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

16th December

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Re: O'Toole Composting Ltd. Reference W0284-01

Dear Ms. Murphy,

Further information was supplied to the Planning Authority in respect of a planning application by O'Toole Composting Ltd. I am now providing same to the Agency in the interest of completeness as follows:

- Traffic Impact Assessment
- Updated screening report for Appropriate Assessment
- Revised surface water flow diagram and the attached information which breaks down the flow from the roof and the yard areas.
- The specification and size of the proposed interceptor which was designed by the supplier based on the information supplied.
- Landscape and visual impact assessment.
- Further information on noise.
- Amended Air Quality Section.
- Further information on soils including details of a trail pit.
- Response from RPS who carried out the odour model to the question 'The applicant is requested to clarify the following points:



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(1) The concentration for odour and hydrogen sulphide emissions are different in the 2 scenarios (compost plant)
(2) How the hydrogen sulphide concentration of 5.7 is derived.
(3) How the concentrations in the skip shed scenario are derived.

- **Response:** The $H_2S$ emission level employed in the model (5.7 mg/m$^3$) is derived as the maximum concentration to allow for compliance with the relevant assessment criteria. In other words, the modelling was undertaken as an iterative process to identify the maximum possible emission rate that would allow compliance with the 7ug/m$^3$ odour annoyance threshold as stated by WHO "*Air Quality Guidelines for Europe*", 2000 at the nearest sensitive receptor. It is the maximum emissions permissible to prevent an odour nuisance from $H_2S$. Scenario 1 is based on the upgrade of the existing biofilter at the composting unit only and hence as this biofilter is the only source the maximum emission concentration identified by the above process is 5.7mg/m$^3$. If this source was the only operational source on site emissions at the level would not breach the WHO Guideline. Once the skip shed biofilter is also operational (Scenario 2) there are two sources of $H_2S$ and hence the emission concentration from the composting biofilter must reduce to 3mg/m$^3$ to account for the additional input of 0.9mg/m$^3$ from the skip shed biofilter. Once both biofilters are operational the emissions at these rates will comply with the WHO Guideline. The skip shed emission level (0.9mg/m$^3$) has been derived using the same iterative approach as above but has a lower contribution to the overall emissions from the site given the smaller size and throughput compared to the composting biofilter.
- Response from RPS to the question ' Further to the Air Dispersion Model carried out in respect of Nitrogen and Sulphur Dioxide, the applicant is requested to submit additional summary information on the methodology use(d) for the study:
- **Response:** The modelling 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. Site specific data such as the locations and dimensions of the CHP have been derived from the engineering drawings of the proposed operations. Background concentrations from the EPA Zone D (rural) monitoring network is included in the model. The key legislation in

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Ireland relating to these 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 and these statutory limits have been applied as the relevant assessment criteria for these pollutants. All other aspects followed the methodology outlined above for the odour modelling.

I trust that this information will assist the Agency in determining the application and if there are any further queries please do not hesitate to contact the undersigned.

Yours sincerely,

---

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

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Stephen Reid Consulting
Traffic and Transportation


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# O'Toole Composting and Recycling, Ballintrane, Co Carlow

*Traffic Impact Report*

NOVEMBER 2014

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Contents



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# 1 INTRODUCTION

## 1.1 BACKGROUND

This Traffic Impact Assessment (TIA) report has been prepared by Stephen Reid Consulting Traffic and Transportation on behalf of O'Toole Composting Limited, for response to a request for further information (RFI) issued by Carlow County Council (CCC) relating to a planning application for development at the existing facility (Planning Reg Ref. PL14/251 refers).

Item 1(a) of the RFI is as follows:

*The applicant is requested to submit a detailed traffic impact assessment (TIA) prepared by suitably qualified and experienced engineer(s) to determine the suitability and feasibility of the proposed development. The TIA should contain the following headings and sub-headings (where relevant and necessary):*

- *Existing Conditions*
- *Proposed Development (state length of permission sought)*
- *Modal Choice/Trip Attraction*
- *Trip Distribution*
- *Trip Assignment*
- *Assessment Years (predicted traffic growth)*
- *Road Impact*
- *Environmental Impact*
- *Road Safety*
- *Internal Layout*
- *Parking*
- *Pedestrians/Cyclists/the Mobility Impaired*
- *Traffic Flow Assessments*
- *Timescale*
- *Peak Flows*
- *Direction Split i.e. a reasonable assessment, based on existing traffic, housing, shopping and factory locations, shall be made regarding the percentage split in traffic approaching/leaving the development.*
- *Construction (traffic management plan)*
- *Road Network Capacity*
- *Large vehicles & abnormal sized vehicles.*

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In summary, the proposed development comprises an increase in operating capacity from the current permitted level of 25,000 tonnes per annum to 60,000 tonnes per annum at an upgraded and extended facility at Ballintrane, Co Carlow.

The purpose of this report is as follows:

- to consider the existing roads and traffic conditions in the environs of the facility;
- set out the existing operations in terms of delivery volumes and haul routes;
- describe the proposed development in terms of the extended facility and access arrangements;
- quantify the additional traffic that would be generated by the proposed development;



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- assess the impact of the additional traffic on the receiving environment and with regard to the access junction onto the local public road, and the impact on the junction of the local public road and the N80 road, in the opening year and in future years, in accordance with the requirements of Carlow County Council;
- make recommendations to mitigate traffic impacts, if applicable.

The traffic count data collected as part of this report has also been supplied to other consultants on the project team for use in preparing the Air Quality and Noise Impact Reports.

Having regard to the list of items and subheadings given in Item 1(a), this TIA has set out those which are considered necessary and relevant, based on experience and the nature and location of the proposed development. Where these are not set out in a subheading, it is because they are not considered relevant or fundamental to this assessment.

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# 2 EXISTING CONDITIONS

## 2.1 GENERAL

The subject site (the site) is located to the south of the N80 National Secondary route, approximately 6.5 kilometres to the south east of Junction 5 on the M9 Motorway, and approximately 11.5 kilometres to the south east of Carlow town centre, as identified in Figure 2.1.

Approximately 6.75 kilometres to the south east of the site, the N80 connects with the south end of the N81, before continuing southeasterly to connect into the N11, to the north of Enniscorthy, in Co Wexford.

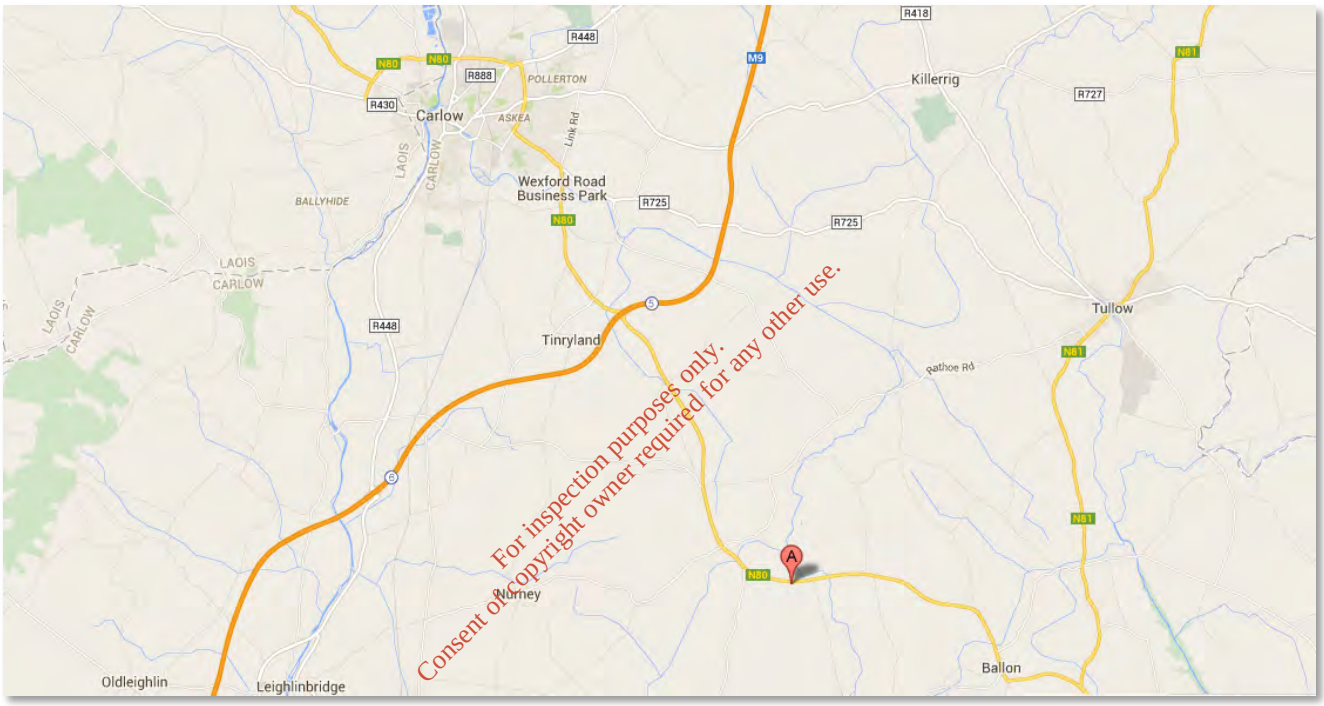


***Figure 2.1 O'Toole Site Location – Regional Context and Road Network (source www.google.ie/maps)***

The site is located in a rural area, with the surrounding uses being primarily agricultural in nature, with occasional residential dwellings, farm buildings and several commercial buildings.

The O'Toole Composting facility has operated from this site since 2005. It is open to the public and for deliveries inwards from 08.30-16.30 (Monday-Friday) and 08.30-15.00 (Saturday).

## 2.2 SITE ACCESS

The site is accessed from a local road (Jock's Lane) which extends southwards from the N80 junction past the site's western boundary. Jock's Lane also serves a dwelling and Equestrian Supplies business, and provides access to a number of fields, before ending in a cul-de-sac, approximately 0.85 kilometres south of the N80 junction (see Figure 2.2).



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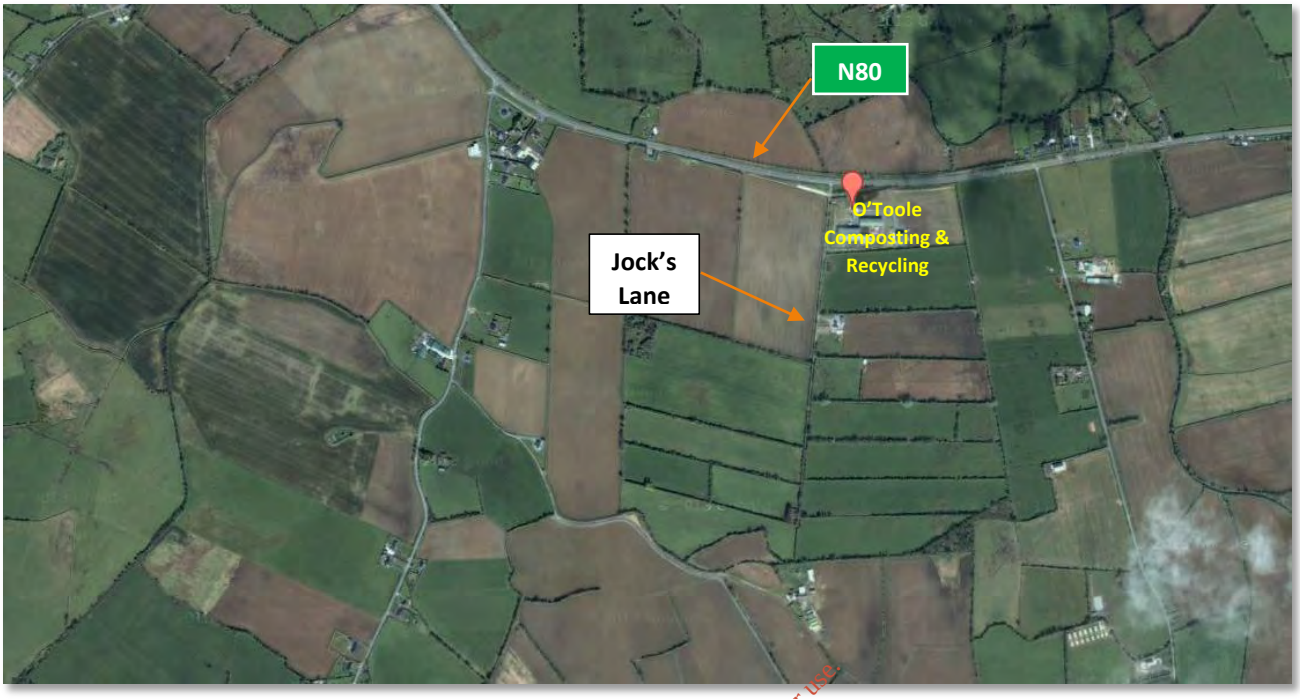


***Figure 2.2 Site Location - Local Access Roads (source www.google.ie/maps)***

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The existing site access is formed by a priority controlled T-junction onto the east side of Jock's Lane, located approximately 30 metres south of the N80 junction, as illustrated in Figure 2.3.

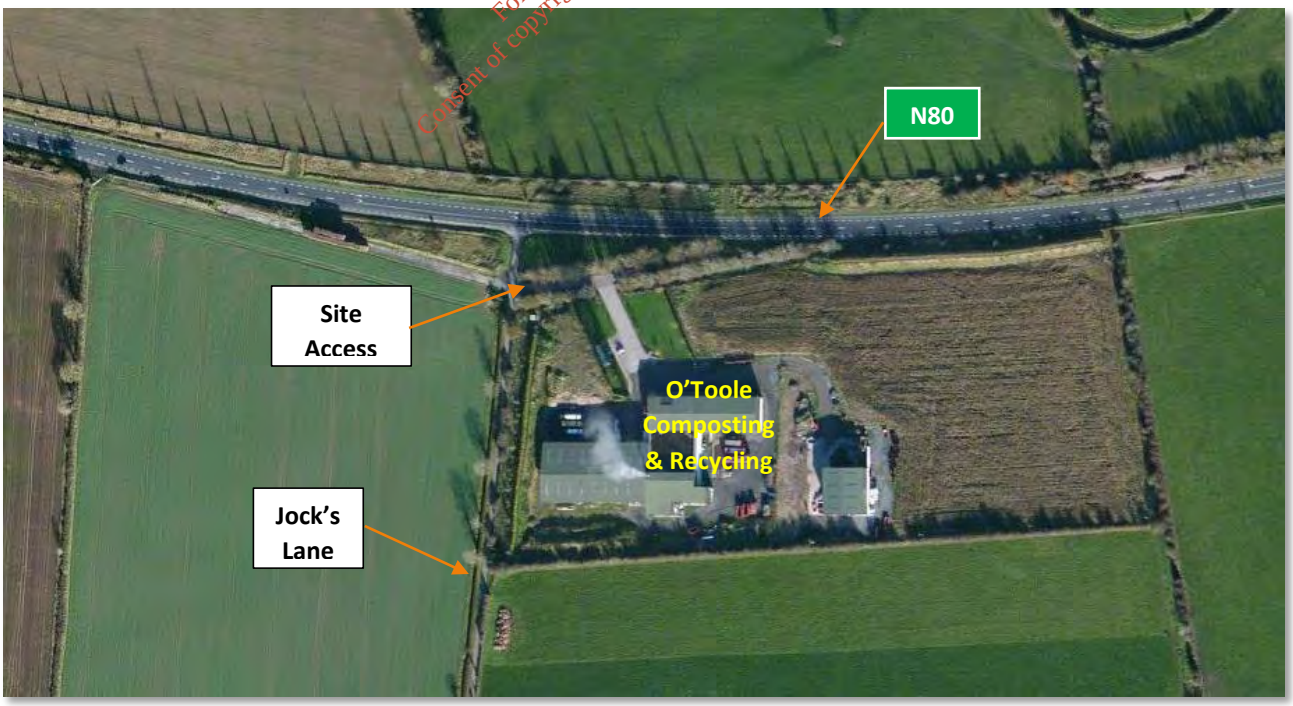


***Figure 2.3 Existing Site Access Junction on Jock's Lane (source www.bing.com/maps)***



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The N80 in the vicinity of the site is in the order of 12.5-12.6 metres wide (surfaced road width between the grass margins), and this is made up of a 4.0 metre wide traffic lane in each direction, with a hard shoulder ranging from 2.1-2.4 metres wide either side, delineated by a yellow broken line (edge of carriageway marking).

On either side of the Jock's Lane junction the southernmost hard shoulder of the N80 is hatched out using a yellow hatch and yellow longitudinal line, which extends 58 metres to the left of the junction and 107 metres to the right.

This existing markings and design arrangement on the N80 junction has an 'advanced' stop line position within the continuation of the hard shoulder width across the side road opening. It is noted that this design layout was superseded by the 2009 version of NRA Design Manual for Roads and Bridges NRA TD 41-42/09, and in subsequent (current) 2011 version NRA TD41-42/11, which revised the junction layout to be consistent with the Traffic Signs Manual (TSM).

The TSM arrangement requires the stop line set-back from the major road edge by a minimum of 600mm. Therefore the NRA have advised Stephen Reid Consulting that any re-lining work at the junction (either through maintenance or due to the proposed development) should as such be in accordance with the current TSM (Chapter 10, Figure 10-06) and the revised DMRB Standard TD41-42/11.

The eastbound approach to the junction is identified with ahead and right turn arrows at -160 metres, -80 metres and 0 metres (opposite the opening), to identify the location of possible right turning movements from the N80, and there are advance warning signs indicating side road ahead at -260 metres (for eastbound traffic) and -240 metres for westbound traffic), in accordance with the Traffic Signs Manual (TSM) Section 6.2 – these are signs W002 (right and left hand variants respectively).

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Exiting traffic from Jock's Lane onto the N80 is controlled with a Stop sign (TSM RUS027), and Stop line (TSM RRM017). The stop line marking and centre line on Jock's Lane are worn but still visible, and the sign is clear and well located for traffic approaching the stop line. The STOP road marking text (TSM M114) is not visible at the junction and it is considered that this should be included in any re-lining of the junction.

The location and definition of the side road junction is further reinforced by positioning of green and white striped reflectorised marker posts (TSM F902) in the verge adjacent to the junction corner radii on either side of the opening.

The speed limit on the N80 in the vicinity of the Jock's Lane junction is 100 kilometres/hour. On the basis of the relevant design document, NRA DMRB TD41-42/11 'Geometric Design of Minor/Major Priority Junctions and Vehicular Access to National Roads' the requirement for a design speed of 100 kilometres/hour is set out in Chapter 7 and Table 7/1, which identifies a desirable minimum sightline of 215 metres in either direction along the nearside road edge.

Paragraph 7.7c of NRA DMRB TD41-42/11 determines that the desirable minimum setback (measured back along the centreline of the minor road from the continuation of the nearside road edge across the opening) is 3.0 metres.

In terms of horizontal alignment, the relevant section of the N80 has a long gradual bend, with the Jock's Lane junction on the outside near to the apex, which affords good visibility in both directions. Furthermore,



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in terms of vertical alignment the N80 has a constant and gradual gradient with no crest or sag in alignment at this section.

The measured available sightlines at the existing junction are well in excess of the required desirable minimum, being in excess of 450 metres to the left, and approximately 430 metres to the right, as shown in Figures 2.4 to 2.6.

A well maintaned wide grass verge area between the road edge and the setback landscape screening is provided to the right for approximately 100 metres, and beyond this point is is noted that the verge is generally 1-2 metres wide in a fairly level grass finish with sections of boundary hedegrow, tree planting and/or fenceline to the rear of this.

To the left of the Jock's Lane junction, there is a similar setback line without the screen of trees to the rear, and while this has been maintained through verge cutting, it is noted that there is a belt of scrub and thorns in this area which are likely to grow up to reduce visibility during summer months without periodic maintenance. Clearly by replicating the existing grassing, planting and maintenance regime which occurs to the right of the junction, it can be ensured that visibility is adequately maintaned throughout the year.


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***Figure 2.4 Measured Exit Visibility at Jock's Lane junction with N80***
***(image source www.google.ie/maps with on-site measurements added)***



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***Figure 2.5 Visibility to left at Jock's Lane junction with N80***

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***Figure 2.6 Visibility to right at Jock's Lane junction with N80***



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Jock's Lane is a public road and terminates approximately 0.85 kilometres south of the N80 junction.

When the N80 was upgraded and realigned slightly northwards some years ago, the older narrower cross-section was discontinued as it passed Jock's Lane (the old alignment is still visible), and provides access into the O'Toole's site. As such Jock's Lane was extended northwards from the old junction to the new N80 alignment. Between the current N80 and old road alignment (the O'Toole site access), Jock's Lane is 5.4 metres wide, while to the south side of the access junction, the older section of Jock's Lane is 3.2 metres wide.

The existing sightlines for traffic exiting the access onto Jock's Lane are measured as 16 metres to the left, and 27 metres to the right, from a 2.4 metre setback. Having regard for the nature of Jock's Lane which only serves for local access and limited drivable speeds (approximately 20-30 km/h) that can occur approaching from either the N80 or from the south side of the site access junction, it is considered that these limited sightline distances do not cause problems for driver visibility on Jock's Lane or exiting the site.

## 2.3 Existing Haul Routes for O'Toole Composting/Recycling Traffic

Based on established operations O'Toole's have advised that typically inbound deliveries arriving to the Ballintrane facility would originate from the N80 from both directions, being a mix of vehicle types, while outbound deliveries by HGV would typically be heading to the M9 to the northwest of the site, via the N80.

Smaller deliveries (particularly to the recycling facility) would be by cars and vans, and would come from the local area so would arrive from both directions on the N80.

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## 2.4 Road Conditions on Existing Haul Routes

The N80 in the vicinity of the Jock's Lane junction was upgraded in recent years with a realignment to ease bends and provide a standard cross-section of 12.5 metres with white centreline and broken yellow edge of carriageway markings/hard shoulders.

The road pavement on the N80 in the vicinity of the Jock's Lane junction is in good condition with no evidence of deterioration as a result of HGV traffic. The road has active drainage with road gulleys inset into the verge edges at approximately 50 metre centres, staggered on both sides of the road. There is some wearing of the road marking lines but these are still reasonably visible.

Jock's Lane is a local public road, which is 5.6 metres wide to the north of the access to O'Toole's site, and 3.2 metres wide to the south. The narrow section of roadway is in reasonable condition having regard for the low levels of use, while the section immediately to the south of the N80 has visible deterioration of the surface and road edges due to HGV movements turning in/out combined with poor drainage of this short section.



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***Figure 2.7 Rutting, cracking and edge deterioration on Jock's Lane at N80 junction***

## 2.5 ROAD SAFETY

The Road Safety Authority (RSA) collision database has been consulted for the section of roads in the vicinity of the site. Data provided is currently up to end of 2012.

Figure 2.8 illustrates the screen view from the RSA website zoomed in to the location of the Jock's Lane junction with the N80, for the period from 2005-2012, during which O'Toole's was operating at the site.

It is noted that there were two minor collisions identified at or near the Jock's Lane junction, and one further west at the next junction (Levitstown).

One of these was in 2006 on a Sunday (10.00-16.00) when O'Toole's would not be open, and the other was in 2012 on a Monday (16.00-19.00).

This low rate of collisions at a junction on a National Road over a period of 7 years is not considered to be statistically significant and does not suggest that there is an existing issue with road safety at this junction.



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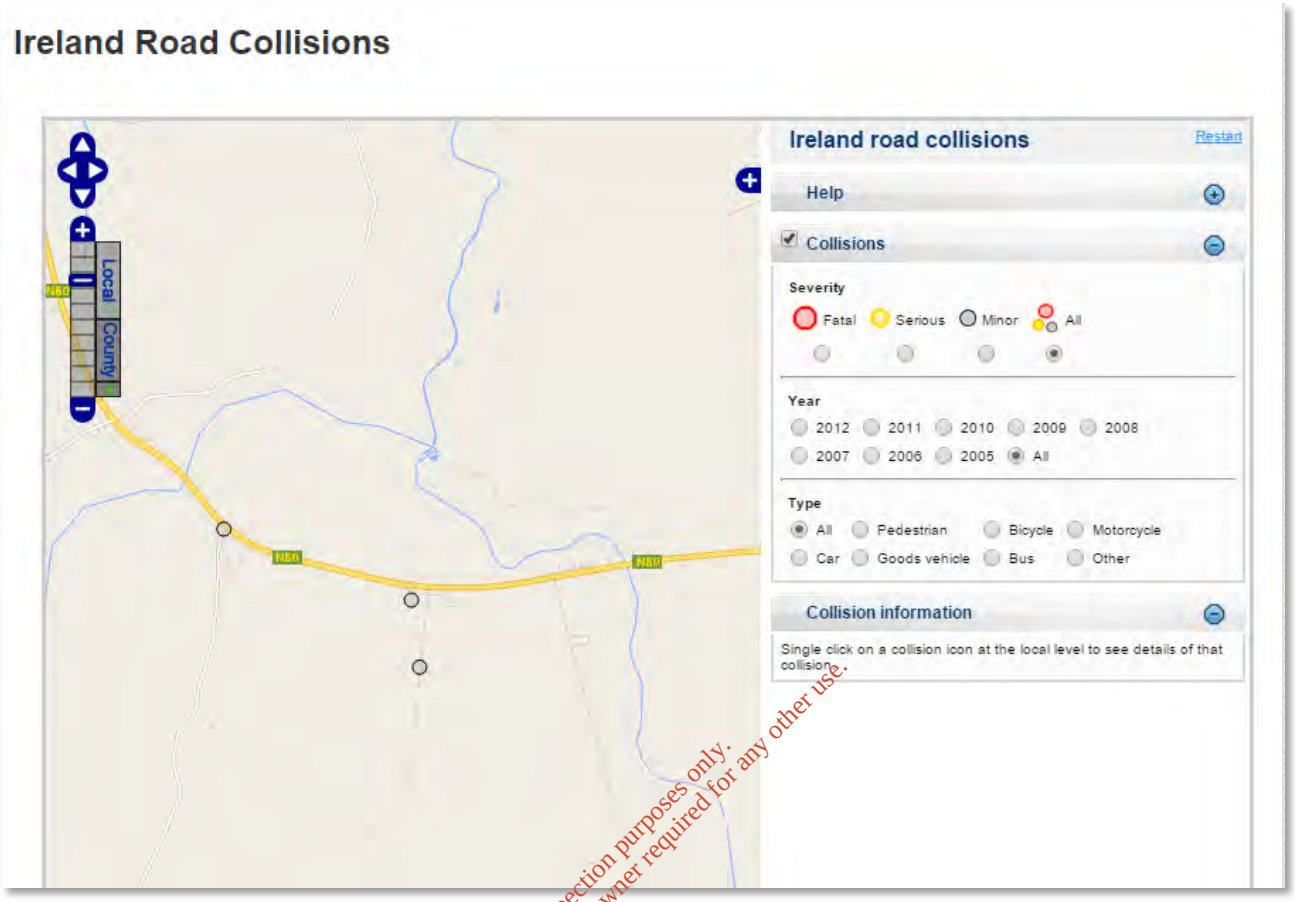


***Figure 2.8 RSA Website Road Collision Data on N80 near Jock's Lane Junction (source: www.rsa.ie/RSA/Road-Safety/Our-Research/Ireland-Road-Collisions/)***

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## 2.6 EXISTING TRAFFIC FLOWS

Traffic counter surveys were undertaken in October 2014 on the N80 to the west of Jock's Lane.

The surveys were carried out for a 7 day period (from Tuesday 21st – Monday 27th October inclusive) using Automatic Traffic Counter (ATC) equipment. It should be noted that the period from Saturday to Monday inclusive was the October Bank Holiday weekend, and therefore the Monday figures were expected to be lower than normal 'term-time' flows.

The full results, including a map identifying the counter location, are appended to this report.

In summary the following key points were noted:

- Average weekday traffic flow of 7,922 vehicles per day (two way, excluding Bank Holiday days);
- 85th percentile traffic speeds of 108.7 km/h eastbound (to Ballon) and 101.2 km/h westbound (to Carlow).
- AM peak hour of 08.00-09.00 and PM peak hour of 17.00-18.00



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- Average weekday two-way hourly volume during AM peak of 738 vehicles, with a tidal split of 70%:30% in favour of traffic towards Carlow and the M9;
- Average weekday two-way volume during PM peak of 777 vehicles, with a tidal split of 64%:36% in favour of traffic from Carlow and the M9.
- Inter-peak flows in the order of 400-500 vehicles per hour (two-way total) with a fairly even directional split.

In addition to these recent ATC survey results, Carlow County Council carried out a two day survey of the traffic entering and exiting the O'Toole's site from the junction on the north end of Jock's Lane in November 2013. The surveys were carried out using an ATC counter on Friday 22nd and Saturday 23rd November 2013.

The results of the 2013 surveys identified the following key points:

***Friday***

- Two-way total flow of 115 vehicles, made up of the following:
  - 72 car/light goods vehicles
  - 43 trucks (HGVs), equating to 37% of the total
  - 85th percentile speed of 22km/hr on the local road at the access

***Saturday***

- Two-way total flow of 84 vehicles, made up of the following:
  - 71 car/light goods vehicles
  - 13 trucks (HGVs), equating to 15% of the total
  - 85th percentile speed of 22km/hr on the local road at the access

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It was noted that O'Toole's were receiving concrete deliveries related to works on-site on the Friday and Saturday, and therefore by discounting these trucks (12 arrivals and 12 departures on Friday, and 3 arrivals and 3 departures on Saturday), the resultant volumes on an average day without the construction traffic would be as follows:

***Weekday Traffic***

- 36 arrivals by car or light goods vehicles, and 8-9 arrivals by trucks, with a similar number of departures.

***Saturday Traffic***

- 36 arrivals by car or light goods vehicles, and 3-4 arrivals by trucks, with a similar number of departures.

It should be noted that the figures above include the cars arriving and departing by 10no. O'Toole staff travelling to/from work, traffic generated by the composting facility, and traffic generated by the civic amenity site.

It is clear that the existing volumes of traffic on the N80 and using the minor road are not currently at levels which would cause issues for the safe operation and capacity of the Jock's Lane junction, having regard for the level of traffic turning in and out.

In terms of the Composting facility, and the overall volumes received in 2013, based on an average payload of 15 tonnes, this equated to an average across the year of approximately 5-6 trucks arriving per day. It



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should be noted that approximately 50% of 'inbound delivery' trucks entering the site were back loaded, with bagged or bulk compost, for onwards delivery from the site to other locations, thereby reducing the volume of overall delivery trucks required and minimising the impact on the local road network.

