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INTRODUCTION

- 13.1 Bow Acoustics, under the direction of SLR, has been commissioned by the applicant to undertake a review of the noise implications that could arise from the relocation of one wind turbine (Turbine No.7), together with those as a result of the changing status and design of wind farms in the cumulative study, resulting in a need for a reassessment of the noise effects of the proposed development.
- 13.2 This Supplementary Environmental Information (SEI) Chapter supplements **Chapter 13: Noise** of the 2022 Kirkton Energy Park Environmental Impact Assessment (EIA) Report. The methodology employed in this SEI is as set out in EIA Report **Chapter 13: Noise**.
- 13.3 The following key documents should be read in conjunction with this SEI:
- EIA Report Volume 2 - **Chapter 13: Noise** (2022);
 - EIA Report Volume 3d - Chapter 13 Plan Figures (2022); and
 - EIA Report Volume 4b – Chapter 13 Technical Appendices (2022).

CONSULTEE RESPONSES TO 2022 EIA REPORT

- 13.4 No noise related responses to the 2022 Kirkton Energy Park application have so far been received from key consultees.

DESIGN AMENDMENTS

- 13.5 As outlined in **SEI Chapter 3: Description of Development**, the only design amendments from the site layout of the 2022 Kirkton Energy Park application (as detailed in the 2022 EIA Report) are the repositioning of Turbine No.7 (and associated crane pad) approximately 53m north, and the realignment of the proposed access track to Turbines No.5 - 11. This relatively minor repositioning of Turbine No.7 has been undertaken in order to accommodate a request from SEPA (see **SEI Chapter 2** and **SEI Chapter 10**).

REVISED FIGURES

Figures

- 13.6 In order to update the graphic information previously issued with the 2022 EIA Report, a revised Figure has been produced for the SEI, as follows:
- **SEI Figure 13.1: Location of Noise Measurement Positions, Noise Sensitive Receptors and Turbines.**

CUMULATIVE BASELINE UPDATE

- 13.7 Since the 2022 Kirkton Energy Park application the cumulative wind farm situation in the study area has changed. The relevant changes to the cumulative context since the 2022 Kirkton Energy Park application are as follows:
- Melvich Wind Energy Hub (application): Located approximately 2km north of the proposed development. 12 wind turbines at 149.9m to tip height, 83.3m hub height;
 - Armadale Wind Farm (application – layout amendment);
 - Pentland Offshore Wind Farm (consented); and
 - West of Orkney Offshore Wind Farm (Scoping), (as noted in previous SEI chapters, this project has now seen a full application submitted, however it is not considered that the full application would change the conclusions of the assessment on cumulative effects presented in this SEI chapter).
- 13.8 As set out in the Institute of Acoustics document '*A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*' (IOA GPG), cumulative wind turbine noise impacts must be considered and are limited to developments that produce a total noise of 35dB L_{A90} or greater at a Noise Sensitive Receptor (NSR) and the individual noise contributions from each of the wind farms are within 10dB.
- 13.9 In the case of the proposed development, only Melvich Energy Hub has the potential to satisfy the IOA GPG criteria and therefore influence the cumulative noise. The others wind farms are more distant. Therefore, further consideration has been given to the potential cumulative noise impacts of Melvich Energy Hub only.

ASSESSMENT OF EFFECTS

- 13.10 The same assessment methodology as set out in **Chapter 13: Noise** of the EIA Report has been followed, including derived noise limits.
- 13.11 The updated predicted operational noise immission levels of the proposed development, noise limit and margin, at each of the identified receptors are presented in **Table 13-1** and **Table 13-2**, for the daytime and night-time periods respectively. A positive margin value indicates the turbine immission exceeds the limit and a negative value shows it is below the limit. The noise levels shown in these tables are predicted for a standardised 10m height wind speed range of 4 – 12ms⁻¹.

