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INTRODUCTION

Background

- 10.1 This Chapter of the EIAR assesses the effects of the proposed development on Noise arising from the proposed replacement of the renewable energy plant at Medite's existing MDF manufacturing plant in the townland of Redmondstown, Clonmel, Co. Tipperary. The assessment of effects has been made based on the proposed development which has been fully described in **Chapter 2: Project Description** i.e. 'the project' including the existing and proposed site layout and details on the dimensions of all proposed structures.
- 10.2 The Chapter describes the relevant legislation, assessment methodology and the baseline conditions currently existing at the application site and its surroundings. It then details the assessment undertaken to determine the potential effects of both the construction and operation of the proposed development on the baseline noise. It outlines the embedded design measures and good practice methods which have been incorporated into the design and would be used during the construction and operation of the proposed development to prevent or reduce identified effects and risks.
- 10.3 Further mitigation methods to ameliorate any potential effects are proposed, where appropriate, and residual effects assessed.

Scope of Work / EIA Scoping

Consultation

- 10.4 A pre-application meeting was held between the applicant and An Bord Pleanála (8 February 2022). Throughout the design process, consultation meetings have also been carried out with various other interested parties such as Tipperary County Council, the EPA, Inland Fisheries Ireland, the NTA and the Regional Design Office (Roads). Further details, including on feedback received, is included within the relevant technical chapters of the EIAR.
- 10.5 An informal EIA Scoping process has been undertaken, during which prescribed bodies and other interested parties were provided with a Preliminary Scoping Report outlining the key issues considered to be of importance to the EIA specialist and the proposed methods of assessing the potential scale of impacts from the proposed development. Further details are included in **Chapter 1** of this EIAR.
- 10.6 Public consultation has also been undertaken by way of distribution of information leaflets within the local area and creation of a project website, through which members of the public were invited to comment on the proposals. Consultation responses obtained from the informal scoping exercise and public consultation that are of most relevance to population and human health are summarised in Table 10-1 below.
- 10.7 A summary of consultee responses is included in **Chapter 4: Population and Human Health** at **Table 4-1** and **Table 10-1** in this chapter, which summaries the issues set out in the Scoping and consultee responses.

Table 10-1
Summary of Consultation

Prescribed Body		Comment
Health Executive	Service	<p>The EIAR should identify the nearest sensitive receptors and consider the impact of the proposed development on them. Sensitive receptors include, but are not limited to</p> <ul style="list-style-type: none"> • Occupied houses • Farms (including stud farms and facilities for the production of vegetables and crops) • Schools • Childcare facilities • Medical facilities and nursing homes • Golf courses, sports and community facilities and • Food premises. <p>Potential for emissions to surface water, groundwater and air (including noise, vibration and dust) should be assessed in the EIAR.</p> <p>Other areas for consideration in the EIA include</p> <ul style="list-style-type: none"> • Staff welfare facilities • Public consultation in addition to consultation with statutory and non-statutory agencies • Potential significant impacts arising during the construction of the proposed development • Cumulative impacts of developments in the locality. <p>Other licenced facilities, industries, and commercial activities within the vicinity of the facility should be identified and assessed when considering the potentially significant cumulative impacts from the proposed development. The EIA should include cumulative traffic, noise, dust, and hydrological impacts.</p>
Environmental Officer	Health	<p>Emissions to air, including noise, vibration and dust</p> <p>The EIA should establish baseline air quality at the nearest sensitive receptors by means of background air quality monitoring. Air quality monitoring should be undertaken prior to the commencement of operations in the extension and throughout the operation of the site using the Bergerhoff Method as specified in the German TA Luft Air Quality Standards (TA Luft 1986).</p> <p>Total dust deposition should not exceed 350mg/m² /day when averaged over a thirty day period. This is a maximum limit and the EMS should be such that dust depositions seldom reach this level.</p>

	<p>The EHS recommends that reference is made by the developer to the EPA’s ‘Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities NG4’ (January 2016). The existing background noise level should be considered when assessing the impact of noise from the proposed development on local receptors and when setting ELVs.</p> <p>Details of the location and frequency of noise monitoring should be included in the EIA to be submitted as part of the Planning Application.</p>
Various	<p>Chapter 1 of the EIAR identifies the full range of prescribed bodies consulted, along with a summary of their feedback. The technical chapters have addressed feedback in relation to the assessment of the potential for environmental emissions. Conclusions from the technical assessments are set out later in this chapter, in order to quantify the potential for associated population/human health impacts.</p>
Community Consultation	<p>Concern regarding small particles of wood dust/fibres emanating from the existing facility.</p> <p>Suggestion that an independently monitored air quality station be installed at Redmondstown Cottages area.</p> <p>Concern regarding the potential for increased noise levels as a result of the proposals.</p> <p>Suggestion that traffic calming measures be implemented around the facility entrance.</p> <p>Lack of residents at Redmondstown Cottages currently employed at the facility.</p> <p>Clarification requested as to the future plans for vacant properties to the north of Redmondstown Cottages / south of Medite</p>

Contributors / Author(s)

10.8 This Chapter of the EIAR has been prepared by ‘competent experts’ as required by Article 5 of the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU. The Noise project team is identified in **Table 10-2**.

Table 10-2
Noise Project Team – Summary of Experience

Specialist Assessor	Qualifications	Years of Experience	Experience
Michelle Dawson Technical Director – Acoustics & Vibration	BSc, MIOA	17	Appointed by Viridian Renewables ROI Limited to undertake a noise assessment of a renewable bioenergy plant that was permitted by Fingal County Council under planning ref.

Specialist Assessor	Qualifications	Years of Experience	Experience
			<p>FW13A/0089 and licensed by the EPA1 at Huntstown, Finglas, Dublin 11. The assessment was required to determine if immaterial deviations of the layout and final design of the plant results in significant environmental effects.</p> <p>SLR Consulting Ltd was appointed to carry out a noise modelling exercise at Donnore Quarry in Ireland. The modelling was required to predict the sound levels associated with the proposed activities associated with the Overburden Management Facility (OBMF).</p> <p>SLR Consulting Limited was instructed to undertake a noise assessment to accompany a planning application to build a residential development on land at Clonee, County Meath.</p> <p>The assessment was completed with reference to the following relevant guidance documents, which provide appropriate limits for recommended internal levels.</p> <p>Lead noise consultant commissioned to undertaken noise investigation surveys at the Runcorn EFW facility in response to complaints from nearby residents, complete noise monitoring as required by the sites Environment Agency permit, and to complete on-site monitoring during different operating phases of the EFW Facility to compare with off-site limits.</p>

Limitations / Difficulties Encountered

- 10.9 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.
- 10.10 Baseline noise levels were measured at four locations only. However, the noise monitoring locations were representative of the nearest Noise Sensitive Receptors to the Site and the measurement period covered those that may be considered most sensitive (i.e., the weekend and night-time periods).

Planning Policy and Development Control

- 10.11 Reference is required to The National Planning Framework 2040. The National Planning Framework 2040 is the Government’s high-level strategic plan for shaping the future growth of Ireland up to the year 2040. Of particular relevance to this Chapter is National Policy Objective 65.

¹ Industrial Emissions Licence P0993-01

- 10.12 National Policy Objective 65 aims to: ‘Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and supports the aims of the Environmental Noise Regulations through national planning and Noise Action Plans’.
- 10.13 The Environmental Noise Regulations recognize a number of British Standards and also recommend the UK national computation method ‘Calculation of Road Traffic Noise (CRTN)’ for road traffic noise prediction. In the absence of any specific Irish guidance, this Chapter has where necessary referenced a number of British standards.
- 10.14 The Acts and Technical Standards referenced in this Chapter are indicated in **Table 10-3**.

Table 10-3
Documents to be Referenced

Demolition and Construction Phase	Operational Phase
Environmental Protection Agency Act 1992 BS5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.	Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

Technical Standards

Construction Noise

- 10.15 The chief noise guidance document used in Ireland in the construction phase of noise assessments is the Environmental Protection Agency Act 1992. This defines environmental pollution as including noise that is a nuisance, or that would endanger human health or cause damage to properties or the environment. ‘Part 4: Integrated Pollution Control’ states: ‘In considering an application for a license or the review of a license or revised license under this Part, the Agency shall have regard to – any relevant noise regulations under section 106’.
- 10.16 To set appropriate construction noise limits for the development site, reference has been made to BS 5228 2009+A1 2014 *Code of practice for noise and vibration control on construction and open sites*. Part 1 of this document “Noise” provides guidance on selecting appropriate noise criteria relating to construction works. The document also sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities and contains tables of sound power levels generated by a wide variety of mobile and fixed plant equipment.
- 10.17 Compliance with BS5228-1:2009+A1:2014 is expected as a minimum standard when assessing the impact of construction noise upon the existing noise environment at nearby sensitive receptors.
- 10.18 BS5228-1:2009+A1:2014 gives several examples of acceptable noise limits for construction or demolition noise. For this assessment as baseline noise data will be available, it is proposed that the ABC method detailed in of BS5228-1:2009+A1:2014 will be used to determine the threshold value at the receptor locations.
- 10.19 In accordance with this method the threshold noise levels for a potentially significant effect are as detailed in **Table 10-4**.

**Table 10-4
Construction Noise Residential Receptors – Example Threshold Values**

Assessment category and threshold value period (L _{Aeq})	Threshold value, in decibels (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00 – 07.00)	45	50	55
Evenings and weekends D)	55	60	65
Daytime (07.00 – 19.00) and Saturdays (07.00 – 13.00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

B) Category B: threshold values to use when the ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

C) Category C: threshold values to use when the ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

D) 19.01 – 23.00 weekdays, 13.01 – 23.00 Saturdays and 07.01 – 23.00 Sundays.

Operational Noise

- 10.20 Potential noise impacts during the operational phase of the development will be assessed in accordance with the Environment Protection Agency (EPA) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4 Guidance).
- 10.21 In accordance with NG4 Guidance it is necessary to designate the noise environment at each sensitive receptor location as one of the following:
- A ‘Quiet Area’,
 - A ‘Low Background Noise Area’ or
 - ‘Not an Area of Low Background Noise’.
- 10.22 To be categorised as a ‘Quiet Area’ the following criteria must be met at each sensitive receptor location:
- at least 3km from urban areas with a population > 1,000 people;
 - at least 10km from any urban areas with a population >5,000 people;

at least 15km from any urban areas with a population >10,000 people;

at least 3km from any local industry;

at least 10km from any major industry centre;

at least 5km from any National Primary Route; and

at least 7.5km from any motorway or dual carriageway.

10.23 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'.

10.24 The noise criteria for these designations are shown in **Table 10-5** below. To be designated as being located in area of low background noise, the daytime, evening, and night-time noise limits must all be met.

Table 10-5
Noise Criteria for Area Designation

Designation	Day L _{AF 90} dB	Evening L _{AF 90} dB	Night L _{AF 90} dB
Low Background Noise Area	≤40	≤35	≤30
Not an Area of Low Background Noise	≥41	≥36	≥31

10.25 The procedure contained in the NG4 guidance sets out a methodology to determine an acceptable noise limit at a receptor location. This noise limit is termed the noise rating level, or L_{Ar,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, only one adjustment should be made.

10.26 To determine if 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:

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

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

10.28 The permitted rating noise level in each designated area is shown in **Table 10-6** below.

Table 10-6
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 10dB below the average daytime background noise level measured during the baseline noise survey	Noise from the licensed site to be at least 10dB below the average evening background noise level measured during the baseline noise survey	Noise from the licensed site to be at least 10dB 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

- 10.29 To determine the noise levels generated by the operation of fixed plant at the proposed development, the prediction protocol prescribed in ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation' will be adhered to.

RECEIVING ENVIRONMENT

Study Area

- 10.30 The lands of the subject site are that of a long-established industrial facility Medite Europe DAC, located in Redmondstown, Clonmel, Co. Tipperary (Refer to **Figure 2-1** and Planning Application **Drawing D01** for OSi Discovery Sheet Location Map).
- 10.31 Figure 2-1 presents the lands subject to this planning application (red line boundary) and land ownership area (blue line). The application site boundary has an area of 29.7 Hectares which is part of the overall Medite landholding of 68.3 ha.
- 10.32 Initial site works and construction of the MDF plant were completed in the period between 1981 and 1983 and over the course of many years, additional works have taken place on the site as the operations expanded.
- 10.33 The site is composed of the main production plant building and materials storage areas. With the exception of log store, almost all areas associated with the facility's operations are located on hardstanding. A number of landscaped areas are located along the perimeter of the site. The land in the area of the subject site slopes in a south-easterly direction towards the River Anner, with an elevation range of 20m to 35mOD.
- 10.34 The application site is situated in what can be characterised predominantly as a green field and agricultural area, located approximately 4km east of the centre of Clonmel town and approximately 0.9 km north of the N24. The site is accessed through a local road that connects directly to the N24. The subject site is well screened and the existing buildings within the industrial facility are situated

50m back from the local access road and are largely obscured from view due to the presence of abundant shrub and tree plantations at the site boundaries.

- 10.35 The River Anner flows to the east of the subject site and connects as a tributary to the River Suir, which is approximately 1 km south of the subject site. The River Suir (including the River Anner) is part of the Lower River Suir SAC. A large industrial facility located just south of the subject site is owned by C&C Group PLC and produces the Bulmers brand of cider as well as other products. The C&C Group PLC facility bounds the N24 and is accessed through entrances positioned along this national primary road.

