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INTRODUCTION

Background

10.1 This Chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the potential noise and vibration related impacts of the proposed increase in the permitted soil and stone intake capacity and extended operational life of the existing soil recovery facility operated by Kilsaran Concrete Unlimited Company ('Kilsaran') at Halverstown, Kilcullen, Co. Kildare.

10.2 The proposed development provides for:

(i) an increase in the permitted total intake of soil and stone and broken rock to the existing licensed recovery facility, from 1.2 million tonnes to 2.06 million tonnes. The additional intake to the facility will comprise a mix of soil and stone managed as waste (as heretofore) and as (non-waste) by-product;

(ii) an extension to the permitted life of the existing facility of 3 years (to December 2029) in order to accommodate the additional soil and stone intake;

(iii) continued shared use of existing, co-located site facilities, structures and infrastructure (including the site office, staff welfare facilities, weighbridge (with dedicated office), wheelwash, hardstand areas, fuel storage tanks and site access road);

(iv) continued separation of any construction and demolition waste (principally concrete, metal, timber, PVC pipework and plastic) inadvertently imported to the facility, prior to removal off-site to authorised waste disposal or recovery facilities;

(v) continued soil and stone intake at a rate of up to 300,000 tonnes per annum, of which no more than 95,000 tonnes (per annum) will be managed as waste;

(vi) continued use of a section of the existing concrete block curing shed as a waste inspection and quarantine facility;

(vii) continued environmental monitoring of noise, dust and groundwater for the duration of the site recovery and restoration activities and for a short period thereafter (and in accordance with EPA waste licence requirements);

(viii) continued temporary stockpiling of topsoil pending its re-use as cover material for final restoration of the site; and

(ix) ultimate restoration of the modified final landform (entailing harrowing, topsoiling and seeding) to establish a native woodland habitat on the northern side of the access road and grassland habitat on the southern side.

10.3 Further detail in respect of the proposed application site and surrounding area are provided in Chapter 1 of this EIAR. Further information on the proposed development, site activities, environmental management systems and controls at the application sites are provided in Chapter 2.

10.4 Ongoing (and continued) backfilling of the lands at Halverstown will progress using only excess soil and stone sourced from pre-approved external construction and development sites. The facility does not, and will not, accept peat, contaminated soils or any non-hazardous waste. The current site layout can be seen in EIAR Figure 2-1.

10.5 An operational vibration assessment has not been undertaken as previous SLR experience, and that of the Applicant, in backfilling and restoring former pits and quarries is that little or no vibration arises from activities of this nature and, as such, no vibration assessment is required.

10.6 The noise impact assessment presented herein describes and assesses the existing noise baseline characteristics of the local area. The anticipated effects of the continued

backfilling and recovery activity at the application site are then assessed. Mitigation measures are identified where necessary to eliminate or to minimise adverse noise impacts insofar as practical.

10.7 To assist the understanding of acoustic terminology and the relative change in noise, a glossary of terms and phrases, which specifically relate to this Chapter, is provided in Appendix 10-A.

Scope of Work / EIA Scoping

10.8 The following sections of this EIAR Chapter describe the potential noise impacts associated with the ongoing and future continuation of backfilling and recovery activities at the application site. The following issues are addressed separately:

- regulatory control framework for noise and vibration
- methodology used to assess potential noise impacts from activities at properties (dwellings and farms) and sensitive ecological receptors;
- baseline conditions pertaining to existing background and ambient noise levels around the application site;
- noise impact evaluation criteria;
- prediction of the noise levels and identification of potential impacts;
- assessment of severity of impacts, with reference to the evaluation criteria;
- description of mitigation measures that will be incorporated into the design and operation of the scheme to eliminate or minimise the potential for noise impact;
- a summary of any residual impacts; and
- monitoring proposals.

Contributors / Author(s)

10.9 SLR Consulting Ireland undertook the impact assessment presented in this chapter on behalf of Kilsaran Concrete. Michelle Dawson (MIOA Bsc) and Claire Bye (AMIOA Bsc) were the Consultants on the Project.

Limitations / Difficulties Encountered

10.10 This assessment is compiled based on published guidance documents, and site-specific field surveys. No difficulties were encountered in compiling the required information.

REGULATORY BACKGROUND

10.11 The following sections describe the main legislative policy requirements in respect of noise associated with existing development activities (and proposed continuation thereof).

10.12 Currently, there is no national or regional legislation which specifically addresses noise from the established backfilling / recovery facility. However, there are a number of guidance documents that are relevant in the context of noise action planning.

Planning Policy and Development Control

National Planning Framework – Project Ireland 2040

10.13 The National Planning Framework (NPF) 2040 (published in February 2018) is a national planning framework for Ireland. The framework provides the policies for all regional and local plans.

10.14 There are no specific policies in relation to noise emissions in NPF for extraction or associated backfilling and restoration activities or for materials recovery activity. The

stated general development objective is to facilitate development while at the same time protecting the environment.

10.15 National Planning Framework Objective 65 addresses noise related impact of development and identifies a requirement for Planning Authorities to:

"Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans."

10.16 The Project Ireland 2040 National Planning Framework does refer to noise in general terms under section 9.4 *Creating a Clean Environment for a Healthy Society* in acknowledging that noise is unwanted sound but is an inevitable consequence of everyday life and it becomes a problem when it occurs in the incorrect place or at the incorrect time or on a frequent or recurring basis. The National Planning Framework aims to support the following measures:

- ***Noise Management and Action Planning***

  Measures to avoid, mitigate, and minimise or promote the pro-active management of noise, where it is likely to have significant adverse impacts on health and quality of life, through strategic noise mapping, noise action plans and suitable planning conditions.

- ***Noise, Amenity and Privacy***

  This includes but is not limited to, good acoustic design in new developments, in particular residential development, through a variety of measures such as setbacks and separation between noise sources and receptors, good acoustic design of buildings, building orientation, layout, building materials and noise barriers and buffer zones between various uses and thoroughfares.

- ***Quiet Areas***

  The further enjoyment of natural resources, such as our green spaces and sea frontage, through the preservation of low sound levels or a reduction in undesirably high sound levels, is particularly important for providing respite from high levels of urban noise. As part of noise action plans, an extra value placed on these areas, in terms of environmental quality and the consequential positive impact on quality of life and health, due to low sound levels and the absence of noise, can assist in achieving this.

Local Planning Policy – Kildare County Development Plan 2023-2029

10.17 The current Kildare County Development Plan details policies and objectives which provide for the planning and future sustainable development of the County between 2023 and 2029. Section 6.8.2 relates to noise.

"Noise, which is continuous, repeated, and / or loud can have significant impacts on our quality of life. The Kildare Noise Action Plan 2019-2023, and subsequent next edition, round 4, seeks to avoid, prevent, and reduce where necessary the harmful effects of long-term exposure to environmental noise. It primarily considers the long-term environmental noise impact from 'Major Road' and 'Major Rail' traffic noise sources (which are mapped) and sets out an approach to review noise impact levels. Environmental noise from major infrastructure (i.e., roads, railways, and airports) is governed by the EU's Environmental Noise Directive as transposed into Irish Law as S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018."

