The Great Grid Upgrade

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Suffolk Operational Noise Assessment

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Version History

Date	Issue	Status	Description / Changes
March 2025	A	Final	For DCO submission
September 2025	B	Final	Update to reflect S89(3) Procedural Decision from the Examining Authority

1. Suffolk Operational Noise Assessment

1.1 Introduction

1.1.1 This appendix presents results of the operational noise assessment conducted as part of the Suffolk Onshore Scheme. The assessment considers the potential effects of operational noise from the proposed Saxmundham Converter Station on nearby noise sensitive receptors (NSR). The assessment is indicative and based on outline design information and is does not therefore provide a definitive indication of noise impacts from the proposed Saxmundham Converter Station. The assessment does, however, present an assessment of noise from a 'generic' converter station with standard noise mitigation measures applied. Further detailed design would be undertaken by the developer, if consent is granted, and noise would be considered as a design parameter, with specific mitigation measures applied. The assessment of operational noise from the proposed Saxmundham Converter Station presented in this appendix therefore represents a likely worst-case scenario.

1.1.2 The assessment draws on the findings of noise survey data detailed in **Application Document 6.3.2.9.A Appendix 2.9.A Suffolk Noise Survey Data**.

1.1.3 The Suffolk Onshore Scheme also includes a proposed substation at Friston. However, there are no notable sources of operational noise (e.g. transformers) at the proposed Friston substation, with plant items being auxiliary and emergency back-up items which are scoped out of assessment. However, at the request of the local authority, an informative noise assessment of sources scoped out of the ES, including auxiliary equipment (switchgear and emergency generator) at the proposed Friston Substation, and the changes to the existing overhead line due to the proposed introduction of Friston substation is provided in **Application Document 6.3.2.9.E Appendix 2.9.E Friston Substation and OHL Operational Noise Information (Informative)**.

1.2 Assessment Methodology

1.2.1 The assessment of operational noise has been conducted in accordance with British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142) (BSI, 2019). The assessment methodology was discussed and agreed with the environmental health department of East Suffolk Council.

1.2.2 BS 4142 is used to assess the potential significance of effects by comparing the 'rating level' of an industrial source to the typically representative 'background sound level' at the location of nearby NSR. Certain acoustic features can increase the potential for a sound to attract attention, and therefore increase its relative significance, than that expected from a simple comparison between the specific sound level and the background sound level. In particular, BS 4142 identifies noise that contains audible tonality, impulsivity and/or intermittency and recommends that a correction be added to the specific sound level. The specific sound level, along with any applicable correction, is referred to as the 'rating level'. It should be noted that the penalties can be additive (i.e., if they have a combination of tonal (e.g. whistling or humming) impulsive (e.g. hammering or banging) and intermittent (e.g. regularly turning on and off) acoustic characters.

1.2.3 Where tonality is audible at a receptor a penalty of between 0 and 6 dB may be applied. Subjectively, a 2 dB penalty may be applied where a tone is just perceptible, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

1.2.4 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 are as follows:

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

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

1.2.6 The assessment should also consider the context of the sound. Where the initial estimate of the impact 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; and
- 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.

1.2.7 With regards to the absolute level of the sound, BS 4142 states that where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background, particularly at night. Guidance on this matter is provided by:

- BS 4142;
- World Health Organization (WHO) Guidelines for Community Noise (GfCN) (WHO, 1999);
- WHO Night Noise Guidelines (NNG) (WHO, 2009);
- The Association of Noise Consultants (ANC) BS 4142:2014+A1:2019 Technical Note Version 1.0 (ANC, 2020);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233) (BSI, 2014);
- The Chartered Institude for Building Services Engineers (CIBSE) Environmental Design Guidance – Guide A (CIBSE, 2021); and
- Planning Practice Guidance for Noise, 2019 (PPGN) (HM Government, 2019).

1.2.8 The noise rating level will be compared to the background sound level to determine the magnitude of impact. The magnitude of impact of operational noise is determined against the criteria detailed in Table 1.1.

Table 1.1 Magnitude of impact of operational noise

Magnitude	Comparison of sound rating level and background sound level
Large	Rating level ≥ 10dB above the background sound level (significant observed adverse effect level (SOAEL)).
Medium	Rating level between 5 and 9 dB above background sound level (lowest observed adverse effect level (LOAEL)).
Small	Rating level between 0 and 4 dB above background sound level.
Negligible	Rating level below background sound level.

1.2.9 Although the above criteria are used to assess the magnitude of impact, it is standard practice to aim for a sound rating level not to exceed the background sound level, such that the impact is 'low' (as defined in BS 4142), or negligible in terms of the impact magnitude definition defined in Table 1.1 above. Additionally, the local authority aim is for the rating level to be at least 5 dB below the background sound level, where feasible.

