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Introduction

Background

This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ireland, addresses the potential noise effects of the proposed development at Knockroe, Bandon, Co. Cork.

The proposed development will consist of:

- Extraction of sand & gravel over an area of c.3.5 Ha.
- Extraction by dry working to 2 metres above the groundwater level, at a maximum rate of 100,000 tonnes per year.
- Transport of the extracted sand & gravel to the adjacent Dromkeen Pit (Plan. Ref. 23/04780) for use in concrete production;
- Upgrading of the existing internal access road and use of the existing access onto the local road L3204.
- Provision of wheelwash and welfare unit (c.8.3 sq.m).
- Restoration of the lands to agricultural and natural habitat use;
- All within an application area of c.4.0 hectares.

Permission is sought for 15 years plus two years for final restoration (total duration of seventeen years). Further details of the proposed development are provided in Chapter 2 of this EIAR.

Based on a maximum annual pit output of 100,000 tonnes per year from the proposed development , and the short transport distance (c. 0.5km) to the adjacent Dromkeen Pit, the road haulage fleet will comprise 1 no. heavy goods vehicle (HGV) – for aggregate haulage. The maximum number of HGV movements will be one to two HGV trips per hour based on a maximum annual total output of 100,000 tonnes per year, 50-week year, 5.day week ,8-hour day and 30 tonne (sand & gravel) HGV loads.

The noise impact assessment presented herein describes and assesses the existing noise baseline characteristics of the local area. The anticipated effects of the sand and gravel extraction activities are then applied to these baseline conditions and the resulting noise impacts assessed. Mitigation measures are identified where necessary to eliminate or minimise adverse impacts, insofar as practical.

A vibration assessment has not been undertaken as previous experience from similar sand & gravel extraction operations has demonstrated that such developments do not produce ground-borne vibrations, at any properties in the vicinity.

In order 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 of the EIAR, is provided in Appendix 10-A.

Scope of Work

The following sections of this EIAR Chapter describe the potential noise impacts associated with the proposed development. The following issues are addressed separately:

- regulatory control framework for noise;
- methodology used to assess potential impacts from activities at properties (dwellings and farms);
- baseline conditions pertaining to existing background / ambient noise levels around the site;
- noise impact evaluation criteria;
- prediction of the noise and vibrations 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)

The noise impact assessment presented in this Chapter was prepared by SLR Consulting Ireland. The lead consultant for the study was Tim Paul MSc CEng MIEI MRICS.

Limitations / Difficulties Encountered

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

Regulatory Control Framework

The following sections address the statutory planning / policy requirements and regulatory control of noise and vibration generated by development activity. Currently, there is no national or regional legislation which specifically addresses noise and vibration generated by mineral extraction and production of aggregates and construction materials. However, there are a number of guidance documents that are relevant in the context of both noise and vibration action planning.

Planning Policy and Development Control

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. In the framework, the extractive industries are recognised as important for the supply of aggregates and construction materials to a variety of sectors.

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."*

There are no specific policies in relation to noise emissions in NPF for mineral extraction or production of construction aggregates and materials. The stated general development objective is to facilitate the development while at the same time protect the environment.

Quarries and Ancillary Activities

The EPA (2006) 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 sand and gravel pit 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 LAeq (1h) = 55 dBA*
>
> *Night-time : 20:00–08:00 h LAeq (1h) = 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.)*

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

Planning Practice Guidance 2014

The web-based Planning Practice Guidance (PPG) sets out the Government's planning policies for England and has a specific category for mineral developments.

With respect to noise, it requires those making mineral development proposals to carry out a noise impact assessment which should identify all sources of noise and, for each source, take into account the emission level, its characteristics, proposed operating location, on-time and its potential impact at the nearby noise-sensitive receptors.

The guidelines provide advice on noise from temporary activities at mineral extraction sites, the recommended derivation of free-field criteria for normal daytime operations, and the absolute criterion of 70dB LAeq,1hr for temporary operations.

Guidelines for Noise Impact Assessment (IEMA)

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.

These guidelines address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. These 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 Table 10-1.

[1] https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

[2] https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

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 L_{pAeqT} (+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

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

To determine the overall noise impact, the magnitude and sensitivity Noise Effects Descriptors are presented in Table 10-2.

