the on site boreholes and/or the mains water supply system. In this case there will be no impact on local surface waters from the facility.

It is proposed to provide the option to direct roof drainage only, directly to a discharge point along the northern boundary. This will comprise of clean rainfall and will not impact on the water quality in the local stream network.

All oil fuel tanks on site will be located in contained concrete bunds with a capacity of 110% of the largest tank contained within. All pipes, valves and connections to the tanks will be located inside the bunds. A ramped concrete apron will be located adjacent to each bund to ensure that any spillages that may occur during loading/unloading of oil will be contained. Oil spill kits consisting of oil absorbent mats and booms will be stored at the site to deal with small spills should they occur. The oil bunds will be located indoors or covered with a canopy in order to prevent rainfall from gaining access to and filling the bunds. These mitigation measures will ensure no impact on surface waters from the oil storage facilities on site.

Sewage effluent from the site toilets, and effluent from the canteens and washrooms will be collected and sewered to the septic tank located along the northern boundary of the facility. The effluent will be pumped from here to the new water tank (tank B) for use in the composting process.

It is expected that there will be some 115 staff working on site to include the composting and mushroom growing businesses. Based on a maximum usage of 80 l/hd/day this will generate some 9.2m^3 of effluent per day. Internal drainage from the floors of the reception hall and composting bunkers and tunnels can not be predicted accurately at this stage. However, as there is no potential for rainfall to gain access to the materials it will comprise solely of seepage from the processes and floor washdown. It is considered that a notional volume of 3m^3 per day would be ample to cover this item at present. Records will be maintained from the first few months of operation to confirm the exact volumes of internal drainage.

Any effluent from the two wheelwashes to be located at the new site entrances will be drained directly to the new water storage tank. The effluent will be directed through a silt trap and oil interceptor built into the wheelwash structure prior to discharge to the water tank.

4.6.4 Likely Significant Effects

When the mitigation measures described above are in place the potential impact from the site on the surface water environment is expected to be insignificant.

4.7 FLORA AND FAUNA

4.7.1 Potential Impacts & Mitigation Measures

The proposed development involves the redevelopment and up-grading of the existing composting facility and will include the demolition of some of the existing buildings, construction of a new reception hall and composting bunker and tunnel buildings and an increase in processing of raw materials from approximately 73,000 t/a to approximately 160,000 t/a.

The site is not covered by any nature conservation designations.

All site works will be contained within the existing site boundaries and therefore there will be little need for removal of or direct impact on local ecological features such as hedgerows, trees, shrubs, agricultural lands or waterways. However, it is proposed to remove the existing hedgerow along the R403 road to provide the required sightlines for traffic accessing the site. This boundary will be set back the required distance and new planting of native indigenous species will be carried out along the new boundary. It is considered that this will not cause a significant impact to the local ecology.

Some minor impacts on local fauna may arise from noise during the construction stage of the development. Noise emissions will only be carried out in day time, will not be excessive and will be temporary in nature until such time as the buildings and construction works are complete. This is not considered a significant impact on local fauna.

As with the present situation, the entire site will consist of roofed areas or a concrete slab and therefore all rainfall will be contained and controlled on site. As the composting process requires substantial volumes of water it is planned that all liquid generated on site will be collected, stored on site and reused in the site composting processes. In this way there will be no requirement to discharge any waters to the local drainage network. It is proposed to provide an option for the routing of roof drainage only to a stream discharge point along the northern boundary. This will consist of roof drainage only which will comprise clean rainfall and will not impact detrimentally on water quality in the local stream network.

A composting facility has been operational at this site since the 1960's and there has been no discernible impact on the local (or regional) flora and fauna. It is submitted that while the proposed development entails almost doubling the volume of compost produced at the site, that the proposed upgrading of the facilities to include the handling of all materials indoors (inside the reception hall and new bunkers and tunnels etc.) will ensure a lower potential for impact on the local ecological environment than existed heretofore and therefore there will be no significant impact on the ecology of the area.