10.18 The development plan also sets out policy and objectives in relation to management of noise as outlined below:

Policy IN P8: *"Implement the provisions of EU and National legislation on air, noise, and light pollution and other relevant legislative requirements, as appropriate."*

Objective IN O63: *"Implement the relevant spatial planning recommendations and actions of the Kildare Noise Action Plan 2019-2023 (and any subsequent update)".*

Objective IN O64:*"Ensure that future developments are designed and constructed to minimise noise disturbance and consider the multi-functional uses of streets including movement and recreation, as detailed in the Urban Design Manual (2009) and the Design Manual for Urban Roads and Streets (2013)."*

Objective IN O65: *"Ensure that noise levels caused by new and existing developments throughout the county do not exceed normally accepted standards."*

Objective IN O66:*"Enforce and comply with European Communities (Environmental Noise) Regulations 2018 by:*

- *Regulating and controlling activities likely to give rise to excessive noise (other than those activities which require regulation by the EPA)*
- *Requiring new developments and / or activities likely to give rise to excessive noise to install noise mitigation measures and monitors."*

Objective IN O67 : *"Ensure noise sensitive development in proximity to national and other roads provides a noise impact assessment / Acoustic Design Statement to the requirements set out in the Noise Action Plan and Local Planning Advice Notes as may issue and includes appropriate spatial consideration in the design phase and, where necessary physical mitigation measures, such as noise barriers, set back landscaping and / or buffer zones between areas of land where development is proposed and existing / proposed national or other roads.."*

10.19 In Section 7.6.8 a number of Environmental Services objectives are set out:

Objective EN4 states: "*Facilitate the implementation of the Kildare Noise Action Plan 2013-2018 and Litter Management Plan 2016-2019 and any subsequent amendments during the period of this Plan*."

Objective EN7 states: "*Require the submission of Annual Environmental Reports (which require ongoing monitoring of specified environmental parameters) on specified developments through the planning process*."

Guidelines

Extractive Industry Guidelines

10.20 The EPA publication *Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*[1] recommends the following in respect of noise:

In relation to quarry developments and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELVs at the nearest noise-sensitive receptor:

- Daytime: 08:00–20:00 h L_{Aeq} (1 hr) = 55 dBA
- Night-time: 20:00–08:00 h L_{Aeq} (1 hr) = 45 dBA

Note: 95% of all noise levels shall comply with the specified limit value(s). No noise level shall exceed the limit value by more than 2 dBA.)

10.21 The DoEHLG (2004) Guidelines for Planning Authorities (*Quarries and Ancillary Activities: Guidelines for Planning Authorities*[2]*)* recommends similar limit values.

[1] https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf
[2] http:/www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/Planning/FileDownLoad%2C1606%2Cen.pdf

Guidelines for Noise Impact Assessment (IEMA)

10.22 The *Guidelines for Noise Impact Assessment* produced by the Institute of Environmental Management and Assessment (IEMA) are generally recognised as established good practice standards for scope, content, and methodology of noise impact assessment.

10.23 The guidelines address the key principles of noise impact assessment and are applicable to development proposals where noise effects are likely to occur. The guidelines state that for any assessment, the noise level threshold and significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. An example impact scale offered by the IEMA guidelines is shown in the table below.

Table 10-1
Example Impact Scale from the Change in Sound Levels (IEMA)

Long-Term Impact Classification	Short-Term Impact Classification	Sound Level Change dB LA_{eq}, T (+ive or -ive) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3.0 dB and < 5 dB
Moderate	Major	≥ 5.0 dB and < 10 dB
Major		≥ 10.0

10.24 The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under most normal conditions. A 10 dB change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

10.25 To determine the overall noise impact, the magnitude and sensitivity, Noise Effects Descriptors are presented in Table10-2 below.

Table 10-2
Noise Effects Descriptors (IEMA)

Very Substantial	Greater than 10 dB LA_{eq} change in sound level perceived at a highly sensitive noise receptor
Substantial	Greater than 5 dB LA_{eq} change in sound level at a noise-sensitive receptor, or a 5 to 9.9 dB L_{Aeq} change in sound level at a highly sensitive noise receptor
Moderate	A 3 to 4.9 dB LA_{eq} change in a sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB LA_{eq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB LA_{eq} change in a sound level at a receptor of some sensitivity
None / Not significant	Less than 2.9 dB LA_{eq} change in sound level and/or all receptors of negligible sensitivity to noise or marginal to the zone of the influence of the proposed development

10.26 As recognised in the IEMA guidance, there are however many factors which affect people's perception and their responses to noise. Guidance on assessment of the magnitude of noise impact and the significance of the effects are presented in Table 10-3.

Table 10-3
Relationship between Noise Impact, Effect and Significance (IEMA)

Magnitude (Nature of Impact)	Description of Effect (On a specific sensitive receptor)		Significance
Substantial	Beneficial	Receptor Perception = Marked Change Causes a material change in behaviour and/ or attitude, e.g., individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant. (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect) ↕ (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect) Less Likely to be Significant
Moderate		Receptor Perception = Noticeable Improvement Improved noise climate resulting in small change in behaviour and/or attitude, e.g., turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	
Slight		Receptor Perception = Just Noticeable Improvement Noise impact can be heard but does not result in any change in behaviour or attitude. Can slightly affect character of the area but not such that there is a perceived change in quality of life.	
Negligible	N/A = no discernible effect on receptor		Not Significant
Slight	Adverse	Receptor Perception = non-intrusive Noise impact can be heard, but does not cause change in behaviour or attitude, e.g., turning up volume of television, speaking more loudly, closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Less Likely to be Significant. Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect) ↕ Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect) More Likely to be Significant
Moderate		Receptor Perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g., turning up volume of television; speaking more loudly; closing windows. Potential for non-awaking sleep disturbance. Affects the character of area such that there is a perceived change in quality of life.	
Substantial		Receptor perception = Disruptive Causes material change in behaviour and /or attitude, e.g., avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to change in character of area.	
Severe		Receptor Perception = Physically Harmful Significant Changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or psychological effects, e.g. regular sleep deprivation / awakening, loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Significant

EPA Noise Guidance for Scheduled Activities (NG4)

10.27 The Environmental Protection Agency's (EPA) 2016 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' sets out scope, content, and methodology for scheduled / licensed industrial and waste activities in Ireland.

10.28 In accordance with the NG4 guidance, it is necessary to designate the noise environment at each sensitive receptor location as a 'Quiet Area', a 'Low Background Noise Area' or 'Not an Area of Low Background Noise'. To be categorised as a 'Quiet Area' the following criteria must be met:

- at least 3 km from urban areas with a population > 1,000 people;
- at least 10 km from any urban areas with a population > 5,000 people;
- at least 15 km from any urban areas with a population > 10,000 people;
- at least 3 km from any local industry;
- at least 10 km from any major industry centre;
- at least 5 km from any National Primary Route; and
- at least 7.5 km from any motorway or dual carriageway.

10.29 If any of the above criteria are not met, then it is necessary to undertake a baseline noise survey of the existing daytime, evening, and night-time noise environments in order to establish whether the receptor is located in a 'Low Background Noise Area' or 'Not an Area of Low Background Noise'.

10.30 The noise criteria for these designations are shown in Table 10-4 below. For an area to be designated as an area of low background noise ($LA_{F\,90}$), the daytime, evening, and night-time noise limits must all be met.