Table 10-2: Noise Effects Descriptors (IEMA)

Very Substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a highly sensitive noise receptor
Substantial	Greater than 5 dB L_{Aeq} 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 L_{Aeq} change in a sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in a sound level at a receptor of some sensitivity
None / Not Significant	Less than 2.9 dB L_{Aeq} 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

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-waking sleep disturbance. Affects the character of area such that there is a perceived change in the 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.	

Magnitude (Nature of Impact)	Description of Effect (on a Specific Sensitive Receptor)		Significance
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

British Standard 5228: 2009+A1:2014

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 construction and operational stage activities at extraction sites, including associated earthmoving / restoration operations. BS5228 also sets out tables of sound power levels generated by a wide variety of mobile equipment.

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).

AQTAG09 - Guidance on Effects of Industrial Noise on Wildlife

AQTAG09 (Air Quality Technical Advisory Group 09) guidance provides guidance to assist planning and/or licensing officials handling pollution prevention and control applications for industrial installations on relevant noise emissions and relates these to the requirements of the Habitats Regulations.

The Habitats Directive (92/43/EEC) specifies that, where specific noise from industry, measured at the habitat / nest site is below the levels in Table 10-4, it is considered unlikely that it will have an adverse impact on designated species. Where noise levels are exceeded, a more detailed noise assessment will be required.

Table 10-4: Specific Noise Levels at Habitat / Nest Site

Parameter	Noise Level, dB
$L_{Amax,F}$	80
$L_{Aeq,1hr}$	55

Noise and Human Health

Environmental noise exposure response relationships and thresholds for health endpoints for industry are not available at European or Irish level in legislation or guidelines.

WHO Environmental Noise Guidelines

World Health Organisation (WHO) Europe have produced the WHO Environmental Noise Guidelines 2018 for the European Region as a regional update to the WHO Community Noise Guidelines. The Guidelines include a review of evidence on the health effects of environmental noise to incorporate significant research carried out in recent years. The guidelines provide recommendation for protecting human health from exposure to environmental noise from various sources. The guidelines assess several environmental noise sources such as aircraft, rail, road, wind turbines and leisure noise.

EU Directive 2002/49/EC on the assessment and management of environmental noise introduced annual average indicators of noise exposure (L_{den} and L_{night}) as long-term exposure indicators, which differ from those used in the earlier WHO Guidelines for Community Noise (1999).

Receiving Environment

Study Area

The proposed development is located approximately 6km east of Bandon and 2km south of Innishannon in Co. Cork, refer to EIAR Figure 1-1.

The lands are bounded by woodland / local roads to the north and east; and woodland / agricultural lands to the south and west. The Bandon River is located on the eastern side of the L3204 local road flowing in a southerly direction, refer to EIAR Figures 1-1 and 1-2.

The surrounding landuse is predominantly woodland and agricultural grazing land (refer to Figure 1-3). There is a history of sand & gravel extraction in the area the existing Dromkeen sand & gravel pit and concrete plant operated by Keohane Readymix Ltd. located c. 200metres to the north of the site.

There are a number of residential dwellings located along the roads to the north and east of the site, refer EIAR Figure 10-1.

Baseline Study Methodology

An environmental noise survey was completed to establish the prevailing noise levels in the vicinity of the nearest noise sensitive receptors to the site.

The survey was conducted by SLR Consulting Personnel in accordance with the procedures outlined in ISO 1996-2:2017 *Acoustics — Description, measurement and assessment of environmental noise - Determination of sound pressure levels.*

All measurements were completed using a Class 1 Sound Level Meters (NTi Audio XL3 and Larson Davis 831 SLM). The sound level meters were calibrated before and after the survey. The calibration deviation was determined to fall within the acceptable range based on the meter specification (+/- 0.8 dB in this instance). The sound level meter was calibrated to traceable standard by a UKAS (United Kingdom Accreditation Service) accredited laboratory within 12 months preceding the measurement.

In addition to subjective observations on key sources contributing to the prevailing noise climate, the following noise level indices were recorded:

- $L_{Aeq,T}$ - The A-weighted equivalent continuous noise level over the measurement period and effectively represents an "average" value.
- $L_{Amax(F),T}$ - The maximum RMS A-weighted sound pressure level occurring within a specified time period. Measured using the "Fast" time weighting.
- $L_{Amin(F),T}$ - The minimum RMS A-weighted sound pressure level occurring within a specified time period. Measured using the "Fast" time weighting.
- $L_{A90,T}$ - The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe the background noise.
- $L_{A10,T}$ - The A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe intermittent noise sources such as road traffic.