1.2.10 Consideration will also be taken of context, as defined in BS 4142, for the final determination of significance; this is particularly the case for absolute noise levels.

1.3 Baseline Data

Introduction

1.3.1 This section details the baseline information used within the preliminary operational noise assessment.

1.3.2 The proposed Saxmundham Converter Station, study area, NSR locations, and noise survey locations, are shown in Plate 1.1.

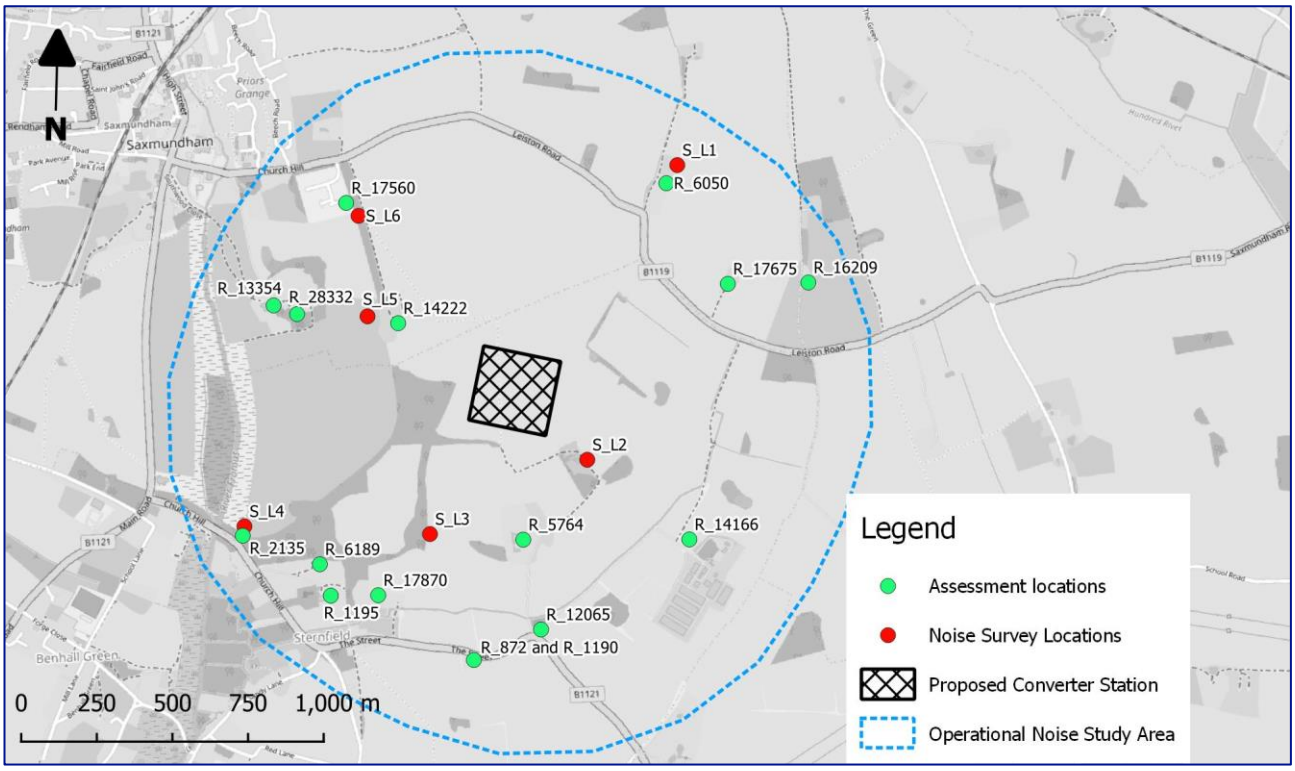

Plate 1.1 Suffolk Onshore Scheme operational noise baseline information

Study Area

1.3.3 The proposed study area for operational noise effects from converter stations, based on guidance from ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors (ISO 9613) (ISO, 2024), is an area within 1 km of the Saxmundham Converter Station, with a particular focus on the nearest NSR within that area.

Noise Sensitive Receptors

1.3.4 The proposed Saxmundham Converter Station site is surrounded by predominantly isolated residential NSR in all directions, as shown in Plate 1.1. The nearest NSR are located approximately 300 m from the proposed converter station site; these are R_5764 and R_14222, to the south and northwest, respectively. The nearest built-up areas are the town of Saxmundham, located approximately 600 m to the northwest (represented by R_17560 at the nearest point), and the village of Sternfield, located approximately 700 m to the southwest (represented by R_17870 at the nearest point).

