Ms. Caroline Murphy,
Inspector,
Environmental Licensing Programme,
Office of Climate, Licensing & Resource Use
Environmental Protection Agency,
PO Box 3000 Johnstown Castle Estate,
Co. Wexford.

24th August 2013 Waste Licence Application Reg. No. W0284-01

Re: Notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations 2004, as amended.

Dear Ms. Murphy,

I refer to the above referenced letter and would reply as follows:

ARTICLE 12 COMPLIANCE REQUIREMENTS

1. A screening for Appropriate Assessment was carried out by Ash Environmental to determine if the current or proposed activity is likely to have a significant effect on a European Site(s), in view of the best scientific knowledge and of the conservation objectives of the site(s) The screening was carried out with reference to the document 'Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities' issued in 2009 by the Department of the Environment, Heritage and Local Government, and revised in 2010. The screening report is attached and it was determined that the development of the OTCL facility *'will not result in likely significant direct or indirect impacts, either alone or in combination, on the structure, function and conservation objectives for the River Barrow and River Nore SAC or any other Natura 2000 site'.*

2. The facility is designed to deal with a throughput tonnage of 90,000 tonnes per annum when fully constructed and when operating at full capacity. This will be achieved as follows:

   Anaerobic Digestion – this will be a specially designed digestor and associated tanks that will be specified to process the 30,000 tonnes that is required. A manufacturers/suppliers performance contract will be entered into at the design stage and a performance bond will be required by O'Toole Composting Ltd from the manufacturer as part of this contract. This will ensure that the equipment supplied is capable of processing the 30,000 tonnes per annum as required.

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used for bulking up and transfer of three main waste types, namely mixed dry recyclables, mixed municipal waste and mixed construction and demolition waste. The mixed dry recyclables is currently being delivered at approximately 2 loads per week and this is expected to increase to approximately one load per day (5000 tonnes per annum) and this material is stored prior to removal offsite for recovery. There is adequate storage space currently for one load per day. The mixed municipal waste is bulked up to the equivalent of one load per day prior to transfer to the drying and bio-stabilisation activity in the composting shed. This will equate to approximately 5000 tonnes per annum. It is proposed to increase the volume of mixed C&D waste up to 10,000 tonnes per annum. Prior to this happening the proposed extension to the shed will be completed. This will increase the area of the building to 1300 square metres including the proposed bio-filter. The increased size will provide more than adequate capacity for the volume of waste that is proposed. It is proposed to carry out recovery activities with this waste type in the future. Any plant will be subject to a SEW approval from the Agency but will include as a minimum – trommel screen (or similar) capable of processing up to 20 tonnes per hour of mixed C&D or C&I waste, picking conveyor designed to the same specification, overband magnet, windshifter, eddy current separator and possibly a pre-shredder. The plant for this purpose can easily be accommodated within this new floorspace and will be designed at twice the required capacity.

Composting Building – There are four composting tunnels in the composting building. Each of these tunnels are 30 metres x 6 metres x 5 metres (l*w*h) giving a cubic capacity of 900 cubic metres. Each 'batch' whether it is compost or MSW for drying will require two tunnels to complete the process (ie two temperature barriers over two weeks approximately). As stated there are four tunnels with one currently being used as a bio-filter. This will be put into operation on completion of the new bio-filter. The requirement for 400 tonnes per week per tunnel (1 &2) to give 40,000 tonnes per annum is adequately catered for by the size of these tunnels.

3. The digestate from the AD process will be landspread locally as fertiliser. This includes both solid and liquid fractions.

4. The AD process will be a fully stand- alone process.

5. For clarification purposes given that biowaste has now been defined in the Waste Management Acts 1996 to 2013, please substitute the term biowaste with 'biodegradable waste' where it is used throughout this application.

6. Please find attached drawing showing both on-site and offsite monitoring locations. The location of the well is shown on the drawing @Location of tanks and well. Please note there will be no emissions.

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7. The water abstracted from the on-site well will to service utilities only (ie toilets and showers). It is estimated that this will be in the region of 50-60 cubic metres per week.

8. Based on previous analyses of surface water at SW1 and SW2 it is proposed that emission limit values be set as follows:

Parameter	Emission Limit Value
pH	≥6.5 and ≤9.5
Ammonia	0.15 mg/l N
Conductivity	1000 µs/cm
BOD	
COD	
Suspended Solids	35

These figures are suggested based upon the Interim Guideline Values recommended by the EPA's report Towards Setting Guideline Values for the Protection of Groundwater in Ireland – 1993.

9. An air dispersion modelling assessment for H_2S, HCl and HF has been carried out by RPS Consulting Engineers and confirms that the relevant air quality standards will not be exceeded. This report is attached.

10. Details of the ability of O'Toole Composting Limited to meet the financial commitments that will be entered into or incurred in carrying out the proposed activity and evidence that OTCL will be in a position to make adequate financial provision will be supplied to the Agency under separate cover. This will include a CRAMP and ELRA prepared in accordance with EPA guidelines. It will also include a proposal for financial provision.

ARTICLE 13 COMPLIANCE REQUIREMENTS:

1. The specification of the proposed AD and CHP systems has not been decided upon yet by the applicant. Therefore it is not yet possible to determine if there will be any additional environmental impact over and above that currently described within the EIS. However both of these additional pieces of infrastructure will require planning permission and SEW approval from the Agency. It is proposed to deal with any environmental impacts (if any) as part of the planning application and SEW approval requests.

The non-technical summary of both the Application and the EIS have been revised where necessary to reflect the information supplied as part of this response. Copies of each are attached. Please note

that an additional drawing showing the location of all tanks on site including firewater, rainwater and effluent are also attached. This drawing also details the location of the well and location of the bunded oil tank.

I trust that this information meets the requirements but if you require any further information please do not hesitate to contact me.

Yours sincerely

Jim Dowdall
Enviroguide Consulting
(on behalf of O'Toole Composting Ltd.)

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August 2013

Screening Statement
for the
Proposed Expansion to Operations

Ballintrane,
Fenagh,
Co. Carlow.

ASH ECOLOGY

Aisling Walsh M.Sc MCIEEM Trading as Ash Ecology Tel: 087 9334739 Web: www.ashecology.com

O'Toole Composting Ltd.

Ballintrane, Fenagh, Co. Carlow.

Screening Statement for the Proposed Expansion to Operations

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1. Introduction

O'Toole Composting Limited (OTCL) is currently in the process of consulting with the EPA regarding an application for a Waste Licence t (Ref W0284-01 in order to develop and expand the current operations. The site is located in Ballintrane, Fenagh, Co. Carlow (see Figure 1).

Ash-Ecology has been commissioned to document the screening process to identify and determine the potential effects, if any, of the proposed expansion to operations at the composting facility on the conservation status of nearby sites with European Conservation designations i.e. Natura 2000 sites. This screening report has been compiled as a further information request by the EPA.

1.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "The Habitats Directive" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats

Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (2009/147/EEC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for AA as follows:

"*Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*"

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures.

1. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts.
2. Second, mitigation measures should be applied, if necessary, during the AA process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, then it is rejected.
3. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

2. Methodology

This Screening Statement has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) and the European Commission Guidance 'Managing Natura 2000 Sites'. The Guidance for Planning Authorities entitled 'Appropriate Assessment of Plans and Projects in Ireland' issued by the Department of Environment, Heritage and Local Government (DEHLG) in December 2009 and revised in February 2010 is also adhered to.

In complying with the obligations under Article 6(3) and following the above Guidelines, the approach to the screening process undertaken for this proposal is set out below:

1. Description of the proposed works;
2. Identification of Natura 2000 sites potentially affected and compilation of information on their qualifying interests and conservation objectives;
3. Identification and description of potentially significant impacts likely to result from the proposed works;
4. Assessment of the significance of the impacts identified above on the integrity of sites. Exclusion of sites where it can be objectively concluded that there will be no significant effects.

2.1 Desk Based Studies

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)[1] and the National Biodiversity Data Centre (NBDC)[2] was reviewed.

The relevant chapters of the Environmental Impact Statement (EIS)[3], prepared by Enviroguide Consulting, addressing the potential environmental impacts of the proposed expansion to operations and proposed mitigation measures, was reviewed.

[1] The National Parks and Wildlife Services map viewer http://webgis.npws.ie/npwsviewer/
[2] The National Biodiversity Data Centre www.NBDC.ie
[3] Enviroguide (2012) Environmental Impact Statement for O'Toole Composting Ltd.

3. Project Description

OTCL currently operates an enclosed windrow composting facility at and also a transfer facility for dry recyclables, general skip waste, household waste and construction and demolition waste.

The facility accepts various types of biodegradable waste for composting at the purpose built in vessel composting plant. Best available technology has been installed at the facility which has been operational since 2005. Various other waste streams are accepted at the facility for waste transfer. The waste transfer building accepts material for storage prior to removal offsite to approved pre-treatment, recycling, recovery or disposal facilities. Materials accepted include municipal solid waste, dry mixed recyclables, bulky waste and timber.

In 2008, OTCL upgraded the existing plant for its composting and installed the best available upgraded technology which it imported from Europe where techniques and practises are considerably advanced. OTCL view the current proposal as the next progressive step in improving and developing operations on site.

This proposed expansion would occur in two stages outlined below.

Stage 1 will see an increased intake of waste for composting with a proposed maximum annual intake of 40,000 tonnes. This will see the composting infrastructure that is currently in place at the facility being used to its maximum capacity. The current activity in the composting shed is the acceptance of Household Solid Municipal Waste, the screening of same to produce organic fines and the bio-stabilisation (composting) of these fines. The remaining material is then shredded and sent offsite for production into Solid Recovered Fuel (SRF). During Stage 1 it is also proposed to construct a civic amenity facility which can be used by members of the public for their waste and recycling. It is also proposed to increase the tonnage of waste accepted in the current waste transfer building up to a maximum tonnage of 20,000 tonnes per annum. Waste material will be bulked up in this building prior to it being transferred offsite to a waste processing or landfill facility. In order to accommodate the additional waste proposed for this building it is proposed to expand the existing building. Planning permission has been granted for the expansion of this building.

Stage 2 will be for the construction, installation and operation of an anaerobic digestion plant. It is proposed that 30,000 tonnes of mainly food waste and industrial waste but also energy crops such as maize and barley would be accepted and processed for energy generation. No planning permission is in place for this development at present. Planning permission would need to be in place before this proposed development could be constructed. Planning permission will be sought at an unknown future date for this proposal.

4. Identification of Natura 2000 Sites

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites within a 15km radius of the OTCL facility is shown below in Table 1. There are no SPAs within 15km, or indeed within Co. Carlow.

Table 1 Special Areas of Conservation within 5km & 15km of the OTCL Facility

Site Name	Code	Within 5km	Approx Distance	Direction
Slaney River Valley	000781	-	6.4 km	East
River Barrow & River Nore	002162	-	8.5 km	West
Blackstairs Mountains	000770	-	11.5 km	South

The OTCL facility itself is not located within a designated site (refer to Figure 2) and all designated sites occur further than 5km of the site. There is no impact, or potential for impact, from the proposed OTCL expansion, or the existing activities, on the Slaney River Valley SAC and the Blackstairs Mountain SAC. Accordingly these two SACs will not be discussed regarding potential impacts.

While there are no qualifying interests of the River Barrow and River Nore SAC on, or adjacent to the facility, the surface water run-off from the site drains to the onsite surface water drainage network, which in turn discharges into the Burren River. The Burren River is a tributary of the River Barrow.

In this regard the potential impacts to the water quality, affecting the River Burren, and potentially the River Barrow and River Nore SAC, will be addressed in detail in Section 5.

4.1 Characteristics of the Designated Sites

4.1.1 River Barrow and River Nore (site code: 002162)

This is an extensive site covering 1,2373.17 ha and consists of the freshwater stretches of the Barrow/Nore River catchments as far upstream as the Slieve Bloom Mountains and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The SAC is noted for several riparian wetland habitats as well as a wide range of Annex II species. The site is selected for the qualifying habitats and species as set out in Tables 2 and 3 overleaf. The site synopsis is contained within Appendix A.

Table 2 Qualifying Habitats for the River Barrow & Nore SAC

***Qualifying Habitats* (* denotes Priority Habitat)**	***Code***
Old sessile oak woods with *Ilex* and *Blechnum* in British Isles	91A0
*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	91E0
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	3260
Salicornia and other annuals colonizing mud and sand	1310
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	1330
Mediterranean salt meadows (Juncetalia maritimi)	1410
European dry heaths	4030
*Petrifying springs with tufa formation (Cratoneurion)	7220
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430
Spartina swards (Spartinion maritimae)	1320
Mudflats and sandflats not covered by seawater at low tide	1140
Estuaries	1130

Table 3 Qualifying Annex II of Directive 92/43/EEC (the Habitats Directive)

Species	***Species Name***
Mammals listed on Annex II of the Habitats Directive	*Lutra lutra* (Otter)
Fish species listed on Annex II of the Habitats Directive	*Salmo salar* (Atlantic salmon)
	Petromyzon marinus (Sea lamprey)
	Lampetra planeri (Brook lamprey)
	Lampetra fluviatilis (River lamprey)
	Alosa fallax (Twait shad)
	Alosa alosa (Allis shad)
Invertebrates listed on Annex II of the Habitats Directive	*Austropotamobius pallipes* (White clawed crayfish)
	Margaritifera margaritifera (Freshwater pearl mussel)
	Margaritifera durrovensis (Nore freshwater pearl mussel)
	Vertigo moulinsiana (Desmoulin's Whorl Snail)

Conservation objectives were set for SAC 002162 in July 2011[4]. The overall aim of the Habitats Directive is to maintain favourable conservation status of the Annex I habitats and the Annex II species for which SAC 002162 has been selected. The Department of Arts, Heritage and the Gaeltacht (DAHG) has now set out specific targets, based on best available information, for the listed habitats and species in the Conservation Objectives.

[4] NPWS (2011) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 1.0. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht.

5. Description and Assessment of Likely Impacts

5.1 Potential Impacts to Qualifying Interests of the River Barrow & River Nore SAC

5.1.1 Habitat Loss and Disturbance

The flora and fauna surveys carried out for the previous EIS[3] found that there were no qualifying interests of the River Barrow and River Nore SAC on, or adjacent to the OTCL facility. The main habitat occurring on the site prior to the OTCL facility was improved agricultural grassland (GA1)[5], and since then the site has been developed, resulting in the main habitat present to be hardstanding/buildings and artificial surfaces (BL3).[5]

5.1.2 Discharge to Water

Construction Phase

The construction and operation of the proposed expansion at the OTCL facility and ancillary hardstanding will alter the natural hydrological setting of the site, whereby overland surface run-off will be increased and natural runoff flow paths disrupted. Discharge of such runoff to receiving watercourses, i.e. the River Burren and subsequently the River Barrow, has the potential to have a negative impact on water quality. However the following measures are currently in place to prevent any pollution to surface water run-off during construction.

During the construction period, any sediment-laden water generated, due to exposure to soil surfaces, will either be attenuated within the site boundaries earthen berm or within the existing surface water drainage system, whereby surface water run-off can pass through a grit trap/oil interceptor prior to discharge. Appropriate measures are already in place that ensures any excess run-off is diverted through the existing site settlement tanks and grit traps. During the attenuation period, suspended materials are allowed to fall out of suspension prior to discharge to the surface water network.

Operational Phase

Measures set out below will ensure that discharges from the site, which could negatively impact surface water run-off and groundwater, are managed and regulated during the operational phase of the proposed expansion of the facility. The measures are already in place for current operations:

- The waste to be handled will not come into contact with rainfall.
- The floor will be cleaned regularly.
- Current facility design will ensure any run-off from incoming material will be captured within the building.
- No waste water is discharged at or from the facility.

[5] Habitat codes taken from: Fossitt, J. (2000) A guide to Habitats in Ireland, Heritage Council, Kilkenny.

- Any run-off thus captured will be regarded as wastewater and will be diverted to the leachate tank which will be reused this water in the composting process.
- The correct design, construction and maintenance of wastewater collection and disposal systems will be used to prevent discharge to ground potentially leading to groundwater contamination.
- If the waste water run-off cannot be re-used as part of the composting process then it will be tankered off site to Carlow County Council's Waste-Water Treatment Facility.
- The correct design of bunded areas for the storage of Diesel tanks will be used to prevent groundwater contamination as a result of accidental spillages from the OTCL facility.
- The existing surface water and wastewater disposal systems on site are built in accordance with best practice and will prevent the occurrence of contaminated leakage or runoff from the site.
- All foul water from the offices and canteen are treated in the existing septic tank system.
- On site storage facilities and activities, any raw materials, fuels and chemicals, are stored within structurally sound warehousing buildings and/or bunded areas, if appropriate, to guard against potential accidental spills or leakages.
- All equipment and machinery has regular checking for leakages and quality of performance.