The weather conditions were generally conducive to environmental noise surveys with light to gentle northeasterly breeze (<4 m/s) present. External ambient air temperature of ~ 14°C was observed.

All measurements were completed under 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).

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. All noise levels are quoted in dB(A) relative to a sound pressure of 20 Pa.

Sources of Information

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 / Noise Monitoring

Measurements were completed at the four measurement positions between the hours of 13:00 and 16:00 hrs on Tuesday, 25th March 2025, noise levels were measured for a period of 45 minutes at each of the monitoring positions.

The four noise monitoring locations selected for the purposes of the baseline noise survey are shown on **Figure 10-1** and comprise the following:

- N01 is located at the front of Riverbank House, facing the L3204 Ballinspittle Road, the microphone was mounted free field and at a similar distance to the road as the façade of Riverbank House;
- N02 is located to the rear (sheltered) side of Riverbank House, facing toward the existing site, the microphone position would be considered near field due to proximity to the façade of the building and adjacent wall;

- N03 is located east of the proposed site and close to the nearest boundary f the pNHA along the L3204 Ballinspittle Road; and,
- N04 is located west of the site adjacent the L1031.

The noise monitoring results are summarised in Table 10-5 below.

Table 10-5: Summary of Noise Monitoring Results (Tuesday 25th March 2025)

Loc.	Start	Sound Pressure Level (dB RE $2x10^{-5}$ Pa)				
		$L_{Aeq,T}$	L_{AFmax}	L_{AFmin}	L_{A10}	L_{A90}
N01	Tue 25 Mar, 13:00	62	82	33	56	42
	Tue 25 Mar, 13:15	62	83	35	58	43
	Tue 25 Mar, 13:30	62	83	39	59	46
N02	Tue 25 Mar, 12:47	45	31	62	48	35
	Tue 25 Mar, 13:02	45	31	63	48	35
	Tue 25 Mar, 13:17	45	31	62	49	36
N03	Tue 25 Mar, 14:00	56	75	28	50	35
	Tue 25 Mar, 14:15	59	78	30	55	38
	Tue 25 Mar, 14:30	61	81	34	56	42
N04	Tue 25 Mar, 15:15	53	69	37	58	41
	Tue 25 Mar, 15:30	52	65	36	57	41
	Tue 25 Mar, 15:45	54	67	34	59	42

The following observations are made in respect of the baseline noise monitoring undertaken around the application site:

- N01: Road traffic noise dominant intermittent source, some HGV but light vehicles, very limited traffic from site. Tractor ploughing field during 1st and 3rd measurement influencing background noise. Period of noise from resident working on wall omitted from measurement. Road traffic noise from R605 clearly audible. Birdsong audible intermittently. Bird scarer audible from site intermittently. No other site noise audible. Winds light NW, 2 ms, 14°C.
- N02: Road traffic noise dominant intermittent source, some HGV but mostly cars. Tractor ploughing field during 1st and 3rd measurement influencing background noise.
- N03: Road traffic noise dominant intermittent source, some HGV but mostly cars. Tractor ploughing field, influencing background noise levels. Road traffic noise from R605 clearly audible. Birdsong audible intermittently. Winds light NW, 2 ms, 14°C.
- N04: Road traffic from R605 dominant intermittent source, tractor ploughing field, influencing background noise levels. Winds light NW, 2 ms, 14°C.

No noise was observed from the operations of the adjacent Dromkeen Pit.

Table 10-6 below identifies the closest receptors affected by noise emissions from activities at the application site, and logarithmic averages of the noise monitoring results.

Table 10-6: Summary of Measured Noise Levels, Free Field dB (Average Values)

Location	Receptors effected	Period	L_{Aeq}
N1 / N2	R1, R2	Daytime	53.5
N4	R3, R4, R5, R6 and R7	Daytime	53
N3	pNHA	Daytime	58

Sensitive Receptors

Human Receptors

Sensitive locations are those where people may be exposed to noise from the planned activities. The closest receptors to the application site have been identified and assessed on the basis of their distance from the soil stripping activities and operational activities. The relevant receptors are listed in Table 10-7 and their locations are shown in Figure 10-1.