NG4 Noise Environment Designation

Quiet Area Screening of the Development Location

- 10.36 At this Step, the location of the proposed development has been screened to determine if the Site is in a “Quiet Area” or a “Non-Quiet Area”.
- 10.37 To be designated a Quiet Area the Site must be:
- at least 3km from urban areas with a population > 1,000 people;
 - at least 10km from any urban areas with a population >5,000 people;
 - at least 15km from any urban areas with a population >10,000 people;
 - at least 3km from any local industry;
 - at least 10km from any major industry centre;
 - at least 5km from any National Primary Route; and
 - at least 7.5km from any motorway or dual carriageway.
- 10.38 From a desktop review of the Study Area SLR has concluded that the Study Area is not within a Quiet Area.

Baseline Environmental Survey

- 10.39 To determine baseline sound levels in the vicinity of the proposed development, a noise survey was undertaken continuously between the 28th March 2022 and the 11th April 2022.

Weather Conditions

- 10.40 The weather during a good period of the survey was suitable for noise monitoring, with dry conditions and wind speeds of less than 5ms⁻¹.
- 10.41 On the 2nd of April, 4th to 7th of April, and 10th to 11th of April windspeeds at time did exceed 5m/s. However, as the lowest median baseline background sound level, measured during each period of

assessment, will be used to determine noise limits, weather effected data (noise level elevated) will be removed from the selection process.

Equipment

10.42 The monitoring equipment used during the survey is detailed in **Table 10-7 Monitoring Equipment**. All measurement instrumentation was calibrated before and after the measurements. No significant drift was observed. The calibration chain is traceable via the United Kingdom Accreditation Service to National Standards held at the National Physical Laboratory.

**Table 10-7
Monitoring Equipment**

Location	Equipment	Serial Number
Location 1	SoundExpert® LxT	0007031
Location 2	SoundExpert® LxT	0007037
Location 3	SoundExpert® LxT	0007029
Location 4	SoundExpert® LxT	0007027

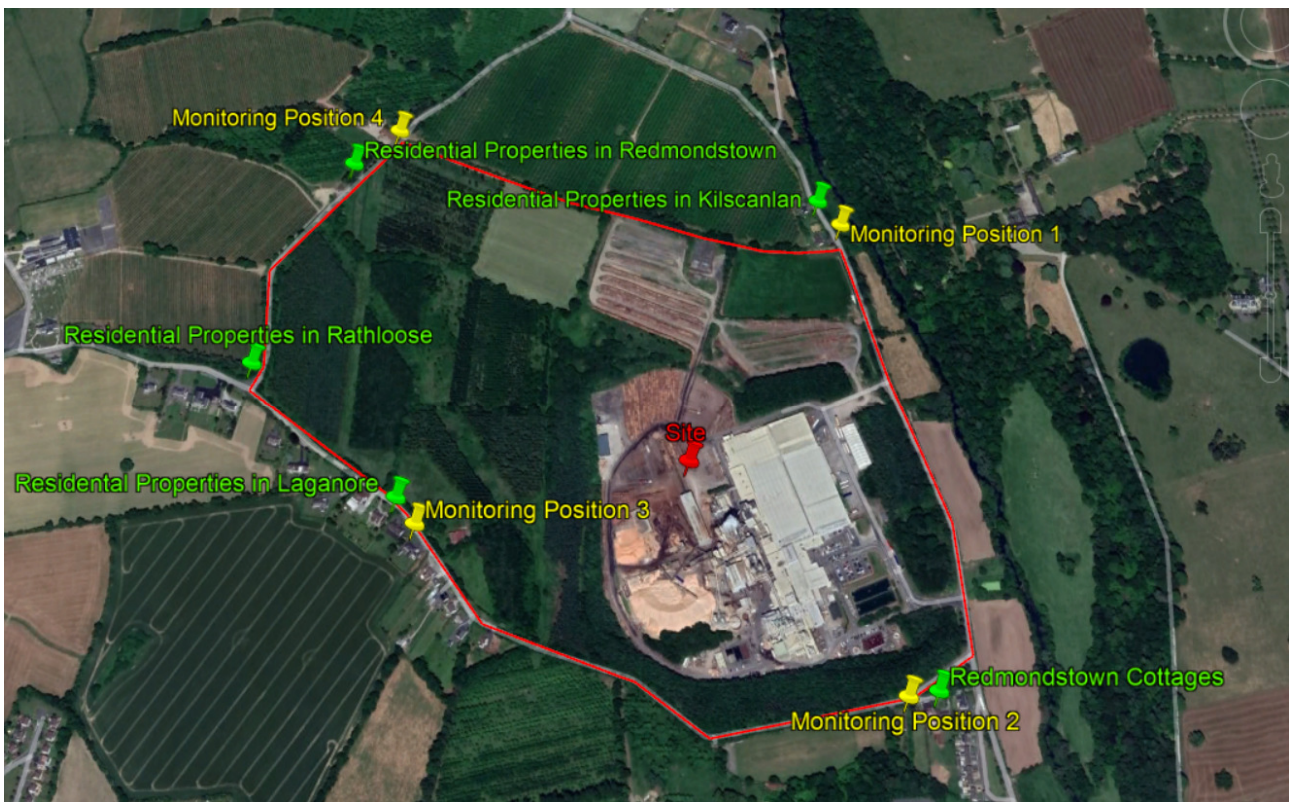
Survey Locations

10.43 Sound levels were measured at four locations, representative of the nearest residential receptors to the site, as follows:

- Location 1: Within a field behind a house in Kilsanlan, beside the local road. Site observations were that site activities may have been audible at this location.
- Location 2: Within the front garden of a cottage in Redmondstown Cottages. The road to the east is used by trucks for deliveries of wood to the site. Some commercial businesses are located to the south of this location.
- Location 3: Set up within the boundary of the unused farm. A local road is located to the south of the location in Laganore. Also considered representative of properties at Rathloose.
- Location 4: - Within a field in Redmondstown. A local road is located to the north and a farm to the north.

10.44 The survey locations referred to within this assessment, are shown in **Figure 10-1**.

Figure 10-1
Monitoring and Sensitive Receptor Locations



10.45 At the monitoring location the microphone was placed 1.5m above the local ground level in free-field conditions, i.e., at least 3.5m from the nearest vertical, reflecting surface. The following noise level indices were recorded:

$L_{Aeq,T}$: The A-weighted equivalent continuous noise level over the measurement period.

L_{A90} : The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise.

L_{A10} : The A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe road traffic noise.

L_{Amax} : The maximum A-weighted noise level during the measurement period.

Baseline Sound Level Results

10.46 A summary of the survey results for each monitoring location are shown in **Table 10-8** to **Table 10-11**. The full survey results are available on request.

Table 10-8
Location 1 – Summary of Measured Noise Levels, free-field, dB

Date	Time Period	L _{Aeq}	L _{AFmax}	L _{A10}	L _{A90}
Monday 28th March 2022	Day (07:00 – 19:00)	53.9	83.4	51.5	44.1
	Eve (19:00 – 23:00)	52.0	76.4	48.9	45.0
	Night (23:00 – 07:00)	49.7	76.0	48.4	46.8
Tuesday 29th March 2022	Day (07:00 – 19:00)	54.7	83.4	52.5	43.3
	Eve (19:00 – 23:00)	51.3	79.3	47.9	44.1
	Night (23:00 – 07:00)	48.6	73.8	47.4	45.6
Wednesday 30th March 2022	Day (07:00 – 19:00)	54.6	80.7	53.5	43.6
	Eve (19:00 – 23:00)	50.6	78.5	45.5	41.8
	Night (23:00 – 07:00)	47.4	76.3	43.7	41.8
Thursday 31st March 2022	Day (07:00 – 19:00)	54.9	85.7	54.4	43.3
	Eve (19:00 – 23:00)	51.2	78.2	46.2	42.2
	Night (23:00 – 07:00)	48.0	78.3	43.7	42.3
Friday 1st April 2022	Day (07:00 – 19:00)	54.3	83.7	52.7	43.5
	Eve (19:00 – 23:00)	51.9	77.6	46.7	42.7
	Night (23:00 – 07:00)	47.7	76.7	45.6	44.3
Saturday 2nd April 2022	Day (07:00 – 19:00)	53.6	81.6	52.6	42.9
	Eve (19:00 – 23:00)	52.6	80.0	47.4	43.4
	Night (23:00 – 07:00)	47.8	73.4	47.2	45.4
Sunday 3rd April 2022	Day (07:00 – 19:00)	52.6	84.1	50.1	42.9
	Eve (19:00 – 23:00)	50.9	80.4	48.0	44.4
	Night (23:00 – 07:00)	48.3	75.2	46.8	44.2
Monday 4th April 2022	Day (07:00 – 19:00)	56.8	82.1	59.1	47.2
	Eve (19:00 – 23:00)	50.3	74.4	48.4	44.3
	Night (23:00 – 07:00)	49.3	76.7	47.6	43.8
Tuesday 5th April 2022	Day (07:00 – 19:00)	57.0	83.6	58.4	48.5
	Eve (19:00 – 23:00)	52.7	79.6	51.2	47.0
	Night (23:00 – 07:00)	49.9	76.0	49.9	46.5
Wednesday 6th April 2022	Day (07:00 – 19:00)	57.9	80.6	58.6	50.5

Date	Time Period	L _{Aeq}	L _{AFmax}	L _{A10}	L _{A90}
	Eve (19:00 – 23:00)	54.6	80.4	55.6	48.6
	Night (23:00 – 07:00)	52.1	75.9	53.3	47.4
Thursday 7th April 2022	Day (07:00 – 19:00)	52.1	75.9	53.3	47.4
	Eve (19:00 – 23:00)	55.7	82.4	55.4	46.6
	Night (23:00 – 07:00)	52.3	84.5	48.1	44.6
Friday 8th April 2022	Day (07:00 – 19:00)	48.7	75.2	47.6	45.0
	Eve (19:00 – 23:00)	55.3	91.9	53.4	42.9
	Night (23:00 – 07:00)	52.9	77.9	48.1	43.2
Saturday 9th April 2022	Day (07:00 – 19:00)	48.6	77.0	46.3	44.2
	Eve (19:00 – 23:00)	53.1	76.2	49.9	42.7
	Night (23:00 – 07:00)	51.4	78.2	45.3	42.6
Sunday 10th April 2022	Day (07:00 – 19:00)	47.2	76.4	43.5	41.9
	Eve (19:00 – 23:00)	54.0	88.0	53.0	45.6
	Night (23:00 – 07:00)	51.2	76.0	49.1	44.8
Monday 11th April 2022	Day (07:00 – 19:00)	50.5	90.6	48.3	44.9
	Eve (19:00 – 23:00)	56.4	85.8	54.3	48.4

Table 10-9
Location 2 – Summary of Measured Noise Levels, free-field, dB

Date	Time Period	L _{Aeq}	L _{AFmax}	L _{A10}	L _{A90}
Monday 28th March 2022	Day (07:00 – 19:00)	53.2	81.0	51.4	46.7
	Eve (19:00 – 23:00)	47.6	66.0	48.5	46.3
	Night (23:00 – 07:00)	50.5	73.9	50.3	48.3
Tuesday 29th March 2022	Day (07:00 – 19:00)	51.4	71.1	52.0	46.8
	Eve (19:00 – 23:00)	48.8	69.7	50.3	46.7
	Night (23:00 – 07:00)	49.8	71.3	49.0	46.8
Wednesday 30th March 2022	Day (07:00 – 19:00)	51.4	77.2	52.9	46.8
	Eve (19:00 – 23:00)	47.6	71.3	47.6	46.2
	Night (23:00 – 07:00)	49.8	72.4	47.6	46.5
Thursday 31st March 2022	Day (07:00 – 19:00)	50.0	71.9	51.3	47.2

Date	Time Period	L _{Aeq}	L _{AFmax}	L _{A10}	L _{A90}
	Eve (19:00 – 23:00)	48.6	71.0	48.9	47.3
	Night (23:00 – 07:00)	49.6	72.7	48.1	47.2
Friday 1st April 2022	Day (07:00 – 19:00)	50.6	73.7	51.4	47.7
	Eve (19:00 – 23:00)	48.8	69.8	49.3	47.8
	Night (23:00 – 07:00)	49.9	73.2	48.0	47.3
Saturday 2nd April 2022	Day (07:00 – 19:00)	50.1	72.6	50.3	47.2
	Eve (19:00 – 23:00)	48.4	76.2	48.9	47.2
	Night (23:00 – 07:00)	50.2	71.7	48.2	47.4
Sunday 3rd April 2022	Day (07:00 – 19:00)	49.1	70.8	49.4	47.6
	Eve (19:00 – 23:00)	48.8	78.8	48.8	47.6
	Night (23:00 – 07:00)	48.6	66.2	48.8	47.5
Monday 4th April 2022	Day (07:00 – 19:00)	52.3	79.3	53.1	49.3
	Eve (19:00 – 23:00)	48.7	72.6	48.9	47.5
	Night (23:00 – 07:00)	49.6	72.1	50.0	48.1
Tuesday 5th April 2022	Day (07:00 – 19:00)	52.2	76.2	52.5	49.2
	Eve (19:00 – 23:00)	49.4	66.6	50.4	47.9
	Night (23:00 – 07:00)	49.4	71.5	49.6	47.1
Wednesday 6th April 2022	Day (07:00 – 19:00)	54.2	73.6	54.8	50.1
	Eve (19:00 – 23:00)	52.9	69.5	55.4	50.2
	Night (23:00 – 07:00)	51.8	73.3	53.0	49.9
Thursday 7th April 2022	Day (07:00 – 19:00)	53.0	78.1	53.8	50.5
	Eve (19:00 – 23:00)	51.2	65.5	51.8	50.5
	Night (23:00 – 07:00)	48.4	70.8	48.1	46.6
Friday 8th April 2022	Day (07:00 – 19:00)	49.8	80.5	50.8	46.6
	Eve (19:00 – 23:00)	48.5	74.6	48.2	46.5
	Night (23:00 – 07:00)	48.4	63.5	48.5	47.1
Saturday 9th April 2022	Day (07:00 – 19:00)	49.2	85.7	49.3	45.8
	Eve (19:00 – 23:00)	48.1	73.7	48.7	46.2
	Night (23:00 – 07:00)	47.2	76.9	46.1	44.3
Sunday 10th April 2022	Day (07:00 – 19:00)	51.2	73.7	51.8	47.1

