

*AN ASSESSMENT OF THE NOISE
EMISSIONS FROM PRE-SELECTED
LOCATIONS IN COMPLIANCE WITH
THE REQUIREMENTS OF BORD NA
MÓNA'S INTEGRATED POLLUTION
CONTROL LICENCE APPLICATION*

REPORT NO:

K960-Nb

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30th September 1999

CONFIDENTIAL

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1.0 INTRODUCTION

As part of the requirements of their Integrated Pollution Control Licence applications Bord na Mona Energy Limited are required to assess each site in relation to its noise output. Due to the expansive mass of the sites and their similarity in terms of production activity it was proposed to choose two sites as a basis for a preliminary noise assessment, namely, the Allen Group and the Boora Group. The initial noise assessment was carried out in May 1999 (refer to Bord na Mona Report No. K960-N) and detailed both the impact of noise emissions on nearby sensitive locations during milling operations and the impact of noise emissions on nearby sensitive locations during daytime rail movements.

An additional noise assessment was subsequently conducted during July and August 1999 on commencement of peat harvesting activities. Perimeter and noise sensitive measurements were taken at Ballykeane (N1 and N2) and Killinagh Bogs (N7 and N8).

In addition, subsequent to the change in weather conditions, an assessment of the impact of noise emissions on nearby sensitive locations during night-time rail movements was also undertaken.

This report presents the results of the second assessment, together with details of the methodologies employed. A broad interpretation of the results is also included.

2.0 METHODOLOGY

Noise measurements were conducted using a Cirrus Noise Sound Level Meter type 703A. The following parameters were applied to the measurements:

Time Weighting	Fast
Frequency Weighting	A
Field	Frontal
Range	31.1 - 143.2

2.1 Sample Locations

- 2.1.1 All measurements were taken at 1.5 m height above local ground level and 1-2 m away from reflective surfaces.

The sample locations and grid references are detailed in Table 2.1 below.

TABLE 2.1 SAMPLE LOCATIONS		
ALLEN GROUP		
Reference ID	Grid Reference	Description of Location
N1	E250660, N222170	Perimeter of Ballykeane Bog
N2	E250930, N222225	Noise sensitive at Ballykeane Bog
N7	E272150, N226250	Perimeter of Killinagh bog
N8	E273180, N226300	Noise sensitive at Killinagh bog
N9	E253840, N229750	Bridge over the railway track (Esker Bog to Cavemount Bogs)
BOORA GROUP		
N6	E220225, N223800	Level crossing near Pollagh Bog

Maps outlining the locations are given in Appendices I and II

2.2 Measurement Parameters

2.2.1 L_{eq} Values

L_{eq} (t) value represent the continuous equivalent sound level over a specified time (t). This value expresses the average level over time and is a linear integral.

2.2.2 Max P Value

The Max P value represents the maximum sound pressure level produced by a source during the monitoring period.

2.2.3. L₉₀ and L₁₀ Values

The L₉₀ and L₁₀ values represent the sound levels exceeded for a percentage of the instrument measuring time. L₁₀ indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L₁₀ is a good statistical parameter for expressing event noise such as passing traffic. The L₉₀ represents post event sound levels and is a good indicator of background noise levels.

2.2.4 Source Noise Predictions

Rail movement was considered the most likely source to generate noise outside the site boundary. It was therefore necessary to predict the contribution of this source to the noise levels at the nearest noise sensitive location. These predictions have been done in all cases using the inverse square law, which is a "rule-of-thumb" used to calculate the expected reduction in noise levels as one moves away from the source. Generally, as one doubles the distance from the source, a reduction of 6 dB is expected. Within a confined space, however, this rule is generally broken due to reflection, where a diffuse field is set up at a level higher than that expected from this law.