A list of the closest sensitive receptors in each direction surrounding the site and their distance from at its closest point are outlined in Table 10-7 below.

Table 10-7: Noise Sensitive Receptors

Receptor reference	Receptor	Sensitivity	Approx. Distance (m) from Extraction Area
R1	Residential	Medium	145
R2	Residential	Medium	190
R3	Residential	Medium	250
R4	Residential	Medium	280
R5	Residential	Medium	285
R6	Residential	Medium	280
R7	Residential	Medium	285
pNHA	Ecological	Medium	40

Ecological Receptors

The nearest ecological receptor is the Bandon Valley Below Innishannon pNHA, the nearest boundary of which is c. 40 metres form the extraction area, refer to Figure 10-1.

Noise Impact Assessment

Proposed Development

Operational noise rating ($L_{Ar,\ 1hr}$) predictions at each receptor location are based on the methodology set out in BS5228: Part 1 (2009)+ A1:2014 "*Code of Practice for Noise and Vibration Control on Construction and Open Sites*"

For the purposes of this impact assessment, the existing woodland, the existing topography (including the scheme design to retain the existing historical pit face) will provide significant natural screening to the closest receptors around the extraction area. A noise reduction of -10bB(A) has been adopted for full screening in assessing noise impacts for soil stripping and sand & gravel extraction.

For the purposes of the assessment, it is assumed that all potential operational noise sources are active and arise 100% continuously and simultaneously during assessment hours for the soil stripping / restoration stages and are active 40% during the assessment hours for the sand & gravel extraction (based on the low level of extraction of one to two loads per hour). On this basis, an On-time Adjustment (based on 40% on-time) has been included in the noise calculations for the sand & gravel extraction. The attenuation distance to the selected receptors is calculated from the extraction site boundary (as indicated in Figure 10-1) and from the noise source.

On the basis of the methodology outlined above, it is considered that the noise impact assessment presented herein is sufficiently robust and conservative and represents a worst-case scenario. Detailed noise assessment calculations are provided in Appendix 10-B.

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 55dB LAeq, 1hr during daytime working hours (defined as 07:00 to 18:00 hours).

A limit of 70dB LAeq, 1hr is permitted for periods of up to eight weeks in any working year at nearby noise sensitive receptors to facilitate ant necessary construction or temporary site works (e.g. screening berm construction).

As set out in Annex D of the updated Environmental Noise Standard, ISO 1996-2:2007(E), a prominent, discrete tonal component may be detected in one-third octave spectra if the level of a one-third octave band exceeds the level of the adjacent bands by some constant level difference (the appropriate level difference varies according to frequency and is greater at lower frequencies).

The noise characteristics of the plant which will be deployed in sand & gravel extraction at Knockroe and considered by this noise assessment are shown in Table 10-8 below.

Table 10-8: Noise Sources

Machinery	Octave band sound pressure levels @ 10m, Hz								L_{AEQ} @ 10m
	63	125	250	500	1k	2k	4k	8k	
Excavator / Loading Shovel (Soil Stripping, Restoration, S & G Extraction)	72	71	74	73	69	66	63	58	75
Dump truck / HGV (Soil Stripping , Restoration and S & G Extraction)	80	76	73	70	69	66	63	58	74

The machinery used at the proposed site will not generate impulsive or tonal noise, no penalty was therefore applied to the predicted operational LAr, 1hr noise level for presence of tonal or impulsive elements or for prediction of resultant noise level at each receptor.

Soil Stripping and Restoration

The following noise sources have been considered in the noise assessment for the initial site operations, during the preparatory works which will include activities such as soil stripping and restoration activities

- Excavator;
- Dump Truck.

For the purposes of the noise assessment, it is assumed that an excavator will be used continuously to carry out the soil stripping / earthworks, with one Dump Truck in attendance on-site at all times. Predicted noise levels calculated at nearest receptors are shown in Table 10-9 below, refer also calculations in Appendix 10-B.

Table 10-9: Soil Stripping and Restoration Predicted Noise Levels: Knockroe

Receptor	Period	Noise limit $L_{AEQ, 1HR}$ dB.(a)	Operational $L_{AEQ, 1HR}$ dB.(a)*	Difference
R1	Daytime	70.0	48	-22
R2	Daytime	70.0	46	-24
R3	Daytime	70.0	43	-27
R4	Daytime	70.0	42	-28
R5	Daytime	70.0	42	-28
R6	Daytime	70.0	42	-28
R7	Daytime	70.0	42	-28
pNHA	Daytime	70.0	56	-14

It can be seen from the results in Table 10-9 above that the noise criterion limits for the short-term preparatory (70dB(A)) are complied with at all sensitive locations assessed.