With the incorporation of these remedial measures, the potential impacts during the construction and operational phase, on the surface water quality of the River Burren, and subsequently the River Barrow and River Nore SAC, is screened out, as are potential contamination impacts to groundwater.

5.2 In-combination Effects

The Habitats Directive requires that due consideration needs to be given to any plan or project which is likely to have a significant effect alone or in combination with other plans and projects. As all potential negative impacts to Natura 2000 sites have been screened out, there cannot be in-combination effects with other plans or projects.

6. Screening Statement Conclusions

In terms of significance with regard to impacts on Natura 2000 sites, the NPWS Guidance (2009) uses an EC definition as follows:

"*any element of a plan or project that has the potential to affect the conservation objectives of a Natura 2000 site, including its structure and function, should beconsidered significant (EC, 2006*)".

Overall, it can be concluded from the screening assessment completed above, that the proposed development will not result in likely significant direct or indirect impacts, either alone or in combination, on the structure, function and conservation objectives for the River Barrow and River Nore SAC or any other Natura 2000 site.

FIGURES

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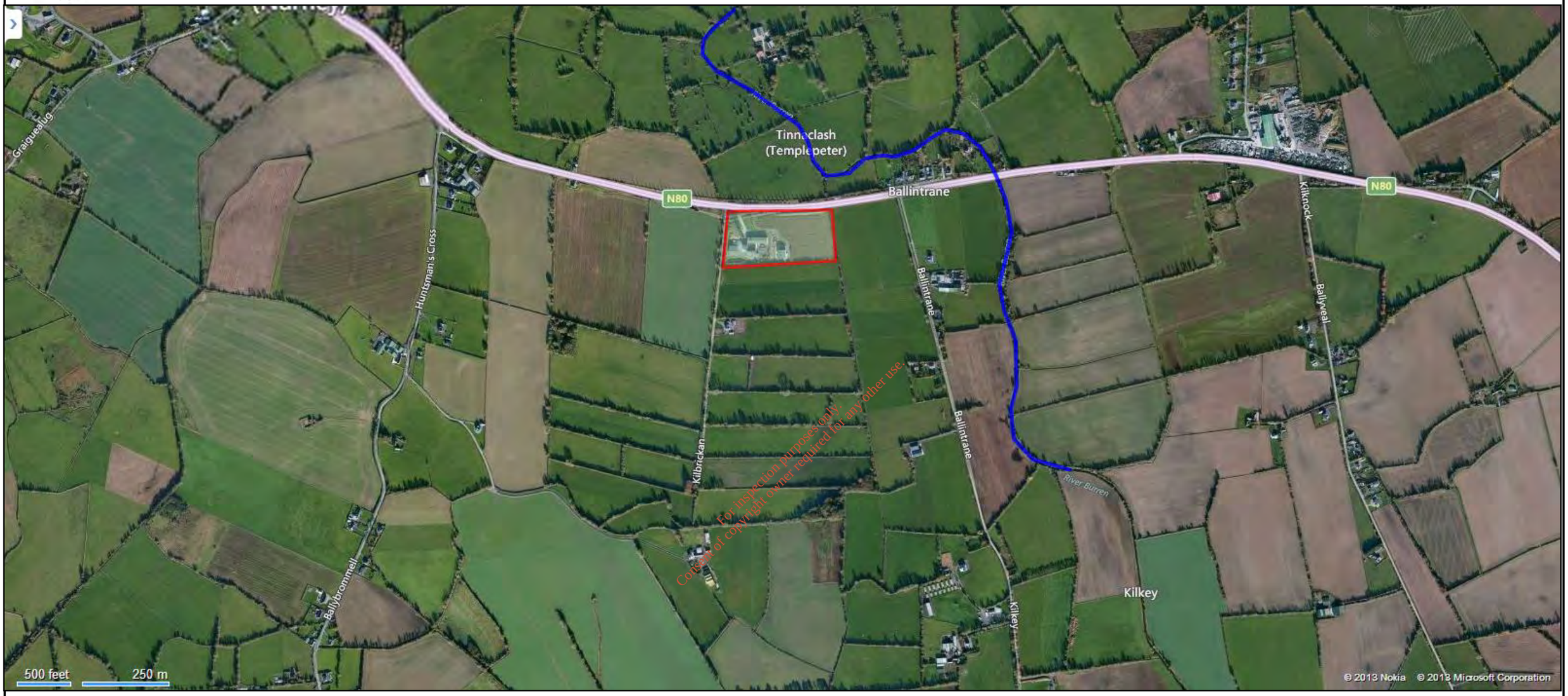

Approximate Site Boundary

River Burren

Client: O'Toole Composting Ltd			Drawing: Site Location			
Job: Screening Statement of Proposed Expansion						
	Drawing Number: Figure 1	Status: Final	Sht. Size: A4	Scale: As shown	Date: Aug 13	Drawn: AW

N

Approximate Site Boundary

Special Area of Conservation

Client: O'Toole Composting Ltd				Drawing: Site Location & Designated Areas within 10km		
Job: Screening Statement of Proposed Expansion						
	Drawing Number: Figure 2	Status: Final	Sht. Size: A4	Scale: As shown	Date: Aug 13	Drawn: AW

APPENDIX A

SITE SYNOPSIS

SITE NAME: RIVER BARROW AND RIVER NORE

SITE CODE: 002162

This site consists of the freshwater stretches of the Barrow/Nore River catchments as far upstream as the Slieve Bloom Mountains and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlington, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also runs through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

The site is a candidate SAC selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Nore Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter, Desmoulin's Whorl Snail *Vertigo moulinsiana* and the Killarney Fern.

Good examples of Alluvial Forest are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Grey Willow (*S. cinerea*), Crack Willow (*S. fragilis*), Osier (*S. viminalis*), with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*). Three rare invertebrates have been recorded in this habitat at Murphy's of the River. These are: *Neoascia obliqua* (Diptera: Syrphidae), *Tetanocera freyi* (Diptera: Sciomyzidae) and *Dictya umbrarum* (Diptera: Sciomyzidae).

A good example of petrifying springs with tufa formations occurs at Dysart Wood along the Nore. This is a rare habitat in Ireland and one listed with priority status on Annex I of the EU Habitats Directive. These hard water springs are characterised by lime encrustations, often associated with small waterfalls. A rich bryophyte flora is typical of the habitat and two diagnostic species, *Cratoneuron commutatum* var. *commutatum* and *Eucladium verticillatum*, have been recorded.

The best examples of old Oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the sixteenth century and has the most complete written record of any woodland in the country. It supports a variety of woodland habitats and an exceptional diversity of species including 22 native trees, 44 bryophytes and 92 lichens. It also contains eight indicator species of ancient woodlands. Park Hill is also the site of two rare plants, Nettle-leaved Bellflower and the moss *Leucodon sciuroides.* It has a typical bird fauna including Jay, Long-eared Owl and Raven. A rare invertebrate, *Mitostoma chrysomelas*, occurs in Abbeyleix and only two other sites in the country. Two flies *Chrysogaster virescens* and *Hybomitra muhlfeldi* also occur. The rare Myxomycete fungus, *Licea minima* has been recorded from woodland at Abbeyleix.

Oak woodland covers parts of the valley side south of Woodstock and is well developed at Brownsford where the Nore takes several sharp bends. The steep valley side is covered by Oak (*Quercus* spp.), Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*) and Birch (*Betula pubescens*) with some Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*). All the trees are regenerating through a cover of Bramble (*Rubus fruticosus* agg.), Foxglove (*Digitalis purpurea*) Wood Rush (*Luzula sylvatica*) and Broad Buckler-fern (*Dryopteris dilatata*).

On the steeply sloping banks of the River Nore about 5 km west of New Ross, in County Kilkenny, Kylecorragh Woods form a prominent feature in the landscape. This is an excellent example of a relatively undisturbed, relict Oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown a small, mature Oak-dominant woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration throughout is evident. The understorey is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Cow-wheat (*Melampyrum* spp.) and Bracken (*Pteridium aquilinum*).

Borris Demesne contains a very good example of a semi-natural broad-leaved woodland in very good condition. There is quite a high degree of natural re-generation of Oak and Ash through the woodland. At the northern end of the estate Oak species predominate. Drummond Wood, also on the Barrow, consists of three blocks of deciduous woods situated on steep slopes above the river. The deciduous trees are mostly Oak species. The woods have a well established understorey of Holly (*Ilex aquifolium*), and the herb

layer is varied, with Brambles abundant. Whitebeam (*Sorbus devoniensis*) has also been recorded.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the flood-plain of the river is intact. Characteristic species of the habitat include Meadowsweet (*Filipendula ulmaria*), Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*). Indian Balsam (*Impatiens glandulifera*), an introduced and invasive species, is abundant in places.

Floating River Vegetation is well represented in the Barrow and in the many tributaries of the site. In the Barrow the species found include Water Starworts (*Callitriche* spp.), Canadian Pondweed (*Elodea canadensis*), Bulbous Rush (*Juncus bulbosus*), Milfoil (*Myriophyllum* spp.), *Potamogeton* x *nitens*, Broad-leaved Pondweed (*P. natans*), Fennel Pondweed (*P. pectinatus*), Perfoliated Pondweed (*P. perfoliatus*) and Crowfoots (*Ranunculus* spp.). The water quality of the Barrow has improved since the vegetation survey was carried out (EPA, 1996).

Dry Heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken (*Pteridium aquilinum*) and Gorse (*Ulex europaeus*) species with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove (*Digitalis purpurea*), Common Sorrel (*Rumex acetosa*) and Bent Grass (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown on the maps Bilberry (*Vaccinium myrtillus*) and Wood Rush (*Luzula sylvatica*) are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of Clover species including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*). These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*.

Dry Heath at the site generally grades into wet woodland or wet swamp vegetation lower down the slopes on the river bank. Close to the Blackstairs Mountains, in the foothills associated with the Aughnabrisky, Aughavaud and Mountain Rivers there are small patches of wet heath dominated by Purple Moor-grass (*Molinia caerulea*) with Heather (*Calluna vulgaris*), Tormentil (*Potentilla erecta*), Carnation Sedge (*Carex panicea*) and Bell Heather (*Erica cinerea*).

Saltmeadows occur at the southern section of the site in old meadows where the embankment has been breached, along the tidal stretches of in-flowing rivers below Stokestown House, in a narrow band on the channel side of Common Reed (*Phragmites*) beds and in narrow fragmented strips along the open shoreline. In the larger areas of salt meadow, notably at Carrickcloney, Ballinlaw Ferry and Rochestown on the west bank; Fisherstown, Alderton and Great Island to Dunbrody on the east bank, the Atlantic and

Mediterranean sub types are generally intermixed. At the upper edge of the salt meadow in the narrow ecotonal areas bordering the grasslands where there is significant percolation of salt water, the legally protected species Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) (Flora Protection Order, 1987) are found. The very rare Divided Sedge (*Carex divisa*) is also found. Sea Rush (*Juncus maritimus*) is also present. Other plants recorded and associated with salt meadows include Sea Aster (*Aster tripolium*), Sea Thrift (*Armeria maritima*), Sea Couch (*Elymus pycnanthus*), Spear-leaved Orache (*Atriplex prostrata*), Lesser Sea-spurrey (*Spergularia marina*), Sea Arrowgrass (*Triglochin maritima*) and Sea Plantain (*Plantago maritima*).

Salicornia and other annuals colonising mud and sand are found in the creeks of the saltmarshes and at the seaward edges of them. The habitat also occurs in small amounts on some stretches of the shore free of stones.

The estuary and the other Habitats Directive Annex I habitats within it form a large component of the site. Extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. Good quality intertidal sand and mudflats have developed on a linear shelf on the western side of Waterford Harbour, extending for over 6 km from north to south between Passage East and Creadaun Head, and in places are over 1 km wide. The sediments are mostly firm sands, though grade into muddy sands towards the upper shore. They have a typical macro-invertebrate fauna, characterised by polychaetes and bivalves. Common species include *Arenicola marina*, *Nephtys hombergii*, *Scoloplos armiger*, *Lanice conchilega* and *Cerastoderma edule*.

The western shore of the harbour is generally stony and backed by low cliffs of glacial drift. At Woodstown there is a sandy beach, now much influenced by recreation pressure and erosion. Behind it a lagoonal marsh has been impounded which runs westwards from Gaultiere Lodge along the course of a slow stream. An extensive reedbed occurs here. At the edges is a tall fen dominated by sedges (*Carex* spp.), Meadowsweet, Willowherb (*Epilobium* spp.) and rushes (*Juncus* spp.). Wet woodland also occurs. This area supports populations of typical waterbirds including Mallard, Snipe, Sedge Warbler and Water Rail.

The dunes which fringe the strand at Duncannon are dominated by Marram grass (*Ammophila arenaria*) towards the sea. Other species present include Wild Sage (*Salvia verbenaca*), a rare Red Data Book species. The rocks around Duncannon ford have a rich flora of seaweeds typical of a moderately exposed shore and the cliffs themselves support a number of coastal species on ledges, including Thrift (*Armeria maritima*), Rock Samphire (*Crithmum maritimum*) and Buck's-horn Plantain (*Plantago coronopus*).

Other habitats which occur throughout the site include wet grassland, marsh, reed swamp, improved grassland, arable land, quarries, coniferous plantations, deciduous woodland, scrub and ponds.

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge (*Carex divisa*), Clustered Clover (*Trifolium glomeratum*), Basil Thyme (*Acinos arvensis*), Hemp nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh Grass (*Puccinellia fasiculata*),

Meadow Barley (*Hordeum secalinum*), Opposite-leaved Pondweed (*Groenlandia densa*), Autumn Crocus (*Colchicum autumnale*), Wild Sage (*Salvia verbenaca*), Nettle-leaved Bellflower (*Campanula trachelium*), Saw-wort (*Serratula tinctoria*), Bird Cherry (*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Broomrape (*Orobanche hederae*) and Greater Broomrape (*Orobanche rapum-genistae*). Of these the first nine are protected under the Flora Protection Order 1999. Divided Sedge (*Carex divisa*) was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge (*Carex strigosa*), Field Garlic (*Allium oleraceum*) and Summer Snowflake (*Leucojum aestivum*). Six rare lichens, indicators of ancient woodland, are found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

The site is very important for the presence of a number of EU Habitats Directive Annex II animal species including Freshwater Pearl Mussel (*Margaritifera margaritifera* and *M. m. durrovensis*), Freshwater Crayfish (*Austropotamobius pallipes*), Salmon (*Salmo salar*), Twaite Shad (*Alosa fallax fallax*), three Lamprey species - Sea (*Petromyzon marinus*), Brook (*Lampetra planeri*) and River (*Lampetra fluviatilis*), the marsh snail *Vertigo moulinsiana* and Otter (*Lutra lutra*). This is the only site in the world for the hard water form of the Pearl Mussel *M. m. durrovensis* and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning.

The site supports many other important animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat (*Myotis daubentoni*), Badger (*Meles meles*), Irish Hare (*Lepus timidus hibernicus*) and Frog (*Rana temporaria*). The rare Red Data Book fish species Smelt (*Osmerus eperlanus*) occurs in estuarine stretches of the site. In addition to the Freshwater Pearl Mussel, the site also supports two other freshwater Mussel species, *Anodonta anatina* and *A. cygnea*.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country.

Landuse at the site consists mainly of agricultural activities – many intensive, principally grazing and silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles

have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath are also popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, overgrazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel and Rhododendron (*Rhododendron ponticum*). The water quality of the site remains vulnerable. Good quality water is necessary to maintain the populations of the Annex II animal species listed above. Good quality is dependent on controlling fertilisation of the grasslands, particularly along the Nore. It also requires that sewage be properly treated before discharge. Drainage activities in the catchment can lead to flash floods which can damage the many Annex II species present. Capital and maintenance dredging within the lower reaches of the system pose a threat to migrating fish species such as lamprey and shad. Land reclamation also poses a threat to the salt meadows and the populations of legally protected species therein.

Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows and the population of the hard water form of the Pearl Mussel which is limited to a 10 km stretch of the Nore, add further interest to this site.

6.10.2006

Air Dispersion Model Report for Waste Licence Application

O'Toole Composting

DOCUMENT CONTROL SHEET

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1 INTRODUCTION

O'Toole Composting Ltd. operates an existing composting plant in the townland of Ballintrane, Co. Carlow. The plant has been in operation since 2004 and provides composting service for food and organic waste for a range of industries including canteens, restaurants, food production companies and hotels.

