

Chapter 11: Noise

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Executive Summary

This chapter provides an assessment of the potential noise impact on nearby noise sensitive receptors from the Proposed Varied Development.

The Proposed Varied Development seeks to increase the height of the turbines to a maximum tip height of 200 metres. This would result in increases in nominal hub height from 91.5m to 125m and nominal rotor diameter from 130m to 150m.

Chapter 14: Noise of the 2018 EIA Report identified the nearby noise sensitive receptors and associated noise limits. Noise limits were expressed in relation to a standardised 10m wind speed, which is derived from the wind speed at hub height. Therefore, as part of this updated noise assessment, the noise limits have been updated to reflect the proposed increased hub height.

The cumulative operational effect of the Consented Development with the consented Beinn an Tuirc III Wind Farm was considered in the 2018 EIA. The current, updated assessment considers Beinn an Tuirc III and the proposed Cnoc Buidhe Wind Energy Hub¹. Cumulative effects have been addressed using Site-Specific Noise Limits ('SSNLs') which have been reduced from the full, cumulative limits to account for the effects of other wind energy developments, and which therefore apply to the effects of the Proposed Varied Development only.

The updated assessment uses the Nordex N149 5.7MW as the candidate wind turbine model. During the daytime period, exceedances of the SSNLs are predicted (up to 1.4dB for wind speeds from 6 to 10 ms⁻¹). This is a potentially significant effect and therefore a mitigation strategy has been provided. With the proposed mitigation strategy to operate with reduced noise operating modes in place, operational noise effects would be **not significant**.

¹ [Scottish Government - Energy Consents Unit - Case Reference ECU00004767](#) Wind farm comprising up to 29 wind turbines, with 14 of these up to 180 m to turbine blade tip and 15 up to 200 m to turbine blade tip, with ancillary energy storage and associated infrastructure. Application by Bellpower UK Limited, located approximately 1 km north of the Proposed varied development, as shown on Figure 11.1a.

11.1. Introduction

- 11.1.1. A noise assessment was previously undertaken for the consented Tangy IV Wind Farm ('the Consented Development') in 2018 in accordance with best practice guidance including the methodology for the assessment and rating of noise from wind farms set out in ETSU-R-97. This assessed a layout consisting of 16 turbines with a maximum tip height of 149.9m.
- 11.1.2. This chapter considers the potential for the Proposed Varied Development as described in **Chapter 2: Design Iteration and Description of Proposed Varied Development** to result in material changes to the effects identified for the Consented Development.
- 11.1.3. The assessment is supported by **Figures 11.1a** and **11.1b** in **Volume 3a**, and **Technical Appendices 11.1** and **11.2** in **Volume 4** of this EIA Report.

11.2. Scope of Assessment

- 11.2.1. The Proposed Varied Development's Scoping Report proposed to scope out the assessment of noise during construction and decommissioning phases. Noise and vibration from both construction and decommissioning are not expected to increase for the Proposed Varied Development in comparison with the Consented Development. This is because the construction process, and the transport and plant vehicles the project intends to use, are not expected to substantially change. Therefore, the assessment will be limited to the operational phase.
- 11.2.2. The Proposed Varied Development comprises 16 turbines of up to a maximum 200m height from the ground to blade tip when vertical. This would result in increases in nominal hub height from 91.5m to 125m and nominal rotor diameter from 130m up to 150m. The candidate turbine is yet to be confirmed, therefore for purposes of this assessment, a worst-case turbine model in terms of noise has been considered from the available options.
- 11.2.3. Baseline background noise levels for wind farms are expressed in relation to a standardised 10m wind speed, which is derived from the wind speed at hub height. Therefore, there is potential for the relationship between wind speed and background noise level to change as a result of the proposed variation.
- 11.2.4. The 2025 Scoping Report² proposed that the assessment of operational noise will include a reanalysis of baseline noise levels to account for the proposed

² See **Technical Appendix 3.1: Scoping Report**

increase in turbine hub height. This will result in updated noise limits, based on the reanalysed baseline noise levels.

