SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 11 Noise and Vibration

SSE Generation Ireland Limited

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Delivering a better world

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11. Noise and Vibration

11.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential noise and vibration impacts and effects associated with the Proposed Development. A full description of the Site, and the Proposed Development are provided within EIAR Chapters 4 (Existing Site and Conditions) and 5 (Description of the Proposed Development) respectively.

This chapter also describes the methods used to assess the effects, the baseline conditions currently existing at the Site and surrounding area, the measures required to prevent, reduce, or offset any significant adverse effects, and the likely residual effects after these measures have been adopted.

11.2 Legislation, Policy and Guidance

The following outlines the main relevant legislation, policy and guidance that has been applied in this chapter:

- **EPA Guidelines 2022**: The Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*[1] are Guidelines written to facilitate the implementation of Directive 2011/92/EU as amended by EU Directive 2014/52/EU in Ireland. These guidelines provide guidance on the assessment and description of environmental impacts.
- **NG4**: *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*[2].
- **NRA Guidelines**: *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*[3].
- **BS5228-1:** *BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites*. *Noise'.*
- **BS5228-2:** *BS5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites*. *Vibration'.*
- **ISO 9613:** *ISO 9613-2:1996 – Attenuation of sound during propagation outdoors*

Additional references are provided in Section 11.10.

[1] EPA (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports.*
[2] EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.*
[3] NRA (2004). *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*.

11.3 Methodology

11.3.1 Study Area

The study area for assessment of on-site construction (and decommissioning) noise and vibration and operational noise is defined as an area extending from the Site of the Proposed Development up to and including the nearest most exposed sensitive receptor locations. If compliant levels of noise and vibration are predicted at the nearest most exposed sensitive receptor locations, it follows that compliant levels will be achieved at all other locations.

The study area for offsite traffic noise is the same as identified in the transport assessment, detailed in Chapter 14 (Traffic and Transport).

11.3.2 Determination of the Baseline Environment

The baseline acoustic environment has been determined via several long-term surveys conducted in and around the Site. These surveys are detailed in Section **Error! Reference source not found.**.

11.3.3 Describing Potential Effects

With reference to the EPA Guidelines[4], effects are described under various headings, including Magnitude, Quality, Significance, Extent and Context, Probability, Duration and Frequency. Of particular relevance are the definitions of significance and duration, which are provided in Table 11.1 and Table 11.2 respectively.

Table 11.1: Description of Significance of Effects[5]

Aspect	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 11.2: Description of Duration of Effects[6]

Aspect	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year

[4] EPA (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports.*
[5] EPA (2022).
[6] EPA (2022).

Aspect	Description
Short-Term	Effects lasting from one to seven years
Medium-Term	Effects lasting from seven to 15 years
Long-Term	Effects lasting from 15 to 60 years
Permanent	Effects lasting over 60 years
Reversible	Effects that can be undone, e.g., through remediation or restoration
Frequency	How often the effect will occur

11.3.4 Significance of Effects: Construction Phase

11.3.4.1 Introduction

To determine potential temporary noise and vibration impacts and effects during the construction phase of the Proposed Development, the following matters have been considered:

- noise caused by construction site activities; and
- noise caused by increases in traffic on public roads during the construction phase.

A detailed assessment of construction related vibration has been scoped out due to the distance to the nearest receptor being large enough that the values for human perception or structural damage in Table 11.5 and Table 11.6 will not be reached.

This conclusion is based on the guidance provided in BS5228-2:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Vibration'* (BS5228-2), which provides piling vibration prediction methodologies up to a maximum of 110m, meaning that construction activities do not produce large enough vibrations to warrant concern beyond this range. In addition, the construction vibration assessment methodology adopted in Highways England document *'Design Manual for Roads and Bridges LA 111 Noise and vibration'* (LA 111) for assessing road schemes, recommends that a maximum study area of 100m is normally sufficient.

11.3.4.2 Criteria: Noise from Onsite Construction Activities

Transport Infrastructure Ireland (TII)[7] is the only government body in Ireland to publish construction noise limits, which are presented in the NRA Guidelines.

It is acknowledged that the limits presented in the NRA Guidelines relate to construction works for road schemes, however, noise sensitive receptors (NSR) are likely to be equally sensitive to construction noise from other project types.

The criteria presented in the NRA Guidelines are presented in Table 11.3.

Table 11.3: Maximum Permissible Noise Levels at the Façade of Dwellings During Construction[8]

Period	$L_{Aeq,1hr}$ dB	$L_{p(max)\ slow}$ dB
Monday to Friday - 07:00 to 19:00	70	80
Monday to Friday - 19:00 to 22:00	60[1]	65[1]

[7] formerly the National Roads Authority (NRA)
[8] NRA (2004).

Period	$L_{Aeq,1hr}$ dB	$L_{p(max)\ slow}$ dB
Saturday - 08:00 to 16:30	65	75
Sundays and Bank Holidays - 08:00 to 16:30	60[1]	65[1]

[1] Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority

Potential construction noise effects can also be assessed using *BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites*' (BS5228-1).

The 'ABC' method (detailed in BS5228-1 Section E.3.2) has been used to develop criteria. Using this method, the construction noise limits for the Proposed Development are determined by rounding the ambient noise levels ($L_{Aeq,T}$) to the nearest 5dB and then comparing this level to the Category A, B and C values given in BS5228-1, as reproduced in Table 11.4.

Table 11.4: BS5228-1 Construction Noise Criteria

Assessment category and threshold value period	Threshold Value $L_{Aeq,T}$ 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 potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.
NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.
NOTE 3: Applies 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 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 ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.
(d) 19:00 - 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.

For the purposes of this assessment, the criteria given in both the *NRA Guidelines* and *BS5228-1* will be considered. Where the criteria differ, the more stringent of the two will be adopted. Where the adopted criterion is predicted to be exceeded a significant effect at the NSR is predicted, and where the criterion is not exceeded no significant effect at the NSR is predicted, subject to context considerations.

11.3.4.3 Criteria: Vibration from Onsite Construction Activities

There are two types of construction vibration criteria: those dealing with human perception and those dealing with structural damage to buildings.

Table B.1 of BS5228-2 presents vibration criteria with regards human perception. These are presented in Table 11.5 with descriptions of likely reactions.

Table 11.5: BS5228-2 Vibration Criteria: Human Perception

Magnitude of impact	Peak Particle Velocity (PPV)	Description
Major	>= 10mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Moderate	>1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
Minor	>0.3mm/s	Vibration might be just perceptible in residential environments.
Negligible	>0.14mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.

Table 2 of the *NRA Guidelines* provide construction vibration criteria identified to control potential for vibration damage during construction. These criteria are presented in

Table 11.6.

Table 11.6: NRA Guidelines Vibration Criteria: Structural Damage

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8mm/s	12.5mm/s	20mm/s

11.3.4.4 Criteria: Noise from Increased Traffic Flows during the Construction Period

The potential increase in noise levels resulting from changes to road traffic flows during the construction period have been determined in accordance with the *NRA Guidelines (2004)*, which refer to the Calculation of Road Traffic Noise, Department of Transport, Welsh Office, 1988 (CRTN) methodology.

The change in noise level for relevant links has been predicted based on the CRTN[9], Basic Noise Level (BNL) methodology. However, the CRTN methodology is not reliable for very low traffic flows (below 1000 AAWT). A commonly accepted approach where flows of this magnitude are predicted, the Noise Advisory Council (NAC) prediction method detailed in the document '*A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq}'* is used.

These methodologies have been used to calculate the BNL i.e., the traffic noise level at 10m from the kerb as a function of vehicle flow rate, percentage HDV and averaged speed. BNL predictions have been undertaken for both "with" and "without" construction traffic scenarios, for each road link in the construction traffic model, using 18-hour Annual Average Weekly Traffic (AAWT) flows provided by the Project Transport Consultants (refer to EIAR Volume II Appendix 14A).

The CRTN and NAC methodologies predict different metrics; CRTN predictions are based on $L_{A10,18hr}$ results whereas the NAC predictions are based on $L_{Aeq,16hr}$ results. $L_{A10,18hr}$ is a statistical value that can be thought of as the level exceeded 10% of the 18-hour reference period, whereas $L_{Aeq,16hr}$ is the single value equivalent noise level over a reference period of 16 hours (in other words it can be thought of as

[9] Department of Transport (1998). *Calculation of Road Traffic Noise.*

an average noise levels). This difference is not significant however, because it is the change in traffic noise level that is relevant.

No specific Irish guidance containing criteria for assessment of the noise effects from construction traffic changes has been published. The criteria for the assessment of noise changes arising from construction road traffic have therefore been taken from Table 3.17 of the *Design Manual for Roads and Bridges (DMRB, 2020) LA 111 Revision 2*[10], as presented in Table 11.7.