Table 10-4
NG4 Noise Criteria for Area Designation

Designation	Day LA_{F90} dB	Evening LA_{F90} dB	Night LA_{F90} dB
Low Background Noise Area	≤ 40	≤ 35	≤ 30
Not an Area of Low Background Noise	≥ 41	≥ 35	≥ 31

10.31 The procedure outlined in the NG4 Guidance document then sets out a methodology to determine an acceptable noise limit at a receptor location. This noise limit is termed the noise rating level (or LA_r,T) and includes, if necessary, a plus 5dB tonal penalty, or a plus 5dB impulsive penalty. If a noise source is both tonal and impulsive however, only one adjustment should be made.

10.32 In order to determine whether or not a 5dB tonal penalty should be applied, it is necessary to obtain third octave frequency data of the noise source in question. The NG4 guidance states that:

'... the time average sound pressure level in the one-third-octave band of interest should exceed the time-average sound pressure levels of both adjacent one-third-octave bands by some constant level difference'. The appropriate level differences vary with frequency. They should be greater than or equal to the following values in both adjacent one-third-octave bands:

- 15 dB in low-frequency one-third-octave bands (25 Hz to 125 Hz);
- 8 dB in middle-frequency bands (160 Hz to 400 Hz); and
- 5 dB in high-frequency bands (500 Hz to 10,000 Hz).'

10.33 To determine whether a 5 dB impulsive penalty should be applied to a noise source, it is necessary to establish whether the noise in question may be 'described as something with a thumping, banging, or impact noise that is clearly audible above everything else.'

10.34 The permitted rating noise level in each designated area is shown in Table 10-5.

Table 10-5
NG4 Permitted Rating Noise Levels

Designation	Daytime Noise Criterion, dB $L_{Ar,T}$	Evening Noise Criterion, dB $L_{Ar,T}$	Night-Time Noise Criterion, dB $L_{Ar,T}$
Quiet Area	Noise from the licensed site to be at least 10 dB below the average daytime background noise level measured during the baseline noise survey	Noise from the licensed site to be at least 10 dB below the average evening background noise level measured during the baseline noise survey	Noise from the licensed site to be at least 10 dB below the average night-time background noise level measured during the baseline noise survey
Areas of Low Background Noise	45.0	40.0	35.0
All Other Areas	55.0	50.0	45.0

British Standard 5228: 2009 + A1:2014

10.35 British Standard 5228-1:2009+A:2014 Noise and vibration control on construction and open sites, Part 1: Noise (BS5228) sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities. It can be used to predict noise levels arising from the site operations and associated / ancillary production activities. BS5228 also sets out tables of sound power levels generated by a wide variety of mobile equipment.

10.36 Noise levels generated by site operations and experienced at local receptors will depend upon a number of variables, the most significant of which are:

- the amount of noise generated by plant and equipment being used at the development site, generally expressed as a sound power level;
- the periods of operation of the plant at the development site, known as the "on-time";
- the distance between the noise source and the receptor, known as the "stand-off";
- the attenuation due to ground absorption or barrier screening effects; and
- any reflections of noise due to the presence of hard vertical faces (i.e.. walls).

Site Specific Emission Limits

10.37 Condition No. 9 of the current planning permission in respect of ongoing backfilling and recovery activities at the application site (Planning Ref. 18/453) states :

9 (a) Nosie measured from the development shall not give rise to sound pressure levels (LAeq) measured at noise sensitive locations which exceed the following limits

(i) 55dB(A) between the hours of 0800 and 18000 Monday to Friday inclusive (excluding bank holidays)

(ii) 45 dB(A) at any other time.

9(b) There shall be no clearly audible tonal component or impulsive component in the noise emission from the development at any noise sensitive location.

10.38 Separately, Condition 4.1 of the EPA Waste Licence stipulates that:

Noise from the facility shall not give rise to sound pressure levels measures at the noise sensitive locations which exceed the limit values (of 55 dB $L_{A,r}$) daytime, 55 dB $L_{A,r}$), evening time and 45 dB $L_{A,r}$) night time set in Schedule B.4).

10.39 The results of compliance noise monitoring undertaken by the Applicant at the existing backfilling / recovery facility since it commenced operations in 2020 are presented in tabulated summary format in Appendix 10-2. Noise data is presented for daytime, evening time and night-time monitoring, with commentary as appropriate on the noise sources which influenced the reported noise levels.

10.40 As can be seen, recorded daytime noise levels at all monitoring locations are within the prescribed emission limit (of 55 dB L_{Aeq}) except at monitoring location N2 which fronts onto the R448 Regional Road. In this instance, the reported L_{A10} value (which is a reflection of intermittent noise, the level of which is exceeded 10% of the time) and on-site observations indicate that the elevated noise levels can be clearly attributed to passing traffic along the R448, rather than to site activities.

10.41 It is also notable that exceedances of evening or night-time noise limits also occur at monitoring location N2, during periods when the existing facility is not operating. On-site observations and reported L_{A10} values clearly attribute the exceedances on these occasions to passing traffic along the R448 Regional Road.

RECEIVING ENVIRONMENT

Study Area

10.42 The application site is located entirely within the townland of Halverstown, approximately 4.5 km south of Kilcullen, just over 2km northeast of Calverstown village and approximately 700m to the west of the M9 motorway.

10.43 The application site is bounded to the north by L6083 local road, by the R448 Regional Road (the former N9 National Primary Road) to the east and by farmland with residential housing and agricultural buildings to the south and west. The application site is accessed via an existing junction and entrance leading off the R448 Regional Road.

10.44 The existing backfilling / recovery facility and application site comprises lands originally developed as a sand and gravel pit (to the south of the access road through the site) and lands previously only ever used for agricultural use, principally grassland (in the north-eastern part of the application site). There is an existing concrete block plant (operated by the Applicant) located to the north-west of the application site and accessed by the road running through it.

10.45 The site is located in a rural area with development generally comprising isolated rural housing and other intermittent development located along the local road network. Land-use in the area is tied to a range of agricultural activities and enterprises, primarily dairy, tillage and horse breeding. There are some active (and former) sand and gravel pits interspersed across the local area, albeit at some distance from the site.

Baseline Study Methodology

10.46 Environmental noise surveys were carried out to capture typical background noise levels at the noise-sensitive receptors closest to the application site. The methodology of the surveys and the results are set out below. The weather conditions during the survey periods were acceptable for noise monitoring, being generally dry with little or no wind.

10.47 The measurements were carried out using a Larson Davis 831 Type 1 sound level meter (serial number A0527). The sound level meter was calibrated before the measurements, and its calibration checked after, using a Larson Davis Cal200 field calibrator (serial number 6970). No calibration drifts were found to have occurred during surveys. All noise equipment had been calibrated to a traceable standard by UKAS (United Kingdom Accreditation Service) accredited laboratories within 12 months preceding the surveys.

10.48 At the measurement positions, the following noise level indices were recorded:

- LA_{eq},T is the A-weighted equivalent continuous noise level over the measurement period, and effectively represents an "average" value.
- LA_{90},T is the A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe the background noise.
- LA_{10},T is the A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe traffic noise.

10.49 Environmental noise surveys were undertaken by SLR Consulting Ireland at the nearest noise sensitive receptors to the application site on Wednesday 10th June 2015, prior to commencement of backfilling and recovery activities. Noise surveys were also undertaken more recently, with site activities ongoing during the daytime of Tuesday 25th July 2023.

