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Technical Appendix 10.1

# Construction Noise Report

## Kellystown Wind Farm

EDF Renewables Ireland Ltd

IE00125-013  
24 September 2024

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## Executive Summary

TNEI Ireland Ltd was commissioned by EDF Renewables Ireland Ltd ('the Applicant') to undertake an assessment of potential noise impact associated with the construction of the proposed Kellystown Wind Farm (the Proposed Development). The noise predictions were used to assess the potential impact of noise attributable to the construction of the Proposed Development on the occupiers of nearby noise sensitive receptors (i.e. residential properties).

The construction 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 noise predictions using a noise modelling software and sound propagation 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 assumptions of plant locations at various phases of construction.

There were 374 noise sensitive receptors (assumed to be dwellings) identified within ~2 km search area of the site (defined from turbine locations within the Site). Of the 374 identified NSRs a total of 15 NSRs were chosen as Construction Noise Assessment Locations (CNALs). The CNALs were chosen to represent the noise sensitive receptors located closest to the Proposed Development. The modelling results for the CNALs has been presented within the main body of this report whilst an assessment for all NSRs has been included within an Annex to the report. For clarity all NSRs are labelled with the letter 'H', to ensure consistency with the labelling within the rest of the Environmental Impact Assessment Report (EIAR).

Predictions have been made assuming that all items of plant are operating continually throughout the assessment periods 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 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.

As part of the cabling for the grid connection route there is a requirement to undertake Horizontal Directional Drilling (HDD) at six locations. For one location there is a requirement to drill under the M1 Motorway therefore detailed noise modelling was undertaken at three receptors (CNALs 16-18) located in closest proximity to those HDD activities.

The results show that the predicted noise levels would be below the noise threshold levels detailed in BS 5228. Accordingly, the assessment concludes that there would be no significant construction noise impacts.

# Contents

Document Control.....	3
Executive Summary.....	4
Contents.....	5
1 Introduction .....	7
1.1 Brief.....	7
1.2 Nomenclature .....	7
1.3 Site Description .....	7
2 Noise Planning Policy and Guidance.....	10
2.1 Overview of Noise Planning Policy and Guidance .....	10
2.2 BS 5228:2009+A1:2014.....	10
3 Potential Impacts .....	11
3.1 Construction Noise Sources .....	11
3.2 Construction Phases.....	11
4 Methodology.....	12
4.1 Methodology for the Prediction of Noise .....	12
4.2 Limitations and Assumptions of the Noise Model.....	12
4.3 Assessing Construction Noise Effects .....	13
4.4 Study Area.....	14
4.5 Baseline Noise Levels .....	15
4.6 Construction Noise Level Thresholds.....	16
5 Noise Impact Assessment .....	17
5.1 Modelling of Individual Sound Sources.....	17
5.2 Modelling of Construction Activities.....	18
5.3 Modelling of HDD Activities .....	19
5.4 Calculated Noise Immission Levels .....	19
5.5 Grid Connection .....	21
6 Summary .....	22
7 References .....	23

## TABLES

Table 1.1: Indicative Construction Programme .....	9
Table 4.1: Example of Threshold of Potential Significant Effect at Dwellings (dB <sub>(A)</sub> ).....	13
Table 4.2: Construction Noise Assessment Locations.....	15

Table 5.1: Predicted Construction Noise Immission Levels, dB  $L_{Aeq(t)}$  ..... 20  
Table 5.2 - Predicted Noise immission levels from HDD activity, dB  $L_{Aeq(t)}$  ..... 20

ANNEXES

Annex A – Figures

Annex B – Noise Model Data

Annex C – Predictions for all NSRs

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# 1 Introduction

## 1.1 Brief

1.1.1 TNEI Ireland Ltd was commissioned by EDF Renewables Ireland Ltd to undertake a construction noise assessment for the proposed Kellystown Wind Farm (hereinafter referred to as the Proposed Development). 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 construction noise threshold levels in accordance with BS 5228-1:2009 +A1:2014 <sup>(1)</sup>;
- 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);
- **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, specifically for construction noise.

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 8.3 km north of Drogheda, 23.6 km South of Dundalk and 50 km North of Dublin in County Louth. The approximate Irish Transverse Mercator (ITM) reference for the centre of the site is 708000, 783500 and the proposed layout is shown on Figure A1.1 in Annex A.

1.3.2 The site will consist of 5 wind turbines, a Battery Energy Storage System (BESS), a Permanent Met Mast, 38 kV on-site substation and all ancillary works and the construction of an underground Grid Connection to Drybridge 110 kV Substation.

- 1.3.3 The Grid Connection will be from the proposed onsite 38 kV substation to the existing Drybridge 110 kV substation in County Louth. The underground cable route, measuring approximately 12.65 km in length, is primarily located within the public road corridor.
- 1.3.4 The wind farm site will be accessed via four site entrances. Two new entrances accessing from the L6274-0 (entrances 1 and 2) and the upgrading of two existing entrances accessing from the L2275-24 (entrances 3 and 4). Construction noise impacts from vehicles establishing, upgrading and using these access tracks were considered, as well as all anticipated noise generating construction activity occurring within the redline boundary.
- 1.3.5 Construction of the Proposed Development will require some tree felling, the establishment or upgrading/ laying of tracks across the Site, establishing the three temporary construction compounds, excavation of turbine foundations, construction of turbine bases, erection of turbines, and the installation of a substation and BESS and other associated infrastructure. A more detailed description of the Proposed Development and the construction requirements can be found in Chapter 2: Description of the Proposed Development of the Environmental Impact Assessment Report (EIAR) for the Proposed Development.
- 1.3.6 Construction is anticipated to last for approximately 16-24 months. An indicative construction programme has been provided by EDF and is reproduced as No night-time construction activities are anticipated, however, an additional night-time scenario has been considered to model potential noise from the operation of generators and other types of plant typically left on over-night for health & safety and security purposes, for example, lighting.
- 1.3.7 In addition to the above construction activities, the temporary noise effects that are likely to occur along the length of the cable route have also been considered within this assessment. In particular, additional modelling has been undertaken to consider the horizontal directional drilling (HDD) that will be required to allow the cable to cross underneath the M1 Motorway.
- 1.3.8 Table 1.1 below. All months coloured in teal have been modelled, those coloured in grey have not been modelled because the construction activities ongoing during those periods are likely to be low noise generating.
- 1.3.9 No night-time construction activities are anticipated, however, an additional night-time scenario has been considered to model potential noise from the operation of generators and other types of plant typically left on over-night for health & safety and security purposes, for example, lighting.
- 1.3.10 In addition to the above construction activities, the temporary noise effects that are likely to occur along the length of the cable route have also been considered within this assessment. In particular, additional modelling has been undertaken to consider the horizontal directional drilling (HDD) that will be required to allow the cable to cross underneath the M1 Motorway.

**Table 1.1: Indicative Construction Programme**

Task	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site Establishment/ Fencing off	█																	
Temporary Construction Compound		█	█															
Forestry felling and drainage		█	█	█	█													
Internal Access Road Upgrade & Construction		█	█	█	█	█												
Substation, BESS & Compound Construction				█	█	█	█											
Substation Electrical Works									█	█	█	█	█	█	█	█		
Substation Commissioning																		█
Excavation & Construction of Turbine Foundations & Hardstands		█	█	█	█	█	█	█	█	█								
Internal Cabling Installation								█	█	█								
Turbine Delivery and Erection										█	█	█	█					
Grid Connection										█	█	█	█					
Energisation															█	█		
Turbine Commissioning																█	█	█
Site Restoration																	█	█

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## 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 construction noise from road developments only. The Association of Acoustic Consultants of Ireland, however, have published *Environmental Noise Guidance for Local Authority Planning & Enforcement Departments* <sup>(2)</sup>, 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 noise data for a variety of construction plant. This data was obtained from field measurements of actual plant operating on construction and open sites and can be used as source level data for undertaking noise predictions. Annex E, part E.3.2 of provides example criteria for assessing the significance of construction noise effects and acceptable limits for construction noise.

## 3 Potential Impacts

### 3.1 Construction Noise Sources

- 3.1.1 Noise levels from construction activities will vary continually over time as activities and plant start and stop and move around the Site. In order to assess the potential impacts of construction noise a worst-case scenario was considered where all construction plant and activities were assumed to be working continually and in the activity locations closest to the nearest NSRs.

### 3.2 Construction Phases

- 3.2.1 Although an indicative construction programme was provided, a specific construction schedule has not been determined at this stage. Chapter 2: Description of the Proposed Development of the EIAR does, however, provide descriptions of the likely construction activities that would be undertaken and the type of plant that would be used.
- 3.2.2 Construction activities will be limited to core hours between 07:00 and 19:00 on weekdays and 07:00 – 13:00 on Saturdays. There will be no working on Sundays and public holidays, however, it should be noted that out of necessity, some activity outside of the core hours could arise from delivery and unloading of abnormal loads, or for health and safety requirements, for example, making optimal use of fair weather windows for the lifting of turbine blades and the erection and dismantling of cranes.
- 3.2.3 The assessment does not consider the noise impacts associated with decommissioning, as the plant and activities used for that phase are assumed to be similar in nature (and noise output) to those already considered in the modelled construction noise modelling. Accordingly, if noise levels during the construction phases are acceptable, they should also be acceptable during decommissioning.

## 4 Methodology

### 4.1 Methodology for the Prediction of Noise

- 4.1.1 In order to predict the noise immission levels attributable to the construction of the Proposed Development, noise propagation models were produced using the propriety noise modelling software CadnaA<sup>(3)</sup>. 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 For each CNAL, the  $L_{Aeq(t)}$  levels have been predicted in accordance with ISO 9613-2:1996 'Acoustics - Attenuation of sound during propagation outdoors: General method of calculation'<sup>(4)</sup>.
- 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, BS 5228 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; and
  - ground reflections.
- 4.1.5 The model uses the octave band sound power levels of the proposed plant as its acoustic input data except for forestry plant which are set at a value at 500 Hz as outlined in ISO 9613, 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 ( $G=0$ ) 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). The quarry and the HDD plant area has been modelled as mixed ground ( $G=0.5$ ). Air absorption based on a temperature of 10 °C and 70 % relative humidity has been assumed.

### 4.2 Limitations and Assumptions 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 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 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 the “ABC method”, an example of significance criteria that can be used to assess construction activities.

