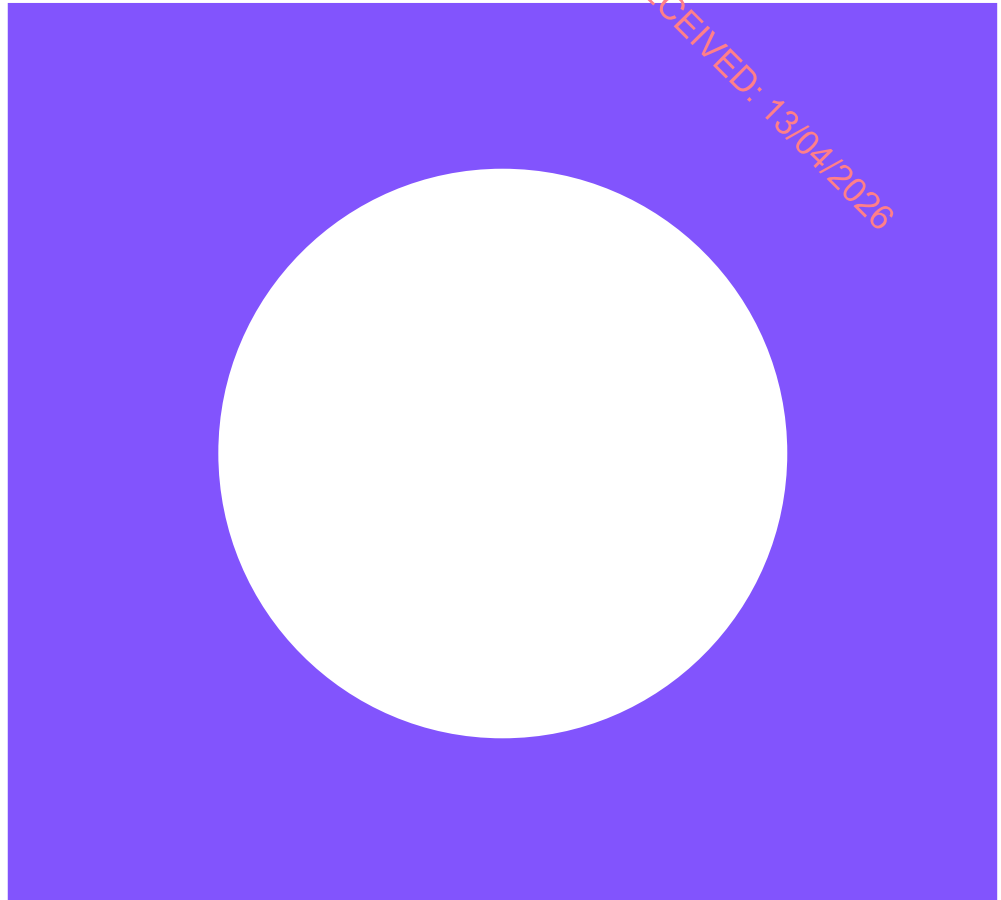


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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 11 Noise and Vibration

April 2026

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 11 Noise and Vibration

April 2026

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11 Noise and Vibration

11.1 Introduction

The assessment considers the potential noise and vibration impacts on the surrounding environment arising from the construction and operation of the Proposed Project (as described in Chapter 5 - *Description of Development*), and where appropriate, specifies mitigation measures to reduce potential impacts.

The construction and operation of the Proposed Project will involve activities and equipment which emit noise. Some types of construction work will also result in ground-borne vibration.

11.2 Policy and Guidance

11.2.1 Policies

The Environmental Noise Regulations (ENR)¹ transpose the EU Directive 2002/49/EC² (commonly referred to as the Environmental Noise Directive (END)) for the strategic control of environmental noise within the Republic of Ireland. The ENR was revised and revoked by the European Communities (Environmental Noise) Regulations 2018³.

Nuisance due to noise is dealt with by the Environmental Protection Agency Act S.I. No. 7/1992 (as amended)⁴, and the Protection of the Environment Act 2003 S.I. No.27/2003 (as amended)⁵ require Best Available Techniques in controlling noise as a result of human activity: “*which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment*”. Both acts clarify that ‘noise’ includes vibration.

11.2.2 Guidelines

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA, 2022)
- Draft EPA Advice Notes for Preparing Environmental Impact Statements (hereafter referred to as the Draft EPA Advice 2015) (EPA, 2015)

There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-statutory national guidelines, where available, in addition to international standards and guidelines

¹ Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006).

² The European Parliament and the Council of the European Union, 2002. Directive 2002/49/EC of 25 June 2002 relating to the assessment and management of environmental noise.

³ The European Communities (Environmental Noise) Regulations 2018 (Statutory Instrument No. 549/2018).

⁴ Government of Ireland. Environmental Protection Agency Act, 1992.

⁵ Government of Ireland. Protection of the Environment Act, 2003.

relating to noise and / or vibration impact for environmental sources. These are summarised below:

- British Standard Institution (BSI) British Standard (BS) 5228 (2009 +A1 2014) Code of practice for noise and vibration control of construction and open sites - Part 1: Noise
- BS 5228 (2009 +A1 2014) Code of practice for noise and vibration control of construction and open sites - Part 2: Vibration
- BS 7385 (1993) Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration
- BS 6472 (2008) Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting
- European Communities (EC) (Environmental Noise) Regulations 2018 (S.I. No. 549 / 2018)
- EC (Environmental Noise) Regulations 2006 (S.I. No. 140/2006)
- EC Noise Emission by Equipment for Use Outdoors (Amendment) Regulations (S.I. No. 241 / 2006)
- International Organization for Standardization (ISO) 9613-2 (1996) Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation
- ISO 1996-1 (2016) Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures
- ISO 1996-2 (2017) Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels
- National Roads Authority (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1
- National Roads Authority (2014) Good Practice Guide for the Treatment of Noise during the Planning of National Road Schemes Noise Guidelines
- UK Department of Transport and Welsh Office (1988) Calculation of Road Traffic Noise (CRTN)
- World Health Organization (WHO) (1999) Guidelines for Community Noise
- WHO (2018) Environmental Noise Guidelines for the European Region
- Institute of Environmental Management and Assessment (IEMA) (2014) Guidelines for Environmental Noise Assessment

11.3 Methodology

The Proposed Project is expected to give rise to both temporary (construction and decommissioning) and permanent (operational) noise and vibration impacts. The potential for these to exceed threshold values associated with annoyance and disturbance has been considered within separate construction and operational assessments. This section describes the approach to the assessment based on the various relevant requirements and criteria. Cumulative impacts due to the contributions of noise from other nearby licenced sites are also assessed.

