The Great Grid Upgrade

North Humber to High Marnham

NHHM-AEC-CNS-REP-0113

North Humber to High Marnham

Volume 6: Environmental Statement

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1. Operational Overhead Line Noise Assessment

1.1 Introduction

1.1.1 This appendix to **Application Document 6.16 Chapter 16 Noise and Vibration** for the North Humber to High Marnham Project (the Project) provides evidence to support scoping out operational noise from the proposed overhead line from the Environmental Statement (ES) for lines where 'triple Araucaria' conductor type would be used and provides information to demonstrate that any noise that may occur during the operation of the proposed overhead line would be not significant. Additionally, an assessment of operational noise is presented for the short stretch of proposed overhead line over the River Ouse, where flexibility in design is required and 'triple Araucaria' may not be used, and one location where there is a realignment of the existing ZDA overhead line where a 'diamond duck under' is proposed between existing pylons ZDA119A and ZDA120C to accommodate the Project.

1.1.2 Operational noise from the proposed overhead line was proposed to be scoped out within **Application Document 6.5.A1 Appendix 5.1 Environmental Impact Assessment (EIA) Scoping Report** as the system would use 'triple Araucaria' conductors or alternative technology that performs to the same or better standard in relation to noise on standard and low height lattice pylons for reducing operational noise, as reported in **Application Document 6.4 Chapter 4 Description of the Project**. This would be regarded as practically quiet. In addition, pylon fittings, such as insulators, dampers, spacers and clamps, are designed and procured in accordance with a series of National Grid Technical Specifications and must be type registered. These processes reduce the potential for audible noise and tones to occur from all types of fittings, including insulators. These embedded measures are set out in commitments DE5 and DE12 of **Application Document 7.3 Register of Environmental Actions and Commitments**.

1.1.3 **Application Document 6.5.A1 Appendix 5.1 Environmental Impact Assessment (EIA) Scoping Report** concluded that operational noise from the proposed overhead line was therefore not likely to be significant at nearby noise sensitive receptors (NSRs) under any weather conditions. The Planning Inspectorate confirmed in **Application Document 6.5.A2 Appendix 5.2 Scoping Opinion** in response ID 3.10.3, that they agreed with scoping out operational noise from the proposed overhead line as there was unlikely to be a significant effect, on the basis of the embedded measures set out in **Application Document 6.5.A1 Appendix 5.1 Environmental Impact Assessment (EIA) Scoping Report**.

1.1.4 Subsequent to **Application Document 6.5.A1 Appendix 5.1 Environmental Impact Assessment (EIA) Scoping Report** and **Application Document 6.5.A2 Appendix 5.2 Scoping Opinion**, the Project has identified the River Ouse crossing as a location where flexibility in design is required, and 'triple Araucaria' may not be used between proposed pylons 4AF76 and 4AF80. This appendix therefore presents an assessment of operational noise from these spans of the proposed overhead line at nearby NSRs based on the worst-case potential conductor type.

1.1.5 Where modifications for existing transmission overhead lines are required, like for like conductors are proposed. No change in noise is therefore expected in these situations where there is no change to the alignment of the overhead line, and no further assessment has been undertaken. However, there is one location where there is a realignment of the existing ZDA overhead line where a 'diamond duck under' is proposed between existing pylons ZDA119A and ZDA120C to accommodate the Project. Operational noise impacts due to this realignment have therefore been assessed in this appendix.

1.2 Background

Noise from Overhead Lines

1.2.1 Noise from high voltage overhead lines is primarily due to a phenomenon called corona discharge. Line noise is generated when the conductor surface voltage gradient (electric stress, or Emax expressed in kilovolts per centimetre (kV/cm)) exceeds the inception level for corona discharge activity which is released as acoustic energy and radiates into the air as sound.

1.2.2 In the United Kingdom (UK), the corona inception level is regarded to occur when electric stress is in the range 17 to 20 kV/cm. Whilst most high voltage overhead lines are designed to operate below this level, those that operate close to this may produce audible noise when enhancement of conductor surface electric stress occurs due to rainfall (wet noise) or the presence of conductor surface contamination (dry noise). Overhead lines that operate significantly below the corona inception level are much less likely to produce audible noise.

1.2.3 When it occurs, overhead line noise can be described as a 'crackle', which is sometimes accompanied by a tonal 'hum' in wet conditions. The highest noise levels generated by an overhead line generally occur during rainfall and therefore the occurrence of wet noise is considered worst-case.

