A specialist energy consultancy

Appendix 12-1

Construction Noise Report

Proposed Repowering of Kilgarvan Wind Farm

Orsted Onshore Ireland Midco Ltd

IE00065-0014
08 May 2024

COMMERCIAL IN CONFIDENCE

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Document Control

Revision	Status	Prepared by	Checked by	Approved by	Date
D0	DRAFT	AD	JS	JS	19/04/2023
D1	SECOND ISSUE	AD	JS	JS	08/05/2024

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Executive Summary

TNEI Services Limited (TNEI) was commissioned by MKO on behalf of Ørsted Onshore Ireland Midco Ltd ('the Applicant') to undertake predictions of noise levels associated with the existing turbine removal and construction for the proposed repowering of Kilgarvan Wind Farm (the Proposed Development). The noise predictions were used to assess the potential impact of noise attributable to the removal of the existing turbines and the subsequent construction of the Proposed Development 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: 1996 *'Acoustics–- Attenuation of sound during propagation outdoors' -Part 2: General Method of Calculation*', together with noise data for appropriate construction plant and activities.

There were 102 buildings (potential noise sensitive receptors) identified within ~3 km search area of the Wind Farm Site (defined from turbine locations within the Site). Two of the buildings identified were subsequently classified as derelict (H34 and H42) and therefore were not considered to be noise sensitive for the purposes of this assessment.

Predictions have been made at all identified noise sensitive receptors assuming that all items of plant were operating continually to provide a precautionary scenario. In addition, the noise model assumed that noise sources would be located within the most likely activity areas closest to the receptors, whereas in reality plant would move around the site 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 at all receptors would be below the most stringent of the noise threshold levels detailed in BS 5228. 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 MKO on behalf of Orsted Onshore Ireland Midco Ltd to assess construction noise associated with the removal of the Existing Kilgarvan Wind Farm and subsequent repowering (hereinafter referred to as the Proposed Development) for the Proposed Development. The following steps summarise the noise assessment process:

- Establish typical ambient noise levels at sensitive receptors located closest to the anticipated turbine removal and construction activities and derive appropriate noise threshold levels in accordance with BS5228-1:2009 +A1:2014 [(1)];
- Undertake predictions of activity noise from different construction phases 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);
- **NML** (Noise Monitoring Location) refers to the location where background noise monitoring was undertaken;
- **NSR** (Noise Sensitive Receptor) are identified receptors that are sensitive to noise; 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 Site Description

1.3.1 The Proposed Development is located approximately 5.5 km northeast of the village of Kilgarvan Co. Kerry and approximately 6 km west of Coolea, Co. Cork. The approximate location for the centre of the site is ITM 508585, 577040. The site location is detailed on Figure A1.1 in Annex A.

1.3.2 The Wind Farm Site will be accessed through the existing entrance off the N22 at Clonkeen. The site access road is c. 7.9 km in length and runs from the N22 to the entrance in the north-east corner of Kilgarvan Wind Farm. Construction noise impacts from vehicles improving and using this access track are considered within this assessment, alongside noise generating construction activity occurring across the whole of the Wind Farm Site.

1.3.3 Works within the Wind Farm Site include the removal of the existing turbines and any associated infrastructure that cannot be reused, the upgrade and construction of existing and proposed site roads and infrastructure, the construction of new turbine foundations and hardstands, and the erection of turbines and meteorological mast. EIAR Chapter 4: Description can be referred to for a detailed description of the Proposed Development and the turbine removal / construction requirements. The existing and proposed site infrastructure is shown on Figure A1.1 in Annex A.

2 Noise Planning Policy and Guidance

2.1 Overview of Noise Planning Policy and Guidance

2.1.1 There is no published Irish guidance that contains noise limits or assessment methods for construction activities other than a 2014 document published by the National Roads Authority (NRA), which relates to noise from road developments only. The Association of Acoustic Consultants of Ireland, however, have published *Environmental Noise Guidance for Local Authority Planning & Enforcement Departments* [2], which states; *"The chief guidance document applied in the assessment of construction phase noise impacts is British Standard BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise (2014).* Accordingly, in the absence of any other applicable legislation or guidance, this assessment is undertaken in accordance with BS 5228.

2.2 BS 5228:2009+A1:2014

2.2.1 The BS 5228 standard provides useful guidance on practical noise control. Part 1 provides 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 noise sources, noise calculation procedures, mitigation measures and their effectiveness.

2.2.2 Part 1 also contains sound power level data for a variety of construction plant. This data was obtained from field measurements of actual plant operating on construction and open sites and is therefore appropriate to use as source level data for construction noise predictions.

3 Potential Impacts

3.1 Turbine Removal and Construction Phases

3.1.1 To consider the variation in noise levels that could occur across the existing turbine removal and construction period, four scenarios have been modelled. The scenarios are based on the combination of existing turbine removal and construction tasks detailed in the indicative timetable shown in Table 3.1 and 3.2 below, Section 4.7 of *Chapter 4: Description* and TNEI's knowledge and experience of other similar sites and turbine removal / construction schedules.

3.1.2 Existing turbine removal and construction activities are anticipated to occur across 18 months and are divided in to two phases, with a break of 6 months between the phases. An indicative construction timeline is detailed in the Table 3.1 and Table 3.2 below for Phases 1 and 2, with grey shaded cells indicating periods of activity.

Table 3.1: Indicative Construction Timetable (Phase 1)

Construction Activities	Months (2025)						
	Mar	Apr	May	Jun	Jul	Aug	Sep
(A[1]) Civil works – Constructions of compounds, sections of new road within the site, new turbine foundations and hardstands (Week 1 -27).							

Table 3.2: Indicative Construction Timetable (Phase 2)

Task	Months (2026 - 2027)										
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
(A[2]) Removal of existing turbines (Week 1-15).											
(B[2]) Civil works - Upgrades and widening to existing roads including the access road, installation of internal cable ducting (Week 1-31).											
(C[2]) Electrical works, substation upgrade, installation of cables and substation commissioning (Week 1-54).											
(D[2]) Turbine Delivery, installation and turbine commissioning (Week 31-56).											

