

# Bord na Móna

### Derryadd, Derryaroge and Lough Bannow Bogs -

Application for Substitute Consent Remedial Environmental Impact Assessment Report

Chapter 11 - Noise and Vibration

March 2025



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#### 11.0 NOISE AND VIBRATION

#### 11.1 INTRODUCTION

This chapter reports the findings of an assessment of any likely significant noise and vibration effects occurring as a result of Bord na Móna's historic peat extraction activities at Derryadd, Derryaroge and Lough Bannow Bogs (the Application Site) during the operational, decommissioning and rehabilitation phases, since 1988. A description of the project activities in terms of noise and vibration effects from 1949 to 1987 is provided in Appendix 4.1.

Noise impact assessments have been prepared for the Peat Extraction/Operational Phase, the Decommissioning Phase and the Rehabilitation Phase of the Application Site at the nearest noise sensitive locations (NSLs). To inform this assessment, background noise levels have been measured at several locations, representative of the nearest NSLs in the vicinity of the Application Site to assess the potential impacts associated with the peat extraction and related activities at the Application Site. Chapter 4 (Project Description) provides a full description of the project and describes the peat extraction activities that took place until July 2019 and subsequent decommissioning works as well as planned rehabilitation works.

In Section 4.5. of this rEIAR, the Annual Environmental Reports (AERs) (which exist for 2001 to the present day) are reviewed and no environmental noise complaints were reported. Noise monitoring was not carried out during this period as it was not required by the IPC Licence.

It is also important to note that in the case of environmental noise in general, once the noise generating activity has stopped, any environmental noise effects also stop, and there is no effect which persists thereafter.

As detailed in Section 1.6.3 of this rEIAR, there was no legal requirement for EIA or screening for EIA in respect of *any* project prior to the latest dates for transposition of the EIA Directive (Directive 85/337/EEC). Accordingly, this application for substitute consent is confined to the development which took place after those dates. The baseline against which the environmental effects of the development required to be assessed has therefore, been identified as being the position as at July 1988.

Chapter 2 of this rEIAR presents full details on the rEIA methodology.

#### 11.1.1 Statement of Authority

This chapter of the rEIAR was prepared by Mike Simms of AWN Consulting who holds a BE and MEngSc in Mechanical Engineering, and is a member of the Institute of Acoustics (MIOA) and of the Institution of Engineering and Technology (MIET). The consultant has worked in the field of acoustics for 20 years and has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, wind energy, industrial, commercial and residential.

Donogh Casey (Acoustic Technician) carried out the baseline noise survey presented in section 11.2.4. He has been working in the field of acoustics since 2018 and has extensive experience in both building acoustic commissioning and environmental surveying. He is currently a member of the Sound Insulation Testing Register, Ireland (SITRI) He is currently studying for the Institute of Acoustics Diploma in Acoustics and Noise Control.

#### 11.2 ASSESSMENT METHODOLOGY

The methodology adopted for this noise impact assessment is summarised as follows:

- Review of appropriate guidance to identify appropriate noise and vibration criteria for the Peat Extraction, Current and Remedial phases;
- Characterise the receiving environment through baseline noise surveys at various NSLs surrounding the Application Site;
- Undertake predictive calculations to assess the potential impacts associated with the Peat Extraction Phase at NSLs;
- Evaluate the potential noise and vibration impacts and effects; and
- Describe the significance of the residual noise and vibration effects associated with the peat extraction and related activities at the Application Site.

#### 11.2.1 Fundamentals of Acoustics

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. To take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels (SPL) is 0 dB (for the threshold of hearing) to 120 dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10 dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3 dB.

The frequency of sound is the rate at which a sound wave oscillates is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250 Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. The 'A-weighting' system defined in the international standard, BS ISO 226:2003 Acoustics. Normal Equal-loudness Level Contours has been found to provide the best correlations with human response to perceived loudness. SPL's measured using 'A-weighting' are expressed in terms of dB(A).

An indication of the level of some common sounds on the dB(A) scale is presented in **Error! Reference source not found.** 



*Figure 11-1: The level of typical common sounds on the dB(A) scale (NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004)* 

For a glossary of terms used in this chapter please refer to Appendix 11.1.

#### 11.2.2 Guidance Documents and Assessment Criteria

The following sections review best practice guidance that are considered appropriate to peat extraction works. Although activity involving the use of machinery at Derryadd, Derryaroge and Lough Bannow Bogs took place between the years 1949 to 2019, the approach here is to assess the historic activities on site against noise level limits in the current applicable Integrated Pollution Control (IPC) Licence Reg No P0504-01 awarded in May 2000. That is to say, noise levels at noise-sensitive locations due to machinery which was on site during activity at the Bogs are calculated. If these noise levels are found to comply with the criteria in the current licence, then it is considered that the site operated without significant noise impact. Thus, the site is being assessed as if the current IPC Licence applied prior to May 2000. Prior to 2000, there were no noise conditions on the site, and as such there was no requirement to control noise levels. In respect of the baseline, there is no data available prior to the noise survey, as discussed in Section 11.3.