There are a series of planned developments at the site in future years with the potential for emissions to atmosphere and each of the following are considered in this report:

- Scenario 1: Upgrade of the existing biofilter at the operational composting unit (Operating Year 2012).
- Scenario 2: Composting Biofilter in addition to the installation of a new biofilter at the skip shed (Operating Year 2014).
- Scenario 3: Composting and Skip Shed Biofilters in addition to the installation of a new biofilter at the proposed reception shed for the AD plant (Operating Year 2016).
- Scenario 4: Combustion emissions from the CHP unit for the AD plant (2016).

In addition to the previously reported modelling of odour and combustion gases, in a further information request dated the 24th June 2013, the EPA has requested modelling of the following chemical constituents which are also included in this updated report:

- Hydrogen Sulphide (H_2S)
- Hydrogen Fluoride (HF)
- Hydrogen Chloride (HCl)

RPS has followed the procedures presented in the EPA Guidance Note AG4 "Air Dispersion Modelling for Industrial Installations" in this assessment. RPS have employed the USEPA approved AERMOD Prime dispersion model to determine the impacts on the environment and at the nearest sensitive receptors. The results of the modelling are assessed against the relevant statutory limits, where available, and ambient air quality guidelines used internationally.

The modelling approach has allowed for the specification of emission guidelines for each phase of the development to minimise the potential for odour nuisance and impacts to human health.

2 EMISSIONS TO ATMOSPHERE

2.1 OVERVIEW

Given the nature if the sources on site this modelling exercise will establish the impacts of the following parameters:

- Odour emissions (OU_E/m^3) and Hydrogen Sulphide emissions from the biofilters (Scenarios 1 to 3)

- Combustion Emissions (NO_x, SO_2, CO, Particulates, HF and HCl) from the CHP for the AD Plant (Scenario 4)

As all sources are proposed installations and no source specific assessment can be undertaken, standard literature sources (such as BAT/BREF, TA Luft, etc.) are employed to determine the emission rates for each source.

2.2 BAT GUIDANCE

The EPA has prepared a BAT Guidance Note for the composting industry but this is still in development and has not been published. As a result, the parent BREF Note for the Waste Treatments Industries (2006, and a review has commenced in 2013) has been employed as a reference for this assessment. Section 5.2 of this BREF Note outlines what is considered BAT for specific types of waste treatments, including biological treatments such as composting. Table 2.1 presents the BAT levels of odour emissions from biological treatment of wastes following abatement, expressed as a range of acceptable values. This BAT range will be used as the basis for determining suitable emission rates from the biofilters on site.

Parameter	Limit for Treated Exhaust Gas
Odour (Ou_E/m^3)	<500 - 6,000

Table 2.1: BAT Emission Levels for Odour Discharges to Air

In terms of odour gases (hydrogen sulphide) or the main combustion gases (oxides of nitrogen, sulphur dioxide, carbon monoxide, hydrofluoric and or hydrochloric acid) there is no specified BAT limit presented in the BREF Guidance note.

2.3 TA LUFT GUIDANCE

The Technische Anleitung zur Reinhaltung der Luft, (*TA-Luft)* are German Government Guidelines for the control of air quality and are frequently used a reference in emissions assessment in Ireland. These Guidelines are also used as a reference for many EPA BAT Guidance Notes. The TA Luft Guidelines detail the technical measures expected to be applied in different sectors of industry including methods for assessment. Originally published in 1986, the 2002 revision has been referenced for this report.

In relation to the combustion emissions, Paragraph 5.4.1.2.3 *Facilities for Generating Electricity, Steam, Hot Water, Process Heat or Heated Waste Gas in Furnaces using Gaseous Fuels (including biogas)* is considered applicable to this assessment. The emission guidelines presented for such facilities are presented in Table 2.2.

Parameter	Concentration Limit
Particulates (Dust)	5 mg/m^3
Carbon Monoxide	80 mg/m^3
Nitrogen Oxides	200 mg/m^3
Sulphur Oxides	350 mg/m^3

Table 2.2: TA Luft Combustion Gas Emission Guidelines

Paragraph 5.4.1.2.3 of TA Luft does not state any emission guideline for H_2S, HF or HCl but Paragraph 5.2.4 provides cross sectoral generic emission guidelines for these compounds as presented in Table 2.3.

TA Luft Class	Parameter	Concentration Limit	Mass Emission Limit
Class II Inorganic Substance	Hydrogen Fluoride	3 mg/m^3	0.015 kg/hr
	Hydrogen Sulphide	3 mg/m^3	0.015 kg/hr
Class III Inorganic Substance	Hydrogen Chloride	30 mg/m^3	0.15 kg/hr

Table 2.3: TA Luft Guidelines for Inorganic Substances

2.4 DISPERSION MODELLING

RPS has followed the procedures presented in the EPA Guidance Note AG4 "Air Dispersion Modelling for Industrial Installations" in this assessment. The model used for Air Dispersion Modelling was the US EPA approved AERMOD Prime model, which is the current regulatory model in the US and a recommended model under the EPA guidance. This model is a third generation model utilising advanced boundary-layer physics. AERMOD is run with a sequence of hourly meteorological conditions to predict concentrations at receptors for averaging times of one hour up to a year. It is necessary to use many years of hourly data to develop a better understanding of the statistics of calculated short-term hourly peaks or of longer time averages.

2.4.1 Source Information

Site specific data such as the locations and dimensions of the biofilters and CHP have been derived from the engineering drawings of the proposed operations. Where information is unknown valid assumptions have been applied and are clearly stated for each source. This information is presented in Table 2.4. Emissions from the biofilters and CHP were modelled assuming 24 hours, 365 days a year operations. It is proposed to engineer a stack (point source) from the biofilter on the composting unit as part of the planned upgrade and this source has been modelled as such.

Source	Source Type	Dimensions	Height (m)	Temp. (^{0}C)	Flow (Nm^3/hr)	Operational
Composting Unit Biofilter	Point	1m (diameter)	10	25	60,000	2012
Skip Shed Biofilter	Area	20.5 x 8.0 m	2	25	10,000	2014
AD Reception Biofilter	Area	30.0 x 8.0 m	2	25	15,000	2016
CHP Unit	Point	0.6m (diameter)	10	150	10,000	2016

Table 2.4: Emission point details for dispersion model

2.4.2 Background Concentrations

There is no database of information available on background odour concentrations. Given the rural location of the site, it is possible that agricultural activities in the area may give rise to occasional odours. However, for the purposes of this assessment, background odours have been assumed as zero, as per standard practice.

There is no EPA ambient air quality monitoring data for the rural Co. Carlow area where the site is located. As such, representative baseline air quality data has been derived from with reference to the EPA National Air Quality Monitoring Programme, Air Quality Zone D: Rural Ireland. A standard reference for Zone D background air quality is the Kilkitt Monitoring Station in Co. Monaghan.

The EPA used a continuous chemiluminescent analyser to determine nitrogen oxides (NO_x) concentrations at the Kilkitt station. The EPA data from 2003 to date are outlined in Table 2.5. Results indicate that the levels detected are below the relevant air quality limits for each year. The annual average NO_2 concentration of 3µg/m^3 is typical of rural background locations and this is considered indicative of the area of the site. Similarly, the annual average NO_x concentration of 4µg/m^3 is typical of rural background locations and this is considered indicative of the area of the site.

Statistic	Kilkitt 2003	Kilkitt 2004	Kilkitt 2005	Kilkitt 2006	Kilkitt 2007	Kilkitt 2008	Kilkitt 2009	Kilkitt 2010	AQ Limit
Annual Mean NO_2 (µg/m^3)	3	3	2	3	2	3	3	3	**40**
Max 1-hour NO_2 (µg/m^3)	71	43	33	58	53	80	50	32	**200**
NO_2 Values >200µg/m^3	0	0	0	0	0	0	0	0	**18**
Annual Mean NO_x (µg/m3)	3	4	4	4	3	4	3	4	**30**

Table 2.5: Results of NO_x Monitoring Carried out by the EPA in a Representative Zone D Site (Kilkitt, Co. Monaghan)

Particulate matter (PM_{10}) may be emitted as a primary pollutant from road vehicle exhausts, which is the main source in urban areas. In rural areas, sources will include traffic, agricultural activities and natural processes. Also point sources such as combustion, i.e. domestic fires, industrial boilers etc. are primary sources of PM_{10}. PM_{10} may also be formed as secondary pollutants from the condensation or reaction of chemical vapours in the atmosphere. Health effects associated with PM_{10},

in the long term, include chronic effects such as increased rates of bronchitis and reduced lung function. The EPA measured PM_{10} from 2006 to date at the Kilkitt station and these results are presented in Table 2.6.

The concentrations of PM_{10} detected at the Kilkitt station indicate an annual average of 10µg/m^3. This is considered representative of a rural background PM_{10} level typical of the study area. Particulate Matter ($PM_{2.5}$) has similar effects on health as PM_{10}, however, $PM_{2.5}$ is a better indicator of anthropogenic (man-made) emissions. Fine particulate matter $PM_{2.5}$ can be responsible for significant negative impacts on human health. Currently there is no monitoring of $PM_{2.5}$ carried out at Zone D locations in Ireland. However, monitoring is being undertaken at Zones, A, B and C. The EPA published a research report entitled *Nature and Origin of PM_{10} and Smaller Particulate Matter in Urban Air* (EPA, 2006) which examined the relationship between PM_{10} and $PM_{2.5}$ in Ireland. The study found that consistently between urban, rural and coastal locations in Ireland, the $PM_{2.5}$ fraction of PM_{10} is approximately 60%. This approximation is borne out by the $PM_{2.5}$ values recorded in Ireland in 2008, 2009 and 2010 in Zone A, B and C locations. Applying this fraction to the EPA PM_{10} data for Kilkitt station for 2006-2010 would provide an approximate $PM_{2.5}$ annual average of 6 µg/m^3 compared to the annual target value for the protection of human health of 25µg/m^3. This level is considered indicative of the air quality in the study area.

Parameter	Statistic	Kilkitt 2006	Kilkitt 2007	Kilkitt 2008	Kilkitt 2009	Kilkitt 2010	AQ Limit
Particulate Matter (PM_{10})	Annual Mean (µg/m^3)	10	10	10	8	10	**40**
	Max 24-hour (µg/m^3)	47	73	57	55	42	**50**
	24-hour Values >50µg/m^3	0	2	1	1	0	**35**

Table 2.6: Results of PM_{10} Monitoring Carried Out by the EPA in a Representative Zone D Site (Kilkitt, Co. Monaghan)

The EPA used a continuous fluorescent analyser to determine sulphur dioxide (SO_2) concentrations at the Kilkitt station. The EPA data from 2003 to date are outlined in Table 2.7. The air quality data from Kilkitt show background SO_2 concentrations (annual averages 3 µg/m^3) below the relevant air quality limits for all averaging periods in the years 2003 to 2010. Levels are typical of rural background SO_2 concentrations and represent the annual average concentrations in rural areas in Ireland where there is an absence of major sources of SO_2.

Parameter	Statistic	Kilkitt 2003	Kilkitt 2004	Kilkitt 2005	Kilkitt 2006	Kilkitt 2007	Kilkitt 2008	Kilkitt 2009	Kilkitt 2010	AQ Limit
Sulphur Dioxide (SO_2)	Annual Mean (µg/m^3)	7	3	3	2	2	4	4	2	**20**
	Max 1-hour (µg/m^3)	51	35	10	13	18	42	16	14	**350**
	1-hour Values >350µg/m^3	0	0	0	0	0	0	0	0	**24**
	24-hour Values >125µg/m^3	0	0	0	0	0	0	0	0	**3**

Table 2.7: Results of SO_2 monitoring carried out by the EPA in a representative Zone D site (Kilkitt Co. Monaghan)

No Carbon Monoxide (CO) monitoring has been continuously carried out in Zone D locations by the EPA in 2009 or 2010 due to the low levels detected in previous years. As such, an average of the

Zone D levels detected in 2008 at Letterkenny and Cork Harbour is employed as a background for this assessment. This level is 0.4mg/m^3 as an annual mean of CO.

Given the absence of any large combustion sources in the area, the background levels of HCl and HF have been assumed as zero in this model assessment.

While there are agricultural sources in the area, which would represent a source of H_2S, these sources are intermittent and as such, the typical background is assumed as zero in this model assessment.

2.4.3 Pathway (Meteorological files)

The most important parameters governing dispersion in the atmosphere are wind speed, wind-direction and the stability or turbulence of the atmosphere. These parameters along with the ambient temperature and inferred mixing heights for each hour were included in the modelling using data from an appropriate met station with validated met data.

The nearest met station to the site is the Kilkenny Station approximately 30km the west of the site. Model ready data was unavailable for this station so data from an alternative location was sought in accordance with the requirements of Section 6.1 of the AG4 Guidance. Section 6.1 of the AG4 Guidance Note requires that a meteorological station may be chosen with a mean annual wind speed ratio between 0.9 – 1.1 to estimate dispersion from the site.

Annual average wind speeds in the Carlow/Kilkenny area are recorded as 3.34 m/s at the Kilkenny Met Station (based on the 30 year average). Data from Birr indicates an annual average wind speed of 3.60 m/s (based on the 30 year average). As such the ratio between the two stations is 1.1 and within the recommended tolerance presented in the AG4 Guidance.

The AG4 Guidance requires a minimum of three years of met data to run a reliable dispersion model. In order to meet these requirements, three years worth of meteorological data (2003-2005) from the met station at Birr were employed in this modelling assessment. The 30-year average wind profile at Birr Met Station is presented as a windrose in Figure 2.1.

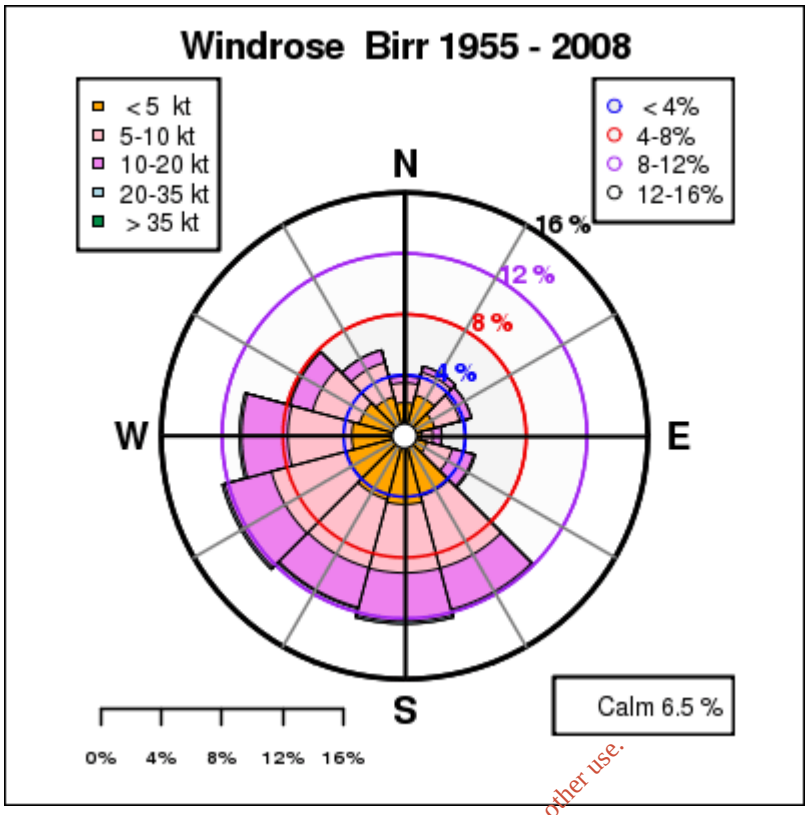

Figure 2.1: Windrose for the Birr Met Station for 1955-2008

2.4.4 Geophysical Data

Any physical structure (such as a building) that is in close proximity to an exhaust point may hinder the dispersion characteristics through a phenomenon known as "building downwash". The potential for building downwash is dependent on the relative differences in height between the stack and the building. In this assessment the analysis suggests that the emission heights of the biofilters are not sufficient to meet the good engineering practice (GEP) recommendation of the US EPA and there is the potential for building downwash to occur. The AERMOD BPIP processor has been applied to all emission scenarios to ensure that building downwash has been fully accounted.

A review of the topography of the area indicates that the surrounding terrain is flat ("simple") with no complex features such as valleys, mountains, etc. As such, there is no requirement for importation of a terrain file into this model.