Table 11.7: Magnitude of Impact: Construction Phase Traffic[11]

Magnitude of Impact	Increase in BNL ($L_{A10,18hr}$ dB) on Closest Public Roads used for Construction
No Change	0
Negligible	0.1 to 0.9
Minor	1.0 to 2.9
Moderate	3.0 to 4.9
Major	5+

11.3.4.5 Construction Phase: Special Areas of Conservation (SAC) and Other Ecological Receptors

The impact of construction phase noise and vibration emissions on habitats and species of Special Areas of Conservation (SAC) and other ecological receptor positions are discussed in Chapter 9 (Biodiversity).

11.3.5 Significance of Effects: Operational Phase

11.3.5.1 Introduction

To determine the potential noise and vibration impacts during the operational phase, the following matters have been considered:

- noise caused by site operations; and
- noise caused by increases in traffic on existing roads.

A detailed assessment of operational vibration has been scoped out due the nature of the activities and distance to the nearest receptor. Operational vibration effects are expected to be no different to that experienced previously at the site.

11.3.5.2 Criteria: Operational Phase Site Noise Emissions

The Proposed Development will comply with the requirements of the *EU (Large Combustion Plants) Regulations 2012, S.I. No. 566 of 2012*, under an IE Licence. The Proposed Development will require a licence from the EPA and this will likely be incorporated by a review of the existing IE licence.

Guidance on permissible noise emission limits for licensed facilities is contained in NG4 (see 11.2). NG4 refers to Best Available Techniques (BAT) as a form of noise mitigation which is defined in Section

[10] Highways England (2020). *Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration*.
[11] Highways England (2020).

7 of the *Protection of the* Environment Act (2003) but more directly under section 5(1) and 5(2) of the Environmental Protection Agency Act 1992 (as amended) as follows:

> *"(2) In subsection (1)*
>
> *(a) 'best', in relation to techniques, means the most effective in achieving a high general level of protection of the environment as a whole;*
>
> *(b) 'available techniques' means those techniques developed on a scale which allows implementation in the relevant class of activity specified in the First Schedule, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced within the State, as long as they are reasonably accessible to the person carrying on the activity;*
>
> *(c) 'techniques' includes both the technology used and the way in which the installation is designed, built, managed, maintained, operated and decommissioned."*

NG4 section 4.3 states that:

> ' *All reasonably practicable measures should be adopted at licensed facilities to minimise the noise impact of the activity, and BAT (Best Available Techniques) should be used in the selection and implementation of appropriate noise mitigation measures and controls.*'

NG4 also provides criteria for use in noise assessments, which vary depending on whether the location of the development is in a 'Quiet Area' or an 'Area of Low Background Noise'. Where a development meets neither of these it is assigned "All Other Areas" criteria, all of which explained further below.

A 'Quiet Area' is defined as a location that meets the following criteria:

- 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.

An 'Area of Low Background Noise' is a location that meets the following criteria:

- Average Daytime Background Noise Level ≤40dB L_{AF90};
- Average Evening Background Noise Level ≤35dB L_{AF90}, and
- Average Night-time Background Noise Level ≤30dB L_{AF90}.

The criteria presented in NG4 are detailed in Table 11.8. “All other Areas” applies to the Proposed Development as is discussed.

Table 11.8: Recommended Operational Noise Limit Criteria[12]

Scenario	Daytime Noise Criterion dB $L_{ar,T}$ (0700 to 1900 hours)	Evening Noise Criterion dB $L_{ar,T}$ (1900 to 2300 hours)	Night-time Noise Criterion dB $L_{Aeq,T}$ (2300 to 0700 hours)
Quiet Area	Noise from the licensed site to be at least 10dB below the average daytime background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10dB below the average evening background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10dB below the average night-time background noise level measured during the baseline survey.
Areas of Low Background Noise	45dB	40dB	35dB
All other Areas	55dB	50dB	45dB

The criteria are given in terms of a Rated Noise Level ($L_{ar,T}$) which is defined in NG4 as:

> *The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/ or impulsiveness of the sound.*

The method for applying adjustments for tonal and/ or impulsive characteristics is described in NG4 section 5 and has been considered in this assessment. Noting that NG4 states that tonal and/or impulsive characteristics should not be audible at night-time at the receptor:

> *“All licensed facilities should use BAT to attempt to eliminate and control tonal components when identified, although it is acknowledged that it may be impractical to always completely eliminate some of these characteristics. At night-time, however, there should be no audible tonal noise at any Noise Sensitive Location (NSL).” And,*
>
> *“While all licensed facilities should use BAT to eliminate and control impulsive components, it may be impractical to always completely eliminate some of these characteristics. At night-time, however, there should be no audible impulsive characteristic to the noise at any NSL.”*

The criteria adopted for this operational assessment is discussed in Section 11.5.3.1.

11.3.5.3 Noise from Increased Traffic Flows on Existing Roads during the Operational Phase

The potential increase in noise levels resulting from changes to road traffic flows during the operational phase has been assessed. However, Chapter 14 (Traffic and Transport), has scoped out a detailed operational phase traffic assessment due to the minimal operational traffic associated with the Proposed Development.

The Site will generate a peak of 18 HDV trips per day, and is therefore considered, in Chapter 14 (Traffic and Transport), to not result in significant noise impacts on the surrounding road network on the basis that the additional trips would not be noticeable against the current traffic flows experienced on the route.

[12] EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

A more detailed assessment of operational phase traffic has therefore been scoped out.

Given the low number of Proposed Development related vehicle movements on existing road networks per day during the operational phase, noise impacts are likely to be **Negligible** or less in the operational phase and therefore no further assessment has been undertaken.

11.3.5.4 Operational Phase: SAC and other Ecological Receptors

The impacts of the operational phase noise emissions on the SAC and other ecological receptors are discussed in Chapter 9 (Biodiversity).

11.3.6 Limitations and Assumptions

The following limitations and assumptions apply to the assessment:

- The sound levels measured during the acoustic surveys undertaken as part of the previous surveys and annual compliance testing that are referenced in this chapter are representative of the baseline acoustic environment.
- The construction equipment list and on-times represents the worst-case scenario. Therefore although the appointed contractor may make slight changes to the construction equipment used and timings, this will be within the parameters described and assessed in this planning application.
- The precise size, configuration, performance, and layout of the operational equipment will be finalised following the award of a contract with an equipment supplier, within the parameters set out in this planning application. For the purposes of this planning application and EIAR, consideration of environmental impacts is on the basis that NSR are considered to be in the “far-field”.
- The calculated noise levels presented in the report have been established using CadnaA 3D noise modelling software. Within the software we have undertaken
    - Construction noise level predictions using *BS5228-1:2009+A1:2‘14 'Code of practice for noise and vibration control on construction and open sites’* and
    - Operational noise level prediction using *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation.*

The *Calculation of Road Traffic Noise*[13] has also been used to predict the relative changes on the local road network.

The assessment is therefore subject to the assumptions and limitations detailed within these standards.

None of the limitations or assumptions affect the efficacy of the assessment of the predicted results.

[13] Department of Transport Welsh Office (1988).

11.4 Baseline Environment

11.4.1 Existing Receptors

The approximate distances to the transformer wall boundary (adjacent to the closest operational sound source) from the closest NSRs have been provided in Table 11.9. The locations of these NSRs are also shown in Figure 11.1 (refer to EIAR Volume III). All NSRs are to the south of the Proposed Development. Only NSRs up to 1km have been considered as controlling effects of noise at these locations will inherently mean they are controlled at more distant receptors.

Table 11.9: Approximate Distance to NSR from the Transformer Wall Boundary

Receptor	X (m)	Y (m)	Approximate Distance (m)
NSR1	507471	649266	245
NSR2	507423	649020	505
NSR3	507235	648493	1050

11.4.2 Baseline Measurements

A baseline noise survey was not undertaken in 2023 in relation to this application due the prevailing acoustic conditions at NSR1 in particular, being considered potentially unrepresentative. This was primarily due to ongoing construction activity in the area in relation to the Temporary Emergency Generator (TEG) facility.

Baseline sound measurement data has been collected from surveys undertaken by third parties from as recently as 2022, prior to construction works and is therefore considered more relevant:

- Enovi in 2018 as part of a planning application for a Battery Energy Storage Site (BESS) to be located on what is instead now the TEG site; and
- Axis Environmental Services in 2021 and 2022 at three locations as part annual compliance testing, one of which is approximately 60m east of NSR1 and is therefore close enough to be considered representative of NSR1. The data has been collected and submitted to EPA as part of the annual compliance measurements and the information is summarised in Table 11.10 for the location representative of NSR1. For Day and Night periods the arithmetic average of measurements is presented.

A summary of the baseline levels can be found in Table 11.10. It is worth noting how the $L_{A90,T}$ remains quite consistent from year to year. It also worth noting that the 2018 measurement is a 24-hour measurement rather than a short measurement.

