



A specialist energy consultancy

Appendix 7.1

Construction Noise Report

Scout Moor II Wind Farm

Cubico UK Development Ltd

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Executive Summary

TNEI Services Limited (TNEI) was commissioned by Cubico UK Development Ltd ('the Applicant') to undertake predictions of noise levels associated with the construction of the proposed Scout Moor II Wind Farm (the Project for Assessment). The noise predictions were used to assess the potential impact of noise attributable to the construction of the Project for Assessment on the occupiers of nearby noise sensitive receptors.

The noise impact assessment was undertaken using guidance contained in BS 5228: Part 1 2009+A1:2014 '*Noise and vibration control on construction and open sites- Noise*' and the calculation methodology in ISO9613: 2024 '*Acoustics - Attenuation of sound during propagation outdoors*' -Part 2: '*Engineering method for the prediction of sound pressure levels outdoors*', together with noise data for appropriate construction plant.

Twelve residential receptors neighbouring the Project for Assessment were identified as the nearest properties located to the proposed construction activities.

Predictions have been made assuming that all items of plant are operating continually throughout the assessment period to provide a worst-case scenario. In addition, the noise model assumes that noise sources would be located within the most likely activity areas closest to the receptors, whereas in reality plant would move around and only a proportion of the plant may be operating at any one time. As such, the predictions are inherently likely to over-predict the actual sound levels that are likely to be experienced.

The results show that the predicted noise levels would be below the most stringent of the noise threshold levels detailed in BS 5228 for daytime periods.

There is potential for noise to exceed the threshold level at one assessment location during the evening/ weekend and night-time periods, however through implementation of appropriate mitigation measures the noise level can be reduced below the BS 5228 threshold level.

Accordingly, the assessment concludes that there would be no significant construction noise impacts.

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1 Introduction

1.1 Brief

1.1.1 TNEI was commissioned by Cubico UK Development Ltd to undertake a construction noise assessment for the proposed Scout Moor II Wind Farm (the Project for Assessment). The following steps summarise the noise assessment process:

- Establish typical ambient noise levels at sensitive receptors located closest to the anticipated construction activities and derive appropriate noise threshold levels in accordance with BS5228-1:2009 +A1:2014 ⁽¹⁾;
- Undertake predictions of activity noise throughout the construction period that would be incident at the nearest sensitive receptors;
- Compare the predicted noise levels with the derived threshold values; and,
- Identify any requirements for mitigation measures, if needed.

1.2 Nomenclature

1.2.1 The following terms and definitions are used throughout this report;

- **Emission** refers to the sound level emitted from a sound source, expressed as either a sound power level or a sound pressure level;
- **Immission** refers to the sound pressure level received at a specific location from a noise source(s);
- **SWL** indicates the sound power level in decibels (dB);
- **SPL** indicates the sound pressure level in decibels (dB);
- **NSR** (Noise Sensitive Receptor) are identified receptors that are sensitive to noise;
- **NML** (Noise Monitoring Location) refers to any location where baseline or specific noise levels have been measured; and
- **CNAL** (Construction Noise Assessment Location) refers to any location where the noise immission levels are calculated and assessed.

1.2.2 Unless otherwise stated, all noise levels refer to free field levels i.e. noise levels without influence from any nearby reflective surfaces.

1.3 Project for Assessment Site Description

1.3.1 The Project for Assessment is located approximately 2.5 km northwest of Rochdale, at approximate OS Grid Reference 385450, 419150 (site centre). The proposed layout is shown on Figure A1.1 in Appendix A.

1.3.2 The Project for Assessment site would be accessed via Scout Road (off the A680) and Rooley Moor Road (of the A681). Scout Road is already used as the main access road to the operational Scout Moor Wind Farm and Scout Moor Quarry and therefore is already suitable for HGVs. Accordingly, this will also be used as the main site access for the Project for Assessment. Access to the site via Rooley Moor Road will be possible, however, upgrades to this road are not required as site deliveries and HGVs are proposed to arrive via Scout Road only.