**Table 4.1: Example of Threshold of Potential Significant Effect at Dwellings (dB<sub>(A)</sub>)**

Assessment Category and Threshold Value Period	Threshold Value L <sub>Aeq,T</sub> dB		
	Category A <sub>(A)</sub>	Category B <sub>(B)</sub>	Category C <sub>(C)</sub>
Night-Time (23:00 – 07:00)	45	50	55
Evenings and Weekends <sub>(D)</sub>	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 to 13:00)	65	70	75
<p>(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values;</p> <p>(B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values;</p> <p>(C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values;</p> <p>D) 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays</p>			

4.3.3 The values can be considered thresholds for the construction noise levels (quantified using the L<sub>Aeq</sub> 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. BS 5228 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 On that basis, 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 when construction activities may occur.
- 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 was defined by a 2 km buffer around the Site. Within this study area, 374 NSRs were identified and for the purposes of this assessment. For the purposes of this assessment all NSRs are properties which are sensitive to noise and, therefore, could be impacted by noise from the Proposed Development. For this assessment, only residential properties are considered as NSRs, and it has been assumed that all 374 NSRs identified are habitable residential properties.
- 4.4.2 A representative sample of 15 Construction Noise Assessment Locations (CNALs) have been chosen to represent the closest NSRs or group of NSRs to the Proposed Development, and an assessment has been made at the CNALs on the assumption that if noise levels are within acceptable levels at the closest receptors, it is reasonable to assume they will also be acceptable at more distant locations. Accordingly, only predictions made at the CNALs are included within the main body of this report, however, predictions for all 374 NSRs are included in Annex C for completeness.
- 4.4.3 The consider the potential noise immission from the HDD activities required to enable the grid connection cable to be routed underneath the M1 Motorway, an additional three CNALs have been identified. These CNALs represent the closest NSRs to the HDD activities and lie outside of the 2 km buffer from the site.
- 4.4.4 Table 4.2 details the CNALs alongside the NSRs, which are shown on Figure A1.1 included in Annex A. 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. A set of inset maps (Figures A1.1a-d) showing the NSRs have been included within Annex A.

**Table 4.2: Construction Noise Assessment Locations**

CNAL Name	X (ITM)	Y (ITM)
CNAL01 (H62)	706612	783934
CNAL02 (H233)	706701	784453
CNAL03 (H55)	707042	784741
CNAL04 (H235)	707506	784843
CNAL05 (H187)	707874	784854
CNAL06 (H70)	708483	784848
CNAL07 (H71)	708669	784739
CNAL08 (H179)	709215	784252
CNAL09 (H115)	709255	783893
CNAL10 (H110)	709289	783047
CNAL11 (H27)	709496	782453
CNAL12 (H374)	708781	782534
CNAL13 (H237)	708102	782128
CNAL14 (H226)	707609	782297
CNAL15 (H46)	707344	782894
CNAL16 *	705950	776991
CNAL17 *	705953	776917
CNAL18 *	705846	777037
* (HDD assessment only)		

4.4.5 Rather than identifying individual receptors on the cable route, this report considers the typical noise levels that are likely to occur along the length of the route, and this can be applied to the assessment of all nearby NSRs.

#### 4.5 Baseline Noise Levels

4.5.1 Baseline noise level monitoring was undertaken as part of an operational noise assessment for the Proposed Development (see Technical Appendix 10.2 of the EIAR for more information).

## 4.6 Construction Noise Level Thresholds

4.6.1 Having due regard to the existing ambient noise levels at around the Proposed Development, the BS 5228 Category A Threshold Values were considered for the construction noise assessment. These values are also the most conservative threshold limits within BS 5228.

4.6.2 Accordingly, the assessment was made against the following noise level limits for all CNALs:

- Daytime weekdays 07:00 – 19:00: 65 dB  $L_{Aeq}$  (12 hours).
- Saturday 07:00 – 13:00: 65 dB  $L_{Aeq}$  (6 hours).
- Evenings & Weekends: 55 dB  $L_{Aeq}$  (t).
- Nights 23:00 – 07:00: 45 dB  $L_{Aeq}$  (8 Hours).

4.6.3 No construction activities are anticipated out with these times.

## 5 Noise Impact Assessment

### 5.1 Modelling of Individual Sound Sources

- 5.1.1 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 activity locations closest to the CNALs, whereas in practice, equipment load and precise location may vary throughout the day. This approach has been adopted to represent a worst-case assessment.
- 5.1.2 A detailed plant list was not available, therefore, a generic plant list based upon experience of similar projects was used.
- 5.1.3 For 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*<sup>(5)</sup> (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 actually 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.
- 5.1.4 The HDD rig (for use by the M1 Motorway) will likely be a PD 250 or similar. Manufacturer supplied data provides a SWL of 86 dBA for the drilling unit, and this has been input directly into the noise model. A Fluid Recycling System will also be required and for the purposes of modelling the specification of an American Augers MPR-600 has been used. Manufacturer supplied data quotes the SPL of the unit, including generator, to be 104 dBA at 1 m. A number of mud pumps will be connected to the recycling unit and these have been modelled separately as individual point sources. No specific noise level data is available for the pumps, however, to predict their operational noise levels the model calculates the noise output from each pump based on the following formula:
- $$SWL = 73 + s + 10 \text{ Log } (a)$$
- where *s* represents a variable for the octave band of interest and *a* is the power of the pump in kW. Appendix M.2 details the calculation used and the octave band sound power levels for each pump.
- 5.1.5 For all other construction activities source noise level data is taken from Annex 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.
- 5.1.6 All modelled noise sources and associated sound power level (SWL) and sound pressure level (SPL) data are included in Annex B: Noise Model Data.
- 5.1.7 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.

- 5.1.8 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.
- 5.1.9 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 line sources 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 Construction Activities

- 5.2.1 The assessment considers a number of construction activities based on the construction months detailed in the indicative construction timetable (**Error! Reference source not found.** of this report).
- 5.2.2 The modelling represents the following construction activities:
- **Month 1 and 2:** Removal of vegetation around entrances 1 and 2 and establishment of site entrances. The construction of temporary construction compounds to north of site begins alongside the construction or upgrade of internal access tracks leading to turbine 1 and 2. Forestry felling along internal access tracks and around turbine 1.
  - **Month 3:** Forestry felling and completion of temporary construction compounds and tracks to turbine 1 and 2, preparation of foundations for turbine 1.
  - **Month 4:** Concrete pour at turbine 1, completion of access track establishment to turbine 4 and preparation of foundations at turbine 2. Track from entrance 3 to substation/BESS upgraded and adjacent temporary construction compound established. Forestry felling around turbine 5.
  - **Month 5:** Completion of track upgrades to turbines 3 and 5. Upgrade of track from entrance 4 to turbine 4, preparation of foundations at turbine 4 and concrete pour at turbine 2. Groundworks for construction of substation and BESS compound begins.
  - **Month 6:** Concrete pour at turbine 4 and BESS and substation compounds. Preparation of foundations at turbine 3, and track upgrade from turbine 5 to substation and BESS compounds are completed.
  - **Month 7:** Preparation of foundations for turbine 5, concrete pour at turbine 3. Completion of substation and BESS foundations.
  - **Month 8:** Concrete pour at turbine 5, onsite cable route trenching for turbine 1.
  - **Month 9:** Onsite cable route trenching for turbines 2 and 4.
  - **Month 10:** Turbine delivery and erection of turbine 1 and 2, onsite cable route trenching for turbines 3 and 5.
  - **Month 11:** Erection of turbines 3 and 4.

- **Months 12-16:** Erection of turbine 5 (month 12) and met mast. Other construction activity during months 13-16 is expected to be limited. It is assumed that HGVs would be delivering plant and materials to complete the construction of the substation and/or BESS during this period. As a result, modelling includes the movement of an HGV from entrance 3 to the substation area and the modelling of a small crane to lift batteries, transformers inverters etc., into place for connection by hand tools.
- **Month 17:** Restoration/backfill of land around turbines 1, 2 and 4.
- **Month 18:** Restoration/backfill of land around turbines 3 and 5, and the area around the substation and BESS compounds.
- **Night-time operations:** Generators for lighting, power, welfare facilities at the temporary construction compound and the substation/BESS area.

### 5.3 Modelling of HDD Activities

- 5.3.1 In addition to the on-site activities detailed above, HDD will be required at six locations along the Grid Connection Route. The obstacles along the route at five of the HDD locations are small in nature and include the requirement to cross near three stone-built bridges and two drains culverts. For these crossing the assessment has assumed the use of a small, portable HDD rig. The sixth location involves HDD under the M1 motorway. A much larger scale HDD rig will be required for this work therefore a separate noise model and assessment has been undertaken to consider the potential noise immission levels at the closest NSRs.
- 5.3.2 The small HDD rig has been assumed to be a Vermeer D36 x 50 Directional Drill, which is much smaller than many HDD rigs and requires less associated plant. As such, DD operations are expected to be lower in noise output than is normal. Additionally, for small crossings, the work would likely be completed within 1 to 2 weeks, therefore is considered a short-term activity.
- 5.3.3 Calculations of the Vermeer DD rig, assuming a source noise level of 94 dBA at 1 m, indicates that noise levels would be below the 65 dBA threshold at a distance of approximately 30 m. Where activities involving the drilling rig are within 30 m of a dwelling, then noise mitigation measures should be considered in line with the guidance presented in BS 5228. This could include the erection of temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from Heras fencing or similar. This should be installed as close to the drilling rig as is practicable and fitted so as to interrupt any direct line of site between the drilling rig and the closest residential receptors. Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc.
- 5.3.4 As detailed in Section 5.1.4 above, the HDD rig (for use by the M1 Motorway) will likely be a PD 250 or similar. A Fluid Recycling System and a number of mud pumps will also be in operation alongside the rig.

### 5.4 Calculated Noise Immission Levels

- 5.4.1 Table 5.1 presents the calculated noise immission levels at each CNAL around the wind farm site and Table 5.2 presents the calculated levels at the three CNALs representative of the NSRs closest to the proposed HDD activity at the M1 motorway.