- 11.2.5. The updated operational assessment also accounts for any relevant cumulative effects by making allowances in the site-specific noise limits for the effects of any application, consented or operational wind farm with the potential to result in significant cumulative operational noise effects together with the Proposed Varied Development.
- 11.2.6. Recent case law has highlighted a requirement to consider the cumulative effects of a proposed wind farm's grid connection. Scottish and Southern Electricity Networks – Transmission ('SSEN-T') will be applying under Section 37 ('S.37') of the Electricity Act for an overhead line between Cnoc Buidhe Wind Energy Hub substation and Carradale, which will be the subject of its own EIA Report. The Proposed Varied Development will be connected to Cnoc Buidhe Wind Energy Hub substation using 5.6 km of underground line, which will be installed by SSEN-T under permitted development rights. The overhead portion of the line is sufficiently remote from the Proposed Varied Development that the likelihood of significant cumulative construction or operational effects is negligible. The underground portion of the grid connection will not produce operational noise.
- 11.2.7. Therefore, the only aspect of the grid connection where there is any potential for a cumulative effect with the Proposed Varied Development is installation (construction) of the underground connection to Cnoc Buidhe Wind Energy Hub Substation. Cumulative construction noise effects would only occur in the event that the underground cable is being installed at the same time as significant construction activity for the Proposed Development within the same vicinity. This could only occur in the vicinity of the onsite substation, which is over 1km from the nearest noise-sensitive receptors. As construction noise levels are rarely significant at distance of over 500m, the likelihood of significant cumulative noise effects is negligible.
- 11.2.8. Therefore, cumulative effects of the Proposed Varied Development and its grid connection would be **not significant**.

11.3. Consultations

- 11.3.1. Argyll & Bute Council ('A&BC') provided a scoping response in August 2025, however, at time of writing they were unable to obtain advice from the Council's Environmental Services on noise. Nevertheless, A&BC did state that

the approach detailed within the Scoping Report “appears to be a generally appropriate approach to the Council”.

11.4. Assessment Methodology

- 11.4.1. As with the 2018 EIA Report, the operational noise effects of the Proposed Varied Development have been assessed in accordance with the relevant requirements of both ETSU-R-97 The Assessment and Rating of Wind Turbine Noise (ETSU-R-97) and A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (the IOA GPG).
- 11.4.2. As discussed, due to the proposed change in hub height, the relationship between wind speed and background noise levels has been re-analysed, as presented in **Technical Appendix 11.1: Baseline Noise Data Reanalysis**. From these updated baseline background noise levels, updated noise limits have been calculated in accordance with ETSU-R-97; these apply to the cumulative effects of all acoustically relevant³ operational and consented wind energy developments as well as those from any that are currently the subject of a valid planning or consent application.
- 11.4.3. SSNLs, which apply to noise from the Proposed Varied Development only, have been then calculated by logarithmically subtracting the calculated noise level contribution of the other wind energy developments from the derived cumulative limits. The process of calculating these SSNLs was in accordance with the recommendations of the IOA GPG and is detailed in **Technical Appendix 11.2: Site Specific Noise Limit Derivation**. Noise levels resulting from operation of the Proposed Varied Development have been calculated in accordance with the recommendations of the IOA GPG, for a worst-case likely candidate turbine model. These predicted noise levels have then been compared with the SSNLs. Where predicted noise levels exceed the SSNLs, an indicative mitigation strategy has been identified which uses reduced-noise operational modes.
- 11.4.4. Where operational noise levels exceed the SSNLs, the requirements of ETSU-R-97 would not be achieved, and this is considered to constitute a **significant** effect in terms of the EIA Regulations. Conversely, operational noise levels no greater than the SSNLs would result in cumulative noise levels meeting the requirements of ETSU-R-97, and this is considered to constitute a **non-significant** effect in terms of the EIA Regulations.