2.4.5 Receptors

A 3km x 3km Cartesian receptor grid has been incorporated into the model to simulate the spatial emissions trends from the proposed operation. The resultant ground level concentrations are presented as contour plots (isopleths) to demonstrate the impact and location of emissions.

In addition, discrete receptors have been identified as the nearest dwelling houses or groups of dwelling houses. The discrete receptors employed in the model are listed in Table 2.8 and presented in Figure 2.2.

Reference	Receptor
R1	Dwelling House to south of the site (Burrin Equestrian Supplies)
R2	Group of Dwelling Houses to the east of the site at Ballintrane Cross Roads on the N80
R3	Tinnaclash House to the north of the site
R4	Dwelling house to the west of the site on the N80

Table 2.8: Discreet Receptors employed in the model

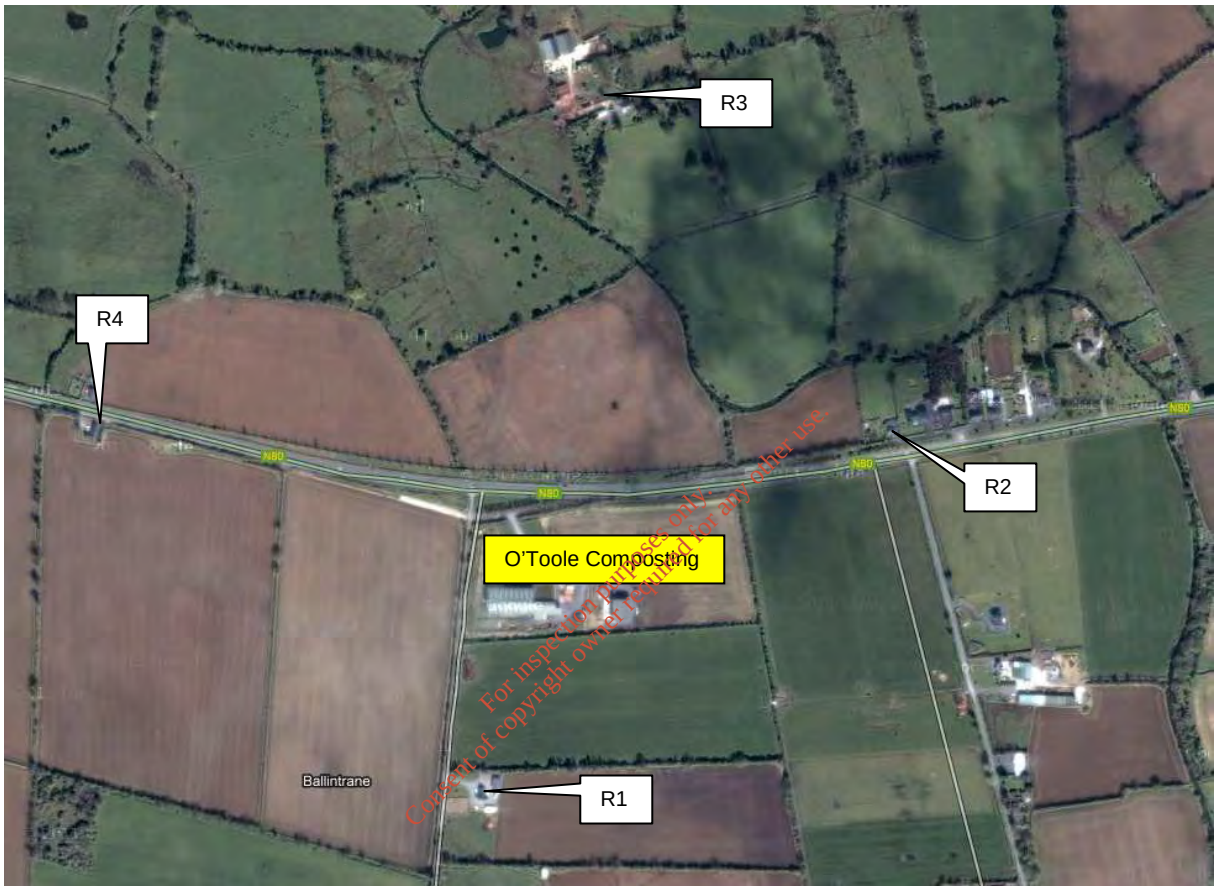

Figure 2.2: Locations of Discrete Receptors

2.4.6 Assessment Criteria

Odour

There are no legislative limits relating to the impact of odour on residential or other receptors. Irish and UK guidance use a series of annoyance criteria for odours from various waste and industrial sources. These bands are described in Table 2.9. In general, the higher the odour risk posed by a facility the more stringent the annoyance criteria (e.g. a landfill would have to comply with annoyance criteria of 1.5 Ou_E/m^3, whereas a bakery would only have to comply with 6.0 Ou_E/m^3 due to the less unpleasant nature of the odour).

Given the nature of the waste operations at the site, it is considered appropriate to place the site in the high risk category and the relevant criteria for this assessment is 1.5 Ou_E/m^3 at the 98th percentile. These criteria are at the 98th percentile of the 1-hour average concentrations, which means they must

be complied with 98% of the time. At this criteria the odours from the plant are not predicted to "give reasonable cause for annoyance" at the nearest sensitive receptors.

Activity	Risk	Indicative Criterion
Activities involving putrescible waste (eg Landfill), Processes involving animal or fish remains, Brickworks, Creamery, Fat & grease processing, Wastewater treatment, Oil refining, Livestock feed factory	High Risk	1.5 Ou_E/m^3 at the 98th percentile of 1-hour averages
Intensive livestock rearing, Fat frying (food processing), Sugar beet processing	Medium Risk	3.0 Ou_E/m^3 at the 98th percentile of 1-hour averages
Chocolate manufacture, Brewery, Confectionery, Fragrance and flavourings, Coffee roasting, Bakery	Low Risk	6.0 Ou_E/m^3 at the 98th percentile of 1-hour averages

Table 2.9: Odour Annoyance Criteria

Hydrogen Sulphide (H_2S)

Hydrogen sulphide is one of the key odour compounds that can cause nuisance impacts from waste facilities. H_2S is a colourless, flammable, extremely hazardous gas with a "rotten egg" odour. It occurs naturally in crude petroleum and natural gas. In addition, H_2S is produced by bacterial breakdown of organic materials (e.g. compost) and human and animal wastes (e.g. sewage and slurry).

There are no statutory limits for the protection of human health for H_2S so guidelines are applied. Two thresholds are employed in this assessment – the threshold for odour nuisance and the threshold for health impacts as presented in Table 2.10 (source WHO "*Air Quality Guidelines for Europe*", 2000).

Parameter	Averaging Period	Guideline	Source
Health Effects	24 hours	150 µg/m^3	World Health Organisation
Odour Annoyance	30 mins	7 µg/m^3	World Health Organisation

Table 2.10: Health and Odour Guidelines for H_2S

Combustion gases

The key legislation in Ireland relating to other pollutants in ambient air is the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), which set limit concentrations for various pollutants for the protection of human health. A summary of the limits applicable to this assessment are presented in Table 2.11.

Pollutant	Limit Type	Value
Nitrogen Dioxide	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3 NO_2
	Annual limit for protection of human health	40 µg/m^3 NO_2
	Annual limit for protection of vegetation	30 µg/m^3 NO + NO_2
Sulphur Dioxide	Hourly Limit Value for the Protection of human health not to be exceeded more than 24 times a calendar year	350 µg/m^3 SO_2
	Daily Limit Value for the protection of human health not to be exceeded more than 3 times a calendar year	125 µg/m^3 SO_2
	Annual limit value for the protection of ecosystems	20 µg/m^3 SO_2
Carbon Monoxide	Limit value for the protection of human health Maximum daily 8-hour mean	10 mg/m^3 CO
Particulate Matter (PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3 PM_{10}
	Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter ($PM_{2.5}$)	Annual target value for protection of human health	25 µg/m^3 $PM_{2.5}$

Table 2.11: Ambient Air Quality Limits as expressed in S.I. 180 of 2011

Hydrogen Fluoride and Hydrogen Chloride

There are no statutory limits for the protection of human health for HF or HCl so guidelines are applied. In the absence of such statutory limits or WHO guidelines for these parameters, it is common practice to reference other suitable authorities such as the UK Environment Agency BAT Guidance.

The Environment Agency has published an IPPC H1 Guidance note "Environmental Assessment and Appraisal of BAT" which includes methods for quantifying environmental impacts from industrial facilities. Annex F (version 2.2, December 2011) of this guidance note presents a series of Environmental Assessment Levels (EALs) for all other pollutants that act as guidelines for the impact assessment of licensed facilities. It is common practice to use these EALs to determine the environmental impact of air emissions from industrial facilities and the relevant EALs (short term and long term) are presented in Table 2.12.

These guidelines are based on the UK Expert Panel on Air Quality Standards Guidelines for halogens and hydrogen halides in ambient air for protecting human health against acute irritancy effects. (February 2006 and addendum in 2009).

Pollutant	Environment Agency Long Term EAL	Environment Agency Short Term EAL
Hydrogen Fluoride	16	160
Hydrogen Chloride	-	750

Table 2.12: Ambient Air Quality Guidelines from the UK Environment Agency

3 MODELLING RESULTS

3.1 SCENARIO 1

Scenario 1 consists of the upgrade of the existing biofilter at the composting unit which is due to be fully operational in 2012. The input parameters for the biofilter are presented in Table 3.1 below. These emission values represent the operating scenario in 2012 when only this emission source is operatoinal. The odour emission factor employed in the model is based on the recommended BAT emission limit range (Table 2.1). The H_2S emission level is derived as the maximum concentration to allow for compliance with the relevant assessment criteria (Table 2.10). The results of the model assessment are presented in Table 3.2 for the discrete receptors.

Parameter	Input
Source Type	Point
Dimensions (diameter)	1 m
Height	10 m
Temperature	25^0C (298K)
Volumetric Flow Rate	60,000 m^3/hr
Odour Emission Concentration	3,300 Ou_E/m^3
H_2S Emission Concentration	5.7 mg/m^3

Table 3.1: Input Emission Factors for Scenario 1

Ref	Receptor	Receptor Type	Predicted Odour Concentration (Ou_E/m^3) 98th Percentile of 1-hour averages	Predicted H_2S Concentration ($\mu g/m^3$) 1-hour max	Predicted H_2S Concentration ($\mu g/m^3$) 24-hour max
R1	Dwelling House to south of the site (Burrin Equestrian Supplies)	Residential	1.13	6.87	1.59
R2	Group of Dwelling Houses to the east of the site at Ballintrane Cross Roads on the N80	Residential	1.44	3.45	1.40
R3	Tinnaclash House to the north of the site	Residential	0.42	2.70	0.72
R4	Dwelling house to the west of the site on the N80	Residential	0.54	2.90	0.97
Guideline			**1.50**	**7**	**150**

Table 3.2: Results of dispersion modelling on discreet receptors for Scenario 1.

The model indicates that the predicted odour emissions from the biofilter will be within the standard annoyance criteria for odour nuisance. The worst affected receptor are the group of dwelling houses to east of the site (R2) in line with the prevailing westerly wind. Odours are not predicted to "give reasonable cause for annoyance" at this property under the operating conditions presented in Table 3.1. The other receptors in the area will experience a lower impact and will not give rise to odour nuisance at these properties.

In relation to H_2S, at the emission concentration of 5.7mg/m^3 the levels at the nearest sensitive receptor (R1) will remain below the WHO odour annoyance criteria. By default, at this emission level the concentrations at the sensitive receptors will be less than 1% of the WHO health protection limit. Levels at other houses will be lower and will not breach the odour annoyance or health impact criteria set by the WHO. In short, while this emission level is above BAT guidance, the level shows no odour or health impact for this scenario.

3.2 SCENARIO 2

Scenario 2 represents the emissions from the composting biofilter in addition to the installation of a new biofilter at the skip shed which is due to be operational from 2014. The input parameters for the biofilters are presented in Table 3.3 below. The emission factors employed in the model are based on the recommended BAT emission limit range for odour (Table 2.1) and hydrogen sulphide (Table 2.3). The results of the model assessment are presented in Table 3.4 for the discrete receptors.

Parameter	Composting Biofilter	Skip Shed Biofilter
Source Type	Point	Area
Dimensions	1 m (diameter)	20.5 x 8.0 m
Height	10 m	3 m
Temperature	25^0C (298K)	25^0C (298K)
Volumetric Flow Rate	60,000 m^3/hr	10,000 m^3/hr
Odour Emission Concentration	3,000 Ou_E/m^3	800 Ou_E/m^3
H_2S Emission Concentration	3 mg/m^3	0.9 mg/m^3

Table 3.3: Input Emission Factors for Scenario 2

Ref	Receptor	Receptor Type	Predicted Odour Concentration (Ou_E/m^3) 98th Percentile of 1-hour averages	Predicted H_2S Concentration ($\mu g/m^3$) 1-hour max	Predicted H_2S Concentration ($\mu g/m^3$) 24-hour max
R1	Dwelling House to south of the site (Burrin Equestrian Supplies)	Residential	1.21	4.65	0.84
R2	Group of Dwelling Houses to the east of the site at Ballintrane Cross Roads on the N80	Residential	1.46	6.85	0.96
R3	Tinnaclash House to the north of the site	Residential	0.44	3.69	0.42
R4	Dwelling house to the west of the site on the N80	Residential	0.54	3.00	0.33
Guideline			**1.50**	**7**	**150**

Table 3.4: Results of dispersion modelling on discreet receptors for Scenario 2.

The model indicates that from 2014, the predicted odour emissions from the biofilters will be within the standard annoyance criteria for odour nuisance. The emission value for the composting biofilter is reduced to account for the additional contribution of the skip shed biofilter. Odours are not predicted to "give reasonable cause for annoyance" at any property.

In relation to H_2S, at the BAT emission concentration of 3mg/m^3 at the composting biofilter stack and an emission rate from the skip shed biofilter of 0.9mg/m^3, the levels at the nearest sensitive receptor (R2) will remain below the WHO odour annoyance criteria and health protection limit. As with the odour levels, the H_2S emission concentration for the composting biofilter stack has reduced from Scenario 1 to account for the additional emissions from the skip shed biofilter.

3.3 SCENARIO 3

Scenario 3 represents the emissions from the composting and skip shed biofilters in addition to the installation of a new biofilter at the proposed reception shed for the AD plant which is scheduled to be operational in 2016. The input parameters for the cumulative emission model from all biofilters are as per those presented in Tables 3.5. The results of the model assessment are presented in Table 3.6 for the discrete receptors.

Parameter	Composting Biofilter	Skip Shed Biofilter	AD Plant Biofilter
Source Type	Point	Area	Area
Dimensions	1 m (diameter)	20.5 x 8.0 m	30.0 x 8.0 m
Height	10 m	3 m	3 m
Temperature	25^0C (298K)	25^0C (298K)	25^0C (298K)
Volumetric Flow Rate	60,000 m^3/hr	10,000 m^3/hr	15,000 m^3/hr
Odour Emission Concentration	2,500 Ou_E/m^3	800 Ou_E/m^3	800 Ou_E/m^3
H_2S Emission Concentration	3 mg/m^3	0.41 mg/m^3	0.36 mg/m^3

Table 3.5: Input Emission Factors for Scenario 3

Ref	Receptor	Receptor Type	Predicted Odour Concentration (Ou_E/m^3) 98th Percentile of 1-hour averages	Predicted H_2S Concentration ($\mu g/m^3$) 1-hour max	Predicted H_2S Concentration ($\mu g/m^3$) 24-hour max
R1	Dwelling House to south of the site (Burrin Equestrian Supplies)	Residential	1.11	4.30	0.84
R2	Group of Dwelling Houses to the east of the site at Ballintrane Cross Roads on the N80	Residential	1.49	6.86	0.93
R3	Tinnaclash House to the north of the site	Residential	0.46	2.91	0.41
R4	Dwelling house to the west of the site on the N80	Residential	0.42	2.64	0.55
Guideline			**1.50**	**7**	**150**

Table 3.6: Results of dispersion modelling on discreet receptors for Scenario 3.

The model indicates that with the predicted odour emissions from all biofilters simultaneously at the prescribed emission concentrations in 2016, the impact at the nearest sensitive receptors will be within

the standard guidelines for odour nuisance. Again, the emission value for the composting biofilter is reduced to account for the additional contribution of the AD plant biofilter.