#### 11.2.2.1 <u>Noise</u>

In Condition 8 of the IPC Licence issued to Bord na Móna the following limits on noise levels are stated.

8.1 Activities on-site shall not give rise to noise levels off site at any noise sensitive location which exceed the following sound pressure limits ( $L_{eq,30min}$ ) subject to Condition 3 of this licence:

Day-time: 55 dB(A)

Night-time: 45 dB(A).

8.2 There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

Condition 3 of the licence is as follows:

3.3 Noise

3.3.1 Noise from the activity shall not give rise to sound pressure levels ( $L_{eq,T}$ ) measured at noise sensitive locations which exceed the limit value(s) by more than 2 dB(A).

As activity on site has historically been, and will continue to be, carried out during daytime hours only (daytime is considered to be between the hours of 07:00 and 23:00), the relevant noise level limit is 55 dB  $L_{Aeq,30min}$  at noise-sensitive locations. This noise criterion is considered to apply to the historical Peat Extraction Phase, the Current Phase and Remedial Phase.

Noise-sensitive locations in this context are any defined as any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels. In this instance, the majority of the NSLs are dwellings. Mercy Secondary School, Killashee is located at a distance of 1.6 km from the Application Boundary. St Mary's Church in Lanesborough is located at a distance of 740m from and the Church of the Holy Rosary at Ballyclare is located at a distance of 1.5 km.

#### 11.2.2.2 <u>Vibration</u>

Reference is made to BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting (BSI 2008) which provides the following Vibration Dose Value (VDV) ranges which result in various probabilities of adverse comment resulting from exposure to vibration within residential buildings, these being the most sensitive building use type. An adverse comment is an unfavourable human reaction or response.

*Table 11.1: BS 6472 VDV (m·s<sup>-1.75</sup>) above which various degree of adverse comment may be expected in residential buildings* 

| Building Type                   | Low<br>probability of<br>adverse<br>comment(1) | Adverse comment<br>possible (m·s <sup>-1.75</sup> ) | Adverse comment<br>probable (m·s <sup>-1.75</sup> ) (2) |
|---------------------------------|--|---|---|
| Residential building –<br>Day   | 0.2 to 0.4                                     | 0.4 to 0.8  | 0.8 to 1.6  |
| Residential building –<br>Night | 0.1 to 0.2                                     | 0.2 to 0.4  | 0.4 to 0.8  |

*Note 1) Below these ranges adverse comment is not expected. Note 2) Above these ranges adverse comment is very likely.* 

#### 11.2.2.3 Additional Traffic on Public Roads

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development made use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that arose because of vehicular movements associated with the development. That said, movement of milled peat from the bogs between 1988 and 2020 would have been exclusively by private Bord na Móna railway so there were no HGV traffic movements of peat during that period. Since the closure of Lough Ree Power Station in 2020, remaining milled peat stockpiles have been transported from the Application Site by HGV via public road to Edenderry Power Station and/or Derrinlough Briquetting Factory. Further details on transportation of stockpiled peat are presented in Chapter 14.

In order to assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 11.2, taken from Design Manual for Roads and Bridges (DMRB), LA 111 Noise and vibration Revision 2 (UK Highways Agency et al, 2020) offers guidance as to the likely degree of impact associated with any long-term change in traffic noise level.

| Change in Sound<br>Level (dB) | Subjective Reaction               | DMRB Magnitude of<br>Impact | EPA Significance of<br>Effect      |
|-------------------------------|-----------------------------------|-----------------------------|------------------------------------|
| 0                             | Inaudible                         | Negligible                  | Imperceptible                      |
| 0.1 - 2.9                     | Barely Perceptible                |                             | Not Significant                    |
| 3 - 4.9                       | Perceptible                       | Minor                       | Not Significant to<br>Slight       |
| 5 - 9.9                       | Up to a doubling of<br>loudness   | Moderate                    | Slight to Moderate                 |
| 10+                           | Doubling of loudness<br>and above | Major                       | Significant to Very<br>significant |

#### *Table 11.2: Significance in Change of Noise Level*

The guidance outlined in Table 11.2 will be used to assess the increases in traffic levels on public roads that arose from activities at the Application Site and comment on the likely long-term impacts.

#### 11.2.3 Study Area

The background noise measurement locations were selected on the proximity to the Application Site; the distances to the site boundary are of the order of 10 m to 550 m.

#### 11.2.4 Field Surveys

Reference is made to the noise survey carried out in the preparation of the proposed Derryadd Wind Farm planning application (Ref. ABP PA14.303592). The field survey methodology and the selection of the locations were chosen to gather baseline information which would be suitable for the wind farm impact assessment as well as this substitute consent application for the Application Site. The methodology is as described in the Institute of Acoustics (IOA) *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (IOA, 2013), Though the baseline noise levels presented in this Chapter are filtered to remove windy periods as described in Section 11.2.4.4.