**Table 5.1: Predicted Construction Noise Immission Levels, dB L<sub>Aeq(t)</sub>**

CNAL	Month													
	1/2	3	5	5	6	7	8	9	10	11	12-16	17	18	Night
CNAL01	42	44	37	33	30	27	30	23	31	19	19	43	28	18
CNAL02	52	50	33	32	28	25	33	23	27	18	17	44	27	29
CNAL03	62	62	33	33	29	26	40	24	27	19	18	44	28	33
CNAL04	46	45	35	34	29	26	58	26	27	19	19	37	28	24
CNAL05	63	63	36	37	30	27	50	27	28	21	19	36	29	35
CNAL06	54	51	38	36	29	26	46	29	29	19	20	36	29	21
CNAL07	45	46	40	37	29	27	39	30	30	19	21	37	28	19
CNAL08	34	37	40	40	33	29	29	33	29	23	24	36	31	8
CNAL09	33	40	46	44	40	35	29	40	36	27	32	40	38	12
CNAL10	29	32	48	57	41	37	28	33	32	28	44	36	40	19
CNAL11	27	29	43	40	35	32	26	26	28	21	41	30	34	16
CNAL12	29	31	51	47	45	40	39	32	40	30	47	36	45	27
CNAL13	28	30	36	38	35	35	30	25	31	21	30	30	35	11
CNAL14	29	31	34	37	34	34	29	25	30	21	27	30	34	12
CNAL15	34	38	35	38	35	34	29	27	32	24	26	35	34	14

**Table 2.2 - Predicted Noise immission levels from HDD activity, dB L<sub>Aeq(t)</sub>**

HDD CNAL	dB, L <sub>Aeq(t)</sub>
CNAL16	59
CNAL17	59
CNAL18	56

5.4.2 At all locations the predicted noise levels for all scenarios are below the weekday and Saturday daytime threshold value of 65 dB L<sub>Aeq(t)</sub>.

5.4.3 Night-time scenarios have been modelled to consider the noise from site generators and lighting rigs. No construction activities have been modelled during these times. At all

locations the predicted noise levels for all scenarios are below the night-time threshold value of 45 dB  $L_{Aeq(t)}$ .

- 5.4.4 For completeness predictions for all other identified NSRs are included in Annex C and results show that the 65 dB  $L_{Aeq,t}$  daytime and 45 dB  $L_{Aeq(t)}$  night-time thresholds are also met at all NSRs.

## 5.5 Grid Connection

- 5.5.1 For the Grid Connection underground electrical cabling route, the amount of required plant is relatively small, typically being based around an excavator for trenching and backfill activities. As such, construction activities in any one location will be limited in duration and adverse noise effects are anticipated to be negligible. Section 2.6.13 of EIAR Chapter 2 describes the construction of the underground electrical cable trench in more detail.
- 5.5.2 Where construction activities occur directly besides a dwelling the noise levels at that location are likely to be in the region of 75 – 80 dBA for a short period of time. This noise level is deemed representative of any receptor that lies adjacent to the 12.65 km Grid Connection underground electrical cabling route. It should be noted, however, that this would only occur where construction activities are directly opposite a dwelling i.e. within approximately 20 m. To put this into context, trenching and backfill activities are anticipated to move along the underground electrical cabling route at approximately 150 m to 300 m a day, therefore, the length of time when construction activities will be occurring adjacent to any given receptor is only likely to be for a few hours. For the majority of the time, plant and equipment will be located at greater distances and noise levels will be lower.
- 5.5.3 Although noise levels from trenching and backfill operations may occasionally exceed the BS 5228 threshold levels during the daytime, this would only occur for a short period of time at any one location. Accordingly, the impact is not deemed significant.

## 6 Summary

- 6.1.1 The noise impact assessment has considered the existing noise environment at local NSRs to determine appropriate noise threshold levels for construction activities. Based on the existing noise levels measured in the area, the Category A threshold would apply.
- 6.1.2 Construction activities for the wind farm would require felling, the laying of tracks across the site, establishing of temporary construction compounds, excavation of turbine foundations, construction of turbine bases, installation of turbines, and the installation of a substation, BESS and other associated infrastructure. Construction is anticipated to last between 16 and 24 months and is likely to be limited to core hours between 07:00 and 19:00 on weekdays and 07:00 – 13:00 on Saturdays.
- 6.1.3 Noise propagation modelling was undertaken in accordance with ISO 9613-2:1996. The modelled scenarios considered the construction activities that are likely to occur across each month and the modelling assumed that activities are occurring at the locations within the development site that are closest to the NSRs.
- 6.1.4 The predicted construction noise levels for all construction activities occurring within the redline boundary and also the HDD activities required for cable routing under the M1 Motorway are below the Daytime Category A Threshold Levels as detailed within BS 5228 at all NSRs. While no construction activities are anticipated during night-time, predicted noise levels from generators powering lighting and welfare facilities within the construction compounds are below the Night-time Category A Threshold Levels as detailed within BS 5228 at all NSRs. Accordingly, construction noise impacts are below the indicator for a potential significant effect.

## 7 References

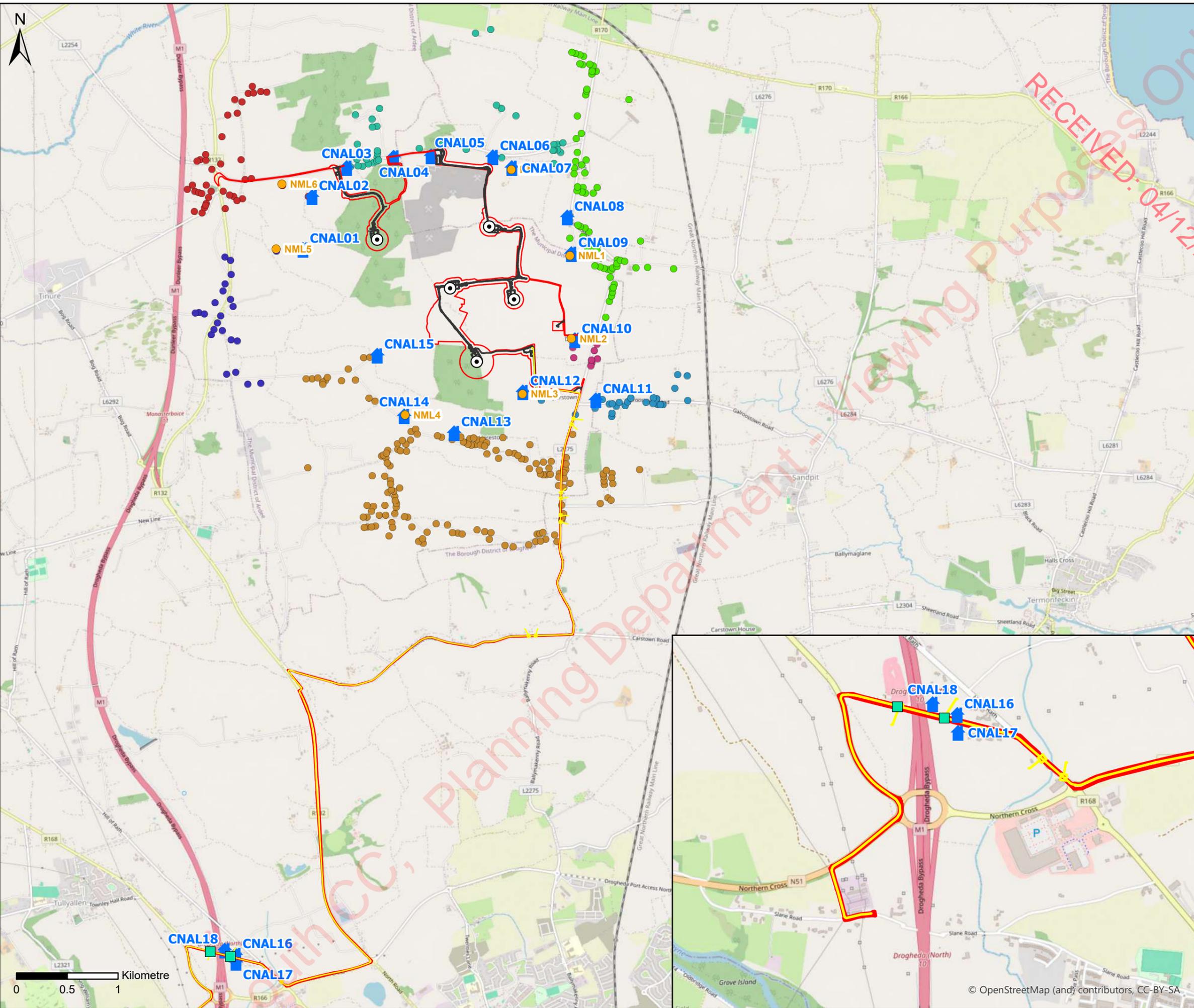
1. **British Standards Institute.** *Code of practice for noise and vibration control on construction and open sites. Noise.* UK : BSI, 2014. BS 5228-1:2009+A1:2014 .
2. **Ireland, Association of Acoustic Consultants of.** *Environmental Noise Guidance for Local Authority Planning & Enforcement Departments.* s.l. : Association of Acoustic Consultants of Ireland, 2021.
3. **DataKustik GmbH.** CadnaA Version 4.4.
4. **(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.
5. **Forestry Commission.** *Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment.* Edinburgh : The Crown, 2003.

## Annex A – Figures

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### LEGEND

- Proposed Project Redline
- Proposed Turbine Locations
- Proposed Grid Connection Route
- Proposed Infrastructure Layout
- Construction Noise Assessment Locations (CNALs)
- Noise Monitoring Locations (NML)
- Indicative HDD Entry/Exit Points

### Noise Sensitive Receptors (NSR)

- Represented by NML1
- Represented by NML2
- Represented by NML3
- Represented by NML4
- Represented by NML5
- Represented by NML6
- Represented by NML7

Rev.	Date	Description	Drawn	Approved
2	24/09/2024	CLIENT ISSUE	KB	GC
		Amendment Details		