10.50 During the 2015 noise survey, noise measurements were undertaken over a 1-hour period during the designated daytime period (07:00 to 19:00). The monitoring periods chosen were considered to give representative daytime noise levels at each noise sensitive location at that time.

10.51 During the 2023 noise survey, noise measurements were undertaken over four non-consecutive 15-minute intervals during the designated daytime period (07:00 to 19:00). The monitoring periods chosen are considered to give representative daytime noise levels at each noise sensitive location.

10.52 During the surveys, the sound level meter was in free-field conditions (i.e., at least 3.5 m from the nearest vertical reflecting surface, with the microphone approximately 1.5 m above ground level).

10.53 All noise levels are recorded in 'A-weighted' decibels, dB(A). A-weighting is the process by which noise levels are corrected to account for the non-linear frequency response of the human ear.

Sources of Information

10.54 A desk study was carried out to gather all relevant information relating to noise conditions around the application site. Further information was gathered through a site visit and technical assessments consistent with current standard methodologies and published best practice guidelines. This yielded the data required to allow an assessment of likely significant effects of the proposed development on sensitive receptors within its zone of influence.

Field Survey / Monitoring

10.55 The initial (pre-development) noise survey for the site was conducted on the 10th June 2015. An updated noise survey was conducted on the 25th July 2023 such to understand the current (with development) noise levels of the area.

10.56 The noise monitoring locations used for the purposes of the baseline noise survey for both 2015 and 2023 noise surveys are shown in Table 10-6 and comprise the following:

- N1: to the south-east of the existing facility;

- N2: to the north of the existing facility;
- N3: to the north-west of the existing facility;
- N4: to the west of the existing facility.

10.57 Table 10-6 below presents the noise climate and the weather conditions observed by the surveyor during the original (pre-development) noise survey in 2015.

Table 10-6
Summary of Noise Climate - 2015 Noise Survey

Location	Photo	Noise Climate Description
Weather Conditions During Survey:		Sunny, No Clouds. Temperature 15 – 18 °C. Wind Speed up to 2.1 m/s. Wind Direction: NE.
N1		Measured baseline noise levels at N1 were mainly dominated by road traffic noise sources on the adjacent R448, natural noises, and farm animals' noises from surrounding fields when noise from the traffic abated. Recorded noise levels reflect the morning traffic on the R448.
N2		Measured baseline noise levels at N2 were mainly dominated by road traffic noise sources on the adjacent line, natural noises, and farm animals' noises from surrounding fields when noise from the traffic abated. Traffic noise from R448 also audible.
N3		Measured baseline noise levels at N3 were mainly dominated by natural noises, and farm animals' noises from surrounding fields. Car passed noise meter to access the farm.

Location	Photo	Noise Climate Description
N4		Measured baseline noise levels at N4 were mainly dominated by road traffic noise sources on the adjacent R418, natural noises, and farm animals' noises from surrounding fields when noise from the traffic abated.

10.58 The table below presents the noise climate and the weather conditions observed by the surveyor during the recent 2023 noise survey, when permitted backfilling and activities were ongoing at the application site.

Table 10-7
Summary of Noise Climate - 2023 Noise Survey

Location	Photo	Noise Climate Description
Weather Conditions During Survey:		Mild, overcast. Temperature 19-22°C. Wind Speed 2-3 m/s.
N1		Cars / lorries passing regularly. Birds, Slight breeze though trees. Quieter when traffic noise abated.
N2		Facility can be heard from this location. Noise from main road traffic. Natural noises - Birds and breeze through trees.
N3		Construction on nearby house - digger, men talking, vehicles entering/exiting site. Facility not audible from this location, natural noise such as birds.

Location	Photo	Noise Climate Description
N4		Cars passing regularly, neighbour car pulled up to ask question, tractor operating in farmhouse opposite, facility not audible from this location.

10.59 A summary of the noise monitoring results for the baseline survey on Wednesday 10th June 2015 and Tuesday 25th July 2023 are provided in Table 10-8 and Table 10-9 respectively below.

Table 10-8
Summary of Measured Noise Levels - 2015 Survey, Free Field dB

Date	Location	Time	Duration (hr:mins)	LA_{eq} (dB)	LA_{10} (dB)	LA_{90} (dB)
10/06/2015	N1	08:04	01:00	75	80	52
	N2	09:10	01:00	54	56	41
	N3	10:37	01:00	47	50	37
	N4	11:51	01:00	64	64	39

Table 10-9
Summary of Measured Noise Levels - 2023 Survey Free Field dB

Date	Location	Time	Duration (hr:mins)	LA_{eq} (dB)	LA_{10} (dB)	LA_{90} (dB)
25/07/2023	N1	08:24	00:15	76	81	51
		09:52	00:15	73	78	39
		11:36	00:15	73	78	42
		13:01	00:15	73	79	42
25/07/2023	N2	08:43	00:15	65	56	46
		10:11	00:15	48	50	39
		11:55	00:15	44	46	35
		13:36	00:15	43	46	36
25/07/2023	N3	09:07	00:15	43	44	34
		10:30	00:15	50	50	26
		12:14	00:15	36	36	23
		13:57	00:15	43	46	36
25/07/2023	N4	09:27	00:15	62	67	33
		10:53	00:15	59	62	33
		12:37	00:15	60	65	37
		14:21	00:15	45	46	36

10.60 An analysis of the 2015 and 2023 survey has been undertaken.

- During the 2023 survey, the site was operational at the time of the survey and was observed by the surveyor.
- An analysis of the data from both the 2015 and 2023 survey shows that measured noise levels are similar to those measured in 2023.
- There have been no major changes in the surrounding area with regards to the noise climate.

10.61 Therefore, based on the above, the 2015 noise survey data has been used within the noise assessment.

10.62 Based on the data presented in Table 10-8, N1 and N2 have been classed as 'All other areas'. N3 and N4 have been classed as 'Areas of Low Background Noise' in accordance with standards set out in the EPA's NG4 Guidance.

10.63 presents the noise monitoring location with the corresponding measured background noise level and NG4 noise limit.

Table 10-10
Summary of Measured Noise Levels, Free Field dB

Location	Receptors	Measured Ambient Noise Level, L_{Aeq} dB	Measured Background Noise Level, L_{A90} dB	NG4 Noise Limit, $L_{Ar,T}$ dB
N1	R1 - R4 & R8 – R9 & R32	75	52	55
N2	R5 - R7 & R16 - R23	54	41	55
N3	R10 – R15 & R24 – R29 & R33	47	37	45
N4	R30 – R31	64	39	45

Sensitive Receptors

10.64 Sensitive locations are those where people may be exposed to noise from the existing or planned activities. The closest receptors to the application site have been identified and assessed based on their distance from the on-site activities (refer to Table 10-11 below). The relevant receptor locations are shown in Figure 10-1.

10.65 There are 33 sensitive receptors identified within 1km approximately of the centre of the application site. A summary of the closest sensitive receptors with the corresponding measurement location and the type of receptor is presented in Table 10-11 below (note distances taken from the centre of the site).