11.3.1 Approach to Data Collection

The information and data sources given in Table 11.1 have been considered during the production of this chapter. The data used is considered to be a 'worst case scenario'.

Table 11.1 Data Sources used to inform this noise and vibration chapter of this PECR

Data source	Date	Data contents
Noise Data Sheet – Quantum HE and PE Twin Skid	May 2024	Manufacture noise data for Wärtsilä BESS container of Quantum HE, 100% Fan Speed
Technical note Noise Reduction for PCSK GEN3 Inverters (TN0056GI)	Nov 2023	Manufacture noise data for PCSK GEN3 Inverters and Transformers
220/110 kV transformer (200 MVA) + cooling fans	n/a	Sound power levels obtained from the Mott MacDonald database for representative items of equipment

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11.3.2 Approach to Impact Assessment

11.3.2.1 Construction Noise

BS 5228 Part 1:2009+A1:2014 has been adopted for the assessment of effects at noise sensitive receptors (refer to Appendix 11.1). It provides comprehensive guidance including details of typical noise levels associated with items of plant and activities, prediction methods, and options for mitigation measures, and therefore has been considered appropriate for use in this assessment.

Based on the BS 5228 Part 1 ‘Example method 2 – 5 dB(A) change’ in BS 5228 Part 1 2009+A1:2014, noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq, T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect.

11.3.2.2 Construction Vibration

The British Standard BS 5228 (2009+A1:2014) ‘Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration’ provides a methodology to predict and assess temporary noise and vibration impacts arising during construction.

BS 5228 provides comprehensive guidance on the assessment of vibration due to construction activity. It considers levels of vibration from construction in terms of peak particle velocity (PPV) defined as the instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position and is expressed in millimetres per second (mm/s). BS 5228 provides guidance on the levels of vibration associated with human perception and disturbance and the onset of potential structural damage to different types of buildings.

Table 11.2 presents guidance on threshold values for the human perception of vibration arising during construction.

Table 11.2: BS 5228 Part 2 guidance on the human perception effects of vibration due to construction activity and significance of effect

Vibration level PPV mm/s	Effect
0.14	Vibration might be perceptible in most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning has been given to the residents.
10.0	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

Source: BS 5228 Part 2:2009+A1:2014

Table 11.2 above indicates that vibration levels of more than 1.0 mm/s can be considered significant.

11.3.2.3 Construction Traffic

Changes in noise from road traffic on public roads can arise due to diversion routes (not required for the Proposed Project) or due to additional traffic for the transfer of materials and equipment and the attendance of site personnel. The National Roads Authority Guidelines⁶ and Guidance⁷ do not provide a method for the assessment of temporary changes in road traffic noise associated with construction, specifically. However, the 2014 Guidance describes requirements for noise monitoring in Section 3.13. This states:

“The baseline noise level should be established for every noise-sensitive building or group of buildings where traffic noise levels are likely to change significantly as a result of the scheme. This includes areas where traffic flows are reduced by 20% or more, and where existing flows are increased by 25% or more. Traffic noise will also change where traffic parameters other than total flow volumes are changed. An increase in the percentage of heavy vehicles, or in traffic speed, will also lead to increases in traffic noise. It is sufficient to calculate the Basic Noise Level with and without the scheme to determine whether there would be a difference of 1dB or more.”

This is mainly concerned with permanent changes in road traffic noise but indicates that a change of 1 dB is the minimum threshold to assess for significance of impact. Although the Proposed Project is not a road scheme, this is adopted for the assessment of temporary changes in road traffic noise as a result of the Proposed Project on a precautionary basis.

11.3.2.4 Operational Noise

The EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016)⁸ describes a methodology to assess and control the predicted and measured noise impacts associated with licenced sites. It specifically considers operational noise impacts only.

The NG4 Guidance sets out a methodology for setting appropriate noise criteria on operational noise emissions with the potential to affect NSLs defined as:

“Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.”

Firstly, sites are screened to determine whether they are Quiet Areas based on the proximity of the Proposed Project to urban areas and other major sources of environmental noise. The Quiet Area Noise Criteria for applicable sites is a limit defined as 10 dB below the average background noise level for the day (07:00 to 19:00), evening (19:00 to 23:00) and night-time (23:00 to 07:00) periods obtained by long-term noise monitoring.

For NSLs that are not identified as being within Quiet Areas, the NSLs are first screened for low background noise defined as those where the average background noise levels (L_{AF90}) are less than or equal to:

⁶ National Roads Authority (2004) Guidelines for the treatment of noise and vibration in national road schemes, Revision 1

⁷ National Roads Authority (2014) Good practice guide for the treatment of noise during the planning of national road schemes noise guidelines

⁸ Environmental Protection Agency Office of Environmental Enforcement Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). January 2016.

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- Daytime: 40 dB L_{AF90}
- Evening: 35 dB L_{AF90}
- Night-time: 30 dB L_{AF90}

The noise criteria for NSLs with low background noise are:

- Daytime (07:00 to 19:00) 45 dB $L_{Ar,T}$
- Evening (19:00 to 23:00) 40 dB $L_{Ar,T}$
- Night-time (23:00 to 07:00) 35 dB $L_{Aeq,T}$

where $L_{Ar,T}$ is the rated noise level, which is equal to the L_{Aeq} plus any correction for tonal or impulsive acoustic features.

Where low background noise criteria are not met, then the general criteria apply as follows:

- Daytime: (07:00 to 19:00) 55 dB $L_{Ar,T}$
- Evening: (19:00 to 23:00) 50 dB $L_{Ar,T}$
- Night-time: (23:00 to 07:00) 45 dB $L_{Aeq,T}$

The EPA NG4 Guidance states that the limit values for noise from licensed sites apply to “*noise attributable solely to on-site activities, expressed as a free field value at any NSL*”.