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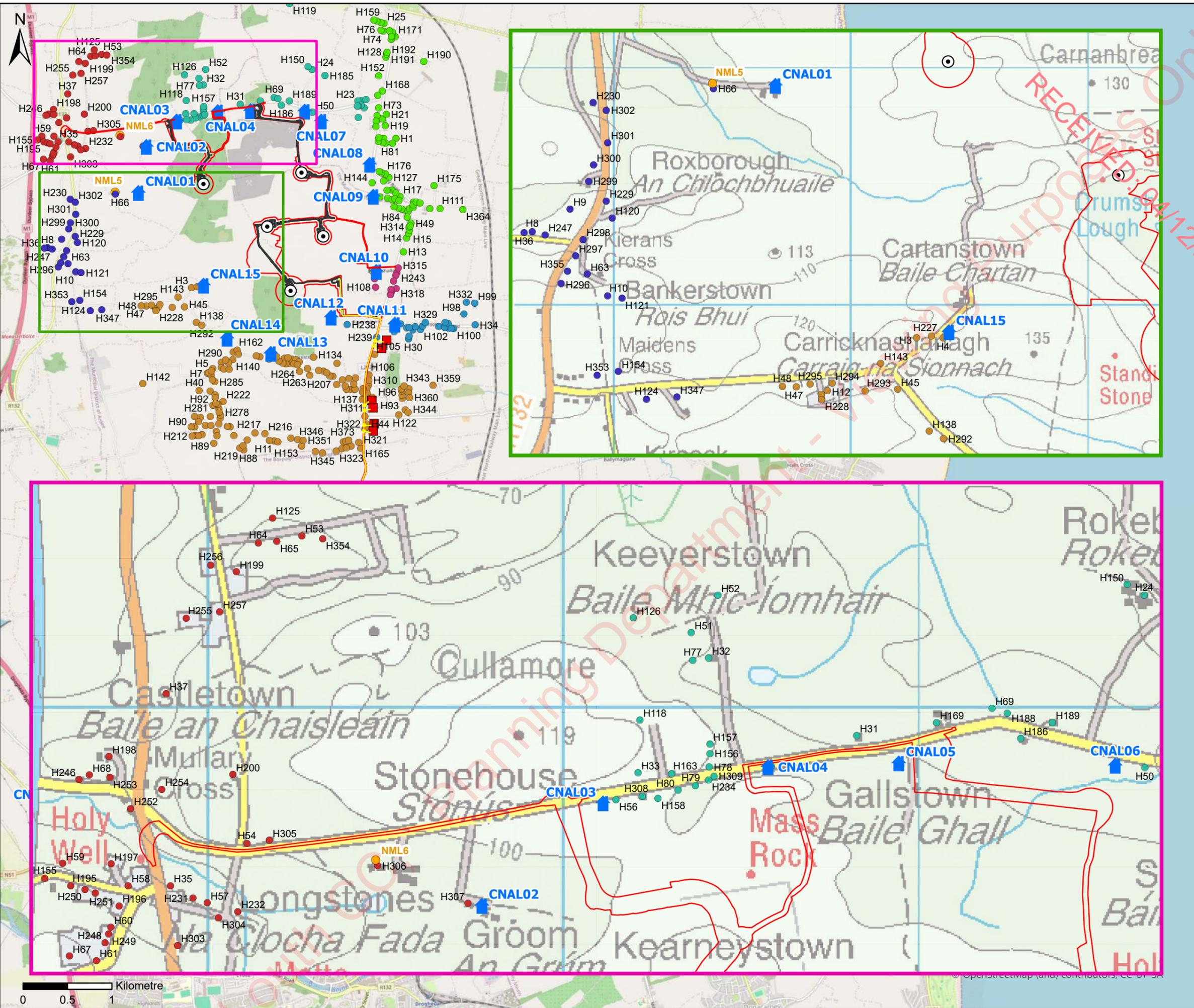
Project Title: **KELLYSTOWN WIND FARM**

Drawing Title: **FIGURE A1.1A - CONSTRUCTION NOISE ASSESSMENT LOCATIONS**

Scale: 1:35,000	Original Size: A3	Spatial Reference: IRENET95 Irish Transverse Mercator
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Drawing Number: **IE00125-021**





### LEGEND

- Proposed Project Redline
- Proposed Turbine Locations
- Proposed Grid Connection Route
- Proposed Infrastructure Layout
- Proposed Horizontal Directional Drilling (HDD) Locations
- Noise Monitoring Locations (NML)

#### Noise Sensitive Receptors (NSR)

- Represented by NML1
- Represented by NML2
- Represented by NML3
- Represented by NML4
- Represented by NML5
- Represented by NML6
- Represented by NML7

Rev.	Date	Amendment Details	Drawn	Approved
1	25/09/2024	SECOND ISSUE	KB	GC
0	12/09/2024	FIRST ISSUE	JCM	GC



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Project Title: KELLYSTOWN WIND FARM

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Drawing Title: FIGURE A1.1b - NOISE SENSITIVE RECEPTORS

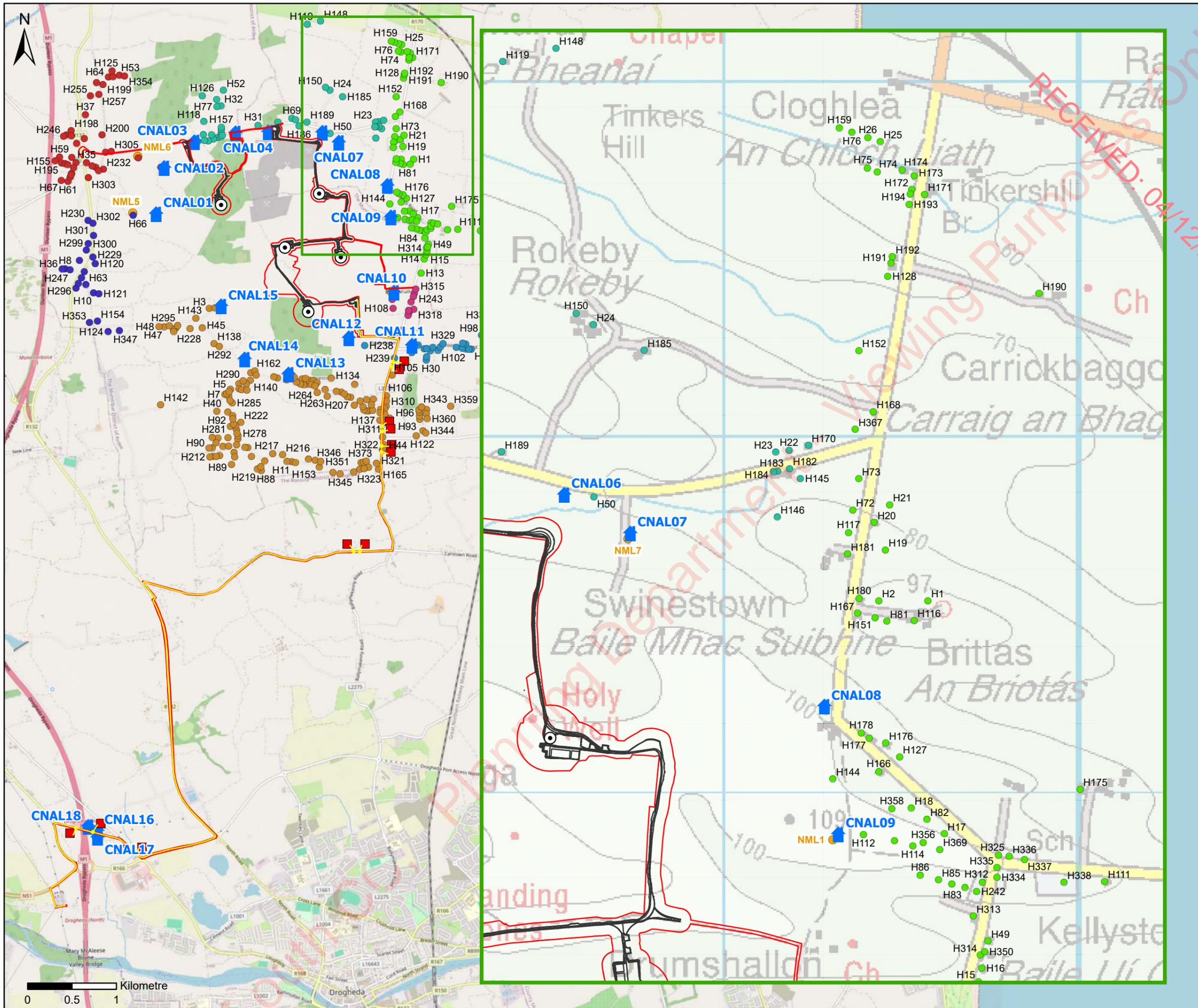
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Drawing Number: IE00125-022





### LEGEND

- Proposed Project Redline
- Proposed Turbine Locations
- Proposed Grid Connection Route
- Proposed Infrastructure Layout
- Proposed Horizontal Directional Drilling (HDD) Locations
- Construction Noise Assessment Locations (CNALs)
- Noise Monitoring Locations (NML)

#### Noise Sensitive Receptors (NSR)

- Represented by NML1
- Represented by NML2
- Represented by NML3
- Represented by NML4
- Represented by NML5
- Represented by NML6
- Represented by NML7

Rev.	Date	Amendment Details	Drawn	Approved
1	25/09/2024	UPDATED RLB	JCM	GC
0	12/09/2024	FIRST ISSUE	JCM	GC

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Drawing Status: FOR PLANNING

Project Title: KELLYSTOWN WIND FARM

Drawing Title: FIGURE A1.1d - NOISE SENSITIVE RECEPTORS

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Drawing Number: IE00125-024

## Annex B – Noise Model Data

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# Annex A – Noise Model Data

**Table B1: Construction Noise Assessment Modelled Plant**

Month	Activities	Plant	Number on site	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level (dBA)
1-2	Construction of temporary construction compound – Entrance 1	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Construction of temporary construction compound – Entrance 2	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Tracks to Entrance 1 to T1	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Tracks to Entrance 2 to T2	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
Tree Felling around access track to T1	Harvester	1	External Reference 1	93.4	
	Forwarder	1	External Reference 1	87.7	
	Skidder	1	External Reference 1	93.4	
Vegetation removal around Entrance 1	Wheeled Backhoe Loader	1	C2.8	95.8	
Vegetation removal around Entrance 2	Wheeled Backhoe Loader	1	C2.8	95.8	
3	Construction of temporary construction compound – Entrance 1	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Construction of temporary construction compound – Entrance 2	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2

Month	Activities	Plant	Number on site	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level (dBA)
	Preparation of foundations at T1	Excavator	2	C2.14	107
		Dumper	1	C4.9	105.2
	Completion of tracks to T1	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Completion of tracks to T2	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Tree Felling around T1	Harvester	1	External Reference 1	93.4
		Forwarder	1	External Reference 1	87.7
		Skidder	1	External Reference 1	93.4
	4	Construction of temporary construction compound – Substation/BESS	Dozer	1	C2.10
Tracked Excavator			1	C2.14	107
Dumper			1	C4.9	105.2
Preparation of foundations at T2		Excavator	2	C2.14	107
		Dumper	1	C4.9	105.2
Concrete pour at T1		Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4
Completion of tracks to T4		Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
Tracks to Substation/BESS from entrance 3		Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
Tree felling around T5		Harvester	1	N/A*	93.4
		Forwarder	1	N/A*	87.7
	Skidder	1	N/A*	93.4	
5	Groundworks for construction of Substation and BESS compounds	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2

Month	Activities	Plant	Number on site	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level (dBA)
	Preparation of foundations at Substation/BESS	Excavator	2	C2.14	107
		Dumper	1	C4.9	105.2
	Preparation of foundations at T4	Excavator	2	C2.14	107
		Dumper	1	C4.9	105.2
	Concrete pour at T2	Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4
	Tracks from T4 to T3	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Tracks from T3 to T5	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
		Dumper	1	C4.9	105.2
	Tracks from Entrance 4 to T4	Dozer	1	C2.10	108
		Tracked Excavator	1	C2.14	107
Dumper		1	C4.9	105.2	
6	Preparation of foundations at T3	Excavator	2	C2.14	107
		Dumper	1	C4.9	105.2
	Concrete pour at T4	Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4
	Concrete pour at Substation and BESS	Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4
	Tracks from T5 to Substation/BESS	Dozer	1	C2.10	108
Tracked Excavator		1	C2.14	107	
7	Preparation of foundations at T5	Excavator	2	C2.14	107
		Dumper	1	C4.9	105.2
	Concrete pour at T3	Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4
	Concrete pour at Substation and BESS	Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4