Measured Noise Levels

1.3.5 The operational noise assessment has been informed by noise survey data obtained from six locations representative of nearby NSR as detailed in Plate 1.1. The survey was undertaken over an eight day period in June 2023. Details of the baseline survey are presented in **Application Document 6.3.2.9.A Appendix 2.9.A Suffolk Noise Survey Data**.

1.3.6 The sound level meter measured a range of parameters including the following:

- $L_{Aeq,T}$ – The A-weighted equivalent continuous sound pressure level over the measurement period T, representative of the 'average' sound pressure level over a given period, in this case 15 minutes;
- $L_{AFmax,T}$ –the maximum A-weighted noise level during the sample period, measured using a fast time weighting; and
- $L_{A90,T}$ – The A-weighted noise level that is exceeded for 90% of the measurement period, and is usually regarded as a descriptor of the background noise level.

1.3.7 A summary of the measured sound levels is provided in Table 1.2.

Table 1.2 Summary of measured sound levels – Suffolk

Time period	Survey Location	Average sound level, dB $L_{Aeq,15min}$	Maximum sound level, dB $L_{AFmax,15min}$	Background sound level, dB $L_{A90,15min}$
Day	S_L1	Range: 29 - 65 Average: 45	Range: 42 - 81 Typical: 56	Range: 21 - 52 Average: 34 Mode: 32
	S_L2	Range: 27 - 64 Average: 45	Range: 39 - 95 Typical: 64	Range: 23 - 47 Average: 35 Mode: 38
	S_L3	Range: 29 - 62 Average: 46	Range: 43 - 90 Typical: 55	Range: 22 - 49 Average: 36 Mode: 37
	S_L4	Range: 35 - 59 Average: 47	Range: 48 - 85 Typical: 59	Range: 23 -51 Average: 38 Mode: 38
	S_L5	Range: 27 - 55 Average: 43	Range: 35 - 81 Typical: 52	Range: 22 - 47 Average: 34 Mode: 35
	S_L6	Range: 32 - 61 Average: 46	Range: 40 - 82 Typical: 59	Range: 25 - 48 Average: 36 Mode: 35
Night	S_L1	Range: 19 - 50 Average: 38	Range: 31 - 81 Typical: 58	Range: 17 – 38 Average: 26 Mode: 18
	S_L2	Range: 21 - 67 Average: 40*	Range: 33 - 82 Typical: 38	Range: 20 - 42 Average: 26 Mode: 21
	S_L3	Range: 19 - 51 Average: 40	Range: 32 - 91 Typical: 41	Range: 16 - 50 Average: 22 Mode: 32

Time period	Survey Location	Average sound level, dB $L_{Aeq,15min}$	Maximum sound level, dB $L_{AFmax,15min}$	Background sound level, dB $L_{A90,15min}$
	S_L4	Range: 21 - 58 Average: 45	Range: 34 - 86 Typical: 49	Range: 18 - 41 Average: 27 Mode: 37
	S_L5	Range: 20 - 56 Average: 39	Range: 30 - 71 Typical: 42	Range: 17 - 38 Average: 28 Mode: 18
	S_L6	Range: 24 - 63 Average: 43	Range: 37 -85 Typical: 48	Range: 20 - 41 Average: 31 Mode: 32

*excluding extraneous events

Representative Background Sound Levels

1.3.8 Table 1.3 presents a summary of representative background sound levels during daytime and night-time periods at the survey locations for use in the operational noise assessment.

Table 1.3 Summary of representative background sound levels

Monitoring Location	Applicable Assessment Locations	Representative Background Sound Level, dB $L_{A90,15min}$	
		Daytime	Night-time
S_L1	R_16209 R_17675 R_6050	31	20
S_L2	R_12065 R_5764	32	22
S_L3	R_6189 R_17870 R_872 R_1190 R_1195	34	22
S_L4	R_2135	35	23
S_L5	R_28332 R_13354 R_14222	34	22
S_L6	R_16209	35	25

1.3.9 The representative background sound levels were agreed with the environmental health department of East Suffolk Council.

1.4 Operational Noise Assessment

Operational Plant Sound Level Data

1.4.1 An indicative 3D view of the current design proposals for the proposed Saxmundham Converter Station is shown in Plate 1.2 . The location of the transformers is identified as these are the main sources of noise from the Saxmundham Converter Station.