Sand and Gravel Extraction

The following noise sources have been considered in undertaking the noise assessment for the operations:

- Front End Loader
- HGV;

The resultant LAeq, 1hr noise level predicted for each receptor location is presented in Table 10-10 below, refer to Appendix 10-B for detailed calculations. Table 10-10 also shows the comparison between the predicted operational LAeq, 1hr noise level and a more onerous noise limit of 55dB(A) adopted at each receptor.

Table 10-10: Sand & Gravel Excavation – Predicted Noise Levels: Knockroe

Receptor	Period	Noise limit $L_{Aeq, 1hr}$ dB.(a)	Operational $L_{Aeq, 1hr}$ dB.(a)*	Difference
R1	Daytime	55.0	44	-11
R2	Daytime	55.0	42	-13
R3	Daytime	55.0	39	-16
R4	Daytime	55.0	38	-17
R5	Daytime	55.0	38	-17
R6	Daytime	55.0	38	-17
R7	Daytime	55.0	38	-17
pNHA	Daytime	55.0	52	-3

It can be seen from the results in Table 10-10 above that the noise levels generated solely by proposed development, even in a worst-case scenario, are below the prescribed noise limit at all nearby residential noise sensitive locations, and marginally above the noise limit by 1 dB(A) at the nearest boundary of the pNHA area.

Cumulative Noise Assessment

To identify the potential impact of the sand & gravel extraction activities, the predicted specific LAeq, 1hr dB(A) noise levels have been logarithmically added to existing 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. The cumulative assessment is presented in Table 10-11 below.

Table 10-11: Cumulative Operational Noise Levels: Sand & Gravel Extraction

Receptor	Period	Existing noise level $L_{Aeq,T}$ dB.(a)	Operational $L_{ar, 1hr}$ dB.(a)*	Cumulative $L_{Aeq, T}$ dB.(a)*	Difference	Short term impact	Long term impact
R1	Daytime	53.5	44	54.5	1	Minor	Negligible
R2	Daytime	53.5	42	53.5	0	Negligible	Negligible
R3	Daytime	53	39	53	0	Negligible	Negligible
R4	Daytime	53	38	53	0	Negligible	Negligible
R5	Daytime	53	38	53	0	Negligible	Negligible
R6	Daytime	53	38	53	0	Negligible	Negligible
R7	Daytime	53	38	53	0	Negligible	Negligible
pNHA	Daytime	58	52	59	1	Minor	Negligible

With reference to the Guidelines for Noise Impact Assessment published by the Institute of Environmental Management and Assessment (IEMA), the cumulative short-term noise impact from the proposed development at all receptors is determined to Minor at R1 and Negligible at all other receptors in a worst-case scenario.

With reference to the Guidelines for Noise Impact Assessment published by the Institute of Environmental Management and Assessment (IEMA), the cumulative long-term noise impact from the proposed development at all receptors is determined to be Negligible in a worst-case scenario.

In view of the above findings, it is considered that further mitigation measures (beyond the natural screening / scheme design) to reduce the noise impacts are not required. Notwithstanding this, and in line with accepted best practice, a number of measures will be implemented at the proposed development to minimise the noise levels generated by site operations.

Ecological Receptors

The cumulative noise impacts at the nearest boundary of the pNHA area are assessed as Minor and Negligible over the short and long term, respectively (i.e. none / not significant). Accordingly, the pNHA Bandon Valley below Inishannon will not be impacted by the proposed development.

Unplanned Events

Accidents, malfunctions and unplanned events refers to events or upset conditions that are not part of any activity or normal operation of the proposed development as has been planned by Keohane. Even with the best planning and the implementation of preventative measures, the potential exists for accidents, malfunctions or unplanned events to occur during proposed development.

Many accidents, malfunctions and unplanned events are, however, preventable and can be readily addressed or prevented by good planning, design, emergency response planning, and mitigation.

In terms of noise impacts the following unplanned events could have an effect on the local area:

- equipment malfunction;
- vehicle collision.