3.1.3 The assessed scenarios are as follows;

- Scenario 01 accounts for activities that are anticipated to occur within Phase 1 (Activity A^1).
- Scenario 02 accounts for activities A^2, B^2 and C^2 occurring concurrently; and,
- Scenario 03 considers activities B^2, C^2 and D^2 occurring concurrently.
- Although no specific construction activities are proposed to occur during the night-time, a fourth scenario has been assessed to consider any potential noise from the operation of generators and or plant that may be required to be left on over-night, for example, to provide lighting on site.

3.2 Construction Noise Sources

3.2.1 Noise levels from the turbine removal / construction activities would vary continually over time as activities and plant start and stop and move around the site, however, the noise models assume worst-case scenarios where all plant and activities are modelled as working continually and in activity locations closest to the nearest NSRs.

4 Methodology

4.1 Methodology for the Prediction of Noise

4.1.1 To predict the noise immission levels attributable to the removal of the existing wind farm and the construction of the Proposed Development, noise propagation models have been built 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.

4.1.2 The noise levels have been predicted in accordance with ISO9613-2:1996 *'Acoustics–- Attenuation of sound during propagation outdoors: General method of calculation'*. [(2)]

4.1.3 The ISO 9613 propagation model was chosen in preference to the calculation method presented in BS 5228, 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 BS 5228 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.

4.1.4 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.

4.1.5 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.

4.1.6 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 construction compounds, tracks, 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.

4.2 Limitations of the Noise Model

4.2.1 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 the 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.

4.3 Assessing Existing Turbine Removal & Construction Noise Effects

4.3.1 Annex E, part E.3.2 of BS 5228 provides example criteria for assessing the significance of construction noise effects and acceptable limits for construction noise.

4.3.2 Table E.1 of BS 5228 (represented here as Table 4.1) contains an example of the significance criteria that can be used to assess construction activities.

Table 4.1: Example of Threshold of Potential Significant Effect at Dwellings ($dB_{(A)}$)

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) and 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.

4.3.3 The values can be considered thresholds for the existing turbine removal and 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."

4.3.4 Therefore, the assessment of existing turbine removal and 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.

4.3.5 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".*

4.4 Study Area

4.4.1 The Study Area for the noise assessment has been defined by a 3 km buffer around the Wind Farm Site. Within this study area, 102 buildings have been identified, of which the majority are residential properties.

4.4.2 Noise Sensitive Receptors (NSRs) are properties, people or fauna that are sensitive to noise and, therefore, may require protection from nearby noise sources. Residential receptors are deemed to have a high level of sensitivity, therefore, all identified residential NSRs within the study area have been assessed. Two of the buildings identified within the 3 km buffer were subsequently classified as derelict (H34 and H42) and have not been considered to be noise sensitive for the purposes of this assessment.

4.4.3 A representative sample of 11 Construction Noise Assessment Locations (CNALs) have been chosen to represent the closest NSRs or group of NSRs to the Wind Farm Site and the assessment of these CNALs are detailed within this report on the assumption that if noise levels are within acceptable levels at the closest receptors, then it is reasonable to assume they will also be acceptable at more distant locations. Nevertheless, for completeness, noise level predictions for all identified NSRs in the study area are provided in Annex C.Table 4.2 details the CNALs, which are also shown on Figure A1.1. For clarity, all CNALs and NSRs are also labelled as 'H' and numbered to ensure consistency with labelling used within the rest of the EIAR.

4.4.4 A set of inset maps (Figures A1.1a-b) show all of the NSRs identified within the study area and have been included within Annex A.

Table 4.2: Construction & Decommissioning Noise Assessment Locations

CNAL - NSR	ITM Coordinates	
	Eastings	Northings
CNAL1 – H3	508647	575524
CNAL2 – H5	506263	575547
CNAL3 – H6	507766	574676
CNAL4 – H7	506736	575142
CNAL5 – H9	508019	579110
CNAL6 – H14	505296	577210
CNAL7 – H16	511783	575938
CNAL8 – H17	511821	577236
CNAL9 – H25	511684	577866
CNAL10 – H32	504921	576134
CNAL11 – H97	510461	579590

4.5 Baseline Noise Levels

4.5.1 Baseline noise level monitoring was undertaken as part of the operational noise assessment undertaken for the Proposed Development (see Appendix 12-2 for more information).

4.5.2 At all NMLs the ambient sound levels were below the BS 5228 Category A Threshold Values, as detailed in Table 4.1.

4.6 Existing Turbine Removal & Construction Noise Level Thresholds

4.6.1 Having due regard to the existing ambient noise levels around the Proposed Development, the BS 5228 Category A Threshold Values have been adopted for the noise assessment.

4.6.2 Accordingly, the assessment is made against the following noise level limits:

- Daytime weekdays 07:00 – 19:00: 65 dB $L_{Aeq\ (12\ hours)}$
- Saturday 07:00 – 13:00: 65 dB $L_{Aeq\ (6\ hours)}$
- Evenings and Weekends 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 $L_{Aeq\ (8\ hours)}$

5 Noise Impact Assessment

5.1 Modelling of Individual Sound Sources

5.1.1 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 Annex B: Noise Model Data.

5.1.2 For tree felling activities broadband noise level data for a harvester, a forwarder and a skidder has been taken from *Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment* [3] (Forestry Commission). No octave band data is available therefore modelling has been undertaken using the 500 Hz octave band data, as recommended in ISO 9613. Noise levels for the Harvester and Forwarder are given at the operator position inside a Q Cab. In order to estimate external levels 10 dB has been added to the quoted levels and the sound power level for each item of plant has been calculated within CadnaA assuming the quoted sound pressure levels (SPLs) have been measured at a distance of 1 m.

5.1.3 For all other existing turbine removal / construction activities source noise level data is taken from Annex C of BS 5228, which provides octave band SPL's for a wide variety of plant and activities suitable for the estimation of noise immission levels.

5.1.4 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.

5.1.5 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.

5.1.6 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.