Table 10-11
Noise Sensitive Receptors

Measurement Location	Receptor Reference	Receptor	Distance to Site Boundary (m)
N1	R1	Residential	230
N1	R2	Residential	366
N1	R3	Residential	309
N1	R4	School	493

Measurement Location	Receptor Reference	Receptor	Distance to Site Boundary (m)
N2	R5	Residential	405
N2	R6	Residential	442
N2	R7	Residential	500
N1	R8	Residential	447
N1	R9	Residential	390
N3	R10	Residential	620
N3	R11	Residential	650
N3	R12	Residential	660
N3	R13	Residential	682
N3	R14	Residential	716
N3	R15	Residential	844
N2	R16	Residential	734
N2	R17	Residential	736
N2	R18	Residential	776
N2	R19	Residential	832
N2	R20	Residential	860
N2	R21	Residential	883
N2	R22	Residential	942
N2	R23	Residential	1062
N3	R24	Residential	703
N3	R25	Residential	792
N3	R26	Residential	862
N3	R27	Residential	921
N3	R28	Residential	983
N3	R29	Residential	881
N4	R30	Residential	962
N4	R31	Residential	991
N1	R32	Residential	277
N3	R33	Residential	802

Ecological Receptors

10.66 The application site is not subject to any statutory nature conservation designation. Ecological receptors of concern are those area designated under EU Habitats Directive (92/43/EEC).

10.67 Based on the nature, size, and scale of the site it is considered that the maximum distance for which the project should be evaluated in terms of Natura 2000 sites is up to a maximum radius of 2 km from the application site, unless there are any potential source-pathway-receptor links between it and any Natura 2000 site(s) beyond this distance.

IMPACT ASSESSMENT

Evaluation Methodology

10.68 To determine the noise impact arising from continued soil intake and backfilling activities at the existing recovery facility, SLR Consulting Ireland carried out a noise prediction assessment, whereby resultant noise levels were calculated at the noise sensitive receptors (residences) within approximately 1km of the site, identified in Figure 10-1.

10.69 Operational noise rating (LA_r, 1 hr) predictions at each receptor location are based on the prediction protocol for fixed plant contained within BS5228: Part 1 (2009)+ A1:2014 "*Code of Practice for Noise and Vibration Control on Construction and Open Sites*''

10.70 The following noise sources have been considered in the noise assessment for the recovery facility operations:

- Dozer;
- Hydraulic Excavator;
- HGV truck.

10.71 The corresponding noise sources of the plant equipment are presented in the table below.

Table 10-12
Noise Levels of Plant Equipment

Receptor Reference	*Sound Power Level (dB)*
Dozer	108
Hydraulic Excavator	108
HGV truck	110

Noise level data from SLR's library has been used within the noise assessment.

10.72 For the purposes of this assessment, it is conservatively assumed that noise sources are simultaneously active for 80% of the time during assessment hours. For the purposes of this impact assessment, a reduction of -5 dB(A) has been assumed for partial noise screening as the attenuation path difference arising (between the noise source and receptors).

10.73 In modelling typical site activities, it is assumed that soil tipping / deposition activity by HGVs will not occur at the site boundary and the excavator and dozer will not be working simultaneously. Some compaction of soil will occur close to the site boundary, albeit it will only be carried out intermittently.

10.74 The EPA (2006) Environmental Management Guidelines for Quarries and Ancillary Activities and the DoEHLG (2004) Guidelines for Planning Authorities both recommend a noise emission limit, applied to the nearest noise-sensitive receptors, of 55 dB LA_{eq}, 1hr during daytime working hours (defined as 07:00 to 18:00 hours). A limit of 70 dB LA_{eq}, 1 hr is permitted for periods of up to eight weeks in any working year at nearby noise sensitive receptors to facilitate any necessary construction or temporary site works.

10.75 As discussed in Paragraph 10.73 above, the excavator and dozer will not be in operation simultaneously. Therefore, either the Dozer and HGV will be in operation simultaneously (Scenario 1) or the Excavator and HGV will be in operation simultaneously (Scenario 2). The predicted noise level at the nearest noise sensitive receptors for both scenarios is presented in Table 10-13 below.

Table 10-13
Noise Sensitive Receptors

Receptor	m	Equipment	Noise Level at Receptor of Equipment	Scenario 1 Dozer and HGV with Façade Reflection	Scenario 2 Excavator and HGV with Façade Reflection
R1	230	Dozer	37.0	**49.1**	**49.1**
		HGV	39.0		
		Excavator	37.0		
R2	366	Dozer	31.9	**44.0**	**44.0**
		HGV	33.9		
		Excavator	31.9		
R3	309	Dozer	33.8	**45.9**	**45.9**
		HGV	35.8		
		Excavator	33.8		
R4	493	Dozer	28.7	**40.8**	**40.8**
		HGV	30.7		
		Excavator	28.7		
R5	405	Dozer	30.8	**42.9**	**42.9**
		HGV	32.8		
		Excavator	30.8		
R6	442	Dozer	29.9	**42.0**	**42.0**
		HGV	31.9		
		Excavator	29.9		
R7	500	Dozer	28.5	**40.7**	**40.7**
		HGV	30.5		
		Excavator	28.5		
R8	447	Dozer	29.7	**41.9**	**41.9**
		HGV	31.7		
		Excavator	29.7		
R9	390	Dozer	31.2	**43.3**	**43.3**
		HGV	33.2		
		Excavator	31.2		
R10	620	Dozer	26.2	**38.3**	**38.3**
		HGV	28.2		
		Excavator	26.2		
R11	650	Dozer	25.7	**37.8**	**37.8**
		HGV	27.7		
		Excavator	25.7		
R12	660	Dozer	25.5	**37.6**	**37.6**
		HGV	27.5		
		Excavator	25.5		
R13	682	Dozer	25.2	**37.3**	**37.3**
		HGV	27.2		
		Excavator	25.2		
R14	716	Dozer	24.6	**36.8**	**36.8**
		HGV	26.6		
		Excavator	24.6		
R15	844	Dozer	22.8	**35.0**	**35.0**
		HGV	24.8		
		Excavator	22.8		
R16	734	Dozer	24.4	**36.5**	36.5
		HGV	26.4		
		Excavator	24.4		

Receptor	m	Equipment	Noise Level at Receptor of Equipment	Scenario 1 Dozer and HGV with Façade Reflection	Scenario 2 Excavator and HGV with Façade Reflection
R17	736	Dozer	24.3	**36.5**	36.5
		HGV	26.3		
		Excavator	24.3		
R18	776	Dozer	23.8	**35.9**	35.9
		HGV	25.8		
		Excavator	23.8		
R19	832	Dozer	23.0	**35.1**	35.1
		HGV	25.0		
		Excavator	23.0		
R20	860	Dozer	22.6	**34.8**	34.8
		HGV	24.6		
		Excavator	22.6		
R21	883	Dozer	22.4	**34.5**	34.5
		HGV	24.4		
		Excavator	22.4		
R22	942	Dozer	21.6	**33.8**	33.8
		HGV	23.6		
		Excavator	21.6		
R23	1062	Dozer	20.3	**32.5**	32.5
		HGV	22.3		
		Excavator	20.3		
R24	703	Dozer	24.8	**37.0**	37.0
		HGV	26.8		
		Excavator	24.8		
R25	792	Dozer	23.5	**35.7**	35.7
		HGV	25.5		
		Excavator	23.5		
R26	862	Dozer	22.6	**34.7**	34.7
		HGV	24.6		
		Excavator	22.6		
R27	921	Dozer	21.9	**34.0**	34.0
		HGV	23.9		
		Excavator	21.9		
R28	983	Dozer	21.2	**33.3**	33.3
		HGV	23.2		
		Excavator	21.2		
R29	881	Dozer	22.4	**34.5**	34.5
		HGV	24.4		
		Excavator	22.4		
R30	962	Dozer	21.4	**33.5**	33.5
		HGV	23.4		
		Excavator	21.4		
R31	991	Dozer	21.1	**33.2**	33.2
		HGV	23.1		
		Excavator	21.1		
R32	277	Dozer	34.9	**47.1**	47.1
		HGV	36.9		
		Excavator	34.9		

Receptor	m	Equipment	Noise Level at Receptor of Equipment	Scenario 1 Dozer and HGV with Façade Reflection	Scenario 2 Excavator and HGV with Façade Reflection
R33	802	Dozer	23.4	**35.5**	**35.5**
		HGV	25.4		
		Excavator	23.4		
Note :Predicted noise levels for Scenario 1 and 2 are the same, as the sound power level of the Excavator and Dozer are the same.					