In relation to noise impact of any unplanned events, these are considered to be negligible, as they have no potential to increase noise levels at sensitive receptors.

Cumulative Impacts

In essence, 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.

This noise impact assessment indicates that the planned development activities will not contribute to a significant increase in noise levels within the surrounding environment.

The cumulative impact of the proposed development on local noise levels is therefore assessed as insignificant.

'Do-nothing Scenario'

At present, the noise environment within the study area is dominated by road traffic noise generated by cars and occasional HGV traffic along the local road network. Some natural sounds such as birdsong, and agricultural activity sources (tractor ploughing, bird scarer etc.) are also audible.

Interaction with Other Impacts

The potential impact of the proposed development on sensitive receptors including local residents and sensitive ecological receptors is further considered in Chapter 4 'Population and Human Health' and Chapter 5 'Biodiversity'.

Noise Mitigation Measures

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.

Notwithstanding the noise assessment which indicates the noise impacts on the nearest receptors will be Minor / Negligible in the short term and Negligible in the long term, the following best practice noise mitigation and management measures will be implemented. These measures will comprise:

Screening :-

- scheme design to maximise topographic and natural woodland screening;
- existing perimeter hedge planting will be retained and enhanced along the boundary of the site;

Machinery:-

- all machinery used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments;
- all machinery will be properly and regularly maintained and operated according to the manufacturers' recommendations, in such a manner as to avoid causing excessive noise;

Traffic :-

- care will be taken when loading HGV's to reduce or minimise potential noise disturbance to local residents;
- access / internal access road will be kept clean and maintained in a good state of repair, to avoid unwanted rattle and "body-slap" from heavy goods vehicles;
- vehicles waiting within the site will be prohibited from leaving their engines running and there will be no unnecessary revving of engines.

Experience and monitoring have demonstrated that by implementing these best practice noise management & mitigation measures, ambient noise levels from site activities and operations can be reduced by up to 5dB(A).

Residual Noise Impact Assessment

With implementation of the mitigation and management measures detailed above the residual noise impacts at all receptors will reduce to Negligible in the short-term and long-term.

Noise Monitoring

Noise monitoring will be undertaken at the application site for the duration of extraction activities at the proposed development (in accordance with EPA and DoEHLG guidelines).

Monitoring Locations

Noise monitoring will be carried out twice per year (every six months) at three monitoring locations N1, N3 and N4, refer to Figure 10-1.

Location N1 is representative of the nearest receptors R1 and R2 to the north of the existing site. Location N3 is representative of the pNHA nearest boundary; and Location N4 is representative of receptors to the east of the site.

Methodology

Continuous Noise Monitoring is carried out using a Larson Davis Model 831 Sound Level Meter or similar, which will be calibrated using a Larson Davis Acoustic Calibrator CAL 200. Noise monitoring is carried out in accordance with ISO 1996/1- 1982 Part 1: "Acoustics-Description and measurement of environmental noise" and EPA Environmental Noise Survey Guidance Document.

During the noise survey, noise is measured for 1 hour at each noise monitoring location and 3 environmental noise parameters are measured. These are defined below:

- LAeq is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an "average" value.
- LA10 is the A-weighted sound level that is exceeded for 10% of the sample period; this parameter is typically used to quantify traffic noise.
- LA90 is the A-weighted sound level that is exceeded for 90% of the sample period; this parameter is typically used to quantify background noise.

A-weighting is the process by which noise levels are corrected to account for the non-linear frequency response of the human ear. All noise levels are quoted in dB(A) relative to a sound pressure of 20Pa.

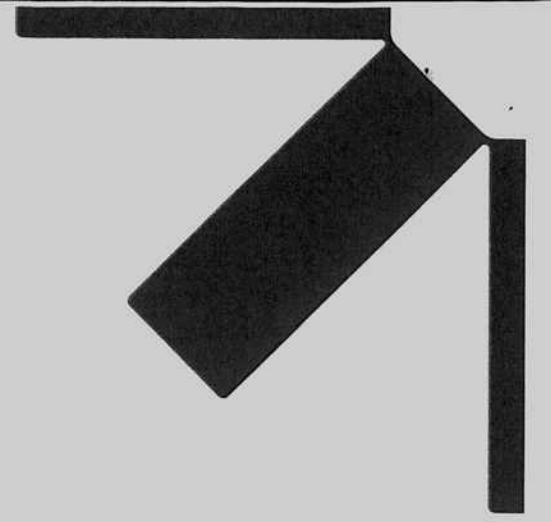
Reporting

A report containing all noise monitoring results and their interpretation will be submitted to Cork County Council Planning / Environmental Section on a six-monthly basis where the results can be inspected by third parties. A copy of report will be maintained on site as part of the EMS documentation.

