

TABLE OF CONTENTS

SECTION	PAGE
15.0 NOISE	15-1
15.1 Introduction	15-1
15.2 Methodology	15-1
15.3 Existing Environment	15-3
15.4 Assessment	15-3
15.5 Impacts	15-4
15.5.1 Construction Phase	15-4
15.5.2 Operation Phase.....	15-6
15.6 Cumulative Impacts.....	15-9
15.7 Mitigation.....	15-11
15.7.1 Construction Phase	15-11
15.7.2 Operational Phase.....	15-11
15.8 Residual.....	15-12

LIST OF TABLES

Table 15.1	Noise Monitoring Locations
Table 15.2	Noise Monitoring Results and Observations
Table 15.3	Maximum Permissible Noise Levels at the Facade of Dwellings During Construction
Table 15.4	Predicted Noise Levels at NSL 75 m From Source During Construction Phase
Table 15.5	Recommended Noise Limits at Waste Facilities
Table 15.6	Predicted Noise Levels at NSL 210 m From Inert Waste Processing Area (IWPA)
Table 15.7	Predicted Noise Levels at NSL 75 m From Plant Operating in Other Areas of the Site

LIST OF FIGURES

Figure 15.1	Noise Monitoring Locations
Figure 15.2	Noise Mitigation Measures

15.0 NOISE

Section 1 (Introduction), Section 6 (Site Setting) and Section 8 (Description of the Proposed Development) of the EIS should be referred to before reading this section.

15.1 Introduction

This section of the EIS assesses potential impacts of continued restoration activities on the noise environment in the vicinity of the Application Site located at Walshestown, Co. Kildare. The noise assessment, includes the following sources of information:

- Golder Associates Ireland baseline noise monitoring carried out on 19th and 20th August 2008;
- Historical noise data gathered by Cemex;
- BS5228, 1997 Noise Control on Construction and Open Sites;
- ISO 1996: Acoustics “Description and measurement of environmental noise”;
- Environmental Noise Survey Guidance Document. EPA 2006, 2nd Edition;
- European Directive 2002/49/EC relating to the assessment and management of environmental noise;
- A good Practice Guide on the sources and Magnitude of Uncertainty Arising in the Practical Measurement of Environmental Noise (N J Craven, G Kerry, October 2001); and
- Safety Health and Welfare at Work (Control of Noise at Work) Regulations 2006 (S.I. No. 371 of 2006).

Particular attention is focused on sensitive receptors, such as residential properties adjacent to the Application Site, and to the extent of the exposure of these receptors to noise derived as a result of the continued development.

The main elements influencing noise emissions from a typical Inert Waste Processing Area include traffic, intermittent noises, crushing, screening, and reversing alarms.

15.2 Methodology

A Cirrus CR:831A sound level meter was used to take the noise measurements. This instrument is a Type 1 data-logging integrated sound level meter and is in accordance with the

requirements of IEC Publication 651. The noise metre was calibrated using a CR:513 Noise Level calibrator. Both pieces of equipment were independently calibrated in September 2007.

This instrument is capable of performing a wide range of measurements simultaneously, including SPL, SEL, Leq, Lavg, TWA, Lmax, Lmin, LDN and Exceedance Levels, and has a measurement range of 20 - 140 decibels.

Measurements were conducted during daytime hours for a sample period of 30 minutes broadband and 15 minutes third octave band at locations N1-N6. The technician carrying out the survey made notes at each location detailing ambient noise conditions and noise sources. A description of the noise monitoring locations is presented in Table 15.1 below and their locations are shown on Figure 15.1.

Table 15.1 Noise monitoring locations

ID/Location	Location
N1	At the northern boundary of the Application Site
N2	At the entrance to the Facility
N3	On the eastern boundary of the Application Site
N4	On the south eastern boundary of the Application Site
N5	On the south western boundary of the Application Site
N6	On the western boundary of the Application Site

3 main parameters were measured at each sample location and are as follows:

- L_{AeqT} is the equivalent continuous sound level. It is a type of average that is used to describe a fluctuating noise such as the non-linear properties of human hearing;
- L_{A1} is used to describe the noise that is exceeded for 1% of the monitoring period and usually describes sudden impact noises;
- L_{A10} is used to describe the noise that is exceeded for 10% of the monitoring period and usually describes sudden impact noises; and
- L_{A90} is used to describe noise that exceeds 90% of the sampling period and is generally used to describe background noise conditions.

The 'A' suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound level results in this report are presented in decibels (dB).