In terms of the recycling facility 'civic amenity site', O'Toole's have provided data for the full year of 2013, which is set out in Table 2.1.

| | Deliveries | Total Tonnage | Average Load/vehicle |
|---|---|---|---|
| 2013 Domestic* | 994 | 314.96 | 0.32 tonnes |
| 2013 Commercial** | 872 | 347.53 | 0.40 tonnes |
| *Total* | *1866* | *662.49* | *0.36 tonnes* |

***Table 2.1: 2013 Annual Deliveries to Civic Amenity Site (O'Toole's Recycling Centre)***

Notes:
*Domestic - householders delivering by car, car and trailer and vans
**Commercial - businesses delivering in vans, car and trailers, trucks, tractor and trailers

On the basis of a six-day week and discounting public holidays when the facility is closed, the civic amenity generated on average 6.14 inbound trips per day in 2013 and the same number of departures.

In addition to the deliveries into the civic amenity site, there would be onwards waste transfer of materials from the O'Toole's site by truck.

It is understood that the civic amenity and skip operations would generate 2-3 trucks arriving each day and a similar number of departures from the site.

Therefore the overall numbers of trucks generated by the existing facility per average day would be in the order of 8 trucks per day, correlating well with the figures recorded in the November 2013 counts (excluding the temporary construction traffic).

It is considered appropriate to assess the traffic impact in terms of an average figure across the year, and therefore the average movements of 8 truck arrivals and 8 truck departures per day, and 36 car/lgv arrivals and 36 car/lgv departures (for all existing operations) have been used to develop baseline traffic flow figures.

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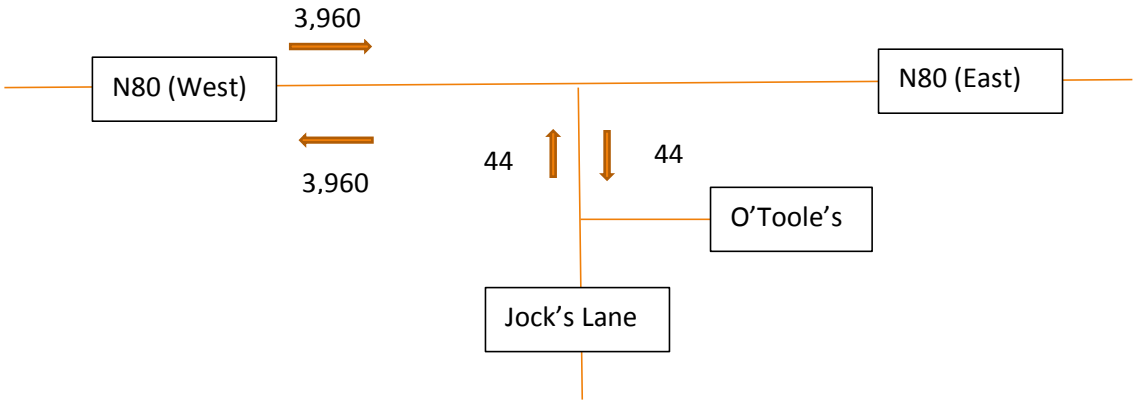


***Figure 2.9 Baseline 2014 Daily Traffic Using N80/Jock's Lane Junction***



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# 3 PROPOSED DEVELOPMENT

## 3.1 GENERAL

The proposed development comprises the expansion of the existing O'Toole Composting and Recycling facility at Ballintrane, from a current permitted level of 25,000 tonnes per annum to an increased volume of 60,000 tonnes per annum.

While the majority of the infrastructure to accommodate the extended development is already in place, there are proposed upgrades of concrete hardstanding areas and bio-filters, truck intake airlock and the bring centre for municipal waste.

The volumes of construction traffic would be short term and are not expected to be much different to the additional traffic generated post development.

When completed, the extended facility will accommodate up to 60,000 tonnes of waste received per annum.

This would be based on the following:

- 40,000 tonnes of biodegradable waste for composting
- 20,000 tonnes of household waste, mixed dry recyclables, commercial and industrial waste (which would be recycled and processed before removal of site for further recovery).

It is intended that the extended development would operate indefinitely.

The proposed layout of the extended facility is illustrated in the site layout plans submitted with the planning application.

As required in Item 6 (a) of the RFI, a revised site plan has been prepared to include a clearly delineated minimum of 12 no. car parking spaces for staff and visitors.

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# 4 EXISTING AND PROPOSED TRAFFIC GENERATION

## 4.1 EXISTING HAUL TRAFFIC

As set out in Chapter 2 of this TIA, data for 2013 was supplied by O'Toole Composting Limited and surveys carried out by Carlow County Council.

It was identified that the typical average daily haul traffic relating to the site was 8 inbound and 8 outbound truck movements, and 36 other vehicle movements each way (cars/car and trailers, and light vans), including staff (see 4.2 below).

## 4.2 EXISTING STAFF TRAFFIC

Typically there would be 10 persons (O'Toole site operatives, office staff and management) on site. The staff are generally resident in the local area of Co Carlow and travel by car to the site. Existing staff traffic therefore equates to 10 arrivals in the morning and 10 departures in the evening, with occasional movements on/off site by staff or management during the working day (excluding the O'Toole haul truck drivers). Therefore it can be said that the existing staff generates in the order of 10-15 arrivals and 10-15 departures per day.

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## 4.3 PROPOSED ADDITIONAL TRAFFIC

As set out previously the increase from the currently permitted 25,000 tonnes to 60,000 tonnes per annum would result in more than doubling of the daily traffic generated by the Ballintrane facility. Based on a pro-rata application of 2.4 compared to the baseline traffic generated by the current facility, this would increase the number of daily arrivals from 8 to 19 trucks, and similarly increasing the daily departures from 8 to 19 trucks. Having discounted the existing staff traffic from the existing total van/lgv traffic, it is considered that the proposed extension will result in an increase in the number of visitor daily cars/lgvs, to 58 arrivals and 58 departures (excluding staff).

## 4.4 PROPOSED ADDITIONAL STAFF TRAFFIC

Future staff numbers are expected to increase from 10 to 12.

This increase of 2 persons would not have any significant impact on traffic flows in the local area with staff arriving before 08.00 and departing after 17.00 on weekdays, but are included for as part of the pro-rata increase in traffic.

## 4.5 OVERALL INCREASE IN O'TOOLE'S TRAFFIC

From 4.3 and 4.4 above, it is estimated that the overall increase (staff, visitors and haul trucks) will result in the following changes, as set out in Table 4.1 below:



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| Type of Traffic | Existing Daily Total | Extended Daily Total | Increase Factor |
|---|---|---|---|
| Staff (car/lgv) | 12 | 14 | 1.2 |
| Visitors (car/lgv) | 24 | 58 | 2.4 |
| Trucks | 8 | 19 | 2.4 |
| *Overall* | *44* | *91* | *2.07* |

***Table 4.1: Daily Arrival Traffic Generated by Existing and Extended O'Toole's facility at Ballintrane***

It can be seen from the above table that the overall volume of arrivals will increase from 44 vehicles/day to 91 vehicles/day if operating at the extended capacity of 60,000 tonnes per annum, with a similar number of departures per day. Of this, it is expected that HGV trucks will increase from 8 to 19 per day.

In terms of hourly increases, it should be noted that the over a 10-hour weekday, the increases per hour are minimal, being in the order of +1 truck arrival and +3.5 car/lgv arrivals per hour, and a similar increase in the number of departures of both vehicle types.

As noted in Chapter 2 of this report, the daily flow on the N80 is equal in both directions of travel. Development traffic is also fairly evenly split in terms of visitor and staff trips per day, although from on-site observations and information from O'Toole's the trucks arriving and departing from Jock's Lane are weighted 2:1 in favour of arrivals from and departures to the west (i.e. to/from Carlow and the M9), which is as expected, having regard for population and road network factors.

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Therefore the daily traffic generated by the extended facility is presented in terms of the turning movements at the N80 junction in Figure 4.1 below.

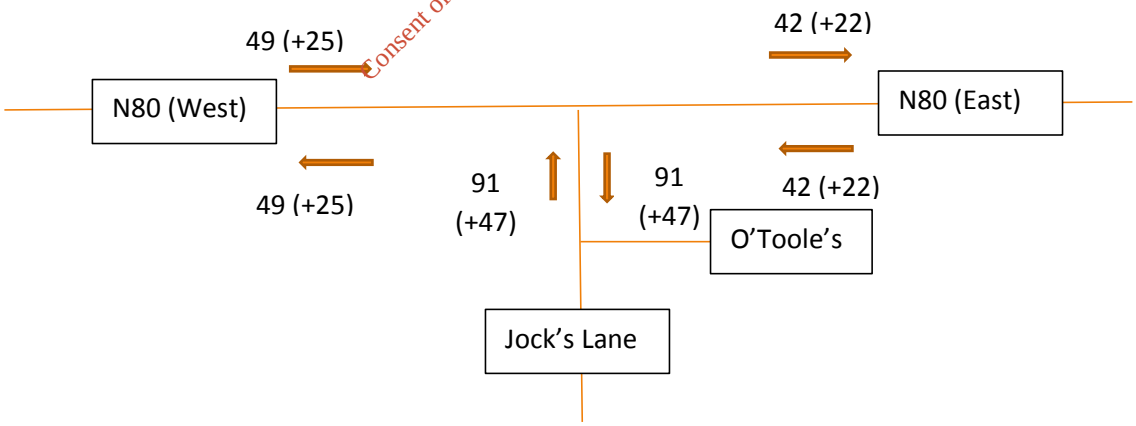


***Figure 4.1 Daily Extended Development Traffic Using N80/Jock's Lane Junction***

Therefore the extended facility will result in a total of 49 right turners from the N80 daily, and 42 right turners from Jock's Lane to the N80 daily.

The impact of this increase on the site access and N80 junction is considered in the following Chapter.



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# 5 IMPACT OF PROPOSED DEVELOPMENT

## 5.1 IMPACT OF INCREASED HAUL TRAFFIC

The NRA document *Project Appraisal Guidelines (PAG) Unit 5.5 Link Based Growth Forecasting* has been used reviewed for future year growth forecasting for the background traffic flows on the roads in the study area.

Medium growth has been selected for the roads, using the Co Carlow Region 3 East factors, set out in Table 5.5.1 of the document. Growth factors up to 2025 are 1.1% per annum (light vehicles) and 0.8% per annum (heavy vehicles). From 2026 onwards this reduces to 0.9% per annum (light vehicles) and 0.1% per annum (heavy vehicles).

For simplifying the calculations, the light vehicle percentage increases have been applied to all existing traffic, and the forecast increase figures are therefore robust. For future year 'background' traffic, these have been applied to the N80 road only, as traffic on Jock's Lane would only increase as a result in development such as the O'Toole's site, and this is calculated separately (see Chapter 4).

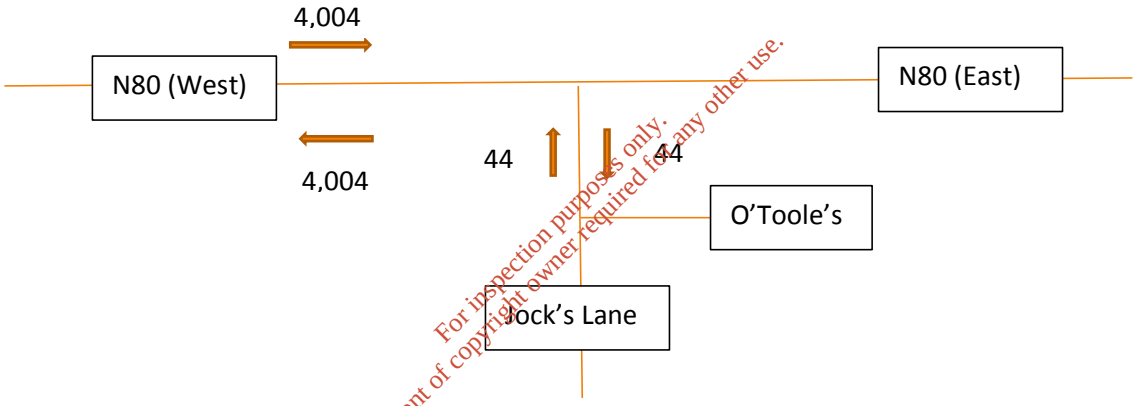


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***Figure 5.1 Opening Year 2015 Daily Traffic Using N80/Jock's Lane Junction (with NRA growth applied)***

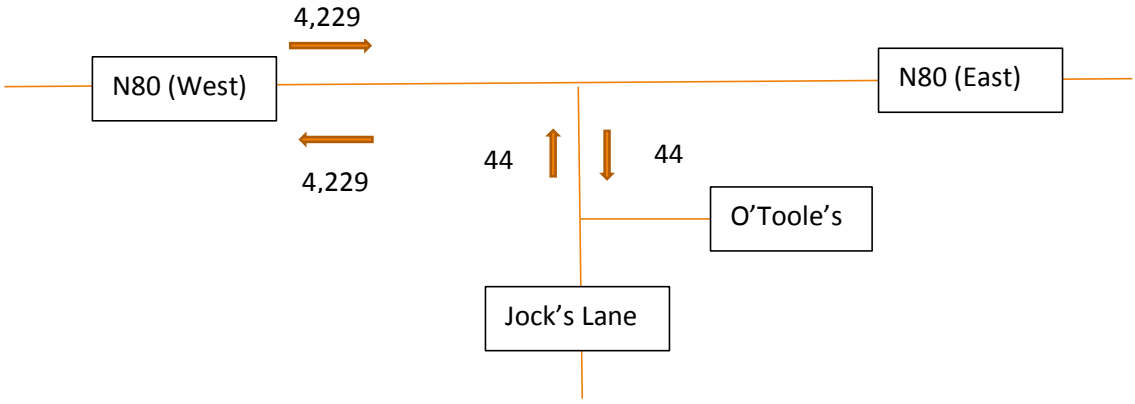


***Figure 5.2 Opening Year+5 2020 Daily Traffic Using N80/Jock's Lane Junction (with NRA growth applied)***



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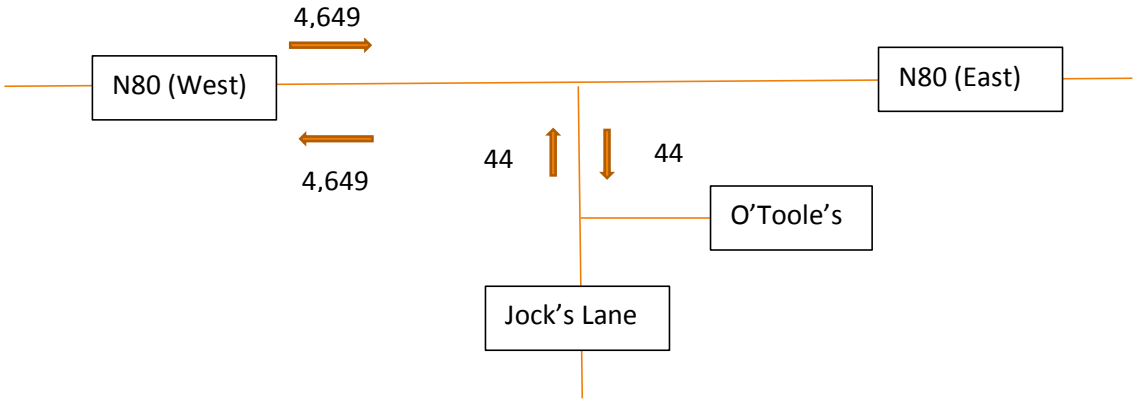


***Figure 5.3 Opening Year+15 2030 Daily Traffic Using N80/Jock's Lane Junction (with NRA growth applied)***

Based on the standard approach of opening year, +5 and +15 design years for traffic impact assessment, as set out in the NRA Traffic and Transport Assessment Guidelines document, it is clear that the total increase on the N80 from 2014 to 2030 using the NRA factors is 17.4%, increasing the Daily traffic from 7,920 vehicles per day to 9,298 vehicles per day (two-way totals). The O'Toole's traffic (for the do nothing figures) would not increase due to traffic growth as they are fixed by the permitted waste handling quantum.

It is submitted that with application of growth factors to the 2014 baseline AADT flows in Chapter 2, the percentage impacts on the N80 road would decrease for future years, even though the total flow on the N80 increases.

It is considered that the actual change in traffic flows on the road links is not significant. This is demonstrated in Figure 5.4, which indicates that the proposed extension would only increase traffic on the N80 by between 0.55% (to the east) and 0.62% (to the west).

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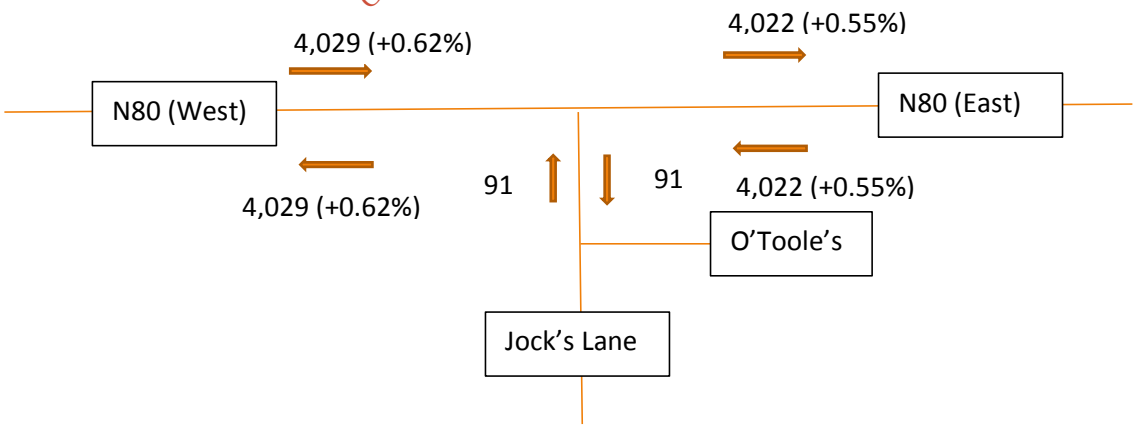


***Figure 5.4 Opening Year 2015 Post Development Daily Traffic Using N80/Jock's Lane Junction***

In terms of the additional volume of right turners, it is noted that the proposed extension would increase daily right turns from the N80 from 24 vehicles to 49 vehicles per day.



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This level of right turning traffic is not considered significant enough to warrant provision of a dedicated right turn 'ghost island' arrangement, in the context of the volumes of traffic using the N80.

However, it may be appropriate to reduce the width of the eastbound hard shoulder through the area of the junction per NRA DMRB TD41-42/11, by re-lining it.

This would have the effect of locally increasing the eastbound lane from 4.0 metres (existing) to 5.5 metres and more clearly identify the correct road position for eastbound traffic passing inside a waiting right turner (instead of the current arrangement where passing traffic must enter the hard shoulder). It is recommended that the planning authority and NRA have consideration for this revision which can be conditioned to be undertaken along with the refreshing and relining of the Jock's Lane Stop control markings.

## 5.2 Mitigation Measures

There are no significant mitigation measures or interventions considered necessary to accommodate the proposed development, apart from the following proposed remedial works and minor edge improvements to the Jock's Lane access junction onto the N80:

- it is proposed to increase the surfaced width of the section between the access and the N80 to 6.0 metres from its current width, and following the widening, this short section of the roadway should be resurfaced to remediate existing surface damage;
- it is proposed to carry out improvements to the edge landscaping to the left side of the N80 junction including minor re-profiling to lower the bank, clearing the existing vegetation and re-seeding with grass to allow easier year round maintenance of the visibility splay;
- refreshing/revisions to the existing road markings in accordance with the current Traffic Signs Manual and NRA DMRB standards in the vicinity of the junction.

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Following completion of the development extension works, O'Toole Composting Limited will continue to provide routine maintenance of the landscaping and vegetation in the south side of the N80 on either side of the Jock's Lane junction to ensure visibility is maintained.



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# 6 SUMMARY

## 6.1 SUMMARY

This Traffic Impact Assessment has been prepared by Stephen Reid Consulting Traffic and Transportation on behalf of O'Toole Composting Limited in relation to the proposed extension to the existing O'Toole Composting and Recycling facility at Ballintrane, Co Carlow

The existing site access is located off a local public road known as Jock's lane, to the south of its junction with the N80 National secondary road.

The existing facility is open to the public/deliveries inward from 08.30-16.30 each weekday and from 08.30-15.00 on Saturday and generates an average of 8 truck arrivals and 8 truck departures each weekday, and 36 smaller vehicles each way per day.

The proposed development is to increase from a current level of 25,000 tonnes per annum to a level of 60,000 tonnes per annum.

On the basis of the existing traffic volumes, it is noted that the proposed expansion would increase the volume of trucks on a typical weekday to 19 arrivals and 19 departures.

It is noted that the changes in traffic flows are not significant on the key roads in the study area, being in the order of +22 HGVs per day on the N80 (two way total).

It is concluded that the proposed development can be accommodated satisfactorily and safely within the road network and the minor mitigation measures on Jock's Lane and revised/refreshed road markings at the N80 junction will provide improved safety. Therefore it is submitted that the proposed development is in accordance with the proper planning and sustainable development of the area.

*Stephen Reid [27.11.2014]*

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# Appendices

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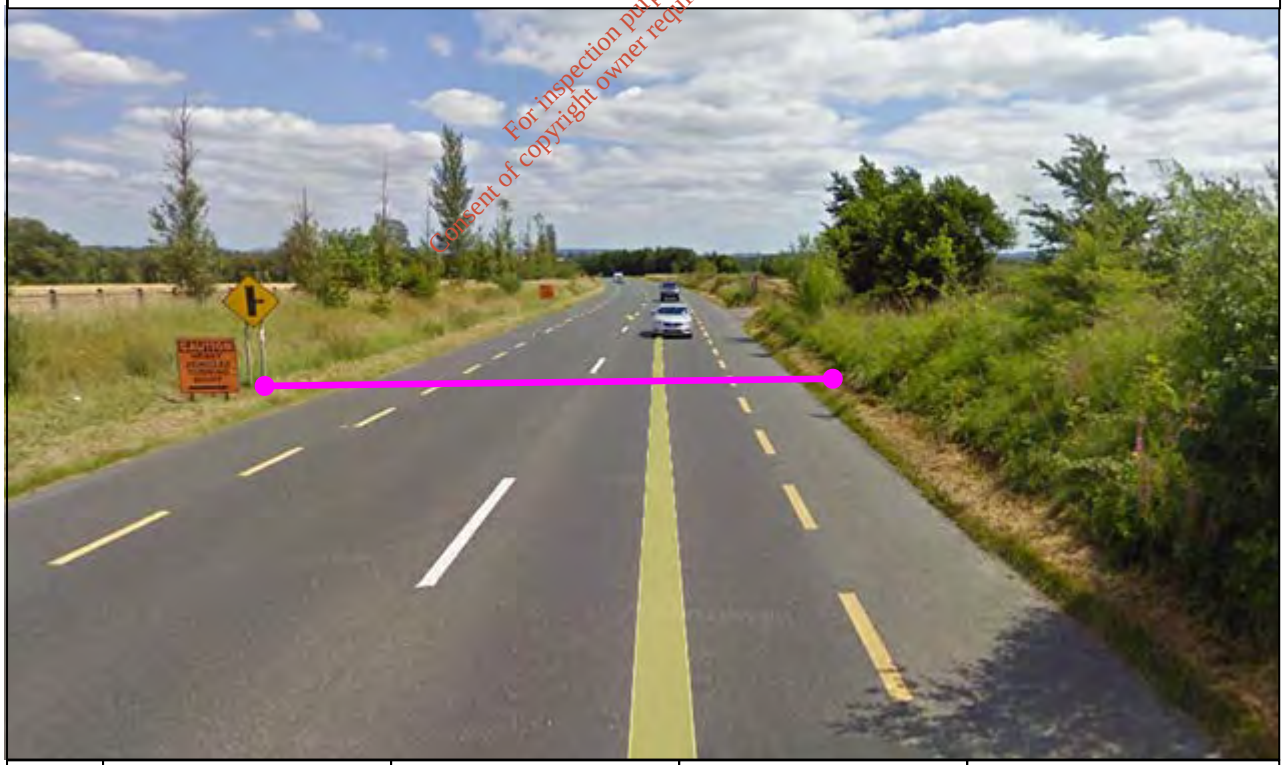
# Site Location


# Speed Survey Location



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| | | | | |
|---|---|---|---|---|
| | Job number: ATH/14/071 | Job date: W/C Tuesday 21st October 2014 | Drawing No: ATH/14/071 | abacus Transportation Surveys |
| | Client: Stephen Reid | | Author: SPW | |

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# ABACUS TRANSPORTATION SURVEYS

**Ballintrane Traffic Count** **Summary** **Week Comm:** **Tuesday 21 October 2014**
**Automatic Traffic Count** **Ath/14/071**

**Site 01**

---

**Location** N80 at Ballintrane

## Speed Survey Summary

| | | |
|---|---|---|
| **E/B - Exit** | 85% Speed = 108.7 km/h, 95% Speed = 118.1 km/h, Median = 96.8 km/h | Maximum = 167.5 km/h, Minimum = 26.9 km/h, Mean = 97.8 km/h |
| **W/B - Entry** | 85% Speed = 101.2 km/h, 95% Speed = 110.5 km/h, Median = 90.0 km/h | Maximum = 161.8 km/h, Minimum = 19.8 km/h, Mean = 90.7 km/h |

## Volumetric Vehicle Counts:

| Direction | Time | Tuesday 21 October 2014 | Wednesday 22 October 2014 | Thursday 23 October 2014 | Friday 24 October 2014 | Saturday 25 October 2014 | Sunday 26 October 2014 | Monday 27 October 2014 | No. Vehicles | 7 day Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| E/B - Exit | 07-19 | 3113 | 3085 | 3145 | 3512 | 2934 | 2218 | 1933 | 19940 | 2849 |
| W/B - Entry | 07-19 | 3201 | 3246 | 3271 | 3331 | 2731 | 2427 | 2449 | 20656 | 2951 |
| E/B - Exit | 00-00 | 3769 | 3800 | 3967 | 4479 | 3575 | 2962 | 2744 | 25296 | 3614 |
| W/B - Entry | 00-00 | 3755 | 3886 | 3952 | 4082 | 3347 | 3105 | 3233 | 25360 | 3623 |

***** Bank Holiday Weekend***

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## Peak Flows Summary

| Peak | AM | IP | PM |
|---|---|---|---|
| **Most Frequent Peak Hour** | 0800 | 1400 | 1700 |
| **Average Vehicles per Peak Hour** | 161 | 270 | 413 |

**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Count**

**Tuesday 21 October 2014**
**Ath/14/071**

**Site 01**
**E/B - Exit**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 38 | 2 | 0 | 3 | 0 | 43 | 46.9 |
| 0100 | 0 | 8 | 0 | 1 | 0 | 0 | 9 | 9.5 |
| 0200 | 0 | 5 | 2 | 0 | 0 | 0 | 7 | 7 |
| 0300 | 0 | 4 | 2 | 0 | 0 | 0 | 6 | 6 |
| 0400 | 0 | 4 | 1 | 0 | 3 | 0 | 8 | 11.9 |
| 0500 | 0 | 10 | 1 | 0 | 2 | 0 | 13 | 15.6 |
| 0600 | 0 | 15 | 2 | 0 | 5 | 0 | 22 | 28.5 |
| 0700 | 0 | 125 | 21 | 3 | 12 | 4 | 165 | 186.1 |
| 0800 | 0 | 170 | 33 | 7 | 15 | 1 | 226 | 250 |
| 0900 | 2 | 181 | 25 | 6 | 8 | 1 | 223 | 235.8 |
| 1000 | 1 | 154 | 15 | 7 | 9 | 1 | 187 | 202.4 |
| 1100 | 0 | 118 | 22 | 5 | 10 | 2 | 157 | 174.5 |
| 1200 | 0 | 163 | 14 | 12 | 17 | 1 | 207 | 236.1 |
| 1300 | 0 | 154 | 26 | 6 | 15 | 0 | 201 | 223.5 |
| 1400 | 0 | 170 | 15 | 8 | 29 | 5 | 227 | 273.7 |
| 1500 | 0 | 225 | 26 | 11 | 25 | 0 | 287 | 325 |
| 1600 | 0 | 271 | 35 | 7 | 19 | 0 | 332 | 360.2 |
| 1700 | 1 | 434 | 48 | 7 | 12 | 0 | 502 | 520.3 |
| 1800 | 1 | 352 | 28 | 4 | 13 | 1 | 399 | 418.1 |
| 1900 | 0 | 158 | 20 | 0 | 7 | 0 | 185 | 194.1 |
| 2000 | 1 | 118 | 7 | 1 | 6 | 0 | 133 | 140.5 |
| 2100 | 0 | 77 | 9 | 3 | 5 | 1 | 95 | 104 |
| 2200 | 0 | 90 | 4 | 1 | 3 | 0 | 98 | 102.4 |
| 2300 | 0 | 33 | 1 | 2 | 1 | 0 | 37 | 39.3 |
| **07-19** | 5 | 2517 | 308 | 83 | 184 | 16 | 3113 | 3405.7 |
| **06-22** | 6 | 2885 | 346 | 87 | 207 | 17 | 3548 | 3872.8 |
| **06-00** | 6 | 3008 | 351 | 90 | 211 | 17 | 3683 | 4014.5 |
| **00-00** | 6 | 3077 | 359 | 91 | 219 | 17 | 3769 | 4111.4 |