5.2 Modelling of Decommissioning and Construction Activities

5.2.1 The assessment considers a number of scenarios based on the key turbine removal / construction activities detailed in *Chapter 4: Description* and also in the indicative timetables (Table 3-1 and Table 3.2 of this report).

5.2.2 Noise propagation modelling has been undertaken considering the key activities that are likely to occur throughout the turbine removal / construction period. 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 Annex B: Noise Model Data.

5.2.3 The modelled scenarios represent the following construction activities:

- Scenario 01: Construction and operation of the site compounds, construction of the proposed new roads within the site and the construction of the hardstands and foundations for the proposed new turbines.
- Scenario 02: Operation of the compounds, removal of the original turbines, upgrades and widening to the existing roads within the site and along the access route and upgrades to the substation.
- Scenario 03: Operation of the compounds, delivery and erection of all new turbines, upgrades and widening to the remaining existing roads within the site and along the access route, upgrades to the substation.
- Scenario 04 (Night-time): Diesel generators for the cabin and lighting at both compounds are operational.

5.2.4 In addition to the above, for Scenario 1 forestry activities have been modelled including felling of trees in the vicinity of T1, T2, T3, T8 and T11 and forwarding for transportation off site.

5.2.5 Further details on the location, number, and type of plant for each activity can be found in Appendix B.

5.3 Calculated Noise Immission Levels

5.3.1 Table 5.1 presents the calculated noise immission levels at each CNAL for each scenario.

Table 5.1: Predicted Turbine Removal / Construction Noise Immission Levels, dB $L_{Aeq(t)}$

CNAL	Scenario			
	1	2	3	Night
CNAL1 – H3	40.2	40.0	39.0	19.0
CNAL2 – H5	31.0	34.0	30.0	4.0
CNAL3 – H6	36.3	34.0	34.0	15.0
CNAL4 – H7	37.1	43.0	34.0	15.0
CNAL5 – H9	30.6	29.0	29.0	12.0
CNAL6 – H14	27.2	27.0	26.0	9.0
CNAL7 – H16	24.6	26.0	26.0	9.0
CNAL8 – H17	25.2	24.0	26.0	6.0
CNAL9 – H25	29.3	30.0	30.0	9.0
CNAL10 – H32	21.3	22.0	21.0	nil
CNAL11 – H97	32.1	33.0	33.0	8.0

5.3.2 For all CNALs the predicted noise levels for all scenarios are below the weekday and Saturday daytime Category A threshold level of 65 dBA and are also below the evening and weekend Category A threshold level of 55 dBA.

5.3.3 No construction activities are anticipated during the night-time, however, some generation plant or similar may operate during night-time hours within the construction compounds. The predicted noise levels for the modelled night-time scenario are below the night-time Category A threshold levels of 45 dBA.

5.3.4 Appendix B presents the calculated noise immission levels at each NSR for each scenario. No exceedances of the threshold levels have been identified at any NSR.

6 Summary

6.1.1 The noise impact assessment has considered the existing noise environment at local residential receptors to determine appropriate noise threshold levels associated with the existing turbine removal and construction activities for the Proposed Repowering of the Proposed Development .

6.1.2 Noise propagation modelling has been undertaken in accordance with ISO 9613-2:1996 and the anticipated noise immission levels presented for scenarios likely to occur during the construction period. The modelled scenarios consider activities that are likely to occur across the existing turbine removal / construction period, and the modelling assumes that activities are occurring at the locations within the development site that are closest to the NSRs.

6.1.3 The predicted levels for the existing turbine removal and construction of the Proposed Development are below the Category A Daytime and Evening and Weekend Threshold Levels, as detailed within BS 5228:2009, for all receptors. Accordingly, noise impacts are below the indicator for a potential significant effect.

6.1.4 An assessment of noise levels that may occur during the night-time, for example, from the use of generators to power on-site lighting, has indicated that levels will remain below the Category A Night-time Threshold Levels.

6.1.5 The assessment concludes that construction noise levels would remain below the indicator for a potential significant effect.