4.8 HUMAN BEINGS

4.8.1 Potential Impacts

As stated in section 2.8.1 there are 22 residential dwellings located within 1km of the site boundary. The bulk of these are located along the R403 road. Potential impacts on these local residents and the local community in general include the following:

- Noise,
- Odours,
- Air quality dis-improvement,
- Water Quality
- Traffic increase,
- Health,
- Visual intrusion,
- Increase in vermin,

Potential noise impacts are assessed in Section 4.3 of the EIS. Potential impacts from air quality and odours are assessed in section 4.2. Groundwater quality is assessed in section 4.5 and surface water quality in section 4.6. Traffic is covered in section 4.9 and visual impacts in 4.10. Impacts relating to vermin, human health and litter are discussed below.

4.8.1.1 Vermin

It is not considered that scavenging birds will be an issue at the site due to the types of materials being processed. Increases in rodent and insect populations will be monitored and measures carried out to control these if required. Measures designated to mitigate against these species include the following:

- It is not envisaged that there will be any major problems from flies or insects. However, if there is a noticeable increase in insect populations at the site then biodegradable insecticides will be used to control fly infestation.

- CCL will employ a pest control company to control any potential vermin problems. Experience at other facilities of this nature and in particular at enclosed facilities indicates that there will be no significant impact from either birds or rats.

4.8.1.2 Human Health

The CCL site is used for the processing of horse and poultry manure for the creation of compost. The potential emissions from the site include dust, odour, aerosols and noise. These potential

impacts are addressed in detail in other sections of the EIS. Other potential impacts on human health include the possibility of injury or illness. The greatest risk of this nature will be to site staff. A safety statement is in place at the facility and applies to all staff. This will ensure that site operatives are sufficiently trained in terms of relevant health and safety matters and are correctly equipped with personal and protection equipment.

4.8.1.3 Employment

Operation of the facility will not impact detrimentally on other forms of employment in the locality in any way. On the contrary it is considered that there will be a positive impact to employment in that the facility itself will provide approximately 115 jobs in the region (this includes the mushroom growing complex). In addition, the facility will be of benefit to the local equine and agricultural industries in providing a locally based outlet for straws and horse manures (and potentially chicken litter) and will also provide a benefit to the local service industries located in nearby towns and villages.

4.8.2 Likely Significant Effects

The likely significant effects on human beings from environmental emissions and nuisances such as noise, air quality, odours, water pollution, traffic and visual intrusion are assessed elsewhere in this EIS. With the mitigation measures described above, the likely effects of the proposed development on the local population in relation to vermin and human health are expected to be insignificant. It is submitted that there will be a positive impact in terms of providing employment both directly at the facility and indirectly to the local service industries.

4.9 ROADS AND TRAFFIC

4.9.1 Introduction

The general operation of the proposed development is outlined in Section 3.1.2 and it is assumed for the purpose of a traffic assessment that similar work practices will be employed at the proposed facility albeit at a modestly larger scale.

Traffic*wise* Ltd. has held discussions with the Applicant regarding the likely additional traffic volumes which might reasonably be generated as a result of the current development proposal.

4.9.2 Proposed Development Traffic Generation

In order to estimate the daily levels of traffic generation at the development we have based our calculations on commercial estimates of likely quantities of materials to be brought to/from the site and proposed changes to staffing arrangements. This information was provided by the Applicant and is shown in Table 4.9.1 below. Table 4.9.1 outlines for each material processed or exported at the site, proposed total annual tonnage, average weight per load and proposed number of loads per week and per day, from which a traffic generation rate for HGVs can be calculated. Also shown is an estimated likely traffic generation rate for light vehicles.

Commercially Generated Traffic

It is expected that growth in the volume of materials handled will be dependent upon commercial and seasonal factors, nonetheless for the purposes of the assessment provided in this report it is assumed that the proposed tonnage will be reached upon opening.

Through discussions with the applicant, there are currently no plans to increase the existing fleet of three rigid vehicles which bring horse manure to the site. This is due to the limited supply of horse manure in the locality and the fact that additional straw could be sourced and used instead of horse manure for the proposed doubling of compost production. However in keeping with our approach to presume the most robust forecasts of future levels of HGV coming to/from the site, we have assumed that the intake of horse manure will equal the amount stipulated in the license, that being 45,000 tonnes/annum as shown in Table 4.9.1 below. Clearly this assumption will lead to an element of double counting of traffic.