15.3 Existing Environment

The Application Site is ca. 68.0 ha. in size and consists predominantly of disturbed lands associated with historical aggregate extraction. The current topography of the area is flat becoming undulating towards the east. Mature hedgerows surround the majority of the boundary which would reduce noise emissions leaving the Application Site. There are also existing berms around the processing area located to the north east of the Application Site which act as noise reducing barriers (Figure 15.2).

15.4 Assessment

As mentioned above a baseline noise monitoring survey was carried out on 19th and 20th August 2008. The results of noise monitoring are presented in Table 15.2, which includes a detailed description of noise sources observed by field personnel. In all six (6 no.) locations were monitored. L_{AEQ} ranged from 37.2 dB(A) to 57.1 dB(A) for all the locations monitored. One monitoring location N2 exceeded the recommended guideline value of 55 dB(A) by 2 dB. This is located at the current entrance to the Application Site. Passing traffic and traffic entering and leaving the adjoining Restoration Facility to the east of the Application Site is likely to have contributed to this exceedence.

For inspection purposes only.
Consent of copyright owner required for any other use.

Table 15.2 Noise monitoring results and observations

Monitoring Location	Date/Time	Wind Speed m/s	L _{AEQ} , dBA	L _{A1} , dBA	L _{A10} , dBA	L _{A90} , dBA	Noise Sources Recorded By Field Personnel
N1	19/08/2008 11:32am	1.1 – 5.5	44.8	35.5	35.5	35.3	Gusts of Wind
							Slight Shower of Rain
							Passing Traffic
N2	19/08/2008 10:28am	1.1 – 2.4	57.1	70.5	56.5	43.0	Passing Traffic
							Traffic Leaving Adjoining Facility
							Lawnmower
N3	19/08/2008 14:58pm	1.6 – 4.6	45.9	45.9	41.9	36.3	Gusts of Wind
							Airplane Flying Overhead
							—
N4	19/08/2008 16:59pm	1.6 – 4.6	50.8	65.0	44.9	37.8	Helicopter Flying Overhead
							Passing Traffic
							—
N5	19/08/2008 16:02pm	1.1 – 3.2	37.4	43.7	38.9	32.8	Vehicle in Distance
							Bird Song
							—
N6	19/08/2008 13:22pm	1.1 – 3.2	37.2	46.4	39.4	33.2	Airplane Flying Overhead
							Slight Gusts
							—

15.5 Impacts

Impacts of the proposed development regarding noise are discussed in detail below. Noise impacts are discussed in two phases, construction and operation phases. Construction will last ca. 9 months and will involve the placing of berms in sensitive areas, installation of a clay liner, construction of cells and the development of an Inert Waste Processing Area.

15.5.1 Construction Phase

Construction work involves various activities, undertaken by different types of plant, at different locations and at varying times. As a consequence, construction noise levels at noise sensitive locations (NSL's) will vary with time as the noise sources moves progressively closer or further away from a property, and as the activities themselves change. The noise producing activities are likely to be confined to earthworks associated with construction of

cells, liner and berms. Construction of the Inert Waste Processing Area will also potentially generate noise sources.

Predicted noise levels have been estimated using figures as given in BS: 5228 Noise and Vibration on Construction and Open Sites. It is expected that some if not all of the following plant and machinery will be required during the construction phase:

- Excavators
- Dozers
- Dump Trucks
- Wheel Loaders
- Crusher
- Screeners
- Compactors
- Tractor and bowsers

In Ireland there are no guidelines established relating to noise limits for construction activities. A publication from the National Road Authority (NRA) '*Guidelines for the treatment of noise and vibration in normal road schemes*' 2004 has outlined recommended noise levels for construction noise. The NRA recommends that Local Authorities should control activities by imposing limits on the hours of operation and consider at their discretion noise limits. Examples of average (L_{Aeq}) and the instantaneous maximum (L_{max}) construction noise level limits are also presented within the NRA Guidelines and are reproduced in Table 15.3.

Although these refer to road projects, they are similar to noise levels from typical construction project such as the proposed development. They also represent a reasonable compromise between the practical limitations during a construction project and the need to ensure an acceptable ambient noise level for local residents. As a result, these limits have become the most acceptable standard for construction noise limits for EIS assessment to date.