Date	Time Period	L _{Aeq}	L _{AFmax}	L _{A10}	L _{A90}
	Eve (19:00 – 23:00)	50.9	69.4	52.9	46.0
	Night (23:00 – 07:00)	52.7	76.1	50.2	45.2
Monday 11th April 2022	day	55.0	71.8	57.1	52.0
	eve				

Table 10-10
Location 3 – Summary of Measured Noise Levels, free-field, dB

Date	Time Period	L _{Aeq}	L _{AMax}	L _{A10}	L _{A90}
Monday 28th March 2022	Day (07:00 – 19:00)	55.7	81.8	55.7	45.7
	Eve (19:00 – 23:00)	48.9	84.2	46.8	44.0
	Night (23:00 – 07:00)	45.8	85.1	41.6	37.9
Tuesday 29th March 2022	Day (07:00 – 19:00)	52.6	84.2	51.6	40.9
	Eve (19:00 – 23:00)	49.0	77.4	46.6	42.5
	Night (23:00 – 07:00)	44.3	75.0	41.6	38.4
Wednesday 30th March 2022	Day (07:00 – 19:00)	53.7	82.1	52.6	41.4
	Eve (19:00 – 23:00)	48.4	77.0	47.1	43.6
	Night (23:00 – 07:00)	45.3	75.6	43.3	39.3
Thursday 31st March 2022	Day (07:00 – 19:00)	52.4	87.0	52.4	43.0
	Eve (19:00 – 23:00)	46.6	74.7	42.8	35.6
	Night (23:00 – 07:00)	44.4	75.0	39.0	35.4
Friday 1st April 2022	Day (07:00 – 19:00)	52.6	83.0	50.3	40.5
	Eve (19:00 – 23:00)	44.1	73.2	40.8	33.6
	Night (23:00 – 07:00)	43.4	75.6	35.2	31.9
Saturday 2nd April 2022	Day (07:00 – 19:00)	50.7	84.5	50.3	40.0
	Eve (19:00 – 23:00)	48.4	76.4	47.4	42.9
	Night (23:00 – 07:00)	48.7	74.3	42.4	39.0
Sunday 3rd April 2022	Day (07:00 – 19:00)	51.9	86.0	49.5	36.6
	Eve (19:00 – 23:00)	46.2	84.4	40.7	35.0
	Night (23:00 – 07:00)	50.7	79.1	39.6	34.5
Monday 4th April 2022	Day (07:00 – 19:00)	53.1	82.6	52.7	42.4

Date	Time Period	L _{Aeq}	L _{AMax}	L _{A10}	L _{A90}
	Eve (19:00 – 23:00)	50.9	81.1	40.4	35.3
	Night (23:00 – 07:00)	52.7	85.2	42.4	36.5
Tuesday 5th April 2022	Day (07:00 – 19:00)	53.5	84.5	52.7	43.7
	Eve (19:00 – 23:00)	51.3	78.4	49.8	42.7
	Night (23:00 – 07:00)	58.4	90.1	47.6	40.4
Wednesday 6th April 2022	Day (07:00 – 19:00)	56.2	84.0	57.6	46.9
	Eve (19:00 – 23:00)	55.4	84.0	56.7	48.6
	Night (23:00 – 07:00)	54.9	84.1	52.2	44.9
Thursday 7th April 2022	Day (07:00 – 19:00)	53.6	85.3	51.6	43.5
	Eve (19:00 – 23:00)	52.2	87.3	44.6	36.5
	Night (23:00 – 07:00)	50.5	75.5	42.3	38.5
Friday 8th April 2022	Day (07:00 – 19:00)	53.7	83.7	51.2	39.4
	Eve (19:00 – 23:00)	50.6	85.4	43.0	35.0
	Night (23:00 – 07:00)	49.6	75.4	36.5	33.5
Saturday 9th April 2022	Day (07:00 – 19:00)	54.0	79.3	50.6	39.4
	Eve (19:00 – 23:00)	48.6	76.3	47.3	43.8
	Night (23:00 – 07:00)	51.5	80.5	47.9	45.3
Sunday 10th April 2022	Day (07:00 – 19:00)	53.9	89.9	52.2	46.5
	Eve (19:00 – 23:00)	51.0	79.3	51.6	46.1
	Night (23:00 – 07:00)	51.8	76.7	51.0	46.4
Monday 11th April 2022	Day (07:00 – 19:00)	55.7	79.7	57.3	51.4

Table 10-11
Location 4 – Summary of Measured Noise Levels, free-field, dB

Date	Time Period	L _{Aeq}	L _{AFMax}	L _{A10}	L _{A90}
Monday 28th March 2022	Day (07:00 – 19:00)	49.5	70.9	51.2	42.7
	Eve (19:00 – 23:00)	47.4	74.5	47.9	43.0
	Night (23:00 – 07:00)	47.1	77.0	40.0	35.5
Tuesday 29th March 2022	Day (07:00 – 19:00)	49.1	76.1	50.7	34.9
	Eve (19:00 – 23:00)	46.1	66.6	45.7	38.8

Date	Time Period	L _{Aeq}	L _{AFMax}	L _{A10}	L _{A90}
	Night (23:00 – 07:00)	45.2	73.4	40.7	36.8
Wednesday 30th March 2022	Day (07:00 – 19:00)	49.2	74.3	50.6	36.2
	Eve (19:00 – 23:00)	47.2	68.7	49.0	38.6
	Night (23:00 – 07:00)	46.6	72.7	41.5	32.6
Thursday 31st March 2022	Day (07:00 – 19:00)	50.8	70.9	52.8	38.5
	Eve (19:00 – 23:00)	46.6	72.3	44.3	29.1
	Night (23:00 – 07:00)	44.4	72.6	33.9	28.2
Friday 1st April 2022	Day (07:00 – 19:00)	49.1	77.8	50.6	34.8
	Eve (19:00 – 23:00)	45.3	69.0	42.8	30.8
	Night (23:00 – 07:00)	43.8	72.9	32.2	28.2
Saturday 2nd April 2022	Day (07:00 – 19:00)	49.3	79.6	51.5	35.1
	Eve (19:00 – 23:00)	47.0	69.2	47.4	39.5
	Night (23:00 – 07:00)	44.3	80.7	40.1	35.5
Sunday 3rd April 2022	Day (07:00 – 19:00)	47.6	77.1	49.5	33.0
	Eve (19:00 – 23:00)	44.8	66.6	41.9	34.5
	Night (23:00 – 07:00)	47.8	78.7	43.9	36.1
Monday 4th April 2022	Day (07:00 – 19:00)	51.2	80.1	53.9	41.1
	Eve (19:00 – 23:00)	46.1	75.8	44.6	34.8
	Night (23:00 – 07:00)	49.0	76.9	48.2	37.6
Tuesday 5th April 2022	Day (07:00 – 19:00)	54.3	82.4	54.1	43.5
	Eve (19:00 – 23:00)	49.1	67.4	49.7	42.4
	Night (23:00 – 07:00)	48.4	78.3	45.7	40.0
Wednesday 6th April 2022	Day (07:00 – 19:00)	54.7	84.3	57.1	46.7
	Eve (19:00 – 23:00)	53.3	71.4	55.9	47.7
	Night (23:00 – 07:00)	53.6	78.1	55.6	47.4
Thursday 7th April 2022	Day (07:00 – 19:00)	53.6	88.8	55.5	43.2
	Eve (19:00 – 23:00)	49.7	90.3	43.6	34.1
	Night (23:00 – 07:00)	46.4	74.3	39.6	35.4
Friday 8th April 2022	Day (07:00 – 19:00)	51.3	86.3	53.0	36.5
	Eve (19:00 – 23:00)	50.7	78.0	45.9	31.7

Date	Time Period	L _{Aeq}	L _{AFMax}	L _{A10}	L _{A90}
	Night (23:00 – 07:00)	49.0	78.0	33.5	29.1
Saturday 9th April 2022	Day (07:00 – 19:00)	49.3	77.2	51.3	37.0
	Eve (19:00 – 23:00)	47.8	72.1	47.1	42.3
	Night (23:00 – 07:00)	50.6	78.6	46.7	43.5
Sunday 10th April 2022	Day (07:00 – 19:00)	51.0	78.4	53.0	45.1
	Eve (19:00 – 23:00)	50.2	73.7	51.7	44.4
	Night (23:00 – 07:00)	53.3	78.1	53.7	45.5
Monday 11th April 2022	Day (07:00 – 19:00)	58.0	77.5	60.8	53.2

10.47 The baseline L_{A90} background sound levels presented in **Table 10-12** will be used to establish the noise criterion to be used in the NG4 assessment. The lowest medial L_{A90} during each assessment period has been selected. This is considered appropriate as it ensures that the proposals are assessed against a baseline background sound level that is robust. That it, it is not an assessment against the lowest baseline background sound level, as this would not be representative, but it is also not an assessment against a baseline that may be too high and not afford enough mitigation for existing Noise Sensitive Receptors.

Table 10-12
Background Sound Levels to be Establish the NG4 Noise Criterion - dB

Location	Daytime L _{A90}	Evening L _{A90}	Night-Time L _{A90}
1	42	42	42
2	46	46	44
3	37	34	32
4	33	29	28

10.48 Based on the data in **Table 10-13** the following noise criterion L_{Ar,T} limits will be used in the assessment at each Location.

Table 10-13
Noise Criterion L_{Ar,T} Limits to be Used in the NG4 Assessment – dB

Location	Daytime L _{Ar,T}	Evening L _{Ar,T}	Night-Time L _{Ar,T}
Kilscanion	55	50	45
Redmondstown Cottages	55	50	45
Laganore and Rathloose	55	50	45
Properties to NW	45	40	35

IMPACT ASSESSMENT

Evaluation Methodology

Determining Sensitivity of Receptor

- 10.49 The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.
- 10.50 The sensitivity of the receiving environment is shown in **Table 10-14**.

Table 10-14
Sensitivity Criteria for Acoustic Receptors

Sensitivity	Definition
High	Residential properties (night-time), Schools and healthcare building (daytime)
Medium	Residential properties (daytime), SAC, SPA, SSSI (or similar areas of special interest)
Low	Offices and other non-noise producing employment areas
Negligible	Industrial areas

Determining the Impact

- 10.51 The Impact has been considered as the change experienced from the baseline conditions at the sensitive receptor and has been considered on a scale of large, medium, small or negligible.
- 10.52 Impacts and effects can be beneficial, neutral or adverse and these have been specified where applicable. Effects can also be temporary, intermittent or permanent in nature.
- 10.53 The impact magnitude definition for each Assessment is provided below.

Construction Noise – Impact Definition

- 10.54 The impact of construction noise upon existing residential receptors, has been assessed in accordance with the ABC method presented in BS5228-1:2009+A1:2014, is as detailed in **Table 10-15**.

Table 10-15
Construction Noise – Noise Impact Magnitude

Magnitude	Exceedance of Threshold Value
Large	Threshold value exceeded by more than 5dB
Medium	Threshold value exceeded between 3.0 and 4.9dB

Magnitude	Exceedance of Threshold Value
Small	Threshold value exceeded between 0.1 and 2.9dB
Negligible	Threshold value not exceeded

Plant Noise – Impact Definition

- 10.55 To prevent any impact from fixed plant across the Site as a whole SLR has set rating level limits with reference to NG4.
- 10.56 The impact of commercial/industrial noise upon NSRs will be determined with reference to the NG4 noise criterion limit set out in **Table 10-13** of this Report. The noise Impact will then be defined with reference to **Table 10-16**.