Table 13-1: Daytime Noise Assessment of the Proposed Development in Isolation

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|-------|-------|------|------|------|------|------|------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR01 | Immission | 23.4 | 28.9 | 33.1 | 35.2 | 35.2 | 35.2 | 35.2 | 35.2 | 35.2 | |
| | Limit | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | |
| | Margin | -21.6 | -16.1 | -11.9 | -9.8 | -9.8 | -9.8 | -9.8 | -9.8 | -9.8 | |
| NSR02 | Immission | 19.9 | 25.4 | 29.6 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | |

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|--------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR03 | Limit | 35.0 | 35.0 | 35.0 | 35.1 | 36.7 | 38.5 | 40.4 | 42.3 | 44.2 | |
| | Margin | -15.1 | -9.6 | -5.4 | -3.4 | -5.0 | -6.8 | -8.7 | -10.6 | -12.5 | |
| | Immission | 19.5 | 25.0 | 29.2 | 31.3 | 31.3 | 31.3 | 31.3 | 31.3 | 31.3 | |
| NSR04 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -15.5 | -10.0 | -5.9 | -5.2 | -6.9 | -8.9 | -11.1 | -13.5 | -16.0 | |
| | Immission | 20.9 | 26.4 | 30.6 | 32.7 | 32.7 | 32.7 | 32.7 | 32.7 | 32.7 | |
| NSR05 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -13.0 | -7.5 | -3.4 | -2.7 | -4.4 | -6.4 | -8.6 | -11.0 | -13.5 | |
| | Immission | 22.0 | 27.5 | 31.7 | 33.8 | 33.8 | 33.8 | 33.8 | 33.8 | 33.8 | |
| NSR06 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -15.5 | -10.7 | -7.4 | -6.5 | -7.9 | -9.5 | -11.4 | -13.4 | -15.6 | |
| | Immission | 22.9 | 28.4 | 32.6 | 34.7 | 34.7 | 34.7 | 34.7 | 34.7 | 34.7 | |
| NSR07 | Limit | 38.4 | 39.1 | 40.0 | 41.2 | 42.6 | 44.2 | 46.1 | 48.1 | 50.3 | |
| | Margin | -15.5 | -10.7 | -7.4 | -6.5 | -7.9 | -9.5 | -11.4 | -13.4 | -15.6 | |
| | Immission | 24.0 | 29.5 | 33.7 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | |
| NSR08 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -11.0 | -5.5 | -1.4 | -0.7 | -2.4 | -4.4 | -6.6 | -9.0 | -11.5 | |
| | Immission | 24.2 | 29.7 | 33.9 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | |
| NSR09 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -10.8 | -5.3 | -1.2 | -0.5 | -2.2 | -4.2 | -6.4 | -8.8 | -11.3 | |
| | Immission | 24.1 | 29.6 | 33.8 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | |
| NSR10 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -10.9 | -5.4 | -1.3 | -0.6 | -2.3 | -4.3 | -6.5 | -8.9 | -11.4 | |
| | Immission | 23.6 | 29.1 | 33.3 | 35.4 | 35.4 | 35.4 | 35.4 | 35.4 | 35.4 | |
| NSR11 | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -11.4 | -5.9 | -1.8 | -1.1 | -2.8 | -4.8 | -7.0 | -9.4 | -11.9 | |
| | Immission | 23.9 | 29.4 | 33.6 | 35.7 | 35.7 | 35.7 | 35.7 | 35.7 | 35.7 | |
| NSR12 | Limit | 35.0 | 35.0 | 36.0 | 37.6 | 39.3 | 41.1 | 42.7 | 44.1 | 45.2 | |
| | Margin | -11.1 | -5.6 | -2.4 | -1.9 | -3.6 | -5.4 | -7.0 | -8.4 | -9.5 | |
| | Immission | 22.1 | 27.6 | 31.8 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | |
| NSR13 | Limit | 35.0 | 35.0 | 36.0 | 37.6 | 39.3 | 41.1 | 42.7 | 44.1 | 45.2 | |
| | Margin | -12.9 | -7.4 | -4.2 | -3.7 | -5.4 | -7.2 | -8.8 | -10.2 | -11.3 | |
| | Immission | 22.5 | 28.0 | 32.2 | 34.3 | 34.3 | 34.3 | 34.3 | 34.3 | 34.3 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -12.5 | -7.0 | -2.9 | -2.2 | -3.9 | -5.9 | -8.1 | -10.5 | -13.0 | |