Embedded Measures

1.2.4 National Grid has committed to embedded mitigation in the form of a 'triple Araucaria' conductor system or alternative technology that performs to the same or better standard in relation to noise on standard lattice pylons for reducing operational noise, with the exception of the overhead line crossing of the River Ouse between pylons 4AF76 to 4AF80. Due to its geometrical configuration the 'triple Araucaria' design is the least electrically stressed conductor system that National Grid uses. The maximum conductor surface electrical stress level of 'triple Araucaria' on a lattice pylon is approximately 12 kV/cm when operated at 400 kV. This is significantly below the corona inception level and is the best design available for reducing the effects of dry and wet noise from the proposed 400 kV overhead line during operation.

National Grid Technical Guidance

1.2.5 National Grid has a suite of documents relating to the management of audible noise from its overhead lines. These documents are described in Table 1.1.

Table 1.1 – National Grid Technical Guidance Documents

Document	Description
Policy Statement PS(T)134 - Operational Audible Noise Policy for Overhead Lines (National Grid, 2021)	The policy describes a three-tier assessment process and sets noise impact criteria against which predicted levels of noise from operational overhead lines can be assessed.
Technical Report TR(E)564 - Development of Method for Assessing the Impact of Noise from Overhead Lines (New Build, Reconductoring, Diversion and Uprating) (National Grid, 2021)	Explains how the noise criteria presented in PS(T)134 were developed, taking into account the UK noise policy context and UK national and international guidance, including World Health Organisation (WHO) guidelines (WHO, 1999) and evidence for health effects.
Technical Guidance Note TGN(E)322 - Operational Audible Noise Assessment Process for Overhead Lines (New Build, Reconductoring, Diversion and Uprating) (National Grid, 2021)	Applies to environmental noise due to the operation of new overhead lines, reconductoring, diversion and uprating projects for overhead lines operated at 275 kV and 400 kV.

1.2.6 TGN(E)322 (National Grid, 2021) describes a method for predicting the environmental impact due to audible noise caused by new, reconductored, diverted or uprated overhead transmission lines. The method uses internationally recognised line noise prediction methodology to calculate noise emission levels based on operating voltage, conductor design and pylon geometry. TGN(E)322 (National Grid, 2021) also sets out noise criteria against which predicted levels of noise from operational overhead lines can be assessed.

1.2.7 TGN(E)322 (National Grid, 2021) criteria apply a +6 decibel (dB) character correction to wet noise effects to account for the additional 'hum' generated during worst-case wet weather conditions and a +3 dB correction to dry noise effects to account for the 'crackle'. This means that the assessment method is consistent with guidance contained in Section 9 of British Standard 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS 4142) (BSI, 2019), which takes account of acoustic features by applying a character correction to the specific sound level to calculate a BS 4142 (BSI, 2019) rating level.

1.2.8 The overhead line noise assessment process set out in TGN(E)322 (National Grid, 2021) follows a three-tier 'screening' approach based on predicted source noise level and the distance to NSRs. If predicted worst case wet-noise levels exceed the threshold values during the Tier 1 assessment, a Tier 2 assessment would be undertaken. If predicted noise levels exceed the threshold values during the Tier 2 assessment, a Tier 3 assessment would be undertaken. The three-tier approach comprises the following steps which are designed to screen NSRs out of further assessment where there would be no adverse impact:

- **Tier 1**: A primary screening step based on 'worst-case' absolute wet noise effects and the pre-determined assessment criteria set out in TGN(E)322 (National Grid, 2021);
- **Tier 2**: A further screening step based on combined absolute wet noise and dry noise effects and recalculated assessment criteria. This step takes account of the

fact that wet noise occurs only during periods of wet weather and therefore does not occur all the time. The Tier 2 assessment therefore takes account of the number of local rainfall hours, which varies across the UK; and

- **Tier 3**: Full assessment following the principles of BS 4142 (BSI, 2019) for both wet noise and dry noise.

1.2.9 Noise criteria have been set taking account of the UK policy context and evidence from multiple sources, including the WHO guidelines (WHO, 1999) and BS 4142 (BSI, 2019), for noise and associated health impacts. The criteria have been developed by National Grid based on health impact data associated with the night-time period. The night-time period is considered more sensitive than the daytime, as background sound levels are normally lower and people are trying to sleep. National Grid Technical Report TR(E)564 (National Grid, 2021) explains the reasoning behind the noise criteria set out in TGN(E)322 (National Grid, 2021).

1.3 Assessment – Triple Araucaria

Tier 1 Assessment Criteria

1.3.1 The Tier 1 Assessment criteria set out in TGN(E)322 (National Grid, 2021) are shown in Table 1.2. The 'No Adverse Impact' criteria applicable to residential NSRs for worst-case wet weather noise is 34 dBA. In the case of the Tier 1 assessment, this is a rating level which includes a +6 dB character correction to account for the occurrence of transmission line 'hum' in wet weather. The criteria for NSRs that may be regarded as highly sensitive to noise (for example vulnerable subgroups as defined by the WHO (WHO, 1999)) is 5 dB lower, while the criteria for NSRs that may be regarded as less sensitive to noise (for example those not used at night and those used for commercial purposes) is 5 dB higher.