Figures

Figure 10-1: Noise Receptors and Noise Monitoring Locations

SLR



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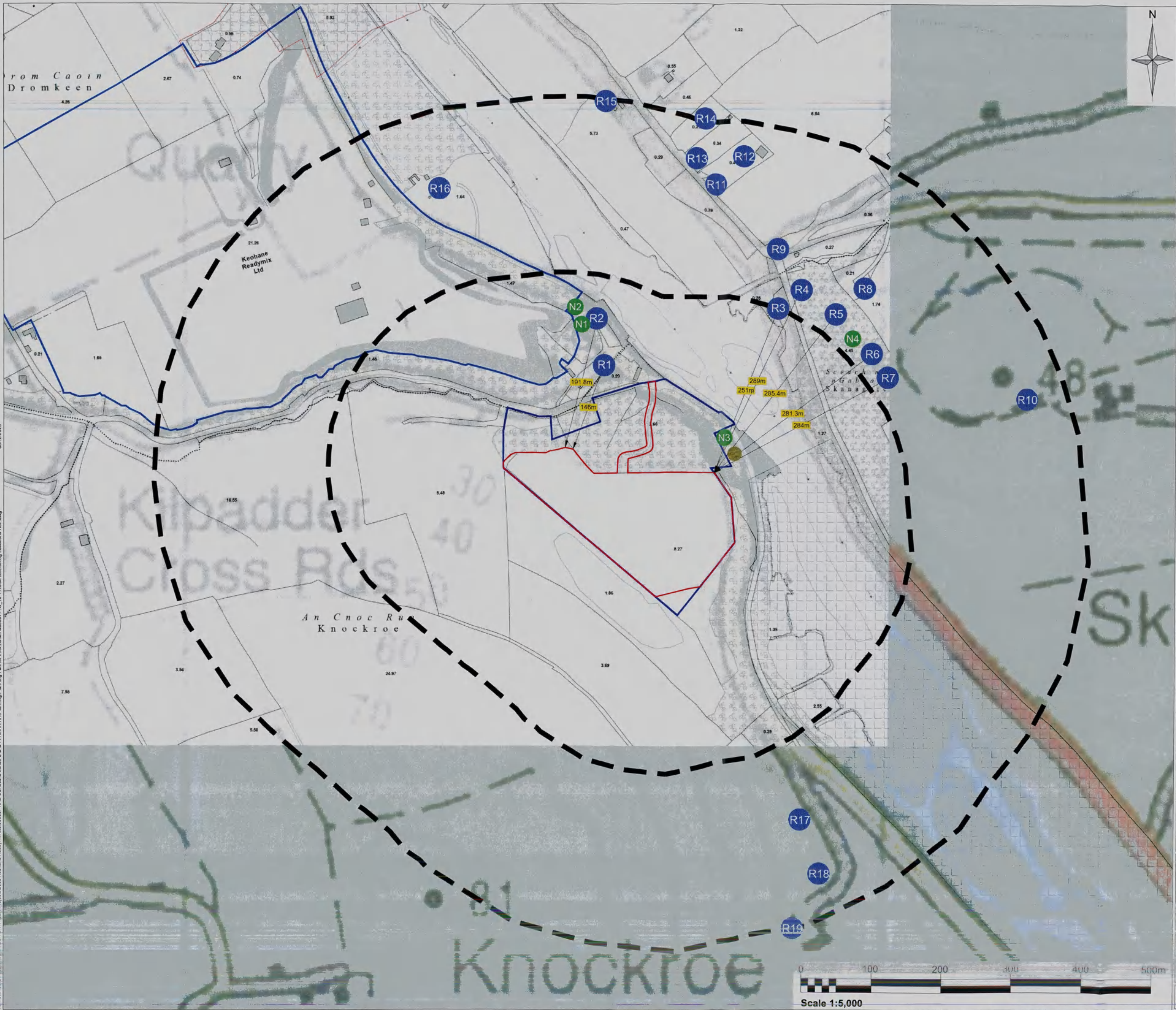