There is a balance in the use of straw and manure in the processing procedure. Where lesser quantities of manure are used the balance can be made in straw and vice versa. From Table 4.9.1 nonetheless it can be seen that for the purposes of this report and in the interest of a robust assessment it is assumed that it is proposed to effectively double the intake of raw materials such as poultry litter, gypsum and straw.

As previously stated, an impact of the proposed development will involve all of the Phase 1 compost being processed to a higher level, being ultimately Phase 3 compost, and then being exported. Therefore Phase 1 and Phase 2 compost will no longer be used in the mushroom growing farms or exported off site and there will be no traffic generated form the handling of these materials.

The opening hours of the site will remain 05:00 to 22:00hrs for each day of the week. However for traffic related matters, HGV movements are limited to weekdays as no raw material deliveries come into the site at the weekend. Therefore the average daily traffic generation rates for the site have been based on a five day week.

It is estimated that approximately 44% of all incoming HGV traffic access the site from the north with 56% coming from the south and 72% of all outgoing HGV traffic turns north onto the R403 with 28% turning south.

The quantities of some materials required in processing are affected by seasonal factors i.e. the facility will accept approximately 75 loads per week of horse manure in the winter months with significantly less predicted to come in the summer months. However in our assessment we have taken the upper bound quantity and assumed a conservative weekly average of 75 loads.

Through discussions the Applicant has indicated that fuel demand will remain unchanged from the present level of two loads per week.

Carbury Mushrooms Ltd has provided a likely range of weights according to each type of vehicle and payload that is coming to/going from the site. For the purposes of this assessment, in order to carry out a 'robust' analysis of traffic impact we have assumed a conservative estimate of the average payload for these vehicles.

As outlined above, the figures shown in Table 4.9.1 can be considered robust due to the assumptions listed above. As explained this has been done in the interests of a thorough assessment in order to provide the planning authority with a level of confidence that fluctuations in traffic volumes to the site have been taken into account.

Staff Generated Traffic

Carbury Mushrooms Ltd. intends to reduce the number of mushroom growing tunnels on site, which in turn will reduce the current staffing levels. Therefore current proposals state that pursuant to the closing of the on-site growing tunnels, the applicant will reduce the current number of staff from 133 persons to 113 persons.

Working hours will remain the same as current conditions with flexible working hours, and shifts starting every hour from 05:00 to 08:00hrs. For the purposes of a conservative assessment, we have assumed that the proposed reduction in staff would have no affect on the existing number of

private cars on site. Instead we have assumed that the degree of car ownership will increase by a factor of 50% from the existing 43 vehicles. Thus we have assumed that each of the future 65 cars will generate 1.5 trips per day, to account for journeys to nearby towns and villages for commercial purposes at lunchtime. Given the observed high car occupancy and high use of public transport to/from the site, we consider that these assumptions are extremely robust but will give a representative 'worst case scenario'. Taking these factors into account we have calculated the existing traffic generation of the site with the results presented in Table 4.9.1 below.

Table 4.9.1 Future Traffic Generation Arising from Proposed Development

Composting Materials	**Type of vehicle**	**Future Quantity** (t/yr)	**Average Weight per HGV** (tonnes)	**Average HGVs per Week**	**Average HGVs per Day**	**Total Trips per Day**
			Incoming			
Horse Manure	Rigid Truck	45,000	11.5	75	15.0	-
Poultry Litter	Artic & Semi Trailer	35,500	24	28	5.7	-
Straw	Artic & Semi Trailer & Tractor & Trailer	60,000 Bales/yr	30 bales per load	38	7.7	-
Gypsum	Artic & Semi Trailer	4,600	24	4	0.8	-
Fuel	Rigid Truck	-	-	2	0.4	-
Sundry	Rigid Truck	-	-	1	0.2	-
Peat	Artic & Semi Trailer	-	-	3	0.6	30.4
			Outgoing			
Phase 3 Compost	Artic & Semi Trailer	95,680	23	80	16.0	-
Spent Compost	Tractor & Trailer	7,450	12	12	2.4	-
Mushrooms	Artic & Semi Trailer	2,320	7.1	6	1.2	19.6
Total HGVs	Mixed Rigid & Articulated	-	-	-	-	50
Staff	Private Car	-	-	-	-	97