Table 1.2 – Tier 1 Noise Impact Criteria (Wet Noise) from PS(T)134

NSR Group	No Adverse Impact (Screened Out)	Further Assessment Necessary (Tier 2 Assessment Required)
Vulnerable subgroups	< 29 dBA	≥ 29 dBA
Residential	< 34 dBA	≥ 34 dBA
Schools and hotels	< 39 dBA	≥ 39 dBA

1.3.2 For the purposes of the Tier 1 assessment, 34 dBA is considered to be the Lowest Observed Adverse Effect Level (LOAEL) for residential NSRs used for sleeping at night. These levels are free-field and apply at the façade of an NSRs. Where vulnerable subgroups are present, the LOAEL is 29 dBA.

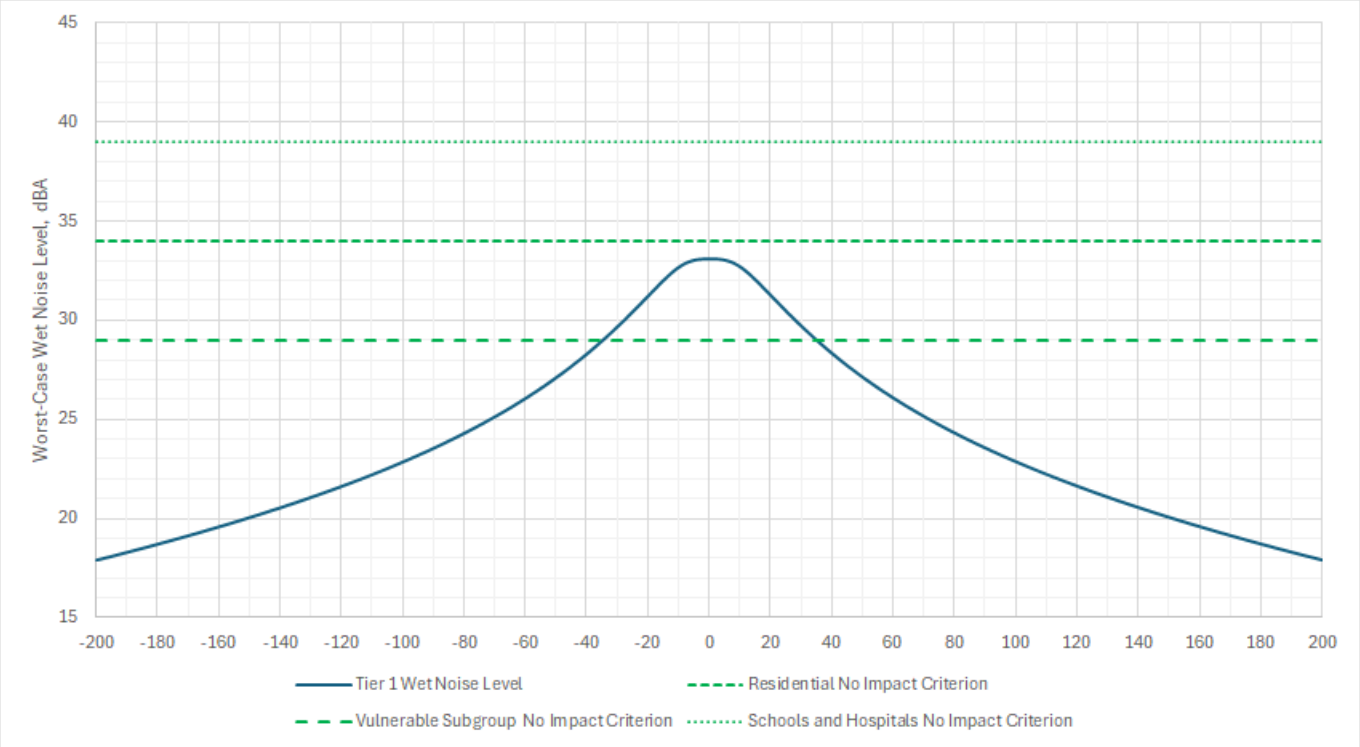
Tier 1 Wet Noise Prediction – Triple Araucaria

1.3.3 Worst-case wet noise levels for the proposed 'triple Araucaria' conductor system have been predicted using the proprietary overhead line noise prediction software EFC-400. This software is widely used across the electricity industry to calculate conductor surface

electrical stress, to assess compliance with electric and magnetic field guidelines and to predict overhead line noise levels under a range of weather conditions.