Table 11.10: NSR1: Short-term Measured Baseline Sound Levels

Date	Period	Measurements	$L_{Aeq,T}$ (dB)	L_{AFmax}(dB)	L_{A90} (dB)
09-04-18 to 10-04-18	Day	24 hr (15min intervals)	-	-	41
	Night		-	-	42
24-05-21	Day	3 x 30 min (conseq.)	49	69	40
	Evening	1 x 30 min	50	71	46
	Night	2 x 30 min	51	68	44

Date	Period	Measurements	$L_{Aeq,T}$ (dB)	L_{AFmax}(dB)	L_{A90} (dB)
09-04-18 to 10-04-18	Day	24 hr (15min intervals)	-	-	41
	Night		-	-	42
28-04-22	Day	3 x 30 min (conseq.)	58	78	40
	Evening	1 x 30 min	46	72	38
	Night	2 x 30 min	43	53	38

Subjective observations of sound sources are provided in Table 11.11 as reported by the third party (Axis Environmental) during the aforementioned measurements.

Table 11.11: Comments and Subjective observations during baseline measurements.

Date	2018	2021	2022
Day	During the day, the background noise level (LA90) ranged from 39 to 43dB. The noise level measured was observed to be steady and continuous and influenced predominantly by an existing onsite transformer. For the distribution of day-time value measured between 1100 to 2300 on 9th April and 0700 to 2215 on 10th April, 41dB(A) is considered representative in the instance and in this instance was the most commonly occurring background noise level and the average measured value.	Car movements passing close to the meter were the most striking sounds during daytime testing. Due to this LA90 is used. ESB overhead electric powerline was heard throughout the survey. People talking and an abrasive work equipment being used; in a local residential dwelling audible during surveying.	The main source of noise was the traffic movements on the N67, <2m away from the noise meter. Operational noise from SSE Generation Ireland Ltd was audible as a continuous hum from unit three. Also perceptible was the ESB who were doing repair works on a nearby electrical station. The noise recorded from the ESB was a hammering sound for the duration of the survey.
Evening		Car movements passing the meter was the most noteworthy noise during evening testing. Due to this the LA90 is used. ESB overhead electric powerline was heard throughout the survey. People talking and waves lightly crashing against the shore was audible during evening surveying.	Cars passing on the N67 was a significant interference, though the movements were infrequent. An operational hum from SSE was the main background noise during testing.
Night	During the day, the background noise level (LA90) ranged from 40 to 43dB. The noise level measured was observed to be steady and continuous and influenced predominantly by an existing onsite transformer. For the distribution of night-time value measured between 2300 to 0700 on 9th to 10th April, 42dB(A) is considered representative in the instance and in this instance was the most commonly occurring background noise level and the average measured value.	Car movements passing the meter was the most significant noise during night testing. Due to this LA90 is used. ESB overhead electric powerline was heard throughout the survey. Waves lightly crashing against the shore was audible during night-time surveying.	The infrequent passing of cars caused peaks in measurements during the monitoring period. Operational noise from SSE Generation Ireland Ltd was perceptible during testing as a constant hum.

11.5 Potential Impacts

Noise emissions from the Proposed Development will occur in three distinct phases: construction operation and decommissioning.

Construction and operational vibration has been scoped out of consideration in this assessment as stated in 11.3.4 and 11.3.5.

During the construction phase, noise levels are expected to vary depending on the work being carried out. Noise levels will likely be highest during the initial enabling period whilst louder activities such as earthworks and piling take place. As the construction phase develops, noise levels are expected to reduce as less noisy works (plant installation, internal works within structures) take over.

Noise levels during the operational phase will be emitted principally from the gas turbine building air inlet, the top of a 55m tall chimney stack, and associated equipment, such as transformers, fan coolers and exhausts. Sound emissions are not expected to possess distinctive characteristics such as tonality or impulsiveness from the nearest sensitive receptors perspective as these would need to be designed out to meet the requirements of NG4 in section 4.3 which states, "*During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSR*". Emissions during the operational phase will comply with expected fixed permitted limits by the EPA, based on current best practice for this type of facility, and which are more stringent during the night-time.

During months 25 to 27 of the construction phase, there will be scheduled fuelling and commissioning of the Proposed Development. It is likely some noise sources, i.e., turbine air inlet, stack, transformers associated with operation will occur concurrently with construction activities. If this does occur, no change to the outcomes of this assessment are expected as operational level contribution would be negligible against construction and/or ambient levels combined. This is because the noise limits for operational phase noise are significantly more stringent than those applied to construction phase sources. As a result, any operational phase noise emissions that occur during the construction phase will not contribute to overall ambient sound levels.

As outlined in Chapter 5 (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken to ensure that there will be no significant, negative environmental effects. The equipment and programme for the decommissioning phase are expected to not produce sound emissions any worse than those experienced during the construction phase. Proposed mitigation measures that will be implemented are outlined in Section 5.6 of Chapter 5 and relevant to both construction and decommissioning phases. It is acknowledged these measures may be updated in accordance with changes in best practice at the time of decommissioning as approved by the local authority.

11.5.1 Construction Phase: Site Operations

By comparison of the measured baseline sound levels presented iA summary of the baseline levels can be found in Table 11.10. It is worth noting how the $L_{A90,T}$ remains quite consistent from year to year. It also worth noting that the 2018 measurement is a 24-hour measurement rather than a short measurement.

Table 11.10 and Table 11.11, the construction noise threshold at NSR1 in the vicinity of the Proposed Development is 'Category A' with regards to the BS5228-1 ABC criteria presented in Table 11.4. The noise threshold for NSR2 and NSR3 is also set as Category A as the ambient sound level are likely to be comparable to NSR1 and this is the most conservative approach.

A construction contractor has not yet been appointed, however the construction working hours will be 0700-1900 Monday to Friday and 0800-1500 on Saturdays. Therefore, the Weekday Daytime and Saturday noise limits apply. If construction works are required to take place outside of these times it will be ensured that such works do not give rise to significant noise effects, this will be agreed in advance with the prior agreement of Kerry County Council (KCC),

Construction noise criteria derived from either BS5228, or the NRA Guidelines are presented in Table 11.12. The criteria apply at one metre from the façade of NSRs. The BS5228-1 criteria is the most stringent noise threshold values in the planned construction working hours and 65dB $L_{Aeq,T}$ is therefore the relevant limit used in this assessment, with exception of 13:00 to 15:00 on Saturdays where 55dB $L_{Aeq,T}$ applies, as this more stringent than NRA Guidelines in the same period. However, it is important to note that during the period 13:00 to 15:00 on Saturdays that activities producing significant noise levels will not be undertaken, instead works will be limited to quieter activities such as servicing equipment, performing site checks on spill kits and stores, etc. Therefore, this assessment focuses only on 0700-1900 Monday to Friday and 0700-1300 Saturdays when noisier works will be undertaken,

Table 11.12: Relevant Construction Noise Criteria

Period	Time	BS 5228 Criteria Category A	NRA Guidelines
Weekday Daytime	07:00 - 19:00	65dB $L_{Aeq,T}$	70dB $L_{Aeq,T}$
Saturday Daytime	07:00 - 13:00	65dB $L_{Aeq,T}$	-
	08:00 - 16:30	-	65dB $L_{Aeq,T}$
Saturday Afternoon to Evening	13:00 - 23:00	55dB $L_{Aeq,T}$	

The construction phase of the Proposed Development will be approximately 29 months, comprising four activities as detailed in Table 11.13.

Table 11.13: Construction Programme

Site Action	Time Period
Mobilisation and Site Prep	Months 1-7
Demolition	Months 3-8
Construction Works	Months 7-27
Fuelling and Commissioning	Months 25-29

A proposed list of mechanical plant operating on-site during these periods has been assessed. The predicted numbers of LDV/HDV trips during construction phase have also been assessed. The equipment and quantities will be reviewed by the appointed Contractor and updated, if necessary, but will not affect the outcome of this assessment. The next two subsections establish the sound power level assumptions used to predict construction noise levels at NSRs from construction site activities within the Site, this includes static equipment and LDV/HDV trips to bring equipment/materials in and out of the Site.

11.5.1.1 Assumed Sound Power Levels of Construction Equipment

Sound power levels for each plant item present have subsequently been assigned from archive data presented in BS5228-1. The plant and associated sound power levels (L_{wA}) for main construction are presented in Table 11.14 along with the anticipated on-times. This assessment has identified that the peak month will be month seven as is it the period where the mobilisation and site preparation,

demolition and construction works activities overlap according to the construction programme provided. Assessment against the peak and typical month is undertaken to provide context of the range that NSRs may experience, “at worst” and “as usual” respectively.

