

Appendix E

Noise
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ENVIRONMENT DEPARTMENT

CONFIDENTIAL REPORT

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Title:

Limerick County Council
Gortadroma Landfill Extension
Environmental Impact Study
Noise and Vibration Aspects

Attention: Mr. C. Wilson

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1 INTRODUCTION

- 1.1 This report was undertaken at the request of RPS-MCOS, Consulting Engineers to Limerick County Council on the Landfill Site at Gortadroma, Co. Limerick. The object of this report is to present the noise and vibration aspects of an Environmental Impact Study for a proposed extension to the existing Landfill Site.
- 1.2 Sound levels are measured with a meter in units called decibels (dB), and noise is defined as unwanted sound. Environmental noise levels are usually assessed in terms of A-weighted decibels, the dB(A). The A-weighting approximates to the response of the human ear. Industrial, occupational and environmental noise is usually expressed in equivalent continuous levels, $L_{Aeq,T}$. This is based on the energy average level over the relevant time interval. Environmental noise may be corrected for tonal or impulsive characteristics and the unit is the rating level, $L_{Ar,T}$. Statistical parameters showing the time varying nature of environmental noise are also used as noise descriptors.
- 1.3 The Landfill Site is currently in operation and waste is accepted between the hours of 08:00 to 17:30 Monday to Friday. There are a number of residences located to the north and south of the boundary of the proposed extension. There is little other activity in the immediate area and the adjacent land is principally agricultural with some afforestation. Road traffic is the greatest background source of noise in the area.
- 1.4 There is no additional night-time activity proposed for the landfill extension. A gas flare in continuous use is located on the existing site.

2. SUMMARY

- 2.1 *The existing noise environment at residences north of the proposed development is principally controlled by the existing landfill facility. The existing noise environment at residences south of the proposed development is principally controlled by road traffic.*
- 2.2 *The proposed development has a potential to exceed normal criteria at residences near the proposed boundary. Amelioration measures are available and will be provided to ensure that the criteria are achieved.*
- 2.3 *The construction of the facility may cause short-term adverse impact on nearby residences. There will be no vibration perceptible off-site.*
- 2.4 *The impact of the noise due to the operation of the proposed development is defined as 'minor impact'. The impact of the noise due to the construction of the proposed development is defined as 'temporary moderate impact'*

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3. EXISTING ENVIRONMENT

3.1 The existing noise environment is principally controlled by the present facility and road traffic in the area. The on-site machinery consists of a CAT D9N dozer and a CAT 826G compactor. There is also an excavator, a JCB and a dump truck operating on the site. The dozer and compactor are the principal on-site sources of noise and they operate in unison to level and compact the landfill material.

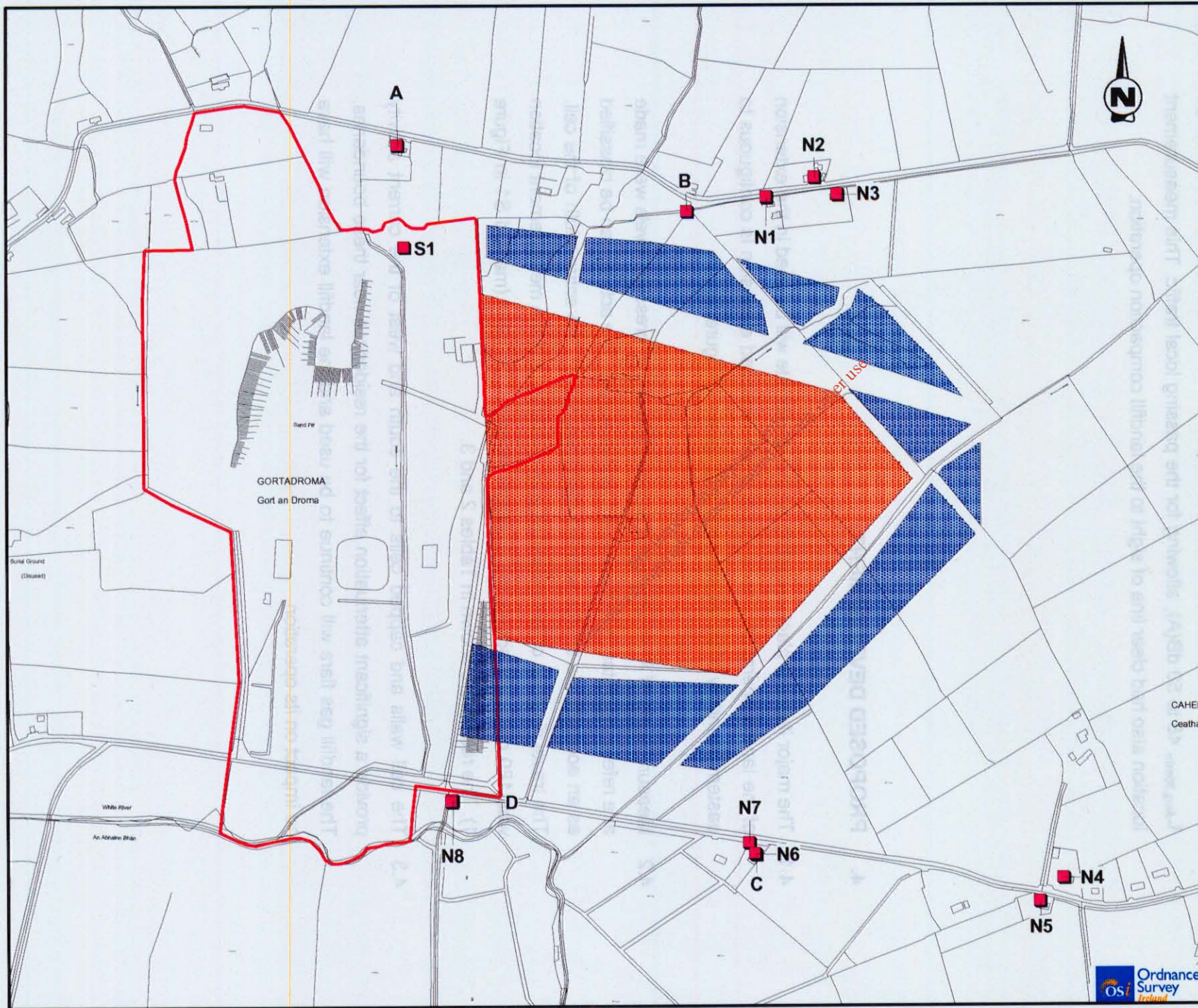
3.2 The nearest residences are c.470 metres northeast of the centre of current activity, locations N1, N2, and N3 shown in the site plan, Figure 1.