Table 10-16
Commercial/Industrial Noise Upon Residential Receptors – Noise Impact

Impact	Description
Large	A $L_{Ar,T}$ 5dB(A) or more above the noise criterion $L_{Ar,T}$
Medium	A $L_{Ar,T}$ 4dB(A) above noise criterion $L_{Ar,T}$
Small	A $L_{Ar,T}$ between 1 and 3 dB(A) above noise criterion $L_{Ar,T}$
Negligible	A $L_{Ar,T}$ below the noise criterion $L_{Ar,T}$ to 0.9dB(A) above

Level of Effect

- 10.57 The level of effect attributed has been assessed based on the Impact of the Proposed Scheme and the evaluation of the sensitivity of the affected receptor.
- 10.58 The following terms have been used to define the significance of the effects identified and these can be ‘beneficial’ or ‘adverse’:
- **Major effect:** where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity. This effect is considered to be ‘Significant’;
 - **Moderate effect:** where the Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability. This effect is considered more likely to be ‘Significant’ but will be subject to professional judgement;
 - **Minor effect:** where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change

or/and can recover from the change. This effect is considered less likely to be ‘Significant’ but will be subject to professional judgement; and

- **Negligible:** where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change. This effect is ‘Not Significant’.

10.59 The sensitivity of the receiving environment together with the magnitude of impact defines the level of effect as shown in **Table 10-17**.

Table 10-17
Level of Effect

Impact Magnitude	Sensitivity – Effect			
	High	Medium	Low	Negligible
Large	Major	Major	Major	Moderate
Medium	Major	Moderate	Moderate	Minor
Small	Moderate	Minor	Minor	Minor
Negligible	Negligible	Negligible	Negligible	Negligible

10.60 Where an effect is classified as High, this is considered to represent a ‘significant effect’ in terms of the EIA Directive. Where an effect is classified as Moderate, this may be considered to represent a ‘significant effect’ but should always be subject to professional judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories or the impact is temporary or intermittent.

10.61 The Level of Effect Matrix provided within **Table 10-17** therefore provides a guide to decision making but is not a substitute for professional judgement.

10.62 Impacts and effects can be beneficial, neutral or adverse and these would be specified where applicable. Effects can also be temporary, intermittent or permanent in nature. It should be noted that significant effects need not be unacceptable or irreversible.

Construction Stage Impacts

10.63 **Table 10-18** details the Phases of construction. A detailed demolition and construction plan is not available. To undertake the assessment reasonable assumptions regarding the Stages of construction during each Phase have therefore been made and are presented in **Table 10-18**.

Table 10-18
Construction Phases and Stages

Phase	Time Period	Stage	Stage Description
One	2024 to 2026	Stage A	Ground preparation of Development Areas One
		Stage B	Substructure work for the Line 1 Energy Plant and fuel reception area
		Stage C	Superstructure work for the Line 1 Energy Plant and fuel reception area
Two	2026 to 2029	Stage A	Removal of existing Line One Energy Plant
Three	2030 - 2033	Stage A	Ground preparation of Development Areas Two
		Stage B	Substructure work for the Line 2 Energy Plant
		Stage C	Superstructure work for the Line 2 Energy Plant
Four	2034 - 2035	Stage A	Removal of existing Line Two Boilers

10.64 This assessment will consider the impact of construction noise and vibration upon NSRs near to the Site. These receptors are shown on **Figure 10-1**.

10.65 The construction noise limit at each receptor is detailed in **Table 10-19**. The limit has been determined using the ABC method detailed in of BS5228-1:2009+A1:2014. The lowest daytime assessment ambient sound level has been used.

Location 1: Residential Properties in Kilsanlan.

Location 2: Residential Properties in Redmondstown Cottages.

Location 3: Residential Properties in Laganore and Rathloose.

Location 4: Residential Properties in Redmondstown.

10.66 At this stage it is envisaged that all activities will take place within normal daytime working hours (07:30 to 18:00 hours, Monday to Friday and 08:00 to 13:00 on a Saturday).

Table 10-19
Threshold Construction Noise Limits dB(A)

Receptor Number	Receptor Name	Baseline lowest daytime ambient noise level	Threshold noise limit
1	Residential Properties in Kilsanlan.	47.2	65
2	Residential Properties in Redmondstown Cottages.	49.1	65
3	Residential Properties in Laganore and Rathloose.	50.7	65
4	Residential Properties in Redmondstown.	47.6	65

Construction Phases and Plant

As stated above, a detailed demolition and construction plan is not available. To undertake the assessment reasonable assumptions regarding the plant that would be used as each Phase and Stage of construction have therefore been made and are presented in Table 10-20.

**Table 10-20
Construction Plant**

Phase	Stage	Plant	Quantity	Sound Pressure Level at 10m	BS5228 Source	Attribute	Operating Height
One	Stage A	Excavator mounted rock breaker	1	93	BS 5228 C.9.11	20%	2m
		Tracked Excavator	2	78	BS 5228 Table C.2 Ref 3	80%	2m
		Handheld Circular Saw	2	84	BS 5228 Table C.4 Ref 73	35%	2m
		Dozer	2	80	C.2.10	20 movements per hour	2m
		Vibratory Roller	1	74	BS 5228 Table C.2 Ref 39	20 movements per hour	2m
		Lorry (Unloading Tipper Truck)	2	79	BS 5228 Table C.8 Ref 20	20 movements per hour	2m
		Concrete Truck Mixer	1	80	BS 5228 Table C.4 Ref 20	5%	2m
		Crusher	2	84	BS 5228 Table C.1 Ref 15	40%	2m
		Road Sweeper	1	76	BS 5228 Table C.4 Ref 90	10 movements in 1 hour	2m
		Mobile generator	1	60 ²	-	100%	1.5m

² Measured by SLR at a site in Cheshire uk

Phase	Stage	Plant	Quantity	Sound Pressure Level at 10m	BS5228 Source	Attribute	Operating Height
	Stage B	Concrete Truck Mixer	2	80	BS 5228 Table C.4 Ref 20	25%	2m
		Small Breaker	2	93	BS 5228 Table C.1 Ref 7	20%	2m
		Compressor	2	65	BS 5228 Table C.5 Ref 5	70%	2m
		Lorry (Unloading)(loading)	2	82	BS 5228 Table C.6 Ref 33	10 movements per hour	2m
		Tracked Excavator	2	78	BS 5228 Table C.2 Ref 3	80%	2m
		Dumper Trucks	2	79	BS 5228 Table C.4 Ref 6	10 movements in 1 hour	2m
		Vibratory Roller	2	74	BS 5228 Table C.2 Ref 39	20 movements per hour	2m
		Poker Vibrator	2	69	BS 5228 Table C.4 Ref 33	40%	2m
		Mobile Crane	1	70	BS 5228 Table C.4 Ref 43	100%	2m
		Lump hammer	8	69	C1.19	80%	10m
	Mobile generator	1	60	-	100%	1.5m	
	Stage C	Concrete Truck Mixer	2	80	BS 5228 Table C.4 Ref 20	25%	2m
		Lifting Platform	2	67	C.4.57	60%	2m
		Lorry (unloading)(loading)	3	82	BS 5228 Table C.6 Ref 33	5 movements per hour	2m
		Petrol Saw	2	91	BS 5228 Table C.4 Ref 73	40%	2m
		Tracked Excavator	2	78	BS 5228 Table C.2 Ref 3	75%	2m
		Dumper Trucks	2	79	BS 5228 Table C.4 Ref 6	10 movements in 1 hour	2m

Phase	Stage	Plant	Quantity	Sound Pressure Level at 10m	BS5228 Source	Attribute	Operating Height
		Poker Vibrator	2	69	BS 5228 Table C.4 Ref 33	40%	2m
		Mobile Crane Operation	2	70	BS 5228 Table C.4 Ref 43	90%	2m
		Telescopic handler	1	79	BS 5228 Table C.4.54	80%	2m
		Hand Tools (hammers)	8	69	BS 5228 Table C1.19	80%	10m
		Concrete Pump (pumping)	2	80	BS 5228 Table C.4 Ref 29	70%	2m
		Mobile generator	1	60	-	100%	1.5m
Two	Stage A	Scaffolding dismantling	4	77	-	100%	2m
		Scaffolding loading poles	8	69	-	100%	2m
		Pulveriser mounted on excavator	1	80	BS 5228 Table C.1.3	100%	2m
		Tracked excavator	1	85	BS 5228 Table C.1.10	100%	2m
		Tracked excavator	1	82	BS 5228 Table C.1.16	100%	2m
		Lump hammer	8	69	BS 5228 Table C.1.19	50%	2m
		Mobile generator	1	60	-	100%	1.5m
Three	Stage A	Excavator mounted rock breaker	1	93	C.9.11	20%	2m
		Tracked Excavator	2	78	BS 5228 Table C.2 Ref 3	80%	2m
		Handheld Circular Saw	2	84	BS 5228 Table C.4 Ref 73	35%	2m
		Spreading Fill (Dozer)	2	109	BS 5228 Table C.2.10	10 movements per hour	2m
		Vibratory Roller	1	84	BS 5228 Table C.5 Ref 24	20 movements per hour	2m

Phase	Stage	Plant	Quantity	Sound Pressure Level at 10m	BS5228 Source	Attribute	Operating Height
		Lorry loading c6.ref33	2	108	BS 5228 Table C.6 Ref 33	10 movements per hour	2m
		Concrete Truck Mixer	1	80	BS 5228 Table C.4 Ref 20	5%	2m
		Tracked Crusher	2	110	BS 5228 Table C.1.14	40%	2m
		Road Sweeper	1	70	BS 5228 Table C.4.90	10 movements in 1 hour	2m
		Mobile generator	1	60	-	100%	1.5m
	Stage B	Concrete Truck Mixer	1	80	BS 5228 Table C.4 Ref 20	25%	2m
		Handheld pneumatic breaker	2	95	C.5.6	20%	2m
		Compressor	2	65	C.5.5	70%	2m
		Lorry (unloading)(loading)	2	82	BS 5228 Table C.6 Ref 33	10 movements per hour	2m
		Petrol Saw	2	91	BS 5228 Table C.4 Ref 73	40%	2m
		Tracked Excavator (Rubber Tracks) (no rubber tracks)	2	86	BS 5228 Table C.1 Ref 13	80%	2m
		Dumper Trucks	2	79	BS 5228 Table C.4 Ref 6	10 movements in 1 hour	2m
		Vibratory Roller	2	102	C5.24	5 movements per hour	2m
		Poker Vibrator	2	97	BS 5228 Table C.4 Ref 33	40%	2m
		Wheeled Mobile Crane	1	103	C.5.37	100%	2m
		Hand Tools (Hammers)	8	76	C.1.19	80%	10m
		Mobile generator	1		-	100%	1.5m

Phase	Stage	Plant	Quantity	Sound Pressure Level at 10m	BS5228 Source	Attribute	Operating Height
	Stage C	Concrete Truck Mixer	2	103	BS 5228 Table C.4 Ref 20	25%	2m
		MEWP-Cherry Picker Genie	2	67	C.4.57	60%	2m
		Lorry (unloading)(loading)	3	82	BS 5228 Table C.6 Ref 33	5 movements per hour	2m
		Petrol Saw	2	91	BS 5228 Table C.4 Ref 73	40%	2m
		Tracked Excavator	2	86	BS 5228 Table C.1 Ref 13	75%	2m
		Dumper Trucks	2	79	BS 5228 Table C.4 Ref 6	10 movements in 1 hour	2m
		Poker Vibrator	2	69	BS 5228 Table C.4 Ref 33	40%	2m
		Mobile Crane Operation	2	70	BS 5228 Table C.4 Ref 43	90%	2m
		Telescopic Handler	1	79	BS 5228 Table C.4.54	80%	2m
		C.1.19 Lump hammer	8	69	BS 5228 Table BS 5228 Table C1.19	40%	10m
		Concrete Pump (pumping)	2	80	BS 5228 Table C.4 Ref 29	70%	2m
		Mobile generator	1	60	-	100%	1.5m
Four	Stage A	Scaffolding dismantling	4	77	-	100%	2m
		Scaffolding loading poles	8	69	-	100%	2m
		Pulveriser mounted on excavator	1	80	BS 5228 Table C.1.3	100%	2m
		Tracked excavator	1	85	BS 5228 Table C.1.10	100%	2m
		Tracked excavator	1	82	BS 5228 Table C.1.16	100%	2m
		Lump hammer	8	69	BS 5228 Table C.1.19	50%	2m
		Mobile generator	1	60	-	100%	1.5m

Direct Impacts

- 10.67 Using the sound power levels and associated percentage on-times shown in **Table 10-20**, noise levels from each construction activity have been predicted at the nearest noise sensitive receptors to the Site.
- 10.68 The predictions have been undertaken using the proprietary noise modelling software CadnaA which incorporates the methodology outlined in BS5228:2009+A1:2014. The model assumes a mix of hard and soft ground with a ground absorption coefficient of 0.5 and applies the screening effect of barriers from Figure F.3 of BS5228:2009+A1:2014 at 500Hz.
- 10.69 With reference to the methodology above, the predicted noise levels for each Activity of the construction works at each of the nearest noise-sensitive receptors are shown in **Table 10-21** below.
- 10.70 The Table also compares the predicted noise levels with the threshold value adopted for the assessment.
- 10.71 Noise levels have been predicted at a height of 1.5m which is representative of a ground-floor window for each receptor.

