

8.1 Introduction

This chapter addresses the issues of noise arising from the proposed composting facility at Pass of Kilbride, County Westmeath. Potential noise sources associated with the proposed development include road traffic, site construction, as well as fixed and mobile plant employed in the composting operations. These have been examined in relation to the possible impacts at locations identified as being potentially sensitive to noise or loss of amenity. The noise impacts have been assessed by comparing existing ambient noise levels with predicted noise levels due to the proposed development, and by considering relevant guidance. Existing noise levels were measured both in the vicinity of the proposed site, which is currently a tillage field devoid of man-made noise sources, and close to residential dwellings in the area.

Consideration has been given to each of the possible noise impacts as they could arise from the proposed composting site. Where required, mitigation measures are specified in order to reduce these impacts.

Noise will initially arise during the construction of the facility. When the proposed operations at the site have commenced, several activities will generate separate noise issues. These comprise the general site activities with noise arising from the delivery, offloading, sorting, shredding and processing of the waste material, noise from trucks arriving and turning on-site, as well as noise arising from the in-vessel air extraction fans and leachate pumps. For completeness, this assessment has included all the noise sources that may impact upon the four Noise Sensitive Receptors identified in the vicinity of the development. (see Figure 8.1)

8.2 Study Methodology

Noise impact from the total proposed development of the composting facility will have three components, namely:

- road traffic noise on the Country Road
- noise from construction plant on-site
- noise from operational mobile and fixed plant on-site

Ambient noise levels at the current tillage site and at some of the identified Sensitive Receptors are reflected in the baseline readings detailed in Table 8.1, and Table 8.2.

Methodologies for the assessment of these components are outlined below.

At present the proposed site is used as a cornfield, with the only potential noise source arising from sporadic agricultural work (i.e. tractors; combined harvester). This current noise impact would be in line with other common noise sources in the rural, predominantly agricultural area of County Westmeath.

As part of this EIS, a baseline noise survey was carried out on the 8th January 2004 as well as on the 8th July 2004. A number of potentially sensitive locations likely to be affected by noise from the proposed development have been identified in this study.

Baseline measurements for the area were initially carried out at four locations in the vicinity of the proposed site, and background noise monitoring of the typical road noise was carried out at one location at 'Cross', the main crossroads on the Country Road between Milltownpass to Correllstown, about 2.5 kilometres north of

the site. A second set of measurements in July 2004 were taken at the final site location, and close to two identified Noise Sensitive Receptors.

The predicted noise impacts associated with the development, as experienced at sensitive locations, have been compared with existing background levels.

8.2.1 Road traffic noise

A potential source of noise associated with the proposed composting facility will be road traffic, particularly heavy vehicles transporting waste to the site.

Predictions of traffic generated by the facility have been used to assess the likely noise impact from traffic at the roads leading to the site entrance. The calculation methodology for noise predictions from increased traffic is based on the Technical Memorandum "Calculation of Road Traffic Noise (CRTN), HMSO, 1988."

The impact of the likely noise from traffic associated with the proposed composting facility has been assessed.

8.2.2 Construction and Operational plant (mobile and fixed) and waste vehicles on the site

Site construction and composting activities, including shredding, screening and mixing, involve the use of items of mobile and fixed plant during the working day. Use of these items of plant, together with waste vehicle movements on-site, have been assessed for potential disturbance at noise sensitive receptors.

Environmental control systems, such as in-vessel extract fans and leachate pumps will operate as required throughout the day or night and must therefore be considered as a potential source of disturbance.