The Inverse Square law is defined as.

$$Lp_2 = Lp_1 - 20 \text{ Log } (R2/R1) \quad \text{where}$$

Lp_2 is the calculated sound pressure level at R2 meters from the source

Lp_1 is the measured reference sound pressure level at R1 meters from the source

3.0 CALIBRATION

The noise level meter was calibrated before and after all measurements. Calibration and equipment details are presented below:

Noise Meter Serial No.	024818
Calibrator Cert No.	101114
Set Level	94.0dB(A)

4.0 RESULTS

4.1 Climatic Conditions

27/7/99	Daytime: Dry and warm with a slight breeze (wind speed <5m/s)
27/7/99	Night-time: Dry and breezy (wind speed <5m/s)
28/7/99	Dry and sunny with a slight breeze (wind speed <5m/s).
19/8/99	Calm, clear and mild

4.2 Noise Measurements

TABLE 4.1.1: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT BALLYKEANE BOG ON 27/7/99 (DAY-TIME)

Ref. No.	Period (mins)	Start Time	L _{eq} dB(A)	L ₁₀ dB(A)	L ₉₀ dB(A)	Max P. dB(A)
N1	5	11:30	37.8	39.0	35.0	49.3
N2	5	12:01	57.1	47.1	33.3	81.0

TABLE 4.1.2: RESULTS OF NOISE MEASUREMENTS AT BALLYKEANE BOG DURING HARVESTING OPERATIONS ON 27/7/99 (DAY-TIME)

Ref.No.	Period (mins)	Start Time	L _{eq} dB(A)	L ₁₀ dB(A)	L ₉₀ dB(A)	Max P. dB(A)
N1	5	11:45	61.3	64.2	41.9	89.4
N2	5	12:07	51.8	42.8	33.4	72.8

TABLE 4.2.1: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT KILLINAGH BOG ON 28/7/99

Ref. No.	Period (mins)	Start Time	L _{eq} dB(A)	L ₁₀ dB(A)	L ₉₀ dB(A)	Max P. dB(A)
N7	5	6:05	55.8	57.2	43.0	72.7
N8	5	6:30	64.2	55.4	36.8	85.6

TABLE 4.2.2: RESULTS OF NOISE MEASUREMENTS AT KILLINAGH BOG DURING HARVESTING OPERATIONS ON 28/7/99

Ref. No.	Period (mins)	Start Time	L _{eq} dB(A)	L ₁₀ dB(A)	L ₉₀ dB(A)	Max P. dB(A)
N7	5	6:12	62.2	64.8	51.7	78.5
N8	5	6:21	62.1	57.1	40.7	81.7

TABLE 4.3.1: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT RAIL LOCATIONS (NIGHT-TIME)

Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N6	5	22:10	61.5	53.4	29.5	87.5
N9	5	23:30	56.3	41.7	30.1	80.6

TABLE 4.3.2: RESULTS OF NOISE MEASUREMENTS DURING RAIL MOVEMENT (NIGHT-TIME)

Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N6-1	8.5	22:40	70.9	74.1	44.9	88.6
N6-2	0.5	23:00	72.6	75.5	58.9	81.2
N9	5	23:30	79.9	83.8	43.4	98.4

TABLE 4.3.3: PREDICTED NOISE LEVELS AT THE NEAREST NOISE SENSITIVE LOCATIONS

Ref. No.	Distance from source to the actual L_{eq} dB(A) measurement (m)	Distance from source to the nearest noise sensitive location (m)	Predicted L_{eq} dB(A) at the nearest noise sensitive location
N6-1	5	50	50.9
N6-2	5	50	52.6
N9	2	20	59.9

5.0 DISCUSSION

Ballykeane Bog - During harvesting operations

Tables 4.1.1 and 4.1.2 present the results of the noise monitoring assessment undertaken at Ballykeane Bog, Allen Group.