#### 11.2.4.1 Measurement Locations

Coordinates for the noise monitoring locations are detailed in Table 11.3.

In the case of the survey for the Application Site, significant noise sources in this area were noted to be distant traffic movements, activity in and around the residences and wind generated noise from local foliage and other typical anthropogenic sources typically found in such rural settings. Flowing water was audible at some locations.

There were no perceptible sources of vibration noted at any of the survey locations.

| Location | Coordinates – Irish Transverse Mercator (ITM) |          |  |
|----------|---|----------|--|
| Location | Easting                                       | Northing |  |
| А        | 602,904                                       | 770,195  |  |
| В        | 605,146                                       | 772,130  |  |
| С        | 604,661                                       | 767,075  |  |
| E        | 606,646                                       | 765,048  |  |
| F        | 610,819                                       | 764,664  |  |
| G        | 604,525                                       | 768,883  |  |
| Н        | 605,379                                       | 769,600  |  |
| I        | 606,904                                       | 763,428  |  |
| J        | 609,090                                       | 765,456  |  |

#### Table 11.3: Measurement Location Coordinates



Figure 11-2: Noise Measurement Locations

#### 11.2.4.2 Measurement Periods

Background noise measurements were conducted at each of the monitoring locations over the periods outlined in Table 11.4.

| Location | Start Date | End Date  |
|----------|------------|-----------|
| А        | 12/5/2022  | 17/6/2022 |
| В        | 12/5/2022  | 17/6/2022 |
| С        | 23/5/2022  | 21/6/2022 |
| E        | 12/5/2022  | 3/6/2022  |
| F        | 12/5/2022  | 26/6/2022 |
| G        | 12/5/2022  | 26/6/2022 |
| Н        | 12/5/2022  | 26/6/2022 |
|          | 12/5/2022  | 23/6/2022 |
| J        | 12/5/2022  | 12/6/2022 |

#### Table 11.4: Measurement Periods

A variety of wind speed and weather conditions were encountered over the survey periods in question. As discussed below, the data collected during this survey in support of the wind farm assessment was filtered to remove windy periods for the current remedial assessment.

#### 11.2.4.3 Instrumentation

The following instrumentation was used at the various locations:

|          | -          | -             |
|----------|------------|---------------|
| Location | Equipment  | Serial Number |
| A        | Rion NL-52 | 1076330       |
| В        | Rion NL-52 | 564809        |
| С        | Rion NL-52 | 586940        |
| D        | Rion NL-52 | 764925        |
| E        | Rion NL-52 | 575785        |
| F        | Rion NL-52 | 976162        |
| G        | Rion NL-52 | 998409        |
| Н        | Rion NL-52 | 164426        |
| I        | Rion NL-52 | 998410        |
| J        | Rion NL-52 | 998411        |

#### Table 11.5: Noise Measurement Instrumentation

Before, after and during each survey period, the measurement instrument was checked and calibrated using a Brüel & Kjær type 4231 Sound Level Calibrator. All calibration drifts were less than +/- 0.5 dB.

Rainfall was monitored using two rain gauges installed at Locations B and E. The rainfall data allows for the identification of periods of rainfall so that they can be removed from the noise monitoring data sets, in line with best practice, when calculating the prevailing background noise levels at the various locations.

#### 11.2.4.4 <u>Procedure</u>

Measurements were conducted at the nine locations over the survey periods outlined in Table 11.4. Data samples for all measurements (noise, rainfall and wind) were logged continuously at 10-minute interval periods for the duration of the survey. Daytime baseline levels were established by removing measured data when the wind speeds were typically above 5 m/s, and by also removing noise levels measured during wet conditions.

#### 11.2.5 Noise Calculations

British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1 Noise' is appropriate for open sites such as the Application Site. The standard contains a calculation method for noise propagation from plant and machinery across different types of ground can take account of screening and the 'on-time' of different items, to calculate a  $L_{Aeq,T}$  at a noise-sensitive location which can be compared to the adopted operational noise criterion.

#### 11.3 ESTABLISHING THE 1988 BASELINE CONDITIONS

By 1988 peat extraction was well established at the Application Site. Drainage was installed in all bogs and railway infrastructure was laid on all bogs as required. In the absence of baseline noise data from 1988, reference is made to the background noise survey undertaken at noise-sensitive locations in the vicinity of the Application Site to support the Derryadd Wind Farm planning application. The relevant details are discussed in the following sections. Measured

noise levels, filtered in accordance with the procedure in Section 11.2.4.4 are presented in Table 11-6.