Table 13-2: Night-time Noise Assessment of the Proposed Development in Isolation

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|--------------|--------------|-------------|-------------|-------------|-------------|--------------|--------------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR01 | Immission | 23.4 | 28.9 | 33.1 | 35.2 | 35.2 | 35.2 | 35.2 | 35.2 | 35.2 | |
| | Limit | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | |
| | Margin | -21.6 | -16.1 | -11.9 | -9.8 | -9.8 | -9.8 | -9.8 | -9.8 | -9.8 | |
| NSR02 | Immission | 19.9 | 25.4 | 29.6 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 39.8 | 41.8 | 43.9 | |
| | Margin | -18.1 | -12.6 | -8.4 | -6.3 | -6.3 | -6.3 | -8.1 | -10.1 | -12.2 | |

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|-------|------|------|------|------|-------|-------|-------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR03 | Immission | 19.5 | 25.0 | 29.2 | 31.3 | 31.3 | 31.3 | 31.3 | 31.3 | 31.3 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -18.5 | -13.0 | -8.8 | -6.7 | -6.7 | -7.1 | -9.3 | -11.8 | -14.4 | |
| NSR04 | Immission | 20.9 | 26.4 | 30.6 | 32.7 | 32.7 | 32.7 | 32.7 | 32.7 | 32.7 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -17.1 | -11.6 | -7.4 | -5.3 | -5.3 | -5.7 | -7.9 | -10.4 | -13.0 | |
| NSR05 | Immission | 22.0 | 27.5 | 31.7 | 33.8 | 33.8 | 33.8 | 33.8 | 33.8 | 33.8 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -16.0 | -10.5 | -6.3 | -4.2 | -4.2 | -4.6 | -6.8 | -9.3 | -11.9 | |
| NSR06 | Immission | 22.9 | 28.4 | 32.6 | 34.7 | 34.7 | 34.7 | 34.7 | 34.7 | 34.7 | |
| | Limit | 40.3 | 40.5 | 41.0 | 41.8 | 42.9 | 44.3 | 45.9 | 47.8 | 49.9 | |
| | Margin | -17.4 | -12.1 | -8.4 | -7.1 | -8.2 | -9.6 | -11.2 | -13.1 | -15.2 | |
| NSR07 | Immission | 24.0 | 29.5 | 33.7 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -14.0 | -8.5 | -4.3 | -2.2 | -2.2 | -2.6 | -4.8 | -7.3 | -9.9 | |
| NSR08 | Immission | 24.2 | 29.7 | 33.9 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -13.8 | -8.3 | -4.1 | -2.0 | -2.0 | -2.4 | -4.6 | -7.1 | -9.7 | |
| NSR09 | Immission | 24.1 | 29.6 | 33.8 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -13.9 | -8.4 | -4.2 | -2.1 | -2.1 | -2.5 | -4.7 | -7.2 | -9.8 | |
| NSR10 | Immission | 23.6 | 29.1 | 33.3 | 35.4 | 35.4 | 35.4 | 35.4 | 35.4 | 35.4 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -14.4 | -8.9 | -4.7 | -2.6 | -2.6 | -3.0 | -5.2 | -7.7 | -10.3 | |
| NSR11 | Immission | 23.9 | 29.4 | 33.6 | 35.7 | 35.7 | 35.7 | 35.7 | 35.7 | 35.7 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.1 | 39.7 | 41.4 | 43.1 | 44.8 | |
| | Margin | -14.1 | -8.6 | -4.4 | -2.3 | -2.4 | -4.0 | -5.7 | -7.4 | -9.1 | |
| NSR12 | Immission | 22.1 | 27.6 | 31.8 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.1 | 39.7 | 41.4 | 43.1 | 44.8 | |
| | Margin | -15.9 | -10.4 | -6.2 | -4.1 | -4.2 | -5.8 | -7.5 | -9.2 | -10.9 | |
| NSR13 | Immission | 22.5 | 28.0 | 32.2 | 34.3 | 34.3 | 34.3 | 34.3 | 34.3 | 34.3 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -15.5 | -10.0 | -5.8 | -3.7 | -3.7 | -4.1 | -6.3 | -8.8 | -11.4 | |