The machinery to be used on the proposed composting site are likely to comprise:

Construction:

1 x Front loading shovel	@ 70% of time
2 x Tracked excavators	@ 60% of time
2 x Dumptruck	@ 70% of time
1 x Scraper	@ 10% of time
1 x Roller	@ 20% of time

Operational:

1x Shredder	@ 80% of time
1 x Mixer	@ 80% of time
1 x Fork lift truck	@ 50% of time
2x Trommel screeners	@ 80% of time
4 x Front Loading shovels	@ 80% of time
HGV's delivering waste	@ 50% of time

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In-vessel extract Fans @ 100% of time
 Leachate pumps @ 70% of time

Haul Road

Tractor & bowser 1 x Movements per hour
 HGVs delivering waste 8 x Movements per hour

8.2.3 Noise assessment criteria

The British Standard BS4142:1997 "Rating industrial noise affecting mixed residential and industrial areas" contains methods for the assessment of noise impact from a development situated in mixed industrial and residential areas. Although only partially applicable to this study, standard calculations for assessing the difference between source noise and baseline noise are provided, and a correction of 5dB for noise sources which exhibit tonal or impulsive qualities is recommended. In carrying out these noise predictions an overall correction of 5dB was added as most of the items of plant under assessment exhibit tonal qualities, including the trommel, the shredder, front-loading shovels, fans and leachate pumps.

Predictions carried out for this development have followed the calculation method specified in BS 5228: Part 1:1984 "Noise and Vibration Control on construction or open sites." This British Standard contains tables of indicative sound power ratings for various types of mobile plant and also provides a method for calculating the noise from vehicles on on-site haul roads. Good prediction accuracy is provided with BS 5228.

For this assessment most of the noise ratings for machinery to be used were obtained by carrying out specific noise measurements on the 18th of February 2004 of similar machinery at the Thorntons waste transfer station in Killeen Road, Ballyfermot, Dublin. This includes the noise ratings for the trommel, shredder, mixer and front loaders. Ratings for other mobile plant, including the dumptrucks, tracked excavator and HGV's are taken from the above guideline BS 5228: Part 1:1984 "Noise and Vibration Control on construction or open sites."

8.3 Receiving Environment

The existing site is currently under tillage, and is located in a rural area north-east of Milltownpass. All sides of the site are surrounded by agricultural land and pine afforestation. Several residences are located within one kilometre of the site. A margin of approximately 100 metres exists on all sides between the site boundary and the location of the proposed facility. The noise predictions were carried out employing the distance between the activities' operation and the identified noise sensitive receptors.

The closest location considered in this assessment is a group of residential houses (NSR-3) about 510 metres north-east of the site, situated at the road side. NSR-1 and NSR-2 are located to the south-east of the site around 900 metres from the site boundary. NSR-4 is located to the north/north-west 760 metres from the site boundary.

On 8th January 2004 an initial baseline noise survey was carried out. This noise survey took place approximately 500 metres to the west of the currently proposed site, at a location where the development was originally proposed. The noise monitoring was carried out in an area of young pine afforestation, further removed from the road and any man-made activities than the site now proposed. Further noise monitoring was carried out on the 8th July 2004, on the site now proposed for the development, as well as at the closest residential dwellings. The data obtained during both surveys is deemed to be representative of the background noise environment currently experienced in the area.

Recorded baseline noise levels are presented in Table 8.1. and Table 8.2. The Noise Sensitive Receptors (NSR-1 to NSR-4) identified in the vicinity of the site are shown on Figure 8.1.

8.3.1 Baseline Noise Monitoring

Baseline monitoring was carried out on the 8th of January 2004 at five noise monitoring points (NMP's), and on the 8th of July at four additional points, listed as NMP 1 to NMP 9 in Table 8.1 and Table 8.2; and shown on Figure 8.1.

Background sound levels were measured at two locations outside of the closest identified Noise Sensitive Receptors (NSR's), as well as on the undeveloped site. Together these measurements provide the overall baseline soundlevel for the surrounding rural area. The baseline recorded at NMP-9 (LA90 36 dB) was used as the background noise level for the Noise Sensitive Receptors located away from the road, i.e. NSR-2 and NSR-4. The baseline recorded at NMP 8 (LA90 38 dB) which reflects the noise impact of passing vehicles on the road, was applied as the background level to NSR-3 and NSR-1 as they are located at or near roads.