**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Count**

**Tuesday 21 October 2014**
**Ath/14/071**

**Site 01**
**W/B - Entry**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 23 | 2 | 0 | 0 | 0 | 25 | 25 |
| 0100 | 0 | 29 | 2 | 0 | 1 | 0 | 32 | 33.3 |
| 0200 | 0 | 16 | 0 | 0 | 2 | 0 | 18 | 20.6 |
| 0300 | 0 | 4 | 0 | 0 | 2 | 0 | 6 | 8.6 |
| 0400 | 0 | 8 | 2 | 0 | 2 | 2 | 14 | 18.6 |
| 0500 | 0 | 14 | 5 | 0 | 8 | 0 | 27 | 37.4 |
| 0600 | 0 | 37 | 14 | 1 | 7 | 1 | 60 | 70.6 |
| 0700 | 1 | 241 | 25 | 6 | 20 | 1 | 294 | 323.2 |
| 0800 | 0 | 470 | 31 | 9 | 13 | 1 | 524 | 546.4 |
| 0900 | 1 | 266 | 22 | 11 | 28 | 2 | 330 | 373.1 |
| 1000 | 1 | 199 | 16 | 12 | 18 | 0 | 246 | 274.6 |
| 1100 | 1 | 152 | 14 | 8 | 20 | 0 | 195 | 224.2 |
| 1200 | 0 | 144 | 18 | 2 | 17 | 3 | 184 | 210.1 |
| 1300 | 0 | 152 | 18 | 5 | 14 | 2 | 191 | 213.7 |
| 1400 | 0 | 159 | 17 | 5 | 6 | 2 | 189 | 201.3 |
| 1500 | 0 | 216 | 28 | 10 | 26 | 4 | 284 | 326.8 |
| 1600 | 0 | 225 | 22 | 3 | 11 | 2 | 263 | 280.8 |
| 1700 | 0 | 254 | 25 | 1 | 8 | 0 | 288 | 298.9 |
| 1800 | 0 | 188 | 12 | 1 | 11 | 1 | 213 | 228.8 |
| 1900 | 0 | 126 | 9 | 2 | 8 | 1 | 146 | 158.4 |
| 2000 | 0 | 79 | 9 | 3 | 5 | 0 | 96 | 104 |
| 2100 | 0 | 49 | 0 | 2 | 2 | 0 | 53 | 56.6 |
| 2200 | 0 | 43 | 4 | 0 | 4 | 0 | 51 | 56.2 |
| 2300 | 0 | 22 | 1 | 2 | 0 | 1 | 26 | 28 |
| **07-19** | 4 | 2666 | 248 | 73 | 192 | 18 | 3201 | 3501.9 |
| **06-22** | 4 | 2957 | 280 | 81 | 214 | 20 | 3556 | 3891.5 |
| **06-00** | 4 | 3022 | 285 | 83 | 218 | 21 | 3633 | 3975.7 |
| **00-00** | 4 | 3116 | 296 | 83 | 233 | 23 | 3755 | 4119.2 |

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**Site 01**
**E/B - Exit**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 15 | 1 | 0 | 1 | 0 | 17 | 18.3 |
| 0100 | 0 | 4 | 0 | 0 | 1 | 1 | 6 | 8.3 |
| 0200 | 0 | 5 | 0 | 0 | 1 | 0 | 6 | 7.3 |
| 0300 | 0 | 4 | 1 | 0 | 1 | 0 | 6 | 7.3 |
| 0400 | 0 | 12 | 2 | 0 | 4 | 1 | 19 | 25.2 |
| 0500 | 0 | 14 | 3 | 0 | 6 | 1 | 24 | 32.8 |
| 0600 | 0 | 50 | 12 | 4 | 9 | 1 | 76 | 90.7 |
| 0700 | 0 | 122 | 19 | 4 | 7 | 1 | 153 | 165.1 |
| 0800 | 0 | 204 | 28 | 1 | 9 | 3 | 245 | 260.2 |
| 0900 | 1 | 154 | 22 | 6 | 15 | 1 | 199 | 221.7 |
| 1000 | 1 | 149 | 28 | 3 | 15 | 1 | 197 | 218.2 |
| 1100 | 0 | 126 | 20 | 3 | 20 | 0 | 169 | 196.5 |
| 1200 | 1 | 150 | 18 | 4 | 14 | 2 | 189 | 210.4 |
| 1300 | 0 | 184 | 34 | 4 | 22 | 1 | 245 | 276.6 |
| 1400 | 0 | 176 | 24 | 4 | 17 | 1 | 222 | 247.1 |
| 1500 | 0 | 216 | 21 | 5 | 27 | 1 | 270 | 308.6 |
| 1600 | 0 | 271 | 30 | 10 | 11 | 1 | 323 | 343.3 |
| 1700 | 0 | 436 | 44 | 7 | 13 | 1 | 501 | 522.4 |
| 1800 | 0 | 327 | 32 | 3 | 9 | 1 | 372 | 386.2 |
| 1900 | 0 | 202 | 17 | 4 | 8 | 0 | 231 | 243.4 |
| 2000 | 1 | 96 | 11 | 1 | 7 | 0 | 116 | 124.8 |
| 2100 | 0 | 100 | 6 | 3 | 0 | 1 | 110 | 112.5 |
| 2200 | 0 | 59 | 5 | 0 | 2 | 0 | 66 | 68.6 |
| 2300 | 0 | 35 | 1 | 0 | 2 | 0 | 38 | 40.6 |
| **07-19** | 3 | 2515 | 320 | 54 | 179 | 14 | 3085 | 3356.3 |
| **06-22** | 4 | 2963 | 366 | 66 | 203 | 16 | 3618 | 3927.7 |
| **06-00** | 4 | 3057 | 372 | 66 | 207 | 16 | 3722 | 4036.9 |
| **00-00** | 4 | 3111 | 379 | 66 | 221 | 19 | 3800 | 4136.1 |

**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Wednesday 22 October 2014**
**Ath/14/071**

**Site 01**
**W/B - Entry**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 15 | 0 | 0 | 1 | 0 | 16 | 17.3 |
| 0100 | 0 | 3 | 0 | 0 | 3 | 1 | 7 | 11.9 |
| 0200 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 3.5 |
| 0300 | 0 | 2 | 1 | 0 | 2 | 1 | 6 | 9.6 |
| 0400 | 0 | 7 | 2 | 0 | 6 | 1 | 16 | 24.8 |
| 0500 | 0 | 27 | 14 | 0 | 13 | 0 | 54 | 70.9 |
| 0600 | 0 | 127 | 19 | 1 | 13 | 0 | 160 | 177.4 |
| 0700 | 0 | 237 | 31 | 6 | 15 | 0 | 289 | 311.5 |
| 0800 | 0 | 482 | 26 | 8 | 19 | 2 | 537 | 567.7 |
| 0900 | 0 | 263 | 19 | 2 | 14 | 3 | 301 | 323.2 |
| 1000 | 0 | 208 | 26 | 5 | 11 | 1 | 251 | 268.8 |
| 1100 | 1 | 143 | 26 | 3 | 14 | 0 | 187 | 205.9 |
| 1200 | 0 | 186 | 18 | 9 | 19 | 0 | 232 | 261.2 |
| 1300 | 0 | 142 | 17 | 5 | 22 | 1 | 187 | 219.1 |
| 1400 | 1 | 179 | 16 | 8 | 16 | 0 | 220 | 244 |
| 1500 | 0 | 177 | 30 | 5 | 13 | 1 | 226 | 246.4 |
| 1600 | 0 | 214 | 36 | 6 | 15 | 1 | 272 | 295.5 |
| 1700 | 0 | 245 | 30 | 5 | 13 | 1 | 294 | 314.4 |
| 1800 | 2 | 208 | 24 | 4 | 12 | 0 | 250 | 266 |
| 1900 | 0 | 145 | 5 | 1 | 6 | 2 | 159 | 169.3 |
| 2000 | 0 | 75 | 4 | 4 | 11 | 0 | 94 | 110.3 |
| 2100 | 0 | 45 | 4 | 0 | 3 | 0 | 52 | 55.9 |
| 2200 | 0 | 41 | 3 | 0 | 0 | 0 | 44 | 44 |
| 2300 | 0 | 25 | 1 | 1 | 1 | 1 | 29 | 31.8 |
| **07-19** | 4 | 2684 | 299 | 66 | 183 | 10 | 3246 | 3523.7 |
| **06-22** | 4 | 3076 | 331 | 72 | 216 | 12 | 3711 | 4036.6 |
| **06-00** | 4 | 3142 | 335 | 73 | 217 | 13 | 3784 | 4112.4 |
| **00-00** | 4 | 3198 | 352 | 74 | 242 | 16 | 3886 | 4250.4 |

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**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Thursday 23 October 2014**
**Ath/14/071**

**Site 01**
**E/B - Exit**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 16 | 0 | 0 | 4 | 0 | 20 | 25.2 |
| 0100 | 0 | 5 | 1 | 0 | 1 | 0 | 7 | 8.3 |
| 0200 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 4.3 |
| 0300 | 0 | 6 | 1 | 1 | 0 | 0 | 8 | 8.5 |
| 0400 | 0 | 8 | 2 | 1 | 3 | 1 | 15 | 20.4 |
| 0500 | 0 | 17 | 3 | 0 | 5 | 2 | 27 | 35.5 |
| 0600 | 0 | 55 | 11 | 2 | 5 | 1 | 74 | 82.5 |
| 0700 | 0 | 128 | 26 | 2 | 17 | 1 | 174 | 198.1 |
| 0800 | 0 | 163 | 30 | 2 | 10 | 1 | 206 | 221 |
| 0900 | 0 | 143 | 27 | 3 | 14 | 0 | 187 | 206.7 |
| 1000 | 0 | 127 | 20 | 7 | 16 | 0 | 170 | 194.3 |
| 1100 | 0 | 131 | 31 | 4 | 18 | 2 | 186 | 213.4 |
| 1200 | 0 | 171 | 23 | 2 | 16 | 4 | 216 | 241.8 |
| 1300 | 0 | 180 | 23 | 6 | 16 | 3 | 228 | 254.8 |
| 1400 | 2 | 194 | 22 | 3 | 18 | 1 | 240 | 264.3 |
| 1500 | 0 | 217 | 37 | 5 | 27 | 5 | 291 | 333.6 |
| 1600 | 2 | 285 | 30 | 9 | 12 | 4 | 342 | 364.5 |
| 1700 | 0 | 434 | 38 | 8 | 15 | 0 | 495 | 518.5 |
| 1800 | 0 | 343 | 41 | 7 | 18 | 1 | 410 | 437.9 |
| 1900 | 0 | 198 | 32 | 2 | 1 | 1 | 234 | 237.3 |
| 2000 | 1 | 152 | 11 | 0 | 9 | 0 | 173 | 183.9 |
| 2100 | 0 | 96 | 6 | 1 | 5 | 0 | 108 | 115 |
| 2200 | 1 | 82 | 7 | 1 | 4 | 1 | 96 | 101.9 |
| 2300 | 0 | 52 | 3 | 0 | 2 | 0 | 57 | 59.6 |
| **07-19** | 4 | 2516 | 348 | 58 | 197 | 22 | 3145 | 3448.9 |
| **06-22** | 5 | 3017 | 408 | 63 | 217 | 24 | 3734 | 4067.6 |
| **06-00** | 6 | 3151 | 418 | 64 | 223 | 25 | 3887 | 4229.1 |
| **00-00** | 6 | 3204 | 426 | 66 | 237 | 28 | 3967 | 4331.3 |

**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Thursday 23 October 2014**
**Ath/14/071**

**Site 01**
**W/B - Entry**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 10 | 1 | 0 | 1 | 0 | 12 | 13.3 |
| 0100 | 0 | 4 | 0 | 1 | 7 | 1 | 13 | 23.6 |
| 0200 | 0 | 3 | 0 | 0 | 1 | 0 | 4 | 5.3 |
| 0300 | 0 | 4 | 2 | 1 | 3 | 1 | 11 | 16.4 |
| 0400 | 0 | 8 | 4 | 0 | 7 | 1 | 20 | 30.1 |
| 0500 | 0 | 21 | 15 | 0 | 9 | 0 | 45 | 56.7 |
| 0600 | 0 | 109 | 32 | 1 | 17 | 0 | 159 | 181.6 |
| 0700 | 0 | 256 | 33 | 3 | 22 | 1 | 317 | 346.5 |
| 0800 | 1 | 457 | 31 | 8 | 26 | 1 | 524 | 562 |
| 0900 | 1 | 291 | 28 | 7 | 18 | 2 | 347 | 375.1 |
| 1000 | 1 | 167 | 23 | 7 | 18 | 1 | 217 | 244.1 |
| 1100 | 0 | 165 | 23 | 7 | 8 | 1 | 204 | 218.9 |
| 1200 | 0 | 179 | 12 | 9 | 16 | 0 | 216 | 241.3 |
| 1300 | 1 | 158 | 17 | 10 | 17 | 2 | 205 | 233.3 |
| 1400 | 0 | 167 | 24 | 6 | 22 | 1 | 220 | 252.6 |
| 1500 | 1 | 211 | 29 | 9 | 17 | 1 | 268 | 294.8 |
| 1600 | 1 | 228 | 17 | 8 | 20 | 1 | 275 | 305.2 |
| 1700 | 1 | 211 | 26 | 5 | 12 | 0 | 255 | 272.3 |
| 1800 | 0 | 190 | 16 | 3 | 12 | 2 | 223 | 242.1 |
| 1900 | 0 | 153 | 12 | 2 | 5 | 0 | 172 | 179.5 |
| 2000 | 0 | 86 | 4 | 1 | 7 | 0 | 98 | 107.6 |
| 2100 | 0 | 69 | 5 | 0 | 5 | 0 | 79 | 85.5 |
| 2200 | 0 | 30 | 3 | 1 | 1 | 0 | 35 | 36.8 |
| 2300 | 0 | 28 | 0 | 0 | 4 | 1 | 33 | 39.2 |
| **07-19** | 9 | 2680 | 279 | 82 | 208 | 13 | 3271 | 3588.2 |
| **06-22** | 9 | 3097 | 332 | 86 | 242 | 13 | 3779 | 4142.4 |
| **06-00** | 9 | 3155 | 335 | 87 | 247 | 14 | 3847 | 4218.4 |
| **00-00** | 9 | 3205 | 357 | 89 | 275 | 17 | 3952 | 4363.8 |

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EPA Export 31-12-2014:23:01:08

**Site 01**
**E/B - Exit**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 20 | 1 | 1 | 1 | 0 | 23 | 24.8 |
| 0100 | 0 | 23 | 1 | 0 | 2 | 1 | 27 | 30.6 |
| 0200 | 0 | 9 | 0 | 0 | 1 | 0 | 10 | 11.3 |
| 0300 | 0 | 8 | 5 | 0 | 0 | 1 | 14 | 15 |
| 0400 | 0 | 10 | 3 | 0 | 3 | 0 | 16 | 19.9 |
| 0500 | 0 | 14 | 1 | 2 | 4 | 0 | 21 | 27.2 |
| 0600 | 0 | 60 | 7 | 2 | 10 | 0 | 79 | 93 |
| 0700 | 0 | 121 | 20 | 2 | 11 | 2 | 156 | 173.3 |
| 0800 | 0 | 157 | 29 | 3 | 16 | 4 | 209 | 235.3 |
| 0900 | 0 | 143 | 27 | 2 | 16 | 3 | 191 | 215.8 |
| 1000 | 0 | 128 | 28 | 4 | 12 | 0 | 172 | 189.6 |
| 1100 | 1 | 149 | 26 | 6 | 16 | 1 | 199 | 223 |
| 1200 | 0 | 161 | 19 | 4 | 18 | 1 | 203 | 229.4 |
| 1300 | 1 | 229 | 23 | 3 | 15 | 2 | 273 | 295.2 |
| 1400 | 0 | 287 | 37 | 5 | 26 | 0 | 355 | 391.3 |
| 1500 | 0 | 327 | 39 | 7 | 22 | 3 | 398 | 433.1 |
| 1600 | 2 | 379 | 42 | 8 | 16 | 3 | 450 | 476.2 |
| 1700 | 1 | 426 | 42 | 5 | 7 | 0 | 481 | 491.8 |
| 1800 | 0 | 375 | 32 | 5 | 12 | 1 | 425 | 444.1 |
| 1900 | 0 | 232 | 32 | 2 | 9 | 2 | 277 | 291.7 |
| 2000 | 0 | 207 | 13 | 2 | 5 | 0 | 227 | 234.5 |
| 2100 | 0 | 126 | 7 | 2 | 4 | 1 | 140 | 147.2 |
| 2200 | 0 | 75 | 6 | 0 | 3 | 0 | 84 | 87.9 |
| 2300 | 0 | 42 | 2 | 0 | 4 | 1 | 49 | 55.2 |
| **07-19** | 5 | 2882 | 364 | 54 | 187 | 20 | 3512 | 3798.1 |
| **06-22** | 5 | 3507 | 423 | 62 | 215 | 23 | 4235 | 4564.5 |
| **06-00** | 5 | 3624 | 431 | 62 | 222 | 24 | 4368 | 4707.6 |
| **00-00** | 5 | 3708 | 442 | 65 | 233 | 26 | 4479 | 4836.4 |

**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Friday 24 October 2014**
**Ath/14/071**

**Site 01**
**W/B - Entry**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 10 | 0 | 2 | 1 | 0 | 13 | 15.3 |
| 0100 | 0 | 8 | 1 | 0 | 2 | 1 | 12 | 15.6 |
| 0200 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 3.5 |
| 0300 | 0 | 8 | 1 | 0 | 6 | 1 | 16 | 24.8 |
| 0400 | 0 | 7 | 1 | 1 | 6 | 1 | 16 | 25.3 |
| 0500 | 0 | 19 | 12 | 0 | 12 | 0 | 43 | 58.6 |
| 0600 | 0 | 122 | 22 | 3 | 10 | 0 | 157 | 171.5 |
| 0700 | 0 | 195 | 33 | 2 | 15 | 1 | 246 | 267.5 |
| 0800 | 0 | 436 | 26 | 5 | 12 | 2 | 481 | 501.1 |
| 0900 | 0 | 257 | 16 | 5 | 22 | 1 | 301 | 333.1 |
| 1000 | 1 | 187 | 15 | 7 | 22 | 1 | 233 | 265.3 |
| 1100 | 0 | 174 | 16 | 7 | 16 | 2 | 215 | 241.3 |
| 1200 | 0 | 189 | 19 | 5 | 15 | 2 | 230 | 254 |
| 1300 | 1 | 207 | 24 | 10 | 12 | 1 | 255 | 275.8 |
| 1400 | 0 | 216 | 26 | 8 | 15 | 2 | 267 | 292.5 |
| 1500 | 1 | 235 | 29 | 9 | 14 | 1 | 289 | 311.9 |
| 1600 | 2 | 269 | 33 | 1 | 11 | 1 | 317 | 331.2 |
| 1700 | 2 | 240 | 25 | 8 | 13 | 2 | 290 | 311.3 |
| 1800 | 0 | 179 | 16 | 3 | 9 | 0 | 207 | 220.2 |
| 1900 | 0 | 156 | 18 | 2 | 7 | 1 | 184 | 195.1 |
| 2000 | 0 | 116 | 11 | 3 | 9 | 0 | 139 | 152.2 |
| 2100 | 0 | 70 | 4 | 1 | 3 | 0 | 78 | 82.4 |
| 2200 | 0 | 45 | 1 | 1 | 3 | 0 | 50 | 54.4 |
| 2300 | 0 | 35 | 2 | 0 | 3 | 0 | 40 | 43.9 |
| **07-19** | 7 | 2784 | 278 | 70 | 176 | 16 | 3331 | 3605.2 |
| **06-22** | 7 | 3248 | 333 | 79 | 205 | 17 | 3889 | 4206.4 |
| **06-00** | 7 | 3328 | 336 | 80 | 211 | 17 | 3979 | 4304.7 |
| **00-00** | 7 | 3382 | 351 | 84 | 238 | 20 | 4082 | 4447.8 |

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EPA Export 31-12-2014:23:01:08

Site 01
E/B - Exit

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 42 | 0 | 0 | 2 | 0 | 44 | 46.6 |
| 0100 | 0 | 29 | 3 | 1 | 0 | 2 | 35 | 37.5 |
| 0200 | 0 | 16 | 2 | 0 | 1 | 0 | 19 | 20.3 |
| 0300 | 0 | 13 | 4 | 0 | 3 | 0 | 20 | 23.9 |
| 0400 | 0 | 7 | 1 | 0 | 2 | 0 | 10 | 12.6 |
| 0500 | 0 | 4 | 1 | 0 | 3 | 1 | 9 | 13.9 |
| 0600 | 0 | 27 | 4 | 2 | 1 | 2 | 36 | 40.3 |
| 0700 | 0 | 48 | 12 | 0 | 5 | 1 | 66 | 73.5 |
| 0800 | 0 | 63 | 15 | 3 | 8 | 1 | 90 | 102.9 |
| 0900 | 0 | 117 | 16 | 1 | 3 | 1 | 138 | 143.4 |
| 1000 | 0 | 149 | 15 | 3 | 3 | 0 | 170 | 175.4 |
| 1100 | 0 | 227 | 14 | 4 | 11 | 0 | 256 | 272.3 |
| 1200 | 3 | 315 | 32 | 5 | 4 | 0 | 359 | 364.3 |
| 1300 | 1 | 292 | 20 | 8 | 7 | 0 | 328 | 340.3 |
| 1400 | 1 | 315 | 20 | 5 | 0 | 0 | 341 | 342.7 |
| 1500 | 1 | 285 | 19 | 5 | 3 | 0 | 313 | 318.6 |
| 1600 | 0 | 256 | 19 | 2 | 6 | 0 | 283 | 291.8 |
| 1700 | 0 | 287 | 26 | 3 | 5 | 0 | 321 | 329 |
| 1800 | 0 | 241 | 23 | 1 | 4 | 0 | 269 | 274.7 |
| 1900 | 0 | 147 | 14 | 0 | 1 | 0 | 162 | 163.3 |
| 2000 | 0 | 102 | 11 | 1 | 2 | 2 | 118 | 123.1 |
| 2100 | 0 | 67 | 7 | 0 | 0 | 0 | 74 | 74 |
| 2200 | 1 | 65 | 7 | 1 | 1 | 0 | 75 | 76 |
| 2300 | 0 | 36 | 2 | 0 | 1 | 0 | 39 | 40.3 |
| **07-19** | 6 | 2595 | 231 | 40 | 59 | 3 | 2934 | 3028.9 |
| **06-22** | 6 | 2938 | 267 | 43 | 63 | 7 | 3324 | 3429.6 |
| **06-00** | 7 | 3039 | 276 | 44 | 65 | 7 | 3438 | 3545.9 |
| **00-00** | 7 | 3150 | 287 | 45 | 76 | 10 | 3575 | 3700.7 |

ABACUS TRANSPORTATION SURVEYS

Ballintrane Traffic Count
Automatic Traffic Counts

Saturday 25 October 2014
Ath/14/071

Site 01
W/B - Entry

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 19 | 1 | 1 | 1 | 0 | 22 | 23.8 |
| 0100 | 0 | 22 | 0 | 1 | 3 | 0 | 26 | 30.4 |
| 0200 | 0 | 4 | 1 | 0 | 0 | 0 | 5 | 5 |
| 0300 | 0 | 9 | 1 | 0 | 1 | 1 | 12 | 14.3 |
| 0400 | 0 | 14 | 4 | 1 | 3 | 0 | 22 | 26.4 |
| 0500 | 0 | 6 | 5 | 0 | 2 | 0 | 13 | 15.6 |
| 0600 | 0 | 37 | 4 | 0 | 4 | 1 | 46 | 52.2 |
| 0700 | 1 | 75 | 14 | 1 | 5 | 0 | 96 | 102.2 |
| 0800 | 0 | 142 | 16 | 3 | 6 | 2 | 169 | 180.3 |
| 0900 | 3 | 168 | 9 | 5 | 5 | 1 | 191 | 198.6 |
| 1000 | 2 | 228 | 15 | 0 | 5 | 0 | 250 | 254.9 |
| 1100 | 1 | 272 | 16 | 2 | 7 | 0 | 298 | 307.3 |
| 1200 | 1 | 282 | 10 | 4 | 4 | 0 | 301 | 307.4 |
| 1300 | 0 | 257 | 17 | 1 | 14 | 0 | 289 | 307.7 |
| 1400 | 7 | 235 | 15 | 5 | 5 | 0 | 267 | 270.4 |
| 1500 | 1 | 226 | 17 | 4 | 7 | 0 | 255 | 265.3 |
| 1600 | 1 | 184 | 14 | 4 | 3 | 0 | 206 | 211.1 |
| 1700 | 1 | 169 | 10 | 2 | 1 | 0 | 183 | 184.5 |
| 1800 | 0 | 209 | 13 | 2 | 2 | 0 | 226 | 229.6 |
| 1900 | 0 | 160 | 4 | 0 | 2 | 0 | 166 | 168.6 |
| 2000 | 0 | 122 | 2 | 1 | 1 | 1 | 127 | 129.8 |
| 2100 | 0 | 81 | 5 | 0 | 1 | 0 | 87 | 88.3 |
| 2200 | 0 | 55 | 7 | 0 | 0 | 0 | 62 | 62 |
| 2300 | 0 | 26 | 1 | 0 | 1 | 0 | 28 | 29.3 |
| **07-19** | 18 | 2447 | 166 | 33 | 64 | 3 | 2731 | 2819.3 |
| **06-22** | 18 | 2847 | 181 | 34 | 72 | 5 | 3157 | 3258.2 |
| **06-00** | 18 | 2928 | 189 | 34 | 73 | 5 | 3247 | 3349.5 |
| **00-00** | 18 | 3002 | 201 | 37 | 83 | 6 | 3347 | 3465 |

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Site 01
E/B - Exit

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 40 | 2 | 0 | 0 | 0 | 42 | 42 |
| 0100 | 0 | 28 | 1 | 0 | 0 | 0 | 29 | 29 |
| 0200 | 0 | 21 | 0 | 0 | 0 | 0 | 21 | 21 |
| 0300 | 0 | 8 | 3 | 0 | 2 | 0 | 13 | 15.6 |
| 0400 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 10 |
| 0500 | 0 | 5 | 1 | 0 | 2 | 0 | 8 | 10.6 |
| 0600 | 0 | 3 | 2 | 0 | 0 | 0 | 5 | 5 |
| 0700 | 0 | 26 | 1 | 0 | 1 | 0 | 28 | 29.3 |
| 0800 | 0 | 25 | 0 | 1 | 1 | 0 | 27 | 28.8 |
| 0900 | 0 | 45 | 3 | 2 | 0 | 0 | 50 | 51 |
| 1000 | 3 | 91 | 6 | 2 | 4 | 0 | 106 | 109.8 |
| 1100 | 1 | 119 | 11 | 1 | 1 | 0 | 133 | 134 |
| 1200 | 0 | 174 | 4 | 3 | 1 | 0 | 182 | 184.9 |
| 1300 | 4 | 235 | 9 | 2 | 2 | 1 | 253 | 254.1 |
| 1400 | 0 | 239 | 9 | 4 | 1 | 0 | 253 | 256.3 |
| 1500 | 2 | 231 | 7 | 0 | 1 | 0 | 241 | 240.7 |
| 1600 | 1 | 283 | 14 | 5 | 2 | 0 | 305 | 309.3 |
| 1700 | 0 | 305 | 11 | 1 | 1 | 0 | 318 | 319.8 |
| 1800 | 0 | 301 | 15 | 2 | 1 | 3 | 322 | 327.3 |
| 1900 | 0 | 232 | 16 | 1 | 4 | 1 | 254 | 260.7 |
| 2000 | 0 | 149 | 4 | 2 | 1 | 0 | 156 | 158.3 |
| 2100 | 0 | 83 | 4 | 0 | 0 | 0 | 87 | 87 |
| 2200 | 0 | 63 | 4 | 0 | 0 | 0 | 67 | 67 |
| 2300 | 0 | 50 | 1 | 0 | 1 | 0 | 52 | 53.3 |
| **07-19** | 11 | 2074 | 90 | 23 | 16 | 4 | 2218 | 2245.5 |
| **06-22** | 11 | 2541 | 116 | 26 | 21 | 5 | 2720 | 2756.5 |
| **06-00** | 11 | 2654 | 121 | 26 | 22 | 5 | 2839 | 2876.8 |
| **00-00** | 11 | 2766 | 128 | 26 | 26 | 5 | 2962 | 3005 |

ABACUS TRANSPORTATION SURVEYS

Ballintrane Traffic Count
Automatic Traffic Counts

Sunday 26 October 2014
Ath/14/071

Site 01
W/B - Entry

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 20 | 0 | 0 | 1 | 0 | 21 | 22.3 |
| 0100 | 0 | 12 | 0 | 0 | 1 | 0 | 13 | 14.3 |
| 0200 | 0 | 19 | 1 | 0 | 1 | 0 | 21 | 22.3 |
| 0300 | 0 | 4 | 1 | 0 | 0 | 0 | 5 | 5 |
| 0400 | 0 | 5 | 2 | 1 | 1 | 0 | 9 | 10.8 |
| 0500 | 0 | 3 | 0 | 0 | 1 | 0 | 4 | 5.3 |
| 0600 | 0 | 8 | 4 | 0 | 1 | 0 | 13 | 14.3 |
| 0700 | 0 | 12 | 2 | 0 | 3 | 0 | 17 | 20.9 |
| 0800 | 0 | 42 | 2 | 1 | 2 | 0 | 47 | 50.1 |
| 0900 | 0 | 75 | 7 | 0 | 1 | 0 | 83 | 84.3 |
| 1000 | 0 | 112 | 3 | 2 | 2 | 0 | 119 | 122.6 |
| 1100 | 0 | 157 | 7 | 1 | 1 | 0 | 166 | 167.8 |
| 1200 | 1 | 270 | 9 | 3 | 4 | 0 | 287 | 292.9 |
| 1300 | 1 | 341 | 13 | 9 | 7 | 0 | 371 | 383.8 |
| 1400 | 1 | 329 | 9 | 4 | 4 | 1 | 348 | 355.4 |
| 1500 | 1 | 281 | 7 | 0 | 1 | 0 | 290 | 290.5 |
| 1600 | 1 | 254 | 8 | 1 | 3 | 0 | 267 | 270.6 |
| 1700 | 3 | 223 | 10 | 0 | 8 | 0 | 244 | 252 |
| 1800 | 0 | 180 | 4 | 2 | 2 | 0 | 188 | 191.6 |
| 1900 | 1 | 199 | 4 | 1 | 2 | 0 | 207 | 209.3 |
| 2000 | 0 | 150 | 5 | 0 | 1 | 0 | 156 | 157.3 |
| 2100 | 0 | 97 | 4 | 0 | 1 | 0 | 102 | 103.3 |
| 2200 | 0 | 84 | 5 | 0 | 1 | 0 | 90 | 91.3 |
| 2300 | 0 | 32 | 3 | 0 | 2 | 0 | 37 | 39.6 |
| **07-19** | 8 | 2276 | 81 | 23 | 38 | 1 | 2427 | 2482.5 |
| **06-22** | 9 | 2730 | 98 | 24 | 43 | 1 | 2905 | 2966.7 |
| **06-00** | 9 | 2846 | 106 | 24 | 46 | 1 | 3032 | 3097.6 |
| **00-00** | 9 | 2909 | 110 | 25 | 51 | 1 | 3105 | 3177.6 |