Month	Activities	Plant	Number on site	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level (dBA)
8	Concrete pour at T5	Cement Mixer	1	C4.24	95.5
		Vibratory Poker	1	C4.33	106.4
	Cable route for T1	Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
9	Cable route for T2 and T4	Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
10	Cable route for T3 and T5	Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
	Erection of T1	Large Mobile Crane	1	C4.41	99.1
		Small Mobile Crane	1	C4.43	97.8
	Erection of T2	Large Mobile Crane	1	C4.41	99.1
		Small Mobile Crane	1	C4.43	97.8
11	Erection of T3	Large Mobile Crane	1	C4.41	99.1
		Small Mobile Crane	1	C4.43	97.8
	Erection of T4	Large Mobile Crane	1	C4.41	99.1
		Small Mobile Crane	1	C4.43	97.8
12-16	Erection of T5	Large Mobile Crane	1	C4.41	99.1
		Small Mobile Crane	1	C4.43	97.8
	Deliveries of plant/equipment/infrastructure to substation & BESS	Road Lorry	1	C11.4	110.9
	Crane lifting Substation/BESS plant into position	Small Mobile Crane	1	C4.43	97.8
17	Cut & backfill around T1	Tracked Excavator	2	C5.35	102.6
		Dozer	2	C2.10	108
	Cut & backfill around T2	Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
	Cut & backfill around T4	Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
18	Cut & backfill around T3	Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
	Cut & backfill around T5	Tracked Excavator	1	C5.35	102.6

Month	Activities	Plant	Number on site	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level (dBA)
	Cut & backfill around Substation & BESS	Dozer	1	C2.10	108
		Tracked Excavator	1	C5.35	102.6
		Dozer	1	C2.10	108
Night	Generator for lights, power, welfare facilities at construction compound - Entrance 1	Diesel Generator	1	C4.79	92
	Generator for lights, power, welfare facilities at construction compound - Entrance 2	Diesel Generator	1	C4.79	92
	Generator for lights, power, welfare facilities at construction compound – Substation and BESS	Diesel Generator	1	C4.79	92
	Generator for lights, power, welfare facilities - HDD	Diesel Generator	1	C4.86	93.5
HDD	Cable trenching along cable route to connection point	Tracked Excavator	1	C1.12	110.4
		Dozer	1	C2.10	108
		Dump Truck	1	C2.31	114.7
	HDD under motorway (entrance)	PD150-600 RP-C Drilling Rig on Crawler	1	External Reference 2	86
		HDD generator	2	C2.44	105.7
	Removing material, cooling drill bit, lubricating bore (entrance)	Fluid recycling system	1	External Reference 3	112
		Mud pump	3	External Reference 4	76.8
	Pulling pipe/cable through bore hole (entrance)	Winch (Bagela kW10 100kN Grundowinch)	1	External Reference 4	98.9
		Winch Generator	1	External Reference 4	91.5
	Supporting pipe/cables (exit)	Tracked Excavator	1	C4.14	94.8

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- 2: **RMH Global Pte Ltd.** (2013). *Versions of Prime Drilling HDD-Rigs 150 - 600 t.* [Online]. RMH Global. Available at: <https://www.rmhglobal.net> [Accessed 25 September 2024].
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- 4: **NorthConnect.** (2018). *HVDC Cable Infrastructure EIA - Volume 3 - Appendices - Appendix H.2: Construction Noise Assessment Data.* [Online]. northconnect.no. Available at: <https://northconnect.no/uploads/downloads/Britain/H.2-Construction-Noise-Assessment-Data.pdf> [Accessed 25 September 2024]. **(Assessment undertaken by TNEI)**

**Table B2: Construction Noise Assessment – Octave Band Sound Power Levels**

Description	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level - 1/3 Octave Spectrum (dB)									
		63	125	250	500	1000	2000	4000	8000	A	Linear
Tracked excavator	C1.12	80.8	92.9	102.4	103.8	105	104.2	99	88.9	110.4	115.6
Dozer	C2.10	90.8	101.9	100.4	97.8	102	99.2	97	90.9	108	121
Tracked Excavator	C2.14	86.8	89.9	96.4	101.8	101	100.2	97	89.9	107	115.1
Dump Truck (empty)	C2.31	87.8	90.9	98.4	103.8	107	113.2	98	86.9	114.7	117.9
Directional drill (generator)	C2.44	68.8	91.9	93.4	96.8	100	101.2	97	87.9	105.7	110.7
Wheeled Backhoe Loader	C2.8	75.8	77.9	83.4	88.8	91	89.2	88	76.9	95.8	103.8
Wheeled Backhoe Loader	C4.14	69.8	78.9	82.4	86.8	90	90.2	83	73.9	94.8	100.5
Concrete pump + cement mixer truck (discharging)	C4.24	70.8	75.9	83.4	90.8	91	88.2	82	73.9	95.5	101
Poker vibrator	C4.33	83.8	91.9	99.4	97.8	97	101.2	99	91.9	106.4	114.2
Mobile telescopic crane	C4.41	74.8	82.9	87.4	94.8	94	92.2	83	75.9	99.1	105.4
Wheeled mobile crane	C4.43	81.8	87.9	90.4	87.8	92	92.2	85	76.9	97.8	110
Diesel generator	C4.79	70.8	82.9	87.4	85.8	85	80.2	75	70.9	92	102.6
Diesel generator	C4.86	79.8	82.9	85.4	86.8	87	84.2	85	75.9	93.5	107.2
Dumper	C4.9	83.8	93.9	97.4	101.8	97	96.2	90	79.9	105.2	114.5
Tracked excavator	C5.35	83.8	83.9	90.4	93.8	97	99.2	90	80.9	102.6	111.3
Lorry 350kW 44t	C11.4	83.8	91.9	97.4	99.8	104	107.2	104	95.9	110.9	114.9

Description	BS5228 Reference (Table Ref No. / External Ref)	Sound Power Level - 1/3 Octave Spectrum (dB)									
		63	125	250	500	1000	2000	4000	8000	A	Linear
Harvester	External Reference 1	-	-	-	93.4	-	-	-	-	93.4	96.6
Forwarder	External Reference 1	-	-	-	87.7	-	-	-	-	87.7	90.9
Skidder	External Reference 1	-	-	-	93.4	-	-	-	-	93.4	96.6
PD150-600 RP-C Drilling Rig on Crawler	External Reference 2	-	-	-	86	-	-	-	-	86	89.2
MPR-6000 Fluid Recycling System	External Reference 3	-	-	-	112	-	-	-	-	112	115.2
Onshore Winch	External Reference 4	24.9	24.9	24.9	98.9	24.9	24.9	24.9	24.9	98.9	102.1
Mud Pump	External Reference 4	-	-	-	80	-	-	-	-	76.8	80
Winch Power Pack	External Reference 4	101.1	85.4	86.4	80.1	79.3	76	70.3	65.2	91.7	105.7

Louth CC, Planning Department - Viewing Purposes Only!

RECEIVED: 04/12/2024

## Annex C – Predictions for all NSRs

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RECEIVED: 04/12/2024

Louth CC, Planning Department - Viewing Purposes Only

**Table C1: Predicted Construction Noise Immission Levels, dB L<sub>Aeq(t)</sub>**

NSR	ITM Coordinates		Month													Night
	X	Y	1 & 2	3	4	5	6	7	8	9	10	11	12 to 16	17	18	
H1	709505	784550	33	35	36	36	30	27	27	28	26	21	22	32	29	10
H2	709367	784550	40	38	37	37	31	27	31	29	26	21	22	33	29	10
H3	707206	782871	37	41	36	36	34	32	28	26	30	23	24	39	32	18
H4	707318	782870	33	36	34	38	35	34	29	27	31	24	26	34	34	13
H5	707444	781961	28	30	32	34	31	31	26	23	27	19	24	28	31	11
H6	707513	781507	30	33	34	37	32	29	23	25	30	19	24	32	32	12
H7	707383	781906	27	30	32	34	31	30	25	22	26	18	24	28	30	10
H8	705584	783319	31	33	26	28	25	22	22	18	21	13	15	34	24	9
H9	705744	783414	31	32	27	29	25	22	22	19	21	14	15	29	24	9
H10	705902	783048	32	34	28	29	26	24	23	20	23	15	16	30	25	11
H11	708134	781146	24	26	31	32	28	27	22	20	24	15	23	25	28	6
H12	706829	782649	36	39	33	34	31	29	26	23	27	19	22	36	30	17
H13	709591	783271	29	31	40	45	36	32	26	29	28	24	32	33	34	16
H14	709625	783428	29	32	42	47	39	35	27	29	34	24	36	33	36	15
H15	709647	783479	30	32	41	46	35	32	26	29	28	24	36	33	34	15
H16	709657	783517	30	32	41	46	35	32	26	29	28	24	36	33	36	12
H17	709551	783895	31	34	40	41	34	30	26	30	27	24	32	34	32	11
H18	709459	783967	32	35	39	41	34	30	27	31	28	24	26	34	32	7
H19	709386	784693	35	36	36	36	30	26	28	28	26	20	21	32	29	10
H20	709354	784771	34	36	35	35	29	26	28	28	25	20	20	32	28	10
H21	709398	784820	34	35	35	34	27	25	27	27	25	15	20	31	27	10
H22	709114	784973	36	37	35	35	29	25	30	28	25	19	20	32	28	8
H23	709077	784968	37	37	36	35	29	25	30	28	26	19	20	33	28	8
H24	708564	785327	46	42	34	33	28	24	38	26	25	18	18	32	27	16
H25	709371	785841	32	32	29	30	25	21	25	22	20	14	15	27	24	7
H26	709336	785853	32	33	34	31	25	21	26	22	24	14	15	31	24	8
H27	709496	782453	27	29	43	40	35	32	26	26	28	21	41	30	34	16
H28	709526	782458	27	29	43	40	35	32	25	25	28	21	40	30	34	16
H29	709557	782461	27	29	43	40	35	32	25	25	28	21	40	29	34	16
H30	709649	782293	26	28	39	38	33	30	24	24	26	19	34	28	32	12
H31	707754	784932	50	49	35	33	26	24	51	25	26	15	19	35	26	26
H32	707338	785150	43	42	32	32	28	24	42	24	25	17	17	34	26	20
H33	707139	784828	51	51	34	33	29	25	43	29	27	19	18	43	28	27
H34	710397	782450	24	26	33	34	29	26	21	22	22	16	25	26	28	6
H35	705824	784510	35	36	27	28	24	21	25	19	21	14	14	31	24	9
H36	705550	783314	31	35	28	28	24	22	23	18	22	13	15	34	24	9
H37	705812	785050	34	34	26	27	22	20	23	17	20	12	13	28	22	6
H38	707240	781305	25	27	29	31	27	26	21	19	23	15	20	25	27	5
H39	707528	781402	25	28	32	36	29	27	23	24	29	19	22	29	28	8
H40	707291	781712	31	34	36	36	31	29	24	22	25	17	23	32	32	13
H41	707540	782027	28	30	33	35	32	32	26	23	28	19	25	29	32	11
H42	707674	782146	28	31	34	36	33	33	28	24	29	20	27	29	33	12
H43	708690	781931	26	29	38	38	35	33	27	24	29	20	31	29	34	14
H44	709175	781337	24	26	33	33	29	27	22	20	24	16	25	25	28	4
H45	707126	782653	35	36	33	35	33	31	27	24	28	21	24	31	32	17
H46	707344	782894	34	38	35	38	35	34	29	27	32	24	26	35	34	14
H47	706698	782663	36	38	32	33	30	28	25	22	27	19	21	36	29	16
H48	706639	782666	36	38	32	33	30	28	25	22	26	18	20	36	29	16
H49	709674	783593	30	32	41	42	34	31	26	29	27	24	35	33	33	11
H50	708565	784842	52	49	38	37	31	27	44	30	29	21	20	36	29	20
H51	707289	785222	44	43	34	32	27	24	42	28	26	17	16	34	26	19
H52	707364	785327	43	41	34	32	27	23	38	28	26	17	16	34	26	18
H53	706194	785494	35	35	26	27	23	20	24	18	20	12	13	28	22	8
H54	706039	784628	37	38	28	29	25	22	27	20	22	15	14	37	24	16
H55	707042	784741	62	62	33	33	29	26	40	24	27	19	18	44	28	33
H56	707077	784751	58	57	34	33	29	26	41	24	27	19	18	44	28	32
H57	705927	784462	36	36	28	29	25	22	24	19	22	14	14	30	24	9
H58	705705	784510	35	37	28	28	24	21	25	18	22	13	14	36	23	11
H59	705521	784573	35	36	27	27	23	20	24	18	21	12	13	35	22	9
H60	705656	784393	36	37	28	28	24	21	25	18	22	13	14	36	23	10
H61	705616	784300	37	37	28	28	24	21	25	18	22	13	14	36	23	10
H62	706612	783934	42	44	37	33	30	27	30	23	31	19	19	43	28	18