| Location | Period  | L <sub>Aeq</sub> | L <sub>A90</sub> |
|----------|---------|------------------|------------------|
|          | Day     | 52               | 35               |
| А        | Evening | 43               | 32               |
|          | Night   | 43               | 25               |
|          | Day     | 55               | 34               |
| В        | Evening | 55               | 31               |
|          | Night   | 45               | 26               |
|          | Day     | 49               | 36               |
| С        | Evening | 45               | 32               |
|          | Night   | 44               | 24               |
|          | Day     | 48               | 36               |
| E        | Evening | 47               | 33               |
|          | Night   | 49               | 26               |
|          | Day     | 58               | 42               |
| F        | Evening | 49               | 42               |
|          | Night   | 48               | 41               |
|          | Day     | 55               | 39               |
| G        | Evening | 52               | 34               |
|          | Night   | 45               | 26               |
|          | Day     | 50               | 36               |
| Н        | Evening | 47               | 30               |
|          | Night   | 50               | 27               |
|          | Day     | 61               | 39               |
| I        | Evening | 55               | 35               |
|          | Night   | 52               | 27               |
|          | Day     | 48               | 33               |
| J        | Evening | 46               | 30               |
|          | Night   | 47               | 32               |

#### 11.4 PROJECT DESCRIPTION

For a detailed description of the Peat Extraction Phase, the Current Phase and Remedial Phase and the Potential Future Land Use, please refer to Chapter 4 Description of Development. The below outlines the noise-emitting specific elements each phase.

# 11.4.1 Peat Extraction Phase 1988 – 2019 (Drainage, Peat Extraction & Associated Activities)

By 1988, the land use at the Application Site was well established as industrial peat extraction. All bogs were fully drained and milled peat extraction was the only form of peat extraction taking place across the Application Site in 1988. As outlined in Section 4.4.3.1, sod peat extraction, which had been taking place exclusively in Derryaroge Bog, ended in 1984. Following the cessation of sod peat extraction, works to convert the drainage infrastructure from sod peat drainage (as described in Section 4.4.3.1) to milled peat drainage (as described in Section 4.4.3.2) commenced. Also by 1998, railway infrastructure was laid on all bogs.

The annual breakdown of primary activities associated with the Peat Extraction Phase are outlined in Table 11-7.

*Table 11.7: Annual Peat Extraction Activities 1988-2019* 

| Calendar Quarter    | Activities   |
|---------------------|--|
| January to March    | Drain/Machinery/Pump/Silt Pond<br>maintenance, Stockpile removal, peat<br>transportation |
| April to June       | Peat extraction, Stockpile<br>development/removal, peat transportation                   |
| July to September   | Peat extraction, Stockpile<br>development/protection/removal, peat<br>transportation     |
| October to December | Drain/Machinery/Pump/Silt Pond<br>maintenance, Stockpile removal, peat<br>transportation |

The types of noise generating peat extraction machines used during the Peat Extraction Phase are detailed in Section 4.2.2 and Section 4.2.3 in Chapter 4 of this rEIAR and are summarised below.

- Drainage and Bog Preparation Machinery such as Dragline/Shovel Excavator
  - Peat Extraction Machinery such as:
  - Tractors (H.D, LHT, and Ridger)
    - o Windrow Machine
    - o Sod Moss Peat Collector
    - o Milled Peat Harvester
- Dump Truck
- Wheeled Loader Lorry;
- Track Excavator;
- Dozer;

•

- Dewatering Pumps;
- Rail Lifter;
- Locomotive and Wagons;
- Motor Cycles; and,
- Service Vehicles.

In addition to these machines, peat which had been extracted at the Application Site was transported to Lanesboro Power Station, Lough Ree Power Station or Mountdillon Works via internal rail. Vehicular traffic also arose from the movement of personnel to and from the Application Site in the mornings and evenings.

As discussed in Section 11.2.2.1, from 2000 onwards, the Application Site has operated under IPC Licence P0504-01.

As activity on the Application Site has been carried out in daytime hours only, the relevant noise level limit is 55dB  $L_{Aeq,30min}$  at noise-sensitive locations. This noise criterion is applied to the Peat Extraction Phase, the Current Phase and Remedial Phase; this is considered appropriate as the activities in each phase formed or will form part of the normal scheduled activities at the Application Site for that period.

Since the implementation of the above, there have been no breaches of noise limits by the onsite activities or noise complaints from noise sensitive locations in the vicinity of the Application Site. There are no records of noise complaints ever received regarding the Application Site for the period 1988 to the implementation of the above limits in 2000.

#### 11.4.2 Current Phase (July 2019 to Present Day)

In January 2021, Bord na Móna formally announced that peat extraction across all bogs within its landholding had ceased, although peat extraction at the Application Site had ceased prior to this in July 2019. The Application Site still operates under the requirements of IPC Licence P0504-01,

However, due to decreased levels of activity and the corresponding reduced employee numbers at the Application Site during the Current Phase, these movements are at a much lesser volume than during the Peat Extraction Phase. The onsite machinery which are used during the Current Phase are detailed in Section 4.2.2 and Section 4.2.3 in Chapter 4 of this rEIAR, and are summarised listed below:

- Wheeled Loader Lorry;
- Track Excavator;
- Locomotive and Wagons;
- Dump Truck; and,
- Tractors.