1.3.4 Image 1.1 shows the predicted worst-case wet noise levels at distances up to 200 m either side of the proposed overhead line alignment and the Tier 1 No Adverse Impact assessment criteria for each of the three NSR groups (green dashed lines).

Image 1.1 – EFC-400 Wet Noise Prediction for Proposed Overhead Line (Tier 1 Screening) – Triple Araucaria



1.3.5 The predicted noise levels are below the No Adverse Impact Criteria for the residential, and school and hospitals NSR groups, even directly underneath the overhead line during worst-case conditions. The No Adverse Impact Criteria would be exceeded during worst-case conditions for vulnerable subgroups within approximately 40 m of the overhead line centre line. However, there are no such subgroups located within this distance, even taking account of the Limits of Deviation (LoD) which may allow lateral movement of the pylons by up to 30 m.

1.3.6 This assessment is conservative, as it assumes wet noise (and hence hum and associated worst-case 6 dB penalty) would occur 100 percent of the time.

1.3.7 The Tier 1 assessment therefore concludes that the predicted worst-case noise rating level for operational noise at all NSRs due to the proposed overhead line fitted with 'triple Araucaria' conductors would be below the 'No Adverse Impact' assessment criteria set out in TGN(E)322 (National Grid, 2021) for all nearby NSRs and therefore there is no requirement to undertake a Tier 2 or Tier 3 assessment.

1.3.8 Operational noise from the proposed overhead line fitted with 'triple Araucaria' conductors would therefore be not significant. It is therefore justified that operational noise from the proposed overhead line fitted with 'triple Araucaria' conductors remains scoped out of the assessment in accordance with **Application Document 6.5.A2 Appendix 5.2 Scoping Opinion**.

1.4 Assessment – River Ouse Crossing

1.4.1 The Project has identified the River Ouse crossing as a location where flexibility in design is required, and 'triple Araucaria' may not be used between proposed pylons 4AF76 and 4AF80. The conductor type has not yet been identified. However, it is likely to be either 'twin Warwick' or 'twin Bersfort'. The worst-case of these two options with regards to operational noise would be 'twin Warwick' and this is assumed in the assessment.

Tier 2 Assessment Criteria

1.4.2 The Tier 1 No Adverse Impact Criteria assessment criteria is likely to be exceeded at nearby NSRs, the nearest of which being approximately 80 m to the west of the proposed overhead line centre line at Ousefleet (R_2150), as shown in **Application Document 6.16.F1 Figure 16.1 Noise and Vibration Baseline** (sheet 4). As such a Tier 2 assessment has been undertaken to account for combined average wet and dry overhead line noise taking account of the duration of rainfall in the area of the NSR.

1.4.3 The Tier 2 Assessment criteria set out in TGN(E)322 (National Grid, 2021) are set out in Table 1.3. The values vary from the Tier values presented in Table 1.2 due to the difference in acoustic character correction between dry and wet conditions also being averaged over the year depending on the rain fall hours.

Table 1.3 – Tier 2 Noise Impact Criteria (Combined Wet and Dry Noise), from TGN(E)322 – Rainfall hours of 600 per year