(Note: Figures were provided by the Applicant)

From Table 4.9.1, it is estimated that the proposed development has the potential to increase the daily traffic generation rate from 94 trips per day to a total of 147 vehicle trips per day. Of these 147 trips, 97 are private vehicles (staff) and 50 are HGVs (commercial deliveries). For HGVs this represents a 71% increase from current levels. However we consider current volumes to be so low that this increase will be easily absorbed onto the surrounding road network without any significant impact upon road carrying capacity.

On the basis of a peak hour factor of 10 percent, the expanded composting facility would be likely to generate typical peak hour volumes of about 15 vehicles to/from the site, with 10 staff trips and 5 HGV trips. We expect the PM Peak period to remain similar to that observed in the surveys i.e. 17:30 to 18:30hrs. Elsewhere throughout the day, trips are expected to be relatively well distributed, with typical hourly volumes during the period 09:00 to 21:00hrs of between 8 and 10 vehicles.

4.9.3 Construction Related Traffic Activities

The construction phase of the development will generate traffic on the local road network. We consider that the primary generators of traffic will be deliveries of construction materials and construction staff. Bearing in mind the above estimates of traffic generation to the proposed development and from our experience in the implementation of similar projects we do not expect construction related traffic activities to outnumber those generated by the development upon opening. Accordingly, traffic generation and therefore impact on capacity during the construction period is likely to be considerably lower than forecast above.

Considering the lower levels of traffic attraction during the construction period we do not believe it necessary to carry out an assessment of the 'short term' impact on the capacity or load carrying capacity of the local roads network in the vicinity of the development during construction.

4.9.4 Assessment Years and Estimation of Traffic Growth

4.9.4.1 General

Recalling the threshold approach of the Institution of Highways & Transportation outlined in Section 2.9.3.1 of this report, in the following we will determine the need for a detailed assessment (computer modelling analysis of road link and junction performance) of traffic impact arising from the proposed development.

In the interest of a worst case assessment of the likely impact of the development on the operation of the local roads network, the following calculations are based on the total traffic generation of the proposed development. It will of course be appreciated that the true measure of impact from the proposal would be the incremental increases in traffic between the existing and proposed developments

4.9.4.2 Forecast Traffic Impact of Proposed Development

If the existing operation were ignored and it was assumed that the proposed development was a greenfield development, the forecast percentage increase in traffic on the adjoining highway

(R403) as a result of the expanded composting facility would be significantly lower than the 10% threshold normally applied under the recommendations of the Institution of Highways and Transportation. Clearly if the existing traffic generated by the facility is taken into consideration the forecast 'incremental' impact of the proposed development on local traffic volumes would be even less.

Clearly the impact of the proposed development on the surrounding roads network is likely to be insignificant.

In accordance with the general advice of the Institution of Highways and Transportation, capacity assessments using computer modelling programs are not considered necessary. It can be appreciated that the very low traffic volumes associated (incremental increase in the order of 1%) with the proposed development would be highly unlikely to have a detectable impact on the operation of the roads network serving the general area.

4.9.4.3 Forecast Peak Hour Traffic – R403 Past Site Access

The peak hour accumulative two-way traffic flow on the R403 passing the site entrance in the evening peak period shows 440 two-way movements 414 of which are cars and 26 are HGVs. The predominant flow of traffic past the site in the evening is from Dublin with practically 80% of traffic travelling northbound. From Section 4.9.2, the proposed development is likely to generate in the region of 5 HGV movements and 10 cars during the evening peak hour.

The 2006 PM peak hour flow represents a 16% reduction from that surveyed in 2005, mainly as a result of the opening of the M4. Applying this 16% reduction factor to the 2005 AM peak hour flow should yield a representative figure for 2006, namely 400 vehicles two-way movements, 364 of which are cars and 36 are HGVs. The predominant flow of traffic past the site in the morning is toward Dublin with practically 63% of traffic travelling southbound. From Section 4.9.2, the proposed development is likely to generate a maximum of 5 HGV movements and 10 cars during the morning peak hour.