Table 11.14: Plant and Associated Sound Power Levels – All Construction Phases

			Equipment quantities for each stage					
					Construction Works			
Plant / Equipment	Sound Power Level dBA	% on time	Mobilisation & Site Preparation	Demolition	Piling and Foundation Works	Building & General Site Activities	Fit Out	Landscaping
Compressors	108	60	2	3	6	6	6	0
Hand held pneumatic breaker	111	60	3	3	0	0	0	0
Dump truck (tipping fill)	107	60	2	2	2	0	0	0
Dump truck (passby)	115	60	3	3	3	0	0	0
Wheeled loader	108	60	0	0	0	2	0	0
Lorry (delivery and collection)	108	60	4	2	6	6	6	0
Water pump (20 kW)	93	60	0	0	0	1	0	0
C.3.1 Hydraulic hammer rig 145 16 m length / 5 t	117	60	0	0	4	0	0	0
Hand-held welder (welding piles)	101	60	0	0	1	0	0	0
Generator for welding	101	60	0	0	1	0	0	0
Dumper (idling)	91	60	0	0	0	1	0	0
Wheeled backhoe loader	95	60	0	0	0	2	0	0
Tracked excavator	99	60	5	5	5	5	0	0
Concrete mixer truck	108	60	6	6	10	10	0	0
Truck mounted concrete pump and boom arm	108	60	0	0	3	3	0	0
Poker vibrator	106	60	0	0	0	1	0	0
Wheeled mobile telescopic crane	106	60	2	2	4	4	4	0
Tower crane	105	60	1	1	2	2	2	0
Lorry with lifting boom	105	60	1	1	0	0	1	0
Lifting platform	95	60	0	0	0	0	1	0
Fork lift truck	103	60	0	0	0	4	1	0
Mini tracked excavator	102	60	0	0	0	0	1	0
Electric core drill (drilling concrete)	113	60	0	0	0	1	1	0
Concrete floor cutter	119	60	0	0	0	1	1	0
Hand-held circular saw (cutting paving slabs)	112	60	0	0	0	0	1	0
Roller	101	60	0	0	0	0	0	1
Diesel generator for site cabins	94	60	4	2	2	2	2	1
Diesel generator for site lighting	93	60	1	1	2	2	2	1
Road sweeper	96	60	1	1	1	1	1	1

			Equipment quantities for each stage					
					Construction Works			
Plant / Equipment	Sound Power Level dBA	% on time	Mobilisation & Site Preparation	Demolition	Piling and Foundation Works	Building & General Site Activities	Fit Out	Landscaping
Angle grinder	108	60	1	1	1	1	1	0
Hand-held cordless nail gun	101	60	0	0	0	0	1	0
Road planer (road construction)	110	60	0	0	0	1	0	0
Vibratory compactor (asphalt)	110	60	0	0	0	1	0	0
Asphalt paver + tipper lorry	105	60	0	0	0	1	0	0
Electric water pump	96	60	2	2	2	2	2	0
Screen stockpiler	115	75	0	1	0	0	0	0
Concrete breaker mounted on wheeled backhoe	120	75	0	3	0	0	0	0
Tracked crusher	112	75	0	1	0	0	0	0

Table 11.15 presents the total sound power level for each construction stage used in this assessment to predict noise levels at receptors. During the Piling and Foundation works stage, the piling activities can be frequent and predicted levels at sensitive receptors are highly dependent on the distance to the receptor. Piling has been considered in two extreme positions, at the southern façade of Gas Turbine Building which is the closest piling position to NSR1 and at a tank which closest piling position to the River Shannon (to inform the ecological assessment). When the piling is separated from the 125dB L_{wA} Piling and Foundation works stage, the piling at each location is 117dB L_{wA} and the remaining activities in that stage amount to 124dB L_{wA}.

In month seven three site actions as referred in Table 11.13 overlap, and henceforth this is referred to this as the peak construction noise level month. Note that to determine a sound power level for the peak construction noise level month the Piling and Foundation Work stage has been combined with Mobilisation and Site Preparation, and Demolition Stages. This is logical as it will occur earlier in the programme. Combining these three stages the peak sound power level for month seven of the construction programme is calculated as 129dB L_{wA}. The piling position closest to NSR1 is used when making predictions for the peak month. The typical month (that which occurs most frequently) would be 125 to 126dB $L_{wA,}$ we take 126dB L_{wA} as being representative of the typical month, no piling locations are used when making predictions for the typical month as this is covered in the Piling and Foundation Works stage predictions.

Table 11.15: Assumed Sound Power Level for All Construction Activities Combined

		Construction Works			
Mobilisation & Site Preparation	Demolition	Piling & Foundation Works	Building & General Site Activities	Fit Out	Landscaping
122	126	125	123	121	101

11.5.1.2 Assumed Sound Power Levels of Construction HDV Movements on Site

A total 278 LDV and 44 HDV vehicles moving between the construction area and main gate each day has been assessed (refer to EIAR Volume I Chapter 14 and Volume III Figure 11.1 for a map indicating the construction area). Predictions have assumed these movements will all occur within the 12-hour day on weekdays and 6-hour day on Saturdays and calculated that LDV 69.5 active mins and HDV 11 active mins within those reference periods based on a 15 second pass-by duration along the access route based on predicted construction site speed limits. An HDV spectrum and a maximum pass-by sound power level taken from BS5228-1 reference C.2.34 used to represent a single HDV and provided in Table 11.16. A representative LDV spectrum has been determined using the Harmonoise model and is presented in Table 11.17.

Table 11.16: Representative HDV Spectrum Sound Power Levels

	63	125	250	500	1k	2k	4k	8k	dBA
HDV Pass-by C.2.34	101	106	106	106	102	101	96	94	108

Table 11.17: LDV 1/3rd Octave spectrum and A-Weighted Broadband Level

1/3 Octave Sound Power Levels (Linear) dB

25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
87	87	87	88	90	90	89	85	84	85	86	86	85	85
630	**800**	**1k**	**1.25k**	**1.6k**	**2k**	**2.5k**	**3.15k**	**4k**	**5k**	**6.3k**	**8k**	**10k**	**dBA**
86	88	89	89	88	87	85	83	81	78	76	74	71	98

11.5.1.3 Predicted Sound Pressure Levels of Construction Activity at NSRs

Specialist environmental noise level modelling software CadnaA was used to predict construction noise levels at NSRs.

The construction site area was represented by a polygon covering the main area within the red line boundary where construction activity, mentioned in Table 11.14 and Table 11.15, will be concentrated. This polygon is marked on EIAR Volume III Figure 11.1.

All construction activity have been modelled as an area source covering the main construction area at 3m height and assigned as either 124dB L_{wA}, 126dB L_{wA} or 129dB L_{wA} as just discussed depending on the scenario being calculated. In the case of the peak and piling and foundation works stage scenarios a point source at 20 height was also assigned 117dB L_{wA} to represent piling activities at ‘Location 1’ which is at the southern façade of the Gas Turbine Building, as this is the worst case for human sensitive receptors. ‘Location 2’ was also modelled for input to the ecological assessment.

The HDV construction vehicles moving between the main access road between N67, and the construction area were represented by a line source. The line source was configured using the representative HDV spectrum and a maximum pass-by sound power level taken from BS5228-1

reference C.2.34. An on-time correction was applied to account for the non-continuous nature of these vehicle movements based on the number of HDV expected. The on-time correction was based on the prediction that a single HDV pass-by event lasts approximately 15 seconds, noting that overestimating the pass-by duration is more conservative.

Based upon the previous paragraphs, the construction noise levels for the peak month, typical month and Piling and Foundation Works stage have been calculated at NSRs. The predicted construction noise levels for each receptor are presented in Table 11.18. Noise level maps of predicted combined construction levels in the Piling and Foundation Works stage, typical and peak months can be found in Volume III:

- Figure 11.3a Typical Month
- Figure 11.3b Peak Month – Piling Location 1
- Figure 11.3c Peak Month – Piling Location 2
- Figure 11.3d Piling and Foundation Stage – Piling Location 1
- Figure 11.3e Piling and Foundation Stage – Piling Location 2

Table 11.18: Predicted Construction Noise Level at Receptors for Peak and Typical Month - Piling and Foundations work stage

Receptor	Constr. Month	Site Access Road Only $L_{Aeq,T}$ dB		Site Activities Only $L_{Aeq,T}$ dB	Predicted Combined Construction Noise Level $L_{Aeq,T}$ dB	
		12hr Weekday	6hr Saturday	12hr Weekday & 6hr Saturday	12hr Weekday	6hr Saturday
NSR1	Peak	45	47	67	67	67
	Piling			65	65	65
	Typical			63	64	64
NSR2	Peak	32	34	66	66	66
	Piling			63	63	63
	Typical			62	60	60
NSR3	Peak	18	20	56	56	56
	Piling			53	53	53
	Typical			53	52	52

Peak month is month 7 of construction programme. Peak month and 'Piling' stage both include contribution of piling at Location 1.

Table 11.18 indicates that the predicted typical construction levels, representing 28 months of a total of 29, is within the relevant BS5228.-1 Category A limits listed in Table 11.12 for weekdays and Saturday morning construction works. In the peak construction month NSR3 remains compliant; however at NSR1 and NSR2 the 65dB $L_{Aeq,T}$ threshold value is exceeded by 2dB and 1dB respectively. This exceedance during month 7 will only be realised if the construction plant contributing to the peak month operates at the quoted maximum sound power levels for the full quoted percentage on-times of the

proposed construction hours, see Table 11.14. The NRA Guidelines threshold value for Saturdays is also 65dB $L_{Aeq,T}$ and therefore NSR1 and NSR2 also exceed the Saturday NRA criteria, but all receptors are otherwise compliant with NRA Guidelines in the relevant weekday daytime period, which is 70dB $L_{Aeq,T}$.