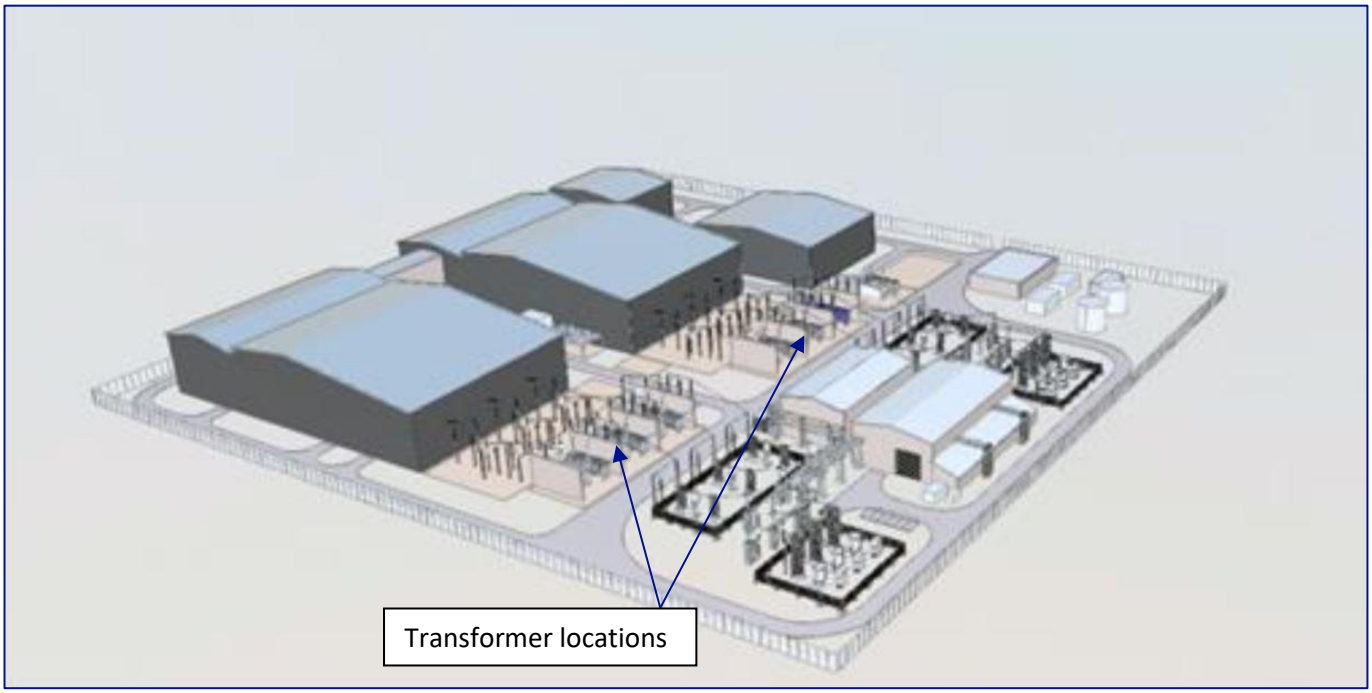

Plate 1.2 Indicative 3D view of Proposed Saxmundham Converter Station

1.4.2 Table 1.4 presents indicative operational sound levels from proposed Saxmundham Converter Station.

Table 1.4 Indicative Saxmundham Converter Station

Plant item	Number of	Source of information	Sound power level dBA	Sound power, dB (unweighted), at octave band centre frequency, Hz							
				63	125	250	500	1k	2k	4k	8k
Reactor Hall	2	Building envelope would be designed to sufficiently control noise egress.									
Valve Hall	2										
DC Hall	2										
Valve Cooler Fans	Two sets	Celtic Interconnector Project (WSP, 2020) / New England Clean Power Link (RSG, 2014)	89	96	91	88	88	84	81	72	62
Transformer (355MVA 1-PH)	6	Interconnexion France-Angleterre 2 (IFA2) (ABB, 2018)	106	Assumed 100 Hz is dominant							
Transformer cooling	6	Celtic Interconnector Project (WSP, 2020) / New England Clean Power Link (RSG, 2014)	90	96	92	89	89	84	82	72	62
400kV PLC Filter (AC Filter) (Reactor)	6	Celtic Interconnector Project (WSP, 2020) / New England Clean Power Link (RSG, 2014)	80	68	85	82	81	63	58	62	54
400kV PLC Filter (AC Filter) (Capacitor)	12	Celtic Interconnector Project (WSP, 2020) / New England Clean Power Link (RSG, 2014)	80	68	85	82	81	63	58	62	54
Air Handling Unit (AHU)	4 sets	IFA2 (ABB, 2018)	85	-	-	-	-	-	-	-	-
400kV Harmonic Filter	6	East Anglia One North and East Anglia Two	82	82	43	79	44	76	74	17	13

Embedded mitigation

1.4.3 National Grid has committed to reducing operational noise levels through the design process of the proposed Saxmundham Converter Station. This is secured through commitment NV07 within **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**.