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**Site 01**
**E/B - Exit**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 42 | 2 | 2 | 1 | 0 | 47 | 49.3 |
| 0100 | 0 | 18 | 3 | 0 | 1 | 0 | 22 | 23.3 |
| 0200 | 0 | 17 | 4 | 0 | 1 | 0 | 22 | 23.3 |
| 0300 | 0 | 20 | 2 | 0 | 0 | 0 | 22 | 22 |
| 0400 | 0 | 17 | 7 | 0 | 3 | 0 | 27 | 30.9 |
| 0500 | 0 | 8 | 2 | 0 | 1 | 0 | 11 | 12.3 |
| 0600 | 0 | 5 | 1 | 0 | 1 | 0 | 7 | 8.3 |
| 0700 | 0 | 21 | 0 | 0 | 4 | 0 | 25 | 30.2 |
| 0800 | 0 | 25 | 3 | 1 | 1 | 0 | 30 | 31.8 |
| 0900 | 0 | 43 | 6 | 1 | 2 | 2 | 54 | 59.1 |
| 1000 | 0 | 59 | 11 | 1 | 2 | 0 | 73 | 76.1 |
| 1100 | 1 | 88 | 7 | 2 | 0 | 0 | 98 | 98.2 |
| 1200 | 0 | 152 | 6 | 3 | 4 | 0 | 165 | 171.1 |
| 1300 | 0 | 198 | 7 | 1 | 2 | 0 | 208 | 211.1 |
| 1400 | 0 | 184 | 14 | 3 | 2 | 0 | 203 | 207.1 |
| 1500 | 1 | 264 | 25 | 2 | 4 | 0 | 296 | 301.4 |
| 1600 | 0 | 232 | 12 | 7 | 4 | 0 | 255 | 263.7 |
| 1700 | 0 | 240 | 9 | 3 | 2 | 0 | 254 | 258.1 |
| 1800 | 0 | 251 | 13 | 5 | 3 | 0 | 272 | 278.4 |
| 1900 | 0 | 206 | 9 | 3 | 4 | 1 | 223 | 230.7 |
| 2000 | 0 | 155 | 3 | 1 | 2 | 1 | 162 | 166.1 |
| 2100 | 1 | 112 | 2 | 0 | 1 | 1 | 117 | 118.5 |
| 2200 | 0 | 94 | 2 | 3 | 3 | 0 | 102 | 107.4 |
| 2300 | 0 | 46 | 2 | 0 | 1 | 0 | 49 | 50.3 |
| **07-19** | 2 | 1757 | 113 | 29 | 30 | 2 | 1933 | 1986.9 |
| **06-22** | 3 | 2235 | 128 | 33 | 38 | 5 | 2442 | 2510.5 |
| **06-00** | 3 | 2375 | 132 | 36 | 42 | 5 | 2593 | 2668.2 |
| **00-00** | 3 | 2497 | 152 | 38 | 49 | 5 | 2744 | 2829.3 |

**ABACUS TRANSPORTATION SURVEYS**

**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Monday 27 October 2014**
**Ath/14/071**

**Site 01**
**W/B - Entry**

| TIME | PCL/MCL | CAR* | LGV** | OGV 1 | OGV 2 | BUS | TOTAL | PCU |
|---|---|---|---|---|---|---|---|---|
| 0000 | 0 | 33 | 3 | 0 | 0 | 0 | 36 | 36 |
| 0100 | 0 | 15 | 2 | 0 | 1 | 0 | 18 | 19.3 |
| 0200 | 0 | 12 | 0 | 0 | 1 | 0 | 13 | 14.3 |
| 0300 | 0 | 16 | 1 | 0 | 1 | 0 | 18 | 19.3 |
| 0400 | 0 | 15 | 0 | 0 | 1 | 0 | 16 | 17.3 |
| 0500 | 0 | 15 | 3 | 1 | 0 | 0 | 19 | 19.5 |
| 0600 | 0 | 18 | 2 | 0 | 2 | 0 | 22 | 24.6 |
| 0700 | 0 | 25 | 2 | 0 | 6 | 0 | 33 | 40.8 |
| 0800 | 0 | 53 | 5 | 2 | 4 | 0 | 64 | 70.2 |
| 0900 | 0 | 57 | 4 | 3 | 4 | 1 | 69 | 76.7 |
| 1000 | 0 | 95 | 9 | 0 | 4 | 1 | 109 | 115.2 |
| 1100 | 2 | 186 | 6 | 2 | 4 | 1 | 201 | 206.6 |
| 1200 | 1 | 220 | 7 | 3 | 4 | 0 | 235 | 240.9 |
| 1300 | 0 | 257 | 11 | 2 | 1 | 0 | 271 | 273.3 |
| 1400 | 1 | 269 | 13 | 1 | 8 | 0 | 292 | 302.1 |
| 1500 | 1 | 304 | 9 | 1 | 5 | 1 | 321 | 328.2 |
| 1600 | 2 | 284 | 8 | 3 | 5 | 0 | 302 | 308.4 |
| 1700 | 1 | 282 | 7 | 2 | 2 | 0 | 294 | 296.8 |
| 1800 | 0 | 245 | 9 | 0 | 4 | 0 | 258 | 263.2 |
| 1900 | 0 | 193 | 7 | 2 | 6 | 0 | 208 | 216.8 |
| 2000 | 0 | 162 | 6 | 2 | 5 | 0 | 175 | 182.5 |
| 2100 | 0 | 126 | 6 | 1 | 5 | 1 | 139 | 147 |
| 2200 | 0 | 74 | 4 | 0 | 1 | 0 | 79 | 80.3 |
| 2300 | 0 | 36 | 1 | 1 | 3 | 0 | 41 | 45.4 |
| **07-19** | 8 | 2277 | 90 | 19 | 51 | 4 | 2449 | 2522.4 |
| **06-22** | 8 | 2776 | 111 | 24 | 69 | 5 | 2993 | 3093.3 |
| **06-00** | 8 | 2886 | 116 | 25 | 73 | 5 | 3113 | 3219 |
| **00-00** | 8 | 2992 | 125 | 26 | 77 | 5 | 3233 | 3344.7 |

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**Ballintrane Traffic Count** | **Site 01** | **Week Comm.:** | **Tuesday 21 October 2014**
**Automatic Traffic Count** | **E/B - Exit** | **Ath/14/071**

| TIME PERIOD | Tuesday 21 October 2014 | Wednesday 22 October 2014 | Thursday 23 October 2014 | Friday 24 October 2014 | Saturday 25 October 2014 | Sunday 26 October 2014 | Monday 27 October 2014 | Average |
|---|---|---|---|---|---|---|---|---|
| 0000 | 43 | 17 | 20 | 23 | 44 | 42 | 47 | 34 |
| 0100 | 9 | 6 | 7 | 27 | 35 | 29 | 22 | 19 |
| 0200 | 7 | 6 | 3 | 10 | 19 | 21 | 22 | 13 |
| 0300 | 6 | 6 | 8 | 14 | 20 | 13 | 22 | 13 |
| 0400 | 8 | 19 | 15 | 16 | 10 | 10 | 27 | 15 |
| 0500 | 13 | 24 | 27 | 21 | 9 | 8 | 11 | 16 |
| 0600 | 22 | 76 | 74 | 79 | 36 | 5 | 7 | 43 |
| 0700 | 165 | 153 | 174 | 156 | 66 | 28 | 25 | 110 |
| 0800 | 226 | 245 | 206 | 209 | 99 | 27 | 30 | 148 |
| 0900 | 223 | 199 | 187 | 191 | 138 | 50 | 54 | 149 |
| 1000 | 187 | 197 | 170 | 172 | 170 | 106 | 73 | 154 |
| 1100 | 157 | 169 | 186 | 199 | 256 | 133 | 98 | 171 |
| 1200 | 207 | 189 | 216 | 203 | 359 | 182 | 165 | 217 |
| 1300 | 201 | 245 | 228 | 273 | 328 | 253 | 208 | 248 |
| 1400 | 227 | 222 | 240 | 355 | 341 | 253 | 203 | 263 |
| 1500 | 287 | 270 | 291 | 398 | 313 | 241 | 296 | 299 |
| 1600 | 332 | 323 | 342 | 450 | 283 | 305 | 255 | 327 |
| 1700 | 502 | 501 | 495 | 481 | 321 | 318 | 254 | 410 |
| 1800 | 399 | 372 | 410 | 425 | 269 | 322 | 272 | 353 |
| 1900 | 185 | 231 | 234 | 277 | 162 | 254 | 223 | 224 |
| 2000 | 133 | 116 | 173 | 227 | 118 | 156 | 162 | 155 |
| 2100 | 95 | 110 | 108 | 140 | 74 | 87 | 117 | 104 |
| 2200 | 98 | 66 | 96 | 84 | 75 | 67 | 102 | 84 |
| 2300 | 37 | 38 | 57 | 49 | 39 | 52 | 49 | 46 |
| **07-19** | 3113 | 3085 | 3145 | 3512 | 2934 | 2218 | 1933 | 2849 |
| **06-22** | 3548 | 3618 | 3734 | 4235 | 3324 | 2720 | 2442 | 3374 |
| **06-00** | 3683 | 3722 | 3887 | 4368 | 3438 | 2839 | 2593 | 3504 |
| **00-00** | 3769 | 3800 | 3967 | 4479 | 3575 | 2962 | 2744 | 3614 |

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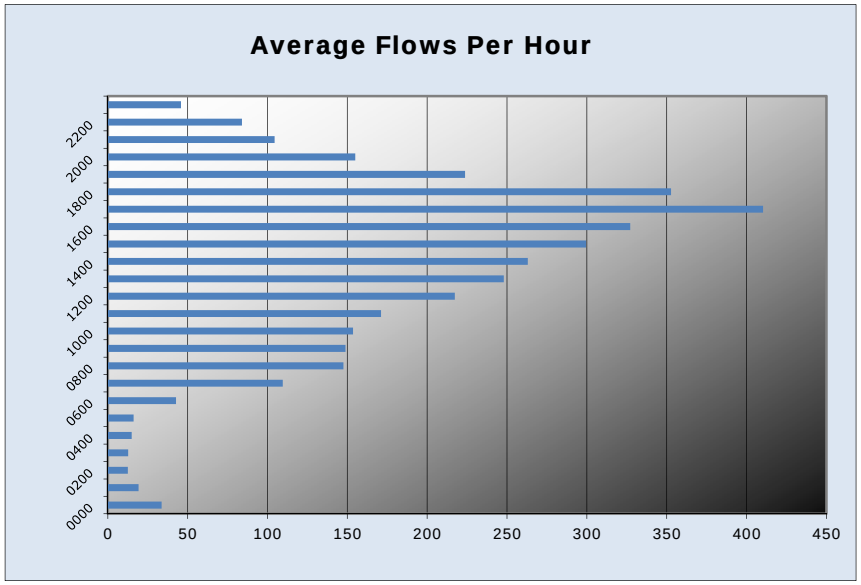


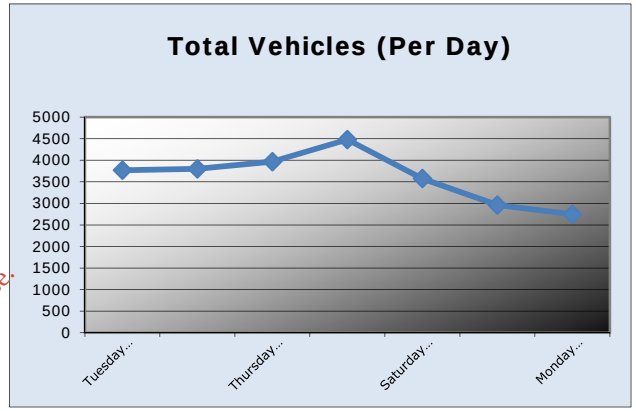


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## Peak Time & Volumetric Count Data

| | Tuesday 21 October 2014 | Wednesday 22 October 2014 | Thursday 23 October 2014 | Friday 24 October 2014 | Saturday 25 October 2014 | Sunday 26 October 2014 | Monday 27 October 2014 | Mode / Average |
|---|---|---|---|---|---|---|---|---|
| **AM** | | | | | | | | |
| **Time** | 0800 | 0800 | 0800 | 0800 | 0900 | 0900 | 0900 | 0800 |
| **Vehicles** | 226 | 245 | 206 | 209 | 138 | 50 | 54 | 161 |
| **IP** | | | | | | | | |
| **Time** | 1400 | 1300 | 1400 | 1400 | 1200 | 1300 | 1300 | 1400 |
| **Vehicles** | 227 | 245 | 240 | 355 | 359 | 253 | 208 | 270 |
| **PM** | | | | | | | | |
| **Time** | 1700 | 1700 | 1700 | 1700 | 1700 | 1800 | 1800 | 1700 |
| **Vehicles** | 502 | 501 | 495 | 481 | 321 | 322 | 272 | 413 |



EPA Export 31-12-2014:23:01:08

**Ballintrane Traffic Count** | **Site 01** | **Week Comm.: Tuesday 21 October 2014**
**Automatic Traffic Count** | **W/B - Entry** | **Ath/14/071**

| TIME PERIOD | Tuesday 21 October 2014 | Wednesday 22 October 2014 | Thursday 23 October 2014 | Friday 24 October 2014 | Saturday 25 October 2014 | Sunday 26 October 2014 | Monday 27 October 2014 | Average |
|---|---|---|---|---|---|---|---|---|
| 0000 | 25 | 16 | 12 | 13 | 22 | 21 | 36 | 21 |
| 0100 | 32 | 7 | 13 | 12 | 26 | 13 | 18 | 17 |
| 0200 | 18 | 3 | 4 | 3 | 5 | 21 | 13 | 10 |
| 0300 | 6 | 6 | 11 | 16 | 12 | 5 | 18 | 11 |
| 0400 | 14 | 16 | 20 | 16 | 22 | 9 | 16 | 16 |
| 0500 | 27 | 54 | 45 | 43 | 13 | 4 | 19 | 29 |
| 0600 | 60 | 160 | 159 | 157 | 46 | 13 | 22 | 88 |
| 0700 | 294 | 289 | 317 | 246 | 96 | 17 | 33 | 185 |
| 0800 | 524 | 537 | 524 | 481 | 169 | 47 | 64 | 335 |
| 0900 | 330 | 301 | 347 | 301 | 191 | 83 | 69 | 232 |
| 1000 | 246 | 251 | 217 | 233 | 250 | 119 | 109 | 204 |
| 1100 | 195 | 187 | 204 | 215 | 298 | 166 | 201 | 209 |
| 1200 | 184 | 232 | 216 | 230 | 301 | 287 | 235 | 241 |
| 1300 | 191 | 187 | 205 | 255 | 289 | 371 | 271 | 253 |
| 1400 | 189 | 220 | 220 | 267 | 267 | 348 | 292 | 258 |
| 1500 | 284 | 226 | 268 | 289 | 255 | 290 | 321 | 276 |
| 1600 | 263 | 272 | 275 | 317 | 206 | 267 | 302 | 272 |
| 1700 | 288 | 294 | 255 | 290 | 183 | 244 | 294 | 264 |
| 1800 | 213 | 250 | 223 | 207 | 226 | 188 | 258 | 224 |
| 1900 | 146 | 159 | 172 | 184 | 166 | 207 | 208 | 177 |
| 2000 | 96 | 94 | 98 | 139 | 127 | 156 | 175 | 126 |
| 2100 | 53 | 52 | 79 | 78 | 87 | 102 | 139 | 84 |
| 2200 | 51 | 44 | 35 | 50 | 62 | 90 | 79 | 59 |
| 2300 | 26 | 29 | 33 | 40 | 28 | 37 | 41 | 33 |
| **07-19** | 3201 | 3246 | 3271 | 3331 | 2731 | 2427 | 2449 | 2951 |
| **06-22** | 3556 | 3711 | 3779 | 3889 | 3157 | 2905 | 2993 | 3427 |
| **06-00** | 3633 | 3784 | 3847 | 3979 | 3247 | 3032 | 3113 | 3519 |
| **00-00** | 3755 | 3886 | 3952 | 4082 | 3347 | 3105 | 3233 | 3623 |

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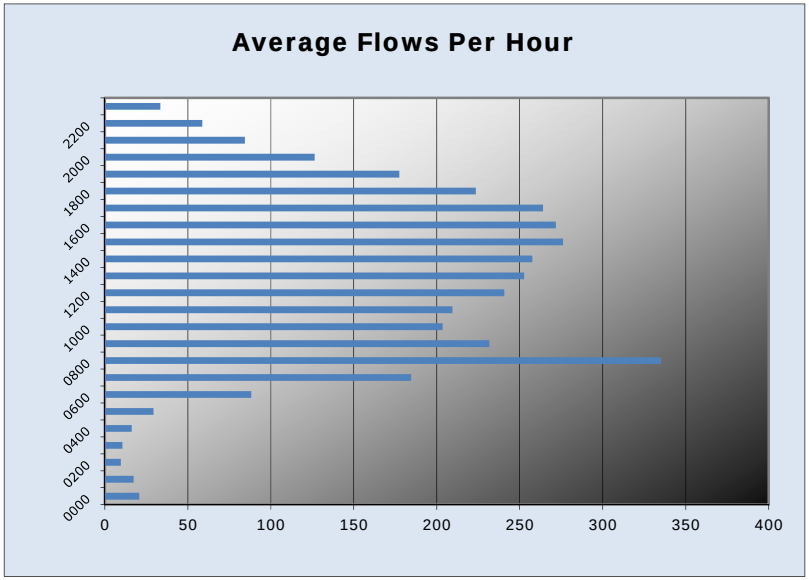


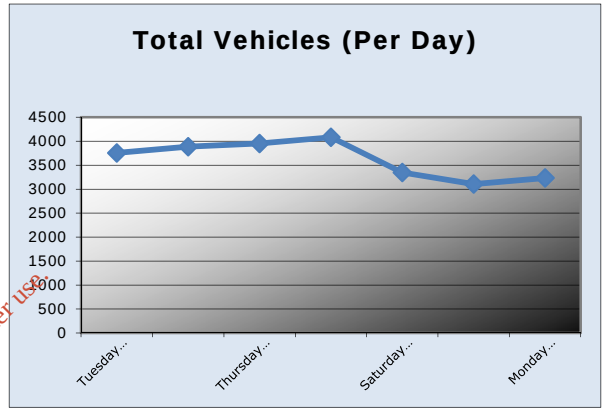


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## Peak Time & Volumetric Count Data

| | Tuesday 21 October 2014 | Wednesday 22 October 2014 | Thursday 23 October 2014 | Friday 24 October 2014 | Saturday 25 October 2014 | Sunday 26 October 2014 | Monday 27 October 2014 | Mode / Average |
|---|---|---|---|---|---|---|---|---|
| **AM** | | | | | | | | |
| **Time** | 0800 | 0800 | 0800 | 0800 | 0900 | 0900 | 0900 | 0800 |
| **Vehicles** | 524 | 537 | 524 | 481 | 191 | 83 | 69 | 344 |
| **IP** | | | | | | | | |
| **Time** | 1300 | 1200 | 1400 | 1400 | 1200 | 1300 | 1400 | 1400 |
| **Vehicles** | 191 | 232 | 220 | 267 | 301 | 371 | 292 | 268 |
| **PM** | | | | | | | | |
| **Time** | 1700 | 1700 | 1600 | 1600 | 1800 | 1600 | 1600 | 1600 |
| **Vehicles** | 288 | 294 | 275 | 317 | 226 | 267 | 302 | 281 |



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**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Week Comm: Tuesday 21 October 2014**
**Ath/14/071**

**Site 01**
**E/B - Exit**

---

## Profile:

Filter time: 00:00 21st October 2014 => 23:59 27th October 2014
Speed range: 0 - 200 km/h.
Separation: Greater than 4.00 seconds. - (Headway)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Vehicles = 13859
Maximum = 167.5 km/h, Minimum = 26.9 km/h, Mean = 97.8 km/h
85% Speed = 108.7 km/h, 95% Speed = 118.1 km/h, Median = 96.8 km/h
20 km/h Pace = 87 - 107, Number in Pace = 9148 (66.01%)
Variance = 144.37, Standard Deviation = 12.02 km/h

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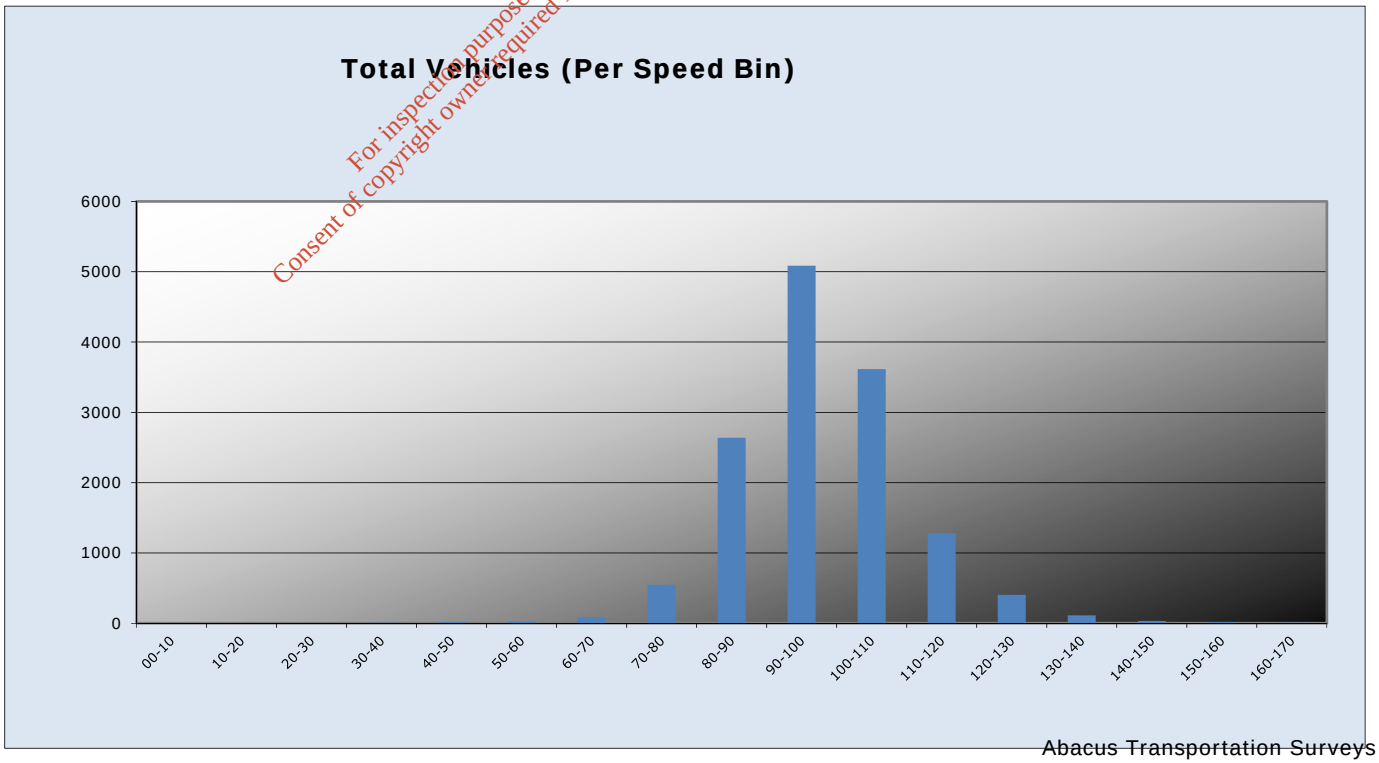
## Speed Bins:

| Speed | Bin | |
|---|---|---|
| KPH | No. | % |
| 00-10 | 0 | 0.0 |
| 10-20 | 0 | 0.0 |
| 20-30 | 2 | 0.0 |
| 30-40 | 5 | 0.0 |
| 40-50 | 13 | 0.1 |
| 50-60 | 24 | 0.2 |
| 60-70 | 87 | 0.6 |
| 70-80 | 546 | 3.9 |
| 80-90 | 2638 | 19.0 |
| 90-100 | 5085 | 36.7 |
| 100-110 | 3614 | 26.1 |
| 110-120 | 1281 | 9.2 |
| 120-130 | 403 | 2.9 |
| 130-140 | 111 | 0.8 |
| 140-150 | 32 | 0.2 |
| 150-160 | 14 | 0.1 |
| 160-170 | 4 | 0.0 |

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Stephen Reid



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**Ballintrane Traffic Count**
**Automatic Traffic Counts**

**Week Comm:** **Tuesday 21 October 2014**
**Ath/14/071**

**Site 01**
**W/B - Entry**

---

## Profile:

Filter time: 00:00 21st October 2014 => 23:59 27th October 2014
Speed range: 0 - 200 km/h.
Separation: Greater than 4.00 seconds. - (Headway)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Vehicles = 14973
Maximum = 161.8 km/h, Minimum = 19.8 km/h, Mean = 90.7 km/h
85% Speed = 101.2 km/h, 95% Speed = 110.5 km/h, Median = 90.0 km/h
20 km/h Pace = 81 - 101, Number in Pace = 10196 (68.10%)
Variance = 150.86, Standard Deviation = 12.28 km/h

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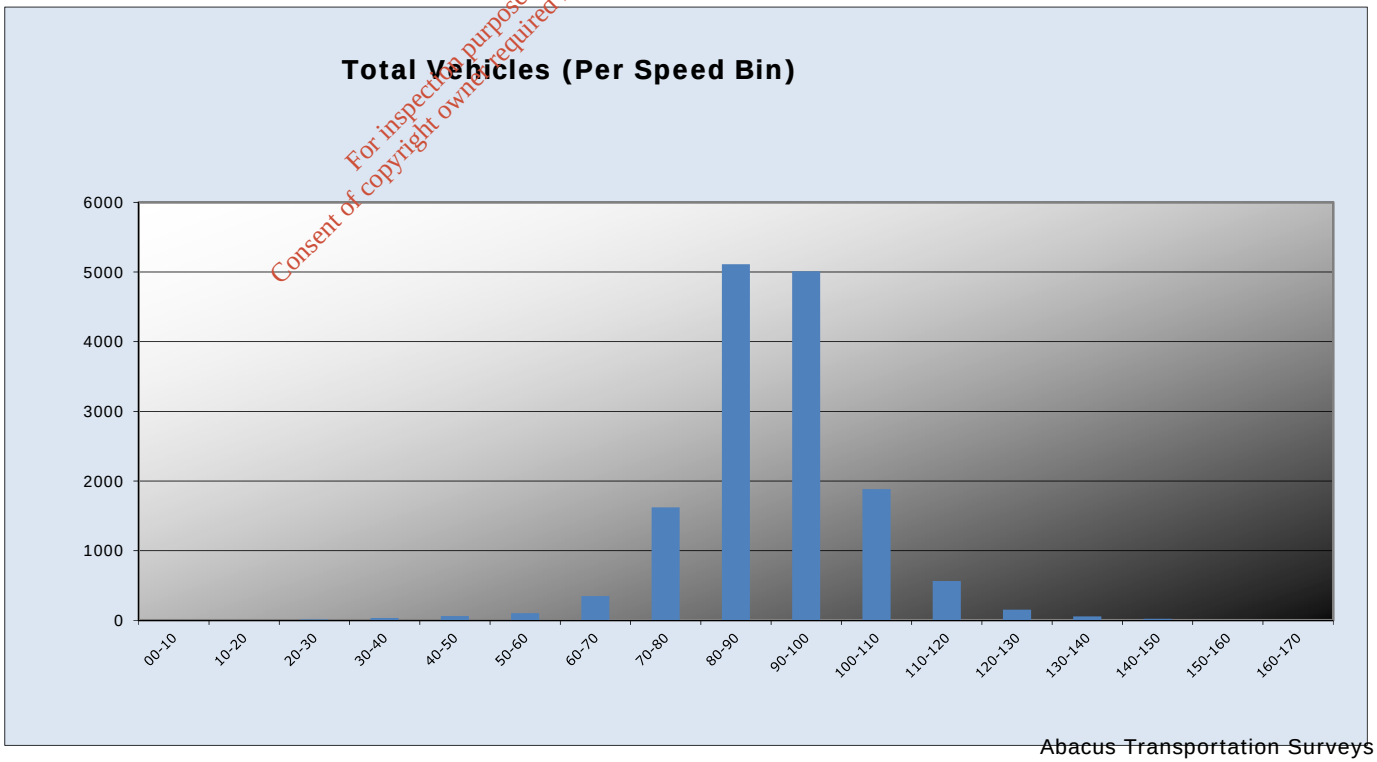
## Speed Bins:

| Speed | Bin | |
|---|---|---|
| KPH | No. | % |
| 00-10 | 0 | 0.0 |
| 10-20 | 1 | 0.0 |
| 20-30 | 12 | 0.1 |
| 30-40 | 32 | 0.2 |
| 40-50 | 60 | 0.4 |
| 50-60 | 101 | 0.7 |
| 60-70 | 347 | 2.3 |
| 70-80 | 1620 | 10.8 |
| 80-90 | 5110 | 34.1 |
| 90-100 | 5009 | 33.5 |
| 100-110 | 1883 | 12.6 |
| 110-120 | 564 | 3.8 |
| 120-130 | 153 | 1.0 |
| 130-140 | 55 | 0.4 |
| 140-150 | 22 | 0.1 |
| 150-160 | 2 | 0.0 |
| 160-170 | 2 | 0.0 |

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# Classification Schemes

### Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FWHA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

| Vehicle Class | Class | Vehicle Type | No. of Axles | Axle spacing in feet | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Axle 1 to 2 | Axle 2 to 3 | Axle 3 to 4 | Axle 4 to 5 | Axle 5 to 6 |
| PCL/MCL | 1 | motorcycle | 2 | <6.0 | | | | |
| CAR* | 2 | passenger car | 2 | 6.0 - 10.0 | | | | |
| | | car + 1 axle trailer | 3 | <10.0 | 10.0 - 18.0 | | | |
| | | car + 2 axle trailer | 4 | <10.0 | | <3.5 | | |
| LGV** | 3 | pickup | 2 | 10.0 - 15.0 | | | | |
| | | pickup + 1 axle trailer | 3 | 10.0 - 15.0 | 10.0 - 18.0 | | | |
| | | pickup + 2 axle trailer | 4 | 10.0 -15.0 | | <3.5 | | |
| | | pickup + 3 axle trailer | 5 | 9.9 - 15.0 | | | <3.5 | |
| BUS | 4 | bus | 2 | >20.0 | | | | |
| | | bus | 3 | >19.0 | | | | |
| OGV 1 | 5 | single unit truck - dual rear axle | 2 | 14.9 - 20.0 | | | <3.5 | |
| | 6 | 3 axle truck | 3 | | <18.0 | | | |
| OGV 2 | 7 | 4 axle truck | 4 | | | | | |
| | 8 | 2S1 | 3 | | >18.0 | | | |
| | | 2S2 | 4 | | >5.0 | >3.5 | | |
| | | 3S1 | 4 | | <5.0 | >10.0 | | |
| | 9 | 3S2 | 5 | | <6.1 | | 3.5 - 8.0 | |
| | | 5 axle combination | 5 | | | | | |
| | 10 | 6 axle combination | 6 | | | 3.5 - 5.0 | | |
| | | 3S3 | 6 | | | | | |
| | 11 | 2S1-2 | 5 | | >6.0 | | | |
| | 12 | 3S1-2 | 6 | | | | | >10.0 |
| | 13 | truck | 7 or more | | | | | |

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Car* Cars and LGV based cars
LGV** Light Goods Vehicles with the exception of LGV based on cars



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November 2014

# Screening Statement
## *for the*
# Proposed Operations


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## Ballintrane,
## Fenagh,
## Co. Carlow.