This provides for a low baseline estimate, even though traffic noise during peak hours may cause higher background noise levels on the road. By using a comparatively low baseline level the maximum worst-case impact of the development has been assessed.

The monitored sound pressure levels are detailed below. Background noise levels are indicated by the LA90 measurements (the noise level which is exceeded for 90% of the time in a given period). The observed LA90 values at the site location range from 34 to 37dB, and at the road side the LA90 levels ranged from 38 to 41 dB, as shown in Table 8.1. and Table 8.2.

The only noise source at the noise monitoring points removed from the road were occasional wind gusts, which caused an elevation in the LA10 and LAeq readings. No man-made noise source was audible at the site. The 15 and 30-minute sampling periods listed below are deemed to be representative of steady-state 1 hour averaging times, as required for the prediction calculations detailed in Appendix 8.1.

Table 8.1 Summary of On-Site Baseline Monitoring, 8th January 2004 and 8th July 2004

Noise Monit. Point	ON-SITE						
	8th January 2004 time	Location	Distance to proposed Site	LAeq T=15min dB	LA10 T=15min dB	LA90 T=15min dB	Comments on audible noise sources
NMP 1	12:15-12:30	Southern boundary of originally proposed site	400 metres	46	48	33	LA10 and LAeq elevated due to occasional wind gusts
NMP 2	12:50 - 13:05	Eastern boundary of originally proposed site	400 metres	50	54	36	LA10 and LAeq elevated due to occasional wind gusts
NMP 3	13:15 - 13:30	Northern boundary of originally proposed site	600 metres	48	51	35	LA10 and LAeq elevated due to occasional wind gusts
NMP 4	13:45 - 14:00	Western boundary of originally proposed site	700 metres	51	54	36	LA10 and LAeq elevated due to occasional wind gusts
Noise Monit. Point	8th July 2004 time	Location	Distance to proposed Site	LAeq T=30min dB	LA10 T=30min dB	LA90 T=30min dB	Comments on audible noise sources
NMP 6	13:15 - 13:45	South-Eastern boundary of proposed site	On-site	48	50	37	LA10 and LAeq elevated due to occasional wind gusts
NMP 7	14:30 - 15:00	South-Eastern boundary of proposed site	On-site	41	44	35	Occasional wind gusts less pronounced

Table 8.2 Summary of Off-site Baseline Monitoring, 8th January 2004 and 8th July 2004

Off-site Noise Monit. Point	OFF-SITE						
	8th January 2004-07:14 Time	Location	Distance to closest Site Boundary	LAeq, T=15min dB	LA10, T=15min dB	LA90, T=15min dB	Comments on audible noise sources
NMP 5	14:40 - 14:55	Crossroads at 'Cross'	>2500 metres	67	66	41	Occasional cars, vans and several HGV's on country road
Off-site Noise Monit. Point	8th July 2004-07:14 Time	Location	Distance to closest Site Boundary	LAeq, T=15min dB	LA10, T=15min dB	LA90, T=15min dB	Comments on audible noise sources
NMP 8	15:25 - 15:40	Outside NSR-3	510 metres	55	51	38	LAeq; elevated above LA10; due to loud sporadic passing trucks and cars
NMP 9	15:55 - 16:10	Outside NSR-1	920 metres	47	45	36	LAeq; elevated above LA10; due to loud sporadic passing trucks and cars

Monitoring on the 8th January was carried out under generally clear conditions with some cloud cover. Occasional south-westerly wind gusts caused elevations of the LA10 and LAeq recordings at the exposed site, however this did not affect the LA90 reading. The survey is considered to have produced typical baseline noise levels for the area, in which there are currently no man-made noise sources, except for sporadic agricultural activity and light traffic on the country road.

The weather conditions during the July survey were warm with some cloud cover and occasional north-easterly wind. As the site is very exposed and flat, the impact of wind gusts on the LA10 and LAeq was noticeable even at moderate wind speeds. Wind was the only noise source on the proposed and final sites during both surveys

8.4 Potential Impacts of the Proposed Development

8.4.1 Road Traffic Noise

The proposed site is currently a field under tillage, with no daily activity taking place on it, and there are no other major activities in the area that generate regular traffic movements.