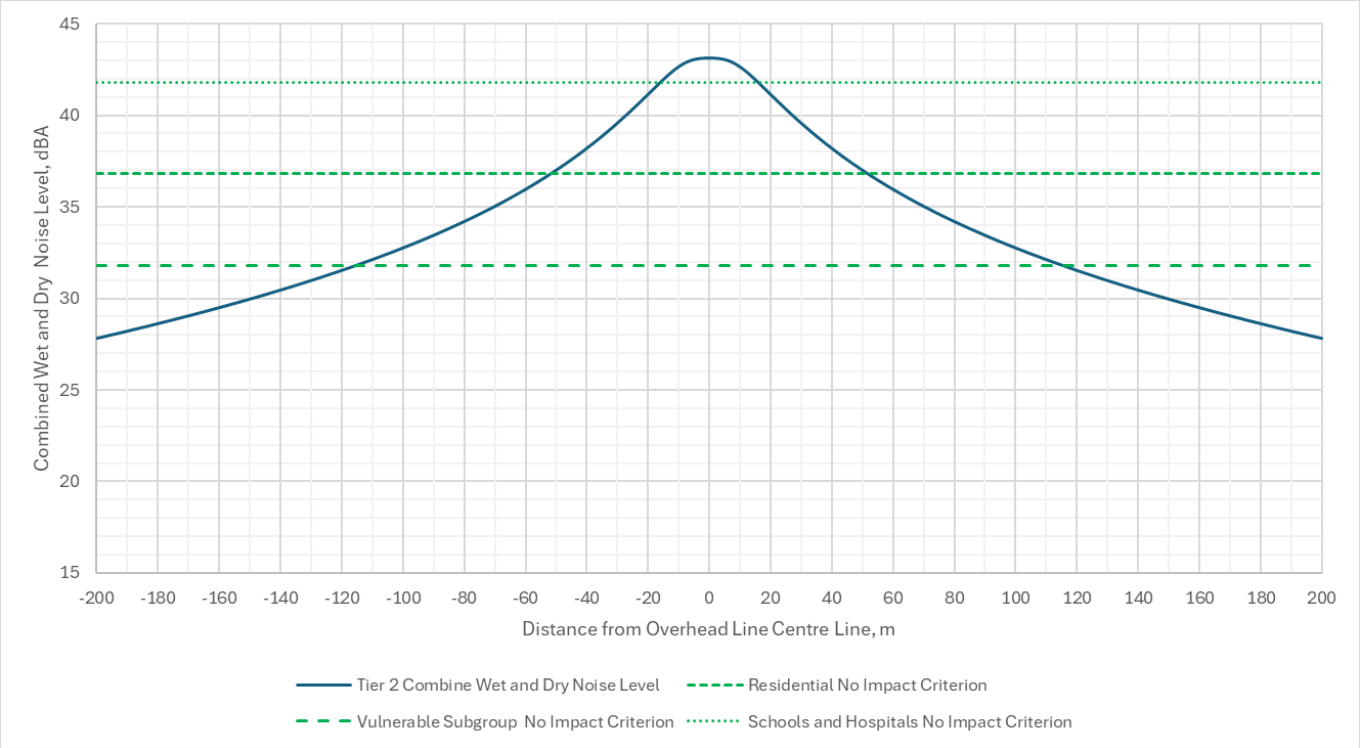
NSR Group	No Adverse Impact (Screened Out)	Further Assessment Necessary (Tier 3 Assessment Required)
Vulnerable subgroups	< 31.8 dBA	≥ 31.8 dBA
Residential	< 36.8 dBA	≥ 36.8 dBA
Schools and hotels	< 41.8 dBA	≥ 41.8 dBA

Tier 2 Combined Wet and Dry Noise – Twin Warwick

1.4.4 Dry and worst-case wet noise levels for the proposed 'twin Warwick' conductor system have been predicted using the proprietary overhead line noise prediction software EFC-400.

1.4.5 Image 1.2 shows the predicted combined wet and dry noise levels at distances up to 200 m either side of the proposed overhead line centre line. It also shows the Tier 2 No Adverse Impact assessment criteria for each of the three NSR groups (green dashed lines).

Image 1.2 – EFC-400 Wet Noise Prediction for Proposed Overhead Line (Tier 2 Screening) – Twin Warwick



1.4.6 No Adverse Impact is calculated beyond the following distances from the overhead line centre line for the various subgroups below :

- Residential: 52 m;
- Vulnerable subgroups: 166 m; and
- Schools and hotels: 16 m.

1.4.7 There are no NSRs within any subgroup within the distances stated above from the centre line of the proposed overhead line. The nearest NSR to proposed pylons 4AF76 and 4AF80 at the River Ouse crossing is a residential NSR (R_2150) approximately 80 m to the west of the proposed overhead line centre line at Ousefleet, as shown in **Application Document 6.16.F1 Figure 16.1 Noise and Vibration Baseline** (sheet 4).

1.4.8 Considering the potential flexibility available within the LoD for pylons to be positioned up to 30 m either side of the proposed overhead line centre line, the nearest NSR would be located approximately 50 m away. This is just within the 52 m Tier 2 threshold distance for residential receptors. As such, a Tier 3 assessment is required for the worst-case scenario where the pylons are located within 2 m of the western extreme of the LoD.

Tier 3 BS 4142 assessment – Twin Warwick

1.4.9 The TGN(E)322 (National Grid, 2021) Tier 3 assessment requires a BS 4142 (BSI, 2019) assessment of dry and wet noise during daytime and night-time periods. The assessment compares the noise rating level, which includes the applicable acoustic character correction, against the representative background sound level.

1.4.10 The greater the difference between the rating level and the background sound level; the greater the likelihood of complaints. The assessment criteria given by BS 4142 (BSI, 2019) are as follows:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse effect, depending on the context
- A difference of around +5 dB could be an indication of an adverse effect, depending on the context.

1.4.11 The lower the rating level is relative to the measured background sound level, the less likely it is that there would be an adverse effect. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low effect (in BS 4142 (BSI, 2019) terminology), depending on the context.

1.4.12 The assessment should also consider the context of the sound. Where the initial estimate of the effect needs to be modified due to the context, all pertinent factors should be considered, including:

- The absolute level of the sound
- The character and level of the residual sound compared to the character and level of the specific sound
- The sensitivity of the receptor, including whether dwellings already incorporate design measures that secure good internal and/or outdoor conditions, such as façade insulation treatment, ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation and acoustic screening.