In relation to H_2S, at the BAT emission concentration of 3mg/m^3 at the composting biofilter stack, an emission rate from the skip shed biofilter of 0.41mg/m^3 and an emission rate from the AD plant biofilter of 0.36mg/m^3, the levels at the nearest sensitive receptor (R2) will remain below the WHO odour annoyance criteria and health protection limit. The H_2S emission concentration for the skip shed biofilter has reduced from Scenario 2 to account for the additional emissions from the AD plant biofilter. The composting biofilter stack remains as per Scenario 2 as this complies with BAT.

3.4 SCENARIO 4

Scenario 4 of this modelling assessment represents the emissions of combustion gases from the proposed CHP unit at the AD Plant. The emission factors employed in the model are based on the TA Luft Guidelines for the combustion of biogas as presented in Table 2.2 and generic TA Luft limits presented in Table 2.3. The emission parameters employed are presented in Table 3.7.

Parameter	Model Value
Source	CHP
Type	Point
Diameter	0.6 m
Emission Height	10 m
Volumetric Flow	10,000 m^3/hr
Temperature	150 ^{0}C (423K)
Particulates (Dust)	5 mg/m^3
Carbon Monoxide	80 mg/m^3
Nitrogen Oxides	200 mg/m^3
Sulphur Oxides	350 mg/m^3
Hydrogen Fluoride	3 mg/m^3
Hydrogen Chloride	30 mg/m^3

Table 3.7: Scenario 4 Combustion Emission Factors from the CHP

The results of the Scenario 4 Combustion Emissions are presented in Table 3.8 and presented graphically as contoured isopleths in Figures 3.1 and 3.2 (for 1-hour and annual average NO_2). Background concentrations have been included in the tabulated results but not in the graphical results. It should be noted that the results presented in Table 3.8 represent the receptor that will experience the maximum ground level concentration (GLC) and all other receptors will be lower than those presented in Table 3.8. All results are compared against the statutory limits for the protection of human health as presented in Table 2.11 (main combustion pollutants) and Table 2.12 (HCl and HF).

Parameter	Averaging Period	Background	Ground Level Concentration (incl Background	Limit/ Guideline
Nitrogen Oxides (as NO_2) ($\mu g/m^3$)	1-hour Note 1	8	51.39	200
	Annual	4	6.82	40
Sulphur Dioxide ($\mu g/m^3$)	1-hour Note 2	6	72.25	350
	24-hour Note 3	3	25.21	125
Particulates ($\mu g/m^3$)	24-hour Note 4	10	10.19	50
	Annual	10	10.07	40
Carbon Monoxide (mg/m^3)	8-hour	0.4	0.41	10
Hydrogen Fluoride ($\mu g/m^3$)	1-hour	0	0.48	160
	Annual	0	0.04	16
Hydrogen Chloride ($\mu g/m^3$)	1-hour	0	4.81	750
	Annual	0	0.36	-

Table 3.8: Results of modelling of Scenario 4 Combustion Emissions

Note:
1. 1-hour average is presented as the 99.8th percentile of averages as per the limit value.
2. 1-hour average is presented as the 99.7th percentile of averages as per the limit value.
3. 24-hour average is presented as the 99.1th percentile of averages as per the limit value.
4. 24-hour average is presented as the 90.4th percentile of averages as per the limit value.

The results of the modelling assessment indicate that emissions at the emission values will not have an adverse impact on air quality in the area. All levels will remain within the statutory ambient limits for the protection of human health. Each combustion gas is discussed in the following paragraphs:

Nitrogen Dioxide (NO_2)

In terms of NO_2, the highest annual average ground level concentration at the nearest sensitive receptor is $2.82\mu g/m^3$ which, on top of a background of $4\mu g/m^3$, results in an overall impact of $6.82\mu g/m^3$. This is approximately 17% of the annual limit for the protection of human health. The maximum impact is predicted to occur to the east of the facility, consistent with the south-westerly prevailing winds. This is also demonstrated by the spatial plume in Figure 3.1 for annual average NO_2 which indicates the location of the maximum ground level concentration.

The maximum 1-hour NO_2 shows a similarly compliant level at the nearest sensitive receptor (51.39 $\mu g/m^3$ including background) and will not breach the annual limit for the protection of human health ($200\mu g/m^3$) at any location. The spatial trend shown in Figure 3.2 indicates that the maximum impact will be dispersed to the west of the site with the maximum impact predicted to be to on the site. This is primarily due to the fact that as a 1-hour maximum the prevailing wind is less of dominant force and typically the 1-hour maximum is associated with calmer conditions and light easterly winds when the plume "lingers" in an area.

Sulphur Dioxide (SO_2)

The SO_2 levels predicted at the nearest receptors are also below the limits for the protection of human health at the relevant 1-hour and 24-hour limits. The maximum 1-hour average GLC is predicted to be 72.25 µg/m^3 on top of a background of 6µg/m^3 leading to levels approximately 21% of the limit for the protection of human health. The maximum 24-hour GLC (25.21 µg/m^3) is approximately 20% of the limit for the protection of human health (125µg/m^3).

Carbon Monoxide (CO)

The results for carbon monoxide indicate that only trace levels (less than 1% of the 8-hour limit) will be experienced at the maximum GLCs. As such, the operation of the CHP at the emission level specified will have a negligible impact on carbon monoxide levels in the area.

Particulates

The predicted levels of particulate are very low and indicate no breaches of the annual or 24-hour limits for the protection of human health. The predicted levels are approximately 25% of the limit and this is principally a result of the naturally high background. This data is modelled at the TA Luft emission value of 5mg/m^3.

Hydrogen Fluoride

At the TA Luft emission levels presented in Table 2.3 (i.e. 3mg/m^3), the model indicates that ground level concentrations at the nearest sensitive receptors will be negligible, i.e. less than 1% of the EA guidelines (Table 2.12). Extrapolation indicates that emission concentrations up to circa 950mg/m^3 would be required to breach these levels at the nearest sensitive receptors.

Hydrogen Chloride

At the TA Luft emission levels presented in Table 2.3 (i.e. 30mg/m^3), the model indicates that ground level concentrations at the nearest sensitive receptors will be negligible, i.e. less than 1% of the EA guidelines (Table 2.12). Extrapolation indicates that emission concentrations up to circa 4,500mg/m^3 would be required to breach these levels at the nearest sensitive receptors.

Summary

The results of the modelling of combustion emissions from the proposed CHP source indicate that at the emission levels specified in Table 3.7, the impact to air quality will be negligible and there will be no adverse impact to human health in the area. These emission levels are based on the TA Luft Guidance for the combustion of biogas where applicable or generic TA Luft guidelines where required.

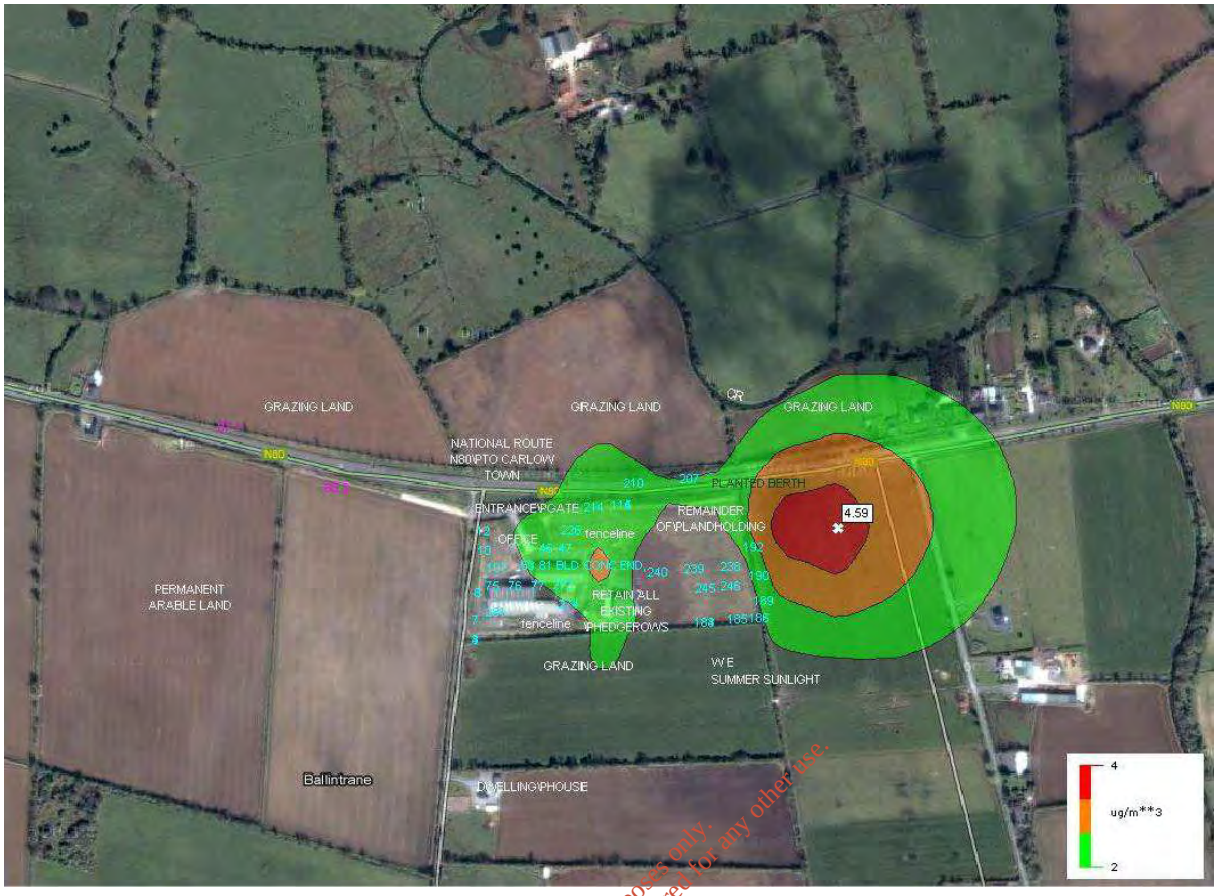

Figure 3.1: Scenario 4, Annual Average NO_2 Concentrations (Contours represent 4µg/m^3, 3µg/m^3 and 2µg/m^3). Backgrounds not included. Statutory limit for the protection of human health 40µg/m^3 (as NO_2).

Figure 3.2: Scenario 4, 1-hour NO_2 Concentrations (Contours represent 60µg/m^3, 50µg/m^3 and 40µg/m^3). Backgrounds not included. Statutory limit for the protection of human health 200µg/m^3 (as NO_2).

4 CONCLUSIONS

A refined dispersion model assessment has been undertaken to simulate the emissions from the proposed developments at O'Toole Composting, Carlow. The modelling procedure has followed that presented by the EPA in Guidance Note AG4. The modelling has assessed the impact of both odours from three biofilters and combustion emissions from a CHP unit which will operate as part of the AD Plant. In a further information request dated the 24th June 2013, the EPA has requested modelling of the chemical constituents H_2S, HF and HCl which are included in this updated report

As all sources are planned a review of suitable emission concentrations has been carried out using standard BREF, BAT and TA Luft references. For all sources the emission concentrations employed comply with these reference documents. The results of the modelling exercise indicate that emissions at the concentrations outlined in the following tables will not give rise to odour nuisance or impacts to human health from the operational facility.

Table 4.1 outlines the modelled emission rates of the three proposed biofilters at the facility over the development lifetime of the three biofilter units. Emission values are presented on a phased basis as modelled in this report and emissions at these values will not give rise to odour nuisance or health impacts in the vicinity of the development. These odour emission concentrations are based on the acceptable emission range outlined in the BREF Note for the Waste Treatment Industries. H_2S emission rates are based on TA Luft. The results indicate that at these levels the impact of all biofilters operating under the various phases will be within the acceptable criteria for odour nuisance and health impact.

Source	Parameter	2012 Emission Value	2014 Emission Value	2016 Emission Value
Composting Unit Biofilter	Odour (Ou_E/m^3)	3,000	3,000	2,500
	Hydrogen Sulphide (mg/m^3)	5.7	3	3
Skip Shed Biofilter	Odour (Ou_E/m^3)	-	800	800
	Hydrogen Sulphide (mg/m^3)	-	0.90	0.41
AD Reception Biofilter	Odour (Ou_E/m^3)	-	-	800
	Hydrogen Sulphide (mg/m^3)	-	-	0.36

Table 4.1: Modelled Odour Emission Values for the Biofilters

Table 4.2 presents the modelled emission rates of the CHP at the facility, based on the TA Luft Guidelines for the combustion of biogas. Where emission levels are not specified for this operation, generic TA Luft emission concentrations are applied. The results of the modelling exercise show that emissions at the prescribed levels do not breach any of the statutory limits for the protection of human health. As such, it can be concluded that the combustion emissions will not have a significant impact on air quality in the area.

Parameter	Value Unit	Emission Value
Volume Flow	Volume Flow (m^3/hr)	10,000
Nitrogen Oxides	Concentration (mg/m^3)	200
Sulphur Oxides	Concentration (mg/m^3)	350
Carbon Monoxide	Concentration (mg/m^3)	80
Particulates	Concentration (mg/m^3)	5
Hydrogen Fluoride	Concentration (mg/m^3)	3
Hydrogen Chloride	Concentration (mg/m^3)	30

Table 4.2: Modelled Combustion Emission Values for the CHP

In summary, the proposed operation of the O'Toole Composting facility at the emission levels prescribed above will not result in odour nuisance or impact to human health at the nearest sensitive receptors.

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Attachment A

Non-technical Summary (Amended)

Attachments in this Section include:

A.1 Non-technical Summary (amended 19th August 2013 to include additional information provided to the EPA in response to Article 14 (2)(b)(ii) request dated 24th June 2013.

Introduction

A non-technical summary has been prepared in accordance with Article 12(1)(u) of the Waste Management (Licensing) Regulations, S.I. 395 of 2004, as amended.

a) An application for a Waste Licence is being made to the Environmental Protection Agency (EPA). The application is being made by

O'Toole Composting Limited,
Ballintrane,
Fenagh,
Co. Carlow.

Telephone: (059) 9148984
Fax: (059) 9148989

All correspondence relating to this application should be sent to:

Mr. Jim Dowdall
Enviroguide Consulting
93 Upper Georges Street
Dun Laoghaire
Co. Dublin

Telephone: (01) 2711896
Fax: (01) 2711897

The registered office of O'Toole Composting Limited is Rathbawn, Tullow, Co. Carlow.

b) O'Toole Composting Limited is in the Planning Authority functional area of:

Carlow County Council
County Buildings
Athy Road
Carlow Town
Co. Carlow

c) There is no discharge of trade effluent or other matter to sewer from the facility. The sanitary authority area in which this facility is located is the HSE South, Carlow Community Care, Athy Road, Carlow Town, Co. Carlow.

d) The facility is located in the townland of Ballintrane in Fenagh, Co. Carlow. The National Grid reference for the facility to which this application relates is S 7886 6762. The site which is 4.87 hectares in area is located in a rural area where the

predominant land use is for agriculture. The closest dwelling located 170 meters south of the facility.

The site itself is well serviced with road networks as can be seen in Figures 1 and 2 below. The site is located directly off the N80 Carlow/Rosslare Road, approximately 6km south east of the M9 Dublin/Waterford Motorway. The main entrance of the facility is located at the north west corner of the site, just off a local access road Jocks Lane, which runs perpendicular to the main N80 roadway. Sufficient sightlines are at either side of the access lane for safe access and egress to the facility.