- 1.3.3 Construction of the Project for Assessment will require the establishment of a construction compound and a temporary laydown area, the laying of tracks from Scout Road up to the construction compound and across the site to the wind turbine locations, excavation of turbine foundations, construction of turbine bases, installation of turbines, and the installation of a substation and other infrastructure. ES Volume 1 Chapter 4: Development Specification can be referred to for a detailed description of the Project for Assessment and the construction requirements.

2 Noise Planning Policy and Guidance

2.1 Legislation

The Control of Pollution Act 1974 (COPA 74) ⁽²⁾ is used to control the noise impacts of construction works. Specifically, Section 60 allows Councils to impose restrictions on construction works, including specifying the plant allowed to be used, hours of activity, or the setting of noise levels that may be emitted from a site.

The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 ⁽³⁾ approves both parts of BS 5228:2009 ^{(4) (5)} as Codes of Practice in relation to Section 60 of COPA 74.

2.2 National Planning Policy

The *National Planning Policy Framework (NPPF)* ⁽⁶⁾ at paragraph 198 states that all planning policies and decisions should:

“a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life,” and,

“b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason”.

The NPPF is supported with the Noise Policy Statement for England (NPSE) ⁽⁷⁾, which states that it's aims are to:

- *“Avoid significant adverse impacts on health and quality of life while taking into account the guiding principles of sustainable development;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”*

Neither document, however, provides specific guidance on appropriate construction noise assessment methods or acceptable levels of construction noise, therefore, it is the approved Code of Practice (BS 5228), as detailed above, that is used to define the construction noise assessment methodology used in this report.

2.3 Relevant Guidance

Part 1 of BS 5228 provides useful guidance on practical noise control and management, with recommendations for basic methods of noise control, including sections on community relations, training, occupational noise effects, neighbourhood nuisance and project supervision. The annexes provide information on typical construction noise sources, noise calculation procedures, mitigation measures and their effectiveness.

Annexes C and D present measured noise levels from construction activities measured across multiple construction sites in the UK, that may be used to inform the prediction of noise from proposed construction activities. Annex E presents methods of assessing the significance of impacts from construction noise.

3 Methodology

3.1 Methodology for the Prediction of Noise

- 3.1.1 In order to predict the noise immission levels attributable to the construction of the Project for Assessment, noise propagation models are produced using the propriety noise modelling software CadnaA. Within the software, complex models can be used to simulate the propagation of noise according to a range of international calculation standards.
- 3.1.2 Construction noise levels have been predicted in accordance with ISO9613-2:2024 '*Acoustics - Attenuation of sound during propagation outdoors: Engineering method for the prediction of sound pressure levels outdoors*'⁽⁸⁾.
- 3.1.3 The ISO 9613 propagation model was chosen in preference to the calculation method presented in BS5228, primarily because of some of the significant distances from source to receptor evident on this site. Specifically, BS5228 notes in F 2.2.2.2, that at distances over 300 m noise predictions using the BS5228 methodology should be treated with caution, especially where a soft ground correction factor has been applied because of the increasing importance of meteorological effects; whereas ISO 9613-2 provides equations that have been validated up to 1,000 m.
- 3.1.4 The ISO 9613 model can take account of the following factors that influence sound propagation outdoors:
- geometric divergence;
 - air absorption;
 - reflecting obstacles;
 - screening;
 - vegetation; and
 - ground reflections.
- 3.1.5 The model uses the octave band sound power output of the proposed plant as its acoustic input data, and calculates on an octave band basis, attenuation due to geometric spreading, atmospheric absorption and ground effects.
- 3.1.6 For the purposes of this assessment, all noise level predictions have been undertaken using a receiver height of 1.5 m above local ground level. Soft ground ($G=1$) attenuation has been assumed at all locations except for water bodies, construction compounds, turbine bases and similar areas of hardstanding, which have been modelled with a ground attenuation of $G=0$ (hard ground). Air absorption based on a temperature of 10 °C and 70 % relative humidity has been assumed.