Traffic flow data provided in Chapter 9 for traffic assessment purposes has been used in order to assess the likely noise impact on the Country Road. The standard calculation methodology for noise predictions from increased traffic is based on the Technical Memorandum, "Calculation of Road Traffic Noise (CRTN), HMSO1988." It states that changes as small as 1dB may be perceived negatively in the vicinity of the roadway in question. Such a change in noise level can arise from a change in the traffic regime of approximately 25%.

Chapter 9 details the investigations regarding projected traffic increases. Approximately 6 HGV movements per hour (3 round trips) between 08:00 and 18:00 hrs Monday to Friday, and 8:00 to 18:00 on Saturdays are predicted when the proposed composting facility is operational. Delivery vehicles and visitors to the site are estimated to account for 4 car movements per hour (2 round trips). A worst case scenario of 4 HGV movements per hour has been used in the assessment to account for potential movement of HGVs around the site.

Based on the figures above a maximum traffic increase of 74% is predicted, which equates to a noise level change of 2.4dBA. While the traffic volumes are still very low at 4 HGV trips an hour, it will be noticeable noise increase in the context of the current low volume of traffic on the Country Road.

8.4.2 Plant and Vehicles on Site

Typical sound power levels for items of fixed and mobile plant which may be used on the site are given in Appendix 8.1, categorised according to their use in construction or operational activities. Sound power levels were obtained from BS5228: Part 1:1984, as well as from a specific noise assessment on 18th February of similar machinery at Thorntons Waste Transfer Station at Killeen Road, Ballyfermot, Dublin.

Noise levels due to vehicles using the site road have been calculated. The results were added to the predicted noise from mobile and fixed on-site plant. Details of the total resultant noise levels, which will be received at noise sensitive locations, are given in Appendix 8.1. In all cases calculations have been carried out in accordance with BS 5228: Part 1:1984.

During construction and operation mobile plant will be operating at various positions within the site at any particular time. In addition, vehicles delivering construction materials, and later waste, will use site roads between the entrance and the waste unloading area. Theoretically, therefore, it would be possible for there to be a cumulative noise impact arising from these different but concurrent activities. However, in practice there would be constraints placed on the total level of activity on the site by the sum total of the mobile plant, and personnel available on the site. Therefore for the purpose of this assessment we have considered both operation and the next noisiest work being carried out as concurrent operations.

Where an item of plant is not in full-time use during the working day, a correction is applied for the percentage of time that it is in operation (% on-time). By adding the corrected average sound power levels for each item of plant in use at any one time, the maximum noise generated during any phase of the operation can be calculated.

Noise may be emitted from extract fans at the in-vessel composting tunnels, and from leachate pumps. Noise ratings for these pieces of equipment have been estimated based on general fan and pump rating information. The likely impacts of the ventilation fans and leachate pumps were included in the noise prediction calculations.

Tonal noise characteristics from the trommel, the shredder, fans, pumps and the mobile plant were considered in the assessment, and a 5 dB weighting was added to the predicted noise levels, in accordance with BS 4142. This weighting also takes account of the higher nuisance value of HGV movements compared to the movement of normal passenger cars.

It is proposed that a 4 to 5 metre high earth berm will be constructed around the northern and eastern perimeter of the proposed activity. A 5 to 10 dB(A) attenuation due to the berm has been applied to the four noise sensitive receptors, depending on whether the berm will entirely or partially screen the line of noise propagation. (See section 8.6.2. for details).

At present the site is quite open to all sides and visible from the Country Road. With the construction of the berm and the planting of trees and vegetation on the margin between the operational facility and the site boundary the site will effectively be screened. This has been taken into consideration in the prediction calculations.