³ i.e. other wind energy developments which are likely to generate noise levels at any noise sensitive receptors within 10dB of those of the proposed Varied Development

11.5. Consented Development EIAR Baseline

- 11.5.1. **Chapter 14: Noise** of the 2018 EIA Report identifies the nearby noise sensitive receptors and their associated limits. **Technical Appendix 14.1** of the 2018 EIA Report provides the full details of how these noise limits were calculated. As mentioned previously, noise limits are expressed in relation to a standardised 10m wind speed, which is derived from the wind speed at hub height. The noise limits shown in **Chapter 14** and **Technical Appendix 14.1** of the 2018 EIA Report are based on a turbine hub height of 91.5m.
- 11.5.2. **Technical Appendix 14.1** of the 2018 EIA Report assesses the cumulative operational effect of the Consented Development with the consented Beinn an Tuirc III Wind Farm. The Beinn an Tuirc I Wind Farm and Beinn an Tuirc II Wind Farm were not included within the cumulative assessment as their noise contribution was deemed negligible.

11.6. Summary of Effects Predicted & Mitigation Measures proposed for the Consented Development

- 11.6.1. No significant noise effects were identified during construction, operation (including cumulatively) or decommissioning of the Consented Development and therefore no specific noise or vibration mitigation measures were deemed to be necessary.

11.7. Revised Assessment of Effects for the Proposed Varied Development

Updated Baseline Background Noise Levels

- 11.7.1. **Technical Appendix 11.1: Baseline Noise Data Reanalysis** details the re-analysis of the relationship between background noise levels and wind speed to account for the change in proposed hub height to 125m. **Table 11.1** and **Table 11.2** detail the resulting updated relationship between wind speed and background noise.

Table 11.1: Quiet Daytime Background Noise Levels, dB, LA90,10min

Reference	Property Name	Standardised 10 m Wind Speed (m/s)									
		3	4	5	6	7	8	9	10	11	12
NML01	Killocrew	25.6	26.1	26.8	27.8	29.0	30.5	32.1	34.1	36.3	38.7
NML02	Drum Farm	28.6	30.1	31.5	33.1	34.7	36.4	38.1	39.9	41.8	43.7
NML03	Gobagrennan	23.1	24.3	25.8	27.5	29.4	31.5	33.7	35.9	38.1	40.1
NML04	Corrylach	28.0	28.0	28.6	29.9	31.8	34.0	36.5	39.0	41.3	43.5

Table 11. 2: Night-time Background Noise Levels, dB, LA90,10min

Reference	Property	Standardised 10 m Wind Speed (m/s)									
		3	4	5	6	7	8	9	10	11	12
NML01	Killocrew	24.6	25.8	27.0	28.2	29.4	30.6	31.8	33.1	34.3	35.5
NML02	Drum Farm	27.2	28.2	29.4	30.8	32.4	34.3	36.4	38.6	41.1	43.8
NML03	Gobagrennan	23.4	24.2	25.4	26.8	28.5	30.2	32.1	34.0	35.8	37.6
NML04	Corrylach	26.6	27.0	27.7	28.9	30.6	32.7	35.2	38.2	41.6	45.4

Updated ETSU-R-97 Cumulative Noise Limits

11.7.2. **Table 11.3** and **Table 11.4** detail cumulative noise limits derived in accordance with ETSU-R-97 from the background noise levels detailed in **Table 11.1** and **Table 11.2**.

Table 11.3: Quiet Daytime ETSU Noise Limits, dB, LA90,10min

Reference	Property Name	Standardised 10 m Wind Speed (m/s)									
		3	4	5	6	7	8	9	10	11	12
NML01	Killocrew	38.0	38.0	38.0	38.0	38.0	38.0	38.0	39.1	41.3	43.7
NML02	Drum Farm	38.0	38.0	38.0	38.1	39.7	41.4	43.1	44.9	46.8	48.7
NML03	Gobagrennan	38.0	38.0	38.0	38.0	38.0	38.0	38.7	40.9	43.1	45.1
NML04	Corrylach	38.0	38.0	38.0	38.0	38.0	39.0	41.5	44.0	46.3	48.5

Table 11.4: Night-time ETSU Noise Limits, dB, LA90,10min

Reference	Property Name	Standardised 10 m Wind Speed (m/s)									
		3	4	5	6	7	8	9	10	11	12
NML01	Killocrew	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NML02	Drum Farm	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.6	46.1	48.8
NML03	Gobagrennan	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NML04	Corrylach	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.2	46.6	50.4

Noise Sensitive Receptors and Assessment Locations

11.7.3. **Figures 11.1a and b⁴** show the location of noise sensitive receptors ('NSRs') in the vicinity of the Proposed Varied Development. As described in **Technical Appendix 11.2**, a representative selection of these NSRs has been identified and considered within the current assessment. These are referred to as Noise Assessment Locations ('NAL'), are shown in **Figures 11.1a and b** and are detailed in **Table 11.5**. The NML⁵ column indicates which sets of background noise levels and cumulative noise limits have been applied to each NAL. Properties where an increased fixed lower noise limit of 45 dB, LA90,10min for financial involvement has been applied are indicated with an asterisk. The assignment of baseline background noise levels and limits and the application of increased limits for financial involvement are consistent with the 2018 EIA Report.