3.2 Limitations of the Noise Model

- 3.2.1 The noise propagation models are intended to give a good approximation of the specific noise level and the contribution of each individual source. However, it is expected that actual levels are unlikely to be matched exactly with modelled values and the following limitations in the model should be considered:

- In accordance with ISO 9613-2, all assessment locations are modelled as downwind of all noise sources and propagation calculations are based on a moderate ground-based temperature inversion, such as commonly occurs at night;
- The predicted barrier attenuation provided by local topography, embankments, walls, buildings and other structures in the intervening ground between source and receiver can only be approximated and not all barrier attenuation will have been accounted for;
- Unless specifically stated, the models assume all noise sources are operating continuously and simultaneously, estimating a worst-case source noise level; and
- All mobile plant assumed to be working on tracks (excavators, dozers, rollers etc) have been modelled as moving point sources along their anticipated movement paths and the sound power level of the source is effectively averaged out across the length of the entire line. This will give an approximation of the overall noise levels from mobile plant at receptor locations; however, in reality noise levels would fluctuate as construction plant and activities move around in their activity areas.

3.3 Assessing Construction Noise Effects

3.3.1 Appendix E, part E.3.2 of BS5228 provides example criteria for assessing the significance of construction noise effects and acceptable limits for construction noise.

3.3.2 Table E.1 of BS5228 (reproduced here as Table 3-1) contains an example of the significance criteria that can be used to assess construction activities.

Table 3-1: Example of Threshold of Potential Significant Effect at Dwellings

Assessment Category and Threshold Value Period	Threshold Value $L_{Aeq,T}$ dB		
	Category A ^(A)	Category B ^(B)	Category C ^(C)
Night-Time (23:00 – 07:00)	45	50	55
Evenings and Weekends ^(D)	55	60	65
Daytime (07:00 – 19:00) & Saturdays (07:00 to 13:00)	65	70	75

(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values;
 (B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values;
 (C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values;
 (D) 19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00 – 23:00 Sundays.

3.3.3 The values can be considered thresholds for the construction noise levels (quantified using the L_{Aeq} noise metric). The values in each category are to be used where the existing noise level at each location, rounded to the nearest 5 dB, is below the level given for a particular time of day. BS5228 provides the following advice regarding the threshold levels:

“Note: 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

Note 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

Note 3: Applied to residential receptors only.”

- 3.3.4 Therefore, the assessment of construction noise reflects a specific noise threshold for the locality (set relative to the existing ambient noise levels) for a particular period of the day, rather than an absolute noise level.
- 3.3.5 It should be noted that exceedance of the limit does not in itself indicate a significant effect, rather, the standard states *“If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated. The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect”*.

3.4 Study Area

- 3.4.1 NSRs are properties, people or fauna which are sensitive to noise and, therefore, may require protection from nearby noise sources. The Study Area for the noise assessment has been defined through the identification of the closest NSRs to the Project for Assessment. Of the NSRs identified a representative sample of CNALs have been chosen to represent the closest receptor or group of receptors.
- 3.4.2 The CNALs were chosen on the assumption that if noise levels are within acceptable levels at the closest receptors then it is reasonable to assume they would also be acceptable at more distant locations.
- 3.4.3 Table 3-2 details the CNALs considered within the assessment and they are also shown on Figure A1.1 included in Appendix A.

Table 3-2: Construction Noise Assessment Locations

CNAL Name	Coordinates	
	Eastings	Northings
CNAL01	383665	420416
CNAL02	383925	420092
CNAL03	384074	420340
CNAL04	384817	420785
CNAL05	385514	421094
CNAL06	388352	419627

CNAL Name	Coordinates	
	Eastings	Northings
CNAL07	387665	417476
CNAL08	387115	416360
CNAL09	385784	416346
CNAL10	381072	418802
CNAL11	387574	418433
CNAL12	380955	418605

3.5 Baseline Noise Levels

- 3.5.1 Baseline noise level monitoring was undertaken as part of the operational noise assessment undertaken for Scout Moor Wind Farm. See Appendix 7.2 for more information. The Noise Monitoring Locations (NMLs) are shown on Figure A1.1.
- 3.5.2 At all locations the ambient sound levels were below the Category A Threshold Values, as detailed in Table 3-1.