1.4.13 Background sound levels for this NSR (R_2150) are taken from Noise Monitoring Position 5, as detailed in **Application Document 6.16.A2 Appendix 16.2 Baseline Noise Survey Data** and shown in **Application Document 6.16.F1 Figure 16.1 Noise and Vibration Baseline** (sheet 4). The representative 'dry' background sound levels at this location are:

- Daytime: 29 dB $L_{A90,15min}$; and
- Night-time: 23 dB $L_{A90,15min}$.

1.4.14 The 'wet' background sound level is derived from the logarithmic sum of the 'dry' background sound level and the Miller curve value for rainfall noise. This approach is taken because it is necessary to compare overhead line wet noise against the prevailing acoustic conditions during wet conditions. However, noise during rainfall cannot be reliably measured during noise surveys due to 'self' noise (e.g. the sound of rain falling on the microphone windshield). As such, TGN(E)322 (National Grid, 2021) requires that rainfall noise is added to the 'dry' background sound level using empirical Miller curve data. Miller curve values are provided in TGN(E)322 (National Grid, 2021) and are reproduced in Table 1.4.

Table 1.4 – Miller Curve values

Miller curve	Condition of ground and vegetation	Miller curve rainfall noise level, dBA, at a rainfall rate of 1.0 mm per hour
R1	Essentially bare, porous ground (ploughed field or snow-covered ground); no standing puddles of water. Relatively small-leafed ground cover vegetation, such as grass lawn, meadow, hay field shortly after mowing, field of small-leafed plants.	38
R2	Non-porous, hard, bare ground or pavement; falling raindrops splash on thin layers or puddles of collected water; or in/beside wooded area of deciduous trees without leaves or with only small leaves; or in/beside wooded area of coniferous trees or evergreens having needles rather than leaves; or thin-leafed ground cover or crop, such as hay, clover or grain.	41
R3	A few small, fully-leafed deciduous trees at 15 to 30 m or a few large, fully-leafed trees at 30 to 90 m.	44
R4	Large area of fully-leafed trees or large-leafed crops or vegetation, such as corn, starting at 15 to 30 m distance.	47
R5	Large area of fully-leafed trees or large-leafed crops or vegetation entirely surrounding the area of interest.	50

1.4.15 Based on the nature of the area, with the nearest NSR (R_2150) including trees in the external amenity space and well within 15 m of the building itself, Miller curve R3 is deemed appropriate for the NSR location. Based on this, the representative 'wet' background sound levels at this location are:

- Daytime: 44 dB $L_{A90,15min}$; and
- Night-time: 44 dB $L_{A90,15min}$.

1.4.16 The daytime and night-time 'wet' background sound levels are the same as the Miller curve rainfall noise level is dominant relative to the 'dry' background sound levels for both periods.

1.4.17 The specific 'twin Warwick' overhead line noise levels at a distance of 50 m are:

- Dry: 20 dB $L_{Aeq,T}$; and
- Wet: 43 dB $L_{Aeq,T}$.

1.4.18 A penalty of 3 dB shall be added to the dry noise level at the NSR to give a rating level. The penalty accounts for the character of the noise being readily identifiable. A penalty of 6 dB shall be added to the predicted OHL wet noise level to account for the character of wet noise hum being tonal to give a rating level. The 'twin Warwick' overhead line noise rating levels at a distance of 50 m are therefore:

- Dry: 23 dB $L_{Aeq,T}$; and
- Wet: 49 dB $L_{Aeq,T}$.

1.4.19 Based on the values stated above, a BS 4142 (BSI, 2019) assessment for the various scenarios is provided in Table 1.5.

Table 1.5 – Overhead line BS 4142 assessment (Twin Warwick at 50 m)

Scenario	Representative Background Sound Level, dB $L_{A90,15min}$	Overhead Line Noise Rating Level, dB $L_{Ar,15min}$	Excess of Rating Level above Background, dB	Impact Magnitude
Daytime, Dry	29	23	-6	Negligible
Night-time, Dry	23	23	0	Low
Daytime, Wet	44	49	+5	Medium, depending on context
Night-time, Wet	44	49	+5	Medium, depending on context

1.4.20 The Tier 3 assessment for ‘twin Warwick’ at the extent of the LoD closest to the nearest NSR indicates that there is a negligible to low magnitude impact during dry conditions, during daytime and night-time periods respectively. During wet conditions there is a potential medium magnitude impact during both daytime and night-time periods.