Table 11.5: Noise Assessment Locations

Reference	Name	Easting	Northing	NML
NAL01	Tangy Farm*	167404	627749	NML02
NAL02	Tangylea*	167437	627626	NML02
NAL03	Dalnaspidal ⁶	167615	627332	NML02
NAL04	Breakachy	167072	626908	NML02
NAL05	Tangy Mill Croft	166146	627659	NML01
NAL06	Tangy Mill	166303	627737	NML01
NAL07	Tangy Cottages	166079	627771	NML01

⁴ Figure 11.1 is presented in two parts, 11.1a and 11.b. 11.1a shows the full cumulative noise study area, whereas 11.1b focuses on the Noise Assessment Locations identified and considered within the assessment.

⁵ Abbreviation for Noise Monitoring Location.

⁶ Referred to as Hazel's Cottage in 2018 EIA Report

Reference	Name	Easting	Northing	NML
NAL08	22/01793/PP ⁷	166088	627850	NML01
NAL09	Maleen	165975	627917	NML01
NAL10	Killarow Farm*	166284	628007	NML01
NAL11	Tigh Na Mara	166095	628176	NML01
NAL12	Tangy Moil*	166228	628553	NML01
NAL13	Tighnamoile	166255	628589	NML01
NAL15	Lagalgarve	165952	629318	NML01
NAL16	Killocrow	166113	630660	NML01
NAL17	Valtos Putechantuy	166542	631468	NML01
NAL18	High Bellochantuy	166275	632095	NML01
NAL19	Gobagrennan	170579	628607	NML03
NAL20	Corrylach	170508	630368	NML04
NAL21	Dorran Cottage	170643	630481	NML04

Updated Site-Specific Noise Limits ('SSNLs')

11.7.4. **Technical Appendix 11.2** details the derivation of SSNLs for the Proposed Varied Development, which are detailed in **Table 11.6** and **Table 11.7**.

Table 11.6: Site-Specific Noise Limits, Daytime, dB, LA90,10min

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL01	Tangy Farm	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	46.7	48.7
NAL02	Tangylea	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	46.7	48.6
NAL03	Dalnaspidal	37.7	37.7	37.7	37.7	39.4	41.2	42.9	44.8	46.7	48.7
NAL04	Breakachy	37.7	37.7	37.7	37.7	39.4	41.2	42.9	44.8	46.7	48.7
NAL05	Tangy Mill Croft	37.7	37.7	37.7	37.7	37.7	37.7	37.7	38.9	41.2	43.6
NAL06	Tangy Mill	37.7	37.7	37.7	37.7	37.7	37.7	37.7	38.9	41.1	43.6
NAL07	Tangy Cottages	37.7	37.7	37.7	37.7	37.7	37.7	37.7	38.9	41.2	43.6
NAL08	22/01793/PP	37.7	37.7	37.7	37.7	37.7	37.7	37.7	38.9	41.1	43.6

⁷ Two dwellings granted planning permission by Argyll & Bute Council under planning reference 22/01793/PP

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL09	Maleen	37.7	37.7	37.7	37.7	37.7	37.7	37.7	38.9	41.1	43.6
NAL10	Killarow Farm	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9
NAL11	Tigh Na Mara	37.6	37.6	37.6	37.6	37.6	37.6	37.6	38.8	41.1	43.6
NAL12	Tangy Moil	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9
NAL13	Tighnamoile	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.8	41.0	43.6
NAL15	Lagalgarve	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.7	41.0	43.6
NAL16	Killocrow	36.9	36.9	36.9	36.9	36.9	36.9	36.9	38.3	40.7	43.4
NAL17	Valtos Putechantuy	35.2	35.2	35.2	35.2	35.2	35.2	35.2	37.2	39.9	43.0
NAL18	High Bellochantuy	35.9	35.9	35.9	35.9	35.9	35.9	35.9	37.6	40.2	43.1
NAL19	Gobagrennan	35.7	35.7	35.7	35.7	35.7	35.7	36.8	39.9	42.4	44.7
NAL20	Corrylach	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
NAL21	Dorran Cottage	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0