Section 11.5.2 presents the noise assessment for the Current Phase. Based on the predicted noise levels, the Application Site has been in full compliance with the noise limits set out in the IPC Licence during the Current Phase.

#### 11.4.3 Remedial Phase

The Remedial Phase refers to managed rehabilitation of the bogs in accordance with the requirements of Condition 10 of the IPC Licence. The key objective of Bord na Móna peatland rehabilitation is environmental stabilisation. The rehabilitation of the Application Site will support biodiversity e.g., plants, insects, bird and mammals, and the formation of wetland habitats. In addition, peatland rehabilitation will bring a range of benefits to the local community via improvements in the local landscape and it is also complying with national policies and strategies regarding the reduction of carbon emissions, supporting biodiversity, habitat regeneration and enhancing water quality. It is anticipated it will take up to 30 years for naturally functioning wetland and peatland ecosystems to fully re-establish.

It is a requirement of 'Condition 10 Cutaway Bog Rehabilitation' of the IPC Licence that Bord na Móna, following decommissioning of use of all or part of their bogs, prepares (to the satisfaction of the EPA) and implements a Cutaway Decommissioning and Bog Rehabilitation Plan. Ecologists and site managers will visit the Application Site regularly for monitoring purposes. Noise generating machinery will be limited to occasional tractors or excavators to facilitate in the drain blocking process across the Application Site. These activities will be limited to the first 2 years of the phase. In addition, ecologists and site managers will travel to and from the site daily in light goods vehicles (LGVs) to oversee these activities. All peat stockpiles have been removed from the Application Site as of November 2022, and as such no Heavy Goods Vehicles (HGVs) movements associated with the removal of extracted peat are anticipated to be required during the Remedial Phase.

The onsite machinery to be used during year 1 and 2 of the Remedial Phase are listed below:

- Tracked Excavator, and
- Tractor.

From year 3 onwards, the only vehicles on site will be infrequent site visits (1-2 per month) by ecologists and site managers in lights good vehicles (LGVs) to monitor the progress of the rehabilitation plans.

Again, during this phase, despite the significant reduction in noise generating machinery the Applicant is committed to complying with all conditions, including noise, set out in IPC Licence, where applicable.

#### 11.5 ASSESSMENT OF SIGNIFICANT NOISE & VIBRATION EFFECTS

#### 11.5.1 Do-Nothing Scenario

As stated in Chapter 2 Section 2.11, "From 1988, in the Do-Nothing Scenario, it is assumed that the peat extraction and associated works ceased and that the bog lands were allowed to naturally revegetate with scrub and bog woodland as is evident from areas of the Application Site which have been out of production for long periods of time". Therefore, if activity were to have stopped in 1988, then consequently there would have been no noise emissions from the site and no noise or vibration effects.

# 11.5.2 Peat Extraction Phase 1988 – 2019 (Drainage, Peat Extraction & Associated Activities)

A variety of items of plant and machinery were in use for the purposes of peat extraction and related activities and these are described in Chapter 4 (Project Description). There were also vehicular movements to and from the site bogs that made use of existing roads, (See 14.6.1.) Potential noise impacts are discussed in the following sections.

The approach here will be to predict noise levels at various distances, to demonstrate that no significant effect is likely to have occurred.

As introduced in Section 11.2.5, the calculation methods in BS5228 are suitable for the calculation of noise levels at noise-sensitive locations due to the peat extraction. The assessment begins with a set of plant items that are considered typical for the activity of peat extraction. Noise levels for items not covered in BS5228 are assumed to have a sound pressure level of 81 dB(A) at 10 m.

| Item (BS 5228 Ref.)          | Plant Noise level at 10m Distance<br>(dB L <sub>Aeq,T</sub> ) |
|------------------------------|---|
| Wheeled Loader Lorry (C2 28) | 74  |
| Track Excavator (C2 22)      | 72  |
| Dozer (C2.13)                | 78  |
| Dump Truck (C4.2)            | 78  |
| Tractor                      | 81  |
| Rail Lifter                  | 81  |
| Locomotive and Wagons        | 81  |
| Miller                       | 81  |
| Harrow                       | 81  |
| Ridger                       | 81  |
| Harvester                    | 81  |
| Motorcycles                  | 81  |
| Service Vehicles             | 81  |

#### Table 11.8: Typical Peat Extraction Plant and Associated Noise Levels

Table 11.8 presents the total predicted operational noise levels at various distances from the activity. The values take account of the soft nature of the ground. No acoustic screening was in place. The 'on-time' is assumed to be 80% as a worst-case scenario, i.e. the machinery was operating for 80% of the working day, but in practice it was actually less. As a conservative measure, the calculations assume that all items of machinery listed in the table above were operating at the same time at the stated distance from a noise-sensitive location, though this is unlikely to have been the case at all times.