On this basis **No Significant Adverse** effects are expected at any NSRs with regards construction phase noise levels generated by on-site activities with exception of NSR1 and NSR2 in the peak month (month 7). In accordance with Table 11.1 and Table 11.2 the impacts would be defined as **Not Significant** and **Short-Term** at all NSRs except at NSR1 and NSR2 in the peak month.

The exceedance (of BS5228-1 criteria) at NSR1 and NSR2 during the peak month is addressed in the Mitigation Measures section that follows however at worst unmitigated the significance of the adverse effect would be characterised as being **above Not Significant but lower than Slight** and would be **Short-Term**.

11.5.2 Construction Phase: Traffic on Public Roads

The predicted traffic flows on the surrounding road network with and without construction traffic are presented in Table 11.19 for the construction year 2026. The links are mapped in EIAR Volume II 11.2.

Table 11.19: Construction Phase Traffic

Link Number	Assumed Average Speed (km/h)	2026 without Construction Traffic		2026 with Construction Traffic	
		18hr AAWT	% HDV	18hr AAWT	% HDV
1	60	3215	6.1%	3243	6.0% **
2	60	4067	6.7%	4361	7.3%
3	50.8*	1298	10.3%	1620	11.0%
4	80	1102	8.5%	1424	9.6%

* This average speed was determined from measured data as it was available. Average speeds for all other links are based on the limit understood.
** this value reduces slightly as construction HDV are not expected to use this link

Calculations have been carried out in accordance with the *Basic Noise Level (BNL)* methodology presented in CRTN[14] to determine the change in road traffic noise levels resulting from these changes in flows.

The results of these calculations alongside the associated magnitude of impact are presented in Table 11.20.

Table 11.20: Change in Road Traffic Noise Level Resulting from Construction Traffic

Link	Change in Noise Level (dB)	Magnitude of Impact
1	0.0	No Change
2	0.3	Negligible

[14] Calculation of Road Traffic Noise (CRTN) methodology

Link	Change in Noise Level (dB)	Magnitude of Impact
3	1.5	Minor
4	1.8	Minor

Based upon the previous table, a **Negligible** to **Minor** impact **(Not Significant)** on existing road traffic noise levels is expected during the construction phase. In accordance with Table 11.1 and Table 11.2 these increases are defined as **Imperceptible** and **Short Term**.

11.5.3 Operational Phase: Site Operations

11.5.3.1 Criteria

The location of the Proposed Development does not meet the definition of a 'Quiet Area' and all night-time $L_{A90,T}$ values summarised in Table 11.10, are above 30dB, which according to NG4 section 4 step 3 excludes the Site from being classed as a 'Low Background Noise Area'. Furthermore, the current license for the Site requires that operations from the Site also meet the 'All other Areas' as summarised in Table 11.8. The following is reproduced from Condition 8 of EPA IPPC License Reg. 716[15]:

> *8.2 Activities on-site shall not give rise to noise levels off-site, at noise sensitive locations, which exceed the following sound pressure limits (Leq,30 minutes) subject to Condition 3 of this licence:*
>
> *8.2.1 Daytime: 55dB(A),*
>
> *8.2.2 Night-time: 45dB(A).*
>
> *8.3 There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.*

It is expected that these operational constraints will be retained in any future license review as the Proposed Development will not change the character of the current acoustic environment and there is no history of noise complaints from the NSRs. NG4 section 1.2 states:

> *"It is acknowledged that retention of the existing daytime and night-time periods and criteria may be appropriate in certain cases, for example, in situations where a site has been operating successfully for a significant period of time without any history of noise complaints."*

The assessment therefore evaluates potential adverse impact from noise emissions against the 'All Other Areas' criteria in Table 11.8.

When in operation, the proposed OCGT could be operated at any time of the day or night for limited periods of time when other sources of electricity are unable to meet grid demand. Therefore, the noise criterion of 45dB $L_{Aeq,8hr}$ for the night-time at all NSR locations has been adopted. Compliance with this night-time criterion at the closest NSR will therefore ensure compliance with the higher criteria for daytime and evening periods.

[15] EPA Revised License 716 - 090151b2805878af.pdf (epa.ie)

11.5.3.2 Power Plant Proposed Equipment

The building construction and equipment details will be finalised later during procurement and detailed design in conjunction with the appointed equipment supplier. Any changes to the proposed equipment during detailed design will be within the parameters described and assessed in this EIAR.

Details of the noise generating mechanical plant associated with the Proposed Development have been provided by the Applicant. They are provided as predicted values for the equipment named and are detailed in Table 11.21 in terms of either sound pressure level (L_{pA}) at a defined distance from the plant item, or the sound power level (L_{wA}) emission from the plant item refer to EIAR Volume III Figure 11.1 for sources locations.

Table 11.21: Proposed Development Fixed Plant Noise Levels

	Item	ID	Sound Power Levels dB(A)									
			31.5	63	125	250	500	1k	2k	4k	8k	dBA
Gas Turbine Package*[1]	Air Inlet - Filter Face	S3	76	84	83	82	82	88	90	94	89	98
	Air Inlet – Ducting	S3	74	78	73	70	73	79	90	86	64	92
	Air Inlet – Plenum	S3	51	66	73	82	87	91	101	92	78	102
	Internal – Turbine Compartment	S1	78	93	97	93	93	95	98	96	88	104
	Internal – Lube Oil / Gas Module	S1	64	80	84	88	93	96	99	93	86	102
	Internal – GT Enclosure Fan Casing + Outlet Exhaust (x 2)	S1	62	75	93	91	94	94	94	98	93	103 (106)
	Internal – Enclosure Fan Casing + Outlet (x 2)	S1	63	77	93	92	95	95	92	91	86	101 (104)
	Internal – Generator Enclosure	S1	74	91	98	92	93	92	91	83	78	102
	Internal – GT Aux Transformer (-15dB during sinusoidal load)	S1	72	96	103	91	84	82	81	80	78	104
	Internal – BoP Aux Transformer (-15dB during sinusoidal load)	S1	47	58	73	81	86	89	91	87	79	95
GT Exhaust	Exhaust duct & Diverter damper	S2	80	89	95	98	97	91	90	80	69	103
	Internal – GT Exhaust Diffuser Compartment	S2	76	87	91	92	93	89	88	84	77	99
	Stack Top	S4	92	94	96	98	103	104	99	98	77	109
Balance of Plant (BOP)	Fin Fan Coolers	S6&7	-	86	95	102	107	107	104	100	92	112
	Grid Transformer	S8	104	101	116	99	95	82	78	73	70	101
	Unit Transformer	S8	99	98	96	86	79	79	74	67	59	85
Selective Catalytic Reduction (SCR)*[2]		S5	-	-	-	-	-	-	-	-	-	96

*[1] Gas Turbine package calculated as a cladded reverberant single area source using 0.8mm steel, air inlet modelled separately

*[2] SCR dBA calculated from client supplied maximum sound pressure level of 85 dB at 1m

11.5.3.3 Assessment

To determine the potential noise impact of the Proposed Development on the NSR locations identified, all of the noise sources identified have been included in the 3D CadnaA 2022 MR2 noise model.

The locations of the various noise sources were taken from Drawing: 60695232-TBT-DR-001 submitted with this application.

The following modelling approaches have been adopted:

- Ground absorption is assumed to be 'acoustically soft' as defined in *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*. Areas of water, the Proposed Development and roads assumed to be acoustically hard / reflective.
- All noise sources have been represented as omni-directional point sources with the exception of the stack body.
- The stack body has been represented as a cylindrical vertical building 55 m high building from ground. The stack body is assumed to not re-radiate noise. The stack outlet has been modelled as a point source at a height of 55.01 m above ground level and therefore just above the stack body.

Section 5 of *NG4* details the assessment of noise sources with tonal or impulsive elements and the appropriate penalties / corrections to apply where sources present these characteristics. In this instance, it is assumed that all sources can be designed such that they do not present tonal or impulsive characteristics at the location of nearby receptor positions as required by the current license as stated in 11.5.3.1. Therefore, no corrections have been applied.

The 3D noise model has been used to calculate operational phase noise levels at the NSR locations identified, as set out in

Table 11.222.

Table 11.22: Operational Sound Levels at Receptors - Unmitigated

Receptor	Receptor Height	All Items Predicted Level ($L_{Aeq,T}$)	Night-time Criterion ($L_{Aeq,8hr}$)	Compliant? (Y/ N)
Freefield Levels				
NSR1 (Single Storey)	1.5m	56	45dB	N
NSR2 (Double Storey*)	4.0m	44		Y
NSR3 (Double Storey*)	4.0m	36		Y

* Worst case assumption

The assessment indicates that unmitigated noise emissions from the Proposed Development complies with the 45dB $L_{Aeq,T}$ night-time criterion at NSR2 and NSR3. At NSR1 the 45dB $L_{Aeq,T}$ night-time criterion is exceeded by 11dB which would be considered significant depending on the context.