Based on the general rule of thumb that the peak hours typically represent between 10 and 12% of the Annual Average Daily Traffic (AADT), the current AADT on the R403 past the site entrance (south of Derrinturn) is estimated from the surveys to be in the region of 4,400 to 5,300 vehicles. The forecast total daily traffic generation to the proposed facility is estimated to be 97 cars and 50 HGVs.

Accordingly the proposed development (assumed to be a standalone new facility) is likely to constitute 3.0% of R403 traffic during the PM peak hour and less than 1.0% AADT. These percentages are based on the total traffic generation of the proposed site and do not account for the existing traffic movements currently generated by the facility, therefore the impact of the proposed expansion of the composting facility on the R403 is considered highly likely to be

insignificant in terms of capacity both of the site access arrangements and the adjoining R403 Regional Road.

4.9.5 Proposed Development Access

There are currently four direct access points from the R403 to the proposed development lands, and all exhibit inadequate sightline criteria. It is proposed to extinguish three of these accesses, namely Access 1, 2 and 4 whilst undertaking improvement works to Access 3 (proposed southern access) and constructing a similar access to the north of this location. In conjunction with the geometric improvements to Access 3 and the introduction of the proposed northern access the existing boundary hedge and fence lines will be altered and set-back from the R403 to achieve satisfactory sightline distance requirements from both access points. The two access points are located at the centre of the road frontage of the site as this is the only location along the frontage where satisfactory sightlines can be achieved.

We consider that the proposed reduction in existing access points and improvement and construction of two DMRB compliant access points will constitute a net safety improvement at the location. There is a high degree of inter-visibility for drivers at both access points and the spacing of the accesses is not considered likely to contribute to an increase in traffic hazard.

We also believe that in removing four sub-standard accesses and replacing them with two DMRB standard access points, this proposal is in compliance with the current Local Authority Development Plan which states:

> *"to avoid the premature obsolescence of identified regional roads through the creation of excessive levels of individual entrances and to secure the recent investments in non-national roads, it is the policy of the Council to restrict new accesses onto these roads where the 100km per hour speed limit currently applies (proposed to be changed to 80km/h).*

4.9.5.1 Relevant Design Standards

The roads design standard by which we have evaluated the access design and visibility sightlines from the property is the NRA: Design Manual for Roads and Bridges. It should be noted that the NRA:Design Manual for Roads and Bridges is used principally in the design of National Primary Roads.

TD 42: '*Geometric Design of Major Minor Priority Junctions'* provides advice relevant to the design of Major/Minor Junctions on the National Primary Road network, nonetheless as highlighted in the general introduction to the standards, the extent to which these directives apply on non-national roads is determined by the overseeing Local Authority.

4.9.5.2 Access Capacity

Through reference to the NRA:Design Manual for Roads and Bridges TD42 Figure 2/2 *'Approximate Level of Provision of T-junctions on New Single Carriageway Roads for Various Major and Minor Road Design Year Traffic Flows'* it can be seen that for a Major Road (R403) AADT of 8,000 vehicles, a ghost island layout should in theory be capable of accommodating approximately 5,000 AADT on the Minor Road (Site Access). The daily traffic generation of the site is approximately 3% of the NRA:Design Manual for Roads and Bridges advice on the theoretical capacity of the access. Clearly the existing access is not likely to experience any operational difficulties due to the implementation of the proposed development.

In respect to the provision of ghost island right turn lanes the paragraph 2.16 of TD42 states the following.

> *"At existing rural and at urban junctions the cost of upgrading a simple junction to provide a right turning facility will vary from site to site. However, upgrading should always be considered where the minor road flow exceeds 500 vehicles 2-way AADT, a right turning accident problem is evident, or where vehicles waiting on the major road to turn right inhibit the through flow and create a hazard."*

The current development site generates significantly less than the 500 vehicle threshold advised by the Institution of Highways and Transportation.

4.9.5.3 Stopping Sight Distance

The R403 past the site is subject to a speed limit of 80kph. Street lighting is provided along the frontage of the site.