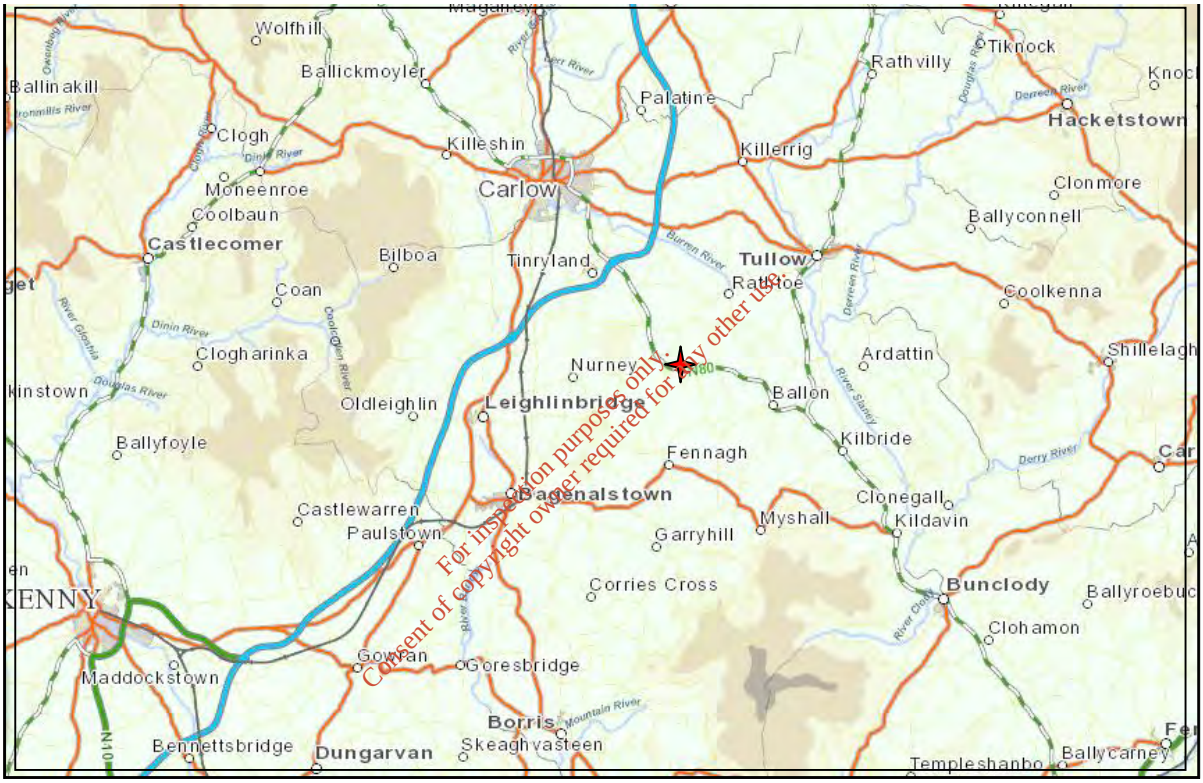


Figure 1: Detailed Site Location Map

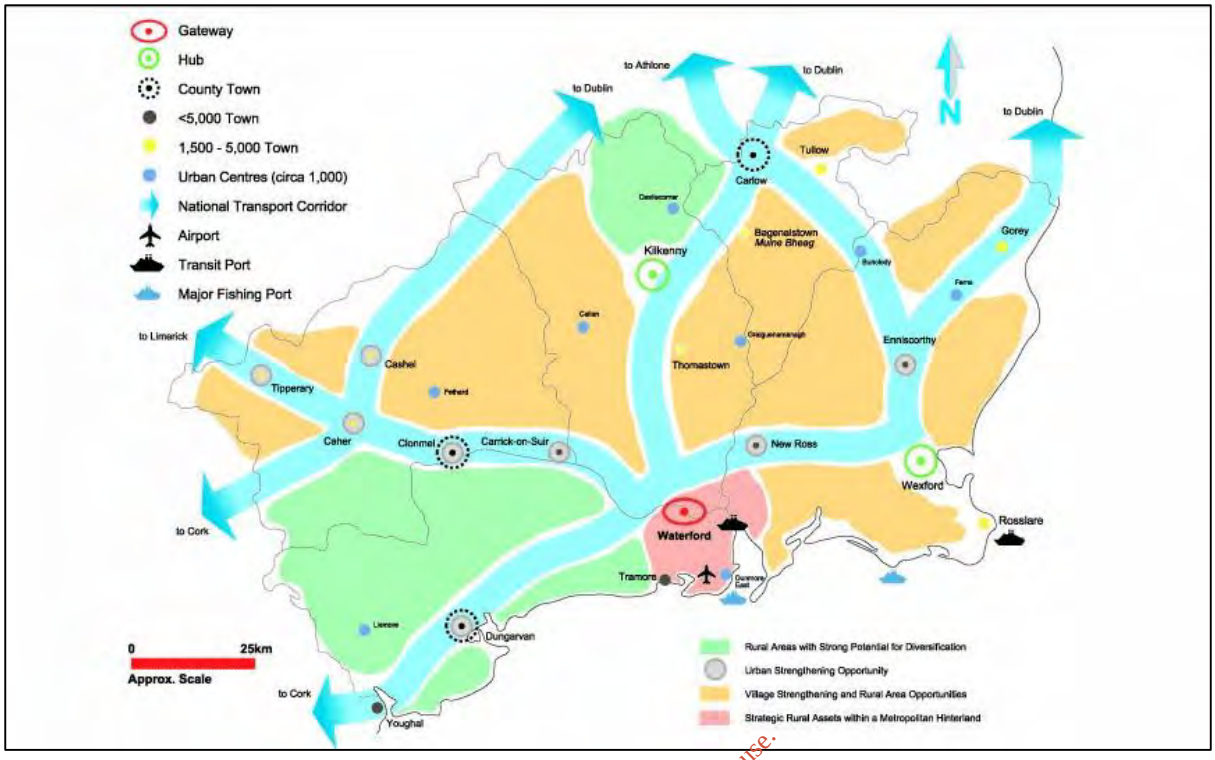


Figure 2: South East Region Transport Corridor

As can been seen from Figure 2, O'Toole Composting is in a central location off the national transport corridor, Carlow being a county town which links the gateways of Waterford and Dublin and the hub towns of Kilkenny and Wexford.

e) This facility currently operates a waste transfer and composting facility with a permitted annual intake of 10,000 tonnes. O'Toole Composting Limited are now proposing to expand the current operations at the facility. There are two proposed stages to this expansion.

This development is proposed to occur in two stages. Stage 1 of the development will see an increased intake of organic waste for composting and or municipal solid waste for drying and stabilisation, with a proposed maximum annual intake of 40,000 tonnes. This will see the composting infrastructure that is currently in place at the facility being used to its maximum capacity. During Stage 1 it is also proposed to construct a civic amenity facility which can be used by members of the public for their waste and recycling. It is also proposed to increase the tonnage of waste accepted in the current waste transfer building up to a maximum tonnage of 20,000 tonnes per annum. Waste material will be bulked up in this building prior to it being transferred offsite to a waste processing or landfill facility. In addition a processing plant will be installed in this building to maximise recycling and recovery of this type of material. This plant will utilise screening, shredding, magnets and a windshifter. In order to accommodate the additional waste proposed for this building it is proposed to expand the existing building. Planning permission has been granted for the expansion of this building.

Stage 2 of this development will be for the construction, installation and operation of an anaerobic digestion plant. It is proposed that 30,000 tonnes of primarily food waste and industrial sludge but also energy crops such as maize and barley could be accepted and processed for energy generation. No planning permission is in place for this development at present. Planning permission would need to be in place before this proposed development could be constructed. Planning permission will be sought at an unknown future date for this proposal. Any additional environmental impacts that might arise will be addressed in the planning application and as part of a Specified Engineering Works request to the EPA.

f) The following Classes of activity in accordance with the Third and Fourth Schedules of the waste Management Act 1996, as amended, are as follows:

Third Schedule -Waste Disposal Activities

13 Blending or mixing prior to submission to any of the operations numbered from D 1 to 12 (if there is no other D code appropriate, this can include preliminary operations prior to disposal including pre-processing such as, amongst others, sorting, crushing, compacting, pelletising, drying, shredding, conditioning or separating prior to submission to any of the operations numbered D1 to D12)

This activity primarily includes the segregation of bulky waste prior to the residual waste being sent for disposal or the compaction of municipal wastes. At a future date this activity may include the pre-processing of municipal solid waste (MSW) such as mechanical biological treatment which mechanically separates the organic fraction of waste from a mixed waste stream. This pre-treatment is intended to reflect in particular recitals 8 & 17 of the EU Landfill Directive (1999/3I/EC). This organic fraction is then biologically stabilised. It may also include the drying of MSW prior to removal offsite.

15 Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of ‘collection’ in section 5(1)), pending collection, on the site where the waste is produced).

This activity will primarily consist to the storage of waste in bays or in the designated quarantine area prior to transfer offsite.

Fourth Schedule Activities -Waste recovery Activities

3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and pyrolisis using the components as chemicals (Principal Activity)

This activity relates to the composting of organic wastes at the facility. It also relates to the recovery or other organic materials such as cardboard, plastic, papers etc.

4 Recycling/reclamation of metals and metal compounds

This activity relates to the reclamation of metal and metal compounds from mixed waste loads.

5 Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials

This activity primarily relates to the recovery and reclamation of inorganic materials such as construction and demolition wastes, tyres and glass. At a future date this activity may include the processing and recycling of gypsum waste at the facility.

12 Exchange of waste for submission to any of the operations numbered R 1 to R11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11)

This activity relates to the preliminary operations prior to recovery or transportation offsite. Examples of such activities include the segregation of single waste streams such as metals, glass, gypsum, cardboard from mixed waste streams prior to recovery or recycling under of any of the previous recovery classes mentioned.

13 Storage of waste pending any of the operations numbered R 1 to R12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced)".

This activity relates to the storage of waste in designated storage bays or quarantine area prior to the waste being transferred offsite to a facility for recovery or recycling.

g) Non-hazardous domestic & commercial waste will be accepted at the facility for composting and waste transfer. The proposed quantities of wastes are as follows:

MSW or Biodegradable for Stabilisation/Composting: 40,000 tonnes per annum
Waste transfer (MSW, C&I and C&D wastes): 20,000tonnes per annum
Anaerobic digestion: 30,000 tonnes per annum

A full detailed description of all waste types including the European Waste Codes as presented by Commission Decision 2000/532/EC of 3 May 2000 11, are included in Attachment H.1 of this application.

h) Raw materials used at this facility include water, electricity and fuel such as diesel and gasoil. Other substances used at the facility are for the operation of machinery such as engine oil, transmission fluid, Ad Blue, antifreeze and lubricants.

Once operational the anaerobic digestion plant will produce renewable energy.

i) Infrastructure, plant and equipment are currently in place for the existing operations at the facility. Apart from the construction of an extension to the waste transfer building and the development of a new civic amenity facility there will be no changes to the current infrastructure on-site for Stage 1 of the development as described in Section (e) of this non-technical summary. On-site processes include the acceptance, storage, composting/drying of municipal solid waste and transfer offsite of wastes. Future on-site processes may include mechanical biological treatment and the processing of gypsum waste. Approval will be sought from the EPA for any proposed new waste processing activity prior to it being commenced at the facility.

All waste vehicles entering the facility are weighed before they enter the site. The vehicle registration, waste type, source of waste and gross weight are all recorded at this point. The vehicle is directed by the weighbridge operative to the appropriate tipping area for that particular waste type. Once waste has been tipped it is inspected by a trained staff member to ensure that the waste type is acceptable. If the waste is found to be unacceptable or contaminated it is rejected from the facility. If the material is accepted the driver is directed back onto the weighbridge where the empty weight will be taken to generate the nett weight for the load. Records of all wastes accepted or rejected from the facility will be maintained on-site at all times.

Mixed waste including skip waste, domestic and commercial waste will be directed to the waste transfer station. Skips or collection vehicles will be emptied on the floor area of the building that has been designated as the waste inspection area. All materials in the skip will be inspected once tipped and if the waste is acceptable it will be moved into the temporary storage bay prior to it being transferred offsite to a waste processing facility. Any unacceptable wastes or wastes that are

considered hazardous material such as light bulbs, paint cans, waste electrical goods, batteries will be separated from the waste and stored in assigned bunded containers in the designated quarantine area until they are collected by an approved contractor.

The Facility Manager will organise vehicles for the transportation of the mixed waste offsite. The mixed waste will be loaded into articulated trailers by the on-site teleporter. The waste will be sent to an approved waste processing facility for further processing, recovery, recycling or disposal. No wastes will be kept on-site long term and there will be no disposal of waste at the facility.

Segregated wood waste will be directed to the wood storage bay by the waste transfer station. All untreated wood such as timber pallets will be temporarily stored in the wood bay. Untreated wood will be shredded on-site. The wood chip that is produced is then used in the composting process. Any treated wood (e.g. wood that has been varnished), will be treated as mixed waste and send off-site for further processing.

Civic amenity facilities for use by members of the public are limited at present. It is proposed to design and expand a new area to be used as a civic amenity facility for members of the public. This area will consist of skips, containers and compactors for the acceptance of various waste household streams such as cardboard, dry recyclables, plastics, waste electrical goods, glass, wood, textile, rubble, batteries, tyres, municipal waste and food waste. All vehicles wishing to access the civic amenity facility will be directed to the entrance by the weighbridge operative. The containers in the civic amenity site will be emptied as necessary at the end of each working day.

Biodegradable waste for composting or MSW for drying/stabilisation will be directed to the composting shed. If the biodegradable waste is accepted it is moved into the delivery bay area. This waste is shredded and then loaded into one of the composting tunnels. After 7 to 10 days the material is removed from this composting tunnel and placed into a second composting tunnel where it is left for a further 7 to 10 days. Each of the composting tunnels are controlled by a specially designed computerised system. This computerised system can control and monitor the temperature and moisture levels to ensure that the correct conditions are maintained within the tunnels to ensure that the composting process is carried out appropriately. A specifically designed floor piping system has been installed in the composting tunnels known as an aeration floor. Air can be introduced to the tunnels via this piping system.

Air is circulated throughout the organic material and is extracted from the tunnels via the overhead duct work. The introduction of air to the material during composting is known as an aeration process.

Once aeration has taken place in the tunnels, material from the tunnel will be discharged via the back door of the tunnel where the materials is screened. The large particles of waste, called oversize, are removed from this area and re-circulated to the waste intake area so that they can be mixed with fresh incoming waste and be further broken down by going back through the aeration process.
The undersize (particles that meet the size grade) is transferred to the maturation floor. The composted material is left on the maturation floor for five to seven weeks to cure.
In the case of stabilised MSW the organic fines or 'compost like output' is screened and the remainder of the material sent for further processing into Solid Recovered Fuel (SRF)

j) O'Toole Composting Limited meet the requirements of Section 40(4) of the Waste management Act 1996, as amended. This can be demonstrated in Section L of this application.

Environmental control measures and management practices at the facility will ensure that emissions from the facility will not give rise to nuisance as a result of the on-site activities. O'Toole Composting Limited are committed to complying with the conditions of the EPA Waste Licence, if granted, to ensure that no environmental pollution will occur as a result of the activities on-site. The best available technology has been installed at the facility. A fully computerised GICOM composting system has been installed in the composting building. All future investments will consider best available technology prior to purchase.

O'Toole Composting Limited can be considered a fit and proper person to hold a waste licence as none of the directors of the company or the company itself have ever been convicted of an offence under the Waste Management Acts, Environmental Protection Agency Acts or Water Pollution Acts. Mr Patrick O'Toole, Facility Manager, has eight years in the waste industry and has completed the FETAC Certificate in Waste Management Course. In addition to this O'Toole Composting are in a financial position to meet operating and closure requirements of the waste licence.

Energy is used efficiently at the facility and energy efficiency practices will continue if this waste licence is granted. In Stage 2 of this proposed development, it is expected that renewable energy will be produced from the AD Plant. This energy can be harnessed and used for the on-site facility operations.

Noise from the facility will not result in nuisances being caused in the surrounds of the facility. Noise monitoring will be carried out on an annual basis at the facility to ensure that noise remains within the limits as set out in the waste licence.

An accident prevention policy and an emergency response procedure is in place at the facility. These policies and procedures will ensure that necessary measures will be taken to prevent accidents and if an accident occurs it will limit the consequence of the accident for the environment.

It is not proposed to cease the activities at the facility in the short or medium term. However should the facility close down, all necessary measures will be taken by O'Toole Composting to ensure that no environmental pollution is caused or that no environmental liability remains on-going at that facility once closed.

k) The main potential emissions from the facility include dust, noise, litter, flies and odour. Control measures are currently in place at the facility to control the level of emissions and to reduce or eliminate emissions where possible. These control measures, which include daily site inspections, are to ensure that any emissions from the facility do not give rise to nuisances at any of the facility surrounds.

Dust generation is mainly from traffic movement to and from the facility during periods of prolonged dry weather and the tipping of dry wastes at the facility. It is proposed to concrete the remainder of the yard area of the facility over a phased basis which should reduce dust levels. In dry weather conditions the yard area will be dampened down with water to prevent dust becoming airborne. In addition to this vehicles delivering and removing waste from the facility will be covered to prevent dust and litter escaping from trailers. All waste handling will occur within the facility buildings. A negative air odour extraction system is in place in the composting building and is proposed for the waste transfer building. This extraction system will also remove dust particles from the building.

The processing of waste will occur indoors which will limit the generation of noise, litter and flies in the surrounding area to the facility. Machinery will be well maintained to avoid any noise from friction or vibration. Noise monitoring will be conducted on an annual basis, or as required by conditions of the licence, to ensure that noise levels are not exceeding the recommended environmental limits. Litter should be limited at the facility as vehicles delivering or removing waste to or from the facility will be covered and any litter that occurs will be swept up once spotted or reported. Daily site inspections will be carried out to inspect for nuisances including dust, noise, litter, flies, mud or odours. If any nuisances are noted during the daily inspections corrective action will be taken.