Table 11.7: Site-Specific Noise Limits, Night-time, dB, LA90,10min

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL01	Tangy Farm	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	46.0	48.8
NAL02	Tangylea	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	46.0	48.7
NAL03	Dalnaspidal	42.8	42.8	42.8	42.8	42.8	42.8	42.8	43.5	46.0	48.8
NAL04	Breakachy	42.8	42.8	42.8	42.8	42.8	42.8	42.8	43.5	46.0	48.8
NAL05	Tangy Mill Croft	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
NAL06	Tangy Mill	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
NAL07	Tangy Cottages	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
NAL08	22/01793/PP	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
NAL09	Maleen	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
NAL10	Killarow Farm	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9
NAL11	Tigh Na Mara	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
NAL12	Tangy Moil	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9
NAL13	Tighnamoile	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8
NAL15	Lagalgarve	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8
NAL16	Killocrow	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6
NAL17	Valtos Putechantuy	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
NAL18	High Bellochautuy	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3
NAL19	Gobagrennan	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3
NAL20	Corrylach	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
NAL21	Dorran Cottage	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0

Candidate Turbine Model

- 11.7.5. The candidate wind turbine model considered within the current assessment is the Nordex N149 5.7MW, with a hub height of 125m. Noise emission data for this turbine model has been sourced from the manufacturer⁸. As this data was provided to SSE under a Non-Disclosure Agreement due to commercial confidentiality, full details cannot be provided herein but may be shared with

⁸ Nordex Document F008_275_A14_EN Octave Sound Power Levels Nordex N149 / 5.X Revision 02, 2020-02-14

A&BC or the Energy Consents Unit ('ECU') on request. However, in accordance with best practice, overall Sound Power Levels in relation to standardised 10m wind speeds are provided in **Table 11.8**.

Table 11.8: Candidate Turbine Sound Power Levels

Standardised 10m Wind Speed, ms ⁻¹	3	4	5	6	7	8	9	10	11	12
Sound Power Level, L _{WA} , dB	94.0	95.5	100.3	104.7	105.6	105.6	105.6	105.6	105.6	105.6

Predicted Noise Levels for Proposed Varied Development

11.7.6. **Table 11.9** shows predicted operational noise levels for the Proposed Varied Development.

Table 11.9: Predicted Noise Levels, dB, LA90,10min

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL01	Tangy Farm	32.8	34.3	39.0	43.4	44.3	44.4	44.4	44.4	44.4	44.4
NAL02	Tangylea	31.3	32.8	37.4	41.8	42.7	42.9	42.9	42.9	42.9	42.9
NAL03	Dalnaspidal	28.5	30.0	34.6	39.0	39.9	40.0	40.0	40.0	40.0	40.0
NAL04	Breakachy	26.4	27.9	32.3	36.7	37.6	37.8	37.8	37.8	37.8	37.8
NAL05	Tangy Mill Croft	24.7	26.2	30.6	35.0	35.9	36.1	36.1	36.1	36.1	36.1
NAL06	Tangy Mill	25.8	27.3	31.8	36.2	37.1	37.2	37.2	37.2	37.2	37.2
NAL07	Tangy Cottages	24.7	26.2	30.6	35.0	35.9	36.1	36.1	36.1	36.1	36.1
NAL08	22/01793/PP	25.0	26.5	30.9	35.3	36.2	36.3	36.3	36.3	36.3	36.3
NAL09	Maleen	24.6	26.1	30.4	34.8	35.8	35.9	35.9	35.9	35.9	35.9
NAL10	Killarow Farm	26.8	28.3	32.7	37.1	38.1	38.2	38.2	38.2	38.2	38.2
NAL11	Tigh Na Mara	25.9	27.4	31.8	36.2	37.1	37.2	37.2	37.2	37.2	37.2
NAL12	Tangy Moil	27.2	28.7	33.2	37.6	38.5	38.6	38.6	38.6	38.6	38.6
NAL13	Tighnamoile	27.4	28.9	33.4	37.8	38.7	38.9	38.9	38.9	38.9	38.9
NAL15	Lagalgarve	23.2	24.7	29.1	33.5	34.4	34.5	34.5	34.5	34.5	34.5
NAL16	Killocrow	22.8	24.3	28.6	33.0	33.9	34.1	34.1	34.1	34.1	34.1
NAL17	Valtos Putechantuy	21.5	23.0	27.2	31.6	32.5	32.7	32.7	32.7	32.7	32.7
NAL18	High Bellochantuy	18.6	20.1	24.1	28.5	29.4	29.6	29.6	29.6	29.6	29.6