Where the predicted noise impacts exceed these values, the final significance of effect shall be considered with regard to:

- Sensitivity of receptor
- Whether the impact is temporary (construction-related) or short-term (operational)
- The magnitude by which the limit value is exceeded
- The change in ambient noise levels as a result of the contribution of the Proposed Project

Operational noise is not expected to include significant tonal or impulsive features and therefore no corrections of the daytime and evening noise levels are applied to represent rating levels.

The operational noise levels will be predicted by using 3-dimensional computer modelling software that based on the methodology provided in ISO 9613-2 (2024)⁹ at all of the considered NSLs which are mostly likely to be affected by operational noise.

BS 4142 (2014+A1:2019) also provides a method to assess noise from fixed plant affecting residential receptors. The method compares the rating level (equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location plus any adjustment for the characteristic features of the sound) with the representative background noise level. Character corrections are applied to the specific sound level, accounting for tonality, impulsivity and intermittency, to determine the rating level. The rating level is compared against representative background sound level to determine the magnitude of noise impact. Typically, the greater the difference between the rating level and background sound level, the greater the magnitude of impact. The criteria for defining magnitude for the assessment of operational noise impacts are provided in Table 11.3.

⁹ International Organization for Standardization (ISO) 9613-2 (2024) Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation

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Table 11.3: Impact criteria in accordance with the BS 4142 methodology

Difference between rating level and background sound level	BS 4142 description
Less than 0 dB	'Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'
Greater than or equal to 0 dB and less than +10 dB	A difference greater than 0 dB is an indication the noise impact is greater than 'low', depending on the context. 'A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on the context.'
Greater than or equal to +10 dB	'A difference of around + 10 dB or more is likely to be an indication of a significant adverse effect, depending on the context.'
Substantially greater than +10 dB	'A difference of around + 10 dB or more is likely to be an indication of a significant adverse effect, depending on the context.'

Summary of significance of effect criteria

Table 11.4 summarises the assessment criteria applied within this assessment.

Table 11.4: Significance of effect

Category	Significance of effect
Construction and decommissioning noise	Exceedance of the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect
Changes in road traffic noise during construction and decommissioning	A significant effect is considered to occur where the predicted temporary increase in daily average road traffic noise due to the Proposed Project is 1 dB or more
Operational Noise	A significant effect is considered to occur where the applicable daytime, evening or night-time threshold values for areas of low background noise as given by the NG4 guidance are exceeded at a NSL due to the Proposed Project Consideration is also given to the findings of an assessment in accordance with the methodology described in BS 4142 – 2014 +A1:2019, which takes into account context

11.3.3 Study Area

The study area was chosen to represent the nearest receptors most likely to be impacted by the noise levels of the proposed plant as part of the BESS and substation compounds.

This area covers approximately 900m from the boundary of the BESS compound. Locations within the study area have been identified that are sensitive to noise and are summarised in Table 11.5 and presented in Figure 11.1.

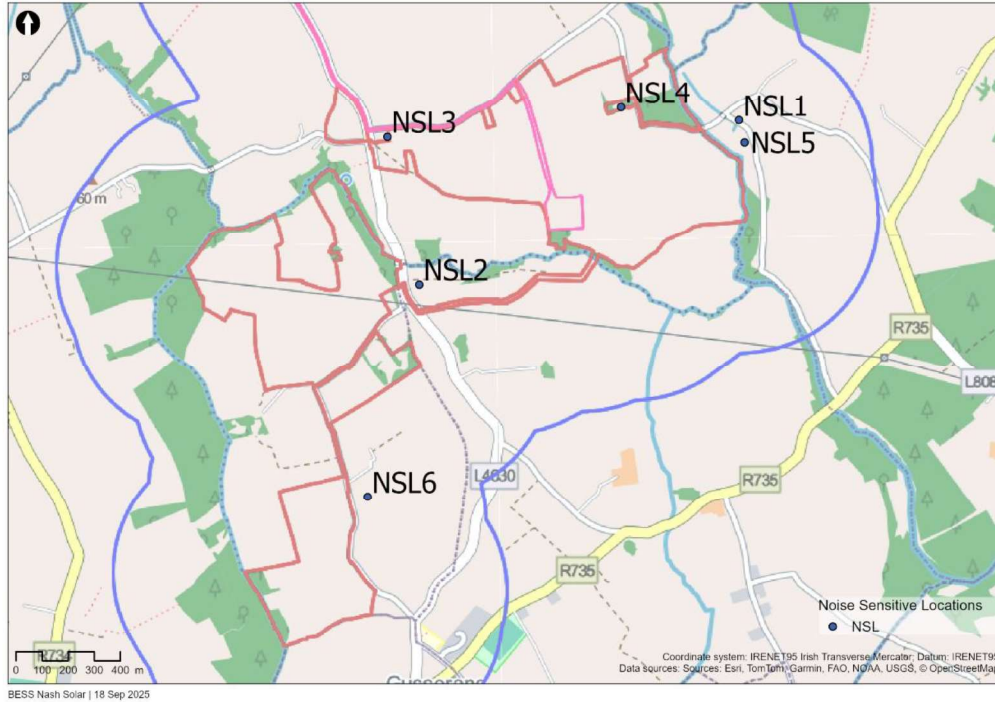
Table 11.5: Noise Sensitive Locations

ID	Location
NSL1	Kilbraney, Gusserane, Co. Wexford Y34 NA43
NSL2	Ballygarvan Mill, Ballygarvan, Gusserane, Co. Wexford Y34 KC99
NSL3	Nash, Gusserane, Co. Wexford Y34 RC85
NSL4	Neighbourly Bridge, Nash, Gusserane, Co. Wexford Y34 T856
NSL5	Kilbraney, Gusserane, Co. Wexford Y34 KP70
NSL6	Cloonagh House, Cloonagh, Gusserane, Co. Wexford, Y34 XD77

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ID	Location
----	----------

Figure 11.1: Noise Sensitive Locations



Source: OpenStreetMap/Mott MacDonald

11.3.4 Limitations of this EIAR

The specific inventory of plant and working methods to be applied during the construction phase will be devised by the appointed contractor. Therefore, these specific details are not available to inform the assessment of potential noise and vibration impacts. However, the assessment has been undertaken based on the impacts of construction activities that are expected to be required. The construction activities are chosen to represent a reasonable worst-case scenario. It is assumed that the majority of works can be undertaken during weekday daytime periods and that works during the night-time would only be undertaken by exception.