10.76 Table 10-14 presents the predicted noise level at the nearest noise sensitive receptors compared against the corresponding NG4 noise limit.

Table 10-14
Predicted Operational Noise Levels

Receptor Reference	Measurement Location	Period	Noise Limit LA_{eq}, 1 hr dB(A)	Operational* LA_r, 1 hr dB(A)	Difference
R1	N1	Daytime	55	49.1	**-5.9**
R2	N1	Daytime	55	44.0	**-11**
R3	N1	Daytime	55	45.9	**-9.1**
R4	N1	Daytime	55	40.8	**-14.2**
R5	N2	Daytime	55	42.9	**-12.1**
R6	N2	Daytime	55	42.0	**-13**
R7	N2	Daytime	55	40.7	**-14.3**
R8	N1	Daytime	55	41.9	**-13.1**
R9	N1	Daytime	55	43.3	**-11.7**
R10	N3	Daytime	45	38.3	**-6.7**
R11	N3	Daytime	45	37.8	**-7.2**
R12	N3	Daytime	45	37.6	**-7.4**
R13	N3	Daytime	45	37.3	**-7.7**
R14	N3	Daytime	45	36.8	**-8.2**
R15	N3	Daytime	45	35.0	**-10**
R16	N2	Daytime	55	36.5	**-18.5**
R17	N2	Daytime	55	36.5	**-18.5**
R18	N2	Daytime	55	35.9	**-19.1**
R19	N2	Daytime	55	35.1	**-19.9**
R20	N2	Daytime	55	34.8	**-20.2**
R21	N2	Daytime	55	34.5	**-20.5**
R22	N2	Daytime	55	33.8	**-21.2**
R23	N2	Daytime	55	32.5	**-22.5**
R24	N3	Daytime	45	37.0	**-8**

Receptor Reference	Measurement Location	Period	Noise Limit LA_{eq}, 1 hr dB(A)	Operational* LA_r, 1 hr dB(A)	Difference
R25	N3	Daytime	45	35.7	**-9.3**
R26	N3	Daytime	45	34.7	**-10.3**
R27	N3	Daytime	45	34.0	**-11**
R28	N3	Daytime	45	33.3	**-11.7**
R29	N3	Daytime	45	34.5	**-10.5**
R30	N4	Daytime	45	33.5	**-11.5**
R31	N4	Daytime	45	33.2	**-11.8**
R32	N1	Daytime	55	47.1	**-7.9**
R33	N3	Daytime	45	35.5	**-9.5**

10.77 As can be seen from the above Table, the EPA NG4 daytime noise criterion limits arising specifically from (any continued) backfilling and recovery operations at the existing backfilling / recovery facility at Halverstown are comfortably satisfied at all nearby noise sensitive locations.

10.78 In this respect, the predicted typical noise levels superimposed on measured baseline (pre-development) noise levels and presented above, reflect the findings of more recent (with development) noise levels recorded in 2023.

10.79 To identify the potential impact of (continued) backfilling and recovery activity at the proposed facility, predicted specific LA_{eq}, 1 hr dB(A) noise levels have been logarithmically added to current background ambient noise levels. The cumulative levels have been compared to the existing ambient noise levels at each of the noise sensitive locations for each time-period and screened against the long-term impact criteria set out in Table 10-1.

10.80 Screening against these (long-term) impact criteria is deemed to be more appropriate for this particular development as the activities under assessment

- have been ongoing at the existing facility / application site since 2017 (and projected to extend out to 2029);
- are well established in the local environment;
- will not require any further site development or works which could introduce potential new sources of noise to the local environment;
- have not generated any noise nuisance which has been the subject of complaint to either the Applicant (the facility operator), Kildare County Council or the EPA.

10.81 The cumulative assessment is presented in Table 10-15 below.

Table 10-15
Cumulative Operational Noise Levels: Recovery Facility

Receptors	Monitoring Location	Existing $LA_{eq,T}$ dB(A)	Operational LA_r, 1 hr dB(A)*	Cumulative LA_{eq}, T dB(A)	Difference	Long Term Impact
R1	N1	52	49.1	53.8	1.8	Negligible
R2	N1	52	44	52.6	0.6	Negligible
R3	N1	52	45.9	53.0	1.0	Negligible
R4	N1	52	40.8	52.3	0.3	Negligible
R5	N2	41	42.9	45.1	4.1	Minor

Receptors	Monitoring Location	Existing $LA_{eq,T}$ dB(A)	Operational $LA_{r,\ 1\ hr}$ dB(A)*	Cumulative $LA_{eq,\ T}$ dB(A)	Difference	Long Term Impact
R6	N2	41	42	44.5	3.5	Minor
R7	N2	41	40.7	43.9	2.9	Negligible
R8	N1	52	41.9	52.4	0.4	Negligible
R9	N1	52	43.3	52.5	0.5	Negligible
R10	N3	37	38.3	40.7	3.7	Minor
R11	N3	37	37.8	40.4	3.4	Minor
R12	N3	37	37.6	40.3	3.3	Minor
R13	N3	37	37.3	40.2	3.2	Minor
R14	N3	37	36.8	39.9	2.9	Negligible
R15	N3	37	35	39.1	2.1	Negligible
R16	N2	41	36.5	42.3	1.3	Negligible
R17	N2	41	36.5	42.3	1.3	Negligible
R18	N2	41	35.9	42.2	1.2	Negligible
R19	N2	41	35.1	42.0	1.0	Negligible
R20	N2	41	34.8	41.9	0.9	Negligible
R21	N2	41	34.5	41.9	0.9	Negligible
R22	N2	41	33.8	41.8	0.8	Negligible
R23	N2	41	32.5	41.6	0.6	Negligible
R24	N3	37	37	40.0	3.0	Minor
R25	N3	37	35.7	39.4	2.4	Negligible
R26	N3	37	34.7	39.0	2.0	Negligible
R27	N3	37	34	38.8	1.8	Negligible
R28	N3	37	33.3	38.5	1.5	Negligible
R29	N3	37	34.5	38.9	1.9	Negligible
R30	N4	39	33.5	40.1	1.1	Negligible
R31	N4	39	33.2	40.0	1.0	Negligible
R32	N1	52	47.1	53.2	1.2	Negligible
R33	N3	52	35.5	52.1	0.1	Negligible

10.82 With reference to the *Guidelines for Noise Impact Assessment* produced by the Institute of Environmental Management and Assessment (IEMA), the cumulative noise impact from the (continued) operation at the backfilling / recovery facility at all receptors is determined to be NEGLIGIBLE, at most receptors and MINOR at receptors R5-R6, R10-R13 and R24.