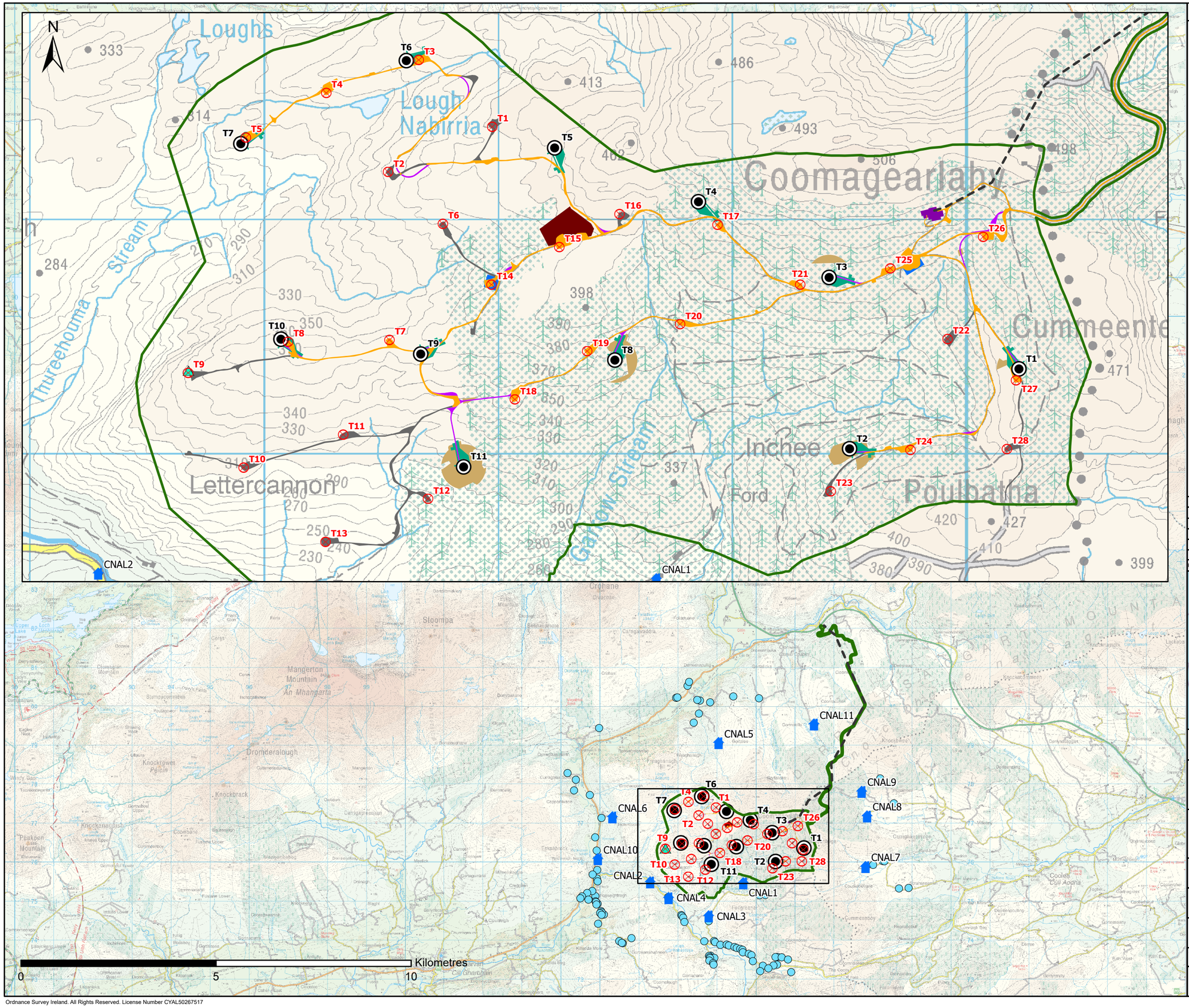
7 References

1. **British Standards Institute.** *Code of practice for noise and vibration control on construction and open sites. Noise.* UK : BSI, 2014. BS 5228-1:2009+A1:2014 .

2. **(ISO), International Organisation for Standardisation.** *Acoustics – Attenuation of Sound During Propagation Outdoors: Part 2 – General Method of Calculation.* Geneva : ISO, 1996. ISO 9613-2:1996.

3. **Forestry Commission.** *Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment.* Edinburgh : The Crown, 2003.

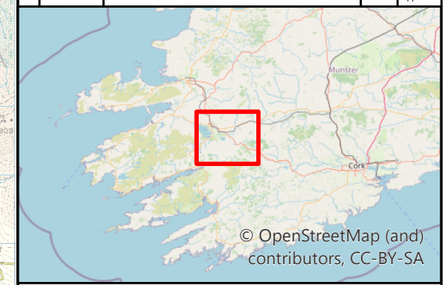
Annex A – Figures



LEGEND

- EIAR Site Boundary
- Construction Noise Assessment Location (CNAL)
- Noise Sensitive Receptor (NSR)
- As Built Turbines
- Proposed Turbine Location
- Proposed Met Mast Location
- Roads to be Upgraded
- Proposed Roads and Widening
- Proposed Hardstands
- Existing Site Roads
- Proposed Construction Compounds
- Proposed Borrow Pit Location
- Proposed Felling Area
- As Built Substation
- Existing 110 kV OHL

Rev.	Date	Amendment Details	Drawn	Approved
1	13/05/2023	CLIENT COMMENTS	JCM	JB
0	03/04/2023	FIRST ISSUE	AD	JB



tnei

Client

Orsted Onshore Ireland Midco Ltd

Drawing Status:

FOR INFORMATION

Project Title:

PROPOSED REPOWERING OF KILGARVAN WIND FARM

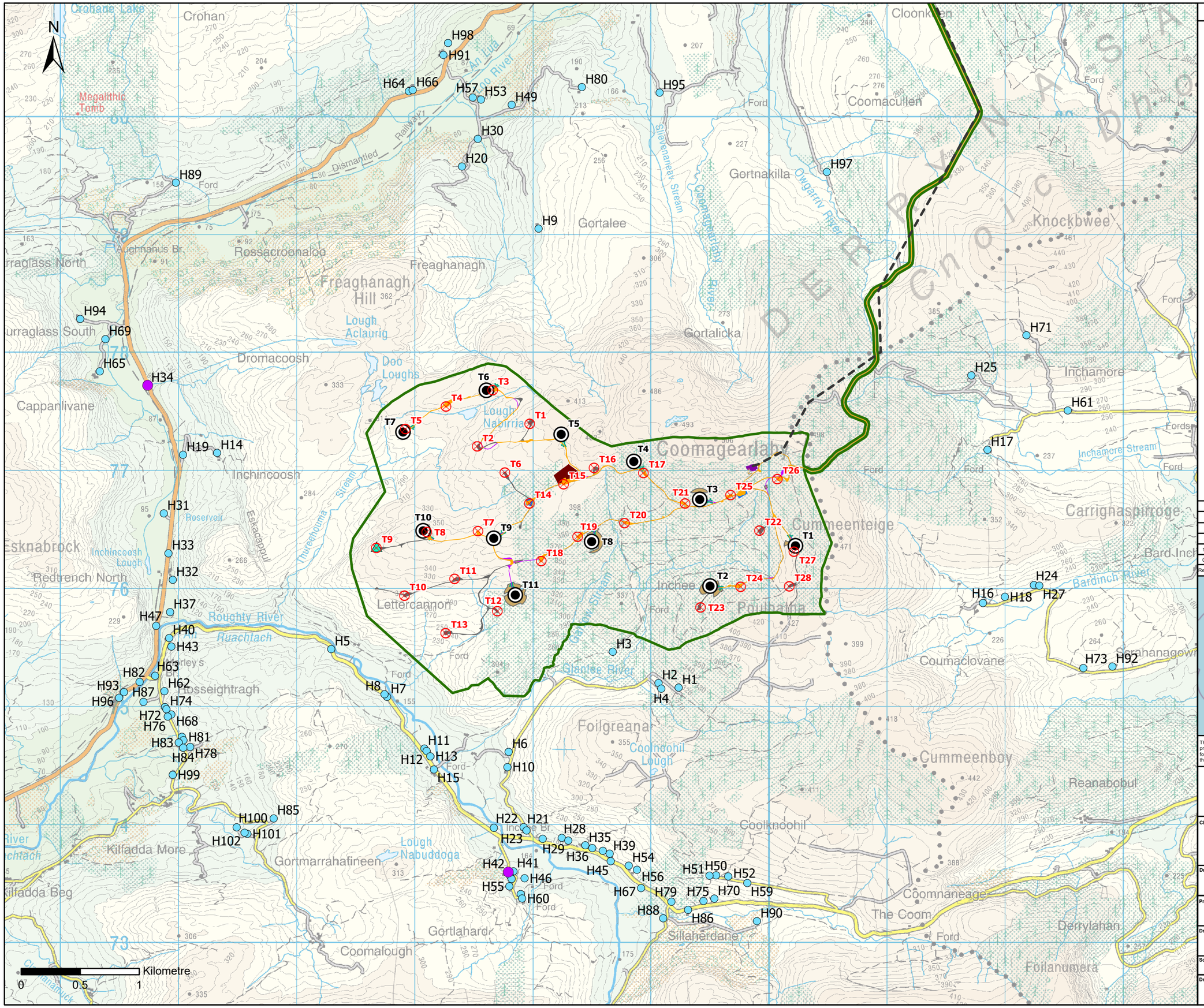
Drawing Title:

FIGURE A1.1 - SITE LAYOUT

Scale:	Original Size:	Spatial Reference:
1:90,000	A3	IRENET95 Irish Transverse Mercator

Drawing Number:

IE00065-011



LEGEND

- EIAR Site Boundary
- Noise Sensitive Receptor (NSR)
- Derelict Property
- As Built Turbines
- Proposed Turbine Location
- Proposed Met Mast Location
- Roads to be Upgraded
- Proposed Roads and Widening
- Proposed Hardstands
- Existing Site Roads
- Proposed Construction Compounds
- Proposed Borrow Pit Location
- Proposed Felling Area
- As Built Substation
- Existing 110 kV OHL

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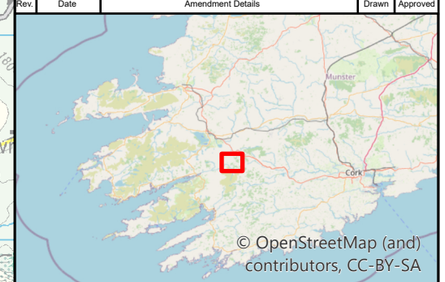
1	13/05/2023	CLIENT COMMENTS	JCM	JB
0	03/04/2023	FIRST ISSUE	AD	JB



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Client
Orsted Onshore Ireland Midco Ltd

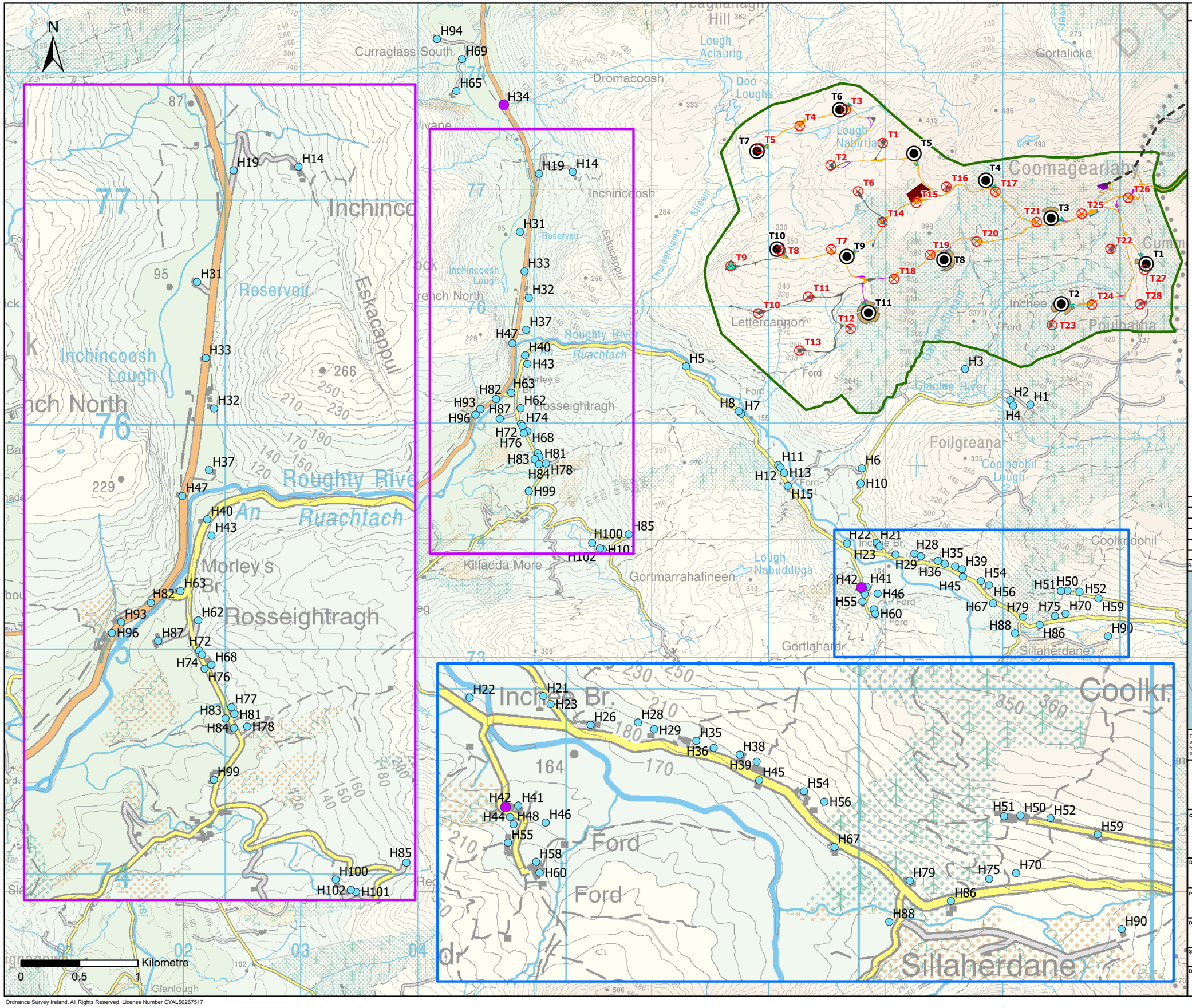
Drawing Status:
FOR INFORMATION

Project Title:
PROPOSED REPOWERING OF KILGARVAN WIND FARM

Drawing Title:
FIGURE A1.1a - SITE LAYOUT

Scale:	Original Size:	Spatial Reference:
1:30,000	A3	IRENET95 Irish Transverse Mercator