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL19	Gobagrennan	23.6	25.1	29.4	33.8	34.7	34.9	34.9	34.9	34.9	34.9
NAL20	Corrylach	21.4	22.9	27.2	31.6	32.5	32.7	32.7	32.7	32.7	32.7
NAL21	Dorran Cottage	20.5	22.0	26.2	30.6	31.5	31.7	31.7	31.7	31.7	31.7

Assessment of Predicted Noise Levels

11.7.7. **Table 11.10** and **Table 11.11** detail the difference between the predicted noise levels in **Table 11.9** and the SSNLs in **Table 11.6** and **Table 11.7**. A negative value indicates that the predicted levels are lower than the SSNLs. Conversely a positive value indicates an exceedance of the SSNLs and a requirement for noise mitigation. As can be seen, the SSNLs could be exceeded by up to 1.4 dB during daytime for wind speeds from 6 to 10 ms⁻¹. This is a potentially significant effect. An indicative mitigation strategy in relation to this effect is described in Section 11.8.

Table 11.10: Difference between predicted noise levels and daytime SSNLs, dB

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL01	Tangy Farm	-12.1	-10.6	-5.9	-1.5	-0.6	-0.5	-0.5	-0.5	-2.3	-4.3
NAL02	Tangylea	-13.6	-12.1	-7.5	-3.1	-2.2	-2.0	-2.0	-2.0	-3.8	-5.7
NAL03	Dalnaspidal	-9.2	-7.7	-3.1	1.3	0.5	-1.2	-2.9	-4.8	-6.7	-8.7
NAL04	Breakachy	-11.3	-9.8	-5.4	-1.0	-1.8	-3.4	-5.1	-7.0	-8.9	-10.9
NAL05	Tangy Mill Croft	-13.0	-11.5	-7.1	-2.7	-1.8	-1.6	-1.6	-2.8	-5.1	-7.5
NAL06	Tangy Mill	-11.9	-10.4	-5.9	-1.5	-0.6	-0.5	-0.5	-1.7	-3.9	-6.4
NAL07	Tangy Cottages	-13.0	-11.5	-7.1	-2.7	-1.8	-1.6	-1.6	-2.8	-5.1	-7.5
NAL08	22/01793/PP	-12.7	-11.2	-6.8	-2.4	-1.5	-1.4	-1.4	-2.6	-4.8	-7.3
NAL09	Maleen	-13.1	-11.6	-7.3	-2.9	-1.9	-1.8	-1.8	-3.0	-5.2	-7.7
NAL10	Killarow Farm	-18.1	-16.6	-12.2	-7.8	-6.8	-6.7	-6.7	-6.7	-6.7	-6.7
NAL11	Tigh Na Mara	-11.7	-10.2	-5.8	-1.4	-0.5	-0.4	-0.4	-1.6	-3.9	-6.4
NAL12	Tangy Moil	-17.7	-16.2	-11.7	-7.3	-6.4	-6.3	-6.3	-6.3	-6.3	-6.3
NAL13	Tighnamoile	-10.1	-8.6	-4.1	0.3	1.2	1.4	1.4	0.1	-2.1	-4.7
NAL15	Lagalgarve	-14.3	-12.8	-8.4	-4.0	-3.1	-3.0	-3.0	-4.2	-6.5	-9.1
NAL16	Killocrow	-14.1	-12.6	-8.3	-3.9	-3.0	-2.8	-2.8	-4.2	-6.6	-9.3