ASH ECOLOGY

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

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# O'Toole Composting Ltd.

Ballintrane, Fenagh, Co. Carlow.

## Screening Statement for the Proposed Operations

## Contents



**Tables**



**Figures**



**Appendices**



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# 1. Introduction

O'Toole Composting Ltd are applying for planning permission for the following developments at Ballintrane, Co. Carlow: (a) instillation of 2 no. bio-filters; (b) development of truck intake air lock building; (c) development of a bring centre for domestic waste; (d) intensification of use of facility resulting in acceptance and processing of 40,000 tonnes of material for composting and 20,000 tonnes of general waste per annum; and (e) all associated site works.

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 operations at the composting facility on the conservation status of nearby sites with European Conservation designations i.e. Natura 2000 sites.

## 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

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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.*"



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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.

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# 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.

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## 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 a proposed expansion to operations and the 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.



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# 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.

The proposed development is outlined below.

There will be 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). 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.

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# 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 operations, 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.

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## 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.



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**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) |

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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.



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# 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 operations 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.

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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 operations 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.



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- 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.

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## 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 on a Natura 2000 site alone or in-combination with other plans and projects. These projects would be subject to a Stage I Screening for Appropriate Assessment that would mitigate or screen out potential impacts.

In-combination effects may arise from the development of other projects in the vicinity of OTCL, such as construction of housing, roads, rail, water and wastewater infrastructure, gas, electricity, provision of tourism facilities and telecommunications infrastructure, however, the in-combination effects of other developments would depend on factors such as the distance in relation to OTCL, the scale and the characteristics e.g. the types and quantities of emissions. Developments in the nearby vicinity, alterations to existing houses/farms, and new housing applications[6] within a 1km radius are shown in Figure 3.

[6] Carlow County Council Planning online mapping http://193.178.1.178/carlowgplan/default.aspx?fn=14251



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Carlow County Carlow outline the following list of developments that could potentially give rise to in-combination effects for the Screening for Appropriate Assessment report carried out for the Draft County Development Plan for County Carlow (2015-2021),[7] however, as already stated, any project with the potential to have a significant impact on a Natura 2000 site would be subject to a Stage I Screening for Appropriate Assessment to mitigate or screen out potential impacts by Carlow County Council.

- The development of infrastructure, such as relief roads and upgrades to regional roads.
- Development of new housing.
- Rural housing policy and one off rural housing.
- The upgrading and development of new water supply and waste water infrastructure.
- Promotion of forestry.
- Further development of the fishing industry, including services along the River Barrow and Slaney River.
- Facilitation of agricultural intensification and diversification.
- Development and growth of the agri-business sector.
- The promotion of the development of tourism services and facilities in the Blackstairs Mountains and the development of tourism along the River Barrow and Slaney River, all of which form part of the Natura 2000 network.
- Development of walking and cycling routes.
- Development of tourist products in rural areas, including the development of improved amenities and accommodation in towns and villages.
- Promotion of mineral/lime extraction.
- Increase in recreational demand and facilities associated with the increased population.
- Industrial and commercial development.
- Proposed construction of a new bio-refinery for sugar beet.
- Development and facilitation of pharmaceutical industries.
- Development of a logistics park.
- Infrastructural renewal and development of electricity networks.
- The extension of the gas network within the county.
- The promotion of the development of wind energy.
- Promotion of other renewable energy including solar, bio-energy, hydroelectric projects, and heat energy distribution.
- Development of the bioenergy sector, including the development of anaerobic digesters and biofuel processing plants.
- Development of telecommunication structures/networks.
- Development of social infrastructure.
- Development of infrastructure associated with educational facilities, e.g., footpaths, parking facilities, pedestrian crossings, etc.
- The encouragement/development of ground source heat pumps.

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[7] Natura Impact Report in Support of the Appropriate Assessment of the Draft Carlow County Development Plan 2015-2021 http://www.carlow.ie/SiteCollectionDocuments/Publications/Draft%20Carlow%20County%20Development%20Plan/appendix-2-appropriate-assessment.pdf



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- Flood risk and management Strategy.

Another project with potential for in-combination effects is the Eirgrid project that crosses County Carlow. Currently there is no way of examining the exact nature of the project and in any event there are no likely impacts.

The potential risk for leaching of nitrates (or other chemicals) is the normal risk posed by agriculture and this risk is mitigated by nitrate management plans at the individual farms. There is no additional risk in this regard posed by the OTCL facility.

In conclusion, for the OTCL facility, all potential negative impacts to Natura 2000 sites have been screened out and in that regard 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.

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# FIGURES

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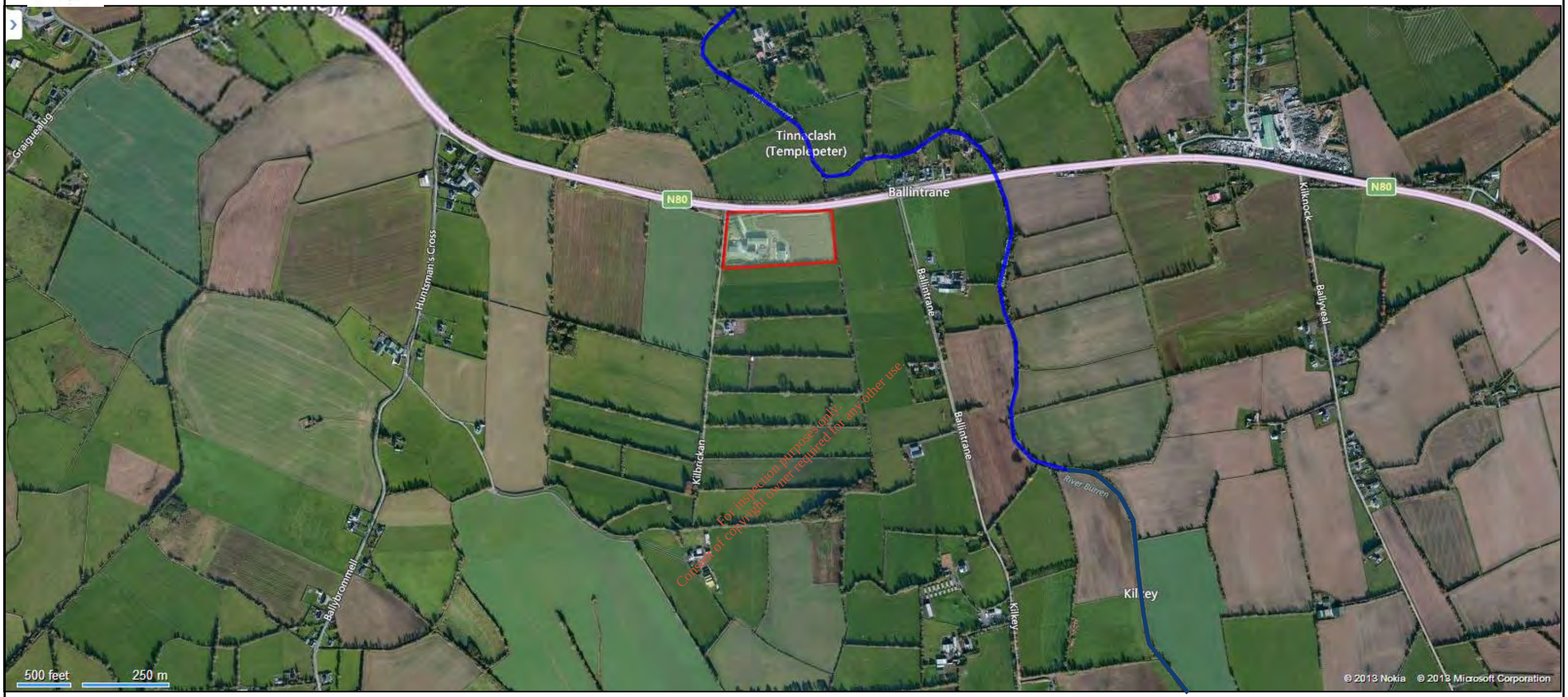
N

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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: Jul 14 | Drawn: AW |

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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 |

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- House and Farmyard
- Farmyard
- House
- Free Range – Chicken/Turkey Farm / Slaughter House

| | | | | | | |
|---|---|---|---|---|---|---|
| Client: O'Toole Composting Ltd | | | Drawing: Developments with 1km of OTCL Facility | | | |
| Job: Screening Statement of Proposed Expansion | | | | | | |
| | Drawing Number: Figure 3 | Status: Final | Sht. Size: A4 | Scale: As shown | Date: Nov 14 | Drawn: AW |

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# APPENDIX A

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# 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.

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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).

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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.

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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

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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*.

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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

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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*.

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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*),

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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.

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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

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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.

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O'Toole Composting – PL14/251 - FI Request:

The applicant is requested to provide further details on surface water discharge including source and extent of the discharges which should be compared against the relevant parameters in the Surface Water Regulations.

Response: The source of the proposed surface water discharges is rainwater falling on the impermeable hardstanding areas. These areas are shown in the attached surface water drawing. The sum of these areas is 4322 square metres. This water will be directed to the discharge point shown on the drawing via the proposed interceptor (see response to question 4 (c).

Please note that all rainfall from the roofs of the buildings is either harvested for firewater, for use in the composting process or discharged separately.

Surface water monitoring has been carried out at the facility since 2011 and the results are appended in the EIS Volume 3 Section. These are summarised below in tabular form and compared with the limits given in the Surface Water Regulations S.I. 272 of 2009.

**Date of sampling: 2/4/2013**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 1 | 1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 1 | 1 | Not defined |
| Ammonia mg/l $NH_3$ | 0.10 | 0.22 | ≤0.140 for rivers with good status |
| pH | 7.5 | 7.7 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 25 | 15 | Not defined but drinking water standard is 1000mg/l |

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**Date of sampling: 18/10/2013**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | <1 | <1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 2 | 3 | Not defined |
| Ammonia mg/l $NH_3$ | 0.31 | 0.09 | ≤0.140 for rivers with good status |
| pH | 7.9 | 7.9 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 2 | 6 | Not defined but drinking water standard is 1000mg/l |

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**Date of sampling: 26/11/2013**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 0.08 | 0.06 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 60 | 53 | Not defined |
| Ammonia mg/l $NH_3$ | 0.01 | 0.04 | ≤0.140 for rivers with good status |
| pH | 7.6 | 7.7 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 7 | 6 | Not defined but drinking water standard is 1000mg/l |

**Date of sampling: 18/12/2013**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 2 | <1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 8 | <1 | Not defined |
| Ammonia mg/l $NH_3$ | 0.12 | 0.06 | ≤0.140 for rivers with good status |
| pH | 7.6 | 7.7 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | <1 | <1 | Not defined but drinking water standard is 1000mg/l |

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**Date of sampling: 20/01/2012**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 2 | 2 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 21 | 18 | Not defined |
| Ammonia mg/l $NH_3$ | <0.01 | <0.01 | ≤0.140 for rivers with good status |
| pH | 7.7 | 7.9 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 3 | <1 | Not defined but drinking water standard is 1000mg/l |

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**Date of sampling: 05/04/2012**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | <1 | <1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 5 | 2 | Not defined |
| Ammonia mg/l $NH_3$ | <0.01 | <0.01 | ≤0.140 for rivers with good status |
| pH | 7.8 | 7.9 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 4 | <1 | Not defined but drinking water standard is 1000mg/l |

**Date of sampling: 27/07/2012**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | <1 | 1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 21 | <1 | Not defined |
| Ammonia mg/l $NH_3$ | 0.74 | 0.48 | ≤0.140 for rivers with good status |
| pH | 7.7 | 7.8 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 1 | 4 | Not defined but drinking water standard is 1000mg/l |

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**Date of sampling: 06/11/2012**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 1 | 1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 21 | 10 | Not defined |
| Ammonia mg/l $NH_3$ | 0.04 | 0.02 | ≤0.140 for rivers with good status |
| pH | 7.3 | 7.5 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 2 | 4 | Not defined but drinking water standard is 1000mg/l |

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**Date of sampling: 20/12/2012**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 2 | 1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 24 | 11 | Not defined |
| Ammonia mg/l $NH_3$ | 0.18 | 0.17 | ≤0.140 for rivers with good status |
| pH | 8.0 | 8.0 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 13 | 2 | Not defined but drinking water standard is 1000mg/l |

**Date of sampling: 01/12/2011**

| Parameter | SW1 | SW2 | Surface Water Regulations |
|---|---|---|---|
| Biochemical Oxygen Demand mg/l | 1 | <1 | <2.6 mg $O_2$/l for rivers with good status |
| Chemical Oxygen Demand mg/l | 9 | 5 | Not defined |
| Ammonia mg/l $NH_3$ | 0.02 | 0.02 | ≤0.140 for rivers with good status |
| pH | 7.6 | 7.5 | Soft water 4.5 – 9.0 Hard water 6.0 – 9.0 |
| Total Suspended Solids mg/l | 3 | <1 | Not defined but drinking water standard is 1000mg/l |

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82.8

312.145

NATIONAL ROUTE N80
TO CARLOW TOWN

D1
PM1

c.EXISTING SITE ENTRANCE

ENTRANCE GATE

EXISTING EFFLUENT TREATMENT PLANT

PERCOLATION AREA

A4

9.455

80.9

N1

SW2

STREAM

79

S.28

"C"
Bring centre for municipal waste(**0.327 HECTARES**)

SET DOWN ONLY

SET DOWN ONLY

SET DOWN ONLY

WB

WEIGH BRIDGE

EXISTING BORE WELL LOCATION

OFFICE

LOCAL ACCESS ROAD - JOCKS LANE

PLANTED BERTH

A1

82.7

D3
PM2

DIRECTION OF FALL

TUNNEL LOADING AREA

SECTION OF ROOF WHERE RAIN WATER IN HARVESTED

"B"

EXISTING SKIP SHED

EXISTING SKIP SHED

COMPOSTING UNIT

BIO FILTER

TUNNEL 1

TUNNEL 2

TUNNEL 3

DIRECTION OF FALL

DIRECTION OF FALL

DIRECTION OF FALL

"A"
PROPOSED BIO FILTER

PROPOSED BIO FILTER "A"

PROPOSED OIL INCEPTOR

SW1

D2
A5

N2

353.758

c.SITE BOUNDARY CLEARLY DELINEATED IN RED

154.112

Air Sensitve Receptors

Dust Monitoring Locations

PM10 Monitoring Locations

Noise Monitoring Locations

Surface Water Monitoring Locations

SMH01 PROPOSED SURFACE WATER DRAIN, ROAD GULLIES AND MANHOLES TO THE REQUIREMENTS OF BS 5911: PART 200. MANHOLE COVERS AND FRAMES TO IS EN 124

SMH01 EXISTING SURFACE WATER DRAIN (ROOF ONLY), ROAD GULLIES AND MANHOLES TO THE REQUIREMENTS OF BS 5911: PART 200. MANHOLE COVERS AND FRAMES TO IS EN 124

SMH01 EXISTING SURFACE WATER DRAIN (YARD ONLY), ROAD GULLIES AND MANHOLES TO THE REQUIREMENTS OF BS 5911: PART 200. MANHOLE COVERS AND FRAMES TO IS EN 124

SMH01 PROPOSED SURFACE WATER DRAIN (YARD ONLY), ROAD GULLIES AND MANHOLES TO THE REQUIREMENTS OF BS 5911: PART 200. MANHOLE COVERS AND FRAMES TO IS EN 124

SITE AREA OUTLINED IN RED
5.0273 HECTARES

LEGENDS AND COLOUR CODED
Existing Structure where Planning Permission has been obtained.
Denotes: Extension and alterations and proposed works

NORTH POINT - TIME CLOCK
WINTER SUNLIGHT
SUMMER SUNLIGHT

WATER SOURCE: BORE WELL
METHOD OF SEWAGE DISPOSAL : PROPRIETY EFFLUENT TREATMENT SYSTEM AND DISTRIBUTION BOX AND PERCOLATION AREA

METHOD OF SURFACE WATER DISPOSAL : WATER COURSE & RAIN WATER HARVESTING,

SITE AREA OUTLINE IN RED : c. 0.3957 HA.
ORDNANCE SURVEY MAP NUMBER O.S. CW008, CW013
DIGITAL MAP 4417, 4475,

ADJOINING PROPERTIES: NORTH EAST & SOUTHWEST OF THE PROPOSED DWELLING

Planning permission is sought by O'Toole Composting Ltd. for the following developments at Ballintrane, Fenagh, Co. Carlow: (a) instillation of 2 no bio-filters; (b) development of truck intake air lock building; (c) development of a bring centre for domestic waste; (d) intensification of use of facility resulting in acceptance and processing of 40,000 tonnes per annum of material for composting and 20,000 tonnes per annum of general waste for recycling and recovery; and (e) all associated site works.

SW1 and Sw2

O'Toole Composting — ORGANIC FOOD WASTE MANAGEMENT SPECIALISTS

O'Toole Skip Hire

KEHOE
ARCHITECTURAL DESIGN
DECLAN THOMAS KEHOE
1A SOUTHCOURT
WEXFORD ROAD BUSINESS PARK
CARLOW
059 9130 8214
059 915 3003
WEB: WWW.KEHOEDESIGN.IE
EMAIL: DECLAN@KEHOEDESIGN.IE

JOB:

TITLE: SITE LAYOUT PLAN SURFACE WATER DRAINAGE

DATE: 20/11/2014 SCALE: 1/500

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

ADDRESS: Ballintrane, Fenagh, Carlow.

FILE NAME:

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

## SURFACE WATER

The total rainfall in millimetres for Oak Park Weather Station in 2011-2014 is displayed below in Table 1. Oak Park weather station is 16km away from O'Tooles Composting. The averages for each month over the 4 years are also worked out below.

*Table 1: Average Rainfall in Oak Park Weather Station*

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | 147.2 | 176.7 | 65 | 52.6 | 78.6 | 61.9 | 24.6 | 122.1 | 18.2 | 138.2 | 46.6 | | 931.7 |
| 2013 | 76.2 | 35.8 | 57.6 | 44.4 | 35.6 | 37.5 | 32.3 | 85.6 | 24.4 | 170 | 27.7 | 136.6 | 763.7 |
| 2012 | 70.8 | 24.5 | 18 | 56.3 | 50.2 | 162.6 | 76.2 | 127.7 | 37.9 | 63.4 | 80.9 | 68.1 | 836.6 |
| 2011 | 50.6 | 121.9 | 16 | 19.5 | 50.7 | 75.2 | 46.4 | 25.5 | 93.9 | 93.9 | 89.2 | 55.5 | 738.3 |
| Mean | 80.4 | 57.3 | 63.4 | 55.9 | 59.8 | 60.8 | 58.7 | 71.9 | 69.6 | 92.9 | 85.9 | 83.6 | 840.2 |

**(Source: http://www.met.ie/climate/monthly-data.asp?Num=375)**

The calculation to work out the expected rainfall in a certain area is as follows: 1 mm of rain on 1 square metre of roof area produces 1 litre of water. Calculations for each location can be seen below in Table 2.

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*Table 2: Annual Average Rainfall for Each Location*

| Location | Area | Annual Average Rainfall |
|---|---|---|
| Car park tarmac surface (Excluding road) | 493 Sq M | 414,219 Litres |
| Concrete around skip shed | 1015 Sq M | 852,803 Litres |
| Bring centre | 2814 Sq M | 2,364,323 Litres |
| Skip Shed (roof) | 1249 Sq M | 1,049,410 Litres |
| Composting shed including proposed works (Excluding front Shed) | 3767 Sq M | 3,165,033 Litres |

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## Technical Data Sheet: CP8 BP Bypass Oil Water Separator.

**Type:** Class 1 Separator - Discharged effluent to contain < 5 mg/litre when tested in accordance with IS EN 858.

**Max. Treated Flow:** 8 l/s

**Storm Flow:** 80 l/s

**Max. Catchment Area:** 4,400 $m^2$

**Lid:** Conventionally reinforced precast concrete lid.

**Separator:** Steel fibre reinforced precast concrete tank with integral steel fibre reinforced concrete internal weir and baffle walls.

**Coalescer:** 'Ortner Wassertechnic' FIC 10 with float type automatic closure device. (Closure device automatically shuts the outlet from the main separation chamber if the oil storage capacity is exceeded)

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**Load Capacity:**

The tank and lid are designed for a soil overburden depth of up to 1m and the most critical of a 10 $kN/m^2$ imposed UDL or a 5,850 kg wheel load acting at any point on the lid surface. Heavy duty lids can be manufactured for more onerous load applications.

**Materials:**

| | |
|---|---|
| Concrete: | |
| Strength Grade: | C60/75 (75N) |
| Min. Cement Content: | 350 $kg/m^3$ |
| Max. Water / Cement Ratio | 0.5 |
| Max. Aggregate Size: | 14mm |
| Max. Slump: | Not applicable – Self compacting mix. |
| Additives: | Glenium – Plasticiser / Water reducing agent. |
| | Crushed Limestone Powder – Filler |
| Reinforcement: | |
| Lid: | High yield type two reinforcement to BS 4449 |
| Tank: | 40 $kg/m^3$ - 47/1.0 'Duoloc' Steel fibre reinforcement |



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**Liquid Retention:**

The separator is designed to be watertight in accordance with BS 8007 – 'Code of practice for design of concrete structures for retaining aqueous liquids'.

**Ventilation:**

The main separation chamber should be ventilated in accordance with BS 8301 – 'Code of practice for building drainage'. A 100mm diameter opening is provided in the lid for this purpose.

**Design Life:**

The separator & lid have a design life of 50 years in a 'severe' category environment as defined by BS 8110.

**Warranty:**

The product warranty covers the first fifteen years from the date of delivery.

**Manufacture:**

Quality of manufacture, standard of workmanship & dimensional tolerances comply with BS 8110 Pt. 1. The separator is cast in one pour to prevent the formation of a cold joint. All precast concrete elements are cured for a minimum of 48 hours prior to delivery.

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**Access Requirements:**

The separator and lid are generally delivered on a platform bodied truck with a hydraulic jib. Up to 6m reach is possible from the back of the truck to the centre point of the placement position. A minimum of 4m entrance width and clear height are required.

**Excavation & Base preparation requirements:**

The depth of excavation should exceed the finished base level by a minimum of 150mm. The excavation should then be brought to level using crushed rock aggregate (40mm max. size), which must be compacted and levelled. In exceptional circumstances (Particularly heavy surface loading or unusually soft ground) a reinforced concrete base may be required.



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The sides of the excavation must be suitably battered to avoid risk of collapse. To minimise the risks associated with deep, open excavations it is recommended that completion should be coordinated to coincide with the arrival of the separator. During placement it is imperative that personnel do not stand beneath a suspended load.

The safety of the excavation and the general works remains the responsibility of the purchaser.

**Backfilling**

The excavation may be backfilled using excavated material provided that topsoil is not used below a depth of 150mm and the backfill is free of large stones and cobbles (Larger than 75mm approx.). Where excavated material is unsuitable for backfilling crushed rock fill may be used (50mm maximum diameter). Backfilling should be completed in horizontal layers not exceeding 500mm depth, lightly compacted on completion of each layer. The lid should be placed in position before backfilling begins to avoid unnecessary contamination of the separator.

**Fitting of Connecting Pipes:**

The inlet and outlet openings are fitted with moulded EDPM wall seals permitting a push through seal of connecting pipes (Up to 300mm diameter). The wall seals have an expected working life of greater than 50 years and are watertight to 0.5 Bar of external water pressure.

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**Floatation:**

It is important to note that the separator will float if submerged in water when empty. If it is anticipated that external water levels will rise higher than 550mm above the base of the separator then a floatation check must be performed. Pending the result of this check appropriate anti floatation measures may be required. These measures include adding additional soil overburden or drilling steel dowel bars into the separator at base level and pouring a hoop of insitu ballast concrete.

**Design Compliances:**

| | |
|---|---|
| BS 8007 | Code of practice for design of concrete structures for retaining aqueous liquids. |
| BS 8110: Pt. 1 | The structural use of concrete |
| | Dramix Design Guidelines for Steel Fibre Reinforced Concrete Structures - BEKAERT. |
| PPG3 | Use & Design of Oil Separators in Surface Water Drainage Systems – EPA |
| IS EN 858: Pt.1 | Separator Systems for light liquids. |



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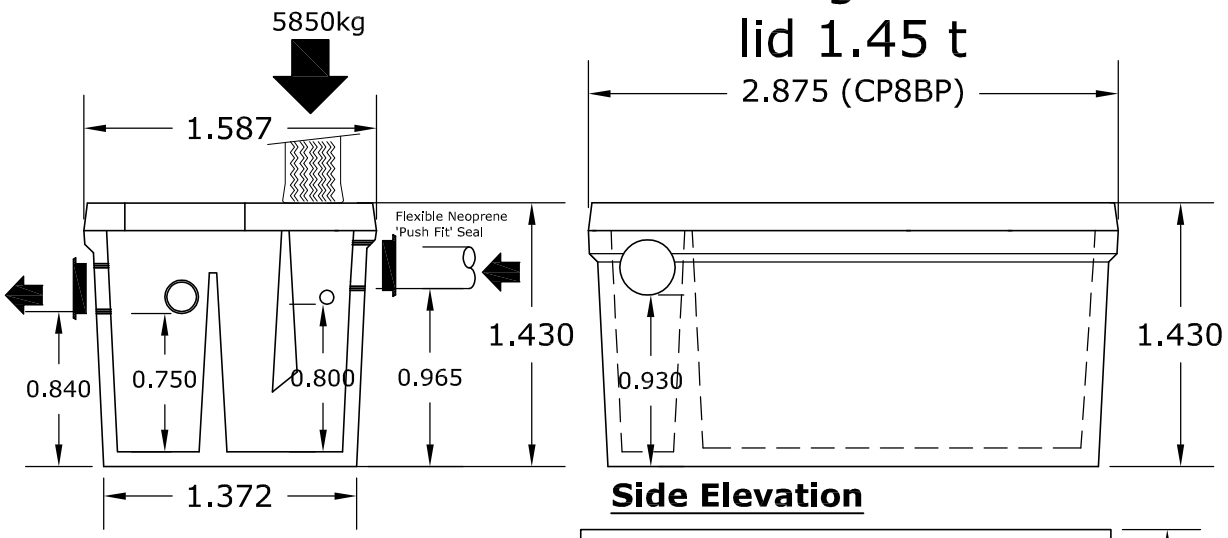
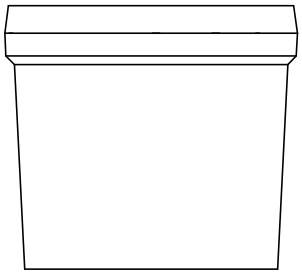
[redacted] CARLOW CONCRETE TANKS.
Kilknock, Ballon, Co. Carlow Tel: 05991 59100, Fax: 05991 59831, e-mail: sales@carlowtanks.com
*Manufacturers of Septic and Effluent Tanks, Pump Chambers, Reservoirs, Interceptors and Special Products*

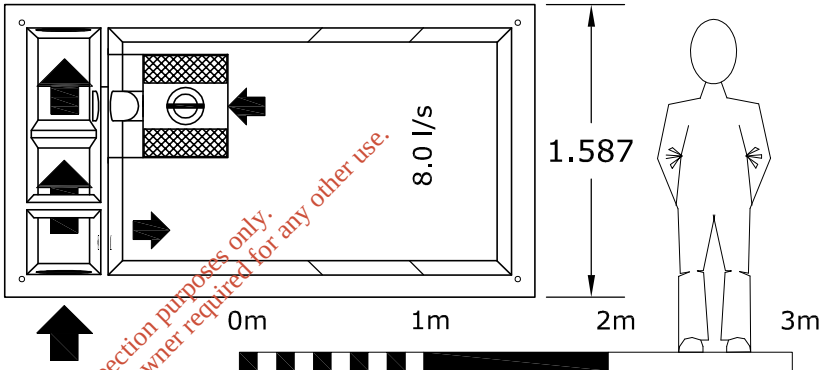
## Modular Bypass Interceptor CP8BP

weight base 3.6t
lid 1.45 t



### Side Elevation

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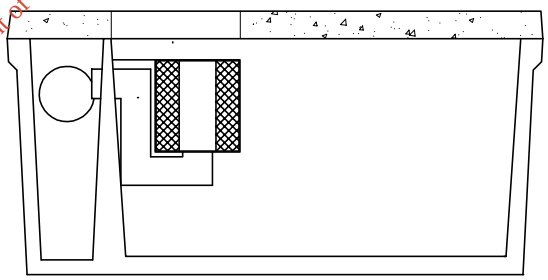
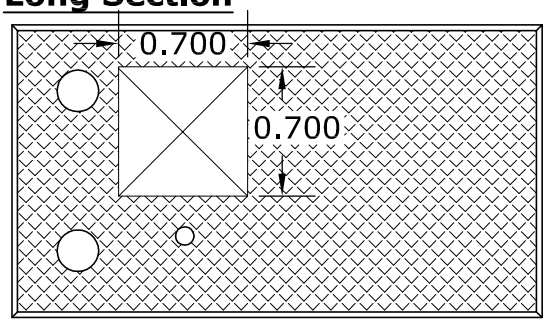
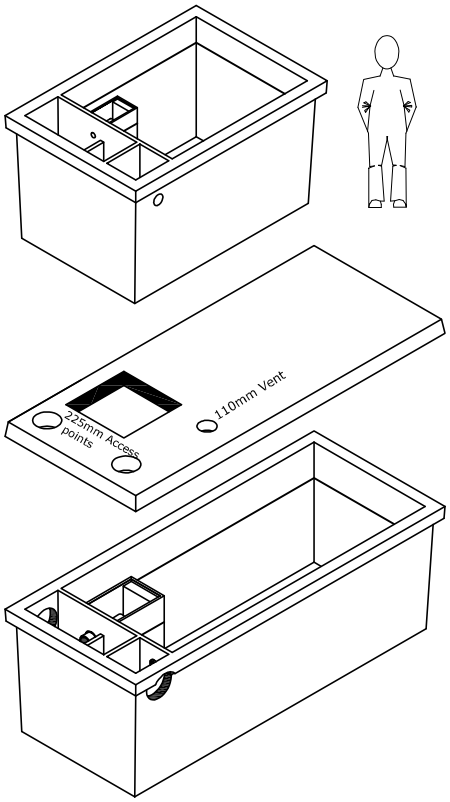
### Internal Plan



### Long Section




### Roof Plan




| | Nominal Flow | Storm Flow | Area Drained (m2) | Standard Pipe Size | Crossfall | Invert to Base | Nominal Oil Storage |
|---|---|---|---|---|---|---|---|
| **CP8BP** | 8.0l/s | 80l/s | 4400 | 225Dia | 125mm | 965mm | 120 l |

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## LANDSCAPE

### Introduction

This chapter assesses the effects of the proposed developments to the existing composting and waste management facility on the landscape and visual amenities of the area. The aim of a landscape character assessment is to identify the elements of the landscape which make it unique and the extent to which it is possible to alter these landscapes before unacceptable consequences arise. Landscape character represents the individuality of an area based on its particular combination of features and elements. The purpose of this assessment is to evaluate the existing landscape character of the site and surroundings, to assess the visual impact of the proposed developments and to identify landscape designations and planning policies that may concern the subject site and its environs.