#### Table 11.9: Typical Noise Levels due to Peat Extraction

| Phase           | Total Predicted Operational Noise Level at Stated Distance (m)<br>from Edge of Works<br>(dB L <sub>Aeq,T</sub> ) |     |     |     |
|-----------------|--|-----|-----|-----|
|                 | 200  | 250 | 300 | 350 |
| Peat Extraction | 55   | 53  | 51  | 49  |

At distances of 200 m and beyond, the levels of peat extraction noise are all within the operational noise criterion of 55 dB  $L_{Aeq,T}$  adopted in Section 11.2.2. Figure 11.3 shows the noise-sensitive locations with a coloured buffer of 200 m around each one.



*Figure 11-3: Noise-sensitive locations with 200 m buffers* 

In the following figures, areas within the site boundary which are within 200 metres of a noisesensitive-location are displayed. The figures show that only in a very limited number of areas, the peat extraction activity had the potential to be within 200 m of a noise-sensitive location. Beyond these 200 m buffers, i.e. within the vast majority of the site, noise levels due to peat extraction activity were below the criteria at noise-sensitive locations and therefore in compliance with the noise level limits stated in the IPC Licence.



*Figure 11-4: Areas within 200 m of a noise-sensitive location – Northern Area of Application Site* 



Figure 11-5: Areas within 200 m of a noise-sensitive location – Central Area of Application Site



*Figure 11-6: Areas within 200m of a noise-sensitive location – Southern Area of Application Site* 

With respect to the EPA criteria for description of effects, the potential effects at the nearest noise sensitive associated with the Peat Extraction Phase are described as **negative**, **not significant and long-term**.

#### 11.5.2.1 Additional Traffic on Public Roads

Peat was transported solely by internal rail network during the Peat Extraction Phase (1988-2019)). In terms of the additional traffic on local roads that was generated as a result of movement of workers to and from site using personnel vehicles, the following comment is presented:

Table 14-2 presents Average Daily Traffic (ADT) values for the N63, R392 and R398 routes for 1988. For example, in 1988, the R398 had an ADT of 506 trips.

Table 14-3 presents the number of vehicle movements due to employees travelling to and from the site. In 1988, there were 120 trips to and from the site. The increase from 506 to 626 (being 506+120) vehicle movements per day corresponds to an increase in noise levels of less than 1 dB. Based on the criteria in Table 11.2, additional traffic introduced onto the local road network did not result in a significant noise impact. The resultant noise impact was **negative**, **not significant and long-term**.

#### 11.5.2.2 Vibration

Criteria for vibration at NSLs have been presented in Section 11.2.2.2 in terms of a vibration parameter Vibration Dose Value (VDV). No vibration measurements are available from the Peat Extraction Phase however for context, the following comment is offered:

Vibration measurements carried out by AWN Consulting, for an unrelated project, at a distance of 15 m from the main Dublin to Limerick/Cork train line yielded a VDV value of  $0.02 \text{ m} \cdot \text{s}^{-1.75}$ . With reference to Table 11.1, this value well below the criteria for adverse comment, even during night-time periods. Considering that the much lower speeds of the locomotives and wagons in use during the Peat Extraction Phase, it is not considered that a significant vibration effect occurred. The resultant vibration impact was **negative**, **not significant and long-term**.

#### 11.5.3 Current Phase (July 2019 to Present Day)

Peat extraction activities ceased in July 2019. Decommissioning is underway across the site; Decommissioning includes removal of all tea centres, maintenance sheds, rail tracks, diesel storage tanks, septic tanks and removal of materials from site. Full details of the process are presented in the Chapter 4 (Project Description).

Similar to the Peat Extraction Phase, the approach here is to predict noise levels at various distances, to demonstrate that no significant effect has occurred or is likely to occur in the future. The set of plant items involved in the removal of the infrastructure associated with peat harvesting operations are listed in Table 11.10.

| Item (BS 5228 Ref.)          | Plant Noise level at 10m Distance<br>(dB L <sub>Aeq,T</sub> ) |
|------------------------------|---|
| Wheeled Loader Lorry (C2 28) | 74  |
| Track Excavator (C2 22)      | 72  |
| Dozer (C2.13)                | 78  |
| Dump Truck (C4.2)            | 78  |
| Tractor                      | 81  |
| Locomotive and Wagons        | 81  |
| Rail Lifter                  | 81  |
| Motorcycles                  | 81  |
| Service Vehicles             | 81  |

#### Table 11.10: Typical Decommissioning Plant and Associated Noise Levels

Table 11.11 presents the total predicted operational noise levels at various distances from the activity. Similarly, the values take account of the soft nature of the ground. No acoustic screening is in place. The 'on-time' is assumed to be 80%, i.e. the machinery was/is operating for 80% of the working period. As a conservative measure, the calculations assume that all items of machinery listed in the table above operate at the same time at the stated distance from a noise-sensitive location, though this is unlikely to have been the case.