With regards to the Proposed Project, there is no specific equipment selected for the substation and the BESS. Data from similar projects has been used to inform the operational assessment.

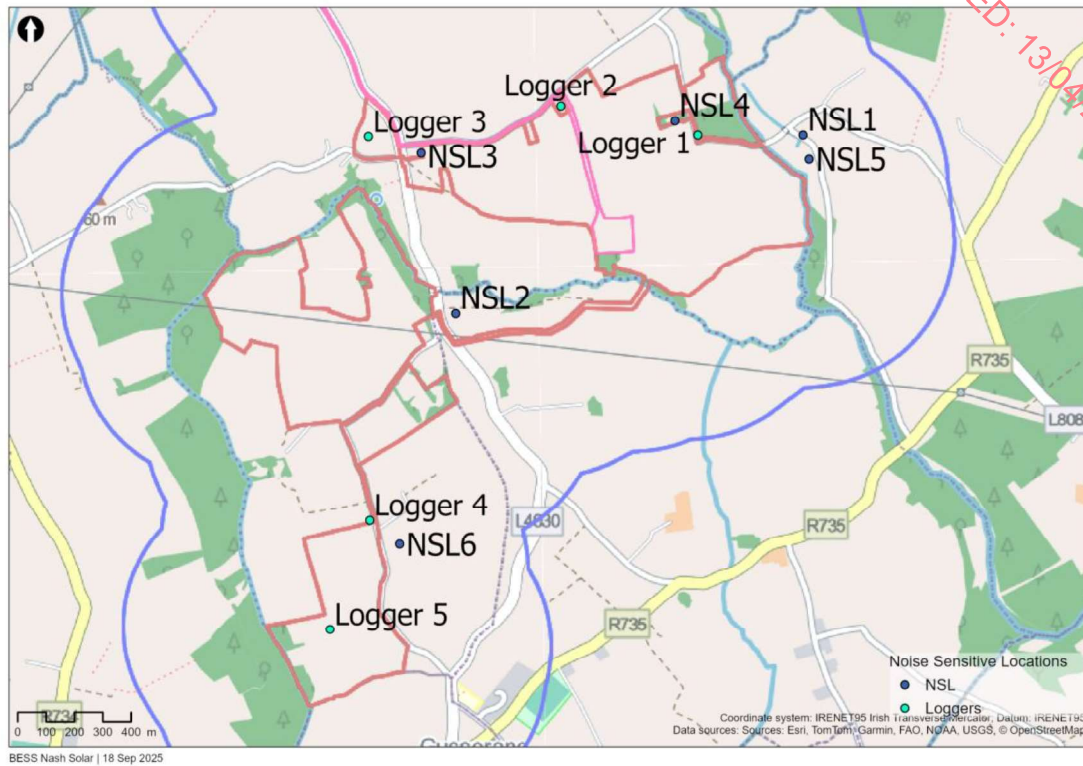
11.4 Receiving Environment

The Proposed Project site is located within a rural area in the townlands of Ballygarven, Clonagh and Nash, Gusserane, Co. Wexford.

Background sound level measurements comprised a combination of attended and unattended long-term measurements undertaken by Amplitude Acoustics from the 31 July to 6 August 2025 for Loggers 1, 2, 4 and 5, and from 31 July to 03 August 2025 for Logger 3.

The locations of the long-term measurements are shown in Figure 11.2.

Figure 11.2: Noise monitoring and NSL locations



Source: OpenStreetMap/Mott MacDonald

The summary of the measurement results is given in Table 11.6:

Table 11.6: Typical measured background sound levels

Location	Nearest identified sensitive location	Daytime L _{Aeq,12h} dB	Evening L _{Aeq,4h} dB	Night L _{Aeq,8h} dB	Typical daytime L _{A90} dB	Typical night-time L _{A90} dB
Logger 1	NSL2	44	41	34	33	22
Logger 2	NSL4	45	32	28	27	19
Logger 3	NSL1, NSL5	37	34	32	29	25
Logger 4	NSL3	47	42	36	32	22
Logger 5	NSL6	39	42	32	31	21

Noise levels between 23:00 on 03 August 2025 and 07:00 on 05 August 2025 were excluded on all loggers due to high noise levels considered to be anomalous.

The full measurement charts are presented in Appendix 11.2.

The survey report with the details of the survey is appended in Appendix 11.3.

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11.5 Likely Significant Impacts

11.5.1 'Do Nothing' scenario

There would be no change to the receiving environment under the 'Do Nothing' scenario. The impacts are assessed as negligible and therefore not significant.

11.5.2 Construction Phase

An indicative list of construction plant is presented in Table 11.7 and has been compiled from the inventories for similar projects and through consultation with the project team. Reference Sound Pressure Levels (SPL) for continuous operation are presented. The level of noise emission is corrected for utilisation time based on the estimated percentage of time the plant is expected to be in use over a working day.

Table 11.7: Details of noise-emitting equipment considered for the construction of the Proposed Project and reference noise levels used for noise calculations

Phase	Activity	Plant item	BS 5228 reference	Qty	Utilisation %	L _{Aeq,10m} dB	Corrected combined L _{Aeq,10m} dB
Substation compound	Site preparation	Tracked excavator	C2-14	2	50	75	86
		Backhole loader	C2-18	2	50	80	
		Concrete truck	C4-29	1	25	64	
		Compactor	C4-42	1	50	78	
		Tipper lorry	C8-19	2	50	78	
		MEWP	C4-59	1	50	82	
		Mobile crane	C4-45	1	25	85	
		Small tools	C4-69	1	25	66	
		Generator	C4-78	1	100	68	
		Loader	C2-8	1	50	80	
		Forklift	C2-34	1	50	67	
				Tracked crane	C3-28	1	
Civil Works		Tracked excavator	C2-14	1	50	75	80
		Backhole loader	C2-18	1	50	80	
		Concrete truck	C4-29	1	50	64	
		Compactor	C4-42	1	50	78	
		Tipper lorry	C8-19	1	50	78	
		MEWP (Mobile Elevating Work Platform)	C4-59	1	50	82	
		Mobile crane	C4-45	1	50	85	
		Small tools	C4-69	1	50	66	
		Generator	C4-78	1	100	68	
		Loader	C2-8	1	50	80	
		Forklift	C2-34	1	50	67	
				Tracked crane	C3-28	1	
Electrical Works		Telescopic handler	C2-35	1	25	71	83
		Tracked mobile crane	C4-50	1	50	85	
		Small tools	C4-69	1	50	50	
		Compressor	D7-10	1	50	80	
		Tractor (towing trailer)	C4-74	1	50	67	
Energisation		MEWP (Mobile Elevating Work Platform)	C.4.57	1	50	65	82
		Diesel generator	C.4.86	1	50	85	