3.6 Construction Noise Level Thresholds

- 3.6.1 Having due regard to the existing ambient noise levels at NSRs around the Project for Assessment, the BS5228 Category A Threshold Values have been considered for the construction noise assessment.
- 3.6.2 Accordingly, the assessment is made against the following noise level limits for all NALs;
- Daytime weekdays 07:00 – 19:00: 65 dB L_{Aeq} (12 hours)
 - Saturday 07:00 – 13:00: 65 dB L_{Aeq} (6 hours)
 - Evenings (weekdays) 19:00 – 23:00: 55 dB L_{Aeq} (4 hours)
 - Saturday 13:00 – 23:00: 55 dB L_{Aeq} (10 hours)
 - Sundays 07:00 – 23:00: 55 dB L_{Aeq} (16 hours)
 - Night time 23:00 – 07:00: 45 dB L_{Aeq} (8 hours)

4 Noise Impact Assessment

4.1 Modelling of Individual Sound Sources

- 4.1.1 Noise immission levels would vary throughout the construction period as construction activities, plant and locations vary. For much of the working day the noise associated with construction activities would be less than predicted, as the assessment assumes all equipment is continually operating at full power and in locations closest to the NSRs, whereas in practice, equipment load and precise location may vary throughout the day. This approach has been adopted to represent a worst-case assessment.
- 4.1.2 At this stage a detailed plant list is not available, therefore, a generic plant list based upon experience of similar projects has been used. All modelled noise sources and associated sound power level (SWL) and sound pressure level (SPL) data is included in Appendix B: Noise Model Data.
- 4.1.3 For all construction activities source noise level data is taken from Appendix C of BS 5228, which provides octave band SPL levels for a wide variety of construction plant and activities suitable for the estimation of noise immission levels.
- 4.1.4 Construction noise sources for any given activity will generally comprise a mix of both moving and static sources. Mobile sources include mobile construction plant and Heavy Goods Vehicles (HGVs), while static construction plant could include generators, lighting rigs and pumps. Static equipment is usually located at a fixed location for an extended period of time.
- 4.1.5 For both mobile and static plant, activity noise levels would be transient in nature due to changes in location, on/off periods, and fluctuations of load on any individual machine.
- 4.1.6 All static items of plant and activities have been modelled as single point sources. All mobile plant (excavators, dozers, dumpers etc.) have been modelled as either a moving point source (line source) along their anticipated movement paths or as a stationary point source located at the closest point of its anticipated work area to any given CNAL.

4.2 Modelling of Construction Activities

- 4.2.1 The core hours for construction activity are anticipated to be 08:00 – 18:00 Monday to Friday and 09:00 – 14:00 on Saturdays, with no working on Sundays or Public / Bank Holidays. The requirement for out-of-hours work could arise, for example, from delivery and unloading of abnormal loads or health and safety requirements, or to ensure optimal use is made of fair weather windows for the erection of turbine blades and the erection and dismantling of cranes. No scheduled construction is anticipated during the night-time except for during the winter months. There may also be a requirement for some plant to be operational during night-time, for example, a portable generator to provide lighting. A night-time scenario has therefore also been considered within the construction noise assessment.
- 4.2.2 Noise propagation modelling has been undertaken considering the key activities that are likely to occur throughout the construction period, which, has an anticipated duration of 2 years (24 months). This is based on the indicative information found in the ES Volume 1 Chapter 4: Development Specification and as discussed in Section 1.3.

- 4.2.3 TNEI have assumed that each scenario (excluding Scenario 07) lasts for one quarter, however ultimately the duration, order and combination in which each construction activity occurs would be dependent on the appointed contractor.
- 4.2.4 All construction activities have been modelled as occurring for the full duration of each quarter, however, in reality it is unlikely that this would be the case and many activities may only occur for a number of weeks. As such, the assessment is likely to overpredict the noise level during each scenario. Details of the items of plant assumed to be operating in each modelled scenario, as well as noise data for each modelled noise source, are included in Appendix B: Noise Model Data.
- 4.2.5 The modelled scenarios represent the following construction activities;
- Scenario 01: The laydown area on Scout Road is being established. Construction of access tracks from Scout Road to the on-site construction compound is occurring. The construction compound is being established.
 - Scenario 02: Establishment of the Scout Road laydown area and on-site construction compound have ended and they are now in operation. Access tracks are being constructed from the construction compound to T1, T3 & T4 and to T9, T10 and T11. Materials are being delivered to the construction compound.
 - Scenario 03: The construction compound and laydown area are in operation. Access tracks are being constructed to T14 and T15. Turbine foundations and crane pads are being constructed at T1, T3 and T4.
 - Scenario 04: The construction compound and laydown area are in operation. Turbine foundations and crane pads are being constructed at T9, T10 and T11. Turbine delivery and erection is occurring at T1, T3 and T4.
 - Scenario 05: The construction compound and laydown area are in operation. Turbine foundations and crane pads are being constructed at T8, T14 and T15. Turbine delivery and erection is occurring at T9, T10 and T11.
 - Scenario 06: The construction compound and laydown area are in operation. Turbine delivery and erection is occurring at T8, T14 and T15. Construction of the on-site substation is occurring.
 - Scenario 07 (evening/night-time): To consider potential occurrence of noise in evening/night-time outside of core hours, a scenario has been modelled with generators associated with the operation of the temporary laydown area and construction compound.