1.4.21 However, the TGN(E)322 (National Grid, 2021) assessment methodology requires the consideration of context when determining the overall effect of noise from overhead lines. In this location, wet conditions with rainfall above 0.2 mm/h only occur for approximately 6.8% of the time based on average rainfall hours data provided in TGN(E)322 (National Grid, 2021). The assessment is worst-case in this regard as the inception of ‘wet’ overhead line noise is only expected to occur at rainfall rates of 1.0 mm/s, which would be notably less than 6.8% of the time. Additionally, the increase in average noise levels over the course of a year is less than 1 dB during both daytime and night-time periods. This is a small magnitude increase in noise and not significant. Therefore, when considering context, the effect of operational noise from overhead lines at the River Ouse crossing is not significant, even considering the worst-case potential conductor type at the extent of the LoD closest to the nearest NSR.

1.4.22 Operational noise from the proposed overhead line between pylons 4AF76 and 4AF80 at the River Ouse crossing would therefore be not significant.

1.5 Assessment – Realignment of the Existing ZDA Overhead Line

1.5.1 Realignment of the existing ZDA overhead line is required to accommodate the Project. A ‘diamond duck under’ is proposed between existing pylons ZDA119A and ZDA120C. The realignment would involve reconductoring of the existing ZDA overhead line with a like for like replacement of ‘twin Rubus’ conductor.

Tier 2 Assessment Criteria

1.5.2 The Tier 1 No Adverse Impact Criteria assessment criteria is likely to be exceeded at nearby NSRs, and as such a Tier 2 assessment has been undertaken to account for combined average wet and dry overhead line noise taking account of the duration of rainfall in the area.

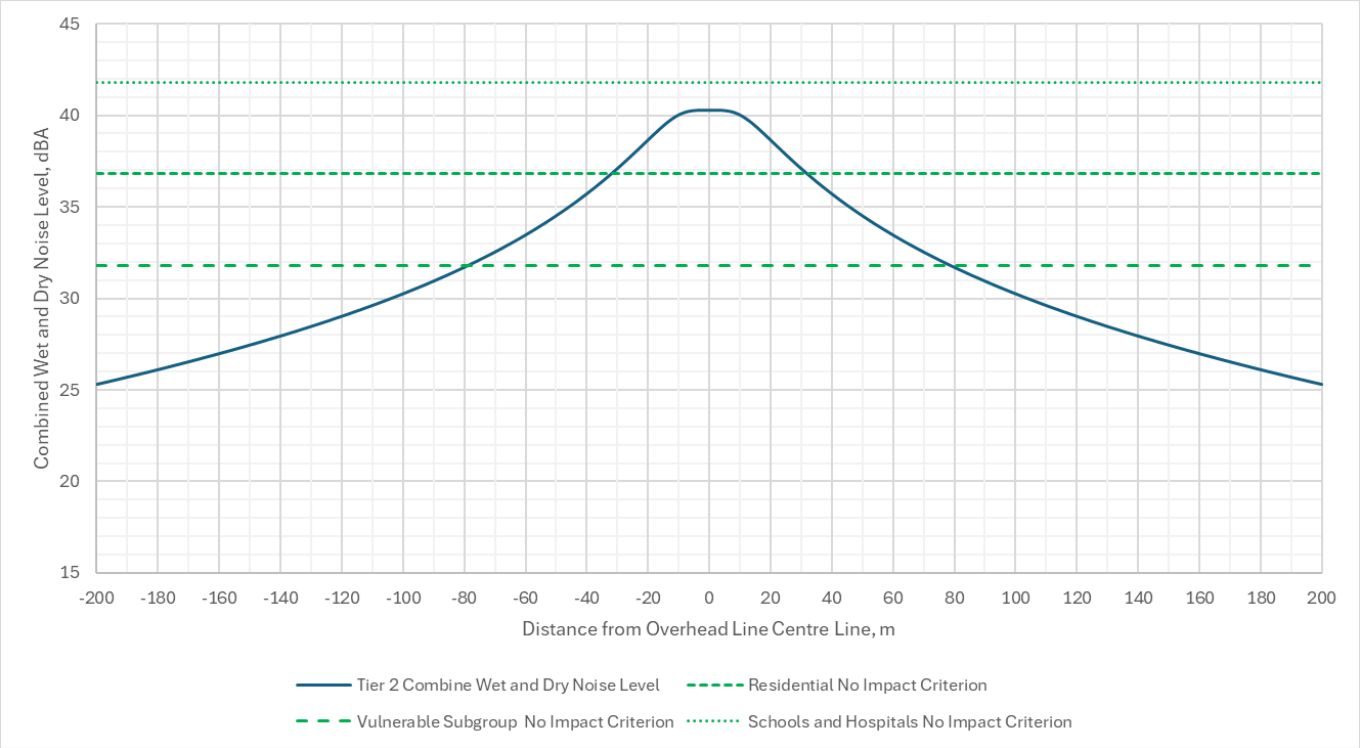
1.5.3 The Tier 2 Assessment criteria set out in PS(T)134 (National Grid, 2021) are set out in Table 1.3, above.