10.83 Notwithstanding the above findings, it is considered best practice to apply mitigation measures to further reduce or limit potential noise impacts plant associated with plant and continued site operations and activities at the existing backfilling / recovery facility, as outlined in later sections (below).

Comparison of Modelled Noise Levels with Reported Noise Levels

10.84 While the noise impact assessment presented above is based on modelling of development impact on a baseline noise environment from 2015 which pre-dated the establishment and operation of the existing backfilling / recovery facility, recognising that the development is in fact extant at the present time, it is considered that there is merit in benchmarking these (predicted) levels against those actually recorded by compliance noise monitoring in the years from 2020 to 2023 (presented in Appendix 10-2).

10.85 **At compliance point N1** (close to R2), the measured daytime $L_{Aeq,T}$ noise levels ranged between 45dB to 50dB. The calculated noise level at receptor R2 arising from site activities is 44dB(A), refer to Table 10.13. The level of 44dB(A) is consistent with the comments made in the compliance log where it was noted noise from plant ranged between 40dB(A) and 45dB(A).

10.86 The elevated measured noise level (compared to the calculated site noise) at compliance point N1 is likely due to road traffic noise, which when added to noise arising at the application site, results in an overall noise level that is above the level of calculated site noise. Compliance noise monitoring results are therefore deemed to be consistent with what would be expected (based on the calculated site noise level in Table 10.13).

10.87 **At compliance point N2** (close to R5), the measured daytime $L_{Aeq,T}$ noise levels ranged between 56dB to 60dB. The calculated noise level at receptor R5 arising from site activities is 42.9dB(A), refer to Table 10.13. The level of 42.9 dB(A) is lower than the noise level comments made in the compliance log where it was noted noise from plant ranged between 45dB(A) and 52dB(A).

10.88 The elevated measured noise level (compared to the calculated site noise) at compliance point N2 is likely due to road traffic noise, which when added to noise arising at the application site, results in an overall noise level that is above the level of calculated site noise. The compliance monitoring results are therefore deemed to be consistent with what would be expected (based on the calculated site noise level in Table 10.13).

10.89 **At compliance point N3** (close to R26), the measured daytime $L_{Aeq,T}$ noise levels ranged between 39dB and 48dB. The calculated noise level at receptor R26 arising from site activities is 34.7dB(A), refer to Table 10.13. The level of 34.7dB(A) is between 4.3dB(A) and 13.3dB(A) below the measured noise levels which is consistent with the comments made in the compliance log which note that noise from site plant is not audible.

10.90 **At compliance point N4** (close to R31), the measured daytime $L_{Aeq,T}$ noise levels ranged between 41dB and 47dB. The calculated noise level at receptor R31 arising from site activities is 33.2dB(A), refer to Table 10.13. The level of 33.2dB(A) is between 7.8dB(A) and 13.8dB(A) below the measured noise level which is consistent with the comments made in the compliance log, which note that noise from plant was only audible occasionally at noise levels of between 30 and 35dB(A) (which it is further noted, is in lined with the modelled predictions).

MITIGATION MEASURES

10.91 Where necessary, the three established strategies for impact mitigation are avoidance, reduction, and remedy. Where it is not possible or practical to mitigate all impacts, then the residual impacts must be clearly described in accordance with the system for impact description set out in the EPA Guidelines. The adoption of Best Practicable Means is generally considered to be the most effective means of controlling noise emissions.

10.92 Notwithstanding the findings of the impact assessment presented above, which determined that the existing (and continued) activities at Halverstown will have negligible to minor noise impact, the following best practice measures will continue to be implemented wherever practicable minimise the potential noise impact of on-site backfilling and recovery activities:

Phasing

- site operations will be carried out on a phased basis, with a view to completing the backfilling works and construction of proposed long-term screening berm on the northern side of the access road at the earliest opportunity. This will provide additional screening of noise to receptors on the northern and eastern side of the application site.

Screening

- existing pit faces, stockpiled materials, berms and screen planting around the existing facility will be retained to act as acoustic barriers. Berms and landscaping should be inspected on a regular basis and maintained as necessary.

Plant

- all mobile plant used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 2000/14/EC and any subsequent amendments thereof;
- all plant items properly maintained and operated in accordance with manufacturers' recommendations, in such a manner as to avoid causing excessive noise (i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained).
- all plant will be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers will be replaced immediately.

Traffic

- all deliveries will be programmed to arrive during working hours only;
- care taken when unloading vehicles to reduce or minimise potential disturbance to local residents;
- access / internal haul roads are kept clean and maintained in a good state of repair, i.e. any potholes are filled and large bumps removed, to avoid unwanted rattle and "body-slap" from heavy goods vehicles;
- delivery vehicles waiting within the facility are prohibited from leaving their engines running and there should be no unnecessary revving of engines.

10.93 Experience from other similar facilities has shown that by implementing these measures, typical noise levels from construction works and/or recovery operations can bring about a further reduction of a few decibels (dB(A)) in ambient noise levels.

RESIDUAL IMPACT ASSESSMENT

10.94 The worst-case noise assessment has shown that in accordance with the scale in the Guidelines for Noise Impact Assessment produced by the Institute of Environmental Management and Assessment (IEMA) the cumulative long term noise impact from plant activities at the application site is typically NEGLIGIBLE in most instances and MINOR at a limited number (7 No.) of receptors closest to the facility.

10.95 Notwithstanding this, it is further noted that any noise related impact associated with ongoing and planned future site activities is already extant, has the benefit of existing planning permission and waste licence and is complaint with the noise limits set in each.

10.96 Table 10-16 summarises the impacts and mitigation measures for operational plant noise at each of the noise sensitive receptors considered.

Table 10-16
Operational Noise Summary Table

Receptors	Increase in LA_{eq}, 1 hr dB(A) Noise Level from Operations	Impact	Mitigation
R1	1.8	Not Significant	None Required
R2	0.6	Not Significant	None Required
R3	1.0	Not Significant	None Required
R4	0.3	Not Significant	None Required
R5	4.1	Not Significant	None Required
R6	3.5	Not Significant	None Required
R7	2.9	Not Significant	None Required
R8	0.4	Not Significant	None Required
R9	0.5	Not Significant	None Required
R10	3.7	Not Significant	None Required
R11	3.4	Not Significant	None Required
R12	3.3	Not Significant	None Required
R13	3.2	Not Significant	None Required
R14	2.9	Not Significant	None Required
R15	2.1	Not Significant	None Required
R16	1.3	Not Significant	None Required
R17	1.3	Not Significant	None Required
R18	1.2	Not Significant	None Required
R19	1.0	Not Significant	None Required
R20	0.9	Not Significant	None Required
R21	0.9	Not Significant	None Required
R22	0.8	Not Significant	None Required
R23	0.6	Not Significant	None Required
R24	3.0	Not Significant	None Required
R25	1.8	Not Significant	None Required
R26	0.6	Not Significant	None Required
R27	1.0	Not Significant	None Required
R28	0.3	Not Significant	None Required
R29	4.1	Not Significant	None Required
R30	3.5	Not Significant	None Required
R31	2.9	Not Significant	None Required
R32	0.4	Not Significant	None Required
R33	0.5	Not Significant	None Required

Cumulative Impacts

10.97 Cumulative impacts are those which result from incremental changes caused by other past, present or reasonably foreseeable actions, together with those generated by the proposed development. Therefore, the potential impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or planned development.