As NSR2 and NSR3 are compliant then in accordance with Table 11.1 and Table 11.2 the effects are considered **Not Significant** or better, **Long-Term** and **Reversible**. The exceedance at NSR1 is

considered in the Mitigation Measures Section 11.6 of this chapter. Otherwise a 10dB exceedance would be considered as Significant and that mitigation would be required.

11.5.4 Operational Phase: Traffic on Existing Roads

Relatively low numbers of vehicles on public roads are expected in relation to the operational phase of the Proposed Development when compared to the existing flows on surrounding roads (see Table 11.19 without construction traffic). “Relatively low” meaning the change in noise level due to the change in traffic flow would be imperceptible. On this basis in accordance with Table 11.1 and Table 11.2 the impacts will be **Not Significant** or better, **Long-Term** and **Reversible**.

11.5.5 Do Nothing Scenario

If the Proposed Development were to not go ahead, the **Temporary** and **Long-Term** noise sources associated with construction and operational phases would not be introduced into the area and the current acoustic environment would continue.

11.6 Mitigation Measures

11.6.1 Construction Phase

The assessment of construction noise detailed indicates no significant adverse effects at residential receptors with the exception of NSR1 during the peak month (month seven) where a 2dB exceedance is predicted over the BS5228-1 criteria.

BS5228-1 Table B.1 provides a generalised table of methods for reducing noise levels from construction plant; the reductions quoted are in the order of 5dB to 10dB for the various interventions/options. Therefore, through the selection of quieter construction plant and implementation of general mitigation measures comprising those in BS5228-1 Table B.1 the exceedance of the threshold value at NSR1 during month seven will be avoided.

Furthermore, to ensure noise levels are kept to a minimum and to reduce the risk of cumulative effects, it is recommended that the following will be implemented during the construction phase, as a minimum:

- Good community communication will be established and maintained throughout the construction process. This shall include informing residents on progress and ensuring measures are put in place to minimise noise and vibration impacts.
- Fixed and semi-fixed plant such as generators, compressors and pumps will be located away from sensitive receptors wherever possible.
- All plant used onsite will be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures and any other components designed to reduce noise or components designed to reduce vibration.
- All noise and vibration generating construction plant will be shut down when not in use.
- The loading and unloading of materials will take place away from NSRs, ideally in locations which are acoustically screened.

- Materials will be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant will be kept to a minimum.
- Modern plant will be selected which complies with the latest European Commission noise emission requirements i.e. The Outdoor Noise Directive 2000/14/EC (OND) which regulates the noise emissions into the environment by outdoor equipment. Electrical plant items (as opposed to diesel powered plant items) will be used wherever practicable. All major compressors will be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Site operations and vehicle routes will be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography.
- No employees, subcontractors or persons employed on the Site will cause unnecessary noise from their activities e.g., excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site will include information on minimising noise and reminding them to be considerate of the nearby residents.
- As far as practicable, noisier activities will be planned to take place during periods of the day which are less noise sensitive *i.e.,* not particularly early or late in the day.
- Measures will be put in place to ensure that employees know that minimisation of noise will be important at the Site.
- Construction traffic from this and other concurrent development will be coordinated to minimise traffic and site noise impacts where possible.

Any noise complaints received during the construction phase will be investigated thoroughly. The results of the investigation, including measured noise and vibration levels at the time of the complaint, on-site activities and any corrective action taken, will also be reported to relevant stakeholders.

The assessments in 11.5.1 and 11.5.2 will be revisited once the Contractor is appointed to confirm that no significant effects are expected, or where necessary, identify appropriate specific noise mitigation measures.

11.6.2 Operational Phase

A commitment is made to adopt the NG4 operational noise limits detailed in Table 11.8 for “All Other Areas” as requirements within the final design, including the need to address distinctive acoustic characteristics of tonality and impulsivity and application of best available techniques (BAT) at procurement and through detailed design stage as per the requirements of NG4 for licensed operations.

Application of BAT will include the selection of equipment that is a quieter alternative, uses quiet modes or can be readily fitted with acoustic interventions such as silencers, mufflers or attenuators all to reduce the sound emissions.

A commitment is also made to check compliance with the nominated criteria confirmed via long-term periodic noise level monitoring. i.e., yearly compliance monitoring in-line with the existing license conditions for the Site.

11.6.2.1 Mitigation Analysis

The assessment of operational activity in Section 11.5.3 has indicated that the unmitigated Proposed Development has the potential to exceed the NG4 assessment criteria in the night-time.

While the commitment has been made to apply BAT to reduce overall sound emission from the Site, it is still necessary to demonstrate a compliant operational design is possible when specific mitigation measures are implemented.

In order to determine where to focus acoustic mitigation it is necessary to first understand what parts of the operations contribute the most to predicted sound levels at sensitive receptors. An analysis of the predicted level contribution at NSR1 for the unmitigated scenario in Section 11.5.3 reveals the following sound sources are the biggest contributors:

- Gas Turbine Building Facades,
- Gas Turbine Building Air Intake; and
- Stack Outlet

Acoustic interventions on the stack outlet have the potential to affect the stack height for example and therefore a mitigation strategy that demonstrates feasibility and compliance is one that addresses only the Gas Turbine Building and Air Intake.

The minimum requirements for the mitigation strategy is described in detail here.

Minimum Requirements:

1) An acoustically rated louvre on the air intake that can achieve a 10dBA broadband insertion loss against the following unmitigated air intake spectrum:

Table 11.23: Reference Spectrum for Sound Power Level of Unmitigated Air Intake Components combined.

Octave Spectrum (dB)									BROADBAND dBA
31.5	63	125	250	500	1k	2k	4k	8k	
117	111	100	94	91	93	101	96	90	104

2) A Gas Turbine building wall and roof construction that can provide a total broadband insertion loss of **18dBA** against the following spectrum:

Table 11.24: Reference Spectrum for Sound Power Level of Reverberant Gas Turbine Building

Octave Spectrum (dB)									BROADBAND dBA
31.5	63	125	250	500	1k	2k	4k	8k	
127	129	127	118	115	112	111	110	106	119

11.6.2.2 Predicted Mitigated Sound Pressure Levels at NSRs

This section demonstrates how compliant levels can be achieved using real interventions that meet the minimum requirements in 11.6.2.1.

An example of meeting minimum requirement one is an air intake louvre with the following insertion loss. This was applied to the 3D sound propagation model and is based on manufacturer data.

Table 11.25: Louvre mitigation

	Octave Spectrum (dB)									BROADBAND REDUCTION*
	31.5	63	125	250	500	1k	2k	4k	8k	
Louvre A	0	3	3	5	7	10	12	11	11	10dBA

* against reference spectrum

An example of meeting minimum requirement two is by improving upon the unmitigated construction of the Gas Turbine building by increasing the thickness of the steel cladding from 0.6mm to 0.8mm, with the following insertion loss in each octave band. Note that any single material or composite cladding construction that meets the minimum requirement would be suitable from an acoustic standpoint.

Table 11.26: Improved Gas Turbine building cladding

	Octave Spectrum (dB)									BROADBAND REDUCTION *
	31.5	63	125	250	500	1k	2k	4k	8k	
0.6mm	8	8	10	14	19	24	29	34	34	16dBA
0.8mm	9	9	12	16	21	26	32	37	37	18dBA

* against reference spectrum

The predicted sound pressure levels at all receptors following the implementation of the example mitigation interventions is presented in Table 11.30. A noise level map of predicted operational levels can be found in EIAR Volume III Figure 11.4.

Table 11.27: Predicted Mitigated Sound Pressure Levels at NSRs for Example Interventions

Receptor	Receptor Height	All Items Predicted Level ($L_{Aeq,T}$)	Criterion ($L_{Aeq,T}$)	Compliant? (Y/ N)
Freefield Levels				
NSR1 (Single Storey)	1.5m	44	45dB	Y
NSR2 (Two Storey*)	4.0m	41		Y
NSR3 (Two Storey*)	4.0m	31		Y

* Worst case assumption

This demonstrates that when the minimum requirements for mitigation are met, the predicted levels are compliant at all NSRs. Louvre and cladding products with different insertion loss specifications can be used as long as they meet the minimum requirements set out in this section.

It is also worth noting some contextual factors which are:

- *BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings* provides guidance on recommended levels within bedrooms as being 30dB $L_{Aeq,8hr}$ during the night-time. It also states that a façade with an open window will provide approximately 15dB of sound attenuation. This means that levels would not be predicted to exceed 30dB $L_{Aeq,8hr}$ and therefore sleep disturbance due to operational activity is not expected.
- With windows shut it is highly likely that noise from the Proposed Development will be difficult to hear within bedrooms at NSR1. Following implementation of mitigation and with windows open, noise levels from the Proposed Development are predicted to meet the BS8233 criterion. It is noted that the BS8233 criterion is applicable to sources without specific character, which is considered appropriate in this context.
- NG4 makes significant reference to the application of Best Available Techniques (BAT). This assessment has identified where to focus and reduce noise emissions from the Proposed Development. The noise mitigation strategies currently proposed are an application of BAT.