Table 2 of TD9 *'Highway Link Design'* it can be seen that the appropriate 'desirable' minimum Stopping Sight Distance for a design speed 80kph is 160m which corresponds to the 85A Design Speed Step. The permitted relaxation by one step gives a Stopping Sight Distance of 120m (minimum required forward visibility to vehicle/obstruction ahead).

4.9.5.4 Visibility Criteria in Accordance with NRA:DMRB

TD41: '*Vehicular Access to All-Purpose Trunk Roads*' Table 2/1 and TD9: Table 7/1 show the required visibility criteria for various roads 'Design Speeds'.

TD9, Table 2/1 shows that the appropriate 'y' distance along the major road (Trunk Road or equivalent National Primary Road) should be 160m corresponding to a major road design speed of 80kph.

Paragraph 2.21 of TD41 and paragraph 7.8 of TD42: '*Geometric Design of Major Minor Priority Junctions'* provides advice on the required 'x' distance.

At lesser trafficked junctions on the National Primary Road network an 'x' distance of 2.4m is normally considered satisfactory. Nevertheless it can be appreciated that the R403 is not a National Primary Road and the access to the site is not a Major/Minor junction.

Save for at the extremities of the site frontage, the R403 past the site is practically straight, accordingly the visibility envelope has been shown in accordance with the advice given in TD42 Figure 7/1 '*Visibility Standards*'.

4.9.5.5 Appraisal of Visibility Sightlines at Existing Access

An assessment of the proposed access arrangements and future visibility criteria is provided on the accompanying **Traffic***wise* Ltd. Drawing No. 02724/01/01/PL01. Visibility sightlines and verge area required to serve the southern access point are shown 'magenta' whilst the corresponding data for the northern access is shown 'blue'.

The R403 is provided with a solid white line marking the centreline. Under such circumstances it is considered reasonable to measure the visibility sightline in the non-leading traffic direction (traffic on opposite side to access) to the solid centreline as opposed to the kerb line; this measure is required for the southern access (viewing south).

The drawing shows that with suitable boundary treatment and relocation, the required visibility envelope measuring 'x' = 2.4m by 'y' = 160m is achievable at the existing upgraded central access point (Access No.3 or proposed southern access) and at the proposed northern access. The gradient of the R403 past the site is relatively constant, accordingly the driver's eye and object heights associated with the 'sight distance triangle' accord with the requirements of paragraph 2.2 and the corresponding Figure 3 of TD9.

The sight distance triangle is measured from a minimum driver's eye height of between 1.05m and 2.00m, to an object height of between 0.26m and 2.00m (both above the road surface). No third party lands will be required in order to achieve visibility sightlines, nonetheless some remedial measures will be required along the existing site frontage. Remedial measures include the relocation of the existing boundary hedge/fence.

4.9.5.6 Forward Visibility R403 Approaches to Proposed Access

On both approaches to the site the R403 has relatively tight bends. Forward visibility at these bends does not comply with the current NRA: Design Manual for Roads and Bridges standards. Forward visibility of 160m is not achievable through the respective bends from a point 1.5 times Stopping Sight Distance in advance of the access. R403 drivers will nonetheless be capable of sighting a vehicle when 160m from the proposed access.

In order to address the shortfall in forward visibility on the public road we propose installing appropriate advance warning signage on the approaches to the proposed access points. The existing advance warning signs should be replaced with the modern equivalent that conforms to the Traffic Signs Manual. We highly recommended that these signs are provided with distance information or distance plates. The approach to a 'junction' is defined in the NRA: Design Manual for Roads and Bridges as 1.5 times Stopping Sight Distance which is equivalent to 240m in this instance. We advise locating the upgraded advance warning signage approximately 250m from the centreline of the proposed access.

The proposed access arrangements have been designed to NRA:Design Manual for Roads and Bridges standards for 'Junctions' on the National Primary Roads network. This is a private development access and not a public junction, and peak hour traffic flows have been shown as likely to be are very low with an average of one vehicle movement either in or out of the development every four to five minutes in the peak hour period.