Table 8.3 summarises the predicted highest noise levels at four identified Noise Sensitive Receptors (NSR's). These figures have been calculated by adding noise levels arising from plant operating at the nearest point to the site boundary closest to the NSR under assessment, thereby providing an accurate representation of potential worst-case noise levels. All calculations are given in Appendix 8.1.

Table 8.3 Predicted highest noise levels at sensitive locations due to Mobile Plant from Landfill Operations

Sensitive Location and Direction from Site	Location	Predicted noise level dB LAeq,1h	Measured background dB LA90	Difference between background and predicted noise
NSR 1 South-east	920 meters from boundary, 1150 metres from site activity	41.2	38	3.2
NSR 2 East/South-east	880 meters from boundary, 1130 metres from site activity	41.4	36	5.4
NSR 3 North-east	510 meters from boundary, 650 metres from site activity	46.9	38	8.9
NSR 4 North	760 meters from boundary, 860 metres from site activity	45.8	36	8.4

Note 1: The 15 and 30-minute sampling periods obtained are deemed to be representative of steady-state 1 hour averaging times, as required for the prediction calculations detailed in Appendix 8.1.

Baseline noise levels in the area around the proposed site range from LA90 values of 36 dB in rural locations to 38 dB at the road side. The British Standard BS4142:1997 advises that where the background sound pressure levels are exceeded by around 5 dBA by noise from a development this will be of marginal significance on the community, whereas if noise levels from the development were to exceed the background sound pressure levels by more than 10 dBA complaints from the residents would be likely.

The highest predicted impacts at NSR-3 and NSR-4, with the earth berm in place around the operational area, are in the region of 8 dBA above the baseline level. A maximum increase in noise levels at NSR-3 of 8.9dBA and at NSR-4 of 8.4dBA is predicted.

It must be noted that all of the predicted impacts at residential dwellings are nearly 10 decibels lower than the 55dBA day-time noise level generally stipulated in EPA waste licences.

The only pieces of equipment that will operate at night-time are the extract fans from the in-vessel composting units. No adverse noise impacts were predicted from these sources.

8.5 Do-nothing Scenario

If the proposed composting development did not proceed, noise levels in the area would remain at a similar level as those indicated during the baseline survey, detailed in Tables 8.1 and 8.2.

8.6 Mitigation Measures

8.6.1 Road Traffic Noise

The worst case scenario for road noise increases is based on the traffic predictions detailed in Chapter 9, Traffic. An increase in traffic noise of 2.4dB is predicted due to 4 HGV trips (8 movements) per hour, as the road traffic volume is otherwise very low.

The site traffic will occur between 8:00 and 16:00 hrs in the afternoons, and from 8:00 to 12:00 on Saturdays only. This period coincides with general day-time traffic.

Thorntons propose to minimise the movement of empty lorries by using the same vehicle for the delivery of incoming wastes, as well as the removal of finished compost. This practice would reduce the amount of HGV movements in and out of the facility, and would mitigate against the noise impact from the HGV's.

Vehicles used on site will be regularly maintained in order to reduce noise generated from their movements.

8.6.2 Mobile and Fixed Plant on the Site

Screening

The British guidance document MPG11 says of the prediction method BS5228:

"It proposes a simple but straightforward and effective method to calculating the effect of barriers on noise emissions: if a noise source is partly visible from the measurement point, it is assumed that the noise level at this point should be reduced by 5 dB; if the noise is completely screened, the noise level should be reduced by 10 dB."

Mitigation measures will focus on reducing the noise impact from the site towards the closest Noise Sensitive receptors, in particular NSR-3 and NSR-4.

It is proposed that a 4 to 5 metre high earth berm will be constructed around the northern and eastern perimeter of the proposed activity. A 5 to 10 dB(A) attenuation due to the berm has been applied in the prediction calculations of the four noise sensitive receptors, depending on the completeness of screening envisaged.

At present the site is quite open to all sides and visible from the Country Road. With the construction of the berm and the planting of trees and vegetation on the margin between the operational facility and the site boundary, the site will effectively be screened in order to minimise the noise emission.