- 13.12 It can be seen in **Table 13-1** and **Table 13-2** that the wind turbine noise immission level from the proposed development in isolation does not exceed the ETSU-R-97 noise limit at any receptor for any given wind speed and would therefore be not significant. The changes to the layout have resulted in a maximum increase in wind turbine noise immission level of 0.2 dB at any receptor when compared to the values presented in the EIA Report **Chapter 13: Noise**.
- 13.13 Further consideration is required for the cumulative noise impacts associated with the proposed development operating with Melvich Wind Energy Hub. As Melvich Wind Energy Hub planning application was submitted after the proposed development, its noise assessment contains a cumulative impact assessment of the two wind farms and concluded there to be no significant cumulative effect.

- 13.14 A separate cumulative assessment has been carried out using the same calculation parameters set out in the EIA Report **Chapter 13: Noise**, including the sound power data for the candidate turbine, Nordex N133, which have been modelled for Melvich Wind Energy Hub using a hub height of 83.3m.
- 13.15 The predicted operational cumulative noise immission levels of the proposed development and Melvich Wind Energy Hub, noise limit and margin, at each of the receptors are presented in **Table 13-3** and **Table 13-4**, for the daytime and night-time periods respectively. A positive margin value indicates the turbine immission exceeds the limit and a negative value shows it is below the limit. The noise levels shown in these tables are predicted for a standardised 10m height wind speed range of 4 – 12ms⁻¹.

Table 13-3: Daytime Cumulative Noise Assessment With Melvich Wind Farm

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|--------------|--------------|-------------|-------------|-------------|--------------|--------------|--------------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR01 | Immission | 23.6 | 29.6 | 34.2 | 36.3 | 36.3 | 36.3 | 36.3 | 36.3 | 36.3 | |
| | Limit | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | |
| | Margin | -21.4 | -15.4 | -10.8 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | |
| NSR02 | Immission | 20.4 | 27.1 | 32.0 | 34.1 | 34.1 | 34.1 | 34.1 | 34.1 | 34.1 | |
| | Limit | 35.0 | 35.0 | 35.0 | 35.1 | 36.7 | 38.5 | 40.4 | 42.3 | 44.2 | |
| | Margin | -14.6 | -7.9 | -3.0 | -1.0 | -2.6 | -4.4 | -6.3 | -8.2 | -10.1 | |
| NSR03 | Immission | 20.0 | 26.8 | 31.8 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -15.0 | -8.2 | -3.3 | -2.6 | -4.3 | -6.3 | -8.5 | -10.9 | -13.4 | |
| NSR04 | Immission | 21.2 | 27.6 | 32.4 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -13.8 | -7.4 | -2.7 | -2.0 | -3.7 | -5.7 | -7.9 | -10.3 | -12.8 | |
| NSR05 | Immission | 22.1 | 28.0 | 32.5 | 34.6 | 34.6 | 34.6 | 34.6 | 34.6 | 34.6 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -12.9 | -7.0 | -2.6 | -1.9 | -3.6 | -5.6 | -7.8 | -10.2 | -12.7 | |
| NSR06 | Immission | 22.9 | 28.5 | 32.8 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | |
| | Limit | 38.4 | 39.1 | 40.0 | 41.2 | 42.6 | 44.2 | 46.1 | 48.1 | 50.3 | |
| | Margin | -15.5 | -10.6 | -7.2 | -6.3 | -7.7 | -9.3 | -11.2 | -13.2 | -15.4 | |
| NSR07 | Immission | 24.0 | 29.6 | 33.8 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -11.0 | -5.4 | -1.3 | -0.6 | -2.3 | -4.3 | -6.5 | -8.9 | -11.4 | |
| NSR08 | Immission | 24.2 | 29.7 | 34.0 | 36.1 | 36.1 | 36.1 | 36.1 | 36.1 | 36.1 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -10.8 | -5.3 | -1.1 | -0.4 | -2.1 | -4.1 | -6.3 | -8.7 | -11.2 | |
| NSR09 | Immission | 24.1 | 29.7 | 33.9 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -10.9 | -5.3 | -1.2 | -0.5 | -2.2 | -4.2 | -6.4 | -8.8 | -11.3 | |
| NSR10 | Immission | 23.6 | 29.2 | 33.5 | 35.6 | 35.6 | 35.6 | 35.6 | 35.6 | 35.6 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -11.4 | -5.8 | -1.6 | -0.9 | -2.6 | -4.6 | -6.8 | -9.2 | -11.7 | |
| NSR11 | Immission | 23.9 | 29.5 | 33.7 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | |
| | Limit | 35.0 | 35.0 | 36.0 | 37.6 | 39.3 | 41.1 | 42.7 | 44.1 | 45.2 | |
| | Margin | -11.1 | -5.5 | -2.3 | -1.8 | -3.5 | -5.3 | -6.9 | -8.3 | -9.4 | |