10.98 A review of Kildare County Council online planning search facilities indicates that no other major developments are planned or have been granted planning permission in the last five years in surrounding townlands or within 2km of the application site. In light of the above, it is considered that there is no potential for other planned development to create significant adverse cumulative noise impacts in the local area.

10.99 Notwithstanding this, this noise impact assessment concludes that the typical noise impacts arising from the continued backfilling and recovery activities at the application site are insignificant / acceptable at all potentially sensitive receptors. As such noise levels arising from the existing / continued activities do not have the potential to increase or adversely impact the local noise environment, either on their own or in combination with other development.

Interaction with Other Impacts

10.100 The potential impact of noise for this project / development on sensitive receptors including sensitive ecological receptors and people living in the area has been fully assessed in this Chapter. The overall impact of the project on these receptors is further considered in Chapter 4 Population and Human Health and Chapter 5 Biodiversity.t

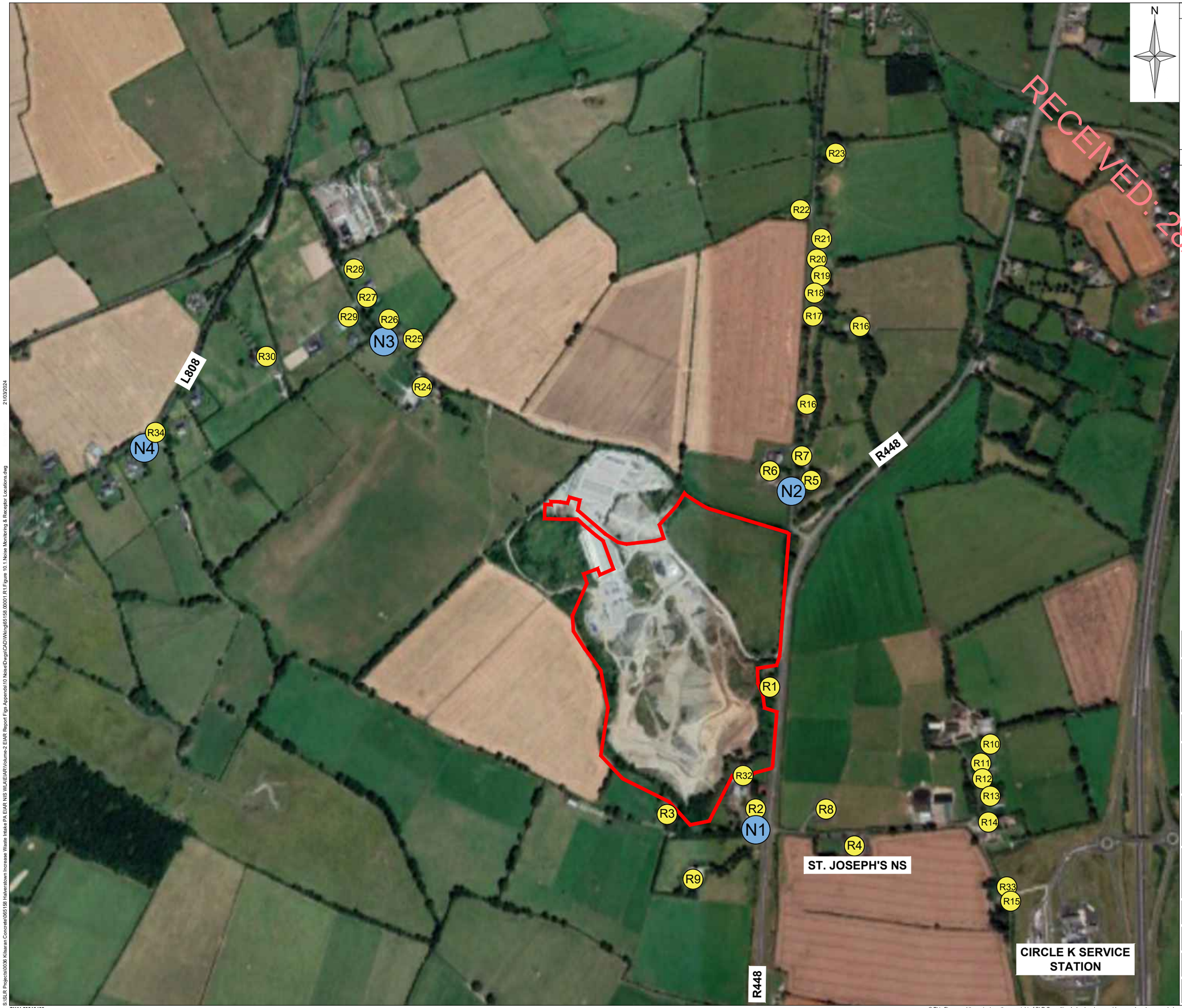
MONITORING

10.101 Noise monitoring will continue to be undertaken around the application site for the extended duration of backfilling / recovery activities. Noise monitoring locations shall be periodically reviewed and revised where and as/when necessary.

10.102 The results of the noise monitoring shall be submitted to Kildare County Council and the EPA on a regular basis for review and record (and compliance) purposes.

FIGURES

Figure 10-1
Local Receptors



RECEIVED: 28/03/2024

Notes:

1. EXTRACT FROM GOOGLE EARTH AERIAL PHOTOGRAPHY - AUGUST 2022.

Legend:

- KILSARAN PROPERTY BOUNDARY
- NOISE MONITORING LOCATIONS (N3)
- LOCAL RECEPTORS (R22)

Rev	Amendments	Date	By	Chk	Auth

SLR

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Client
KILSARAN CONCRETE

Project
INCREASED INTAKE TO EXISTING
SOIL RECOVERY FACILITY
HALVERSTOWN, KILCULLEN, CO. KILDARE.

Figure Title
NOISE MONITORING & RECEPTOR LOCATIONS

Scale	SLR Project No.
NOT TO SCALE @ A3	065158.00001

Designed	Drawn	Checked	Authorised
EW	EW	DL	DL
Date	Date	Date	Date
08/23	08/23	02/24	02/24

Figure Number **FIGURE 10-1** Rev. **1**

S:\SLR Projects\00036 Kilsaran Concrete\065158 Halverstown Increase Waste Intake PA EIAR NIS WLA\EIAR\Volume-2 EIAR Report Figs Appends\10 Noise\Dwgs\CAD\Wking\65158.00001 R1 Figure 10.1 Noise Monitoring & Receptor Locations.dwg 21/03/2024

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APPENDIX 10-A
Glossary of Terminology

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 10A-1
Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (of 20 µPa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

$L_{Aeq, T}$ $L_{Aeq, T}$ is defined as the notional steady sound level which, over a stated period T, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

$L_{A10, T}$ & L_{A90} If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence LA10 is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, LA90 is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the LA10 index to describe traffic noise.

$L_{Amax(F)}$ $L_{Amax(F)}$ is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

APPENDIX 10-B
Compliance Noise Monitoring 2020-2023