Table 15.3 Maximum permissible noise levels at the facade of dwellings during construction

Days & Times	L _{Aeq} (1 hour) dB	L _{Amax} dB
Monday – Friday 0700 - 1900	70	80
Monday – Friday 1900 - 2200	60*	65*
Saturday 0800 - 1630	65	75
Sundays and Bank Holidays 0800 - 1630	60*	65*

Note: * Construction activities at these times, other than that required in respect of emergency works, will normally require the permission of the relevant local authority

Calculations of noise levels taking a worst-case scenario where some of the above plant would be operating at an area on the Application Site 75m away from an NSL have been tabulated in Table 15.4. Table 15.4 indicates that NSLs located greater than 75 m from the proposed construction activities, the NRA Guideline values shown in Table 15.3 will be achieved.

Table 15.4 Predicted noise levels at NSL 75 m from source during construction phase

Item No.	Plant/Equipment	Source L _{Aeq} dB(A) @10m	Distance From Source to NSL (m)	Predicted L _{Aeq} dB(A) at NSL 75 m from Source
1	Tracked excavator 40t	79	75	61
2	Tracked excavator 30t	75	75	57
4	Dozer	79	75	61
5	Articulated dump truck 23t	78	75	60
	Cumulative noise level at NSL 75 m from construction activities			67

It is proposed to meet the above NRA Guideline values listed in Table 15.3 during the construction phase. Permission from the Local Authority/Agency will be sought if works are to be carried out which may exceed these guideline values.

15.5.2 Operation Phase

It is anticipated that noise generated from the proposed development will be less than that which occurred during previous quarrying activities, as measures will be taken to reduce elevated noise levels. These measures include:

- Placing of the processing area in a well-sheltered area, with associated berms and cut embankments; and
- Constructing berms along the eastern boundary.

Noise impacts from the operation of the Facility will depend on the number and type of equipment used during the development. It is envisaged that regular works associated with the Facility will involve some if not all the following plant/equipment:

- Excavators
- Dozers
- Dump Trucks
- Wheel Loaders
- Crusher
- Screeners
- Compactors
- Tractor and bowsers

The impacts of noise emissions from the above activities will generally be within the confines of the Application Site with berms providing significant acoustic screening from operating machinery.

The proposed Facility will operate during the hours specified in Section 8.12 of the EIS, and the following noise guideline values will be met during operational phase at closest noise sensitive receptors.

Table 15.5 Recommended noise limits at Waste Facilities

Period	Times	Accepted Level
Daytime	08:00 - 22:00	55 dB LAeq
Night time	22:00 - 08:00	45 dB LAeq

Potential noise emissions from the Application Site will be generated from two sources 1) Inert Waste Processing Area and 2) General Filling Area.

Inert Waste Processing Area

The Inert Waste Processing Area will be one of the main sources of noise emission from the Application Site with a number of plant and equipment operating in this area at any one time and vehicles transporting material in and out of the Facility. This area will be located in the northeast corner of the Application Site (Fig. 15.2). Table 15.6 below calculates the noise levels received at the closest NSL located ca. 210 m away from the Inert Waste Processing Area (NSL1, Figure 15.2). The crushing and screening activity is to be located in an enclosed area surrounded by stockpiled material thereby providing shelter from prevailing winds and

further minimising noise emissions. Figure 8.5 depicts the layout of the Inert Waste Processing Area.

It is worth noting that processing will only be undertaken from time to time and will depend on supply and demand to a certain extent. Furthermore, only ca. 15% of the total intake of inert materials will be passed through the processing area.

Table 15.6 Predicted noise levels at NSL 210 m from Inert Waste Processing Area (IWPA)

Item No.	Plant Equipment	Source L _{Aeq} dB(A) @10 m	Distance From Source to NSL (m)	Noise Reduction due to screening/berms etc. dB(A)	Predicted L _{Aeq} at NSL dB(A) (210 m From Source)
1	Tracked excavator 30t	75	210	10	39
2	Tracked exc. with breaker	90	210	10	54
3	Crusher	82	210	10	46
4	Screener	81	210	10	45
5	Screener	81	210	10	45
6	Wheel loader	76	210	10	40
7	Articulated dump truck 23t	78	210	10	42
	Cumulative noise level at NSL1 210 m from IWPA				55

Table 15.6 indicates that as long as the proposed Inert Waste Processing Area is located >210m from an NSL, the EPA Guideline value will be achieved. As highlighted in Figure 15.2, the closest NSL to the proposed processing area is 212 m (NSL1).

It is also important to state that processing activities at the Inert Waste Processing Area will only be operational during day-time hours (i.e. 08:00 to 18:00, Monday to Friday inclusive (excluding Bank Holidays) or as may be agreed with the Planning Authority/EPA, and between 08:00 and 14:00 on Saturdays, with no activities being permitted on Sundays or public holidays.