From the above we consider that the proposed development site access arrangement is an appropriate junction layout to serve the proposed development and has sufficient capacity to cater for the demands of the facility.

4.9.6 Conclusions

Traffic generation rates associated with the construction and operation of the expanded and modernised composting facility have been shown to be very low and the extra traffic will not have an adverse effect on the capacity and operation of the current road network. The proposed development will generate a maximum of approximately 150 vehicles per day which represents 2-3% of the 2006 AADT (4400-5300 vehicles per day).

The proposed closure of three existing site accesses and alteration and improvement of the existing Access 3 and the construction of a northern access, both to NRA: Design Manual for Roads and Bridges standards will represent a net safety improvement for all road users at this location on the R403.

4.10 LANDSCAPE AND VISUAL AMENITIES

4.10.1 Specific Characteristics of the Proposal

The proposed redevelopment of the site involves the demolition of many of the older buildings and replacing them with modern custom built structures including a materials reception hall, composting bunkers and tunnels, a new water storage tank, some small ancillary structures such as oil bunds and a new wastewater treatment plant. A 1.8m diameter stack to control air emissions will be constructed on the southern side of the reception hall and will be 17.5 m high. Please see Drawings 3154CPL–'06 1.02 and 3154CPL-'06 1.03 showing the existing and proposed structures at the facility. The existing western boundary including tress and hedgerow will be removed and the boundary set back into the site to facilitate sightlines for traffic access. The new boundary will be fenced and planted with native plant species.

4.10.2 Potential Impacts and Mitigation Measures

4.10.2.1 Landscape Character and Visibility

As detailed in section 2.10 of the EIS the site is located in a rural area about 2km south of Derrinturn village. The site occupies some 9.4 ha including both the composting (5.03 ha) and mushroom growing facilities. The existing site is occupied by a large number of buildings and the entire site is covered with a concrete slab. Many of the buildings were constructed in the 1950's and 1960's and outer surfaces comprise a concrete block finish with some concrete and plastering finish. These old buildings are showing their age and while still functional have become worn and somewhat dilapidated in appearance. The existing facility has been operational since the 1960's, is reasonably well screened from local views by the quality and strength of the boundary and intervening hedgerows and has to a certain extent become embedded in the local landscape.

The proposed redevelopment has the potential to impact on the local landscape character as there will be new buildings constructed to replace some of the older buildings. However, it is expected that there will be no great change to the site as a whole and therefore potential impacts on the general landscape character are expected to be low. There will be fewer new buildings constructed than demolished and each will be finished with side walls and roofs sympathetic to the environment in terms of texture and colour. The rough blockwork evident in the old existing buildings will be replaced with a smooth concrete exterior and the tegral roofs will be finished in a colour that will blend in with the local environment and can be agreed with the local authority in advance of construction. The construction of a new air emissions stack at a height of 17.5 m will perhaps provide a potential for impact as this will constitute the highest point in the redevelopment. It is submitted that the stack at a height of 17.5 m is not excessively high and its location in the northeast corner of the site removes it as far as possible from the nearest sensitive receptors and the public R403 road.

The removal of the hedges and trees along the existing western boundary in order to provide adequate sightlines for site traffic will of course impact on the screening value of these plants from passing traffic and views from the west. However, it is planned that new planting will be carried out along the new set back boundary comprising native species and this will with time provide strong screening of views from the west.

A positive impact to the general landscape will arise from the proposal to store and treat the raw materials and the Phase I compost in enclosed structures. The existing situation involves the storage of raw materials outside on the open yard and carrying out the Phase I compost in open windrows (long ridges) in the open yard area. The new site will enclose all of these operations inside the reception hall and the Phase I composting bunkers and therefore they will no longer be visible from any aspect.

The site is not located in any environmentally designated area. The redevelopment will not obstruct or impinge on any views or prospects identified in the County Development Plan and will not impact on any scenic routes, sensitive or vulnerable areas.

4.10.3 Likely Significant Effects

It is considered that there will be no significant visual impacts resulting from the proposed development.

4.11 CULTURAL HERITAGE

4.11.1 Potential Impact of the Proposed Development

It is likely that if any archaeological remains were present on site they have been destroyed by pre-existing development. Therefore there will be no impact on the cultural heritage of the site by this development. There are two archaeological sites located approximately 600m and 1,020m distant from the site and the proposed development will have no impact on these sites.