Phase	Activity	Plant item	BS 5228 reference	Qty	Utilisation %	L _{Aeq,10m} dB	Corrected combined L _{Aeq,10m} dB	
Underground 220kV Cabling		Small tools	C.4.69	1	50	68		
		Water pump (diesel)	C.4.88	1	50	75		
	Pre-Construction	Tracked excavator 21t	C.2.3	1	25	66	79	
		Articulated dump truck 30t	C.2.32	1	25	74		
		Disc cutter	C.5.36	1	10	78		
		Mobile telescopic crane	C.4.39	1	50	83		
		Cement spreader	C.4.18	1	25	74		
		Cement mixer	C.4.24	1	25	75		
		Power for welder - diesel generator	C.4.85	1	75	56		
	Civil works (Trenching and ducting works and temporary reinstatement)	Compactor	C2-42	1	50	73	82	
		Jack Hammer	C1-6	1	50	71		
		Tracked excavator	C5-35	1	50	85		
		Vibratory roller	C5-35	1	50	78		
	Cable installation and jointing	Hydraulic winch	Datasheet	1	25	66	69	
Tractor (towing trailer)		C4-74	1	25	74			
Telescopic handler		C2-35	1	25	78			
HV cable commissioning (sheath test, cross bonding and HV/AC testing)	Small tools	C4-69	1	25	83	80		
Solar PV Farm	Civil Works	Tracked excavator	C2-14	1	50	79	81	
		Backhole loader	C2-18	1	50	75		
		Concrete truck	C4-29	1	50	80		
		Compactor	C4-42	1	50	64		
		Tipper lorry	C8-19	1	50	78		
	Mechanical Works	Mobile crane	C4-45	2	50	82	86	
		Small tools	C4-69	1	50	85		
		Generator	C4-78	1	100	66		
		Loader	C2-8	1	50	68		
		Forklift	C2-34	1	50	80		
		Tracked crane	C3-28	2	50	67		
	Electrical Works	Telescopic handler	C2-35	1	50	71	83	
		Tracked mobile crane	C4-50	1	50	71		
		Small tools	C4-69	1	50	85		
		Compressor	D7-10	1	50	78		
		Tractor (towing trailer)	C4-74	1	50	73		
	Commissioning	Small tools	C4-69	1	50	85	82	
	BESS		Tracked excavator	C2-14	2	50	79	
			Backhole loader	C2-18	1	50	75	
Concrete truck			C4-29	1	50	80		
Site Clearance and enabling works		Compactor	C4-42	1	25	64	87	
		Tipper lorry	C8-19	4	50	78		
		MEWP	C4-59	1	50	78		
		Mobile crane	C4-45	1	25	82		
		Small tools	C4-69	1	50	85		
		Tracked excavator	C2-14	1	50	79		
Civil works		Backhole loader	C2-18	1	50	75	77	

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Phase	Activity	Plant item	BS 5228 reference	Qty	Utilisation %	L _{Aeq,10m} dB	Corrected combined L _{Aeq,10m} dB
		Concrete truck	C4-29	1	25	80	
		Compactor	C4-42	1	50	64	
		Tipper lorry	C8-19	1	50	78	
		MEWP (Mobile Elevating Work Platform)	C4-59	1	25	78	
		Mobile crane	C4-45	1	50	82	
		Small tools	C4-69	1	25	85	
		Generator	C4-78	1	50	66	
		Loader	C2-8	1	50	68	
Electrical Installation		Telescopic handler	C2-35	1	50	71	83
		Tracked mobile crane	C4-50	1	50	71	
		Small tools	C4-69	1	50	85	
		Compressor	D7-10	1	50	50	
		Tractor (towing trailer)	C4-74	1	50	80	
BESS Container Installation		Telescopic handler	C2-35	1	50	71	77
		Tracked mobile crane	C4-50	1	50	71	
		Compressor	D7-10	1	50	78	
		Tractor (towing trailer)	C4-74	1	50	73	
Commissioning and testing		Small tools	C4-69	1	50	85	82

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Source: Mott MacDonald

The sources of noise are assumed to be evenly distributed across the site at locations adjacent to site components scheduled for construction. Normal working hours during the construction period are expected to be Monday to Friday 07:00 to 19:00 hours, and 08.00 to 14.00 on Saturday. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours, but this will be limited to inspection, testing and if necessary, emergencies.

Neither of the example methods in BS 5228 specified in Annex E ‘Significance of Noise Effects’ align with requirements set by the Environmental Protection Agency and as a result have not been considered as methods for deriving the definition of a significant adverse effect.

Due to the existing low background levels, the significance of impact has been assessed against lower cut-off values of 65 dB, 55 dB and 45 dB L_{Aeq, T} from site noise alone, for the daytime, evening and night-time periods, respectively.