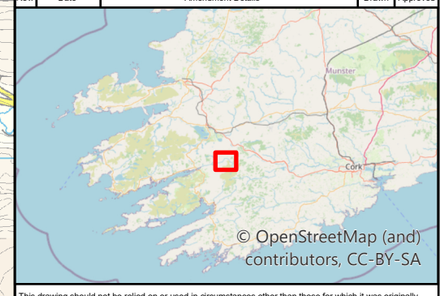
Drawing Number:
IE00065-012



LEGEND

- EIAR Site Boundary
- Noise Sensitive Receptor (NSR)
- Derelict Property
- As Built Turbines
- Proposed Turbine Location
- Proposed Met Mast Location
- Roads to be Upgraded
- Proposed Roads and Widening
- Proposed Hardstands
- Existing Site Roads
- Proposed Construction Compounds
- Proposed Borrow Pit Location
- Proposed Felling Area
- As Built Substation
- Existing 110 kV OHL

Rev.	Date	Amendment Details	Drawn	Approved
1	13/05/2023	CLIENT COMMENTS	JCM	JB
0	03/04/2023	FIRST ISSUE	AD	JB



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Client

Orsted Onshore Ireland Midco Ltd

Drawing Status:

FOR INFORMATION

Project Title:

PROPOSED REPOWERING OF KILGARVAN WIND FARM

Drawing Title:

FIGURE A1.1b - SITE LAYOUT (INSET MAP)

Scale:	Original Size:	Spatial Reference:
1:30,000	A3	IRENET95 Irish Transverse Mercator

Drawing Number:

IE00065-013

Annex B – Noise Model Data

Modelled Noise Sources

Noise Source Activity	Assumed working location	Plant (BS5228 Reference)	Data Source
Scenario 01	**Phase 1**		
Temporary Construction Compounds	Both Temporary Construction Compounds	Diesel Generator (C4. 84), Diesel Generator (C4. 86), Wheeled Excavator (C4. 10)	BS 5228-1:2009+A1:2014
Felling	All 5 felling locations	Harvester, Forwarder, Skidder	Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment
Turbine Foundations	Proposed locations for T1 – T11	Concrete mixer truck + truck mounted concrete pump + boom arm (C4.32), Vibratory roller (C5.20)	BS 5228-1:2009+A1:2014
Turbine Hardstands	Proposed locations for T1 – T11	Dozer (C2.12), Tracked Excavator (C2.14), Dumper (C4.3)	BS 5228-1:2009+A1:2014
Borrow Pit	Borrow pit	Tracked mobile drilling rig (C9.3), Excavator mounted rock breaker (C9.12), Tracked semi-mobile crusher (C9.15), Dozer (C2.12), Dumper (C4.3)	BS 5228-1:2009+A1:2014
Road Upgrades	3 proposed site roads (Line Sources)	Dozer (C2.12), Tracked Excavator (C2.14), Dumper (C4.3)	BS 5228-1:2009+A1:2014
Delivery Route	Along access road (Line Source)	3*Lorry (C6.21)	BS 5228-1:2009+A1:2014
Scenario 2	**Phase 2 (1)**		
Temporary Construction Compounds	Both Temporary Construction Compounds	Diesel Generator (C4. 84), Diesel Generator (C4. 86), Wheeled Excavator (C4. 10)	BS 5228-1:2009+A1:2014
Turbine Removal	Existing Turbines T1, T3, T5, T6, T9, T10, T12, T13, T16, T21, T23, T26, T28	2*Mobile telescopic crane (C4. 45), Road lorry (C6. 21)	BS 5228-1:2009+A1:2014
Substation Upgrade	Existing substation	Lorry (C11. 14), Mobile telescopic crane (C4. 45)	BS 5228-1:2009+A1:2014
Road Upgrades	4 proposed site road upgrades (Line Sources)	Dozer (C2.12), Tracked Excavator (C2.14), Dumper (C4.3)	BS 5228-1:2009+A1:2014
Delivery Route	Along access road (Line Source)	3*Lorry (C6.21)	BS 5228-1:2009+A1:2014
Scenario 3	**Phase 2 (2)**		
Temporary Construction Compounds	Both Temporary Construction Compounds	Diesel Generator (C4. 84), Diesel Generator (C4. 86), Wheeled Excavator (C4. 10)	BS 5228-1:2009+A1:2014
Substation Upgrade	Existing substation	Lorry (C11. 14), Mobile telescopic crane (C4. 45)	BS 5228-1:2009+A1:2014
Turbine Installation	Proposed locations for T1 – T11	2*Mobile telescopic crane (C4. 45), Road lorry (C6. 21)	BS 5228-1:2009+A1:2014
Road Upgrades	4 proposed site road upgrades (Line Sources)	Dozer (C2.12), Tracked Excavator (C2.14), Dumper (C4.3)	BS 5228-1:2009+A1:2014

Modelled Noise Sources

Delivery Route	Along access road (Line Source)	3*Lorry (C6.21)	BS 5228-1:2009+A1:2014
Scenario 4	**Night**		
Temporary Construction Compounds	Both Temporary Construction Compounds	Diesel Generator (C4. 84), Diesel Generator (C4. 86)	BS 5228-1:2009+A1:2014