Table 10-21
Construction Noise Assessment Results – dB(A)

Receptor	Phase	Stage	Predicted Noise Level	Threshold Value	Diff.	Impact / Effect	
Residential Properties in Kilsanlan	One	A	48.9	65	-16.1	Neg./Neg.	
		B	50.4	65	-14.6	Neg./Neg.	
		C	49.3	65	-15.7	Neg./Neg.	
	Two	A	42.2	65	-22.8	Neg./Neg.	
	Three	A	44.9	65	-20.1	Neg./Neg.	
		B	50.6	65	-14.4	Neg./Neg.	
		C	50.8	65	-14.2	Neg./Neg.	
	Four	A	40.5	65	-24.5	Neg./Neg.	
	Residential Properties in Redmondstown Cottages	One	A	57.8	65	-7.2	Neg./Neg.
			B	57.6	65	-7.4	Neg./Neg.
C			56.1	65	-8.9	Neg./Neg.	
Two		A	54.5	65	-10.5	Neg./Neg.	
Three		A	56.8	65	-8.2	Neg./Neg.	
		B	57.5	65	-7.5	Neg./Neg.	

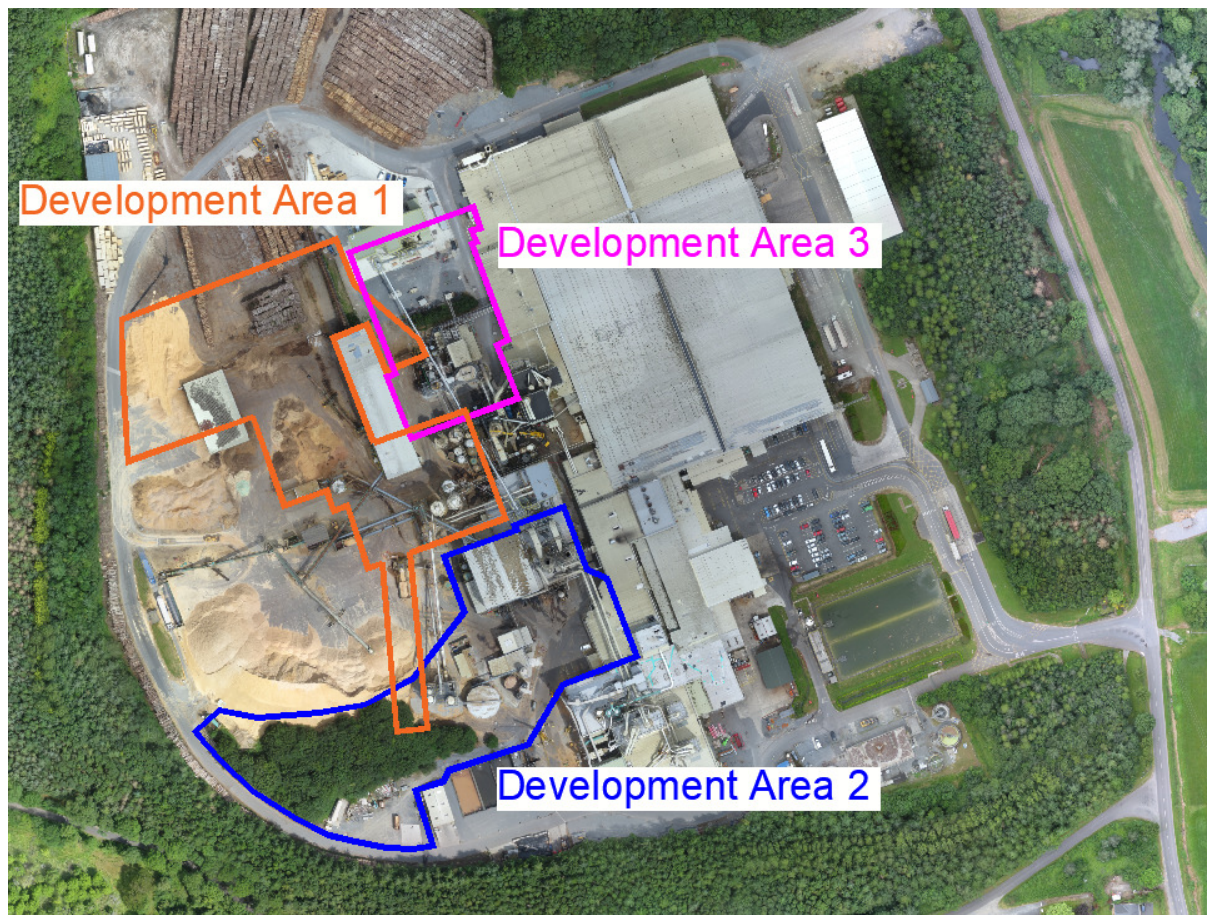
Receptor	Phase	Stage	Predicted Noise Level	Threshold Value	Diff.	Impact / Effect	
		C	56.4	65	-8.6	Neg./Neg.	
	Four	A	54.0	65	-11	Neg./Neg.	
Residential Properties in Laganore	One	A	58.0	65	-7.0	Neg./Neg.	
		B	58.7	65	-6.3	Neg./Neg.	
		C	58.4	65	-6.6	Neg./Neg.	
	Two	A	55.6	65	-9.4	Neg./Neg.	
	Three	A	55.6	65	-9.4	Neg./Neg.	
		B	55.3	65	-9.7	Neg./Neg.	
		C	55.0	65	-10	Neg./Neg.	
	Four	A	55.9	65	-9.1	Neg./Neg.	
	Residential Properties in Rathloose	One	A	49.3	65	-15.7	Neg./Neg.
			B	50.5	65	-14.5	Neg./Neg.
C			49.9	65	-15.1	Neg./Neg.	
Two		A	45.7	65	-19.3	Neg./Neg.	
Three		A	46.7	65	-18.3	Neg./Neg.	
		B	51.6	65	-13.4	Neg./Neg.	
		C	49.3	65	-15.7	Neg./Neg.	
Four		A	45.9	65	-19.1	Neg./Neg.	
Residential Properties TO NW		One	A	47.7	65	-17.3	Neg./Neg.
			B	49.1	65	-15.9	Neg./Neg.
	C		48.5	65	-16.5	Neg./Neg.	
	Two	A	44.2	65	-20.8	Neg./Neg.	
	Three	A	44.1	65	-20.9	Neg./Neg.	
		B	49.9	65	-15.1	Neg./Neg.	
		C	48.3	65	-16.7	Neg./Neg.	
	Four	A	44.3	65	-20.7	Neg./Neg.	

10.72 Construction noise will be a **Temporary Short-Term Effect**. As the Effect would occur during the daytime the Sensitivity of each Receptor is Medium. As can be seen from the Table above at all receptors the noise Impact is Negligible. The **Significance of the Effect is Negligible**; an Effect which is **Not Significant** at all receptors.

Operational Stage Impacts

10.73 The operational stage impacts for each Development Area will be determined separately, and cumulatively. The location of each Development Area is shown in **Figure 10-2**.

Figure 10-2
Development Areas



10.74 The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA, which implements the full range of UK calculation methods. The calculation algorithms set out in ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation have been used and the model assumes:

- A ground absorption factor of 0.5.
- A reflection factor of 2.
- A daytime receiver height of 1.5m.
- A night-time receiver height of 4m.

Direct Impacts Development Area 1

- 10.75 Development Area 1 will accommodate the fuel reception, storage and conveying/screening plant and associated infrastructure works.
- 10.76 **Table 10-22** details the noise sources associated with Development Area 1.

Table 10-22
Development Area One Noise Sources

Plant (Drawing Reference) ³	Number	Dimensions	Location (Drawing Reference) ⁴	Sound Power Level, dB	Movements per hour / On-Time	Noise Source Type
HGV Movements	289 a day	n/a	Fuel Building	88.0 ⁵	24 per hour (over 12 hours). 12 in, 12 out.	Moving Point Line Source. 1.5m above ground.
HGV Reverse	289 a day	n/a		89.6 ⁶	6 minutes (30 seconds each of the 12 HGV arrivals)	Line Source.
Conveyors	9	Various / Max = c. 17.3m H	1 SBelt Conveyor (Fuel infeed Hopper – Item 2.2) 6 Belt Conveyors transporting from the Fuel infeed Hopper (2.2) and the Walking Floor Infeed Systems (2.3) into the existing conveyors at the MTX system (1.19). Secondary conveyors not operational at night. 2 belt conveyors (item 2.5) in series leading from item 1.19 to Development Area 2, 1 belt conveyor (item 2.6) leading from item 1.19 to Development Area 3	77dB ⁷ 77.0 Belt Conveyor	60 minutes (100% on time)	Line source.

³ See drawings 23-09-700-EP

⁴ See drawings 23-09-700-EP

⁵ Measured by SLR at Runcorn EfW Facility (15mph speed, flat made road)

⁶ Measured by SLR

⁷ 3dB(A) quieter at middle section of each chain conveyor (at distance from the motor/s)

Plant (Drawing Reference) ³	Number	Dimensions	Location (Drawing Reference) ⁴	Sound Power Level, dB	Movements per hour / On-Time	Noise Source Type
Walking Floor Infeed System	1	Ground Level (10.0m x 20.0m)	Item 2.3	90.0		Area Source
Pneumatic Dry Fluid System	1	Edge Trim Silo Ø=6.4M x H=11.8M	(2.7)	75.0		Point source
Edge Silo	1	19.4m	(2.8)	80.0		Point source

Specific Sound Level

10.77 The predicted sound levels of the noise sources associated with Development Area 1 are shown in **Table 10-23** below.

Table 10-23
Predicted Specific Sound Levels, Development Area 1

Receptor	Period	Predicted Specific Sound Level, dB
Properties to NW	Daytime / Evening	31
	Night-Time	31
Kilscanian	Daytime / Evening	32
	Night-Time	35
Redmondstown Cottages	Daytime / Evening	32
	Night-Time	33
Laganore	Daytime / Evening	38
	Night-Time	38
Rathloose	Daytime / Evening	32
	Night-Time	33

10.78 A graphical image of the predicted specific sound level during the daytime can be seen in **Figure 10-3**. A graphical image of the predicted specific sound level during the night-time can be seen in **Figure 10-4**.