The assessment has been undertaken in accordance with best practice, legislation and guidance notes. The methodology used is based on the Environmental Protection Agency Documents; *Guidelines on the Information to be contained in Environmental Impact Statements (2002)* and *Advice notes on current practise in the preparation of Environmental Impact Statements (2003),* and the Landscape Institute and Institute of Environmental Management & Assessment Document *Guidelines for Landscape and Visual Impact Assessment* (2013).

The aforementioned documents recommend baseline studies to describe, classify and appraise the existing landscape and visual properties, focusing on any sensitive receptors in the area and the ability of the landscape to accommodate the proposed development changes that will occur at the subject facility at Ballintrane, Fenagh, Co. Carlow. This is established through a collective process of desktop study and onsite survey work. Once the baseline conditions were established it allowed for the identification of impacts, and an assessment of their magnitude and significance on the landscape character and visual amenities of the area.

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A judgement on the sensitivity of the landscape is made from a combination of the susceptibility of the landscape to development and therefore change and the value attached to that landscape. This is determined by way of existing designations both legislative and non-legislative for scenic beauty, landscape quality, recreational value, significant importance, rarity etc. Visual sensitivity is determined by a combination of judgements about the susceptibility of visual receptors such as dwellings, roads, scenic spots etc. to changes in visual amenity and the value attached to these views. The *Guidelines for Landscape and Visual Impact Assessment* states that the aim is "to establish the area in which the development will be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points".

The following documents were reviewed as part of the baseline study;

- The Carlow County Development Plan 2009-2015
- The Heritage Council: Historic Landscape Characterisation in Ireland: Best Practice Guidance 2013
- Published and unpublished literature and data from relevant national guidelines, studies, surveys and reports

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- EPA ENVISION mapping http://maps.epa.ie/internetmapviewer/mapviewer.asp
- The National Parks and Wildlife Service (NPWS) website www.npws.ie

***Table 1: Criteria for Assessing Impact Magnitude***

| **Impact Magnitude** | **Definition** |
|---|---|
| Imperceptible Impact: | An impact capable of measurement but without noticeable consequences |
| Minor Impact: | An impact which causes noticeable changes in the character of the environment without affecting its sensitivities |
| Moderate Impact: | An impact that alters the character of the environment in a manner that is consistent with the existing and emerging trends |
| Significant Impact: | An impact which, by its character, magnitude, duration or intensity alters a sensitive aspects of the environment |
| Profound Impact: | An impact which obliterates sensitive characteristics |

The duration of the effect (i.e. permanent or temporary, short, medium or long-term) were also taken into account in this assessment and the following duration of impacts apply:

- Temporary Impact - Impact lasting for one year or less.
- Short Term Impact - Impact lasting one to seven years.
- Medium Impact - Impact lasting seven to fifteen years.
- Long Term Impact - Impact lasting fifteen to sixty years.
- Permanent Impact - Impact lasting over sixty years.

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### 3.9.2 The Existing Environment

The subject facility is located in the townland of Ballintrane in Fenagh, Co. Carlow. The site which is 4.87 hectares is located in a largely rural area where the predominant land use is for agriculture. The rural housing in the area is largely low density, one-off and follows a typical pattern for extensive agriculture tending to be dispersed with some local concentrations in a linear pattern along roadways. The closest dwelling is located approximately 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.

The area is serviced by an extensive road network; the N80 Carlow-Rosslare Road marks the northern boundary of the site, whilst a local access road runs along the western boundary. The M9 Dublin/Waterford Motorway is approximately 6km to the northwest and the N81 Carlow-Dublin National Road approximately 5km to the east. There is a wide splayed entrance to the facility 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 (See figure 2 below). The entrance to the site is paved in concrete hardstand. Concrete hardstand also extends around the waste storage and processing buildings. The terrain surrounding the site tends toward a low-lying, mildly undulating landscape. The buildings on site are of a typical agricultural style common to the area and are comprised of concrete blockwork with a steel cladding painted dark green.

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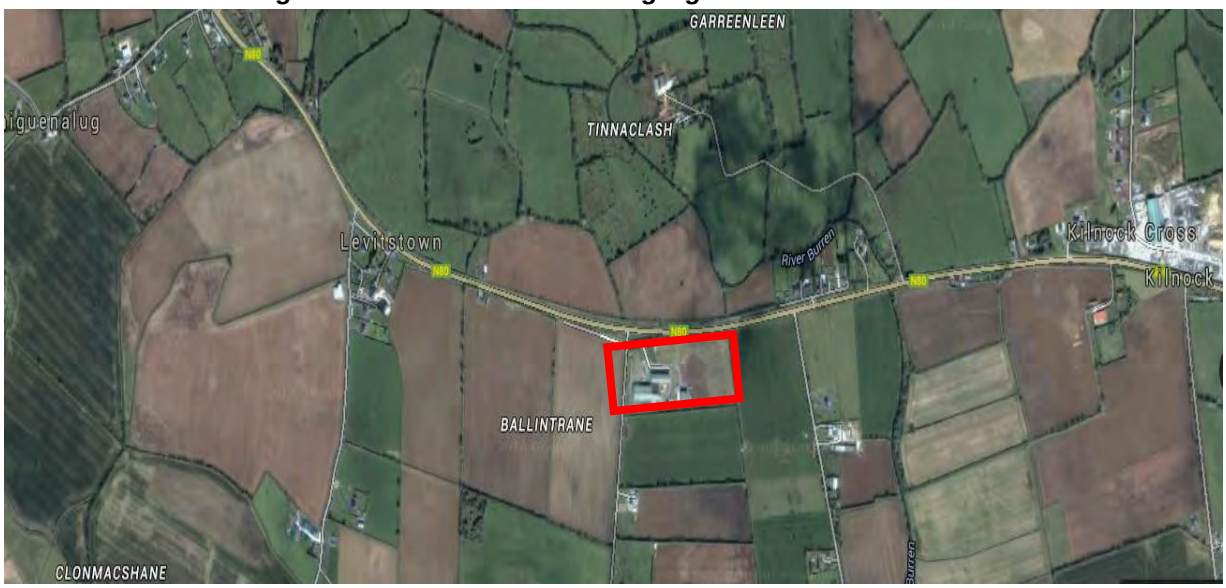
***Figure 1: Site Location Showing Agricultural Surrounds***




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. The roadside boundaries are well defined and offer significant screening. The perimeter of the facility is bounded by mature hedgerows and a planted berth at the west and north of the site which screens the facility from surrounding dwellings and adjoining roadways. This shelterbelt presents the appearance of the site being well-wooded. The planted berths and mature hedgerow also create a buffer to the surrounding agricultural lands and ensure that the existing development has no visual impact. To the west, the site is bounded by a local access road-Jocks Lane. The south of the facility is bounded by agricultural land with the N80 roadway bounding the north of the facility. The east of the facility is bounded by agricultural land which is detached from the facility by a local stream. 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.

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***Figure 2: Site Entrance Showing Screening***

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**Identification of Designated Sites both Statutory and Non-Statutory**

The subject site and surrounding area is not located within a statutory designated area, in fact the nearest Natura 2000 site is over 6.4km away to the East (Slaney River Valley Site Code: 000781). A list of Natura 2000 Sites within a 15km radius of the OTCL facility is shown below in Table 2. There are no SPAs within 15km, or indeed within Co. Carlow. There are also no visual or landscape designations for the subject site in the current County Development Plan. There are no scenic routes or viewpoints located along this section of the N80 and it has no non-statutory designations. There is therefore no impact or potential for impact to the landscape or visual amenity of any designated sites from the proposed operations.

***Table 2 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 |

**Landscape Character**

Landscape Character Types (LCT's) and Landscape Character Areas (LCA's) are set out in Appendix 8 of the Carlow County Development Plan 2009-2015. LCT's are generic areas of distinctive character which may occur in several places across the County. LCTs are used to categorise the more geographically specific LCA's. The Landscape Character Assessment divides Carlow into 4 landscape character types (LCTs). These are:

- Central Lowlands
- River Slaney - East Rolling Farmland
- Blackstairs and Mount Leinster Uplands
- Killeshin Hills

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These LCTs are sub-divided into 9 geographically specific landscape character areas. The LCA includes recommendations that seek to protect and enhance the landscape character, and facilitate and guide sensitively designed development. In the Landscape Assessment of the Carlow County Development Plan, the existing compost facility is located within the Central Lowlands Character Area of County Carlow (See Figure 3 below).This central plain landscape character area occupies a substantial portion of the County and includes the County's major settlements. The landscape is primarily rural, with medium to quite large fields defined by well maintained and generally low hedges. Since the 1950's field enlargement has taken place to accommodate larger farm machinery, and has involved the removal of hedges and trees.

The boundary of the area is based on soil types and topography. Its historically determined land uses derive from the high fertility of the soil and the gentle topography. The topography is underlain by limestone in the western portion of the area (flanking the Barrow River), and by granite in the east where the O'Toole Composting Facility is located. This area within the slightly higher, eastern portion of this landscape area is underlain by granite bedrock. This often results in rounded hills characterising the landscape, such as around Nurney, and at Ballon Hill.

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***Figure 3: Landscape Character Areas in Carlow***


Views within and from the Character Area are generally open and expansive except where restricted by buildings, plantations or ridges. Distant views include the Blackstairs, the Wicklow Mountains, the Castlecomer Plateau/ Western Uplands and Brandon Hill. The farmed ridges found in the north and west of the area are prominent features and can delimit views

Objectives in the County Development Plan for the Central Lowlands Character Area include:

- *To continue and encourage the improved management of field boundaries such as hedgerows and stone walls and hunting copses/ wooded copses.*
- *Facilitate the development of sustainable rural industries that encourage interaction between urban and rural landscapes and dwellers, e.g. farmer's markets.*
- *Maintain the existing grain of the landscape with its well-developed pattern of fields, hedgerows, trees and shelterbelts.*
- *Discourage the replacement of hedgerow boundaries with wire fences.*
- *Encourage the use of native and indigenous planting in new developments to integrate buildings into the surrounding landscape. Compile a list of suitable trees and shrubs for planting in the County.*

The LCA deems the Central Lowlands character area to be moderately sensitive to development with the capacity to absorb most types of development subject to the implementation of appropriate mitigation measures such as integrating proposed buildings into the surrounding landscape.

### 3.9.4 Impact Assessment

This section of the EIS assesses the possible impacts to the landscape and the visual amenity of the area as a result of the proposed development at the OTCL facility. Both qualitative and quantitative information has been used to identify the significant impacts, including the positive, negative, direct, indirect and the cumulative effects from the operations at the site.

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### 3.9.4.1 Landscape Impact

The subject site has been operating as a composting facility and a waste transfer station since 2005. The applicant is not proposing any alterations to the existing land use on site. The landscape of the area will not change as a result of the on-site operations and the existing topography will remain as low lying land in an agricultural setting adjacent to a national road.

The site itself is well screened due to extensive planting of thick screening berms. This has not only provided a natural shelter around the facility but has also provided a habitat for a diverse range of wildlife species and is in keeping with the company's green profile.

This also fits in with the LCA recommendations to; "*Maintain the existing grain of the landscape with its well-developed pattern of fields, hedgerows, trees and shelterbelts."* It also conforms to the recommendation in the LCA to; *"Encourage the use of native and indigenous planting in new developments to integrate buildings into the surrounding landscape."*

The subject site represents a very small component of the overall landscape and from a distance has very little visibility, the proposed development even less so. It is therefore considered that there will be no undue consequences for the maintenance of the baseline situation and the vulnerability of the landscape to change from the proposal is assessed as being minor.

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### Visual Impact

As part of the visual impact assessment for the subject site a zone of visual influence (ZVI) was established which included the sensitive visual receptors in the area surrounding the site and allowed for a determination of the impact of the proposed developments on their visual amenity (see Figure 4 below). The sensitive receptors that the proposed development may impact on includes dwellings, public roads, scenic routes, and viewpoints.

Visibility of the existing facility is limited due to its small footprint, the natural topography of the area, and the screening berms surrounding the site itself. In fact from the north and west of the site the facility is entirely screened from view. The primary extent of the ZVI is therefore located to the northeast, east and south of the site where the national road and local road run and where the principal sensitive receptors are located. This area of visibility includes a zone that stretches for approximately 2km to the south, the majority of which is privately owned and therefore not publicly accessible.

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***Figure 4: Zone of Theoretical Visibitlity***


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Primary Sensitive Receptors:

Along the section of the N80 to the north east and the local road to the east any visual impact is limited due to a combination of the low lying landscape and the existing mature hedgerows. The subject site is at its most visible when travelling north along the local access road 'Jock's Lane' where the roof of the existing facility can be glimpsed over the tops of the trees along the hedgerow to the southwest and on the local access road to the east of the facility (Please see Plates 1 and 2 below). The green cladding on the existing composting building ensures the facility has a minimal impact to its visibility at this point. In fact the facility looks no different to other agricultural buildings dotted around this landscape and is only visible on the horizon. The closest dwelling to the subject site is located approximately 170 meters directly south of the facility along Jocks Lane. This is a two storey dormer and its view of the facility is minor as it faces away from the facility and is surrounded by fully mature Beech trees and hedgerows (See Plate 1 below).

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*Figure 5: View of Facility from Closest Sensitive Receptor to the South*


***Plate 1***

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*Figure 6: View of Facility from the Local Access Road to the East*


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The facility was established in 2005 and as such the existing planted berms and boundaries are mature and extensive. This tree lined berm offers a natural barrier around the OTCL facility and insures the site has a low visual impact to local residents and the surrounding area. The existing development has integrated into the surrounding landscape and has a limited visible outline from either the N80 (See Plate 3 below) or the local access road serving the site on the western boundary.

***Figure 7: View of Subject Site Travelling East to West on the N80***


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**Plate 3**

The proposed development will have no impact on the existing landscape and its visual amenity nor will it increase the visibility of the premises within this rural setting. The potential impacts from the proposed additional infrastructure on the existing landscape of the area are considered insignificant. The height of the existing building will not be increased and there are no chimney stacks or plumes proposed as part of this development. The additional infrastructure will not have any impact on the overall footprint of the site and will not increase its visibility in the landscape to anything greater than its existing outline. The subject site has been operating as a composting and waste management facility since 2005. OTCL are not proposing any alterations to the existing land use on site but are simply proposing to extend their existing operations. The landscape of the area will not change as a result of the proposal and the existing topography will remain as low lying land in an agricultural setting adjacent to

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a national road. The site itself is well screened due to extensive planting of native trees and bushes in keeping with the company's green profile.

### 3.9.5 Mitigation Measures

Going forward all existing screening and bunding on site will be maintained to an optimum level for the duration of the facilities operations. Following the cessation of composting processes on site, restoration will commence in line with the aftercare management plan specific to the site and in accordance with the IED license conditions, and the site easily converted back to its previous agricultural use. As a result of the above measures the impact of the purposed development on the land use character of the area is considered minor.

### 3.9.6 Conclusion

The proposed development will have no impact on the existing landscape and its visual amenity. It is an established site with mature boundaries and planting. The existing development has integrated into the surrounding landscape and is not visible from either the N80 or the local access road serving the site on the western boundary. The potential impacts from the proposed additional infrastructure on the existing landscape of the area are considered insignificant. The subject site has been operating as a waste management facility since 2005. OTCL are not proposing any alterations to the existing land use on site but are simply proposing to extend their existing operations. The landscape of the area will not change as a result of the proposal and the existing topography will remain as low lying land in an agricultural setting adjacent to a national road. The site itself is well screened due to extensive planting of native trees and bushes in keeping with the company's green profile.

Following cessation of the waste recycling and processing facility, site restoration will commence in line with the aftercare management plan specific to the site and in accordance with the IED license conditions. As a result of the above measures the landscape and visual impact of the proposed development on the landscape character of the area is considered to be long-term in duration and minor in impact.

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## Further Information Request: 4(h) - The applicant is requested to submit further details on the use of the LA90 level as a compliance standard and reference should be made to EPA Guidance.

## Further Information Response:

The 2012 EPA document '*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)'* describes LA90 as;

'A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to describe a background level. Measured using the "Fast" time weighting.'

The impact of traffic noise was a significant interference during surveying at some of the locations at the subject site. Where traffic noise is interfering with noise measurements the above mentioned document outlines that it is acceptable to assess noise compliance against LA90 for the monitoring period. This would represent a statistical measurement of the noise level exceeded for 90% of the time which would largely be associated with the subject facility.

Also of particular relevance to the subject site is the FAQ issued by the EPA in relation to NG4 where Question 5 asks; with regard to interference noise from off -site activities such as road traffic causing a breach in LAeq license limits, should the LA90 readings be used to compare levels detected to license limits?

- Answer: The LA90 is considered to be appropriate in this situation, as long as the reason for using this noise index is clearly outlined in the report, but the LAeq should also be included for information purposes (as well as some comments on the main noise sources ex. external traffic). See section 7.9 of the guidance document.

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The annual noise reports for 2011, 2012 and 2013 whose baseline data was used as part of this EIS all clearly outline the reasoning for using LA90 namely because of the proximity of the O'Toole Composting facility to the N80 road, a national secondary road which resulted in significant background interference from traffic movement throughout all the surveys. This resulted in the daytime and nightime LAeq levels exceeding broadband levels at some of the monitoring locations. The main noise source at these locations were the continuous traffic movements along the N80. EPA guidance in relation to locations like this is to use LA90 to give a more representative outlook of noise emanating from the subject facility. As required in the EPA FAQ these monitoring reports also include the LAeq levels and the maximum levels. (Please See Appendices Volume 3.5.3 for full copies of these reports).

The EPA NG4 report also states that *'for some noise surveys, the LAF90,T index may be used to give a good indication of the actual noise output from the site, where the noise emissions on site are relatively steady and extraneous noises may unduly influence the measured LAeq,T. The report should clearly interpret the noise results and highlight whether noise from the activity or extraneous noise sources are the dominant contributors to the noise levels measured. This interpretation should be based on the various noise measurements and any comments included on the dominant and/or intermittent sources of noise at the various measurement locations'.*

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The three Noise Monitoring Reports used in this EIS include comments on each of the monitoring locations and give a brief description of the sources of noise and an interpretation of the results in line with the EPA NG4 Guidance Document. For example the November 2013 Noise Survey carried out by Axis Environmental Services states in relation to the daytime monitoring location N4 that the '*main source of noise at this point was the continuous movements of traffic on the N80, in which the meter was located 8 meters from. The guidance for a location like this is the use the LA90 for assessment of noise from the O'Toole Composting Facility to reduce the interference from traffic movements. Other sources of noise at this point were birds chirping in nearby vegetation. There was no noise audible from the O'Toole Composting Facility at this point'.* The report thereby justifies its use of LA90 and gives a clear interpretation of the results.

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**Further Information Request: 4(i) - The Original Noise Reports have not been transcribed correctly. LA90 levels have been interchanged with LA10 levels and should be corrected.**

**Please find amended noise tables 27-34 attached in response to this request.**

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*Table 27: Daytime Results October 2013*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LAFMAX | LA90 |
| N3 | 24/10/2013 13:55 | Primary source of noise here was farm machinery operating nearby | 41 | 65 | 37 |
| N4 | 24/10/2013 14:47 | Continuous N80 Road Traffic noise | 69 | 83 | 50 |
| N6 | 24/10/2013 14:03 | Traffic from local access road and birds chirping were main sources of noise | 62 | 93 | 42 |

*Table 28: Night-time Results September 2013*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LAFMAX | LA90 |
| N3 | 13/11/2013 22:05 | Low noise environment | 52 | 63 | 45 |
| N4 | 13/11/2013 22:05 | N80 Road traffic noise dominant no audible noise from GTCL | 59 | 85 | 44 |
| N6 | 13/11/2013 22:51 | Traffic from the N80 the most significant source of noise | 55 | 76 | 43 |

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*Table 29: Daytime Results September 2012*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LAFMAX | LA 90 |
| N1A | 03/10/2012 14:58 | N80 Road Traffic noise dominant throughout | 67 | 80 | 52 |
| N2 | 03/10/2012 15:33 | Fan noise and operational noise from inside sheds | 53 | 81 | 49 |
| N3 | 03/10/2012 15:47 | Distance traffic noise. Passing vehicle approx distance 2 m | 51 | 74 | 44 |
| N4 | 03/10/2012 16:34 | N80 Road Traffic noise dominant | 68 | 80 | 53 |
| N5 | 03/10/2012 06:25 | Continuous traffic noise from N80 | 76 | 92 | 54 |
| N6 | 03/10/2012 17:02 | Traffic from local access road and birds chirping were main sources of noise | 65 | 87 | 47 |

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*Table 30: Night-time Results October 2012*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LAFMAX | LA90 |
| N1A | 03/10/2012 20:29 | Traffic from N80 the predominant noise source | 57 | 85 | 39 |
| N2 | 03/10/2012 19:55 | Low noise environment. Extractor fans dominant. | 43 | 52 | 41 |
| N3 | 03/10/2012 20:09 | Low noise environment. Vehicles using private cul de sac passing directly by the meter | 46 | 76 | 36 |
| N4 | 03/10/2012 20:56 | N80 Road Traffic noise dominant. | 62 | 84 | 40 |
| N5 | 03/10/2012 21:00 | N80 Road Traffic noise dominant dog barking beside meter | 65 | 82 | 38 |
| N6 | 03/10/2012 19:12 | Traffic movements on local access road and N80 | 61 | 85 | 43 |

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*Table 31: Daytime Results September 2011*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LA10 | LA90 |
| N1 | 24/09/2011 13:28 | N80 Road Traffic Noise dominant/Occasional truck entering/exiting premises | 47 | 44 | 62 |
| N1A | 24/09/2011 12:21 | N80 Road Traffic noise dominant throughout | 57 | 46 | 65 |
| N2 | 24/09/2011 12:56 | Quiet environment. Continuous fan noise broadband in characteristic. | 47 | 49 | 53 |
| N3 | 24/09/2011 14:00 | Distance traffic noise. Occasional passing vehicle. | 50 | 41 | 56 |
| N4 | 24/09/2011 13:28 | N80 Road Traffic noise dominant. Trucks passing (>90dB recorded) | 62 | 45 | 70 |
| N5 | 24/09/2011 07:57 | Almost continuous traffic noise. Passing conversation | 60 | 37 | 68 |
| N6 | 24/09/2011 07:20 | Occasional passing vehicle. Distant traffic noise. | 49 | 47 | 56 |

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*Table 32: Night-time Results September 2011*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LA10 | LA90 |
| N1 | 24/09/2011 05:00 | Occasional traffic from N80 | 40 | 38 | 51 |
| N1A | 24/09/2011 06:00 | Occasional traffic from N80 | 39 | 38 | 44 |
| N2 | 24/09/2011 05:41 | Low noise environment. Extractor fans dominant. Occasional rustle in trees | 39 | 37 | 41 |
| N3 | 24/09/2011 05:17 | Low noise environment. Extractor fans dominant. Rustle in trees | 38 | 35 | 40 |
| N4 | 24/09/2011 06:23 | N80 Road Traffic noise dominant. | 51 | 38 | 57 |
| N5 | 24/09/2011 06:57 | N80 Road Traffic noise dominant. Passing trucks and tractors (>90 dB recorded) | 60 | 38 | 69 |
| N6 | 24/09/2011 06:40 | Quiet overall. No site noise audible. | 42 | 40 | 48 |

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*Table 33: Daytime Results September 2010*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LA90 | LA10 |
| N1 | 30/09/2010 12:35 | N80 road traffic dominant throughout | 57 | 44 | 62 |
| N1A | 30/09/2010 13:11 | N80 road traffic dominant throughout | 57 | 45 | 64 |
| N2 | 30/09/2010 13:59 | Fan noise and machinery inside of shed | 52 | 48 | 58 |
| N3 | 30/09/2010 14:44 | Distant Traffic Noise, occasional rustle | 51 | 42 | 53 |
| N4 | 30/09/2010 15:20 | N80 Road Traffic noise dominant. | 66 | 44 | 70 |
| N5 | 30/09/2010 16:30 | Traffic noise dominant. | 67 | 55 | 73 |
| N6 | 24/09/2010 17:10 | Occasional passing traffic, wind began to strengthen with rain at end | 56 | 4 | 59 |

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*Table 34: Night-time Results September 2010*

| Location | Time and Date | Notes | Noise Levels dB(A) | | |
|---|---|---|---|---|---|
| | | | LAeq | LA90 | LA10 |
| N1 | 24/09/2011 05:00 | Occasional traffic from N80 | 42 | 38 | 44 |
| N1A | 24/09/2011 06:00 | Occasional traffic from N80 | 44 | 40 | 49 |
| N2 | 24/09/2011 05:41 | Low noise environment. Extractor fans dominant. Occasional rustle in trees | 39 | 36 | 41 |
| N3 | 24/09/2011 05:17 | Low noise environment. Extractor fans dominant. Rustle in trees | 37 | 36 | 439 |
| N4 | 24/09/2011 06:23 | N80 Road Traffic noise dominant. | 48 | 40 | 54 |
| N5 | 24/09/2011 06:57 | N80 Road Traffic noise dominant. Passing trucks and tractors (>90 dB recorded) | 50 | 41 | 56 |
| N6 | 24/09/2011 06:40 | Quiet overall. No site noise audible. | 42 | 40 | 48 |

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## Further Information Request: 4(j) - The examination of noise impacts from the upgraded plant should be expanded, following the amendments outlined above. This should include predicted LAeq and LA90 noise levels.

## Further Information Response:

The proposed upgraded plant includes the following components;

- A new bio-filter for the composting building.
- Installation of a bio-filter on the waste transfer and processing facility (skip shed).

The proposed bio-filters are the only upgraded plant proposed for this development. They will be installed so as not to adversely affect the existing ambient noise climate during both day and night time periods. The purpose built composting building and the inner housing for the proposed new bio-filter beside the skip shed will incorporate added noise insulation in order to ensure no added noise impacts on site. Additional roof fans associated with the bio-filters will not cause significant impact to the nearest sensitive receptors, as they will be similar in character and emission to those currently in operation without significant impact. Table 1 below outlines the noise output of the proposed improved plant.

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Due to nature of the proposed upgraded plant it will not have the potential to cause groundborne vibrations, and therefore an assessment of vibrational impacts was not required to be addressed as part of this impact assessment study. Items of plant will be secured and fitted with shock absorber cushions to ensure they remain fixed to the floor of the building. In the absence of these measures, the operation of the plant would not generate groundborne vibrations that would extend beyond the site.

It is proposed that two 30Kw fans, each with a noise level of 105 dB(A) will be installed. The predicted noise output for these fans is illustrated in Table 1 below.

*Table 1: Noise Output from the proposed new bio-filter fans at the Composting Building*

| Composting Building Bio-filter | No. Fans | dB (Lw) | dB (A) LwA |
|---|---|---|---|
| 2 x 30kw fan and motor | 2 | 111 | 105 |

There is also a proposed new bio-filter at the waste transfer and processing facility. This bio-filter will have a 30 Kw fan with a noise level of 105 dB (A). This fan will be located internally and will be insulated as required to limit noise.

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*Table 2: Noise Output from the Proposed Bio-filter at the Waste Processing Facility*

| Waste Transfer Facility Bio-Filter | No. Fans | dB (Lw) | dB (A) LwA |
|---|---|---|---|
| 1 x 30 Kw Motor and Fan | 1 | 111 | 105 |

An assessment of the noise generated by the addition of these fans to the nearest sensitive receptors and noise monitoring locations has been undertaken to determine if any noise impacts will occur as a result. A conservative 40dB has been used in the calculations for attenuation provided by the structure of the building itself.

Predicted noise levels have been estimated using the methodology described in BS: 5228: Noise and Control on Construction and Open Sites, 1997. Predictions are based on noise levels obtained from the manufacturer of the fans, intended to be used in the process. Predictions are based on a LAeq1hour value with fans operating for a continual period of 1 hour.

The noise impact of the additional fans proposed for the day time and night time periods have been predicted utilising baseline information gathered for the 2012 noise monitoring reports. These figures are presented in Tables 3 and 4 below respectively and include the cumulative impact of the predicted noise emission from the new fans on the existing noise climate.

*Table 3: Predicted Noise Impacts LAeq (Day)*

| | N1A | N2 | N3 | N4 | N5 | N6 |
|---|---|---|---|---|---|---|
| 2 x Proposed Fans | 3dB | 7dB | 5dB | 3dB | 3dB | 3dB |
| 1 x Proposed Fan | 3dB | 50dB | 20dB | 3dB | 3dB | 3dB |
| Existing Noise Climate | 67dB | 53dB | 51dB | 68dB | 76dB | 65dB |
| Combined Level LAeq 1 hour | 67dB | 55dB | 51dB | 68dB | 76dB | 65dB |
| Limit Value | 55dB | 55dB | 55dB | 55dB | 55dB | 55dB |

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*Table 4: Predicted Noise Impacts LAeq (Night)*

| | N1A | N2 | N3 | N4 | N5 | N6 |
|---|---|---|---|---|---|---|
| 2 x Proposed Fans | 3dB | 7dB | 5dB | 3dB | 3dB | 3dB |
| 1 x Proposed Fan | 3dB | 40dB | 20dB | 3dB | 3dB | 3dB |
| Existing Noise Climate | 57dB | 43dB | 46dB | 62dB | 65dB | 61dB |
| Combined Level LAeq 1 hour | 57dB | 45dB | 46dB | 62dB | 65dB | 61dB |
| Limit Value | 45dB | 45dB | 45dB | 45dB | 45dB | 45dB |

As can be seen from the tables above, the additions of the new bio-filter fans will not have a negative impact on the facility. The sensitive receptor N2, the closest monitoring point to the newly proposed bio-filters is expected to see small increase in noise levels. However this increase in noise levels in not expected to breach the 55dB limit on site. Further mitigation such as insulation will be employed if required in order to attain this limit

The main noise source at these locations is still expected to be the continuous traffic along the N80. This is illustrated in Tables 5 and 6 below which outline the predicted LA90 figures.