4.3 Calculated Noise Immission Levels

- 4.3.1 Table 4-1 presents the calculated noise immission levels at each CNAL for all modelled scenarios.

Table 4-1: Predicted Construction Noise Immission Levels, dB L_{Aeq(t)}

CNAL	Scenario 01 (Day)	Scenario 02 (Day)	Scenario 03 (Day)	Scenario 04 (Day)	Scenario 05 (Day)	Scenario 06 (Day)	Scenario 07 (Evening / Night)
CNAL01	27	32	27	34	35	34	16
CNAL02	27	34	26	36	37	35	15
CNAL03	23	29	22	29	34	33	8
CNAL04	31	38	31	40	40	41	20
CNAL05	25	29	24	30	31	30	13
CNAL06	26	29	30	33	32	27	15
CNAL07	26	30	37	37	26	22	15
CNAL08	25	29	36	36	29	26	12
CNAL09	26	27	29	30	30	28	13
CNAL10	49	38	38	38	38	38	22
CNAL11	30	33	37	38	33	29	19
CNAL12	58	48	48	48	48	48	46

- 4.3.2 For all CNALs the predicted noise levels for all scenarios are well below the weekday and Saturday daytime threshold value of 65 dB(A).
- 4.3.3 The predicted noise levels at all CNALs are also below the evening and weekend threshold level of 55 dB(A) except for at CNAL12, where the predicted noise level during Scenario 01 is 58 dB(A) as a result of the construction of the temporary laydown area on Scout Road.
- 4.3.4 The predicted noise levels during the night-time scenario are well below the night-time threshold level of 45 dB(A) at all CNALs, except at CNAL12 where the noise level is predicted to be up to 46 dB(A). This is as a result of a small diesel generated lighting rig which is modelled within the temporary laydown area on Scout Road.
- 4.3.5 To mitigate the effects of noise, construction of the temporary laydown area on Scout Road should only occur during the weekday daytime hours (07:00 - 19:00) and Saturday daytime hours (07:00 - 13:00) i.e. not during the evening and weekend periods. Additionally the use of diesel generators for lighting and similar, should not be avoided within the temporary laydown area during BS 5228 night-time hours (23:00 - 07:00), wherever possible.
- 4.3.6 Should lighting be required during night-time hours, for example for safety or security reasons, additional mitigation measures will be required, such as, the implementation of an

acoustic barrier in a U shape formation around any generator. This could provide between 5-10 dB(A) of attenuation at the dwelling (as detailed in F.2.2 in BS 5228), which would sufficiently lower the noise level below the 45 dB(A) night-time threshold level, and therefore, below the indicator for potentially significant effects. Careful placement of noise sources within the temporary laydown area should also be considered (where possible) to maximise screening between the noise source and the dwelling by using the non-residential buildings situated directly opposite the laydown area as barriers.