Considering the operational numerical assessment against the NG4 'All Other Areas' criteria, adoption of mitigation and contextual factors, significant impacts are not expected with respect to operational noise emissions at nearby NSRs. In accordance with Table 11.1 and Table 11.2 the impacts would be defined as **Not Significant**, **Long-Term** but **Reversible.**

11.7 Residual Impacts

11.7.1 Construction Phase

Post mitigation, **No Significant** residual impacts are expected in the construction or decommissioning phases. A summary of this for each potential impact is provided in Table 11.28 and is relevant to both construction and decommissioning phases.

Table 11.28: A summary of the residual effects following the application of construction mitigation measures

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/ Specific)	Mitigation Description	Residual Impact Significance /Duration
NSR1	Site (Month 7)	Above Not Significant but lower than Slight & Temporary	General	Application of general measures to reduce noise levels, including quieter plant selection, those listed in BS 5228 Table B.1 and Section 11.6.1	Not Significant

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/ Specific)	Mitigation Description	Residual Impact Significance /Duration
	Site (Typical Month)	Not Significant & Short-Term	General		Not Significant
NSR2	Site	Not Significant & Short-Term	None	None required to be compliant however application of the general measures is best practice	Not Significant
NSR3	Site	Not Significant & Short-Term	None		Not Significant
General	Public Roads	Not Significant & Short-Term	None	None	Not Significant

11.7.2 Operational Phase

Following implementation of the minimum requirements for mitigation the top three contributors of noise at NSR1 is predicted to be:

- Stack Outlet
- Gas Turbine Building Facades, and
- Gas Turbine Building Air Intake;

However, post mitigation, **No Significant** residual impacts are expected. Any further reductions that can be obtained through procurement process (quieter plant), improved façade construction or other design details would also be considered as demonstration of the application of BAT. A summary of this for each potential impact is provided in Table 11.29.

Table 11.29: A summary of the residual effects following the application of operational mitigation

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/ Specific)	Mitigation Description	Residual Impact Significance /Duration
NSR1	Site	Significant & Long-Term but Reversible	Specific	Minimum specification provided for Gas Turbine Building wall/roof construction and gas turbine air intake louvre. See 11.6.2.1	Not Significant & Long-Term but Reversible
NSR2	Site	Not Significant & Long-Term but Reversible	None	None	Not Significant & Long-Term but Reversible
NSR3	Site	Not Significant & Long-Term but Reversible	None	None	Not Significant & Long-Term but Reversible

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/ Specific)	Mitigation Description	Residual Impact Significance /Duration
General	Public Roads	Not Significant & Short-Term but Reversible	None	None	Not Significant & Long-Term but Reversible

11.8 Cumulative Impacts

Table 4.2 in Chapter 4 provides a list of planning applications considered in relation to potential cumulative impacts. From a high-level review, cumulative impacts are not expected as a result of the construction or operational phases of the Proposed Development due to:

- construction phases not overlapping, or the listed developments being constructed already.
- operational traffic volume changes being low at either the listed development and the Proposed Development, or both, leading to negligible changes in road traffic noise levels on the surrounding road network; and
- the distance and / or nature of the development not being considered as likely to increase noise levels at nearby receptors.

The cumulative effects from the Temporary Emergency Generator (TEG) Development, SSE Battery Energy Storage Site Development and EirGrid Re-cabling Development are considered in further detail in the following sections.

11.8.1 The Temporary Emergency Generator (TEG) Development

The TEG development is located west of the NSR1 and immediately south-west of the Proposed Development, see EIAR Volume III Figure 4.2. The two developments share the same closest NSR namely NSR1 representing multiple residential dwellings.

The nature of the Temporary Emergency Generator (TEG) plant is that it can respond quickly when demand on the national grid is high. It is understood the TEG plant at the SSE Tarbert site is limited to maximum of 500 operational hours per year and that the facility has a limited life span of five years.

During the planning and environmental reporting stage the TEG plant was committed to be compliant with the 45dB $L_{Aeq,8hr}$ at NSR1. The predicted sound pressure level was 40dB $L_{Aeq,8hr}$ and the manufacturer's guaranteed level is 43dB $L_{Aeq,8hr}$.

Therefore for the purposes of a conservative cumulative assessment of the TEG plant and Proposed Development a worst case assumption is adopted that the TEG is predicted to be 43dB $L_{Aeq,T}$ at the Proposed Development nearest sensitive receptor (NSR) in the day and evening periods.

It is expected that the TEG will be in operation prior to the commencement of the Proposed Development construction.

11.8.1.1 Proposed Development during Construction with TEG Operating

Should the TEG be needed to meet demand during the construction phase in daytime of the Proposed Development, the noise level contribution from the TEG at NSRs would be at least 10dB below the day-time construction threshold value. This means that its contribution to the predicted construction noise levels at NSRs would be negligible and therefore the cumulative impact is not significant in this scenario.

11.8.1.2 Proposed Development and TEG Operating

The night-time period is excluded from the cumulative assessment on the basis that high electricity demand is not expected in the night-time period.

The cumulative worst case predicted sound pressure levels for all sensitive receptors are presented in Table 11.30:32 and compared to the relevant NG4 assessment criteria. As a conservative approach the level of the TEG at NSR2 and NSR3 is assumed to be the same as at NSR1, in practice it will be less due to the additional distance.

Table 11.30: Predicted Cumulative Sound Pressure Levels

Receptor	TEG or BESS Development Worst Case Noise Level ($L_{Aeq,T}$)	Proposed Development Predicted Level ($L_{Aeq,T}$)	Worst Case Cumulative Predicted Level ($L_{Aeq,T}$)	Day, Evening and Night Criterion ($L_{Aeq,T}$)	Compliant Day & Evening? (Y/ N)
NSR1	43	44	47	Day: 55 dB Evening: 50 dB (Night: 45 dB)	Y
NSR2	43*	41	45*		Y
NSR3	43*	31	43*		Y

* These levels will be less in practice as the receptors are much further away than NSR1

It is worth noting that should the predicted levels be compared against the night-time criteria there would be a 2dB exceedance at NSR1. However, this scenario is considered unlikely given that both Proposed Development and TEG will function during periods of high demand and hence their simultaneous operating at nighttime would be unlikely. Furthermore, according to NG4 section 4.4.1,

> *"In some instances, licensed sites will have certain items of emergency equipment (e.g., standby generators) that will only operate in urgent situations (e.g., grid power failure). Depending upon the context, it may be deemed permissible for such items of equipment to give rise to exceedances in the noise criteria/limits during limited testing and emergency operation only. If such equipment is in regular use for any purposes other than intermittent testing, it is subject to the standard limit values for the site."*

This is taken to be applicable when considering the cumulative assessment of two or more developments that must meet the same operational noise limit at a shared NSR and one of them is designed to operate specifically in an emergency situation, as well as when considering the Proposed Development in isolation.

On this basis cumulative impact of the two developments is concluded to be negligible and not significant.

11.8.2 SSE Battery Energy Storage Site

The Battery Energy Storage Site (BESS) application was submitted in 2018 and the project was granted consent in 2019 (expires 2029) to be built on an area of approximately 2.278 hectares (ha) contained within the boundary of the existing power station, a 42ha site. It will also include a 33kV underground cable connection to the existing 110kV ESB substation to the southeast. This is the same area of land where the TEG is being constructed and therefore this development can only be constructed and completed if the TEG is decommissioned. The following subsection consider the cumulative impact of the BESS and Proposed Development during construction and operational phases as relevant. There are no cumulative effects relating traffic due to BESS site being unattended in normal conditions.

11.8.2.1 Proposed Development and BESS during construction

Operational levels from the Proposed Development are more than 10dB below the weekday daytime and Saturday morning BS5228-1 construction noise criteria. Therefore, the Proposed Developments contribution to cumulative levels during the BESS construction would be negligible and considered not significant.

11.8.2.2 Proposed Development and BESS during operation

The BESS application (document ref 19011-6005-C, April 2018) predicts a noise level of 43dBA in the day, evening, and night periods at NSR1 assuming it runs continuously within those periods. As this is the same level assumed for the TEG operation at NSR1, please also refer to Table 11.30 for the cumulative predicted levels from the BESS and Proposed Development combined.

On this basis a 2dB exceedance of the night-time criteria is predicted at NSR1 however when determining the significance of a likely effect from a potential impact it is important to consider a range of factors, as suggested by the EPA 2022 Guidelines see section 11.3.3, in this instance the understanding the “Extent and Context” as well as the “Magnitude” (+2 dB) of the exceedance is particularly important.

Contextual considerations for the night-time exceedance caused by the BESS and Proposed Development combined

The first contextual factors relate to the Proposed Development operation:

- The Proposed Development function is a peaking power plant where it functions when there is a high demand for electricity for example in the morning (typically between 07.00 - 09.00) and in the evening (typically between 17.00 - 20.00). Therefore, there is a low likelihood of the Proposed Development operating at maximum capacity and emitting the full predicted 44dBA through-out all of the night-time period. For example, if the Proposed Development was to operate for 2 hours at maximum output 44 dBA in the night-time period prior to the morning peak (0500 to 0700), the resulting night-time 8-hour level would be determined using an on-time correction of -6dB from ($10*\log_{10}(2h/8h) = -6$ dB). Therefore the predicted night-time level would instead be 44 - 6 = 38dB $L_{Aeq,8h}$ for the Proposed Development. When this is combined with the conservative BESS level of 43dBA $L_{Aeq,8hr,}$ the cumulative level drops from 47dB $L_{Aeq,8hr}$ to 44dB $L_{Aeq,8hr}$ which is compliant.