1.4.4 As noted in the introduction to this appendix, this assessment is indicative and based on outline design information and is does not therefore provide a definitive indication of noise impacts from the proposed Saxmundham Converter Station. The assessment does, however, present an assessment of noise from a 'generic' converter station with standard noise mitigation measures applied. Further detailed design would be undertaken by the developer, if consent is granted, and noise would be considered as a design parameter, with specific mitigation measures applied.

1.4.5 For the purposes of this assessment, the mitigation described in Table 1.5 is assumed to be in place.

Table 1.5 Assumed indicative mitigation measures

Plant item	Potential mitigation option	Indicative level of reduction, dB	Source
Transformers	Plant selection, acoustic enclosure, screening, and site layout.	20 to 30	20 dB: Standard enclosure (ABB, 2018). 30 dB: (WSP, 2020).
Transformer Cooling	Plant selection, manufacturers attenuation, screening, and site layout.	16	(WSP, 2020)
PLC capacitors	Enclosure, screening. and site layout.	10	(WSP, 2020)
Valve coolers	Plant selection and manufacturers attenuation, acoustic barrier / louvered enclosure, acoustic lined cowl, and site layout. Designed to meet site specific requirements.	10	(WSP, 2020), (ABB, 2018), (RSG, 2014).
PLC Reactors	Enclosure, screening, and site layout.	10	(WSP, 2020)
Air handling units	Plant selection, manufacturers attenuation, screening, and site layout. Designed to meet site specific requirements.	10	(ABB, 2018)

1.4.6 Although these measures are likely to be incorporated in the final design, other mitigation measures may be considered by the developer that result in the same outcome. However, this assessment considers typical operational noise levels with the use of a standard mitigation option. The resultant noise levels therefore represent an achievable outcome and a proportionate assessment for this stage of the design process.

Operational Sound Propagation Modelling (with Mitigation)

1.4.7 Specific sound levels at nearby NSR due to the proposed Saxmundham Converter Station plant have been predicted via computer noise modelling using SoundPLAN software (version 9.0). The model calculates noise levels in accordance with the methodology described in ISO 9613-2 (ISO, 2024). The resultant noise levels at nearby NSR are presented in Table 1.6. For the purposes of the assessment, it is assumed that the sound reduction from the mitigation applied to the transformers would fall in the range of 20 to 30 dB. The assessment results therefore consider the likely range of resultant noise levels based on these assumptions.

Table 1.6 Resultant specific noise levels at NSR (with Mitigation)

NSR location	Resultant specific sound level, dB L_{Aeq}	Excess over background, dB	
		Daytime	Night-time
R_12065	15-22	-17 to -10	-7 to 0
R_28332	13-19	-21 to -15	-9 to -3
R_6189	13-20	-21 to -14	-9 to -2
R_17870	16-23	-18 to -11	-6 to 1
R_872 & R_1190	16-23	-18 to -11	-6 to 1
R_5764	**22-28**	**-10 to -4**	**0 to 6**
R_13354	13-20	-21 to -14	-9 to -2
R_17560	13-19	-22 to -16	-12 to -6
R_16209	9-14	-22 to -17	-11 to -6
R_14166	14-21	-18 to -11	-8 to -1
R_1195	14-21	-20 to -13	-8 to -1
R_2135	10-17	-25 to -18	-13 to -6
R_17675	9-15	-22 to -16	-11 to -5
R_6050	8-15	-23 to -16	-12 to -5
R_14222	21-26	-13 to -8	-1 to 4

1.4.8 The results indicate that the worst-case affected NSR is R_5764 (as indicated in bold), as this has the greatest exceedance of specific noise level over the typical background sound level. This receptor is therefore considered in subsequent analysis as a worst-case.