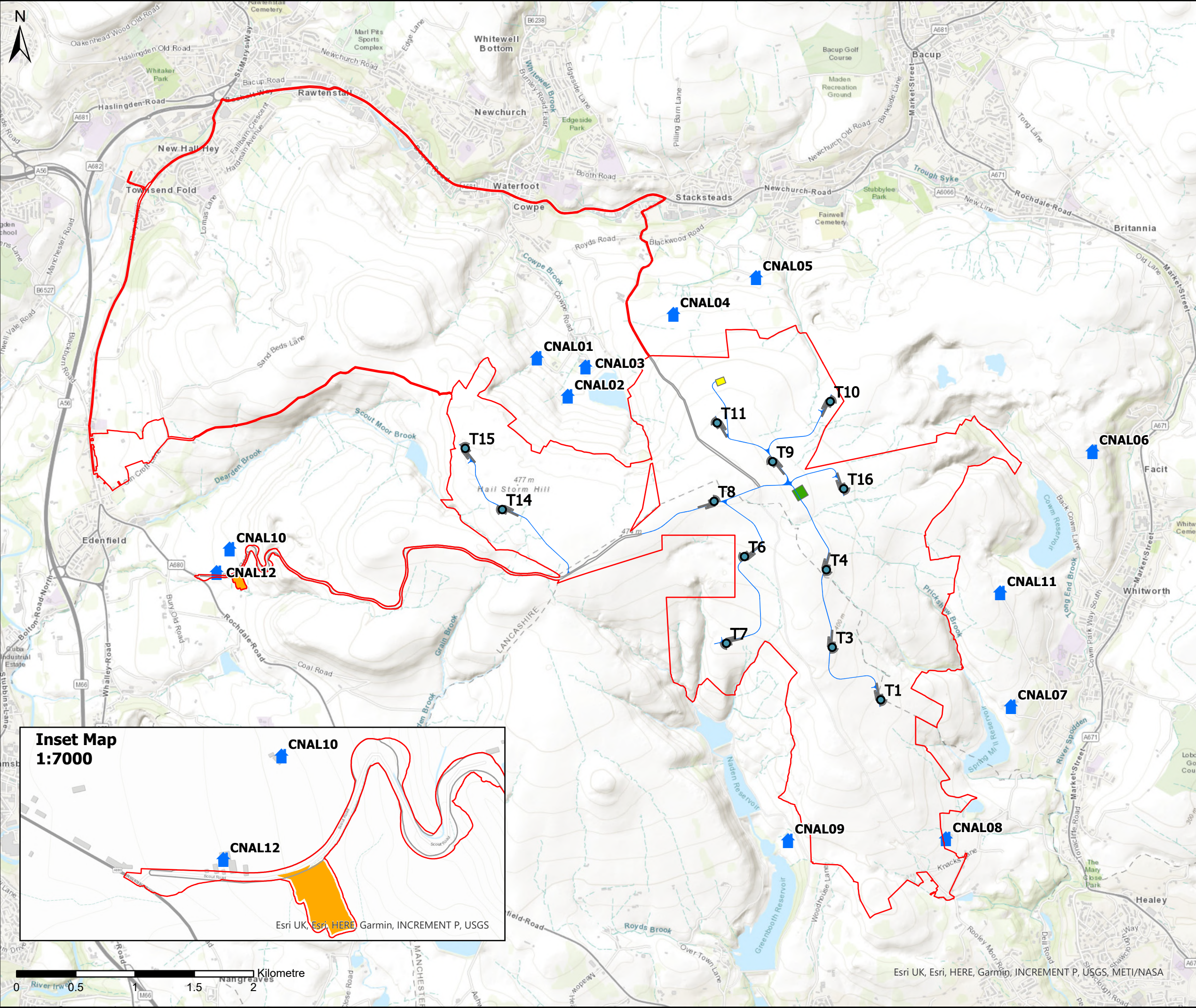
5 Summary

- 5.1.1 The noise impact assessment has considered the existing noise environment at local residential receptors to determine appropriate noise threshold levels for construction activities.
- 5.1.2 Noise propagation modelling has been undertaken in accordance with ISO 9613-2:2024 and the anticipated noise immission levels presented for scenarios likely to occur throughout the construction period of the Project for Assessment. The modelled scenarios consider the 'noisiest' activities that are likely to occur during the construction period and the modelling assumes that the construction activities are occurring at locations within the development site that are closest to the NSRs.
- 5.1.3 The predicted levels are below the Category A Threshold Levels for daytime periods, as detailed within BS 5228. Accordingly, construction noise impacts are below the indicator for a potential significant effect during the daytime.
- 5.1.4 No regular construction activities are currently proposed outwith of the BS 5228 defined daytime periods, however, it is noted that the predicted noise levels are also below the BS 5228 threshold levels for evenings and weekends, except at CNAL12 during the initial period of construction, where the predicted noise level is 58 dB(A) whilst establishing the temporary laydown area. Accordingly, construction activities at this location should be avoided during evening and weekend periods.
- 5.1.5 During the night-time, predicted noise levels are below the Category A Threshold Levels at all CNALs, except for at CNAL12 where an exceedance of the threshold level of 1 dB(A) is predicted. Suggested mitigation measures such as switching diesel powered lighting off during night-time periods, or using temporary acoustic barriers, will therefore need to be implemented to ensure that noise levels remain below the BS 5228 threshold levels.
- 5.1.6 No additional mitigation measures are required to lessen the impacts of construction noise, and the noise control measures that are required to be employed in the temporary laydown area are very simple to implement. As such, the assessment concludes that construction noise levels would remain below the indicator for a potential significant effect at all dwellings.

6 References

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Annex A – Figure



LEGEND

- Assessment Boundary
- Turbine Locations
- Construction Noise Assessment Locations (CNALs)
- Existing Site Tracks
- Substation
- Hardstanding
- Track Extents
- Construction Compound
- Temporary Laydown Area

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Blackburn

FOREST OF ROSSENDALE

A681

Rochdale

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Client

Drawing Status:

FOR PLANNING

Project Title:

SCOUT MOOR II WIND FARM

Drawing Title:

FIGURE A1.1: CONSTRUCTION NOISE ASSESSMENT

Scale:	1:30,000	Original Size:	A3	Spatial Reference:	British National Grid