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|------|------|------|------|------|------|-------|-------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR12 | Immission | 22.1 | 27.6 | 31.9 | 34.0 | 34.0 | 34.0 | 34.0 | 34.0 | 34.0 | |
| | Limit | 35.0 | 35.0 | 36.0 | 37.6 | 39.3 | 41.1 | 42.7 | 44.1 | 45.2 | |
| | Margin | -12.9 | -7.4 | -4.1 | -3.6 | -5.3 | -7.1 | -8.7 | -10.1 | -11.2 | |
| NSR13 | Immission | 22.6 | 28.2 | 32.4 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| | Limit | 35.0 | 35.0 | 35.1 | 36.5 | 38.2 | 40.2 | 42.4 | 44.8 | 47.3 | |
| | Margin | -12.4 | -6.8 | -2.7 | -2.0 | -3.7 | -5.7 | -7.9 | -10.3 | -12.8 | |

Table 13-4: Night-time Cumulative Noise Assessment with Melvich Wind Farm

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|-------|-------|------|------|------|-------|-------|-------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| NSR01 | Immission | 23.6 | 29.6 | 34.2 | 36.3 | 36.3 | 36.3 | 36.3 | 36.3 | 36.3 | |
| | Limit | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | |
| | Margin | -21.4 | -15.4 | -10.8 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | -8.7 | |
| NSR02 | Immission | 20.4 | 27.1 | 32.0 | 34.1 | 34.1 | 34.1 | 34.1 | 34.1 | 34.1 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 39.8 | 41.8 | 43.9 | |
| | Margin | -17.6 | -10.9 | -6.0 | -3.9 | -3.9 | -3.9 | -5.7 | -7.7 | -9.8 | |
| NSR03 | Immission | 20.0 | 26.8 | 31.8 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -18.0 | -11.2 | -6.2 | -4.1 | -4.1 | -4.5 | -6.7 | -9.2 | -11.8 | |
| NSR04 | Immission | 21.2 | 27.6 | 32.4 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -16.8 | -10.4 | -5.6 | -3.5 | -3.5 | -3.9 | -6.1 | -8.6 | -11.2 | |
| NSR05 | Immission | 22.1 | 28.0 | 32.5 | 34.6 | 34.6 | 34.6 | 34.6 | 34.6 | 34.6 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -15.9 | -10.0 | -5.5 | -3.4 | -3.4 | -3.8 | -6.0 | -8.5 | -11.1 | |
| NSR06 | Immission | 22.9 | 28.5 | 32.8 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | |
| | Limit | 40.3 | 40.5 | 41.0 | 41.8 | 42.9 | 44.3 | 45.9 | 47.8 | 49.9 | |
| | Margin | -17.4 | -12.0 | -8.2 | -6.9 | -8.0 | -9.4 | -11.0 | -12.9 | -15.0 | |
| NSR07 | Immission | 24.0 | 29.6 | 33.8 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | 35.9 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -14.0 | -8.4 | -4.2 | -2.1 | -2.1 | -2.5 | -4.7 | -7.2 | -9.8 | |
| NSR08 | Immission | 24.2 | 29.7 | 34.0 | 36.1 | 36.1 | 36.1 | 36.1 | 36.1 | 36.1 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -13.8 | -8.3 | -4.0 | -1.9 | -1.9 | -2.3 | -4.5 | -7.0 | -9.6 | |