Figure 10-3
Daytime Predicted Specific Sound Level at 1.5m, Development Area One

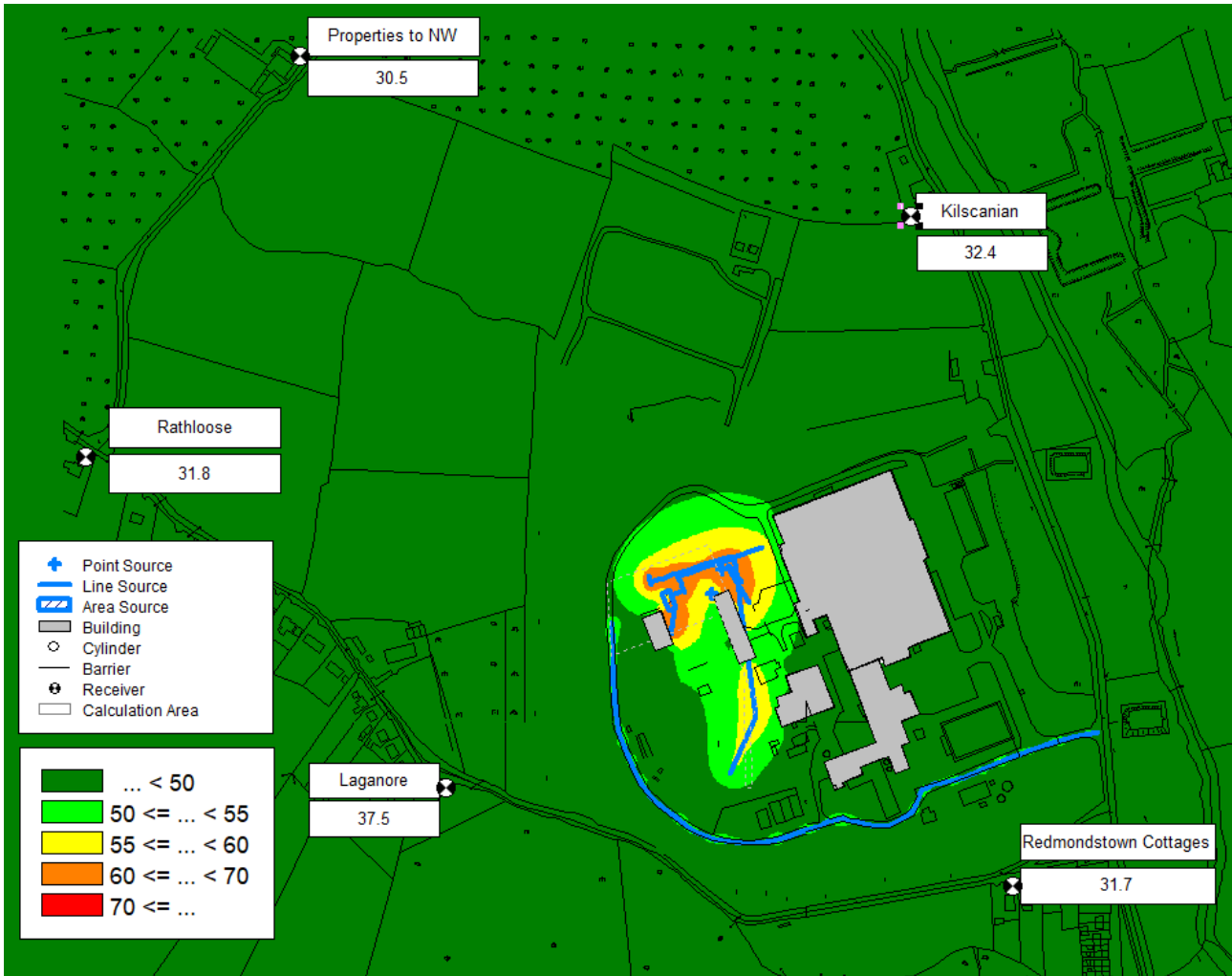
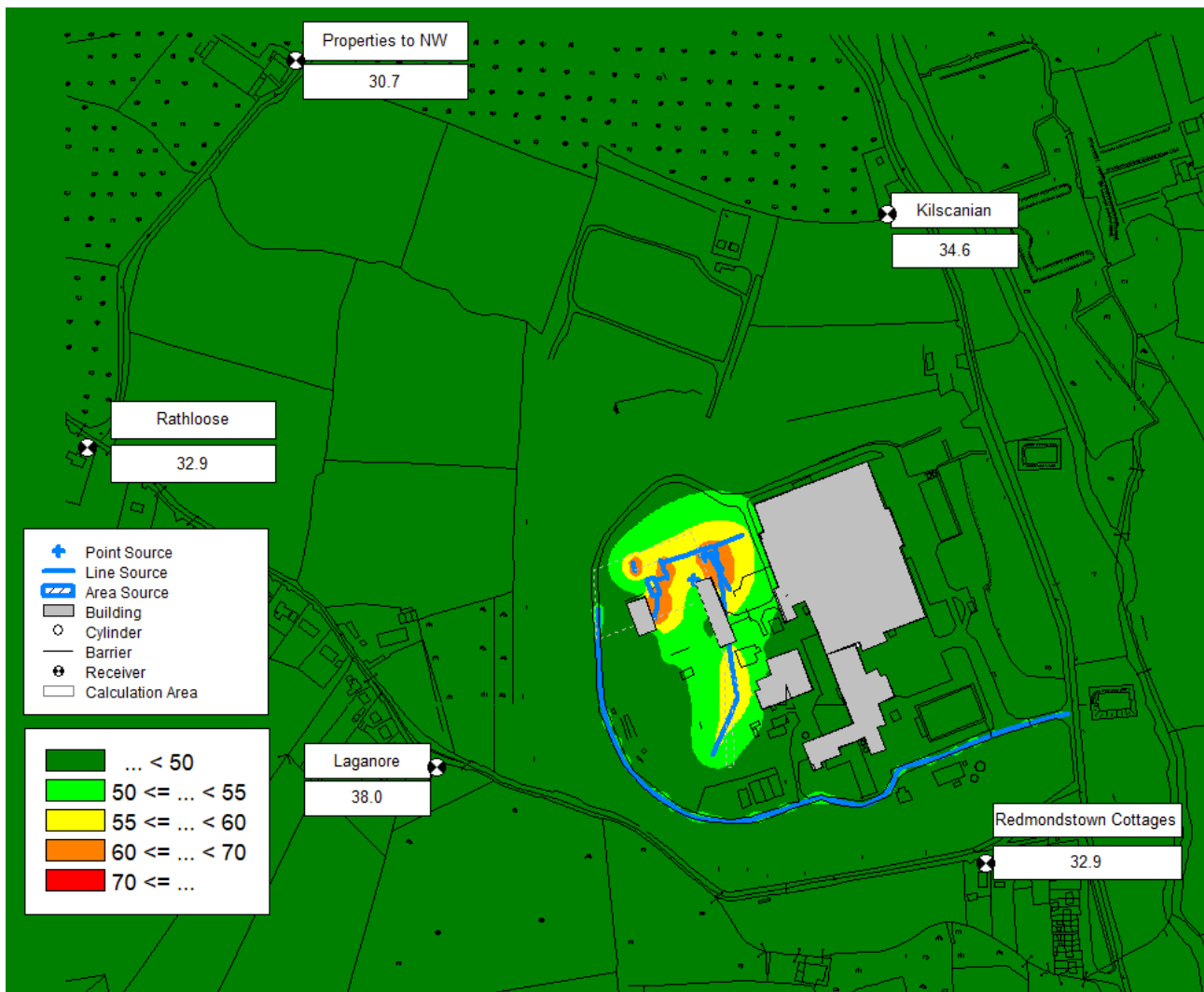


Figure 10-4
Night-Time Predicted Specific Sound Level at 4m, Development Area One



Direct Impacts Development Area 2

- 10.79 Development Area 2 will accommodate the new Line 1 energy plant which will be located to the south of the Medite site.
- 10.80 **Table 10-24** details the noise sources associated with Development Area 2.

Table 10-24
Development Area Two Noise Sources

Plant	Number	Dimensions	Location	Sound Power Level, dB	On-Time	Noise Source Type
Conveyor	1	No data provided	Belt Conveyor from Fuel Metering Bin to Line 1 Fuel Meter Bin (Conveyor Not numbered on drawing but from 3.1 to 3.7)	77 ⁸	60 minutes (100% on time)	Line Source.
Conveyor	1	No data provided	Belt Conveyor referenced above to the Grate Furnace Chamber 1 Line 1 Energy Plant (3.2)	77		Line Source.
Primary Fan	1	Line 1 Energy Plant (32.0m x 19.8m x 24.7H)	Energy Plant (3.3)	86.0		A building with a surface area of 231m ² , and an absorption value of 0.1. Modelled as vertical area sources and a roof (area source). A sound reduction of 24dB has been added to account for single skin cladding. With all the individual plant items added the internal reverberant sound level is 78.4dB(A).
Secondary Fan	1			85.0		
Core Dryer	1			89.0		
Face Dryer	1			89.0		
Hit Gas Duct	1			89.0		
Thermal Oil Heat Exchanger	1			86.0		

⁸ 3dB(A) quieter at middle section of each chain conveyor (at distance from the motor/s)

Plant	Number	Dimensions	Location	Sound Power Level, dB	On-Time	Noise Source Type
LP Steam Generator	1			79.0		
Thermal Oil Steam Generator	1			79.0		
Thermal Oil Heater Exhaust	1			72.0		
Wet Ash Conveyor	1			72.0		
Booster Pump	1			80.0		
Deaerator	1			80.0		
Electrostatic Precipitator	1			73.0		
Primary Pumps	1			81.0		
Line 1 Hot Gas Duct	1	110M long x Ø2.4M	(3.5)	71.0		Line Source
Line 1 Start Up Stack	1	34 x Ø2.7M	(3.6)	72.0		Point Source
Line 1 Thermal Fluid Piping	1	approx. 250M	(3.8)	73.0		Line Source
Line 1 Steam Generator	1	(20m x 4.5m x 7.0mH) &	(3.9)	79.0		Point Source

Plant	Number	Dimensions	Location	Sound Power Level, dB	On-Time	Noise Source Type
		associated Steam piping (approx. 250M)				
Dry Electrostatic Precipitator	1		(3-4)	73.0		Modelled as a radiating building, combination of area sources and vertical area sources

Specific Sound Level

10.81 The predicted sound levels of the noise sources associated with Development Area 2 is shown in **Table 10-25** below.

**Table 10-25
Predicted Specific Sound Levels, Development Area Two**

Receptor	Period	Predicted Specific Sound Level
Properties to NW	Daytime / Evening	18.2
	Night-Time	18.6
Kilscanian	Daytime / Evening	17.1
	Night-Time	17.5
Redmondstown Cottages	Daytime / Evening	32.7
	Night-Time	34.3
Laganore	Daytime / Evening	31.4
	Night-Time	33.5
Rathloose	Daytime / Evening	23.5
	Night-Time	22.6

10.82 A graphical image of the predicted specific sound level during the daytime can be seen in **Figure 10-5**. A graphical image of the predicted specific sound level during the night-time can be seen in **Figure 10-6**.

Figure 10-5
Daytime Predicted Specific Sound Level at 1.5m, Development Area Two

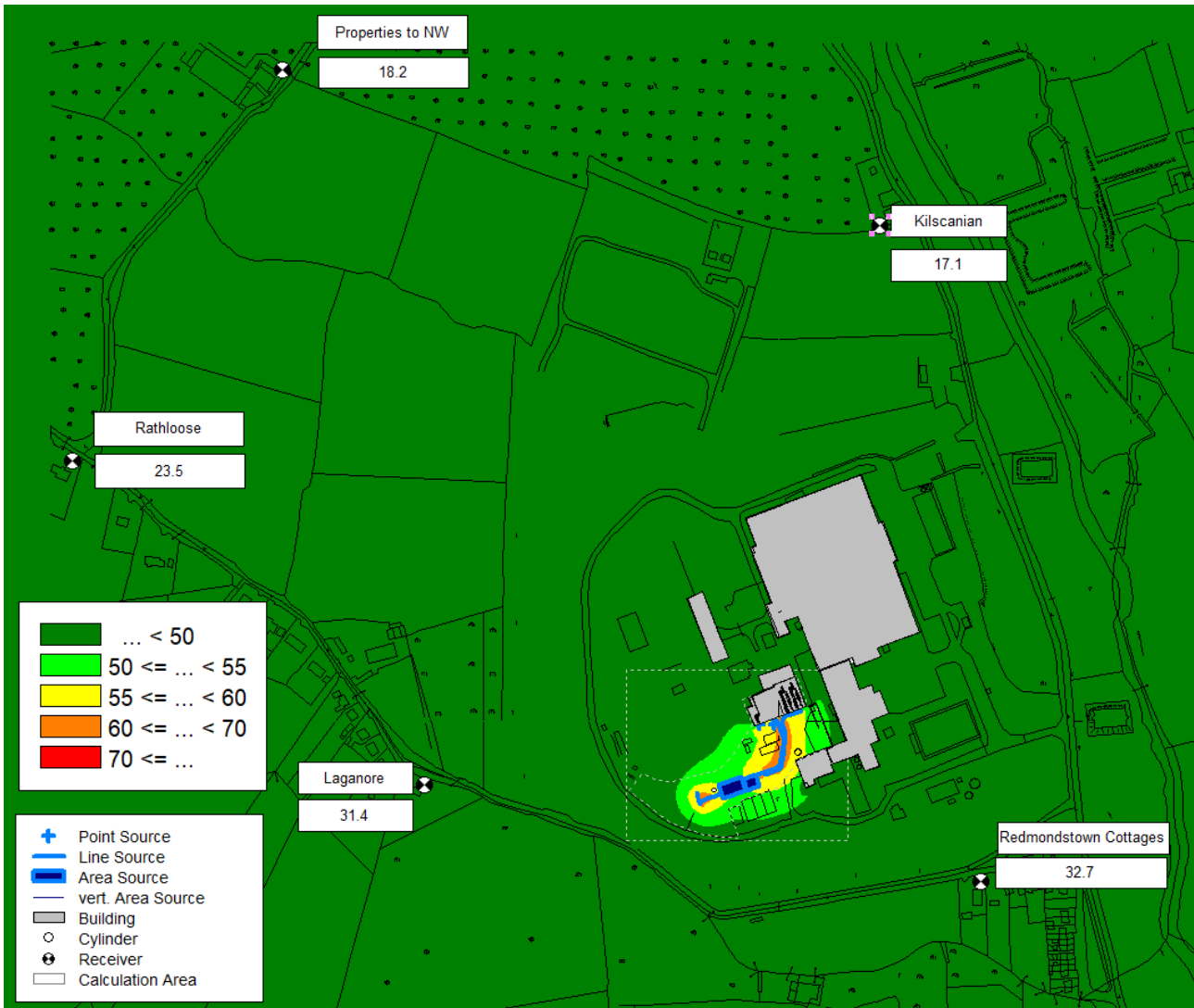
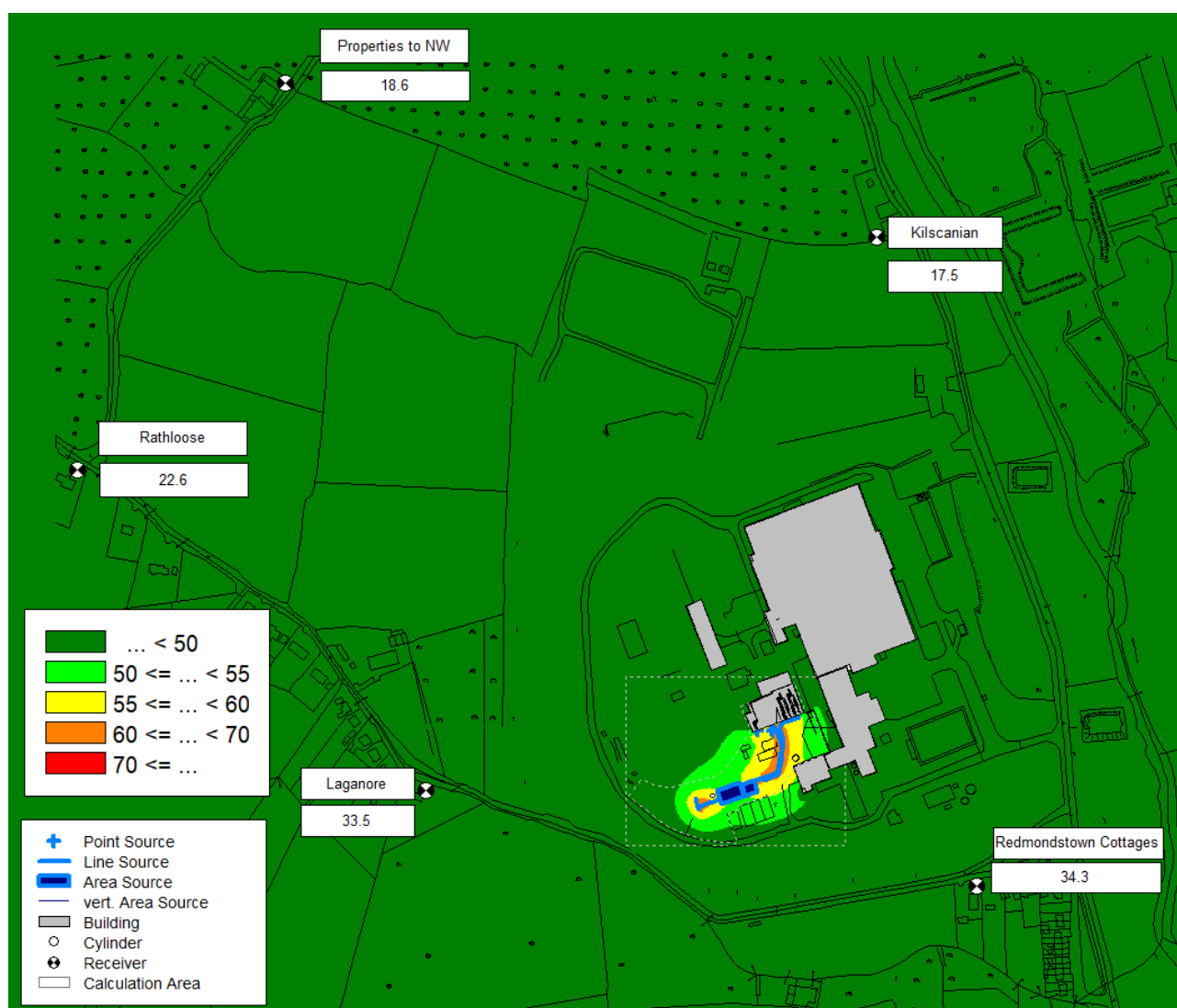