Initial BS 4142 Assessment (with Mitigation)

1.4.9 The results of the BS 4142 assessment at the worst affected receptor (R_5764) are presented in Table 1.7.

Table 1.7 Resultant specific noise levels at worst affected NSR (with Mitigation)

Parameter	Value		BS 4142 clause	Commentary
	Daytime	Night-time		
Background sound level, dB L_{A90}	32	22	8.1	Representative background sound level at nearby receptors based on measured noise data.
Specific sound level, dB $L_{Aeq,T}$	22 to 28	22 to 28	7.3	Calculated via noise model based on indicative plant data.
Acoustic feature correction, dB	2	4	9.2	Assumed potential tonal audibility at receptor as worst-case. In practice likely to be less.
Sound rating level, dB $L_{Ar,T}$	24 to 30	26 to 32	9	Sum of specific sound level and acoustic corrections.
Difference in rating noise level relative to background sound level, dB	-8 to -2	+4 to +10	11	
Initial Assessment Outcome (BS 4142 terminology)	'Low' impact, depending on context.	'Adverse' to 'Significant adverse' impact, depending on context.	11	In ES terminology, the initial assessment indicates that there is a negligible magnitude impact during daytime periods, and a small to large magnitude impact during night-time periods. The initial assessment requires consideration of context.
Uncertainty			10	Uncertainty has been minimised through the use of noise survey data over a suitable representative period. The main uncertainty is from the use of indicative plant noise data, although this is based on plant at similar sites. Likely worst-case acoustic character correction applied for tonality. In practice likely to be lower. Uncertainty is unlikely to affect the outcome of the assessment. However, this assessment is indicative

Parameter	Value		BS 4142 clause	Commentary
	Daytime	Night-time		
				based on available plant noise data and further studies would be conducted as the design progresses.

Notes:
BS 4142 Clause refers to the corresponding clause in BS 4142 relating to that aspect of the assessment.

1.4.10 The initial assessment indicates that there is a negligible magnitude impact during daytime periods, and a potential small to large magnitude impact during night-time periods at the worst-case affected receptor (R_5764). The impact at other receptors would be lower, and these are summarized in the terminology of an initial BS 4142 in Table 1.8.

Table 1.8 Summary of initial BS 4142 outputs at other NSR

NSR location	Resultant noise rating level, dB $L_{Ar,T}$		Excess over background, dB		Initial BS 4142 Assessment Outcome (in ES terms), Depending on Context	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R_12065	17 to 24	19 to 26	-15 to -8	-3 to 4	Negligible	Negligible to small
R_28332	15 to 21	17 to 23	-19 to -13	-5 to 1	Negligible	Negligible to small
R_6189	15 to 22	17 to 24	-19 to -12	-5 to 2	Negligible	Negligible to small
R_17870	18 to 25	20 to 27	-16 to -9	-2 to 5	Negligible	Negligible to medium
R_872 & R_1190	18 to 25	20 to 27	-16 to -9	-2 to 5	Negligible	Negligible to medium
R_5764	24 to 30	26 to 32	-8 to -2	4 to 10	Negligible	Small to large
R_13354	15 to 22	17 to 24	-19 to -12	-5 to 2	Negligible	Negligible to small
R_17560	15 to 21	17 to 23	-20 to -14	-8 to -2	Negligible	Negligible
R_16209	11 to 16	13 to 18	-20 to -15	-7 to -2	Negligible	Negligible
R_14166	16 to 23	18 to 25	-16 to -9	-4 to 3	Negligible	Negligible to small
R_1195	16 to 23	18 to 25	-18 to -11	-4 to 3	Negligible	Negligible to small
R_2135	12 to 19	14 to 21	-23 to -16	-9 to -2	Negligible	Negligible
R_17675	11 to 17	13 to 19	-20 to -14	-7 to -1	Negligible	Negligible
R_6050	10 to 17	12 to 19	-21 to -14	-8 to -1	Negligible	Negligible
R_14222	23 to 28	25 to 30	-11 to -6	3 to 8	Negligible	Small to medium

1.4.11 The assessment indicates that noise from the proposed Saxmundham Converter Station would be negligible magnitude impact during daytime periods at all NSR. During night-time periods, there is a predicted:

- Negligible magnitude impact at five NSR;
- Negligible to small magnitude impact at six NSR;
- Negligible to medium magnitude impact at two NSR;
- Small to medium magnitude impact at one NSR; and a
- Small to large magnitude impact at one NSR.

1.4.12 In accordance with BS 4142, these are initial estimates of the impact which need further consideration of context to determine significance.

Assessment of Context

1.4.13 The initial assessments require consideration of context for the determination of potential significance. The assessment of context considers:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound; and
- 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.

Absolute sound levels

1.4.14 The predicted absolute sound levels range between 8 and 28 dB $L_{Aeq,T}$, with corresponding night-time noise rating levels ranging between 13 to 32 dB $L_{Ar,Tr}$, typical existing night-time background sound levels ranging from 20 to 25 dB L_{A90}, and existing average night-time ambient noise levels ranging from 38 to 45 dB $L_{Aeq,8h}$. BS 4142 states that:

"*For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

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

1.4.15 The 2019 version of BS 4142 does not define 'low' in the context of background sound levels or rating levels. However, ANC guidance (ANC, 2020) suggests that the values stated in the 1997 version would not be unreasonable; namely: very low background sound levels as being less than about 30 dB L_{A90}, and low rating levels as being less than about 35 dB $L_{Ar,Tr}$.