An odour impact assessment model was carried out which predicts the potential impacts from odour if this facility were to expand as is proposed by this application. The odour models in this report predicts that there will be no impact from odour at any of the neighbouring properties to the facility. This H_2S, HCl and HF.

l) As the facility is currently operational it is not considered that there will be any new emissions introduced as a result of the facility operations. Existing site practices will continue in relation to the environmental management of the facility to limit any potential increase in emissions. All wastes will be processed indoors. Due to the building design and infrastructure emissions from the facility will be limited and controlled.

m) At present monitoring is carried out at the facility in locations identified in Figure 3. It is proposed to continue environmental monitoring at each of these locations as part of this Licence application. It is not anticipated that any of the emission limit values will be exceeded due to the environmental management systems that are in place at the facility. In the event of any emission limit values being exceeded at any stage, the exceedence will be treated as an environmental incident. All environmental incidents will be investigated to determine the root cause of the incident. Retesting will be carried out as part of the incident investigation process. Once the root cause of the incident has been identified, appropriate corrective and preventative action measures will be put in places so as to limit or eliminate the environmental consequences of such an occurrence. Emission Limit Values have been proposed for SW1 and SW2 in line with the EPA's Interim Guideline Values.

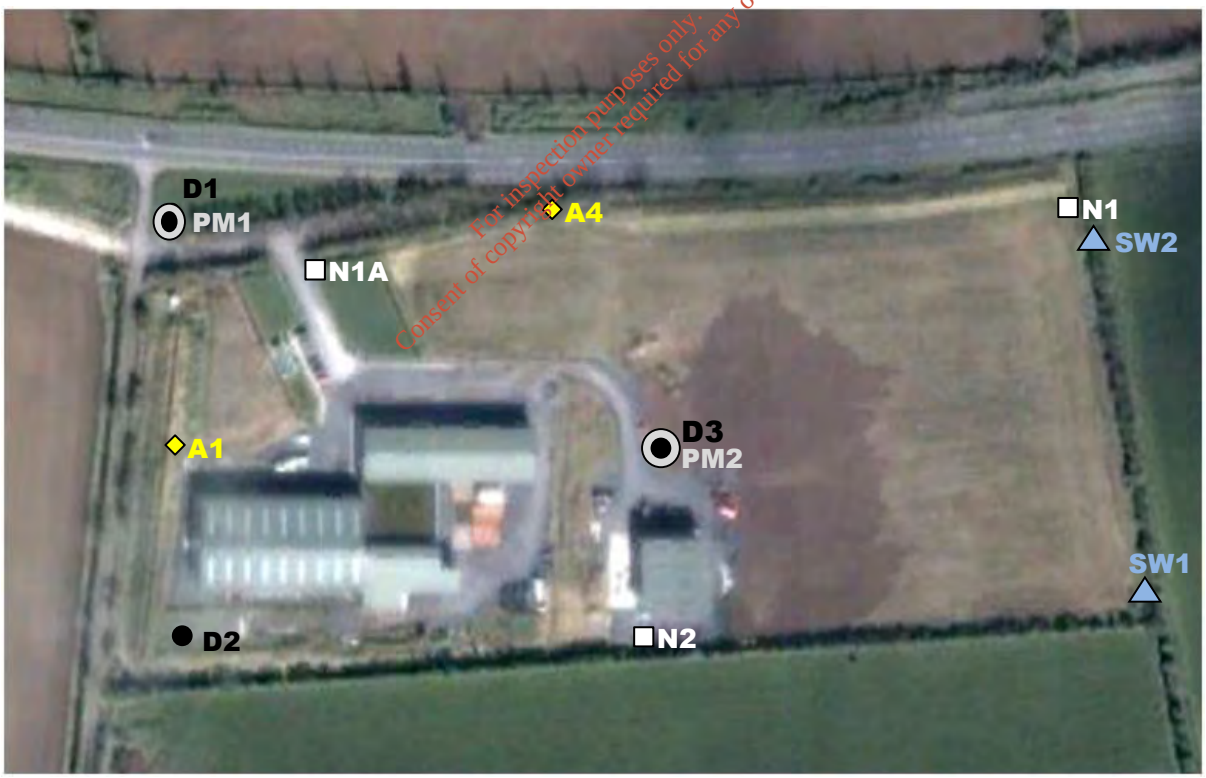


Figure 3 On-Site Monitoring Locations

- Air Sensitive Receptors
- Dust Monitoring Locations
- PM10 Monitoring Locations
- Noise Monitoring Locations
- Surface Water Locations

n) All waste on-site will be handled and processed on-site in a manner that will not affect the recyclability of the materials. Recyclable waste will remain segregated from non-recyclable wastes at all times. Any residual waste at the facility that results from the processing of waste will be transferred offsite to an approved facility. A segregated bin system is implemented in the facility offices for the segregation of all recyclable wastes. Waste from the recycling processes such as waste oil or fuels will be stored in bunded containers and collected from the facility by and approved contractor. No other wastes will be produced on-site. No wastes will be disposed of at the facility.

o) All wastes temporarily stored at the facility will be transferred offsite to approved waste facilities for further processing, recovery, recycling, waste to energy or disposal. Waste will only be transported by an approved haulier that holds a waste collection permit. Any excess liquid waste water runoff from the composting building will be tankered offsite to an approved waste water treatment plant.

p) An environmental management system (EMS) is in place at the facility. This EMS contains various management procedures that are in place to ensure that activities at the facility are carried out in accordance with the Licence conditions and in an environmentally sound manner so that any potential emissions from the facility will be controlled. An accident prevention policy and an emergency response procedure are in place at the facility to prevent the occurrence of emergency at the facility and to limit the environmental impact of such an emergency in the unlikely occurrence of such an event. Fire water tanks have been installed at the facility which will acts as a fire fighting water source in the event of a fire. At present there are six 5,000 gallon tanks on-site.

q) There are no short or medium term proposals to close the facility or to cease operations at the facility. In the unlikely event that activities cease at the facility, the facility will be closed so that no environmental liabilities remain at the facility. All wastes will be removed from the facility and transferred to an approved waste facility. Buildings, plant and machinery will be washed down, disinfected or drained of any fuels as necessary. O'Toole Composting Limited will have financial resources available to ensure that the facility can be retendered free from environmental liability if activities cease at the facility. A fully costed CRAMP and ELRA has been supplied to the Agency.

r) No wastes will be landfilled at the facility at any stage. Any non-recyclable wastes will be transferred from the facility to an approved facility.

s) The European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2000 (S.I. No. 476 of 2000) do not apply to the proposed activities at this facility.

t) The bedrock in the underlying area of the facility is that of granite and other igneous intrusive rocks Due to the nature of the proposed activity and the underlying bedrock it is considered that the activity will not give rise to an emission into an aquifer containing the List I and II substances specified in the Annex to Council Directive 80/68/EEC of 17 December 1979.

WASTE LICENCE APPLICATION REG. NO. W0284-01

O'TOOLE COMPOSTING LTD.

REVISED NON-TECHNICAL SUMMARY

19th AUGUST 2013

Introduction

This is a non-technical summary for the Environmental Impact Statement that has been completed for O'Toole Composting Limited. This EIS has been completed as part of a Waste Licence Application that is being submitted to the Environmental Protection Agency (EPA). An EIS is required for all waste facilities that propose to accept more than 25,000 tonnes of waste per annum. This non-technical summary has been revised in respect of any changes as a result of information submitted to the EPA as a result of an Article 14 (2)(b)(ii) request dated 24th June 2013.

Overview of the Proposed Development

O'Toole Composting Limited is based in Ballintrane, Fenagh, Co. Carlow. This facility has been operational as a composting facility and a waste transfer station since 2005. The facility operates under Waste Permit number WFP-CW-10-0003-01, issued by Carlow County Council. It is now proposed to develop and expand operations at the facility. As part of this expansion an application must be made to the EPA for a Waste Licence which, if granted, will supersede the Waste permit for the facility.

This development is proposed to occur in two stages. Stage 1 of the development will see an increased intake of organic waste for composting and/or municipal solid waste for drying and stabilisation, with a proposed maximum annual intake of 40,000 tonnes. This will see the composting infrastructure that is currently in place at the facility being used to its maximum capacity. During Stage 1 it is also proposed to construct a civic amenity facility which can be used by members of the public for their waste and recycling. It is also proposed to increase the tonnage of waste accepted in the current waste transfer building up to a maximum tonnage of 20,000 tonnes per annum. Waste material will be bulked up in this building prior to it being transferred offsite to a waste processing or landfill facility. In addition a processing plant will be installed in this building to maximise recycling and recovery of this type of material. In order to accommodate the additional waste proposed for this building it is proposed to expand the existing building. Planning permission has been granted for the expansion of this building.

Stage 2 of this development will be for the construction, installation and operation of an anaerobic digestion plant. It is proposed that 30,000 tonnes of mainly food waste and industrial sludge will be used for this process but energy crops such as maize and barley could also be accepted and processed for energy generation. No planning permission is in place for this development at present. Planning permission would need to be in place before this proposed development could be constructed. Planning permission will be sought at an unknown future date for this proposal. During this planning stage any possible environmental impacts associated with this development will be addressed and will also be submitted to the EPA as part of a Specified Engineering Works request.

Need for the Proposed Development

OTCL is committed to the recycling of waste from all sources including Household, Commercial and Industrial, and Construction and Demolition. Currently these is no other waste transfer facility in County Carlow for the acceptance of commercial waste. The company is particularly focussed on the recycling/composting of biodegradable waste. If the facility operations are expanded as proposed then OTCL will have more composting tonnage capacity available that can be used by other waste operators. This will contribute to Ireland's efforts to meet EU targets of biodegradable municipal waste (BMW) accepted at landfill for disposal as set out by the EU Landfill Directive.

OTCL currently have capacity for up to 40,000 tonnes of composting but are prevented from operating their facility to this capacity by the restrictions of the Waste Facility Permit. It is therefore necessary that OTCL apply to the EPA for a waste licence to operate at this capacity.

Site Description

The facility is located in the townland of Ballintrane in Fenagh, Co. Carlow. The National Grid reference for the facility to which this application relates is S 7886 6762. The site which is 4.87 hectares in area is located in a rural area where the predominant land use is for agriculture. The closest dwelling located 170 meters south of the facility. The site itself was historically used as agricultural land until it was developed by O'Toole Composting as a composting facility in 2005. Currently the facility operates under Waste permit reference Number WFP-CW-1-0003-01, which was granted by Carlow County Council on the 3rd of August 2010 with a maximum permitted tonnage of 10,000 per annum. Various planning permissions have been granted for the facility.

The site itself is well serviced with road networks. The site is located directly off the N80 Carlow/Rosslare Road, approximately 6km south east of the M9 Dublin/Waterford Motorway. The main entrance of the facility is located at the north - west corner of the site, just off a local access road Jocks Lane, which runs perpendicular to the main N80 roadway. Sufficient sightlines are at either side of the access lane for safe access and egress to the facility. O'Toole Composting is in a central location off the national transport corridor, a county town which links the gateways of Waterford and Dublin and the hub towns of Kilkenny and Wexford.

The bedrock in the underlying area of the facility is that of granite and other igneous intrusive rocks which act as an impermeable barrier to groundwater from the facility.

The site is located in the River Barrow Catchment, within the South Eastern River Basin District. The River Burren flows in a north, north-westerly direction along the eastern site boundary. The Graiguealug stream flows in an easterly direction to the north of the site and joins the River Burren. Because the River Burren is part of the

River Barrow system and the former is a candidate Special Area of Conservation a screening for Appropriate Assessment was carried out. This screening determined that the development will not have any impact on the SAC.

Waste Activities

The following Classes of activity in accordance with the Third and Fourth Schedules of the waste Management Act 1996, as amended, are as follows:

Third Schedule -Waste Disposal Activities

13 Blending or mixing prior to submission to any of the operations numbered from D 1 to 12 (if there is no other D code appropriate, this can include preliminary operations prior to disposal including pre-processing such as, amongst others, sorting, crushing, compacting, pelletising, drying, shredding, conditioning or separating prior to submission to any of the operations numbered D1 to D12)

This activity primarily includes the segregation of bulky waste prior to the residual waste being sent for disposal or the compaction of municipal wastes. At a future date this activity may include the pre-processing of municipal solid waste (MSW) such as mechanical biological treatment which mechanically separates the organic fraction of waste from a mixed waste stream. This pre-treatment is intended to reflect in particular recitals 8 & 17 of the EU Landfill Directive (1999/3I/EC). This organic fraction is then biologically stabilised. It may also include the drying of MSW prior to removal offsite.

15 Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).

This activity will primarily consist to the storage of waste in bays or in the designated quarantine area prior to transfer offsite.

Fourth Schedule Activities -Waste recovery Activities

3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and pyrolisis using the components as chemicals (Principal Activity)

This activity relates to the composting of organic wastes at the facility. It also relates to the recovery or other organic materials such as cardboard, plastic, papers etc.

4 Recycling/reclamation of metals and metal compounds

This activity relates to the reclamation of metal and metal compounds from mixed waste loads.

5 Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials

This activity primarily relates to the recovery and reclamation of inorganic materials such as construction and demolition wastes, tyres and glass. At a future date this activity may include the processing and recycling of gypsum waste at the facility.

12 Exchange of waste for submission to any of the operations numbered R 1 to R11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including, pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11)

This activity relates to the preliminary operations prior to recovery or transportation offsite. Examples of such activities include the segregation of single waste streams such as metals, glass, gypsum, cardboard from mixed waste streams prior to recovery or recycling under of any of the previous recovery classes mentioned.

13 Storage of waste pending any of the operations numbered R 1 to R12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced)".

This activity relates to the storage of waste in designated storage bays or quarantine area prior to the waste being transferred offsite to a facility for recovery or recycling.

Non-hazardous domestic & commercial waste will be accepted at the facility for composting and waste transfer. The proposed quantities of wastes are as follows:

MSW or Biodegradable for Stabilisation/Composting: 40,000 tonnes per annum

Waste transfer:	20,000 tonnes per annum
Anaerobic digestion:	30,000 tonnes per annum

Environmental Impact

Environmental Nuisances

As with any waste facility it is possible that some environmental nuisances may occur within the site, and within the surrounding environment. Potential nuisances may possibly include noise, vermin, dust, odours or litter. However this impact will be minimal due largely to the control measures adopted on site to combat the effect of these environmental nuisances. Strict adherence to the conditions of the waste license, good management practises, control over individual procedures, and maintenance of the odour abatement systems are essential to ensure the site will not impact on receptors in the area. The existing site has a good environmental record which O'Toole Composting Ltd. strives to maintain. It is not expected that the expansion of operations at the facility will give rise to nuisances offsite.

Noise

The primary source of noise at the facility is from the movement of on-site vehicles and machinery and the movement of vehicles to and from the facility. As all processing of waste will occur within the processing buildings noise will be controlled. The impact of noise from traffic to and from the facility is not considered to have an adverse impact due to the current traffic volumes on the N80 roadway. Noise monitoring has been carried out at the facility. All noise emissions were within the recommended limits. Noise monitoring will continue to be carried out at the facility.

Vermin

A vermin control system is in place at the facility. This system includes laying of bait points and weekly inspections. At present vermin does not cause any nuisance at the facility. Existing control measures will remain in place and routine inspections will be maintained. External rodent control companies will be employed if considered necessary in the future.

Dust

Dust may be caused at the facility from traffic movement at the facility during prolonged periods of dry weather or from the processing of dry wastes. Control measures are in place at the facility in the form of a traffic management plan which limits the speed of vehicles on-site and the processing of all wastes is carried out within the processing buildings. In addition to this concrete hardstand at the facility will limit dust. Areas of the yard can be dampened down with water during periods of prolonged dry weather. The odour control negative air system also acts as dust extraction system. Dust

monitoring has been carried out at the facility and all dust emissions are within the necessary limits. This monitoring will continue to be conducted.

Odour

Odour is the most significant environmental aspect of this proposed development. For this reason several odour control measures have been put in place at the facility. The primary odour control measure is the proposed (and extension of existing) odour control system which is based on a bio-filter and will be a simple and effective way of controlling the odour of the waste air coming from the building. OTCL have a mobile atomised probe unit at the facility. This unit is a self contained transportable system which is powered by a motor and disperses odour neutraliser to give immediate odour suppression to confined areas if odour is detected.