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL17	Valtos Putechantuy	-13.7	-12.2	-8.0	-3.6	-2.7	-2.5	-2.5	-4.5	-7.2	-10.3
NAL18	High Bellochantuy	-17.3	-15.8	-11.8	-7.4	-6.5	-6.3	-6.3	-8.0	-10.6	-13.5
NAL19	Gobagrennan	-12.1	-10.6	-6.3	-1.9	-1.0	-0.8	-1.9	-5.0	-7.5	-9.8
NAL20	Corrylach	-13.6	-12.1	-7.8	-3.4	-2.5	-2.3	-2.3	-2.3	-2.3	-2.3
NAL21	Dorran Cottage	-14.5	-13.0	-8.8	-4.4	-3.5	-3.3	-3.3	-3.3	-3.3	-3.3

Table 11.11: Difference between predicted noise levels and night-time SSNLs, dB

Dwelling ID	Dwelling Name	Standardised 10m Wind Speed, ms ⁻¹									
		3	4	5	6	7	8	9	10	11	12
NAL01	Tangy Farm	-12.1	-10.6	-5.9	-1.5	-0.6	-0.5	-0.5	-0.5	-1.6	-4.4
NAL02	Tangylea	-13.6	-12.1	-7.5	-3.1	-2.2	-2.0	-2.0	-2.0	-3.1	-5.8
NAL03	Dalnaspidal	-14.3	-12.8	-8.2	-3.8	-2.9	-2.8	-2.8	-3.5	-6.0	-8.8
NAL04	Breakachy	-16.4	-14.9	-10.5	-6.1	-5.2	-5.0	-5.0	-5.7	-8.2	-11.0
NAL05	Tangy Mill Croft	-18.2	-16.7	-12.3	-7.9	-7.0	-6.8	-6.8	-6.8	-6.8	-6.8
NAL06	Tangy Mill	-17.1	-15.6	-11.1	-6.7	-5.8	-5.7	-5.7	-5.7	-5.7	-5.7
NAL07	Tangy Cottages	-18.2	-16.7	-12.3	-7.9	-7.0	-6.8	-6.8	-6.8	-6.8	-6.8
NAL08	22/01793/PP	-17.9	-16.4	-12.0	-7.6	-6.7	-6.6	-6.6	-6.6	-6.6	-6.6
NAL09	Maleen	-18.3	-16.8	-12.5	-8.1	-7.1	-7.0	-7.0	-7.0	-7.0	-7.0
NAL10	Killarow Farm	-18.1	-16.6	-12.2	-7.8	-6.8	-6.7	-6.7	-6.7	-6.7	-6.7
NAL11	Tigh Na Mara	-17.0	-15.5	-11.1	-6.7	-5.8	-5.7	-5.7	-5.7	-5.7	-5.7
NAL12	Tangy Moil	-17.7	-16.2	-11.7	-7.3	-6.4	-6.3	-6.3	-6.3	-6.3	-6.3
NAL13	Tighnamoile	-15.4	-13.9	-9.4	-5.0	-4.1	-3.9	-3.9	-3.9	-3.9	-3.9
NAL15	Lagalgarve	-19.6	-18.1	-13.7	-9.3	-8.4	-8.3	-8.3	-8.3	-8.3	-8.3
NAL16	Killocrow	-19.8	-18.3	-14.0	-9.6	-8.7	-8.5	-8.5	-8.5	-8.5	-8.5
NAL17	Valtos Putechantuy	-20.6	-19.1	-14.9	-10.5	-9.6	-9.4	-9.4	-9.4	-9.4	-9.4
NAL18	High Bellochantuy	-23.7	-22.2	-18.2	-13.8	-12.9	-12.7	-12.7	-12.7	-12.7	-12.7
NAL19	Gobagrennan	-18.7	-17.2	-12.9	-8.5	-7.6	-7.4	-7.4	-7.4	-7.4	-7.4
NAL20	Corrylach	-13.6	-12.1	-7.8	-3.4	-2.5	-2.3	-2.3	-2.3	-2.3	-2.3
NAL21	Dorran Cottage	-14.5	-13.0	-8.8	-4.4	-3.5	-3.3	-3.3	-3.3	-3.3	-3.3