Drawing Number:	16647-018				

Annex B – Noise Model Data

Modelled Construction Noise Scenarios – Noise Sources

	Assumed working location	Plant (BS5228 Reference)	Data Source
Scenario 01			
Access track upgrades	Access tracks from Scout Road to the construction compound (line source, 1 of) (point source, 1 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014
Laydown area construction	Temporary laydown area on Scout Road (point source, 1 of)	Wheeled Excavator (C4.10) Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014
Deliveries to construction compound	Access track from Scout Road to the construction compound (line source, 1 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction Compound Construction	Construction Compound (point source, 1 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014
	Construction Compound (point source, 1 of)	Diesel Generator (C.84) Diesel Generator (C.86)	BS 5228-1:2009+A1:2014
Scenario 02			
Turbine track upgrades	Access tracks to T1, T3 & T4 and T9, T10 and T11 (line source, 4 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014
Laydown area operation	Temporary laydown area on Scout Road (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Deliveries to construction compound	Access track from Scout Road to the construction compound (line source, 1 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction Compound Operation	Temporary Construction Compound (point source, 1 of)	Diesel Generator (C.84) Diesel Generator (C.86)	BS 5228-1:2009+A1:2014
	Temporary Construction Compound (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Scenario 03			
Turbine track upgrades	Access tracks to T14 and T15 (line source, 1 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014
Crane pad and turbine foundations	Construction of crane pad and turbine foundation at T1, T3 and T4 (point source, 3 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20) Concrete mixer truck + truck mounted concrete pump + boom arm (C4.32)	BS 5228-1:2009+A1:2014
Laydown area operation	Temporary laydown area on Scout Road (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Deliveries to construction compound	Access track from Scout Road to the construction compound (line source, 1 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction Compound Operation	Temporary Construction Compound (point source, 1 of)	Diesel Generator (C.84) Diesel Generator (C.86)	BS 5228-1:2009+A1:2014
	Temporary Construction Compound (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Scenario 04			
Turbine Erection	Erection of T1, T3 and T4 (point source, 3 of)	Mobile telescopic crane (C4.45) Mobile telescopic crane (C4.45)	BS 5228-1:2009+A1:2014
	Lorry transporting turbines along tracks (line source, 2 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Crane pad and turbine foundations	Construction of crane pad and turbine foundation at T9, T10 and T11 (point source, 3 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014