Other measures include:

- Ensuring where possible that the building is constructed without any gaps in the building fabric using combined flashing and expanding foam,
- Installation of roller doors on the entrance and exit of the waste reception hall,
- Give consideration to the installation of PVC plastic curtains inside the doors to reduce the available door area once the roller door is opened if necessary,
- Zoned extraction within the building to remove odorous air from the most odorous sources within the building.

Litter

The main source of litter at the facility is from litter being created from the transportation of waste. All waste collection vehicles delivering waste to or transferring waste from the facility will be appropriately covered to ensure that windblown litter will not be caused. Site inspections are carried out on a daily basis and the facility and surrounds are monitored for litter. If litter is detected then it is picked up immediately.

Water

An environmental assessment was carried out by Enviroguide Consulting to determine the impact that this proposed development would have on surface and ground water. The geology was examined with all published information that was available.

This section is divided into sub-sections, so as to describe the various aspects relating to the water environment.

Surface Water

This section deals with the potential impacts on surface water resulting from the construction of an extension at the waste facility and the proposed control measures to minimise such an impact.

All surface water from the facility runs to a stream that runs along the eastern boundary of the site. This stream flows into the Burren River. As the facility is currently operational surface water sampling is carried out at two locations on this stream. Results of this sampling is included in the main body of the EIS. All results are below recommended EPA's Interim Guidelines limit levels. ('Towards Setting Guideline Values for the Protection of Groundwater in Ireland' – EPA 1993)

Groundwater

There are no proposed discharges to ground water from the facility. There are no source protected zones in the vicinity of this facility. All liquids and fuels stored on-site are stored in bunded containers to prevent penetration to ground water in the event of a spillage. Concrete hardstand at the facility and the underlying bedrock act as protection barriers to groundwater.

Waste Water

Wastewater from the operation of the facility is collected in holding tanks on-site. This wastewater is either reused in the composting process for moisture in the composting tunnels or it is tankered offsite to a waste water treatment plant. Foul water discharges from the offices is diverted to a septic tank on-site.

During the construction phase there is a potential for sediment laden water to run off from the site. Due to control measures on-site the predicted impact of the construction phase on surface water quality is minimal.

Surface water monitoring is proposed to continue at the facility to ensure that the operation of the facility does not cause any adverse affects on water quality.

Human Beings

Human beings are one of the most important elements of the 'environment' to be considered. One of the principal concerns in any proposed development is that the local population experiences no reduction in the quality of life as a result of the development on either a permanent or temporary basis. As the facility is currently operational it is expected that any impacts on human beings will be of little impact.

The facility is located just off the N80 main Carlow to Wexford road. The nearest dwelling is approximately 170 meters away to the south. The facility has a low visibility impact on the residents due to the screening surround the facility. Potential impacts could include impacts on noise, traffic, fire safety, human health, land use, odour and socio-economic impacts.

Due to the location of the facility and considering that the facility is currently operational, and has been since 2005, the predicted impacts on noise, traffic, safety, human health, land use, odour and socio-economic impacts are considered to be of

negligible impact. Several fire safety measures have been implemented at the facility to control any potential impacts in the unlikely event that a fire would occur at the facility. These controls include six 5,000 gallon (22,000 litre) water tanks for holding water specifically for fire fighting purposes. Appropriate fire extinguishers have been installed at various points throughout the facility so that fires can be extinguished rapidly to limit fire damage.

Air Quality

This section of the EIS outlines the current baseline conditions of air quality at the facility. Possible predicted impacts from the proposed increased activity at the facility are odour, dust and bio-aerosols. All wastes are processed within the facility buildings which will reduce the potential of these impacts. In addition to this, a bio filter has been installed in the waste composting building. This bio-filter will greatly eliminate any odour, dust or bioaerosol particles that may be otherwise emitted from the building. As part of the proposed extension to the waste transfer building it is proposed to install a biofilter in this building also to minimise dust and odour impacts. With these control measures in place the impact to air quality is considered negligible. An Air Dispersion Model was prepared by RPS consulting to predict possible patters of air dispersions from the facility. This includes dispersion modelling for H_2S, HCl, and HF. A copy of this report is included in the EIS document.

Traffic

The facility is located on the main N80 Carlow to Wexford Road. A Traffic Impact Assessment was carried out to determine the impacts the proposed increased activity would have on overall traffic volumes. The survey indicated that the annual average daily traffic on the west (Carlow) side of the facility is 4,292 vehicles per day with a HGV content of 8.6%. The average daily traffic on the east (Wexford) side of the facility is 4,089 vehicles per day with a 9.7% HGV content. While it is predicted that the traffic to and from the facility will increase as a result of the proposed expansion of activities at the facility, the overall increase in traffic is less than 5% of the current traffic volumes.

The entrance to the facility is located off a local laneway just off the N80 roadway. There will be no queuing of vehicles on the main roadway. Safe sightline visibility exist to allow for safe access and egress from the junction.

Noise

The main source of noise at the facility is the background noise created from traffic movement on the N80 roadway. However day and night time monitoring is carried out at the facility on an annual basis. All noise limits are within the recommended noise limits. Full copies of the noise reports are included as part of the EIS document.

Flora & Fauna

An assessment of flora and fauna was carried out at the facility. The existing flora on site is limited due to the extent of the existing hardstanding area. However within the small areas of managed grassland there are several dominant grass species. The surrounding land is used exclusively for agriculture with fields immediately adjacent to the facility.

Due to the developed nature of the facility there is a lack of Fauna species. Fauna present on the site are mainly birds using the hedgerows adjacent to the site doe shelter or winter roosts. None of the bird species identified are a protected species.

The survey found that there were no sensitive or protected flora or fauna present at the site. In addition there are no significant additional groundworks proposed as part of the application therefore it is considered that there will be no resulting impacts on flora or fauna.

Soil & Geology

Published geological information for the site identifies the bedrock as Caledonian Granite. There are no geological features of significance either at or beneath the site and therefore the proposed development will have little or no impact on local geology.

The site and its immediate surrounds have historically been used for agricultural grazing and it is not expected that there is potential for previous contamination of the subsurface.

There will be no discharges to the subsoil as part of this proposal and therefore no impacts to the underlying subsurface. There will be no extraction or removal of sub-soils.

The potential interaction with groundwater is low due to the low porosity of granite.

Mitigation measures will include storage of all liquids, fuels etc in appropriate bunds.

Cultural Heritage

There are no known sites of archaeological interest located in the environs of the site and there are no additional excavation groundworks proposed as part of the development. Therefore there will be no impact on archaeology in the area. None of the archaeological sites indentified in the EIS can be seen from anywhere within the development site and as such the proposed development will not result in any negative visual impact to these features.

The proposed development will not impact on features or events of historical interest.

There are no structures of archaeological interest located in the defined study area and as such there will not be any negative impact resulting from the proposed development.

Material Assets

The facility is not designated as a Natural Heritage Area or proposed candidate Special Area of Conservation.

Property prices are expected to be unaffected by the proposed development as the facility has been in operation since 2005. The extra traffic movements may cause very slight disruption to road users but this is expected to be countered by the extra employment created at the site.

Interaction of the Foregoing

Human Beings/Fauna

Waste facilities have the potential to attract unwanted fauna such as rats, flies, and birds. Mitigation measures to protect against these potential impacts are proposed in the EIS, after which effects on the local community are expected to be insignificant.

Human Beings/Water

Mitigation measures to address potential impacts on water quality are addressed in the chapters dealing with Soils and Geology and Hydrogeology and Hydrology.

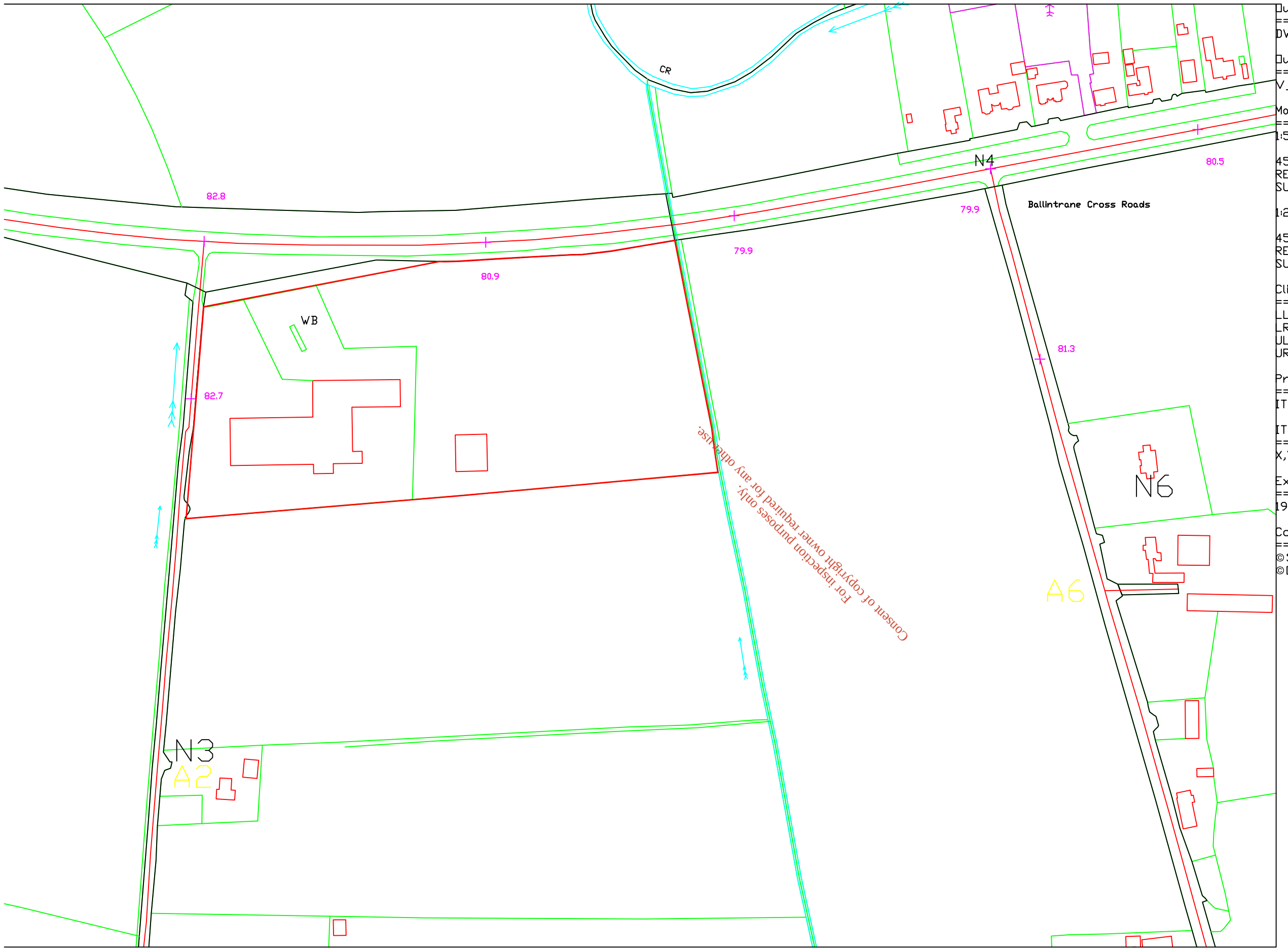
Water/Flora and Fauna

Contamination of surface water has the potential to impact on water quality of streams and rivers. This impact has the potential to affect the aquatic life of these water courses. Mitigation measures are detailed in the relevant chapters.

Water/Soil

Soil beneath the site can act as a pathway for contaminants reaching both the groundwater and surface water. Mitigation measures and monitoring controls are detailed in the relevant chapters.

The facility will be operated to the Best Available Technology (BAT) as per EPA recommendations and under the conditions of the Waste Licence.
The EPA carry out regular environmental audits and compliance monitoring is carried out by both the Agency and the licensee. These reports are available to the public and will allay any public concerns regarding the environmental performance of the site and will result in a positive interaction with respect to human beings.



Output Format:
==========
DWG_35_LEVEL

Output File:
==========
V_00_25168999_00000001.DWG

Map Series:
==========
1:5000

4533
REVISION DATE = 14-Feb-2011
SURVEY DATE = 31-Jul-2000

1:2500

4533-B
REVISION DATE = 14-Dec-2011
SURVEY DATE = 03-Dec-2003

Clip Extent:
==========
LLX,LLY = 678695,667202
LRX,LRY = 679525,667202
ULX,ULY = 678695,667817
URX,URY = 679525,667817

Projection:
==========
ITM

ITM Centre Point Co-ordinate:
==========
X,Y = 679110,667510

Extraction Date:
==========
19-Aug-2013

WINTER SUNLIGHT
SUMMER SUNLIGHT

N- Noise Monitoring Receptors

A- Air Sensitve Receptors

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TITLE:

DATE: | SCALE:

CLIENT'S NAME'S:

ADDRESS:

FILE NAME:

Drawing by: | PAGE No.

82.8

154.3

NATIONAL ROUTE N80
TO CARLOW TOWN

156.5

79

PLANTED BERTH

existing storm drainage

STREAM

80.0

ENTRANCE
GATE

BOREWELL

LOCAL ACCESS ROAD - JOCKS LANE

PLANTED BERTH

WB

WEIGH
BRIDGE

3 No.
5,000
Gallon
Tanks

OFFICE

73.5

REMAINDER OF
LANDHOLDING

fenceline

existing storm drainage

97.39

97.28

153.8

102.7

138.9

BUNDED OIL
TANK LOCATION

COMPOSTING UNIT

BIO FILTER

TUNNEL 1

TUNNEL 2

TUNNEL 3

RAIN WATER
TANK LOCATION (2500GAL)

LEACHATE TANK
LOCATION (120 M3

BIO FILTER

LEACHATE TANK LOCATION
(2000GAL)

SLUICE VALVE AND
FEMALE SUCTION
COUPLING TO BS 336

fenceline

RETAIN ALL EXISTING
HEDGEROWS

3 No.
5,000
Gallon
Tanks

GRAZING LAND

8.0

SKIP SHED

BIO FILTER

fenceline

RECEPTION SHED

BIO FILTER

HEATED STORAGE TANK

CONTROL BUILDING

CHP UNIT

STORAGE TANK 1

STORAGE TANK 2

STORAGE TANK 3

POST DIGESTER STORAGE TANK

STORAGE TANK 4

FERMENTING TANK

STORAGE TANK 5

SITE AREA OUTLINED IN RED
c.4.87 HECTARES

RETAIN ALL EXISTING
HEDGEROWS

NORTH POINT - TIME CLOCK

WINTER SUNLIGHT

SUMMER SUNLIGHT

O'Toole Composting ORGANIC FOOD WASTE MANAGEMENT SPECIALISTS

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JOB:

TITLE: SITE LAYOUT PLAN

DATE: 19/08/2013 | SCALE: 1/500

CLIENT'S NAME'S: O'Toole Composting Ltd

ADDRESS: Ballintrane, Carlow.

FILE NAME:

Drawing by: D.T.K. | PAGE No. 002/B

82.8

154.3

NATIONAL ROUTE N80
TO CARLOW TOWN

156.5

D1
PM1

A4

PLANTED BERTH

80.0

existing storm drainage

SW2

N1

STREAM

ENTRANCE
GATE

N1

WB

WEIGH
BRIDGE

73.5

D3
PM2

REMAINDER OF
LANDHOLDING

LOCAL ACCESS ROAD - JOCKS LANE

PLANTED BERTH

OFFICE

fenceline

existing storm drainage

153.8

A1

82.7

138.9

97.39

97.28

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COMPOSTING UNIT

BIO FILTER

TUNNEL 1

TUNNEL 2

TUNNEL 3

8.0

SKIP SHED

BIO FILTER

fenceline

RECEPTION SHED

BIO FILTER

HEATED STORAGE TANK

CONTROL BUILDING

CHP UNIT

STORAGE TANK 1

STORAGE TANK 2

STORAGE TANK 3

POST DIGESTER STORAGE TANK

STORAGE TANK 4

FERMENTING TANK

STORAGE TANK 5

SW1

D2

A5

fenceline

RETAIN ALL EXISTING
HEDGEROWS

N2

Air Sensitve Receptors

Dust Monitoring Locations

PM10 Monitoring Locations

Noise Monitoring Locations

Surface Water Monitoring Locations

GRAZING LAND

SITE AREA OUTLINED IN RED
c.4.87 HECTARES

RETAIN ALL EXISTING
HEDGEROWS

N
E
S
W

NORTH POINT - TIME CLOCK

WINTER SUNLIGHT

SUMMER SUNLIGHT

O'Toole Composting
ORGANIC WOOD WASTE MANAGEMENT SPECIALISTS

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