NSR	ITM Coordinates		Month													Night
	X	Y	1 & 2	3	4	5	6	7	8	9	10	11	12 to 16	17	18	
H63	705816	783140	36	36	28	29	26	22	22	19	22	15	15	30	25	17
H64	706071	785473	35	34	26	27	23	20	24	18	19	12	12	28	22	8
H65	706123	785479	35	35	26	27	23	20	24	18	20	12	12	28	22	8
H66	706349	783922	37	38	31	31	28	25	27	21	25	17	17	34	27	15
H67	705540	784312	35	36	28	27	24	21	24	18	22	13	13	36	23	10
H68	705596	784822	33	33	26	27	23	20	22	17	19	12	13	28	22	6
H69	708136	785009	55	51	36	35	30	26	43	28	27	20	19	35	28	25
H70	708483	784848	54	51	38	36	29	26	46	29	29	19	20	36	29	21
H71	708669	784739	45	46	40	37	29	27	39	30	30	19	21	37	28	19
H72	709294	784805	35	36	36	35	29	26	28	28	26	20	20	32	28	10
H73	709311	784893	35	36	35	35	29	25	29	27	25	19	20	32	28	10
H74	709363	785756	32	32	30	30	24	21	24	22	21	14	16	27	23	5
H75	709335	785767	32	32	30	30	25	21	24	22	21	15	15	27	24	5
H76	709291	785868	32	33	34	31	25	21	25	22	24	14	15	31	24	8
H77	707293	785144	43	44	32	32	28	24	41	24	25	17	17	34	26	19
H78	707340	784844	46	47	34	33	29	26	49	25	27	19	18	37	28	23
H79	707301	784792	47	48	34	34	29	26	47	25	27	19	18	38	28	25
H80	707252	784779	49	49	34	33	29	26	42	25	27	19	18	38	28	25
H81	709390	784492	39	37	37	37	31	27	30	30	26	22	22	33	30	10
H82	709503	783935	32	34	38	41	34	30	27	31	27	24	26	34	32	7
H83	709610	783744	30	33	42	45	41	35	27	30	35	24	35	33	39	11
H84	709573	783753	31	33	42	45	41	35	28	30	34	24	35	34	39	11
H85	709535	783765	31	33	42	46	41	36	28	31	35	25	35	34	40	11
H86	709484	783778	31	34	42	47	42	36	28	31	35	25	35	34	40	11
H87	708177	781136	24	26	31	32	28	27	22	20	24	15	23	25	28	6
H88	707792	781047	24	26	29	31	27	25	21	19	22	14	20	25	27	4
H89	707456	781117	24	26	28	30	26	24	19	19	21	14	19	25	26	4
H90	707203	781303	25	27	28	30	27	26	21	19	22	15	20	25	27	5
H91	707245	781206	24	26	27	30	26	23	19	18	21	14	19	25	25	4
H92	707415	781706	31	34	33	35	30	29	24	22	26	17	23	32	30	13
H93	709577	781624	24	26	34	34	29	27	22	21	24	16	27	26	29	6
H94	709574	781659	24	26	34	34	29	27	22	21	24	16	27	26	29	6
H95	709571	781704	24	26	35	35	30	28	22	22	24	17	28	26	29	7
H96	709565	781730	24	26	35	35	30	28	22	22	24	17	29	26	29	8
H97	709652	781734	24	26	34	34	30	28	22	21	24	16	28	26	29	7
H98	710271	782572	25	27	34	35	30	27	21	22	23	17	27	27	29	7
H99	710392	782695	25	27	34	35	29	26	21	22	23	17	28	26	28	5
H100	710154	782410	25	27	35	35	30	27	22	22	24	17	28	27	29	7
H101	710096	782415	25	27	35	36	31	28	22	23	24	18	29	27	29	8
H102	709782	782400	26	28	38	38	33	30	24	24	26	19	34	28	32	12
H103	709653	782327	26	28	39	38	33	30	24	24	26	20	35	28	32	13
H104	709486	782375	26	29	42	40	35	32	25	25	28	21	39	29	34	14
H105	709265	782119	26	28	40	39	34	32	26	24	28	20	36	29	33	12
H106	709201	781889	25	27	37	37	33	31	25	23	27	19	31	28	32	8
H107	709196	781773	25	27	36	36	32	30	24	23	26	18	30	27	31	7
H108	709275	782875	29	31	51	47	41	37	28	29	32	26	48	34	40	21
H109	709266	782972	29	32	47	50	41	38	28	30	32	26	44	34	40	20
H110	709289	783047	29	32	48	57	41	37	28	33	32	28	44	36	40	19
H111	710003	783760	29	31	35	37	31	28	24	26	25	20	26	30	30	9
H112	709324	783893	32	40	45	44	40	35	29	39	37	26	32	40	37	12
H113	709411	783875	32	39	44	43	39	34	28	38	36	25	32	39	37	12
H114	709463	783861	32	34	40	42	36	32	28	31	29	25	29	34	34	11
H115	709255	783893	33	40	46	44	40	35	29	40	36	27	32	40	38	12
H116	709467	784495	34	36	36	37	31	27	28	29	26	21	22	33	29	10
H117	709282	784741	35	36	36	36	30	26	29	29	26	20	21	33	29	10
H118	707145	784976	47	47	33	32	28	25	37	24	26	18	17	36	27	22
H119	708308	786067	35	34	29	29	25	21	28	21	21	14	14	28	24	8
H120	705922	783376	37	39	30	30	26	24	24	20	24	15	16	36	25	18
H121	705963	783038	31	34	28	30	26	24	23	20	23	15	17	30	25	11
H122	709536	781439	24	25	33	33	29	27	21	20	23	15	26	25	28	5
H123	706804	782632	36	39	33	34	30	29	26	23	27	19	21	36	30	16
H124	706066	782611	32	36	29	30	26	24	23	20	23	15	17	34	26	15
H125	706111	785544	35	34	26	27	23	20	24	18	19	12	12	28	22	8
H126	707126	785263	42	41	32	31	27	23	33	24	24	17	16	33	26	18