Figure 10-6
Night-Time Predicted Specific Sound Level at 4m, Development Area Two



Direct Impacts Development Area 3

- 10.83 Development Area 3 will accommodate the new Line 2 energy plant which will be located adjacent to the existing Line 2 Energy Plant.
- 10.84 **Table 10-26** details the noise sources associated with Development Area 3.

**Table 10-26
Development Area Three Noise Sources**

Plant	Number	Dimensions	Location	Sound Power Level, dB	On-Time	Noise Source Type
Conveyor	1	Line 2 Wet Fuel Metering Bin (9.7m x 3.8m x 4.2mH)	Belt conveyor from Development Area 1 to Line 2 Fuel Meter Bin(no reference number on drawing)	77 ⁹	60 minutes (100% on time)	Line Source.
Conveyor	1	Line 2 Energy System Fuel Feed Conveyor (29m long conveyor x 17m H)	Belt conveyor from Line 2 Fuel Meter Bin to the Grate Furnace Chamber 2 Line 2 Energy Plant (2.6)	77 ¹⁰		Line Source.
Primary Fan	1	Line 2 Energy Plant (11 x 8.0 x 10H)	Energy Plant (4.3)	86.0		A building with a surface area of 468m ² , and an absorption value of 0.1. Modelled as vertical area sources and a roof (area
Secondary Fan	1			85.0		
Core Dryer	1			89.0		
Face Dryer	1			89.0		
Hit Gas Duct	1			72.0		

⁹ 3dB(A) quieter at middle section of each chain conveyor (at distance from the motor/s)

¹⁰ 3dB(A) quieter at middle section of each chain conveyor (at distance from the motor/s)

Plant	Number	Dimensions	Location	Sound Power Level, dB	On-Time	Noise Source Type
Thermal Oil Heat Exchanger	1			79.0	60 minutes (100% on time)	source). A sound reduction of 24dB has been added to account for single skin cladding. With all the individual plant items added the internal reverberant sound level is 84dB(A).
LP Steam Generator	1			79.0		
Thermal Oil Steam Generator	1			79.0		
Thermal Oil Heater Exhaust	1			79.0		
Wet Ash Conveyor	1			72.0		
Booster Pump	1			80.0		
Deaerator	1			81.0		
Primary Pumps	1			81.0		
Line 2 Hot Gas Duct	1	62M long x Ø2.4M	(4.5)	74.0		Line Source
Line 2 Start Up Stack	1	30 x Ø2.1M	(4.6)	72.0		Point Source
Line 2 Thermal Fluid Piping	1	approx. 100M x 7.9mH	(4.7)	78.0		Line Source
Dry Electrostatic Precipitator.	1		(3-4)	73.0		Modelled as a radiating building using area and vertical area sources.

Specific Sound Level

10.85 The predicted sound levels of the noise sources associated with Development Area 3 are shown in **Table 10-27** below.

Table 10-27
Predicted Specific Sound Levels, Development Area Three

Receptor	Period	Predicted Specific Sound Level, dB
Properties to NW	Daytime / Evening	19.0
	Night-Time	19.4
Kilscanian	Daytime / Evening	24.5
	Night-Time	24.8
Redmondstown Cottages	Daytime / Evening	23.7
	Night-Time	23.9
Laganore	Daytime / Evening	17.9
	Night-Time	19.2
Rathloose	Daytime / Evening	21.8
	Night-Time	21.1

10.86 A graphical image of the predicted specific sound level during the daytime can be seen in **Figure 10-7**. A graphical image of the predicted specific sound level during the night-time can be seen in **Figure 10-8**.

Figure 10-7
Daytime Predicted Specific Sound Level at 1.5m, Development Area 3

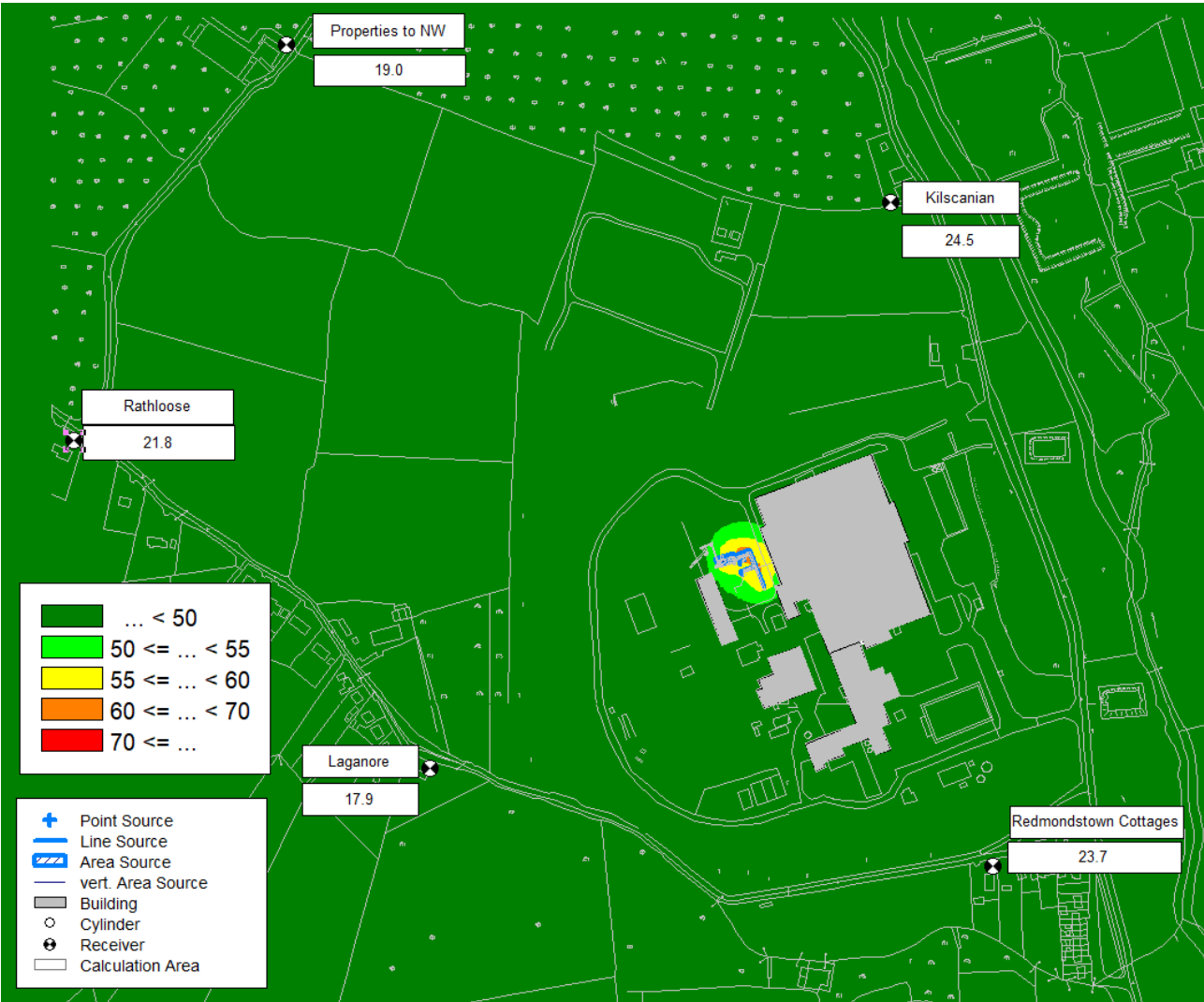
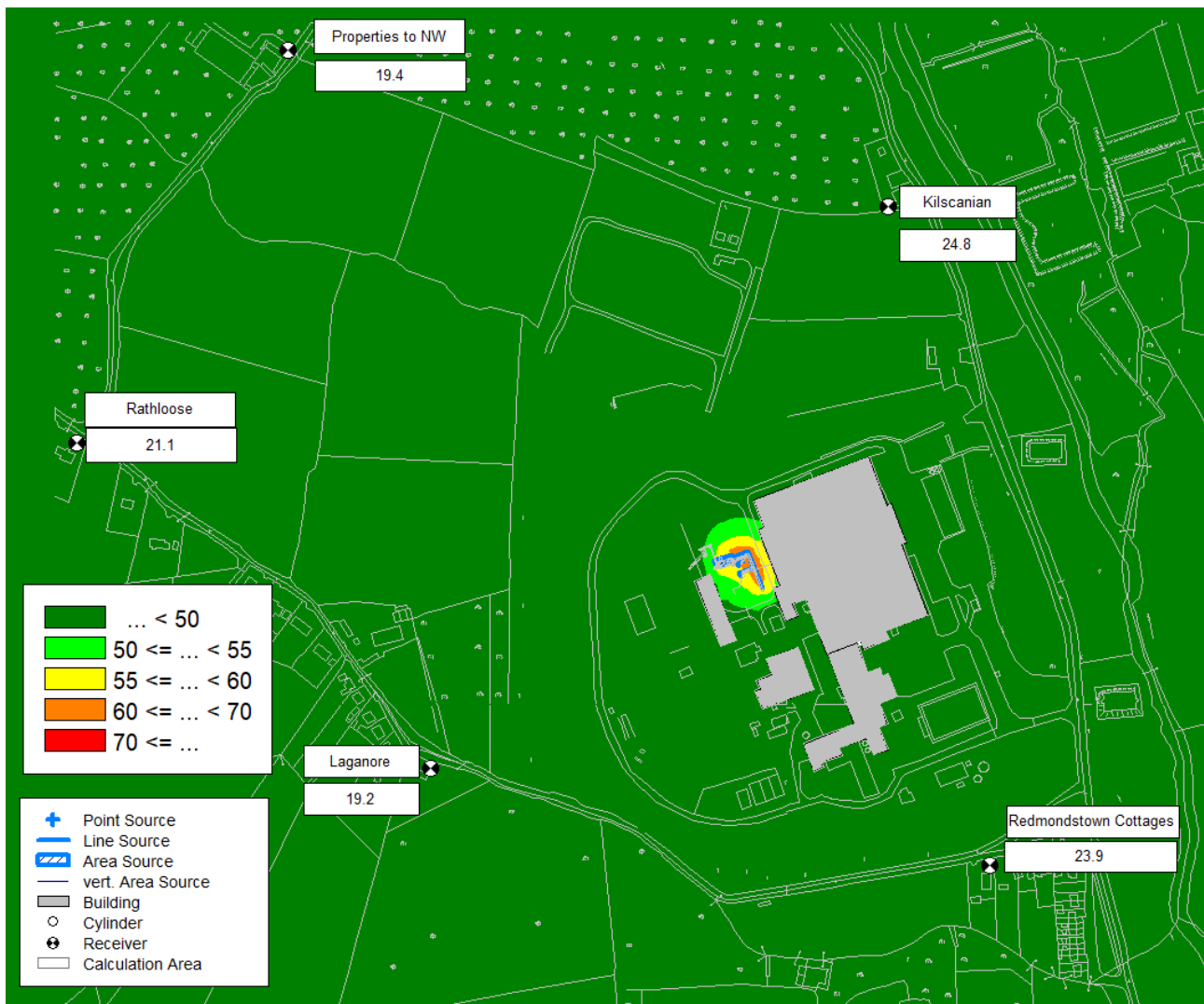


Figure 10-8
Night-Time Predicted Specific Sound Level at 4m, Development Area 3



Development Area One, Two and Three - Cumulative

10.87 The predicted sound levels of the noise sources associated with Development Area 1, 2 and 3 combined are shown in **Table 10-28** below.