| NSR09 | Immission | 24.1 | 29.7 | 33.9 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -13.9 | -8.3 | -4.1 | -2.0 | -2.0 | -2.4 | -4.6 | -7.1 | -9.7 | |
| NSR10 | Immission | 23.6 | 29.2 | 33.5 | 35.6 | 35.6 | 35.6 | 35.6 | 35.6 | 35.6 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -14.4 | -8.8 | -4.5 | -2.4 | -2.4 | -2.8 | -5.0 | -7.5 | -10.1 | |
| NSR11 | Immission | 23.9 | 29.5 | 33.7 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.1 | 39.7 | 41.4 | 43.1 | 44.8 | |
| | Margin | -14.1 | -8.5 | -4.3 | -2.2 | -2.3 | -3.9 | -5.6 | -7.3 | -9.0 | |
| NSR12 | Immission | 22.1 | 27.6 | 31.9 | 34.0 | 34.0 | 34.0 | 34.0 | 34.0 | 34.0 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.1 | 39.7 | 41.4 | 43.1 | 44.8 | |

| NSR | Detail | Standardised 10m Height Wind speed, ms ⁻¹ | | | | | | | | | |
|-------|-----------|--|-------|------|------|------|------|------|------|-------|--|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| | Margin | -15.9 | -10.4 | -6.1 | -4.0 | -4.1 | -5.7 | -7.4 | -9.1 | -10.8 | |
| NSR13 | Immission | 22.6 | 28.2 | 32.4 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| | Limit | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.4 | 40.6 | 43.1 | 45.7 | |
| | Margin | -15.4 | -9.8 | -5.6 | -3.5 | -3.5 | -3.9 | -6.1 | -8.6 | -11.2 | |

- 13.16 It can be seen in **Table 13-3** and **Table 13-4** that the cumulative wind turbine noise immission level from the proposed development and Melvich Wind Energy Hub does not exceed the ETSU-R-97 noise limit at any receptor for any given wind speed and would therefore be not significant.

SUMMARY OF CHANGES TO THE SIGNIFICANCE OF EFFECTS

- 13.8 The relocation of Turbine No.7, together with the changing status of wind farms in the cumulative study, would result in no change to the significance of effects assessed in **Chapter 13: Noise** of the EIA Report.

CONCLUSIONS

- 13.6 Bow Acoustics, under the direction of SLR, has been commissioned by the applicant to undertake a review of the noise implications that could arise from the relocation of Turbine No.7, together with those as a result of the changing status and design of wind farms in the cumulative study.
- 13.9 Using the same methodology as set out in **Chapter 13: Noise** of the EIA Report, this SEI Chapter reassesses the noise effects of the proposed development. On the subject of noise, there remains no significant effect of the proposed development in isolation and when operating cumulatively with Melvich Wind Energy Hub. Other, more distant cumulative wind farms have been considered and would not contribute to the overall wind turbine cumulative noise level.