Modelled Noise Sources

Noise Source Library – Sound Power Levels

Name	BS5228 Reference	31.5	63	125	250	500	1k	2k	4k	8k	A	lin	Source
Harvester	-					103					103	106	Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment
Forwarder	-					101					101	104	Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment
Skidder	-					108					108	111	Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment
Dozer	C2.12	0	113	102	104	101	100	106	90	84	109	115	BS 5228-1:2009+A1:2014
Tracked Excavator	C2. 14	28	113	106	105	105	101	99	96	91	107	115	BS 5228-1:2009+A1:2014
Dump Truck (empty)	C2. 31	28	114	107	107	107	107	112	97	88	115	118	BS 5228-1:2009+A1:2014
Dumper	C4. 3	28	112	109	102	101	100	96	89	81	104	115	BS 5228-1:2009+A1:2014
Wheeled Excavator	C4. 10	28	92	88	91	92	90	85	79	73	94	98	BS 5228-1:2009+A1:2014
Concrete mixer truck	C4. 20	28	111	102	94	97	98	106	88	83	108	113	BS 5228-1:2009+A1:2014

Modelled Noise Sources

Noise Source Library – Sound Power Levels

Name	BS5228 Reference	31.5	63	125	250	500	1k	2k	4k	8k	A	lin	Source
Concrete mixer truck + truck mounted concrete pump + boom arm	C4. 32	28	101	101	105	104	100	98	93	90	106	110	BS 5228-1:2009+A1:2014
Mobile telescopic crane	C4. 45	28	118	109	106	102	105	104	97	89	109	119	BS 5228-1:2009+A1:2014
Diesel generator	C4. 84	28	103	100	104	98	97	93	84	75	102	108	BS 5228-1:2009+A1:2014
Diesel generator	C4. 86	28	106	99	94	90	87	83	84	77	94	107	BS 5228-1:2009+A1:2014
Water pump (diesel)	C4. 88	28	98	93	94	92	92	91	84	74	97	102	BS 5228-1:2009+A1:2014
Vibratory roller	C5. 20	28	118	110	101	100	98	93	87	82	103	119	BS 5228-1:2009+A1:2014
Road lorry (full)	C6. 21	28	124	110	102	101	105	100	99	92	109	124	BS 5228-1:2009+A1:2014
Tracked mobile drilling rig	C9. 3	28	105	111	110	112	113	113	112	107	119	120	BS 5228-1:2009+A1:2014
Excavator mounted rock breaker	C9. 12	28	119	117	113	117	115	115	112	108	121	125	BS 5228-1:2009+A1:2014
Tracked semi-mobile crusher	C9. 15	28	119	119	116	115	113	111	106	96	118	124	BS 5228-1:2009+A1:2014

Modelled Noise Sources

Noise Source Library – Sound Power Levels

Name	BS5228 Reference	31.5	63	125	250	500	1k	2k	4k	8k	A	lin	Source
Rigid dump truck	C9. 17	28	114	117	116	116	114	111	104	98	119	123	BS 5228-1:2009+A1:2014
Lorry	C11. 14	28	121	107	104	102	101	100	97	94	107	121	BS 5228-1:2009+A1:2014

Annex C – Noise Sensitive Receptor Results

Predicted Existing Turbine Removal / Construction Noise Levels, dB $L_{Aeq(t)}$

NSR	ITM Coordinates		Dwelling Status	Scenario			
	Eastings	Northings		1	2	3	Night
H1	509205	575221	Dwelling	39.4	38.0	38.0	18.0
H2	509035	575259	Dwelling	38.9	39.0	37.0	19.0
H3	508647	575524	Dwelling (Holiday Home)	40.2	40.0	39.0	19.0
H4	509059	575212	Dwelling	39.0	39.0	37.0	19.0
H5	506263	575547	Dwelling	31.0	34.0	30.0	4.0
H6	507766	574676	Dwelling	36.3	34.0	34.0	15.0
H7	506736	575142	Dwelling	37.1	43.0	34.0	15.0
H8	506715	575165	Dwelling	37.0	43.0	34.0	15.0
H9	508019	579110	Dwelling	30.6	29.0	29.0	12.0
H10	507755	574547	Dwelling	35.5	34.0	33.0	14.0
H11	507052	574704	Dwelling (Mobile Home)	35.0	39.0	33.0	14.0
H12	507071	574684	Dwelling	35.0	38.0	33.0	14.0
H13	507102	574638	Dwelling	34.8	38.0	32.0	14.0
H14	505296	577210	Dwelling	27.2	27.0	26.0	9.0
H15	507133	574527	Dwelling	34.5	37.0	33.0	13.0
H16	511783	575938	Dwelling	24.6	26.0	26.0	9.0
H17	511821	577236	Dwelling	25.2	24.0	26.0	6.0
H18	511969	575990	Dwelling	25.0	27.0	26.0	9.0
H19	505008	577194	Dwelling	28.8	28.0	27.0	9.0
H20	507371	579636	Dwelling	24.5	24.0	23.0	5.0
H21	507893	574038	Dwelling	30.1	29.0	29.0	9.0
H22	507641	574033	Dwelling	33.0	34.0	31.0	12.0
H23	507917	574010	Dwelling	30.0	29.0	29.0	9.0
H24	512214	576090	Dwelling	19.6	21.0	20.0	nil