	Assumed working location	Plant (BS5228 Reference)	Data Source
		Concrete mixer truck + truck mounted concrete pump + boom arm (C4.32)	
Laydown area operation	Temporary laydown area on Scout Road (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Deliveries to construction compound	Access track from Scout Road to the construction compound (line source, 1 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction Compound Operation	Temporary Construction Compound (point source, 1 of)	Diesel Generator (C.84) Diesel Generator (C.86)	BS 5228-1:2009+A1:2014
	Temporary Construction Compound (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Scenario 05			
Turbine Erection	Erection of T9, T10 and T11 (point source, 3 of)	Mobile telescopic crane (C4.45) Mobile telescopic crane (C4.45)	BS 5228-1:2009+A1:2014
	Lorry transporting turbines along tracks (line source, 2 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Crane pad and turbine foundations	Construction of crane pad and turbine foundation at T8, T14 and T15 (point source, 3 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20) Concrete mixer truck + truck mounted concrete pump + boom arm (C4.32)	BS 5228-1:2009+A1:2014
Laydown area operation	Temporary laydown area on Scout Road (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Deliveries to construction compound	Access track from Scout Road to the construction compound (line source, 1 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction Compound Operation	Temporary Construction Compound (point source, 1 of)	Diesel Generator (C.84) Diesel Generator (C.86)	BS 5228-1:2009+A1:2014
	Temporary Construction Compound (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Scenario 06			
Turbine Erection	Erection of T8, T14 and T15 (point source, 3 of)	Mobile telescopic crane (C4.45) Mobile telescopic crane (C4.45)	BS 5228-1:2009+A1:2014
	Lorry transporting turbines along tracks (line source, 2 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction of substation hardstanding	Substation (point source, 1 of)	Dumper (C4.3) Dozer (C2.12) Tracked Excavator (C2.14) Vibratory roller (C5.20) Concrete mixer truck + truck mounted concrete pump + boom arm (C4.32)	BS 5228-1:2009+A1:2014
Laydown area operation	Temporary laydown area on Scout Road (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Deliveries to construction compound	Access track from Scout Road to the construction compound (line source, 1 of)	Lorry (C11.14)	BS 5228-1:2009+A1:2014
Construction Compound Operation	Temporary Construction Compound (point source, 1 of)	Diesel Generator (C.84) Diesel Generator (C.86)	BS 5228-1:2009+A1:2014
	Temporary Construction Compound (point source, 1 of)	Wheeled Excavator (C4.10)	BS 5228-1:2009+A1:2014
Scenario 07 (Night-time)			
Lighting for temporary laydown area	Temporary laydown area on Scout Road (point source, 1 of)	Diesel Generator (C.86)	BS 5228-1:2009+A1:2014

Noise Source Library – Sound Power Levels

Name	BS5228 Reference	31.5	63	125	250	500	1k	2k	4k	8k	A	lin	Source
Dozer	C2.12LAeq	28	113	102	104	101	100	106	90	84	108.7	114.8	BS 5228-1:2009+A1:2014
Tracked Excavator	C2.14LAeq		113	106	105	105	101	99	96	91	107	115.1	BS 5228-1:2009+A1:2014
Dumper	C4.3LAmax	28	112	109	102	101	100	96	89	81	104.3	114.5	BS 5228-1:2009+A1:2014
Wheeled Excavator	C4.10LAeq	28	92	88	91	92	90	85	79	73	93.9	98.1	BS 5228-1:2009+A1:2014
Concrete mixer truck + truck mounted concrete pump + boom arm	C4.32LAeq	28	101	101	105	104	100	98	93	90	105.8	110	BS 5228-1:2009+A1:2014
Mobile telescopic crane	C4.45LAeq	28	118	109	106	102	105	104	97	89	109.4	119.2	BS 5228-1:2009+A1:2014
Diesel generator	C4.84LAeq	28	103	100	104	98	97	93	84	75	101.7	108.3	BS 5228-1:2009+A1:2014
Diesel generator	C4.86LAeq	28	106	99	94	90	87	83	84	77	93.5	107.2	BS 5228-1:2009+A1:2014
Vibratory roller	C5.20LAeq	28	118	110	101	100	98	93	87	82	103	118.8	BS 5228-1:2009+A1:2014
Lorry	C11.14LAmax	28	121	107	104	102	101	100	97	94	106.9	121.4	BS 5228-1:2009+A1:2014