Notes:

1. EXTRACT FROM TAILTE EIREANN DIGITAL MAPPING 1:2,500 SCALE, MAP. NO. 6578

Legend:

- LAND INTEREST BOUNDARY
- PLANNING APPLICATION AREA (c.4.0 Hectares)
- 250m/500m RADIUS FROM EXTRACTION AREA
- PROPOSED NOISE MONITORING LOCATION
- RESIDENTIAL PROPERTY / RECEPTOR LOCATION
- UNINHABITED PROPERTY
- 001740_BANDON VALLEY ABOVE INNISHANNON PNHA
- 001515_BANDON VALLEY BELOW INNISHANNON PNHA

Planning Department
04 DEC 2025
Cork County Council
County Hall
Cork

Rev	Amendments	Date	By	Chk	Auth

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Drawing Status & Suitability Code: **FINAL**

Client: KEOHANE READYMIX LTD.

Project: SAND & GRAVEL PIT KNOCKROE, BANDON, CO. CORK

Drawing Title: NOISE MONITORING LOCATIONS & RECEPTORS

Scale	SLR Project No.
1:5,000 @ A3	065557.00001

Designed	Drawn	Checked	Authorised
EW	EW	TP	TP
11/25	11/25	11/25	11/25

Drawing Number: FIGURE 10-1 | Rev: 2

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Appendix 10-A Glossary Of Terminology

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In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

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 10-A-1: Noise Levels Commonly Found in the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at one metre away
110 to 130dB(A)	Jet aircraft on take off
140dB(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 (2x10-5 Pa).

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

L_{10} & L_{90} If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

L_{Amax} 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 Noise Assessment Calculations

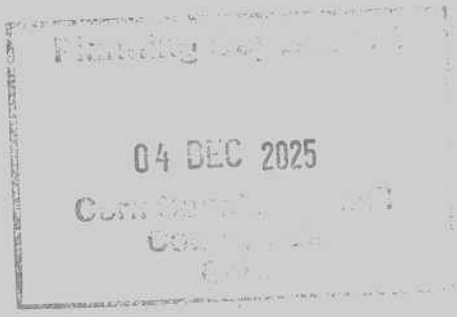

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Table 10-B-1: Soil Stripping and Restoration: Predicted Noise Calculations

Activity	Receptor	Activity LAeq (dB) at 10m Distance		Reflection	Screening	Activity Distance (m)	Noise Reduction Attenuated with Distance dB(A)	Noise level at receptor from Excavator (dB(A))	Noise level at receptor from Dump truck (dB(A))	Cumulative Noise Levels dB (A) at receptor
		Excavator	Dump Truck	dB(A)	dB(A)					
Soil Stripping, / Restoration	R1	75	74	3	-10	145	-23	45	44	48
	R2	75	74	3	-10	190	-25	43	42	46
	R3	75	74	3	-10	250	-28	40	39	43
	R4	75	74	3	-10	280	-29	39	38	42
	R5	75	74	3	-10	285	--29	39	38	42
	R6	75	74	3	-10	280	-29	39	38	42
	R7	75	74	3	-10	285	-29	39	38	42
	pNHA	75	74	-	-10	40	-12	53	52	56

Table 10-B-2: Sand & Gravel Extraction Activities: Predicted Noise Calculations

Activity	Receptor	Activity LAeq (dB) at 10m Distance		Reflection	Screening	Activity Distance (m)	Noise Reduction Attenuated with Distance dB(A)	On-time Adjustment (Plant working 40% of the time), dB(A)	Noise level at receptor from Loading Shovel (dB(A))	Noise level at receptor from HGV (dB(A))	Cumulative Noise Level at receptor dB (A)
		Loading Shovel	HGV	dB(A)	dB(A)						
Sand & Gravel Extraction	R1	75	74	3	-10	145	-23	-4	41	40	44
	R2	75	74	3	-10	190	-25	-4	39	38	42
	R3	75	74	3	-10	250	-28	-4	36	35	39
	R4	75	74	3	-10	280	-29	-4	35	34	38
	R5	75	74	3	-10	285	--29	-4	35	34	38
	R6	75	74	3	-10	280	-29	-4	35	34	38
	R7	75	74	3	-10	285	-29	-4	35	34	38
	pNHA	75	74	-	-10	40	-12	-4	49	48	52