Predicted Existing Turbine Removal / Construction Noise Levels, dB $L_{Aeq(t)}$

NSR	ITM Coordinates		Dwelling Status	Scenario			
	Eastings	Northings		1	2	3	Night
H25	511684	577866	Dwelling	29.3	30.0	30.0	9.0
H26	508054	573940	Dwelling	28.5	28.0	28.0	7.0
H27	512260	576085	Dwelling	21.8	22.0	22.0	1.0
H28	508216	573948	Dwelling	26.7	27.0	26.0	7.0
H29	508271	573925	Dwelling	26.6	27.0	26.0	7.0
H30	507505	579870	Dwelling	22.4	22.0	22.0	nil
H31	504845	576697	Dwelling	30.2	29.0	28.0	9.0
H32	504921	576134	Dwelling	21.3	22.0	21.0	nil
H33	504884	576358	Dwelling	25.7	25.0	24.0	1.0
H34	504709	577782	Derelict	-	-	-	-
H35	508415	573885	Dwelling	27.0	27.0	26.0	7.0
H36	508474	573861	Dwelling	27.1	27.0	26.0	7.0
H37	504898	575860	Dwelling	29.2	31.0	26.0	8.0
H38	508563	573838	Dwelling	27.6	28.0	27.0	8.0
H39	508621	573814	Dwelling	27.8	27.0	27.0	7.0
H40	504891	575641	Dwelling	25.3	28.0	25.0	0.0
H41	507807	573664	Dwelling	31.5	32.0	29.0	11.0
H42	507764	573658	Derelict	-	-	-	-
H43	504909	575568	Dwelling	25.5	29.0	25.0	nil
H44	507779	573624	Dwelling	31.3	32.0	29.0	11.0
H45	508630	573750	Dwelling	27.9	28.0	27.0	7.0
H46	507901	573606	Dwelling	31.3	32.0	29.0	11.0
H47	504780	575744	Dwelling	29.7	31.0	28.0	9.0
H48	507791	573600	Dwelling	31.3	32.0	29.0	11.0
H49	507792	580159	Dwelling	22.2	22.0	22.0	0.0

Predicted Existing Turbine Removal / Construction Noise Levels, dB $L_{Aeq(t)}$

NSR	ITM Coordinates		Dwelling Status	Scenario			
	Eastings	Northings		1	2	3	Night
H50	509523	573630	Dwelling	24.1	24.0	24.0	0.0
H51	509467	573628	Dwelling	25.2	25.0	25.0	3.0
H52	509625	573621	Dwelling	26.2	26.0	26.0	4.0
H53	507532	580204	Dwelling	29.1	27.0	27.0	9.0
H54	508783	573712	Dwelling	26.4	26.0	26.0	1.0
H55	507772	573537	Dwelling	31.0	32.0	29.0	11.0
H56	508852	573677	Dwelling	27.3	27.0	27.0	4.0
H57	507462	580221	Dwelling	29.4	27.0	27.0	9.0
H58	507868	573471	Dwelling	31.1	32.0	29.0	10.0
H59	509787	573565	Dwelling	25.0	25.0	25.0	4.0
H60	507880	573434	Dwelling	31.1	31.0	30.0	10.0
H61	512501	577569	Dwelling	27.3	28.0	28.0	11.0
H62	504851	575191	Dwelling	27.3	28.0	25.0	nil
H63	504771	575321	Dwelling	24.9	27.0	24.0	1.0
H64	506921	580274	Dwelling	26.9	26.0	26.0	9.0
H65	504303	577900	Dwelling	28.0	27.0	26.0	7.0
H66	506953	580284	Dwelling	27.0	26.0	26.0	9.0
H67	508887	573522	Dwelling	26.1	26.0	26.0	4.0
H68	504909	574993	Dwelling	26.8	28.0	25.0	0.0
H69	504350	578173	Dwelling	27.9	27.0	26.0	7.0
H70	509508	573433	Dwelling	25.4	25.0	25.0	3.0
H71	512151	578207	Dwelling	28.9	29.0	29.0	12.0
H72	504855	575056	Dwelling	25.7	28.0	25.0	nil
H73	512633	575387	Dwelling	25.2	27.0	25.0	8.0
H74	504867	575038	Dwelling	26.8	28.0	25.0	1.0

Predicted Existing Turbine Removal / Construction Noise Levels, dB $L_{Aeq(t)}$

NSR	ITM Coordinates		Dwelling Status	Scenario			
	Eastings	Northings		1	2	3	Night
H75	509416	573413	Dwelling	25.2	26.0	25.0	4.0
H76	504879	574975	Dwelling (Mobile Home)	27.8	28.0	26.0	2.0
H77	504999	574804	Dwelling	28.6	30.0	26.0	8.0
H78	505069	574718	Dwelling	28.8	30.0	27.0	8.0
H79	509144	573407	Dwelling	26.2	27.0	26.0	5.0
H80	508386	580309	Dwelling	28.5	29.0	28.0	5.0
H81	505011	574775	Dwelling	28.7	30.0	27.0	7.0
H82	504640	575269	Dwelling	28.0	28.0	26.0	7.0
H83	504972	574755	Dwelling	28.7	30.0	27.0	8.0
H84	505010	574711	Dwelling	28.6	30.0	27.0	8.0
H85	505776	574112	Dwelling	26.4	28.0	25.0	nil
H86	509285	573338	Dwelling	26.4	27.0	26.0	5.0
H87	504673	575100	Dwelling	28.1	28.0	26.0	4.0
H88	509075	573266	Dwelling	27.2	27.0	27.0	9.0
H89	504947	579499	Dwelling	27.0	26.0	26.0	7.0
H90	509868	573242	Dwelling	25.6	26.0	25.0	5.0
H91	507213	580582	Dwelling	28.8	26.0	26.0	8.0
H92	512879	575400	Dwelling	18.6	20.0	20.0	nil
H93	504508	575183	Dwelling	27.9	28.0	26.0	8.0
H94	504137	578345	Dwelling	27.3	26.0	25.0	6.0
H95	509044	580262	Dwelling	29.8	28.0	28.0	10.0
H96	504466	575135	Dwelling	27.9	28.0	26.0	8.0
H97	510461	579590	Dwelling	32.1	33.0	33.0	8.0
H98	507253	580683	Dwelling	28.5	26.0	26.0	8.0
H99	504921	574481	Dwelling	28.2	30.0	27.0	8.0

Predicted Existing Turbine Removal / Construction Noise Levels, dB $L_{Aeq(t)}$

NSR	ITM Coordinates		Dwelling Status	Scenario			
	Eastings	Northings		1	2	3	Night
H100	505462	574037	Dwelling	28.0	29.0	26.0	6.0
H101	505553	573982	Dwelling	28.0	29.0	26.0	6.0
H102	505529	573991	Dwelling	27.9	29.0	26.0	6.0