#### Table 11.11: Typical Noise Levels due to Decommissioning

| Phase           | Total Predicted Operational Noise Level at Stated Distance<br>from Edge of Works<br>(dB L <sub>Aeg,T</sub> ) |     |     |     |
|-----------------|--|-----|-----|-----|
|                 | 200  | 250 | 300 | 350 |
| Decommissioning | 53   | 51  | 49  | 47  |

In this instance, at distances of 200 m and beyond, the predicted levels of noise are all below the operational noise criterion of 55 dB  $L_{Aeq,T}$  adopted in Section 11.2.2.

With reference to Figures 11.4, 11.5, and 11.6 showing 200m buffer zones, a similarly small area of the site lies within 150 m of a noise-sensitive location. Beyond 150 m noise levels are within

the required criteria as stated in Section 11.2.2.1, and therefore compliant with the noise levels stated in the IPC Licence.

With respect to the EPA criteria for description of effects, the potential effects at the nearest noise sensitive location associated with the Current Phase are described as **negative**, **not significant and short-term**.

Comments in relation to vibration from rail movements presented in Section 11.5.2.2 also apply to the Current Phase. The resultant vibration impact was **negative**, **not significant and short-term**.

#### 11.5.4 Remedial Phase

At the beginning of the rehabilitation works, the main activities will be the blocking of drains in the bog in general and the ploughing of gravel slopes. Predicted noise levels are likely to be lower than those predicted for the Current Phase as works will be localised and short-term. No significant noise effects are likely at noise-sensitive locations. Similarly, vehicle movements to and from the site will be minimal.

Given the nature of the works discussed above, no vibration effects are expected at off-site locations.

With respect to the EPA criteria for description of effects, the potential effects at the nearest noise sensitive location associated with the Remedial Phase described are as negative, not significant, and long-term.

#### 11.5.5 Cumulative and Indirect Impacts

Chapter 2 contains a list of relevant projects for the cumulative assessment. Many of the projects are at distances too great for the possibility of a significant cumulative impact.

Projects close to the site boundary are discussed here:

- Lanesborough Power Station (IPC Licence No. P0629) operated from pre-1988 until its decommissioning in 2004. The analysis above shows that there were some areas of the Application Site which were within 200 m of a NSL (see figure below) The main element of operational noise at these NSLs at the Application Site was the transport by rail of the peat to the power station, at a distance of the order of 130 m from the NSLs. Considering the additional distance to the Lanesborough power station (some 750 m in total) it is not considered that significant cumulative noise or vibration effects were likely.
- Lough Ree power station operated from 2004 until its decommissioning in 2020. Similarly, it was served by rail from the Application Site. Noise emissions from the site were governed by IPC Licence P0610. In summary, the noise level limits in the licence were 55 dB L<sub>Aeq,15min</sub> by day and 45 dB L<sub>Aeq,15min</sub> by night, at NSLs, with no clearly audible tonal components permitted. Considering the additional distance to Lough Ree power station (some 750 m in total) it is not considered that significant cumulative noise or vibration effects were likely.
- Within the power station site are the following projects:
  - Ref. 281: 110 kV Station Control Building;
  - Ref. 5438: Extension between existing Battery Room and existing Switch Room at Aghamore 38 kV Station, and
  - $\circ~$  Ref: 18139: development along the existing Cloon to Lanesboro 110 kV Overhead Line

- Ref. 2460315: Permission for a battery energy storage system (BESS) within the Lanesborough/Lough Ree site
- Ref: 2275: Synchronous Condenser with the Lanesborough/Lough Ree site.
- Ref 19201: Redevelopment of the existing Lanesboro 110kV AIS substation with a new 110 kV Gas Insulated Switchgear (GIS) substation

Given the limited buffer areas within which works potentially give rise to noise levels at NSLs of 55 dB  $L_{Aeq,T}$ , it is not considered that significant cumulative noise or vibration effects were likely.

- Derraghan Ash Disposal Site served the Lough Ree power station between 2004 and 2022, after which no more waste was accepted. Considering that the nearest NSL to that site is at a distance of the order of 450 m, it is not considered that significant cumulative noise or vibration effects were likely.
- Other commercially harvested bogs operated by Bord na Móna and private operators: Given the limited buffer areas (see Figures 11.4, 11.5 and 11.6) within which works potentially give rise to noise levels at NSLs of 55 dB L<sub>Aeq,T</sub>, it is not considered that significant cumulative noise or vibration effects were likely.
- Sliabh Bawn Wind Farm: This project is at a distance of 6 km from the application site and therefore it is not considered that significant cumulative noise or vibration effects are likely.
- Permission for retention and completion of existing disposal site at Cloonfuigh, Killashee, Ref 673; Given the limited buffer areas within which works potentially give rise to noise levels at NSLs of 55 dB L<sub>Aeq,T</sub>, it is not considered that significant cumulative noise or vibration effects were likely.