These mitigation measures will ensure that the potential noise impact from the site operations will not exceed the predicted levels of 3.2 to 8.9 dBA..

The short term activity of erecting perimeter bunds will not cause significant disturbance for residents, and furthermore will provide effective mitigation in the longer term against noise from the activity of mobile plant on the composting site. MPG11 discusses noise associated with the creation of noise bunds, and recommends higher temporary noise limits because these activities are of limited duration and offer a longer term benefit.

Management controls

This assessment has, in accordance with good acoustical practice, examined realistic worst-case conditions as they may apply at the proposed composting site. In order to do this, each activity has been examined, with those activities with the potential to generate the highest noise levels at the various off-site noise sensitive receptors being examined in most detail.

This assessment has made worst-case assumptions about the location of noise generating plant, ie, in calculating noise levels it has been assumed that the plant would be located at the side of the facility closest to each of the Noise Sensitive Receptors under consideration. In practice not all of the mobile plant used in the prediction calculations will be working on the same side of the activity at any one time, and the trommels, shredders and mixer will be located at the centre of the site, rather than at the perimeter. Furthermore, most of the above machinery will be operational within enclosed production sheds, which will result in further noise minimisation. The predicted noise levels are therefore indications of occasional maximum levels that could be experienced if all mobile plant were concurrently operating on the same side of the site.

Reversing alarms

The predicted noise levels do not include any noise impacts from reversing alarms on site vehicles, as the very short duration of the noise event means that they do not contribute to the measurable LAeq noise level. All mobile plant on the site will only be operating during daytime hours. The plant used on the site may be fitted with either non-audible alarms or with alarms which adjust their output according to the noise climate prevailing in the immediate vicinity of the item of plant concerned.

The in-vessel ventilation fans and leachate pumps are not considered to represent a noise source which will have a noticeable off-site impact. Noise mitigation is built into the design of these plant, such as the enclosure of leachate pumps. No further mitigation is required.

8.7 Predicted Impact of the Proposed Development

The proposed development has the potential to give rise to noise from three sources:

- road traffic noise on the County Road
- noise from construction plant on-site
- noise from operational mobile and fixed plant on-site

Noise predictions have indicated that the Noise Sensitive Receptors will not be significantly impacted upon by noise emissions from the proposed development.

Once mitigation measures are implemented, including the construction of a 4 to 5 metre high earth berm around the northern and eastern site boundary, the predicted noise levels at the Noise Sensitive Receptors closest to the site, NSR-3 and NSR-4, will not exceed the background noise levels by more than 9dB(A). As stated in BS 4142, a noise increase between 5 to 10dBA is likely to be of marginal significance on the community,

Mobile plant will only be operational during day-time, therefore they will not have an impact on the night time noise environment.

No negative noise impact has been predicted during day time or night time from the in-vessel extract fans which are the only equipment that will operate 24 hours a day.

The application of good environmental control through effective site management in the implementation of mitigation measures will minimise the potential for noise disturbance.

8.8 Monitoring

Noise monitoring is recommended biannually at the identified noise sensitive receptors, as well as at four locations around the site boundary. The monitoring survey should consist of 30 minute averaging times at each location, and provide statistical analysis including LA10, LA90 and the LAeq. The results will be compared to limits set by the Regulatory Authority. Frequency analysis should be carried out to assess the extent of tonal characteristics in the noise emissions from the site.

8.9 Restoration and Residual Impacts

Noise emissions give rise to immediate disturbance and may cause a deterioration of the quality of life if ongoing and severe. However, once the source of noise is removed, the noise impact ceases at once.

Should the composting operations discontinue at the site, there will be no ongoing noise source from the activity. Therefore, no continued noise disturbance is predicted after composting operations cease.