Table 11.8: Construction noise levels at NSLs

Phase	Activity	Predicted noise level, dB L _{Aeq}				
		NSL1	NSL2	NSL3, NSL5	NSL4	NSL6
GIS Substation	Site preparation	48	46	46	51	39
	Civil Works	42	39	39	45	33
	Electrical Works	45	43	43	48	36
	Energisation	44	42	42	47	35
Underground 220kV Cabling	Pre-construction	40	49	42	49	51
	Civil works (Trenching and ducting works and temporary reinstatement)	43	52	45	52	54

Phase	Activity	Predicted noise level, dB L _{Aeq}				
		NSL1	NSL2	NSL3, NSL5	NSL4	NSL6
	Cable installation and jointing	30	39	32	39	41
	HV cable commissioning (sheath test, cross bonding and HV/AC testing)	41	50	43	50	52
Solar PV Farm	Civil Works	42	51	44	51	53
	Mechanical Works	43	52	45	52	54
	Electrical Works	44	53	46	53	55
	Commissioning	43	52	45	52	54
BESS	Site Clearance and enabling works	49	46	46	52	40
	Civil Works	39	36	36	42	30
	Electrical Installation	45	42	42	48	36
	BESS container installation	39	36	36	42	30
	Commissioning and testing	44	41	41	47	35
Significant adverse effect		No	No	No	No	No

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Source: Mott MacDonald

The results of the calculations indicate that predicted noise levels at the NSLs due to the construction of the Proposed Project are below the daytime criterion of 65 dB L_{Aeq} and evening criterion of 55 dB L_{Aeq}. Therefore, it is concluded that construction noise will result in no significant effects.

11.5.2.1 Construction Vibration

An assessment of the proposed plant provided in Table 11.7 has determined that plant likely to give raise to elevated levels of ground-borne vibration are the compactors.

Annex E of BS 5228–2:2009 presents empirical methods for the prediction of levels of vibration arising from mechanized construction works. This includes an equation to estimate steady state vibration arising from vibratory compaction.

Most sensitive locations such as residential dwellings and schools are located at significant distance away from the construction area and will not be impacted by vibration as a result of the construction activities. However, some receptors such as NSL6 and NSL4 are located approximately 15-20 metres away from the Proposed Project boundary.

At this distance, depending on the compactor characteristics, there is a 5% possibility that the vibration levels from vibratory compaction will be 1 to 14mm/s and a 50% possibility that the levels will be 0.3 to 4mm/s. This could result on a significant impact at the receptors. At these levels, vibration is expected to be perceptible and may cause complaint. However, these values are below threshold values for the onset of potential cosmetic damage to light-framed buildings.

It is recommended that vibration levels are minimised where practicably possible by using a drum with greater width and lower vibration amplitude. Prior notification will be given to the occupiers of the closest properties ahead of the use of vibratory compactors providing information on the timing, duration and reason for the works. Therefore, there is a low risk that there will be a significant impact.

11.5.2.2 Construction Traffic

In order to access the Proposed Project site, the contractors will be required to utilise local public roads. Traffic data as presented in Table 14.17 in Chapter 14 has been used to predict

changes in road traffic noise during construction. The 'Do nothing' traffic data (without the implementation of the Proposed Project) is for year 2027, when the peak in construction traffic movements are expected to occur.

For the assessment, the level of road traffic noise due to links with flows of less than 1,000 vehicles cannot be calculated using the CRTN methodology and have been disregarded. Furthermore, traffic noise from these roads is not likely to result significant impacts because the absolute level of road traffic noise will be relatively low. However, the overall traffic flows including the construction vehicles will not give rise to high noise levels and therefore the impacts are likely to be less significant than expected by magnitude of change alone.

The predicted increases in the Basic Noise Level (BNL) for road traffic noise (L_{A10} dB), based on the Annual Average Daily Traffic (AADT) flows in the year 2027 and forecasted additional movements are between 0.1 to 0.9 dB on the major roads R733, R734, R735 and L4023. This will have a not significant impact on the dwellings located alongside the roads.

Table 11.9 provides the details of the calculation of traffic noise levels expressed using the L_{A10} descriptor.

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Table 11.9: Analysis of traffic data and changes in basic noise levels

Link	Baseline 2027					During construction					Change in LA10 dB
	km/h	Flow	HGV	HGV%	LA10 dB	Additional LGV	Additional HGV	Flow	HGV%	LA10 dB	
R733: Between New Ross & N25 junction.	60	7,542	771	10.2	70.6	60	16	7618	10.33	70.6	0.1
R733: Between N25 junction and R734 junction.	60	5,622	302	5.4	68.4	132	31	5785	5.76	68.6	0.2
R734: Between R733 junction and L4023 junction.	60	3,949	229	5.8	66.9	132	31	4112	6.32	67.2	0.2
L4023: Between N25 Junction & L4030 Nash junction.	60	1,198	63	5.3	59.5	96	26	1320	6.74	60.5	0.9
R734: Between L4023 Tellarought junction & R735 junction.	60	2,267	166	7.3	64.4	0	0	2267	7.32	64.4	0.0

Source: Mott MacDonald

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11.5.3 Operation and Maintenance Phase

The operational noise assessment implements the procedures of ISO 9613-2⁹ using a three-dimensional acoustic model developed using DataKustik CadnaA software.

The parameters used for the model are as follows:

- The methodology used for the calculation of noise propagation is ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors — Part 2: Engineering method for the prediction of sound pressure levels outdoors
- Mapping data has been imported from Open Street Maps
- Topographic data has been imported from site survey
- Barriers are fully absorptive and 8.5m in height
- The maximum number of reflections has been set to 2
- Buildings and barrier have been set a reflection loss of 2 dB
- Ground absorption has been set to 50% absorptive (G = 0.5)
- Sensitive receptor elements at first floor level

A list of operational noise sources is presented in Table 11.10 and the steady state sound power levels (SWL) that have been applied within the acoustic model. The item numbers correspond to the equipment layout presented at Figure 11.3. The noise emission data of plant items for the Proposed Project have been obtained from the data sheet of the manufacturers or other similar projects with similar specifications. It is assumed that all plant will operate continuously with no significant tonal or impulsive features. Three scenarios have been considered in the noise model.