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EPA Guidance from the 2012 document '*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* in relation to locations like this is to use LA90 to give a more representative outlook of noise emanating from the subject facility. When the interference from traffic is removed, all monitoring points are determined to be in compliance. The figures show that noise due to the normal facility operations of the subject development does not exceed the daytime or night-time permitted levels.

*Table 5: Predicted Noise Impacts LA90 (Day)*

| | N1A | N2 | N3 | N4 | N5 | N6 |
|---|---|---|---|---|---|---|
| 2 x Proposed Fans | 6dB | 7dB | 8dB | 6dB | 6dB | 6dB |
| 1 x Proposed Fan | 9dB | 49dB | 37dB | 9dB | 9dB | 9dB |
| Existing Noise Climate | 52dB | 49dB | 44dB | 53dB | 54dB | 47dB |
| Combined Level | 52dB | 52dB | 44dB | 53dB | 54dB | 47dB |
| Applicable Limit Value | 55dB | 55dB | 55dB | 55dB | 55dB | 55dB |

*Table 6: Predicted Noise Impacts LA90 (Night)*

| | N1A | N2 | N3 | N4 | N5 | N6 |
|---|---|---|---|---|---|---|
| 2 x Proposed Fans | 3dB | 22dB | 17dB | 3dB | 3dB | 3dB |
| 1 x Proposed Fan | 6dB | 42dB | 27dB | 6dB | 6dB | 6dB |
| Existing Noise Climate | 39dB | 41dB | 36dB | 40dB | 38dB | 43dB |
| Combined Level | 39dB | 44dB | 36dB | 40dB | 38dB | 43dB |
| Applicable Limit Value | 45dB | 45dB | 45dB | 45dB | 45dB | 45dB |

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The following mitigation measures will be implemented with a view to reducing overall noise impacts on the noise sensitive locations:

- Extra noise insulation will be incorporated in the building design of the new bio-filter building that will be located beside the skip shed. This extra insulation will ensure that there are no negative noise impacts from the added bio-filter fan.
- The internal pavement of the facility should be improved to reduce vehicular noise, especially banging from empty trucks;
- Screening bunds close to the residences at the noise sensitive location should be maintained and the planting programme continued to further reduce potential noise impact;
- Periodic noise monitoring at the noise sensitive locations should be introduced to ensure that all national guidelines in relation to noise ELV's are being complied with; and
- A review of reversing sirens should take place with a view to examining their possible replacement with white sound technology.

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The equivalent continuous sound level (LAeq) of noise generated by all site activities at the nearest noise sensitive premises shall be limited to 55 dB(A) during the daytime period (08:00 to 22:00 hours) and 45 dB(A) during the night time period (22:00 to 08:00 hours) which will ensure that the impact of noise from the facility will be negligible. It is predicted that with noise attenuation provided by the facility building and distance attenuation between the site boundary and the nearest residential properties, these guidance noise limit values will be achieved.

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## 3.4 AIR QUALITY

### 3.4.1 Introduction

This chapter examines the potential for the proposed development to impact upon air quality within the vicinity of the subject site. The chapter describes the current baseline conditions at the site using existing monitoring data carried out in compliance with the conditions of the Waste Facility Permit: WFP-CW-10-0003-01 as reviewed by WFP-CW-14-5. This chapter also describes the assessment methodology, the likely significant environmental effects, the mitigation measures required to prevent, reduce or offset any significant adverse effects after these measures have been employed. It has been written with regard to current advice notes from the EPA for preparation of an Air Quality Chapter in an EIS.

In 1996, the Environment Council adopted the Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management (AAQ&M). The Directive sets a general policy framework for dealing with ambient air quality. Instead of looking first at the sources of the pollution, the Directive looks at the effects of the air pollution on human health and environments, and then shifts the focus to those sources that contribute the most to the effects. The main objectives of the Air Quality Framework Directive are:

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- Sets out an EU-wide system for setting binding air quality objectives for specific pollutants to protect human health and environment;
- Requires Member States to put in place systems for assessing the quality of the ambient air based upon common methods and criteria;
- Requires Member States to maintain ambient air quality where it is good and improve it in other cases, by means of plans and programmes of action and
- Lays down provisions for a system of gathering, reporting and publicising information. This includes both data to be reported to the European Commission and information to be disseminated to the public.

The Directive was incorporated into the EPA Act, 1992 (AAQ & M) Regulations, 1999 (S.I. No. 33 of 1999) and it covers the revision of previously existing legislation and the introduction of new air quality standards for previously unregulated air pollutants, setting the timetable for the development of daughter directives on a range of pollutants.

The Directive deals with each EU member state in terms of "Zones" and "Agglomerations". For Ireland, four zones are defined in the Air Quality Regulations (2002), amended by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations (2009).

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The main areas defined in each zone are:

- **Zone A:** Dublin Conurbation
- **Zone B:** Cork Conurbation
- **Zone C:** Other cities and large towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Letterkenny, Celbridge, Newbridge, Mullingar and Balbriggan.
- **Zone D:** Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

Air Quality for Zone D is currently classified as Very Good. The index is calculated by the EPA at their numerous monitoring stations around the country and is based on the latest available measurements of ozone, nitrogen dioxide, PM10 and sulphur dioxide in Zone D.

(FI-E) The Clean Air for Europe (CAFE) Directive (2008/50/EC) sets limits for specific pollutants. The CAFE Directive is an amalgamation of the Air Quality Framework Directive and its subsequent First, Second and Third Daughter Directives. The EU intends to incorporate the Fourth Daughter Directive into the CAFE Directive in the future. The CAFE Directive introduced no changes to existing limit values for SO2, NO2, NOX, CO, ozone, benzene and lead, however, the upper and lower assessment thresholds for PM10 were increased.

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The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999. The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).

These Directives;

- Establish limit values and as appropriate, alert thresholds for concentrations of certain pollutants in ambient air intended to avoid, prevent or reduce harmful effects on human health and the environment as a whole;
- Provide for the assessment of concentrations of certain pollutants in ambient air on the basis of methods and criteria common to the Member states of the EU;
- Provide for the obtaining of adequate information on concentrations of certain pollutants in ambient air and ensure that it is made available to the public, inter alia by means of alert thresholds and;
- Provide for the maintenance of ambient air quality where it is good and the improvement of ambient air quality in other cases with respect to certain pollutants.

The limit values set out in the CAFE Directive for Sulphur Dioxide, Nitrogen Dioxide, Oxides of Nitrogen, PM10, PM2.5 and Benzene are as follows in Table 8 below.

*Table 8: Limit Values from CAFE Directive 2008/50/EC*

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| Pollutant | Limit Value Objective | Averaging Period | Limit Value ug/m3 | Limit Value ppb | Basis of Application of the Limit Value | Limit Value Attainment Date |
|---|---|---|---|---|---|---|
| SO2 | Protection of human health | 1 hour | 350 | 132 | Not to be exceeded more than 24 times in a calendar year | 1 Jan 2005 |
| NO2 | Protection of human health | 1 hour | 200 | 105 | Not to be exceeded more than 18 times in a calendar year | 1 Jan 2010 |
| NO2 | Protection of human health | calendar year | 40 | 21 | Annual mean | 1 Jan 2010 |
| NO + NO 2 | Protection of ecosystems | calendar year | 30 | 16 | Annual mean | 19 July 2001 |
| PM10 | Protection of human health | 24 hours | 50 | | Not to be exceeded more than 35 times in a calendar year | 1 Jan 2005 |
| PM10 | Protection of human health | calendar year | 40 | - | Annual mean | 1 Jan 2005 |
| PM 2.5 Stage 1 | Protection of human health | calendar year | 25 | - | Annual mean | 1 Jan 2015 |
| PM 2.5 Stage 2 | Protection of human health | calendar year | 20 | - | Annual mean | 1 Jan 2020 |
| Benzene | Protection of human health | calendar year | 5 | 1.5 | Annual mean | 1 Jan 2010 |

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The primary national legislation for the control of air pollution is the Air Pollution Act, 1987 (SI No. 6/1987). This act provides a comprehensive statutory framework for the control of air quality by

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local authorities, specifically through 'orders' or 'plans' produced under Part IV Special Control Areas and Part V of Air Quality Management Plans and Standards to which Local Authorities must have regard to in planning or Waste Licence decisions. Part V of the Act also makes provision for transposing Air Quality Standards into law. The Act refers specifically to potential emissions of dust and or odours in section 24(2) which states 'The occupier of any premises shall not cause or permit an emission from such premises in such a quantity or in such a manner as to be a nuisance'.

Traffic derived pollutants, Oxides of Nitrogen, Volatile Organic Compounds, $PM_{10}$, $PM_{2.5}$, odour and the generation of dust are considered the main potential pollutants that may impact on the air quality during the construction and operational phases of the proposed development. Of particular importance in the instance of the subject proposal is the potential for the generation of odour and its impact on the air quality of the surrounding area.

### 3.4.2 The Existing Environment

#### 3.4.2.1 Dust

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Dust is defined as particulate matter in the range 1-75µm. The particles of dust between 1 and 10 µm are known as particulate matter <10 µm or 'suspended particles'. Particulate matter varies widely in its physical and chemical composition, source and particle size. Particulate matter arises from both man-made and natural sources. Natural sources include windblown dust, sea-salt and biological particles such as pollen. Man-made sources include large carbon particles from incomplete combustion, ash, dust particles from quarrying and construction activities and dust generated from road traffic. In general large particles do not stay in the atmosphere for long and are deposited close to their source, whereas small particles can be transported long distances. Particles, which are deposited to ground, give rise to problems such as soiling of buildings and other materials and also cause a general nuisance. In general the recommended guideline value for dust emissions is 350 mg/$m^2$/day.

In accordance with the Waste Facility Permit Number WFP-CW-10-0003-01 as reviewed by WFP-CW-14-5, dust monitoring is carried out biannually and at least once during the period May to September (See Volume 3: Appendix 4 for Monitoring Reports, 2010 -2013). The limit laid out in the permit for dust is 350mg/$m^2$/day. The sampling was carried out for O'Toole Composting by Axis Environmental Services in 2012 and 2013, IAS Laboratories in 2011, and Tel Labs in 2010. An analysis for environmental dust deposition on the site is given below in Table 9. Annual samples were required for 2010 and 2011 whilst in 2012 and 2013 the Waste Permit required bi-annual monitoring. The sampling was carried out in accordance with VDI 2110 Part 2 using Bergerhoff dust deposition gauges (German environmental standard for the monitoring of dust recognized by the EPA) at three locations shown on Figure of this document. The method works by leaving out onsite dust jars for a period of 30 days. The samples were analysed at IAS laboratories and Tel Labs respectively.

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*Table 9: Dust Monitoring Results for the O'Toole Facility*

| mg/m²/day | D1 | D2 | D3 |
|---|---|---|---|
| **Results 1 (June 2010)** | 45 | 51 | 55 |
| **Results 2 (July 2011)** | 17 | 10 | 47 |
| **Results 3 (April 2012)** | 33 | 0.4 | 0.8 |
| **Results 4 (Aug 2012)** | 0.3 | 4 | 7 |
| **Results 5 (May 2013)** | 115 | 88 | 165 |
| **Results 6 (Nov 2013)** | 0.2 | 0.2 | 0.8 |

As can be seen from the above table the level of deposition seen at all available locations is below the EPA guideline of 350mg/m$^2$/day deposition. All results are within the emission limit values as outlined in Waste Facility Permit Number WFP-CW-10-0003-01 which indicates that current dust mitigation measure are effective.

In general dust from waste processing activities on site is contained within the enclosed sheds. The main factors which affect the potential for airborne dust to be created and dispersed to sensitive receptors beyond the site boundary are road traffic and traffic on site. Although still well within the recommended limits dust levels on site increase in the summer months due to truck movements along the eastern portion of the site which is not fully covered in hard standing.

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#### 3.4.2.2 $PM_{10}$ & $PM_{2.5}$

Particulate matter with an aerodynamic diameter less than 10 microns is commonly known as $PM_{10}$. $PM_{10}$ arises from direct emissions of primary particulate such as black smoke and formation of secondary PM in the atmosphere by reactions of gases such as sulphur dioxide and ammonia. The main sources of primary $PM_{10}$ are incomplete burning of fossil fuels such as coal, oil and peat and emissions from road traffic, in particular diesel engines. Other sources of particulates include re-suspended dust from roads.

Directive 1999/30/EC (CEC, 1999) established limit values for $PM_{10}$ levels as follows; the $PM_{10}$ daily mean limit of 50 µg/m$^3$ should not be exceeded more than 35 times per calendar year. The annual mean $PM_{10}$ limit value is 40 µg/m$^3$.The current EPA data gives the air quality as very good.

$PM_{10}$ monitoring on site for 2010, 2011, 2012 and 2013 was carried out by BHP Laboratories in 2010 and 2011, and Axis Environmental Services in 2012 and 2013. Monitoring occurred at the three primary monitoring locations in all instances. The monitors were set up to sample $PM_{10}$ particles, i.e. inhalable dust, by attaching a 10µm particle knock out. As can be seen from Tables 9, 10 and 11 and 12 below, the concentration levels of $PM_{10}$ dust recorded at all 3 monitoring locations are below the limit values set down in the Air Quality Directive. However the results are not entirely comparable as the averaging period for each of the measurements was typically 15 minutes and thereby different to the averaging periods expressed in the Directive.

$PM_{2.5}$ or 'fine' particulate matter is particle pollution made of a mixture of solids and liquids of size 2.5 µm or less. It is composed of a number of varying components depending on its source. These

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can include acids such as nitrates and sulphates, VOCs, metals, and soil or dust particles. Thus $PM_{2.5}$ can be emitted directly into the atmosphere or can be formed secondarily. For example, sulphate particles are formed by the chemical reaction of SO2 in the atmosphere after its release from power plants or industrial facilities. $PM_{2.5}$ is considered a better indicator of man-made particulate matter than $PM_{10}$. The CAFE Directive introduced new obligations relating to fine particulate matter $PM_{2.5.}$, which is considered to be especially harmful to human health. Levels of $PM_{2.5.}$ in Ireland are generally low and Ireland is fully compliant with the new CAFE limit values and subsequently is below the Stage 1 and Stage 2 limit values. However, all Member States are required to calculate the current exposure of their population to $PM_{2.5.}$ and to take steps to reduce this exposure by 2020 with Ireland's requirement amounting to a 10% reduction in $PM_{2.5}$ concentration.

#### 3.4.2.2 Odour and Hydrogen Sulphide

In general the odours associated with waste are considered to be unpleasant and if detected at sensitive receptor locations may potentially lead to loss of amenity. 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).

An odour management programme, good management practises, and control over individual procedures, ensures that odour is not a major issue on site. Previous assessments of the baseline air quality on site (Volume 3: Appendix 4) have not found any significant odour.

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#### 3.4.2.3 Sulphur Dioxide ($SO_2$)

$SO_2$ is a gas which is formed when sulphur containing fuels mainly coal and oil are burned. Power stations are the principal source of sulphur dioxide ($SO_2$) emissions in Ireland, emitting 56 per cent of the total in 2008 according to EPA figures. $SO_2$ concentrations across Ireland and much of the European Union are low where industrial abatement technology has being successful. As a traffic-based pollutant, $SO_2$ is mainly emitted from vehicles running on diesel fuel, which will include most light goods vehicles (LGV's) and heavy goods vehicles (HGV'S). Ireland's national emission ceiling limit for $SO_2$ as defined in the 2008 CAFE Directive and S. I. No. 180 of 2011 in Irish Legislation is 42 kilotonnes (kt). Ireland achieved the emission ceiling in 2009 due to large decrease in $SO_2$ emissions across a range of sectors. This reflects significant switching from the use of oil and solid fuels to natural gas and reduced sulphur content in coal and oil in the power generation and industry sectors as well as the application of flue gas desulphurisation at the Moneypoint coal-fired power station which had been a key point source up to that point.

The $SO_2$ levels predicted at the nearest receptors are below the limits for the protection of human health at the relevant 1 hour and 24 hour limits according to the Air Dispersion Model completed by RPS. A fully copy of this report is included in Volume 3: Appendix 3.1.3. According to this report, the maximum 1 hour average GLC is predicted to be 72.25$\mu g/m^3$ on top of a background

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of 6μg/m$^3$ leading to levels of approximately 21% of the limit for the protection of human health (125μ/m$^3$).

#### 3.4.2.4 Nitrogen Oxides ($NO_x$)

The term oxide of nitrogen refers predominately to nitric oxide (NO) and nitrogen dioxide ($NO_2$). These Oxides are formed when nitrogen combines with oxygen at the high temperatures generated by fossil fuel combustion. Nitric oxide has no odour, or taste and is non-toxic. In the atmosphere it is rapidly oxidized to nitrogen dioxide by reaction with ozone. Nitrogen dioxide is a reddish-brown gas that has an irritating odour. It absorbs light and contributes to the yellow-brown haze sometimes seen hanging over cities. It is one of the main components of smog. Nitrogen oxides occur both naturally and from human activities. In nature, they are a result of bacterial processes, biological growth and decay, lighting, as well as forest and grassland fires. Traffic emissions are the principal source of anthropogenic nitrogen oxides and is responsible for approximately half the emissions in Europe ('Ireland's *Environment –A Millennium Report' EPA April 2000)*.

According to the Air Dispersion Model completed by RPS, the Nitrogen Oxides combustion emissions from the proposed development is well within the limits as set out for human health. The highest annual average ground level concentration at the nearest receptor is 2.82μg/m$^3$ which, on top of a background level of 4μg/m$^3$, results in an overall impact of 6.82μg/m$^3$. This is approximately 17% of the annual limit for the protection of human health (40μg/m$^3$). The maximum impact is predicted to occur to the east of the facility, consistent with the south-westerly prevailing winds.

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#### (FI- F)3.4.2.5 Volatile Organic Compounds (VOC's)

Organic compounds are chemicals that contain carbon and are found in all living things. VOCs are organic compounds that easily become vapors or gases. Along with carbon, they contain elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulfur or nitrogen. Many volatile organic compounds are also hazardous air pollutants. Volatile organic compounds (VOCs) are emitted as gases from the use of a wide array of products including paints, paint strippers, glues and adhesives and cleaning agents. Several constituents of gasoline are important VOCs, which are emitted by combustion and evaporation. VOCs also arise as a product of incomplete combustion of other fuels, especially solid fuels, and as such are significant emissions from residential fuel combustion. Individual VOCs may give rise to local air quality concerns but the principal environmental problem associated with VOC is their contribution to the formation of ground level ozone. The EU National Emissions Ceilings (NEC) Directive set a target of 55 kilotonnes (kt) of VOC emissions in Ireland by 2010 and in each year after 2010. This is equivalent to a 34.8 per cent reduction in emissions from the 84.4 kt 1990 baseline figure.

According to the EPA's report on Irelands Transboundary Gas Emissions in 2012, emissions of volatile organic compounds (VOC) across Ireland decreased by 47% between 1990 and 2012. Between 2011 and 2012 the decrease was 3%, due primarily to reductions in the transport sector. Please see figure 5 below for further details. The main sources of VOC emissions in Ireland are

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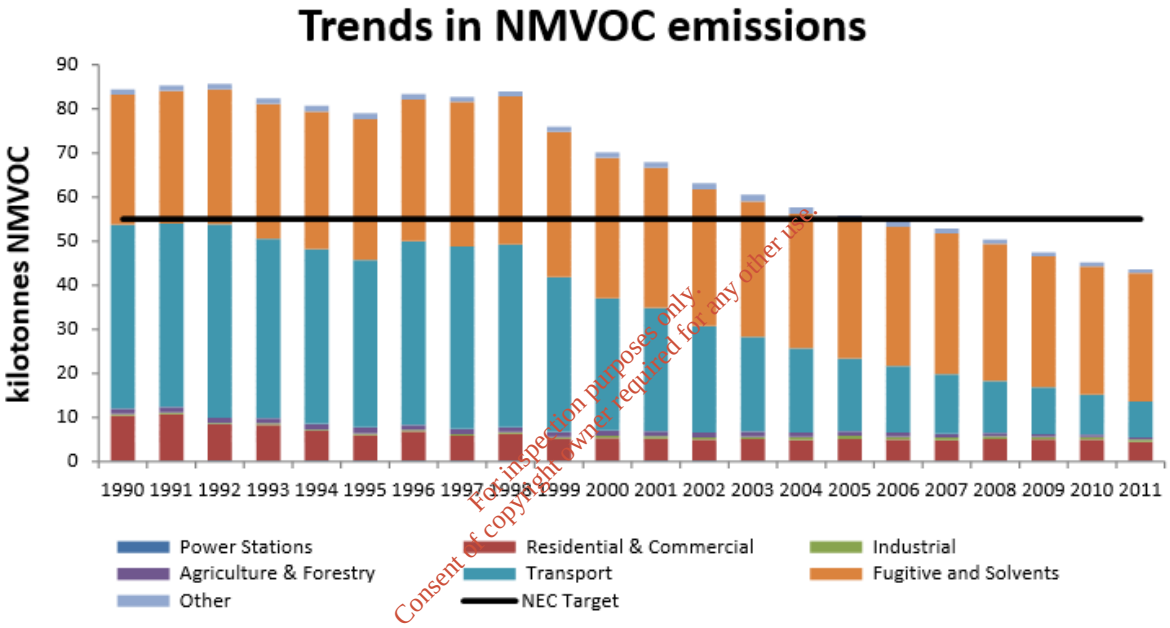
solvent use, transport, and emissions from domestic coal burning. Ireland's 2010 national emission ceiling for VOC was 55 kilotonnes. Emissions in 2006 were already below the 2010 ceiling. The data from 2012 shows Ireland to be 11.3 kilotonnes below the 2010 limit. VOC emission levels in the solvent use sector have remained relatively constant since 1990 even though drivers such as population, paint use, dry cleaning, and industrial activity have increased. This reflects a direct reduction in the VOC content of products such as paints. VOC emissions from transport have reduced due to improved EU standards in car manufacturing and the more widespread use of vehicle exhaust catalytic converters.

*Figure 5: Irelands Transboundary Gas Emissions in 2012 (Source EPA)*

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VOC's are released in vehicle exhaust gases either as unburned fuels or as combustion products and are also emitted by the evaporation of solvents and motor fuels. Certain VOC's are important because of the role they play in the photochemical formation of ozone in the atmosphere. The existing Waste Permit does not require specific monitoring for VOC's largely because there is no emissions point on site. The subject facility does not involve processes that use VOC containing paints or solvents, it is not a Vehicle Refinishers or a Dry Cleaners and does not manufacturer, produce, supply, wholesale and is not a major retailer of any or all of the products listed in Schedule 1 of the European Union (Paints, Varnishes, Vehicle Refinishing Products And Activities) Regulations 2012 and therefore further sampling is not required. The only composting processes on site that have the capability to generate VOC gases are from the plant and machinery used such as loaders and from traffic entering and exiting the site. VOC generation from the subject site is therefore minimal and will be well within the recommended limit values. The majority of VOC generation in this area of Carlow is primarily a result of vehicular traffic however, it is still well within relevant ambient air quality standards.

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In more general terms further reductions in VOC emissions depend largely on the effects of legislative controls on hydrocarbon emissions from road vehicles and on the benefits that result from implementation of EU Directives on solvents and on the solvent content of paints.

**(FI-G) 3.2.4.6 Bio-Aerosols**

Bio-aerosols are generated when organic matter including bacteria, fungi and yeasts become airborne. These particles have the potential to travel within the air and cause adverse human health effects to those exposed. One of the major constituents of bio-aerosols that is known to cause adverse health effects in humans is Aspergillus Fumigatus. The resultant disease from exposure to this fungus is Aspergillosis. This disease mainly affects individuals with immune deficiencies. The fungus rarely affects healthy individuals even if they are exposed to high concentrations. Aspergillus is a widespread fungus and there is no evidence to suggest that concentrations arising from even conventional outdoor windrows pose any threat to public health. Historic monitoring data from 2010-2013 shown in Tables 10-13 below found no Aspergillus present. Please see Volume 3 Appendix 5.2 for full detailed reports. The recommended maximum threshold limit value for Total Bacteria is: 1000 CFUs/m3 for the total number of bio-aerosol particles. Bacterial concentration levels were well below this recommended threshold at all monitoring points. Full monitoring details are in Volume 3 Appendix 5.2. The monitoring found that there were no significant bio-aerosol impacts in the vicinity of the facility, with all reported bio-aerosol ambient air concentrations within the lower range of the assessment criterion.

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The proposed development will continue to function to the same standards that has resulted in no risk to human health from Aspergillus Fumigatus or Total Bacteria. It is considered that the proposed increase in tonnage will not result in an increase in the levels of Aspergillus Fumigatus or Total Bacteria as the operating procedures, comprehensive environmental management plan and strident housekeeping, will continue to operate to the same criteria that has resulted in no significant impacts to date. The processing and movements of organic material will all take place indoors within the facility. The temperature of the composting process is and will continue to be strictly controlled to ensure that the process temperature exceeds 60`C to minimise Aspergillus which grows at a temperature of between 20 and 50 degrees centigrade. Most bio-aerosols generated during the composting process occur during the mechanical treatment of biowaste and at the first stage of composting. These processes will be fully enclosed and the material accepted for composting will remain unchanged from current acceptance procedures. All process steps in the facility will be equipped with air extraction and bio-filter treatment of process air. It is therefore envisaged that no significant emissions of bio-aerosols will occur from the facility and that no impacts are expected

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*Table 10: Air Monitoring Results for OTCL 2013*

| Parameter | Up Wind | Down Wind | Facility offices |
|---|---|---|---|
| **PM10** | 13.4 µg/m3 | 17.5 µg/m3 | 53.7 µg/m3 |
| **Aspergillus** | 0 | 0 | **0** |
| **Total Bacteria** | 255 CFU/m3 | 117 CFU/m3 | 95.7 CFU/m3 |
| **H2S** | <0.0mg/m3 | <0.0mg/m3 | <0.0mg/m3 |
| **Mercaptans** | 5pp/m | 5pp/m | 5pp/m |
| **Ammonia** | 22pp/m | 22pp/m | 22pp/m |
| **Amines** | <0.0mg/m3 | <0.0mg/m3 | <0.0mg/m3 |
| **Odour** | No odour | No odour | No significant odour (compost building) |

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*Table 11: Air Monitoring Results for OTCL 2012*

| Parameter | Up Wind | Down Wind | Facility offices |
|---|---|---|---|
| **PM10** | 29 µg/m3 | 40 µg/m3 | 36 µg/m3 |
| **Aspergillus** | 0 | 0 | 0 |
| **Total Bacteria** | 96 CFU/m3 | 176 CFU/m3 | 344 CFU/m3 |
| **H2S** | <0.0mg/m3 | <0.0mg/m3 | <0.0mg/m3 |
| **Mercaptans** | <0.5mg/m3 | <0.5mg/m3 | <0.5mg/m3 |
| **Ammonia** | <0.25mg/m3 | <0.25mg/m3 | <0.25mg/m3 |
| **Amines** | <0.01mg/m3 | <0.01mg/m3 | <0.01mg/m3 |
| **Odour** | No odour | No odour | No significant odour (compost building) |

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*Table 12: Air Monitoring Results for OTCL 2011*

| Parameter | Up Wind | Down Wind | Facility offices |
|---|---|---|---|
| **PM10** | 41 µg/m3 | 33 µg/m3 | 42 µg/m3 |
| **Aspergillus** | 0 | 0 | 0 |
| **Total Bacteria** | 85 CFU/$m^3$ | 100 CFU/$m^3$ | 135 CFU/$m^3$ |
| **H2S** | <0.2mg/$m^3$ | <0.2mg/$m^3$ | <0.2mg/$m^3$ |
| **Mercaptans** | <0.5mg/$m^3$ | <0.5mg/$m^3$ | <0.5mg/$m^3$ |
| **Ammonia** | <0.25mg/$m^3$ | <0.25mg/$m^3$ | <0.25mg/$m^3$ |
| **Amines** | <0.01mg/$m^3$ | <0.01mg/$m^3$ | <0.01mg/$m^3$ |
| **Odour** | No odour | No odour | No significant odour (compost building) |

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*Table 13: Air Monitoring Results for OTCL September 2010*

| Parameter | Up Wind | Down Wind | Facility offices |
|---|---|---|---|
| **PM10** | 32 µg/m3 | 36 µg/m3 | 39 µg/m3 |
| **Aspergillus** | 0 | 0 | 0 |
| **Total Bacteria** | 20 CFU/m3 | 100 CFU/m3 | 130 CFU/m3 |
| **H2S** | <0.2mg/m3 | <0.2mg/m3 | <0.2mg/m3 |
| **Mercaptans** | <0.5mg/m3 | <0.5mg/m3 | <0.5mg/m3 |
| **Ammonia** | <0.25mg/m3 | <0.25mg/m3 | <0.25mg/m3 |
| **Amines** | <0.01mg/m3 | <0.01mg/m3 | <0.01mg/m3 |
| **Odour** | No odour | No odour | No significant odour (compost building) |

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### 3.4.3 The Predicted Impacts

The possible predicted impacts on air quality from the proposed developments at the OTCL facility are odour, hydrogen sulphide, and dust.

### 3.4.4 Construction Phase

As most of the infrastructure for this development is currently in place and as the proposal is predominantly for an expansion of existing activities it is anticipated that there will be a minimal construction phase. This will be restricted to the construction of the Civic Amenity Site, installation of a new bio-filter at the rear of the skip shed and the addition of an airlock to the composting building.

During this stage of the proposal the main potential impact to air quality will result from the generation of dust during the construction phase and the movement of additional traffic for construction purposes. However the short-term construction period required (less than 3 months for all significant works) to construct the proposed development will minimise the potential to impact on air quality.

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#### 3.4.4.1 Generation of Dust

The impact of fugitive dust generated from the construction phase will to a certain extent depend on wind direction, wind speed and rainfall. A limited amount of topsoil will be dug up during construction due to the existing ground levels and most of this overburden will be reused on site. Any construction waste generated will be retained on site and processed during the operational phase of the development. Fugitive dust may arise from the movement of construction vehicles on the existing hard standing area. However the level of dust is likely to be of a relatively short duration with minimal impact on the receiving environment.