Tier 2 Combined Wet and Dry Noise Prediction – Twin Rubus

1.5.4 Dry and worst-case wet noise levels for the proposed ‘twin Rubus’ conductor system have been predicted using the proprietary overhead line noise prediction software EFC-400.

1.5.5 Image 1.3 shows the predicted worst-case wet noise levels at distances up to 200 m either side of the proposed overhead line alignment. It also shows the Tier 2 No Adverse Impact assessment criteria for each of the three NSR groups (green dashed lines).

Image 1.3 – EFC-400 Wet Noise Prediction for Proposed Overhead Line (Tier 2 Screening) – Twin Rubus



1.5.6 No Adverse Impact is calculated beyond the following distances from the overhead line centre line for the various subgroups below:

- Residential: 33 m;
- Vulnerable subgroups: 80 m; and
- Schools and hotels: Not exceeded, even directly underneath the proposed overhead line.

1.5.7 The nearest NSR is located approximately 200 m southwest of the overhead line centre line at Ealand. Additionally, considering the potential LoD for pylons of 30 m either side of the overhead line centre line, the nearest NSR would be located approximately 170 m away. As such, there are no NSRs within any subgroup within the distances stated above from the proposed overhead line centre line, even considering the LoD.

1.5.8 The Tier 2 assessment for 'twin Rubus' therefore concludes that the operational noise from the proposed realignment of the existing ZDA overhead line would be below the 'No Adverse Impact' assessment criteria set out in TGN(E)322 (National Grid, 2021) for all NSRs.

1.5.9 Operational noise from the proposed realignment of the existing ZDA overhead line would therefore be not significant.

1.6 Overhead Line Fixtures and Fittings

1.6.1 To be approved for use on the National Grid high voltage electricity transmission network, each fitting design must be 'Type Registered'. Type registration comprises a series of tests on the fitting in question to provide compliance with the relevant technical specification. These tests include performance requirements for corona

inception and audible noise on all fittings along with wind tunnel testing of insulators for audible tones generated by Aeolian mechanisms. These embedded measures are secured in commitment DE5 of **Application Document 7.3 Register of Environmental Actions and Commitments**

1.6.2 Once the fitting has been Type Registered and approved for use, a number of further tests are also carried out post-manufacture in the form of sample testing. This demonstrates that the fitting design conforms to the specification in the Type Registration document.

1.6.3 The Technical Specification and Type Registration processes reduce the potential for audible noise and tones to occur from all types of fittings, including insulators. Where noise does occur, it is likely to be localised and of short duration. If due to a fault, actions can be taken to rectify it. Where noise from fittings does occur, which results in a complaint, appropriate actions can be taken to seek to remedy the cause of the noise, usually through cleaning or replacement of the relevant fitting. Therefore, noise from fixtures and fittings remains scoped out in accordance with the **Application Document 6.5.A2 Appendix 5.2 Scoping Opinion**.

1.7 Operational noise effects on Public Right of Way (PRoW) users, canal and waterway users, and horses

1.7.1 There are potential effects from operational noise from overhead lines on PRoW users, canal users, and horses.

1.7.2 With regards to users of PRoWs, canals, and waterways effects would be temporary and short lived as users traverse close to overhead line and reduce as they move away from the overhead line. Effects of this type would not be significant.

1.7.3 With regard to horses, operational noise from overhead lines would be relatively low for all conductor types, even directly beneath the overhead line and during wet weather conditions. In addition, the noise would be steady and continuous in nature. While individual horses may be aware of the noise, significant disturbance or significant effects on horses are not anticipated.

1.8 Conclusions

1.8.1 This appendix presents the technical background to demonstrate that the effect of operational audible noise from the proposed overhead line would not be significant. This includes operational noise from: the proposed ‘triple Araucaria’ conductor, which is proposed for the majority of the route; the River Ouse crossing, where flexibility in design is required and ‘triple Araucaria’ may not be used; and the realignment of the existing ZDA route to accommodate the Project.

1.8.2 National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department for Energy Security & Net Zero, 2025) includes the requirement for the applicant to consider noise from overhead lines. Paragraphs 2.9.41 to 2.9.44 and 2.11.7 of that document provide guidance on what needs to be considered during the application and decision-making process. The evidence presented within this appendix is considered to satisfy the requirements of the relevant paragraphs in EN-5 (Department for Energy Security & Net Zero, 2025) and provides sufficient information to demonstrate that the residual noise impacts of the proposed overhead line would be not significant.

References

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