Table 11.10: List of noise sources considered within the acoustic model for the operation of the Proposed Project¹⁰

Description	Number of items	Sound power level dB(A)
Wärtsilä Quantum BESS container operation at 100% fan speed	80	81
PCSK transformer and invertor [2]	19	96
220/110 kV transformer with cooling fans	1	72

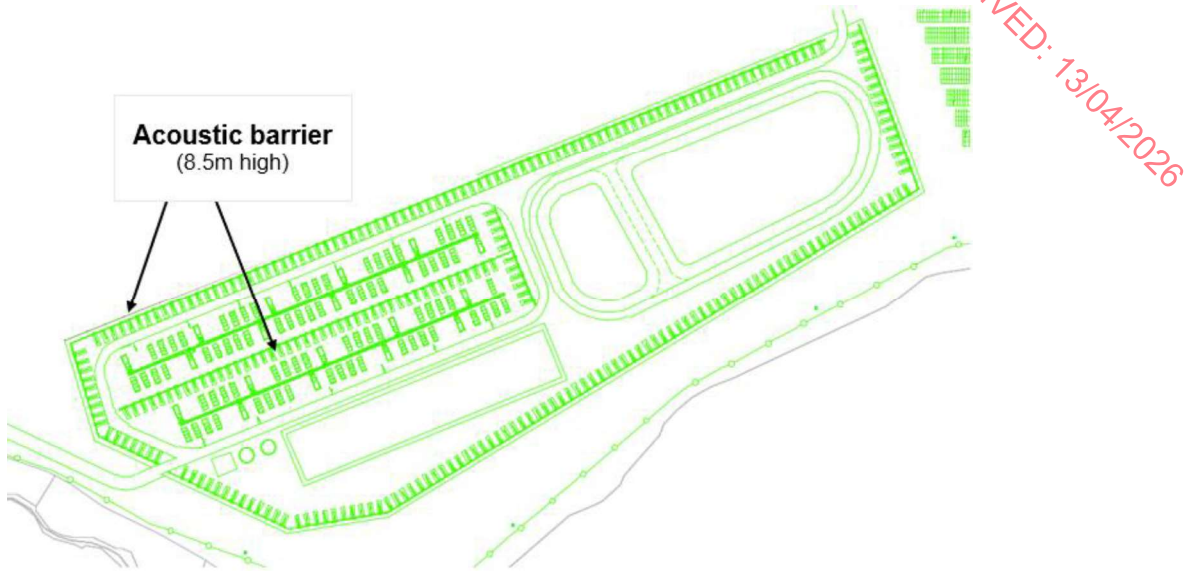
Remarks: [1] Noise attenuation kits have been considered in PCSK transformer and invertor system.

Source: Mott MacDonald

The BESS compound will include barriers, shown in Figure 11.3 in dark blue, which will be fully absorptive at a height of 8.5 metres. It is also noted that the equipment does not all run at the same time, or at full load. However, in the absence of operational information, a worst case assessment for 100% running has been presented.

¹⁰ Sound power levels obtained from the Mott MacDonald database for representative items of equipment.

Figure 11.3: Location of acoustic barriers within the BESS compound



Source: Mott MacDonald

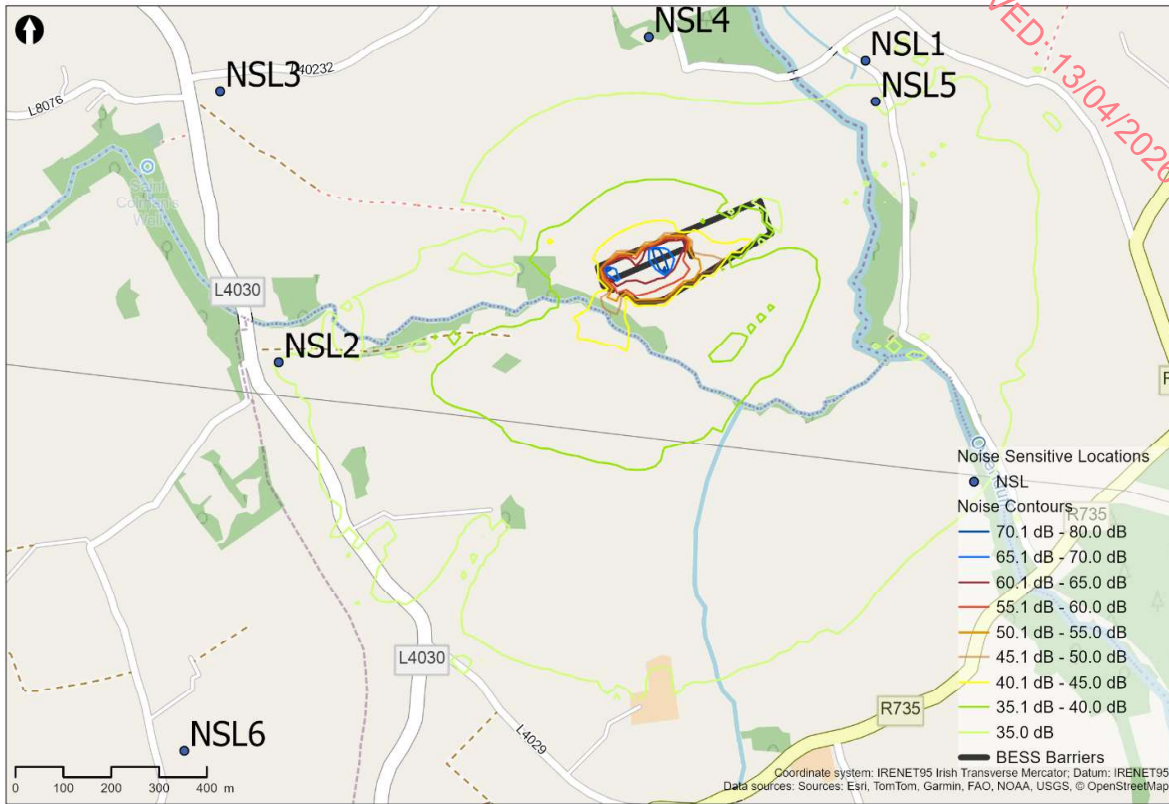
The predicted operational noise levels for each NSL are presented in Table 11.11. Noise contours plots produced by the acoustic model are presented in Figure 11.4.

Table 11.11: Predicted operational noise levels NSLs due to the Proposed Project

Noise sensitive location	Predicted noise level, dB L _{Aeq}
NSL1	34
NSL2	34
NSL3	28
NSL4	33
NSL5	35
NSL6	30

Source: Mott MacDonald

Figure 11.4: Contour plot of predicted operation noise levels



BESS Nash Solar | 16 Sep 2025

Source: Mott MacDonald

The predicted operational noise levels do not exceed the noise criteria given in the NG4 guidance of 45 dB L_{Aeq} daytime, 40 dB L_{Aeq} evening and 35 dB L_{Aeq} night-time at all locations.