1.4.16 The context of absolute noise levels therefore indicates that both the background sound levels and noise rating levels are very low. Therefore, in this instance the absolute levels might be as, or more, relevant that the margin by which the rating level exceeds the background sound level.

1.4.17 Further guidance of absolute noise levels is provided by:

- WHO GfCN (WHO, 1999);
- BS 8233 (BSI, 2014);
- WHO NNG (WHO, 2009); and
- CIBSE guidance (CIBSE, 2021).

1.4.18 The WHO GfCN and BS 8233 provide recommended guideline values for internal and external amenity spaces, including bedrooms, living rooms, and gardens, albeit for 'anonymous' noise sources, such as road traffic. The guidance values for desirable conditions are:

- Bedrooms at night: 30 dB $L_{Aeq,8h}$;
- Living rooms and bedrooms during the day: 35 dB $L_{Aeq,16h}$; and
- External amenity spaces (gardens): 50 dB $L_{Aeq,16h}$.

1.4.19 With regard to external amenity spaces, the predicted specific noise level from the proposed Saxmundham Converter Station of 28 dB L_{Aeq} is significantly below the guidance values for desirable external conditions.

1.4.20 With regards to internal noise levels, consideration must be given to reduction in noise level through a partially open window, which may be required for ventilation. WHO GfCN and BS 8233 indicate that the reduction in sound level through a partially open window is 15 dB (attenuation through closed windows would be expected to be in the region of 25 dB). Assuming a 15 dB reduction, the corresponding external noise levels for desirable conditions are:

- Outside bedrooms at night: 45 dB $L_{Aeq,8h}$; and
- Living rooms and bedrooms during the day: 50 dB $L_{Aeq,16h}$.

1.4.21 It is noted that the guideline values for reasonable conditions in external amenity areas is the same as the guideline value outside of habitable spaces during daytime periods (i.e. 50 dB $L_{Aeq,16}$).

1.4.22 The predicted specific noise level from the proposed Saxmundham Converter Station of 28 dB L_{Aeq} externally would result in an internal sound level in the region of 13 dB L_{Aeq}. This is significantly below the guidance values for desirable conditions.

1.4.23 The WHO NNG indicates that the lowest observed adverse effect level (LOAEL) is 40 dB $L_{night,outside}$. The predicted specific noise level from the proposed Saxmundham Converter Station of 28 dB L_{Aeq} externally is significantly below the LOAEL indicated by the WHO NNG.

1.4.24 CIBSE guidance provides recommended noise criteria for various internal spaces, including bedrooms, with a recommended internal upper noise level of NR25. Previous versions of the CIBSE guidance stated that if the sound contained tones, values should be reduced by 5. It is considered that this is a sensible precaution and as such a guidance upper noise level of NR20 is assumed. The NR value is approximately 6 dB

lower than the corresponding dBA level (i.e. NR20 ≈ 26 dBA) (25 dBA assumed for simplicity). Assuming a 15 dB reduction through an open window, suitable internal noise levels would be expected to be achieved where the sound rating level is below 40 dB $L_{Aeq,8h}$ externally, which aligns with the WHO NNG guidance. The predicted specific noise levels from the proposed Saxmundham Converter Station of 28 dB L_{Aeq} externally is significantly below the upper guideline value indicated by the CIBSE guidance.

1.4.25 With closed windows, internal noise levels would be even lower.

Existing and Potential Character and Level

Existing and Potential Character

1.4.26 The existing noise climate is characteristic of a rural area. Background and ambient noise levels are low during both daytime and night-time periods, and the main sources of noise are local and distant road traffic. There are also contributions from agricultural activities, predominantly during the daytime, although some night-time activity was noted. Impulsive noise sources were noted in the form of bird scarers in fields. There are few industrial and commercial noise sources in the area, except for agricultural activity, with the main source of such noise being from local businesses within Saxmundham (e.g. shops) but this is relatively localized.

1.4.27 Depending on the level of noise generated relative to the existing levels, the introduction of the Saxmundham Converter Station would be distinctive against the existing noise climate in the vicinity of the converter station. Further consideration of the existing and potential noise levels is provided below.

Existing and Potential Noise levels

1.4.28 An assessment of predicted noise level change is presented in Table 1.9. For the purposes of the assessment, the highest predicted specific noise level is assumed as a worst-case.