- Operating at full capacity throughout the 8-hour night-time if required would likely be considered an emergency and the NG4 section 4.4.1 statement about permissible exceedances would apply.
- A commitment is made in section 11.6.2 that BAT will be applied in the procurement process and detailed design stage to reduce predicted noise levels at receptors further where it is practical to do so. This means that noise levels are likely to be lower than those predicted in this assessment and as such the exceedance will be less than 2 dB or avoided altogether.

The magnitude of the exceedance is important to consider as well.

- A difference of 3dB is considered to be just noticeable to the human ear in everyday listening conditions and therefore from a perceptual perspective there is no clear notable difference in a predicted operational noise level of 45dBA compared to 47dBA - the difference is Imperceptible per the EPA 2022 Guideline terminology. This also means that with respect to potential annoyance, disturbance and health effects, there is no major concern to attribute to the 2dB exceedance and the magnitude of impact at the receptor is no different between 45dBA which is compliant with the NG4 licensing criteria and 47dBA which exceeds it in the night-time.

The extent, duration and prevalence of BESS operational noise are also important factors to consider when determining the overall significance of effect to attribute to the cumulative operational noise. A number of relevant contextual factors relating specifically to BESS operations follow:

- The BESS operation will primarily respond to Grid energy demands, which typically peak in the mornings (07:00 - 09:00) and evenings (17:00 - 20:00), especially during colder months. However, the need for cooling decreases in these months. The cooling fans for the proposed batteries, are designed to work in ambient temperatures between -15 and +45 degrees Celsius. This means they will not often operate at full power due to the prevailing ambient temperatures in the locale, especially at night.
- While the BESS site is assumed to emit noise 24/7, in practice, its noise emissions will be less frequent and would therefore be less than predicted in the application, especially at night, since cooling requirements are lower. The on-time discussed previously for the Proposed Development is relevant to the BESS as well.
- Within the consented 2018 BESS application, at section 9.1.2, it was stated that,

> *"Based on indicative available equipment sound power data, there is the potential to marginally exceed the EPA night-time limit of 45dB cumulatively with existing operations. To prevent and mitigate this, the final layout and equipment selection will be optimised to minimise noise emissions and ensure they are below EPA limits."*

This means that the potential to exceed night-time limits when the Power Station and BESS operations are combined was highlighted in 2018 application (later consented) and that the same Applicant has stated they will ensure cumulative noise levels are below the limits through choice of BESS layout and BESS equipment selection.

- It will be approximately 10 or more years since the application was written and procurement process begins, and it is likely that the BESS technology and markets will have developed considerably in that time. This means that the market should be able to offer a wider range of inherently quieter equipment or modes than the units originally used in the assessment.

Finally, comparing the predicted sound level against the background sound level is another common method to assessing the significance of effects in addition to assessing the absolute level. This method is presented in BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. A rating level is compared to the background sound level and the difference can be used to quantitatively assess significance depending on the context. In this case, the rating level is the predicted level of the Proposed Development corrected for tonality, impulsivity and intermittency characteristics as perceived at the assessment location. NG4 states that tonality and impulsivity characteristics must not be audible at the receptor at night-time and as such the cumulative rating level of the Proposed Development is equal to the predicted cumulative level, 47 dB $L_{Aeq,8h}$ at NSR1, see Table 11.30.

The reported background sound level at NSR1 was reported in the BESS application as 42dB $L_{A90,8hr}$ as presented in 11.4.2 of this chapter. The more recent but much shorter duration measurements help to support that sound levels in the area have remained similar from year to year.

Subtracting the representative night-time background sound level from the established rating level gives a result of 5dB over the background sound level.

A difference of about 10dB or more is likely to be an indication of a significant adverse impact, depending on the context, whereas a difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.

Summary of Contextual Considerations

In summary, actual noise levels at NSR1 are expected to be lower than that predicted in the assessment when considering both the BESS and Proposed Development individually and combined. A range of reasons why cumulative levels will be lower in practice have been presented and why the exceedance would be unlikely to cause disturbance if it did occur was explained.

It was also explained that the Applicant has previously committed to, "*ensure* [cumulative levels] *are below EPA limits*" as part of the consented BESS application which also predicted a cumulative exceedance.

Therefore, considering all of the contextual factors together it is determined that the cumulative impacts from the combined Proposed Development and BESS operational noise emissions are **Not Significant**, **Long Term** and **Reversible.**

11.8.3 EirGrid re-cabling Development

The Tarbert 220kV Circuit across the Shannon Estuary is planned for an upgrade. The existing 220kV cables within submarine pipes, linking the Tarbert Generating Station to the Kilkerin Point LCIM compound, will be replaced. Both substations will see decommissioning of certain equipment and the introduction of new layouts. A new fibre optic cable duct route will also be established, running parallel

to the 220 kV cables within the subsea pipes, connecting Kilkerin Point to the substation through various townlands. Subject to approvals, construction aims to commence in Q3 2024 and finish by Q4 2025.

Construction activities at Tarbert and Kilkerin Point are expected to last between 8 to 10 months. Concurrently, the work related to the fibre optic cable duct route is projected to span 36 to 40 weeks.

The documents currently available on planning portal do not provide any quantitative assessment of predicted construction noise levels and therefore a quantitative assessment is not possible. However, given the gradually moving nature of the works the overall contribution to predicted levels from the construction phase of the Proposed Development at NSRs it is considered not significant and will be of limited duration from the perspective of NSR1, including when the TEG or BESS is operating.

11.8.4 Cumulative Impacts Summary

No Significant cumulative impacts are expected to arise from the Proposed Development, either during the construction/decommissioning or operational phases (with mitigation in place as in 11.6.1 and 11.6.2 respectively), for the following reasons:

- Construction noise levels are not predicted to exceed the defined limits and therefore no significant adverse residual impacts from construction noise have been predicted at NSRs within the vicinity of the Proposed Development; and
- Day time and evening cumulative operational levels are sufficiently below the NG4 criteria for those periods.
- The Proposed Development is not expected to generate significant traffic during its operational phase.
- While potential cumulative exceedances were identified in the night-time period for the TEG and BESS:
    - The exceedance is small (2dB) and predicted levels are based on conservative operational assumptions, such as the need to operate at maximum capacity at night and with maximum cooling requirements despite that ambient temperatures are already favourably low.
    - The Proposed Development is expected to reduce operational noise below those predicted through the application of BAT at procurement and detailed design stage.
    - The TEG operation responds to high demand for electricity and is less likely to run at maximum capacity at night-time. The predicted exceedance is based on the TEG operating at the manufacturer guaranteed level, rather than the manufacturers predicted level at NSR1 which was 3dB lower. Furthermore, NG4 section 4.4.1 also refers to permissible exceedances in emergency conditions.
    - The applicant has previously stated with respect to cumulative levels from the BESS to "*ensure they are below EPA limits*" through optimisation of "*final layout and equipment selection".*

11.9 Summary

The Proposed Development has been assessed with regard to the following areas:

- Short-term impacts during the construction and decommissioning phase, including:
  - Noise generated by onsite construction activities; and
  - Noise generated by changes to traffic flows on existing roads.
- Long-term impacts during the operational phase, including:
  - Noise generated by the Proposed Development once complete; and
  - Noise generated by changes to traffic flows on existing roads.
- Cumulative impacts including the Proposed Development and:
  - The Temporary Emergency Generator (TEG);
  - SSE Battery Energy Storage Site (BESS); and
  - EirGrid re-cabling Development

Vibration effects were scoped out of the assessment as the intervening distance was considered large enough for vibration impacts not to be significant.

The assessment of construction noise detailed indicates no significant adverse effects at residential receptors with the exception of NSR1 during the peak month (month seven) where a 2dB exceedance is predicted. Mitigation measures were proposed for the construction/decommissioning in section 11.6.1 to address the exceedance. BS5228-1 Table B.1 provides a generalised table of methods for reducing noise levels from construction plant; the reductions quoted are in the order of 5dB to 10dB for the various interventions/options. Therefore, it is feasible that through the selection of quieter construction plant and implementation of general mitigation measures comprising those in BS5228-1 Table B.1 the exceedance of the threshold value at NSR1 during month seven will be avoided.

Subject to the adoption of the mitigation measures detailed in this chapter, all effects are defined in accordance with Table 11.1 and Table 11.2 as either **Imperceptible** or **Not Significant**. Construction effects are defined as **Temporary / Short-Term**, whilst operational effects will be **Long-Term**, although all would be **Reversible.**

11.10 References

BSI Group (2003). *BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures*

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