Table 10-28
Predicted Specific Sound Levels, Development Area One, Two and Three Combined

Receptor	Period	Predicted Specific Sound Level, dB
Properties to NW	Daytime / Evening	31.0
	Night-Time	31.0
Kilscanian	Daytime / Evening	33.1
	Night-Time	35.0
Redmondstown Cottages	Daytime / Evening	35.2
	Night-Time	36.5
Laganore	Daytime / Evening	38.6
	Night-Time	39.4
Rathloose	Daytime / Evening	32.8
	Night-Time	33.3

- 10.88 A graphical image of the predicted specific sound level during the daytime can be seen in **Figure 10-9**. A graphical image of the predicted specific sound level during the night-time can be seen in **Figure 10-10**.

Figure 10-9
Daytime Predicted Specific Sound Level at 1.5m, All Development Areas

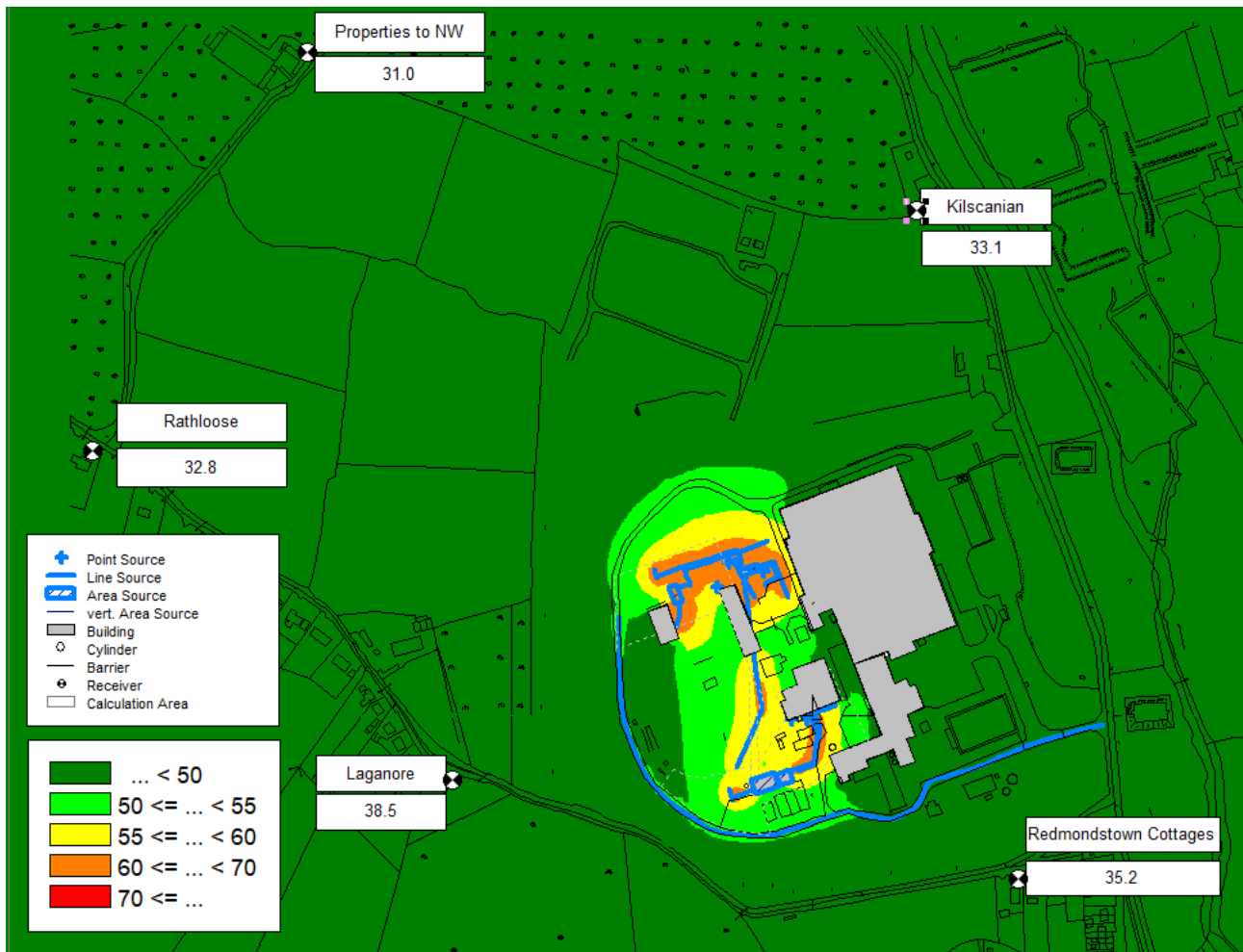
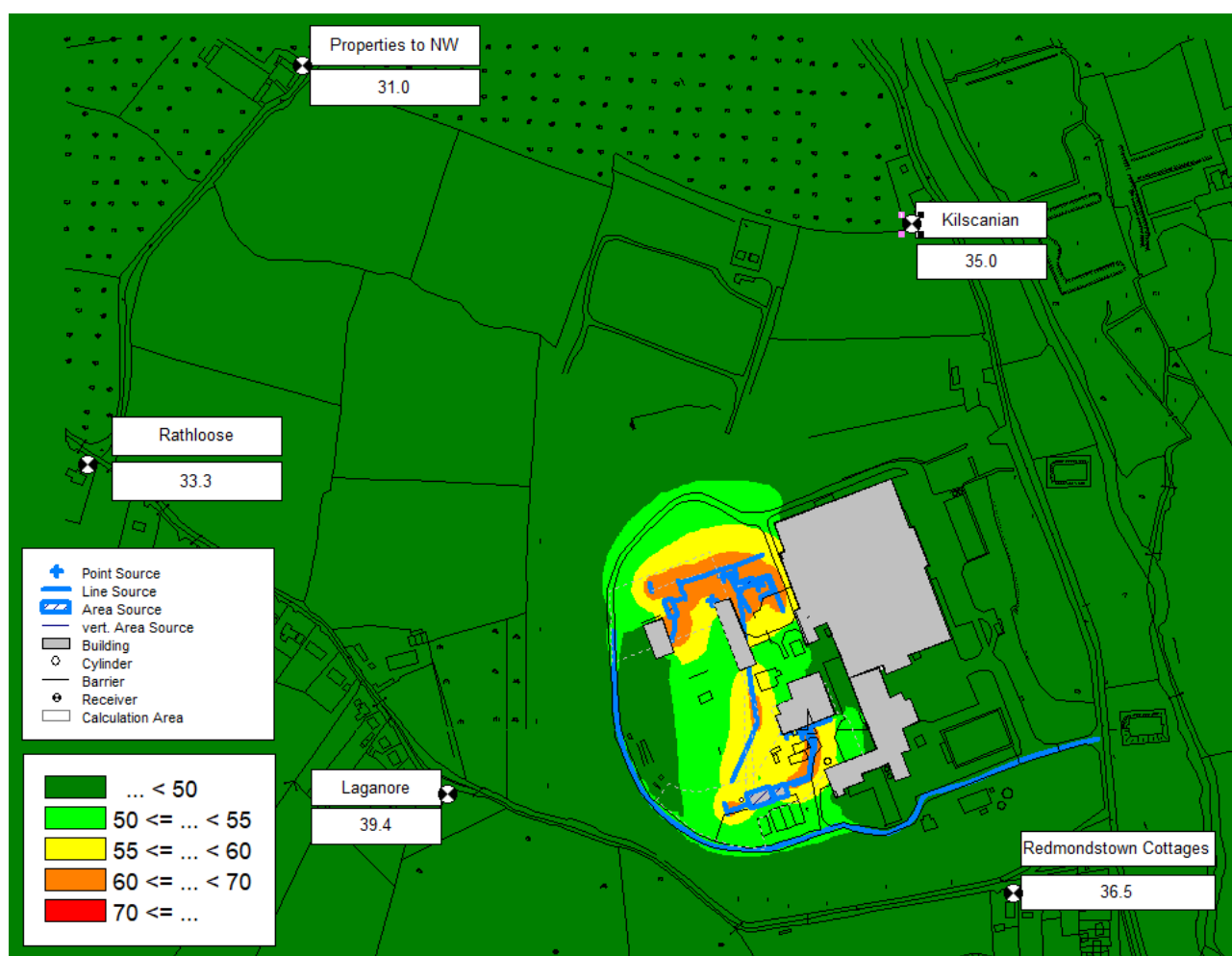


Figure 10-10
Night-Time Predicted Specific Sound Level at 1.5m, All Development Areas



Development Area One, Two and Three NG4 Character Correction

10.89 The character of each noise source, and the correction that will be applied in the NG4 assessment are as follows:

- **Tonality:** SLR has not undertaken the NG4 method for assessing the audibility of tones as octave data has not been available. However, it is not expected that sound from the Site would be tonal in nature. If a tone was identified, it would be mitigated to remove the tone.
- **Impulsivity:** On occasion noise sources from the Site may include thumping, banging or impact noise. However, it is not expected that this would occur during normal operations or would be significantly different to existing sources of noise at the Site.

10.90 In total a 0dB character correction should be added to the calculated specific sound level at each receptor. However, for robustness the character correction of 5dB(A) has been added.

Development Area One, Two, and Three NG4 Assessment

- 10.91 The results of the NG4 assessment are shown in **Table 10-29**.
- 10.92 Based on the accuracy of the prediction methodology, i.e. ISO9613-2, the uncertainty of the CadnaA model accuracy, i.e. barrier corrections for buildings, etc., it is considered that the results of the assessment are as accurate as reasonably practicable and considered to be within +/-3dB.

Table 10-29
NG4 Assessment Table – dB(A)

Receptor	Period	Predicted Specific Sound Level, dB	Rating Level	Noise Criterion $L_{A,r,T}$	Difference	Impact/Effect
Properties to NW	Daytime	31	36	45	-9	Negligible
	Evening	31	36	45	-9	Negligible
	Night-Time	31	36	35	+1	Small/Moderate
Kilscanian	Daytime	33	38	55	-17	Negligible
	Evening	33	38	50	-13	Negligible
	Night-Time	35	40	45	-5	Negligible
Redmondstown Cottages	Daytime	35	40	55	-5	Negligible
	Evening	35	40	50	-10	Negligible
	Night-Time	37	42	45	-3	Negligible
Laganore	Daytime	39	44	55	-9	Negligible
	Evening	39	44	50	-6	Negligible
	Night-Time	39	44	45	-1	Negligible
Rathloose	Daytime	33	38	55	-15	Negligible
	Evening	33	38	50	-13	Negligible
	Night-Time	33	38	45	-7	Negligible

10.93 It can be seen from Table 3-16 that:

- The **Impact** of **Long-Term** operational noise will be **Negligible** with a **Negligible Effect** at all Receptors except the Property to the NW at night where the 1dB(A) exceedance results in a **Small Impact** which at night is classed as **Moderate** owing to the Receptor sensitivity. However, this 1dB(A) exceedance is not considered significant.

Direct Impacts – Cumulative

10.94 A cumulative assessment of Development Areas One, Two, and Three has been presented.

MITIGATION MEASURES

Construction Stage

10.95 Mitigation measures that will be implemented as appropriate to reduce construction noise levels are set out in Appendix 01. Most of these mitigation measures can be incorporated within a suitable Construction Environmental Management Plan ('CEMP') to be implemented during the construction phase.

Operational Stage

10.96 With the inclusion of all the conveyors as belt conveyors with sound power of 77dB(A) no mitigation is required. The conveyors have been included in the noise model with the following parameters.

10.97 Embedded mitigation has included each conveyor being split into 4 sections. The end sections have been attributed a sound power level of 77dB(A) (with a sound pressure level of 69dB(A) at 1m). The two middle sections have been attributed a lower noise level as it is considered that the noisier elements of the belt would be at the end points. The two middle sections have been modelled to achieve a sound pressure level of 66dB(A at 1m).

10.98 With this embedded mitigation in place no further mitigation with a residual assessment is required.

RESIDUAL IMPACT ASSESSMENT

Construction Stage

10.99 Without mitigation this assessment has demonstrated the required noise limits would be met with no significant effect. Nevertheless, with the mitigation measures presented in Appendix 01, construction noise levels can be reduced by 5dB(A) or more.

Operational Stage

10.100 Without mitigation this assessment has demonstrated the required noise limits, with one exception, would be met with no significant effect. At the Receptor to the NW, the 1dB(A) exceedance of the limit is not considered significant.

MONITORING

10.101 Whilst the limits are expected to be met, the applicant would undertake attended short term monitoring at nearby noise sensitive receptors to validate the predicted construction and operational noise levels in this Chapter.

Receptor	Period	Predicted Specific Sound Level, dB
Properties to NW	Daytime / Evening	40.5
	Night-Time	42.3
Kilscanian	Daytime / Evening	41.9
	Night-Time	45.5
Redmondstown Cottages	Daytime / Evening	41.4
	Night-Time	43.3
Laganore	Daytime / Evening	47.6
	Night-Time	48.9
Rathloose	Daytime / Evening	41.9
	Night-Time	43.5

REFERENCES

Environmental Protection Agency Act 1992

BS5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)