Table 1.9 Assessment of pre and post operational ambient noise levels at NSR

NSR location	Resultant specific sound level, dB L_{Aeq}	Existing Ambient Noise Level, dB $L_{Aeq,T}$		Resultant Ambient Noise Level, dB $L_{Aeq,T}$		Change, dB		Effect	
		Daytime	Night-time	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R_12065	22	45	40	45	40	0	0	No change	No change
R_28332	19	43	39	43	39	0	0	No change	No change
R_6189	20	46	40	46	40	0	0	No change	No change
R_17870	23	46	40	46	40	0	0	No change	No change
R_872 & R_1190	23	46	40	46	40	0	0	No change	No change
R_5764	28	45	40	45	40	0	0	No change	No change
R_13354	20	43	39	43	39	0	0	No change	No change
R_17560	19	46	43	46	43	0	0	No change	No change
R_16209	14	45	38	45	38	0	0	No change	No change
R_14166	21	45	40	45	40	0	0	No change	No change
R_1195	21	46	40	46	40	0	0	No change	No change
R_2135	17	47	45	47	45	0	0	No change	No change
R_17675	15	45	38	45	38	0	0	No change	No change
R_6050	15	45	38	45	38	0	0	No change	No change
R_14222	26	43	39	43	39	0	0	No change	No change

1.4.29 The assessment indicates that there would be no change to average ambient noise levels at nearby NSR during either daytime or night periods due to the introduction of the proposed Saxmundham Converter Station.

1.4.30 As there is no anticipated change to average ambient noise levels, the change to the character of the noise climate is likely to be negligible during most periods. There is, however, expected to be a change in the noise climate due to operational noise from the proposed Saxmundham Converter Station during the period in the middle of the night when existing background noise levels are lowest, and a potential change to spectral noise levels. This would be an adverse impact on the noise climate, but not sufficient to cause a significant adverse impact.

Receptor Sensitivity

1.4.31 All nearby NSR are residential dwellings, with no high sensitivity non-residential NSR in the vicinity. The dwellings are a range of ages and styles, but it is anticipated that the dwellings do not include alternative forms of ventilation which would negate the need to open windows. The potential impact of noise from the proposed Saxmundham Converter Station would therefore need to consider the requirement for dwellings to have open windows for ventilation. This has been considered above, with the assessment indicating that suitable internal sound levels can be achieved with open windows.

1.4.32 The assessment above also indicates that average ambient noise levels would not change as a result of the proposed Saxmundham Converter Station. Therefore, existing average internal and external noise levels would be maintained at nearby NSR.

1.4.33 The assessments do not consider the potential effect of screening from garden and boundary fences. Existing suitable noise level levels in garden spaces would be achieved regardless.

Summary of Context

1.4.34 A thorough review of context has been undertaken at the request of East Suffolk Council. The assessment has concluded that:

- Suitable internal and external noise levels would be maintained at all nearby NSR, even when considering open windows. In this regard the impact is negligible.
- The character of the noise climate is not expected to significantly change at NSR. However, background sound levels would increase during the period in the middle of the night when background noise levels are currently at their lowest close to the proposed Saxmundham Converter Station, and there is a potential change to spectral noise levels. There would therefore be an adverse impact on the noise climate close to the proposed Saxmundham Converter Station, but not sufficient enough to cause a significant an adverse effect. In this regard the impact is small.
- All nearby NSR are residential dwellings, with no high sensitivity non-residential NSR in the vicinity. The assessment has considered the requirement for ventilation of these dwellings via open windows, as detailed above. In this regard the impact is negligible.

1.4.35 In summary, taking account of context, the BS 4142 initial estimate of operational noise impacts resulting from the proposed Saxmundham Converter Station can be revised to a **negligible** to **small** magnitude impact, which is **not significant** at any nearby NSR.

1.5 Conclusions

1.5.1 This appendix presents results of the operational noise assessment conducted as part of the Suffolk Onshore Scheme. The assessment considers the potential effects of operational noise from the proposed Saxmundham Converter Station at nearby NSR.

1.5.2 The assessment has been conducted in accordance with current guidance and good practice. The assessment draws on noise survey data, and indicative operational plant noise data.

1.5.3 The assessment indicates that with standard mitigation measures and based on the indicative plant data, the impact of operational noise from the proposed Saxmundham Converter Station would be a **negligible** to **small** magnitude at nearby NSR when taking account of context. The effect of operational noise from the proposed Saxmundham Converter Station would therefore be **not significant**.

1.5.4 The assessment is based on indicative plant noise data and it is anticipated that further assessment would be conducted as the design progresses, as secured through commitment NV07 within **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**.

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National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com