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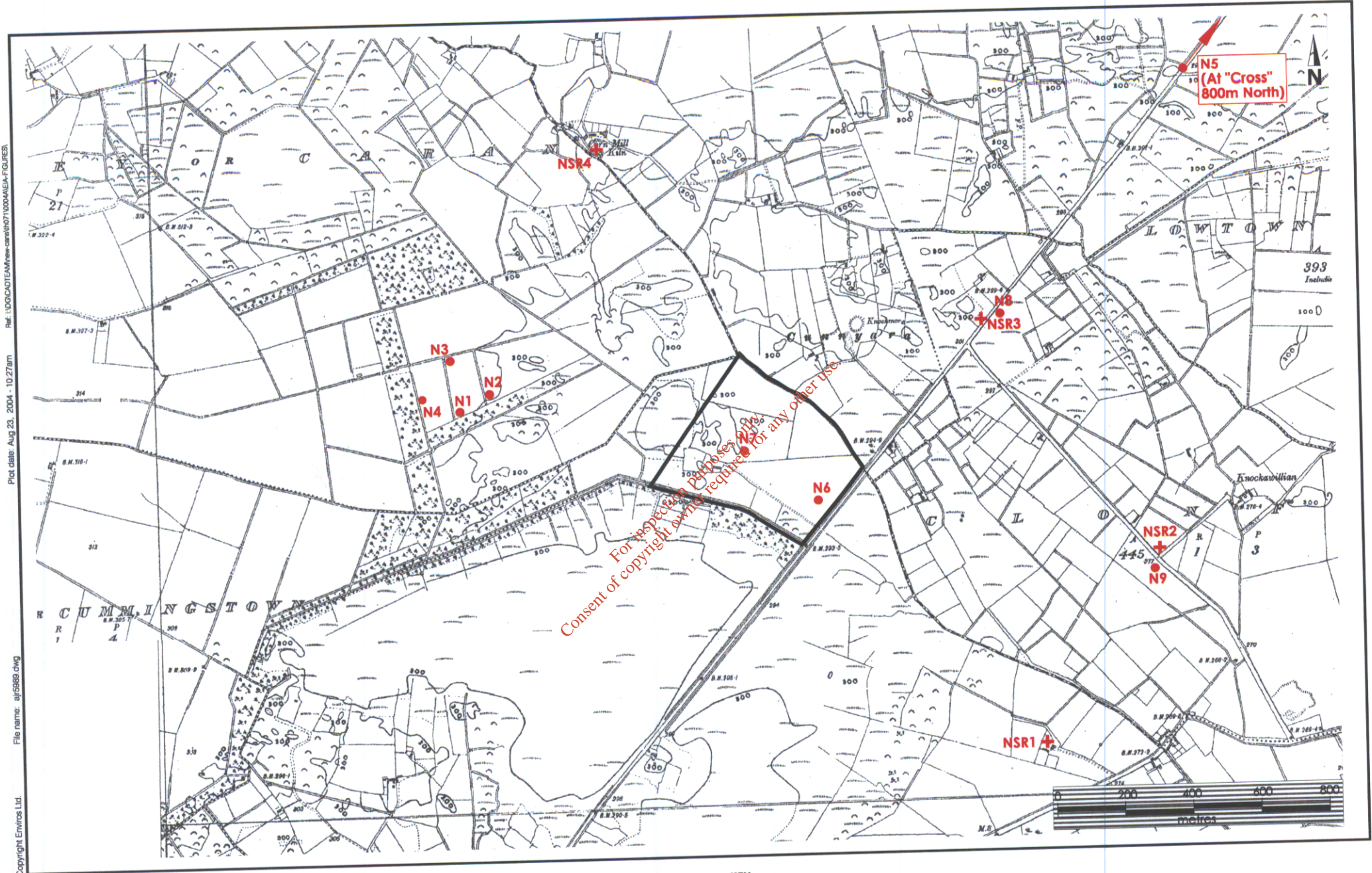


FIGURE 8.1
NOISE SENSITIVE RECEPTORS AND SAMPLING LOCATIONS

- KEY:**
- Noise baseline sampling locations
 - + Noise sensitive receptors