An assessment in line with methodology described in BS 4142:2014+A1:2019.

Table 11.12: Predicted operation noise levels assessed in accordance with BS 4142 - daytime

	Daytime (07:00-23:00)					
	NSL1	NSL2	NSL3	NSL4	NSL5	NSL6
Total Specific Level, $L_{Aeq,Tr}$	34	34	28	33	35	30
Acoustic Feature Correction	0	0	0	0	0	0
Total Rating Level, $L_{Ar,Tr}$	34	34	28	33	35	30
Background Level (Typical daytime $L_{A90,T}$)	29	33	32	27	29	31
Difference ($L_{Ar,Tr} - L_{A90,T}$)	+5	+1	-4	+6	+6	-1

Table 11.13: Predicted operation noise levels assessed in accordance with BS 4142 – night-time

	Night-time (23:00-07:00)					
	NSL1	NSL2	NSL3	NSL4	NSL5	NSL6
Total Specific Level, $L_{Aeq,Tr}$	34	34	28	33	35	30
Acoustic Feature Correction	0	0	0	0	0	0
Total Rating Level, $L_{Ar,Tr}$	34	34	28	33	35	30
Background Level (Typical daytime $L_{A90,T}$)	25	22	22	19	25	21
Difference ($L_{Ar,Tr} - L_{A90,T}$)	+9	+12	+6	+14	+10	+9

The assessment presented in Table 11.12 and Table 11.13 indicate a negative impact on the receptors. However, BS 4142:2014+A1:2019 says:

“Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”

Currently, the background noise levels are 25 dB L_{A90} or lower. The predicted noise levels as a result of the operation of the Proposed Project are between 28 to 35 dB $L_{Aeq,T}$ at night. Although these noise levels are in some cases over 10 dB higher than the existing background sound levels, these are still sufficiently low not to exceed sleep disturbance threshold values indoors even with open windows.

Therefore, it is considered that with the proposed mitigation there will not be a significant operational noise impact on the nearest sensitive locations.

11.5.4 Decommissioning Phase

Subject to the granting of statutory approval, the Shelburne Energy Farm and grid connections will form part of the national electrical grid infrastructure. The design life of the PV Solar Farm and BESS is 30 years and 20 years respectively, where the planning permission for the operational life span of the Proposed Project overall is 40 years. The impacts during decommissioning from airborne noise and ground-borne vibration due to demolition activities are expected to be of a similar magnitude to those during construction but generally of shorter duration. Therefore, it is concluded that the noise and vibration impacts due to decommissioning are not likely to result in significant effects.

The Shelburne Energy Farm is to be decommissioned in line with the Decommissioning and Land Restoration Plan, contained in Appendix 3.1, Volume 3 of this EIAR.

It is expected that the 220kV Grid Connection will remain a permanent part of the national electricity transmission network and will be refurbished and / or redeveloped as required rather than be decommissioned.

11.6 Cumulative Effects

Cumulative effects consider the potential effects of the Proposed Project in combination with the potential effects of other existing or approved developments within the surrounding area.

A review of the projects detailed in Table 3.2 of Chapter 3 *EIA Methodology* was undertaken to determine if there are any other projects which could act in combination with the Proposed Project to increase noise impact at nearby receptors.

A potential extension of the BESS battery storage may have a cumulative noise impact on the receptors nearest to the compound, depending on the number of BESS units and the BESS equipment selected.

Any potential extension of the solar farm is unlikely to have any cumulative impact on noise and/or vibration when considered with the Proposed Project.

11.7 Mitigation and Monitoring Measures

11.7.1 Mitigation Measures

No specific noise mitigation measures are proposed for the construction phase. However, in accordance with best practice, noise emissions should be minimised at source to minimise the exposure site personnel to noise from construction.

The CEMP will be implemented during the construction phase to minimise any construction noise and vibration impacts and in consultation with local councils. The Contractor is obliged to comply with Local Authority controls on noise and vibration during construction. This will include (but is not limited to):

- setting limits for the control of noise and vibration from construction activities
- the provision of mitigation measures required whilst adopting best practicable means
- noise or vibration monitoring where disturbance is reported as required.

A comprehensive noise and vibration monitoring protocol will also be implemented. As part of the CEMP, the Contractor will also develop and implement a stakeholder communications plan which will facilitate community engagement prior to the commencement of construction.

To control vibration from the use of compactors, it is recommended that the equipment is selected such that the vibration levels are as low as possible, with lower amplitude of drum vibration magnitude and maximising the vibrating roller drum width. Before the works with potential vibration impacts commence, the residents should be given prior notification.

There are no operational and maintenance phase mitigation required.

11.7.2 Monitoring Measures

No specific monitoring measures are proposed for the construction or operation and maintenance phase.

11.8 Residual Impacts

The Proposed Project is expected to generate noise during both the construction and operational stages.

The assessment has considered the likelihood of significant effects based on predictions of noise where the noise emissions of construction and operational plant have been assumed.

The likelihood of significant effects during construction are considered unlikely.

Construction traffic noise will likely not have significant impact on major roads.

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Without prior notification, vibration from compaction has the potential to have a significant impact on the receptors closest to the site in terms of disturbance. However, this will be temporary for short periods of time and with the proposed mitigation (large width drum and lower magnitude vibration), the risk can be reduced to not significant.

The BESS compound will be fitted with absorptive barriers suitable to mitigate the noise impact on the nearby receptors. Therefore, the residual operational effects are not considered significant.

11.9 References

British Standard Institution BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

British Standard Institution BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'

EC Noise Emission by Equipment for Use Outdoors (Amendment) Regulations (S.I. No. 241 / 2006)

Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006)

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Environmental Protection Agency Office of Environmental Enforcement (January 2016). Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

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National Roads Authority (2004). Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1

National Roads Authority (2014) Good Practice Guide for the Treatment of Noise during the Planning of National Road Schemes Noise Guidelines.

The European Communities (Environmental Noise) Regulations 2018 (Statutory Instrument No. 549/2018)

The European Parliament and the Council of the European Union, 2002. Directive 2002/49/EC of 25 June 2002 relating to the assessment and management of environmental noise

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