#### 3.4.4.2 Traffic Pollutants

The movement of construction vehicles at the site during the construction phase of the development will generate exhaust fumes and subsequently an increase in the emissions of volatile organic compounds, nitrogen oxides, sulphur dioxide and $PM_{10}$. While the levels of these pollutants will increase temporarily during the construction phase strict adherence to 'good site/engineering practices' such as switching all vehicles off when not in use will minimise the generation of any unnecessary air emissions. In any event it is considered that the level of contamination emitted will be minimal and of short duration. Given that facility is located immediately beside the N80 and that the increased activity will have a negligible impact on traffic it is also expected that there will not be any increased impact on traffic related pollutants.

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### 3.4.5 Operational Phase

Once the proposed development is fully operational it is anticipated that it will result in a predicted 15 Heavy Goods Vehicular movements per day.

#### 3.4.5.1 Dust, $PM_{10}$ & $PM_{2.5}$

Dust production during day to day operations can be a significant environmental issue at composting facilities. This dust originates from both direct emissions from the composting process if not controlled and moisture levels are allowed to drop. Dust can also be generated by loading and unloading of material unto vehicles, transfer of material between buildings and general site operations.

The results of ongoing monitoring at the facility show that the current band of environmental dust emissions based on previous dust monitoring reports over a period of 4 years during 2010-2013 range between 1.0 and 165 mg/m$^2$/day with an average of 123 mg/m$^2$/day recorded in 2013. Taking this worst case scenario dust over the area would equate to 44,775 mg/m$^2$ per annum.

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## 3.8 Soil & Geology

### 3.8.1 Introduction

This section of the EIS examines the type of soils and geology underlying the site. A desk top study was carried out using information obtained from Geological Survey of Ireland (GSI) reports and comprehensive interactive mapping services. These reports include, Carlow Development Plan 2008, National Soil Survey of Ireland and interactive mapping software from www.gsi.ie.

There were no intrusive ground investigations such as boreholes, trial pits or auguring, undertaken as part of this study as the proposed development is an expansion of current operations at the site.

### 3.8.2 The Existing Environment

The site where the O'Toole Composting Facility is located is set in a rural area where the surrounding lands are predominantly agricultural. The facility has been in operation since 2004. Prior to this the site was a greenfield site used as agricultural land for grazing. Currently, the site is partially paved with concrete hardstand with green areas along the boundaries and to the east of the site. During the initial construction stage of the facility in 2004 and 2005 the upper soil horizons beneath the site were altered slightly, however it is felt that this has had no major impact to the natural area. Also due to the nature of the work that takes place in the facility and the fact that the facility has been built and in operation for the past 10 years, it is expected that there will no impact on the soils or geology.

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

The Carlow Development Plan 2008 states that Co. Carlow is underlain by a bedrock sequence that dates from the Palaeozoic Era, and is Ordovician to Upper Carboniferous in age. The county's macro-topography is influenced by the dominant bedrock lithologies and structures. Predominantly, the county is underlain by granite which covers almost two thirds of the county. Limestone, shales, slates and sandstone are the other predominant rock types cropping out elsewhere in the county. Overall, the bedrock surface is exposed rarely in the county, with outcrop and subcrop estimated at covering about 15% of the land surface.

The Blackstairs Granite and the Tullow Granite, both exposed in Carlow form part of the Leinster Granite. Extending from the Carlow-Wexford area northeast to Dublin Bay, the Leinster Granite is the largest body of granite in Ireland and Britain. It was intruded into the Lower Palaeozoic rocks towards the end of the Caledonian Orogeny, during early Devonian times (around 400 million years ago). The intrusion of the granite cooked and metamorphosed the surrounding country rock as it was emplaced, altering the mudstones of the Maulin Formation to micaceous phyllites and schists adjacent to the granite.

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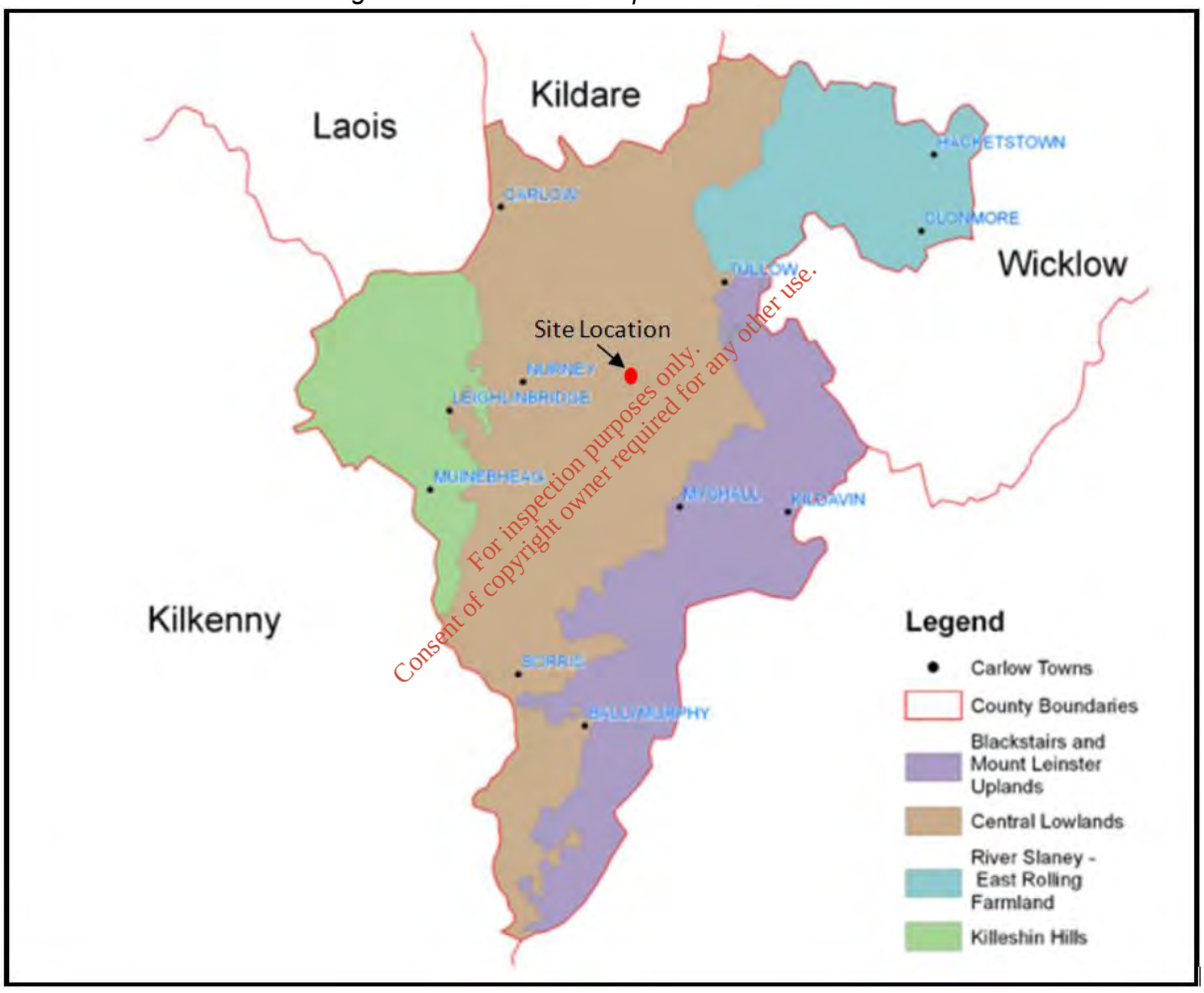
The oldest rocks are exposed in the easternmost portion of the County, around Clonegall, Kildavin and as far southwest as Slievebawn and were deposited during the Ordovician period (495-440 MY ago). These Ordovician rocks have generally been metamorphosed or partly metamorphosed by the later intrusion of the Leinster granites, and are schists, slates, siltstones and sandstones.

O'Tooles Composting Facility is located near the middle of the county, off the N80 main Carlow Wexford road, approximately 14km southeast of Carlow town. Published geological information from the National Soil Survey of Ireland identifies the bedrock in the area as Tullow Type 2 Sparsely Porphyritic Granite. This formation is Silurian to Devonian in age.

*Figure 6: Carlow Landscape Character Areas*

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*(Source: Carlow Landscape Character Assessment April 2008)*

According to the Carlow Landscape Assessment 2008, the composting facility is located within the Central Lowlands Character Area of County Carlow. This central plain landscape character area occupies a substantial portion of the County and includes the County's major settlements. Refer to figure 6 above for details. The landscape is primarily rural, with medium to quite large fields defined by well maintained and generally low hedges. Since the 1950's field enlargement has taken place to accommodate larger farm machinery, and has involved the removal of hedges and trees.

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The boundary of the area is based on soil types and topography. Its historically determined land uses derive from the high fertility of the soil and the gentle topography. The topography is underlain by limestone in the western portion of the area (flanking the Barrow River), and by granite in the east.

*Figure 7: Geology of Co. Carlow*


*(Source: Carlow Landscape Character Assessment April 2008)*

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O'Tooles Composting Facility is located in the soil subgroup 1000 Typical Luvisols. These soils are associated with clay eluviation which results in a Bt horizon with significant accumulation of clay (argillic B horizon) compared to the overlying horizons. Base saturation is > 35%. An albic E horizon may be present between the A and Bt horizons. These soils are decalcified, thus soils that are calcareous do not have argillic B horizons. They correlate closest with the Luvisol Reference Soil Group of WRB (IUSS Working Group WRB 2006).

Within this group the soil is classified further as Elton 1000 C. This soil type is defined as a fine loamy drift with limestones. Please see Figure 8 below for a diagram displaying the topsoil attributes. The red dot is located on the loam section of the triangle which represents the Elton 1000C topsoil attributies.

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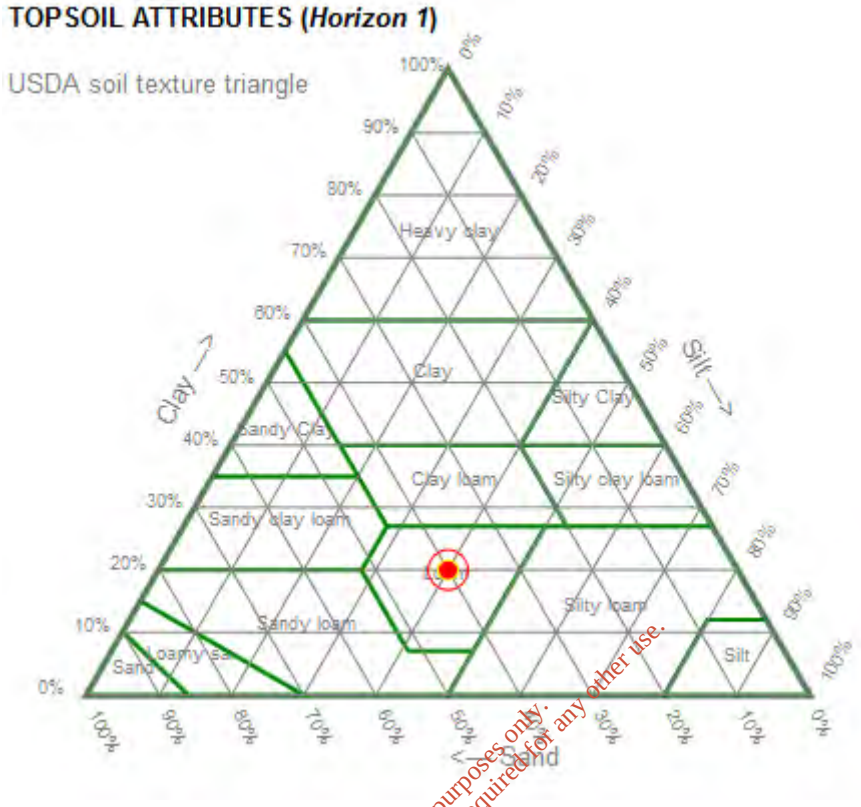
*Figure 8: Elton 1000C Topsoil Attributes*

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Figures 9, 10 and 11 below show a detailed breakdown of the make up of the different horizons associated within the Elton soil that is located on the O'Toole site.

*Figure 9: Horizon 1: 0 - 25 cm*

| | | | | | |
|---|---|---|---|---|---|
| **Humose:** | No | **Stones (% total):** | Few (2-5 %) | **HCL reaction:** | No reaction |
| **Matrix colour (moist):** | 10YR43 | **Stones details:** | Fine gravels (2-6 mm) | **Packing density:** | Medium |
| **Texture:** | Fine loamy | **Stickiness:** | Sticky | **Plasticity:** | Slightly plastic |
| | | | | **Textural Class (USDA):** | Loam |
| **TOTAL %** | | **PARTICLE SIZE %** | | **Bulk density:** | - |
| **Nitrogen:** | 0.24 | **Sand:** | 40% | **pH:** | 6.90 |
| **Carbon:** | 2.21 | **Silt:** | 40% | | |
| **Organic carbon:** | 1.94 | **Clay:** | 20% | | |
| **Loss on ignition:** | - | | | | |
| **EXCHANGEABLE COMPLEX** | | | | | |
| **Exchangeable Bases (cmol kg$^{-1}$)** | | **CEC (cmol kg$^{-1}$):** | 16.46 | | |
| **Na:** | 0.10 | **Base saturation:** | 96% | | |
| **K:** | 0.17 | | | | |
| **Mg:** | 0.80 | | | | |
| **Ca:** | 14.69 | | | | |

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*Figure 10: Horizon 2: 25 - 60 cm*

| | | | | | |
|---|---|---|---|---|---|
| **Humose:** | No | **Stones (% total):** | Common (5-15 %) | **HCL reaction:** | No reaction |
| **Matrix colour (moist):** | 75YR44 | **Humose:** | No | **Packing density:** | Medium |
| **Texture:** | Fine loamy | **Matrix colour (moist):** | 75YR44 | **Plasticity:** | Very plastic |
| | | **Texture:** | Fine loamy | | |
| **TOTAL %** | | **Stones details:** | Medium gravels (6mm -2 cm) | **Textural Class (USDA):** | Loam |
| **Nitrogen:** | 0.08 | **Stickiness:** | Very sticky | **Bulk density:** | - |
| **Carbon:** | 0.78 | **PARTICLE SIZE %** | | **pH:** | 7.37 |
| **Organic carbon:** | 0.57 | **Sand:** | 37% | | |
| **Loss on ignition:** | - | **Silt:** | 37% | | |
| **EXCHANGEABLE COMPLEX** | | **Clay:** | 26% | | |
| **Exchangeable Bases (cmol kg$^{-1}$)** | | **CEC (cmol kg$^{-1}$):** | 9.42 | | |
| **Na:** | 0.08 | **Base saturation:** | 100% | | |
| **K:** | 0.10 | | | | |
| **Mg:** | 0.79 | | | | |
| **Ca:** | 8.86 | | | | |

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Figure 11: Horizon 3: 60 - 120 cm

| | | | | | |
|---|---|---|---|---|---|
| **Humose:** | No | **Stones (% total):** | Abundant (40-80 %) | **HCL reaction:** | Extremely strong (thick foam) |
| **Matrix colour (moist):** | 10YR54 | **Stones details:** | Medium gravels (6mm -2 cm) | **Packing density:** | High |
| **Texture:** | Coarse loamy | **Stickiness:** | Slightly sticky | **Plasticity:** | Non-plastic |
| **TOTAL %** | | **PARTICLE SIZE %** | | | |
| **Nitrogen:** | 0.01 | **Sand:** | 57% | **Textural Class (USDA):** | Sandy Loam |
| **Carbon:** | 7.75 | **Silt:** | 29% | **Bulk density:** | - |
| **Organic carbon:** | 0.25 | **Clay:** | 14% | **pH:** | 8.56 |
| **Loss on ignition:** | - | | | | |
| **EXCHANGEABLE COMPLEX** | | | | | |
| **Exchangeable Bases (cmol kg$^{-1}$)** | | **CEC (cmol kg$^{-1}$):** | 8.63 | | |
| **Na:** | 0.08 | **Base saturation:** | 100% | | |
| **K:** | 0.05 | | | | |
| **Mg:** | 0.51 | | | | |
| **Ca:** | 32.03 | | | | |

### 3.8.3 The Predicted Impacts

There are no geological features of significance either at or beneath the site therefore the proposed development will have little or no impact on local geology. Taking into account that the ground works associated with this development are limited, a negligible impact is expected. The construction of the anaerobic digester is the only proposed groundwork, subject to planning permission being granted at a future date. There will be no direct discharges to the subsoil as part of the proposal and subsequently there will be no impacts to the underlying subsurface. There will be no extraction or removal off-site of sub-soils.

The potential interaction with groundwater is low due to the low porosity of granite. The site is underlain with a poor aquifer (refer to Section 3.2.2.6), therefore the potential for contaminants leaching to groundwater is low.

### 3.8.4 Mitigation Measures

Raw materials, intermediates and products used on site comprise of fuel (diesel, hydraulic oil, engine oil, Ad-Blue, coolants, water, detergent, disinfectants and lubricants for the vehicles and plant. A list of all chemicals and substances used on-site is maintained at the facility along with the applicable materials safety data sheets (MSDSs). Copies of the MSDSs for the principal fuels used on-site are included as part of this attachment. If new chemicals are ordered, an MSDS is requested with the first delivery of the product.

All plant associated liquids are stored in bunded areas. Bulk fuel storage at the site is located within tanks on-site, which are complete with integrity certificates.
All waste water runoff from the composting process is diverted to underground leachate sumps which store the waste water until it is reused in the composting process. There is no discharge from this sump. Any excess wastewater from the process is tankered offsite to a waste water treatment facility. The facility is underlain with granite bedrock which acts as a poor aquifer, further reducing the potential of penetration of discharges to groundwater sources.

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# MK Environmental Solutions Ltd.

*Ballingale,*
*Ferns,*
*Enniscorthy,*
*Co. Wexford.*

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**Job Description:** Further information request by Mr. Pat Connolly environmental section Carlow County Council.

**Client:** Mr. Patrick O'Toole. O'Toole Composting Ltd.

**Site Location:** Ballintrane, Fenagh, Co. Carlow.

**Date of request:** November 2014.

**Date of Inspection**: 13th of November 2014.

**Date of reporting**: 19th of November 2014.

*TEL/FAX: 053-9388333 086-3364102*
*Directors: M. Kehoe & C. Whelan.*
*VAT NO: IE6430807B*



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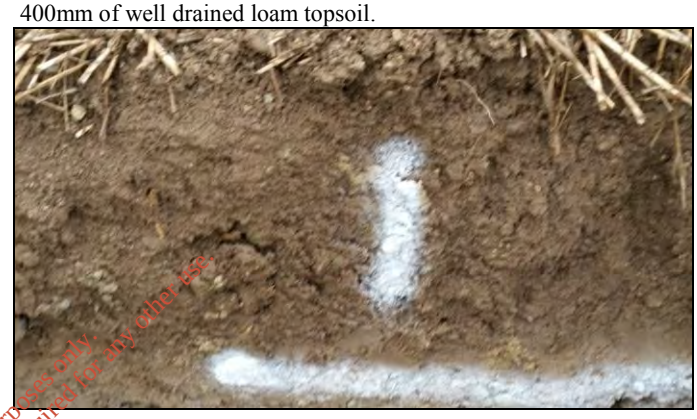
**SITE PICTURES:**

Trial hole dug to a depth of 2.1 mts.

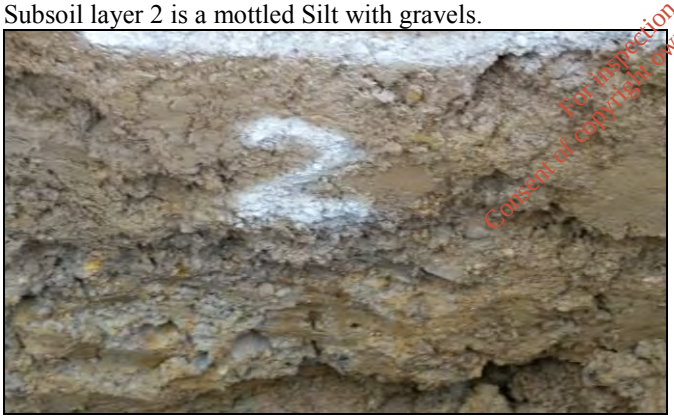
Subsoil Profile on site – Poorly drained subsoil matrix overall.

Trial pit spoil as excavated – a lot of heavy rain a few days before the test was undertaken by MKES Ltd.

400mm of well drained loam topsoil.



Subsoil layer 2 is a mottled Silt with gravels.



Soft Clay impermeable till material below 900mm.

Soil samples as taken from the trial pit.

Topsoil hand sample. Friable loamy topsoil material.

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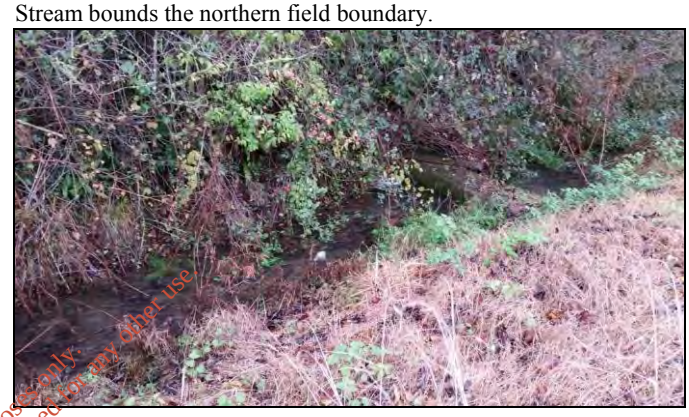
**SITE PICTURES CONTINUED**

Subsoil No:2 sample. Mottled gravelly Silt.

Subsoil No:3 Dense impermeable Clay with limestone gravel.

Trial pit topsoil as excavated on site.

Stream bounds the northern field boundary.



Trial pit as excavated on site.

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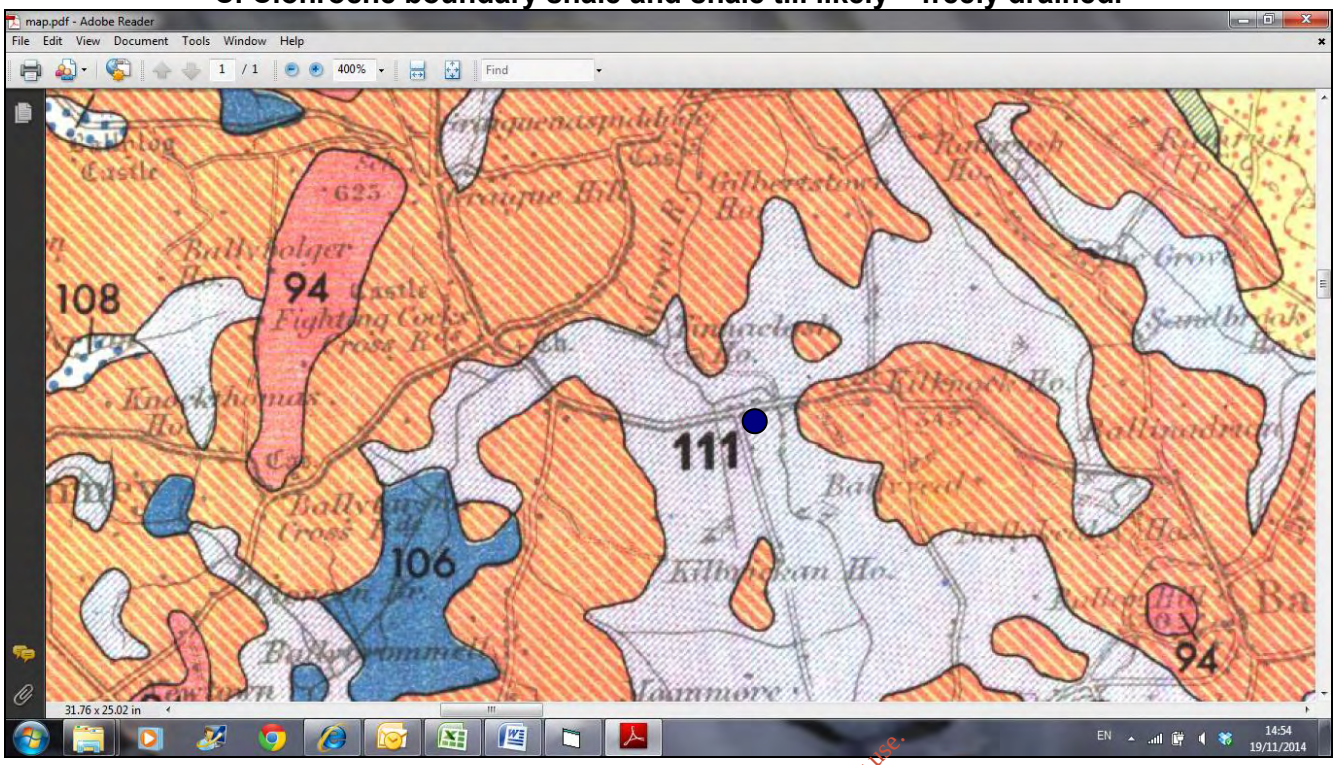
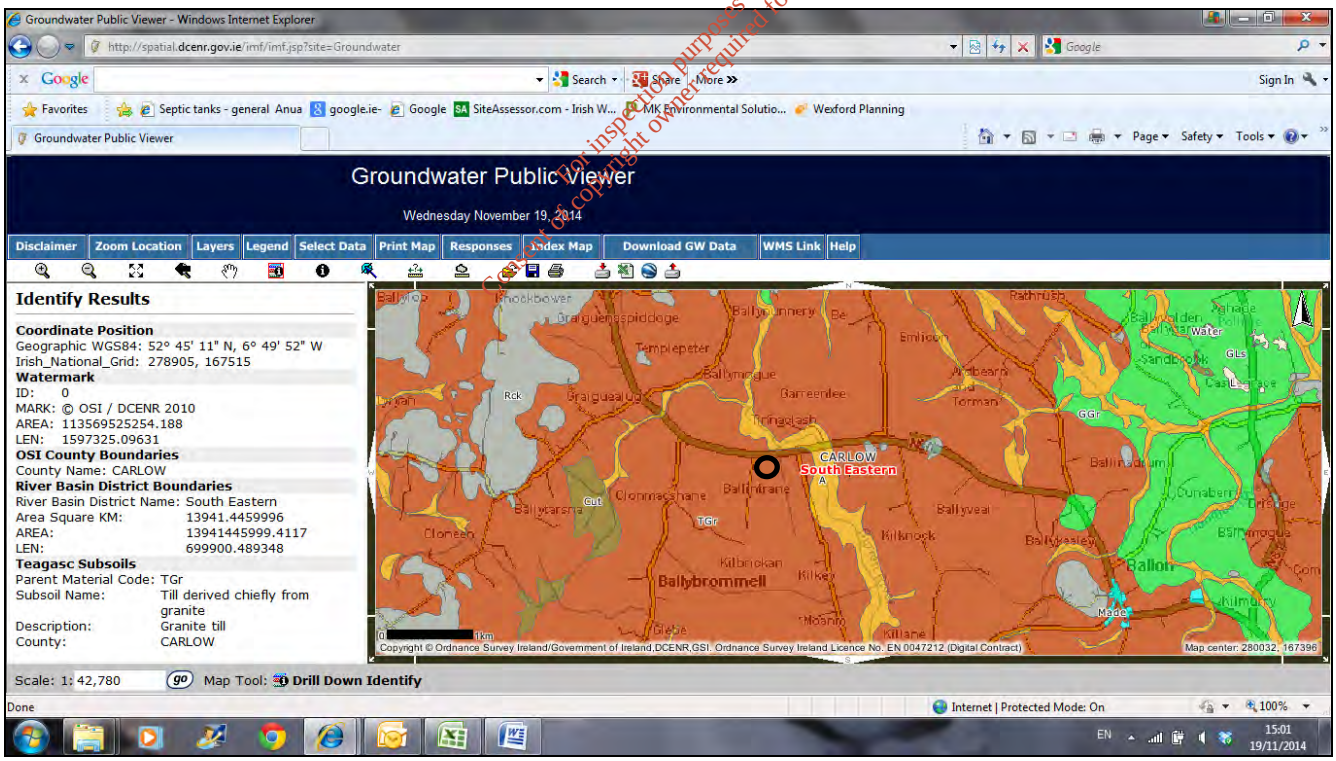
**Teagasc subsoil map of Carlow:**
**Cl Clonroche boundary shale and shale till likely – freely drained.**




**I.G.I.S. Web Browser Subsoil map of the site: - TGr – Till derived chiefly from granite.**

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**Further Information Request:**

**4. In relation to the EIA to be carried out by the Planning Authority, the following further information is required to be submitted:**

**k) The applicant is requested to submit additional details on the soils underlying the site.**

**Response:**

MKES Ltd carried out a detailed trial pit analysis on the 13th of November 2014. This assessment included a full set of colour photographs illustrating the exact make up of the soil and subsoil on site along with a detailed soil/subsoil classification to accompany the photos'. The teagasc soils map of Carlow has also been used as an additional data source along with some GSI mapping of the site.

**Trial Pit findings:**

Surface horizon is made up of a loose relatively well drained Sandy loam (dark greyish brown) overlying a mottled B horizon made up of a Silt loam with widespread gravels. Permeability here is average given the presence of the coarse gravel material. Seasonal water logging may occur due to machinery compaction. BH has a poor overall structure and can become very hard and compact when dry. The colour here is a mix of mottled greys and oranges as seen in the site photos'. The topsoil ranges to a depth of 400mm while subsoil horizon B goes to a depth of 900-1 meter.

The underlying parent material is a Clay based impermeable material. Some perched water is also visible between horizon B and the parent material. This calcareous parent material is classed as a strong gley with intermixed limestone gravels. Extremely sticky when excavated as seen in the large blocky lumps found in the trial pit spoil.

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**Conclusions:**

Soils overall are gley with only limited permeability in the upper 400-500mm. Only artificial drainage can prove successful for agricultural use. Deeper subsoil completely impermeable. Perched water table present at 1.2 mts. Teagasc soils map classification of gley soils of the Newtown complex, poorly drained calcareous glacial till composition are correct.

Kind Regards;

Michael Kehoe Bsc. Env. Mgmt. (Hons).

On behalf of MK Environmental Solutions.

Fas Site Assessor 2004.

Member of the IOWA 2015.

PI Insurance No: PSD00099566



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