11.8. Revised Mitigation Measures for the Proposed Varied Development

- 11.8.1. In common with most currently available wind turbine models, the candidate turbine can operate in a range of reduced noise modes, which lower noise emissions to enable compliance with relevant noise limits. In addition to the standard operational mode, Mode 0, the candidate turbine can operate in up to 15 reduced noise modes. An indicative mitigation strategy based on these modes that would reduce operational noise levels to no greater than the SSNLs is shown in **Table 11.12**.

Table 11.12: Indicative Mitigation Strategy

Turbine	Mode	Standardised 10m Wind Speeds, ms ⁻¹	Wind Direction 30° Bins vs North, Degrees
T01	10	6	270 - 120
	8	7 – 9	300 - 150
	1	10	30 - 120
T02	9	6	300 - 120
	2	7	330
T03	2	6	120
	6	7	0 - 150
	7	8 – 9	0 - 150
T06	4	7	0 - 150
	5	8 – 9	0 - 150
T07	1	8 – 9	30 - 120
All other cases would be Mode 0			

- 11.8.2. It should be noted, however, that the actual mitigation implemented in practice may differ to this, as it will depend on factors such as the turbine model installed or revised availability of modes. Refinements or adjustments may also be implemented during the operation of the Proposed Varied Development based on the results of noise monitoring, revised availability of modes, and optimisation for energy output, etc.
- 11.8.3. It is anticipated that a condition will be attached to consent for the Proposed Varied Development, similar to Condition 34 of the existing consent, which details applicable noise limits and requirements for noise monitoring in the

event of noise complaints. It is recommended that this condition refers to, or replicates, the following tables from this assessment:

- **Table 11.5:** Noise Assessment Locations
- **Table 11.6:** Site-Specific Noise Limits, Daytime, dB, LA90,10min
- **Table 11.7:** Site-Specific Noise Limits, Night-time, dB, LA90,10min

- 11.8.4. It should be noted that if consent is not granted for Cnoc Buidhe Wind Energy Hub, more noise ‘budget’ would be available and therefore it may be appropriate to recalculate SSNLs for inclusion in a consent condition to maximise the productivity of the Proposed Varied Development. Revised site-specific noise limits can be supplied at the request of A&BC or the ECU.
- 11.8.5. Following implementation of the above mitigation measures, operational noise levels would not exceed the SSNLs, and therefore the requirements of ETSU-R-97 in relation to cumulative noise levels would be fulfilled. As such, operational noise effects post-mitigation are considered to be **not significant**.
- 11.8.6. It should be understood, however, that although operational noise levels from the Proposed Varied Development would be within appropriate limits, it is likely to be audible at nearby residential locations, with the degree of audibility variable depending on wind and atmospheric conditions.

11.9. Comparison of Effects of the Proposed Varied Development with the Effects of the Consented Development

- 11.9.1. The significance of operational noise effects post-mitigation would remain unchanged from those identified for the Consented Development.

11.10. Conclusion

- 11.10.1. The operational noise effects of the Proposed Varied Development have been assessed in accordance with ETSU-R-97 and the IOA GPG. It was found that operational noise could potentially exceed appropriate limits. However, with the implementation of appropriate mitigation measures in the form of reduced noise operating modes, the limits could be met. Therefore, operational noise effects have been found to be **not significant**.

11.11. References

ETSU-R-97 The Assessment and Rating of Noise from Wind Turbines, Energy Technology Support unit for the DTI, 1996

A Good Practice Guide to the Application of ETSU-R-97 to the Assessment and Rating of Wind Turbine Noise, Institute of Acoustics, May 2013

Tangy IV Wind Farm, Environmental Impact Assessment Report, Chapter 14: Noise and Vibration, August 2018

Tangy IV Wind Farm, Environmental Impact Assessment Report: Technical Appendices, Appendix 14.1: Noise, August 2018

The Scottish Government Consent under Section 36 of the Electricity Act for Tangy IV Wind Farm, 20 December 2019