NSR	ITM Coordinates		Month													Night
	X	Y	1 & 2	3	4	5	6	7	8	9	10	11	12 to 16	17	18	
H127	709426	784111	33	35	38	40	33	29	27	31	28	24	25	34	31	7
H128	709392	785462	33	37	31	32	26	23	29	24	22	16	17	31	25	6
H129	708305	782018	27	29	36	38	35	34	29	25	30	21	29	29	34	9
H130	708330	782064	27	30	37	39	36	35	30	25	31	21	30	30	35	15
H131	708379	782060	27	30	37	39	36	35	30	25	31	21	31	30	35	15
H132	708418	782035	27	29	37	39	35	35	29	25	30	21	31	29	35	15
H133	708356	782014	27	29	36	38	35	34	29	25	30	21	29	29	34	9
H134	708578	782087	27	29	39	42	36	35	30	32	31	21	34	30	36	18
H135	709648	781687	24	26	34	34	30	27	22	21	24	16	28	26	29	7
H136	709004	781720	25	27	35	36	32	30	25	22	26	18	28	27	31	7
H137	709126	781613	25	26	34	34	31	29	23	22	25	17	26	26	30	6
H138	707259	782477	30	32	33	36	33	32	27	24	29	21	25	31	32	12
H139	709611	781494	24	25	33	33	29	26	21	21	23	15	26	25	28	5
H140	707668	782062	28	30	34	36	33	33	27	24	29	20	26	29	32	9
H141	707304	781411	26	29	33	37	33	28	22	24	28	18	23	31	32	8
H142	706657	781789	27	28	28	30	27	26	22	20	23	15	19	26	26	8
H143	707054	782762	36	40	34	35	32	31	27	25	29	21	23	37	31	17
H144	709238	784049	34	40	46	42	39	34	30	41	35	26	31	41	37	12
H145	709146	784894	36	38	36	35	29	26	32	28	26	20	20	33	28	11
H146	709081	784786	43	40	37	36	30	26	35	29	27	20	21	34	29	12
H147	707624	782023	28	30	33	36	32	32	27	24	28	20	26	29	32	9
H148	708458	786104	34	33	29	29	24	21	26	21	20	14	14	28	23	10
H149	709179	781738	25	27	36	36	32	30	24	22	26	18	30	27	31	7
H150	708515	785357	46	42	34	33	28	24	38	26	24	18	18	32	27	16
H151	709357	784502	39	38	37	37	31	27	31	30	27	21	22	33	30	10
H152	709311	785254	34	35	33	33	27	24	28	25	23	17	18	30	26	6
H153	708444	781087	24	26	31	32	28	27	22	20	23	15	23	25	28	5
H154	705947	782729	32	36	29	29	26	24	23	19	23	15	17	34	25	15
H155	705470	784531	33	33	26	27	23	20	22	18	20	12	13	28	22	9
H156	707342	784881	46	47	34	33	29	26	49	30	27	19	18	37	28	24
H157	707342	784908	46	47	34	33	29	25	48	30	26	19	18	37	28	23
H158	707196	784755	51	51	34	33	29	26	44	25	27	19	18	40	28	26
H159	709256	785880	32	33	34	31	25	21	25	22	24	14	15	31	24	9
H160	708205	782041	27	30	36	38	35	35	29	25	30	21	30	29	34	9
H161	708510	781960	27	29	37	38	35	34	28	24	29	20	30	29	34	9
H162	707719	782168	28	31	34	37	34	34	29	25	30	21	27	30	33	12
H163	707234	784825	49	49	34	33	29	26	46	29	27	19	18	38	28	25
H164	709237	781637	25	26	35	35	31	29	23	22	25	17	28	26	30	6
H165	709111	781063	23	25	31	32	28	26	21	19	22	14	24	24	27	4
H166	709367	784069	33	36	39	40	34	30	28	32	28	25	25	35	32	7
H167	709307	784515	39	37	37	37	31	27	30	30	27	21	22	34	30	10
H168	709352	785081	34	36	34	34	28	24	30	26	24	18	19	31	27	7
H169	707979	784969	58	54	36	35	29	26	47	27	27	20	19	35	28	27
H170	709169	784987	36	37	35	35	29	25	31	27	25	19	20	32	28	8
H171	709496	785693	31	32	30	30	24	21	24	22	21	14	16	27	24	4
H172	709460	785707	32	32	30	30	24	21	24	22	21	14	16	27	24	4
H173	709467	785745	31	31	29	30	24	21	24	22	20	14	15	27	24	5
H174	709433	785761	31	32	29	30	24	21	24	22	20	14	15	27	24	5
H175	709934	784020	30	31	35	37	31	27	24	27	25	20	24	30	29	5
H176	709387	784150	33	36	39	40	33	29	28	31	28	24	25	34	31	7
H177	709340	784164	33	36	39	40	33	29	28	32	28	24	25	35	31	7
H178	709318	784178	33	36	39	40	33	29	28	32	28	24	25	35	31	7
H179	709215	784252	34	37	40	40	33	29	29	33	29	23	24	36	31	8
H180	709312	784556	39	38	37	37	31	27	31	30	27	21	22	33	29	10
H181	709279	784682	40	38	37	36	30	26	32	29	26	20	21	33	29	10
H182	709116	784922	36	38	36	35	29	26	31	28	26	19	20	33	28	11
H183	709082	784914	37	38	36	35	29	26	32	28	26	19	20	33	28	12
H184	709070	784913	37	39	36	35	29	26	32	28	26	19	20	33	28	12
H185	708707	785255	47	44	39	35	28	25	39	32	30	19	18	37	27	16
H186	708216	784924	57	51	37	36	30	27	46	28	28	20	20	35	29	25
H187	707874	784854	63	63	36	37	30	27	50	27	28	21	19	36	29	35
H188	708178	784996	55	51	36	35	30	26	44	28	27	20	19	35	28	24
H189	708305	784969	54	50	37	36	30	26	45	28	28	20	19	35	29	23
H190	709818	785414	30	31	30	31	26	22	23	23	21	15	16	27	24	3

NSR	ITM Coordinates		Month													Night
	X	Y	1 & 2	3	4	5	6	7	8	9	10	11	12 to 16	17	18	
H191	709402	785500	33	37	35	32	26	22	29	23	25	16	17	31	25	6
H192	709405	785518	32	37	35	32	26	22	29	23	25	16	17	31	25	6
H193	709453	785665	32	32	30	30	24	21	24	22	21	14	16	28	24	4
H194	709456	785693	32	32	30	30	24	21	24	22	21	14	16	27	24	4
H195	705544	784509	36	36	28	27	23	20	24	18	22	13	13	35	23	10
H196	705680	784453	36	37	28	28	24	21	25	18	22	13	14	36	23	10
H197	705657	784572	34	37	28	27	24	21	25	18	22	13	13	35	23	10
H198	705651	784873	34	33	26	27	22	20	23	17	20	12	13	28	22	6
H199	706010	785393	35	34	26	27	23	20	24	18	19	12	12	28	22	8
H200	705999	784823	37	36	27	28	24	21	25	18	21	14	14	30	24	15
H201	708974	781721	25	27	35	36	32	30	25	23	27	18	28	27	31	7
H202	708947	781729	25	27	36	36	32	30	25	23	27	18	29	27	31	7
H203	708977	781847	26	28	37	37	33	31	26	23	27	19	32	28	32	10
H204	708935	781765	25	27	36	36	33	31	25	23	27	18	29	27	32	8
H205	708905	781831	26	28	37	37	33	31	26	23	28	19	32	28	32	10
H206	708838	781781	26	28	36	37	33	31	26	23	27	19	29	28	32	8
H207	708796	781872	26	28	37	37	34	32	27	24	28	19	31	28	33	9
H208	708636	781939	26	29	37	38	35	33	28	24	29	20	31	29	34	14
H209	708397	782002	27	29	36	38	35	34	29	25	30	21	29	29	34	9
H210	708267	782013	27	30	36	38	35	34	29	25	30	21	29	29	34	9
H211	708078	782066	28	30	36	38	35	35	29	25	30	21	30	29	34	10
H212	707212	781200	24	26	26	29	26	22	19	18	21	13	18	24	25	4
H213	707323	781217	25	26	29	30	27	26	21	19	22	14	20	25	27	5
H214	707484	781251	25	27	29	31	28	26	22	20	23	15	21	25	27	7
H215	708081	781151	24	26	30	32	28	27	22	20	24	15	23	25	28	6
H216	708031	781228	25	26	31	32	29	27	22	20	24	16	23	25	28	6
H217	707920	781237	25	26	31	32	29	27	22	20	24	15	23	25	28	6
H218	707831	781155	24	26	30	31	28	27	22	20	23	15	22	25	27	5
H219	707748	781065	24	26	29	31	27	25	20	19	22	14	20	25	26	4
H220	707681	781206	25	26	30	31	28	27	22	20	23	15	22	25	27	7
H221	707513	781338	25	27	30	34	28	27	22	20	25	16	22	26	28	8
H222	707561	781590	26	28	32	36	30	29	24	23	25	17	23	27	29	8
H223	707469	781664	31	34	34	38	32	30	24	23	30	17	24	32	33	13
H224	707425	781885	27	29	32	34	31	30	25	22	27	18	24	28	30	10
H225	707542	781969	28	30	33	35	32	31	26	23	28	19	25	28	31	9
H226	707609	782297	29	31	34	37	34	34	29	25	30	21	27	30	34	12
H227	707268	782879	37	41	36	37	34	31	28	26	30	23	24	39	33	18
H228	706805	782611	36	38	32	34	30	29	25	23	27	19	21	36	30	16
H229	705896	783448	34	38	30	29	26	24	24	20	24	15	16	37	25	14
H230	705841	783863	35	37	30	29	26	23	25	19	24	15	15	38	25	11
H231	705887	784475	36	35	28	28	25	22	24	19	21	14	14	30	24	9
H232	706014	784437	37	37	28	29	25	22	25	19	22	15	15	31	24	16
H233	706701	784453	52	50	33	32	28	25	33	23	27	18	17	44	27	29
H234	707338	784807	47	47	34	34	29	26	49	25	27	19	18	38	28	24
H235	707506	784843	46	45	35	34	29	26	58	26	27	19	19	37	28	24
H236	707514	784845	46	45	35	34	29	26	58	26	27	19	19	37	28	25
H237	708102	782128	28	30	36	38	35	35	30	25	31	21	30	30	35	11
H238	708956	782454	28	30	49	44	40	38	35	28	34	24	47	32	41	21
H239	709290	782312	27	29	43	40	36	33	26	25	29	21	40	30	35	16
H240	709136	781735	25	27	36	36	32	30	24	22	26	18	29	27	31	7
H241	709182	781682	25	27	35	35	31	29	24	22	26	17	29	27	31	7
H242	709642	783733	30	33	41	44	40	35	27	30	33	24	35	33	38	11
H243	709515	783040	29	31	44	53	37	34	26	34	29	24	39	34	37	16
H244	709454	782822	28	30	50	46	38	37	27	36	30	24	48	33	38	18
H245	709444	782792	28	30	51	46	39	38	27	29	30	24	48	32	38	18
H246	705567	784809	33	33	26	27	23	20	22	17	19	12	12	28	22	6
H247	705638	783305	32	33	27	28	25	22	22	19	21	14	15	28	24	12
H248	705640	784350	38	37	28	28	24	21	25	18	22	13	14	36	23	10
H249	705650	784374	37	37	28	28	24	21	25	18	22	13	14	36	23	10
H250	705583	784500	36	36	28	27	23	21	24	18	22	13	13	36	23	10
H251	705613	784489	36	36	28	27	24	21	25	18	22	13	13	36	23	10
H252	705712	784727	34	34	26	27	22	20	23	17	20	11	13	29	22	6
H253	705654	784815	34	33	26	27	22	20	23	17	20	12	13	28	22	6
H254	705800	784781	35	35	27	27	22	20	23	17	20	12	13	29	22	7