Measurements were taken at the perimeter of the bog (N1) and at the nearest noise sensitive location (N2) both in the absence of, and during harvesting operations. The latter measurement depicts the worst case scenario. Four harvesting units were in operation and the measurements were conducted when all machines were travelling approximately 100metres to and from the monitoring location. At the noise sensitive location, which is located approximately 150m from the perimeter, the main contributor to both the background level and the measurement taken during the harvesting operation was the passing of cars on the road adjacent to the house. The L_{90} value which essentially filters out short term noise events such as passing traffic, demonstrate levels which are well within the EPA guideline daytime value of 55dB(A).

Killinagh bog- During harvesting operations

Tables 4.2.1 and 4.2.2 present the results of the noise monitoring assessment undertaken at Killinagh Bog, Allen Group.

Measurements were taken both in the absence of harvesting and during the harvesting operation. In both cases, the main contribution to those levels recorded was traffic/farm vehicle movement on the nearby roadway. This is reflected in the L_{10} values of 57.2, 55.4, 64.8 and 57.1dB(A) respectively. Once again examination of the L_{90} values demonstrate levels which are within the EPA guideline of 55dB(A).

In conclusion the results of this monitoring programme demonstrate that noise generated during the harvesting operation does not have an adverse effect on the nearby environment and will not result in exceedence of EPA guideline values at nearest noise sensitive locations.

Noise Source Predictions

Tables 4.3.1 and 4.3.2 present the results of the measurements taken during night-time rail movements. Furthermore Table 4.3.3 outlines the predicted contributions of these measurements to the noise levels at the nearest noise sensitive locations.

Location N9, Allen Group (night-time) :

During the month of August peat produced from the Esker bog was transported during night-time hours via rail to the one of the Bord na Móna Briquette Factories. As outlined previously (Bord na Mona Report No. K960-N), peat trains or 'rakes' as they are described operate in pairs. Therefore, in order to assess the maximum noise source level a measurement was taken during night-time hours at the Railway Bridge while both rakes were passing. This bridge (N9) is located approximately 20metres from the nearest residence. The result of the predicted noise level at this location (59.9dB(A)) exceeds the BATNEEC guidance level of 45dB(A). However, it should be noted that the background level recorded was 56.3dB(A), which is also in exceedence of same. This was attributable to passing traffic on the road as demonstrated by the L_{10} Value of 41.7dB(A) compared to a L_{90} Value of 30.1dB(A).

Location N6, Boora Group (night-time) : Pollagh

Night-time noise measurements were taken at location N6, the level crossing at Pollagh Bog under the following conditions:

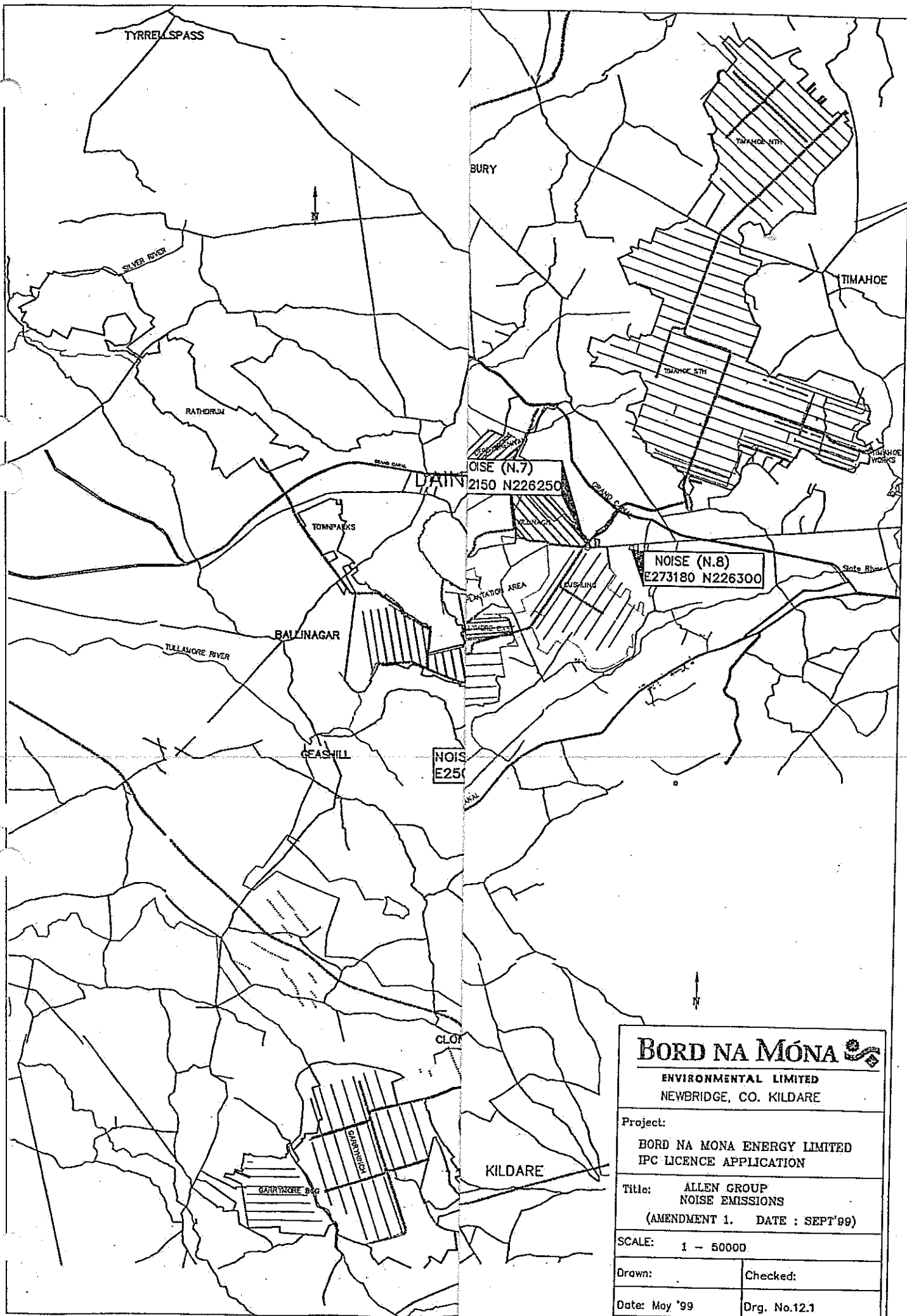
1. Background - in the absence of rail movement
2. During transport operations – two rakes crossing the road
3. During transport operations – rolling motion only (no idling/railway gates opening)

The passing traffic on the road was the main contributor to the ambient background noise levels at the crossing. This is indicated by the L_{10} Value of 53.4dB(A) compared to a L_{90} Value of 29.5dB(A). In addition this activity also accounted for the Max. P level (87.5dB(A)). The maximum predicted noise level at the nearest residence is 52.6dB(A), which arises from the rolling motion and exceeds the recommended guideline of 45dB(A).

Although all measurements exceed the recommended guideline of 45dB(A), it must be noted that night-time rail movement is an intermittent noise source and the results obtained depict the worst case scenario. Typically, a maximum of 2 rakes would operate on any one bog during night-time hours (weather permitting). Therefore, it may be considered that this event would only occur twice in any one night.

Appendix 1

LOCATION OF NOISE MONITORING LOCATIONS - ALLEN GROUP



BORD NA MÓNA

ENVIRONMENTAL LIMITED
NEWBRIDGE, CO. KILDARE

Project:

BORD NA MÓNA ENERGY LIMITED
IPC LICENCE APPLICATION

Title:

ALLEN GROUP
NOISE EMISSIONS
(AMENDMENT 1. DATE : SEPT'99)

SCALE:

1 - 50000

Drawn:

Checked:

Date: May '99

Drg. No.12.1

Appendix 2

LOCATION OF NOISE MONITORING LOCATIONS – BOORA GROUP