General Filling Activities

There will also be plant operating in areas where inert waste will be placed and used for the restoration of the Application Site. Plant operating in this area will distribute the inert materials evenly in layers and compact material to reduce future settlement. It is expected that the plant listed in Table 15.7, or similar plant, will be involved in general filling activities.

With the exception of the entrance, a fill phase boundary offset of ca. 75 m from dwellings located along the Application Site boundary has been achieved across the Site to reduce interference from the proposed works on nearby residences. Table 15.7 calculates the noise levels received at an NSL 75 m away from plant operating in the proposed filling areas. Table 15.7 indicates that as long as the NSL is located >75m from the filling activities the EPA Guideline value will be achieved.

Table 15.7 Predicted noise levels at NSL 75 m from plant operating in other areas of the Site

Item No.	Plant Equipment	Source L _{Aeq} dB(A) @10m	Distance From Source to NSL (m)	Noise Reduction due to screening/berms etc. dB(A)	Predicted L _{Aeq} at NSL dB(A) (75 m From Source)
1	Tracked Excavator 30t	75	75	10	47
2	Compactor	79	75	10	51
3	Articulated Dump Truck 23t	78	75	10	50
	Cumulative Noise Level at NSL 75 m From Source				55

A noise reduction value of 10dB has been attributed to screening berms and ground absorption. This will be due to stockpiles surrounding the equipment, screening berms, fencing, tree lines, ground absorption and a closed line of sight between the source and receiver. Calculations are based on all plant operating at the one time which will not be the case on a continuous basis.

In practice noise levels due to the Facility are anticipated to be lower than those listed in Tables 15.4, 15.6 and 15.7. Noise will be monitored around the boundary of the Application Site and at NSL's to ensure noise-control measures are effective, and that the EPA thresholds will be met.

15.6 Cumulative Impacts

Cumulative impacts of the proposed development are considered in the context of the proposed Application Site and the adjoining inert facility (Behan's Land Restoration Ltd.). It is noted that the baseline noise assessment was carried out during which the Behan Facility was active, where traffic movements accessing this Facility were observed to have contributed to the cumulative baseline environment. It is expected that these activities will continue to contribute to the cumulative noise environment for their duration, expected to be ca. 15 years, as highlighted in their Waste Licence Application.

There may be minimal impact during the construction phase on residences close to the restoration works being carried out which will be short lived, lasting a maximum of ca. 6 to 8

weeks at each location, whilst restoration and grading activities are completed. Where possible the NRA guideline values will be met, otherwise the Local Authority/Agency will be informed. Traffic movements during the life of the proposed development are not expected to change from those during the former sand and gravel extraction activities (i.e. 95 loads/day).

*For inspection purposes only.
Consent of copyright owner required for any other use.*

15.7 Mitigation

Further mitigation measures for the construction and operational phases are discussed below.

15.7.1 Construction Phase

The main construction phase will last ca. 9 months and in the context of minimising impacts on the noise environment, will include constructing berms to reduce noise emissions from the Application Site (Figure 15.2). The following measures will be implemented:

- Where possible meet the NRA guidance values for noise during construction activities;
- Development of screening /acoustic berms around the fill phases area (Figure 15.2);
- Plant with low inherent potential for generation of noise and or/vibration will be selected; and
- Access of plant to sensitive areas will be restricted where possible.

15.7.2 Operational Phase

Other mitigation measures proposed to reduce operational noise emissions during the operational phase are as follows:

- On-going monitoring and compliance in accordance with EPA Guidance values for scheduled activities;
- Construction of berms around the processing area in sensitive areas as shown in Figure 15.2, and planting and maintenance of berms around fill phase boundary;
- Restricting the operational times of the Inert Waste Processing Area to daytime hours;
- Minimising drop heights of material from plant and machinery;
- Use of rubber linings on chutes and transfer points;

- Selecting machines with mufflers installed and ensuring these are maintained in good condition;
- Avoidance of Audible tones or impulsive noises as far as is possible; and
- Regular maintenance and lubrication of plant and machinery.

15.8 Residual

Once all mitigation measures, as highlighted in Figure 15.2, are adopted impacts on the noise environment will be negligible and are expected to remain below the NRA and EPA Guideline threshold at the nearest sensitive receptor, during construction and operation phases respectively.

*For inspection purposes only.
Consent of copyright owner required for any other use.*