4.11.2 Recommended Avoidance, Remedial or Reductive Measures

The proposed development does not impact on any known archaeological sites or monuments and will not cause any ground disturbance or visual impact outside of the existing site boundaries. The proposed development will not extend into undeveloped areas. Thus there will be no discernible impact on the archaeological/historical resource and no mitigation measures are required.

4.12 MATERIAL ASSETS

4.12.1 Potential Impacts

It is not expected that the proposed development will have any negative impact on the local environment in terms of infrastructure, agriculture, tourism etc. The vehicles using the facility may have a slight impact on the roads servicing the site in terms of general wear and tear. This is addressed in Section 4.9 where the impact is considered insignificant. No other impacts on the infrastructure of the area are predicted and no mitigation measures are proposed

A positive impact of the CCL site is that it provides infrastructure and recycling capacity that is available for use by the agricultural industry in the local area and industry and commerce in the wider area of the Mid Kildare region and the surrounding environment. The development will provide an outlet for horse manure, poultry litter and straw in the region and will reduce the requirement for use of other natural resources to produce mushroom compost.

4.12 INTERACTIONS

The European Communities Environmental Impact Assessment (Amendment) Regulations, 1998, require that an EIS describes the impacts and likely significant effects on the interaction between any of the following environmental media:

- human beings
- flora
- fauna
- soil
- water
- air
- climate
- the landscape

Table 4.13.1 highlights impacts and effects on interactions between these media and identifies the sections of the EIS where the interactions are addressed. It should be noted that in certain cases there are obvious interactions between environmental media, e.g. climate and flora, however, if the Carbury site does not have the potential to impact or affect the interaction, then that interaction is not highlighted in Table 4.13.1. The identified interactions are as follows:

Human Beings / Water

Contamination of surface water at the site has the potential to impact on the water quality in the Cushaling River. This impact could potentially affect the amenity value of the river which would affect human beings. Contamination of groundwater beneath the site would restrict any future use of the underlying strata for water supplies and would also have the potential to impact on the water quality in the Cushaling River. Mitigation measures to ameliorate these potential impacts are proposed in Sections 4.5 and 4.6, after which the effects are expected to be insignificant.

Human Beings / Air

Dust emissions, noise emissions, aerosols and odours from the facility have the potential to impact on human beings in the vicinity of the site. A range of mitigation measures are proposed in sections 4.2 and 4.3 and these will limit the impacts such that there will be no significant impact on the environment.

Water / Flora and Fauna

Contamination of surface water or shallow groundwater at the site has the potential to impact on the water quality in the streams and river downgradient of the site. This impact could potentially affect the aquatic life in these water courses. It is expected that there will be no discharges to either groundwater or surface water and therefore no significant impact on local waters.

Water / Soil

Soil beneath the site can act as a pathway for contaminants reaching both the groundwater and the surface water. Contamination of the soil can therefore lead to contamination of the water environment. As the site will be covered with a concrete slab there will be no impact on the underlying soils from any emissions.

Human Beings / The Landscape

The visual impact of the facility has the potential to affect human beings. However, as discussed in section 4.10 the proposed development will be designed and constructed so as to minimise any impact. In addition, there is good existing and proposed screening from boundary hedgerows that will limit the potential for impact on the local landscape.

Table 4.13.1: Impacts and Effects on Interactions between Environmental Media

	Human Beings	Flora	Fauna	Soil	Water	Air	Climate	The Landscape
Human Beings								
Flora	None							
Fauna	None	None						
Soil	none	None	None					
Water	Sections 4.5 & 4.6	Sections 4.6 & 4.7	Sections 4.6 & 4.7	None				
Air	Sections 4.2 & 4.3	None	None	None	None			
Climate	None	None	None	None	None	None		
The Landscape	Section 4.10	None	None	None	None	None	None	

Note: This table identifies the section of the EIA where impacts or effects on interactions between environmental media are discussed.

Any interactions which will not be impacted upon or affected by the facility are not described in the EIS.