NSR	ITM Coordinates		Month													Night
	X	Y	1 & 2	3	4	5	6	7	8	9	10	11	12 to 16	17	18	
H255	705868	785262	34	34	26	26	22	19	23	17	19	11	12	28	22	6
H256	705937	785412	33	33	26	26	21	18	23	16	19	9	12	28	21	6
H257	705962	785280	35	34	26	27	22	20	24	17	20	11	13	28	22	7
H258	709053	781852	26	28	37	37	33	31	25	23	27	19	32	23	32	10
H259	709046	781725	25	27	35	36	32	30	24	22	26	18	28	27	31	7
H260	708843	782018	27	29	39	39	35	33	28	25	29	20	34	29	34	16
H261	708760	781877	26	28	37	37	34	32	27	24	28	19	31	28	33	9
H262	708726	781912	26	28	37	38	34	33	27	24	29	20	32	29	33	14
H263	708535	781883	26	28	36	37	34	33	27	24	28	20	29	28	33	8
H264	708421	781927	27	29	36	37	34	33	28	24	29	20	28	29	33	8
H265	708252	782077	28	30	37	38	36	35	30	25	31	21	30	30	35	10
H266	708233	782021	27	30	36	38	35	34	29	25	30	21	29	29	34	9
H267	708187	782044	28	30	36	38	35	35	29	25	30	21	30	29	34	9
H268	708163	782093	28	30	36	38	35	35	30	25	31	21	30	30	35	10
H269	707974	782092	28	30	35	38	35	35	29	25	30	21	29	30	34	10
H270	707933	782103	28	30	35	37	34	34	29	25	30	21	29	30	34	10
H271	707283	781361	25	27	32	37	32	27	22	24	28	18	22	30	32	8
H272	707284	781205	24	26	27	30	27	24	21	19	21	14	20	25	26	5
H273	707360	781320	25	27	29	31	28	26	22	20	23	15	21	25	27	8
H274	707423	781321	25	27	29	32	28	27	22	20	23	15	21	25	27	8
H275	707786	781092	24	26	29	31	28	26	21	19	23	15	21	25	27	5
H276	707640	781305	25	27	30	33	28	27	22	20	24	15	22	26	28	7
H277	707609	781309	25	27	32	35	28	27	22	24	24	15	22	27	28	7
H278	707530	781439	26	31	33	36	29	28	23	25	29	19	22	32	28	8
H279	707518	781467	26	28	33	36	30	28	23	25	29	19	22	29	29	8
H280	707417	781420	27	30	33	37	33	28	23	25	29	19	23	31	32	9
H281	707445	781545	30	33	34	37	33	29	23	25	30	16	24	32	33	12
H282	707503	781557	28	31	33	37	31	29	24	25	30	17	23	30	32	10
H283	707479	781570	27	32	33	37	32	29	24	25	30	17	24	32	32	9
H284	707471	781630	31	34	34	38	32	30	24	25	30	17	24	32	33	13
H285	707466	781810	27	29	32	35	31	30	25	22	26	18	24	28	30	8
H286	707440	781835	27	29	32	35	31	30	25	22	26	18	24	28	30	9
H287	707401	781915	27	30	32	35	31	30	25	22	27	18	24	28	30	10
H288	707430	781935	27	30	32	35	31	30	25	23	27	18	24	28	30	10
H289	707570	781956	28	30	33	35	32	31	26	23	28	19	25	28	31	9
H290	707588	782057	28	30	33	36	32	32	27	24	28	20	26	29	32	11
H291	707733	782121	28	30	34	37	34	33	28	24	29	20	27	29	33	9
H292	707320	782445	30	32	33	36	33	32	27	25	29	21	25	30	32	12
H293	706989	782647	36	39	33	35	32	30	26	24	28	20	23	37	31	17
H294	706850	782679	36	39	33	34	31	29	26	23	28	19	22	37	30	17
H295	706756	782676	36	39	33	33	30	29	25	23	27	19	21	36	29	17
H296	705706	783101	36	37	29	29	25	23	23	19	23	14	15	35	24	16
H297	705767	783216	36	37	29	29	25	23	23	19	23	14	16	35	25	17
H298	705798	783285	33	35	28	29	26	23	23	19	22	15	16	30	25	13
H299	705822	783531	32	37	29	29	26	23	24	19	24	15	16	37	25	10
H300	705842	783600	33	37	30	29	26	23	25	20	24	15	16	37	25	11
H301	705902	783694	35	38	30	29	26	23	26	20	24	15	16	38	25	15
H302	705896	783830	35	38	30	29	26	23	26	20	24	15	16	38	25	11
H303	705844	784342	36	37	27	28	25	22	26	19	21	14	14	35	24	11
H304	705959	784420	36	36	28	29	25	22	25	19	22	15	15	31	24	12
H305	706102	784637	38	38	28	29	25	22	27	20	22	15	15	38	24	16
H306	706407	784566	44	43	30	30	27	24	30	21	24	16	16	40	26	24
H307	706661	784461	51	49	33	32	28	25	32	22	26	18	17	44	27	30
H308	707151	784761	52	51	34	33	29	26	43	25	27	19	18	43	28	29
H309	707353	784818	46	46	34	34	29	26	49	25	27	19	18	38	28	24
H310	709200	781828	25	27	37	36	32	30	24	23	26	18	31	27	31	8
H311	709179	781595	24	26	34	35	31	29	23	22	25	17	27	26	30	6
H312	709659	783758	30	33	41	44	40	35	27	29	33	23	35	33	39	11
H313	709633	783663	30	33	42	45	41	36	27	30	33	24	36	33	39	11
H314	709653	783554	30	32	41	44	36	34	27	29	29	24	36	33	35	12
H315	709531	783091	29	31	42	53	37	33	26	32	29	24	35	33	36	16
H316	709503	783005	29	31	44	51	37	34	26	34	29	24	40	34	37	16
H317	709478	782944	28	31	44	49	38	34	27	32	30	24	39	33	37	18
H318	709508	782861	28	30	47	49	37	37	27	35	30	24	44	36	38	18

NSR	ITM Coordinates		Month													Night
	X	Y	1 & 2	3	4	5	6	7	8	9	10	11	12 to 16	17	18	
H319	709450	782849	28	30	50	47	38	38	27	36	30	24	47	36	38	19
H320	708598	781027	23	25	31	32	28	26	21	20	23	15	23	24	27	5
H321	709088	781130	23	25	31	32	28	26	21	20	23	15	24	24	27	4
H322	709157	781278	24	25	32	33	29	27	22	20	23	15	25	25	28	4
H323	708833	781031	23	25	31	32	28	26	21	20	23	15	23	24	27	5
H324	708900	781062	23	25	31	32	28	26	21	20	23	15	24	24	27	5
H325	709704	783834	30	33	40	43	40	34	27	29	34	23	33	32	38	10
H326	709694	782393	26	28	43	38	33	30	24	24	26	20	37	29	33	14
H327	709723	782432	26	28	39	38	33	30	24	24	26	20	35	29	32	14
H328	709807	782438	26	28	38	38	33	30	24	24	26	19	33	28	32	12
H329	709837	782477	26	28	38	38	33	30	23	24	26	19	32	28	31	9
H330	709987	782433	25	27	36	37	31	28	23	23	25	18	30	27	30	8
H331	710055	782422	25	27	35	36	31	28	22	23	24	18	30	27	30	8
H332	710299	782705	25	27	37	35	30	27	22	23	23	17	32	27	29	6
H333	709157	781422	24	26	33	33	30	28	22	21	24	16	26	26	29	5
H334	709700	783772	30	32	41	45	40	35	27	29	34	23	34	32	38	11
H335	709700	783800	30	33	41	44	40	34	27	29	34	23	34	32	38	11
H336	709734	783831	30	32	40	43	40	34	27	29	34	22	33	32	38	10
H337	709777	783823	30	32	39	39	33	29	25	28	26	22	31	32	31	10
H338	709888	783758	29	31	40	41	39	33	26	27	32	21	33	31	37	10
H339	709626	782417	26	28	44	39	34	31	25	25	27	20	39	29	33	15
H340	709655	782420	26	28	44	39	34	31	24	25	27	20	38	29	33	15
H341	710093	782469	25	27	35	36	31	28	22	23	24	18	29	27	30	8
H342	709164	781301	24	25	32	33	29	27	22	20	23	15	25	25	28	4
H343	709597	781764	24	26	35	35	30	28	22	22	24	17	29	26	30	8
H344	709643	781469	23	25	33	33	29	26	21	20	23	15	26	25	28	5
H345	708679	781011	23	25	31	32	28	26	21	20	23	15	23	24	27	5
H346	708399	781162	24	26	31	32	29	27	22	20	24	15	24	25	28	5
H347	706194	782621	32	37	30	30	27	25	24	20	24	16	18	34	26	15
H348	707491	781202	25	26	29	31	27	26	22	19	23	15	21	25	27	5
H349	709000	781085	23	25	31	32	28	26	21	20	23	15	24	24	27	4
H350	709665	783563	30	32	41	44	35	32	26	29	28	24	35	33	34	12
H351	708461	781151	24	26	31	32	29	27	22	20	24	15	24	25	28	5
H352	708290	782083	28	30	37	39	36	35	30	25	31	21	31	30	35	16
H353	705858	782712	32	36	29	29	26	23	23	19	23	14	16	34	25	15
H354	706252	785486	36	35	27	27	23	20	25	19	20	13	13	29	22	8
H355	705733	783152	36	37	29	29	25	23	23	19	23	14	16	35	24	16
H356	709492	783870	31	34	39	41	34	30	27	31	28	25	27	34	32	11
H357	710128	782412	25	27	35	36	30	27	22	23	24	17	29	27	29	8
H358	709404	783965	32	35	39	41	34	30	27	32	28	25	26	35	32	8
H359	709923	781772	24	25	33	34	29	26	21	21	23	16	27	25	28	5
H360	709659	781632	24	26	33	33	29	27	22	21	24	16	27	25	28	6
H361	709031	781787	25	27	36	36	33	31	25	23	27	18	30	27	32	8
H362	707629	781952	27	30	33	35	32	31	26	23	28	19	26	28	31	9
H363	709130	781697	25	27	35	35	31	29	24	22	26	18	27	27	31	6
H364	710258	783747	28	29	34	36	30	26	23	25	23	19	25	29	28	8
H365	710059	782479	25	27	35	36	31	28	22	23	24	18	29	27	30	8
H366	707240	781420	30	33	33	37	32	27	22	24	28	18	22	33	32	12
H367	709301	785032	34	37	34	34	28	25	31	26	24	19	19	31	27	7
H368	708915	781136	23	25	31	32	28	26	21	20	23	15	24	25	28	5
H369	709539	783850	31	34	40	41	34	30	26	30	27	24	33	34	32	11
H370	708323	781177	24	26	31	32	29	27	22	20	24	15	24	25	28	6
H371	708949	781069	23	25	31	32	28	26	21	20	23	15	24	24	27	4
H372	708942	781142	23	25	31	32	28	26	21	20	23	15	24	25	28	4
H373	708972	781153	23	25	32	32	28	26	21	20	23	15	24	25	28	4
H374	708781	782534	29	31	51	47	45	40	39	32	40	30	47	36	45	27