Consideration is also given to the following Future Uses of the Application Site as outlined in Table 2.9.2:

- The proposed future uses of the Application site will be subject to a separate planning consent application including and an EIAR which will include an assessment of wind turbine noise in accordance with the Institute of Acoustics (IOA) A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IOA, 2013). This assessment will in turn include consider cumulative impact with the Current Phase and Remedial Phase;
- Enhanced rehabilitation under the Peatlands Climate Action Scheme (PCAS); similar to the Remedial Phase, any noise-generating works will be localised and short-term, significant cumulative noise and vibration effects are not likely.

The Derryadd wind farm will be subject to a separate EIAR and will contain a noise assessment of noise from the construction, operation and decommissioning phase of wind farm in accordance with best practice. As wind turbine noise varies with wind speed at any time, a specific noise assessment methodology is used which takes account of the variability of noise levels over the operating wind speed range. Wind turbine noise at noise-sensitive locations is described in terms of the  $L_{A90}$ , parameter which is the level which is exceeded for 90% of the measurement period. It will therefore exclude the effects of brief, intermittent events and is used to estimate a background level.

The proposed operational limits in  $L_{A90,10min}$  for Derryadd Wind Farm will be, at the facades of noise-sensitive locations:

- 40 dB L<sub>A90,10min</sub> for quiet daytime environments of less than 30 dB L<sub>A90,10min</sub>;
- 45 dB L<sub>A90,10min</sub> for daytime environments greater than 30 dB L<sub>A90,10min</sub> or a maximum increase of 5 dB above background noise (whichever is higher), and;

• 43 dB L<sub>A90,10min</sub> or a maximum increase of 5 dB above background noise (whichever is higher) for night time periods.

Noise from the rehabilitation plant noise sources is not dependent on the wind speed and is therefore assessed differently, i.e. calculating the external noise level at the façade of noise-sensitive locations. These noise levels are then compared to criteria as discussed in Section 11.2.2.1, in terms of the L<sub>Aeq</sub> parameter, which is the equivalent continuous sound level. Each assessment method is robust and appropriate to the noise source in each case.

If the wind farm is consented, it is extremely unlikely the drain blocking activities of the remedial phase will occur concurrently to the operation of the wind farm. The drain blocking will be done either in advance of any wind farm construction or post construction. However, in the unlikely event they occurred at the same time, the noise criteria for the remedial phase (day time) activities are 55 dB L<sub>Aeq</sub> (defined in Section 11.2.2.1). Therefore, based on the below limits for the wind farm, it is considered that there is no significant potential for cumulative effects should the two events run concurrently.

As such, there is no potential for cumulative effects with the Derryadd Wind Farm and the Remedial Phase.

#### 11.6 MITIGATION AND MONITORING MEASURES

# 11.6.1 Peat Extraction Phase 1988 – 2019 (Drainage, Peat Extraction & Associated Activities)

The assessment in section 11.5.2 has found that there were no significant noise impacts, therefore no additional specific mitigation measures were necessary. Since 2000, noise levels were controlled by compliance with the noise condition in the IPC Licence as discussed in Section 11.2.2.1. This also applies to the Current Phase and Remedial phases.

#### 11.6.2 Current Phase (July 2019 to Present Day)

The assessment in section 11.5.3 has found that there are no significant noise impacts, therefore no specific mitigation measures are necessary.

#### 11.6.3 Remedial Phase

The assessment in section 11.5.4 has found that there are no significant noise impacts, therefore no specific mitigation measures were necessary.

#### 11.7 RESIDUAL EFFECTS

# 11.7.1 Peat Extraction Phase 1988 – 2019 (Drainage, Peat Extraction & Associated Activities)

The Noise Impact Assessment has concluded that noise emissions and vibration generated during the Peat Extraction Phase were not significant. The noise emissions associated with the current onsite activities and the future rehabilitation works are considered less than the past peat extraction activities and therefore potential of residual effects associated with these phases are considered long term negative but not significant. In respect of noise and vibration from additional traffic on public roads due to activity on site, the effects at the nearest noise sensitive were also long-term negative but not significant.

#### 11.7.2 Current Phase (July 2019 to Present Day)

The residual effects at the nearest noise-sensitive locations associated with the Current Phase are described as negative, not significant and long-term.

#### 11.7.3 Remedial Phase

The potential effects at the nearest noise sensitive locations associated with the Remedial Phase are described as negative, not significant and long-term.

#### 11.8 MAJOR ACCIDENTS AND NATURAL DISASTERS

There has not been any accident or natural disaster that would have created a noise or vibration effect at noise-sensitive locations.

#### **11.9 REFERENCES**

- British Standard Institute (BSI) *BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites Part 1: Noise* (BSI, 2014).
- British Standard Institute (BSI) BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting (BSI, 2008).
- International Organization for Standardization (ISO) *ISO 1996: 2017: Acoustics Description, measurement, and assessment of environmental noise* (ISO, 2017).
- United Kingdom Highways England (now National Highways) (UKHE) *Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2*(UKHE, 2020).

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