3.3 Baseline noise measurements were made close to the nearest residences and at other locations around the site, locations A, B, C, and D shown in Figure 1. The residences are close to the proposed boundary of the extension. The instrumentation consisted of Environmental Noise Analysers Larson Davis 824, 814, and CEL 252. Calibration checks were made on site with a B&K type 4230 sound level calibrator.






3.4 Noise measurements were made 1.5 m above the local ground level at locations B to D and 3 m above ground level at location A (the increased height at 'A' was to avoid local screening effects). The following parameters were measured:

- $L_{Aeq,T}$ the equivalent continuous noise level for the measurement period. This parameter is very sensitive to local high-level short time sources, e.g. local traffic, etc.
- $L_{A01,T}$ the sound level equalled or exceeded for 1% of the measurement period, the maximum levels.
- $L_{A10,T}$ the sound level equalled or exceeded for 10% of the measurement period, the parameter usually used for traffic noise assessment.
- $L_{A90,T}$ the sound level equalled or exceeded for 90% of the measurement period. This level is sometimes taken to represent the "background" noise level.

3.5 The measured noise level results are shown in Table 1. The noise levels at locations A and B were principally due to landfill operation with a small number of vehicles passing location B. A safety bleeper from some of the reversing lorries was audible at times at both these locations. The measured noise levels at locations C and D were principally due to traffic on the adjacent road.



Legend

-  Existing Landfill Site
-  Screening/Landscaping Buffer Areas
-  Waste Disposal Areas
-  A-D & S1 = Sampling Locations
-  N1- N8 = Residences



Project **Gortadroma Landfill Extension EIS**

Title **Location of Noise Baseline Monitors**

Figure 1



Issue Details		
Drawn: CW	Project No.	MDE0148
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- 3.6 The daytime $L_{Aeq,30min}$ levels at location A were in the range 50 to 54 dB(A). This measurement location had clear line of sight to the landfill compaction operation. The corresponding noise levels at location B were estimated to be in the range $L_{Aeq,30min}$ 48 to 50 dB(A), allowing for the passing local traffic. This measurement location also had clear line of sight to the landfill compaction operation.

4. PROPOSED DEVELOPMENT

- 4.1 The major items of plant operating on the landfill site will be used in the extension of the landfill operation. The location of the proposed extension is contiguous to eastern boundary of the existing site and shown in Figure 1.
- 4.2 Measurements of A-weighted and octave band sound pressure levels were made at a reference distance to the current landfill activity. The activity can be classified as an acoustic line-source with the machines moving the entire width of the cell. The travel distance of the machines was c. 100 m, and the measurement location was 180 m distant across the drainage stones of the cells (marked S1 in Figure 1). The results are shown in Tables 2 and 3.
- 4.3 The cell walls and capped cells to the south and west of the current activity provide a significant attenuation effect for the residences near these boundaries. The landfill gas flare will continue to be used and the landfill extension will have no impact on its operation.

5 CRITERIA

- 5.1 There are no statutory limits for environmental noise emissions for this type of activity in this country. In general, noise is likely to provoke complaints when its level exceeds the level of the background noise by a certain margin or when certain absolute levels are attained.
- 5.2 A daytime limit of 55 dB(A) is suggested by the EPA as the target level appropriate for noise sensitive locations. This level is not exceeded due to the current activity.

6 POTENTIAL IMPACT OF PROPOSAL

- 6.1 The criteria limits are not exceeded by current noise emissions from the Landfill Site.
- 6.2 The proposed Landfill Extension will move the centre of activity to within c.220 metres of the nearest residences both north, locations N1 to N3, and south, locations N6 to N8 (location N8 is owned by Limerick County Council and is currently uninhabited). The noise levels due to the current operation, when interpolated to the distances from the proposed development, have a potential to equal the criterion limit of 55 dB(A) at the nearest residences. An increase in Landfill Activity on the Site could cause the noise emissions to exceed this criterion at the nearest houses.
- 6.3 The construction work will increase the noise level in the immediate vicinity of the site. Higher noise levels associated with the excavation and movement of material could cause some annoyance but these operations shall be controlled in order to achieve an acceptable standard. During the construction of the facility the operation of the earth moving equipment has a potential for excessive increases above the landfill criteria. Construction noise criteria are higher than the long-term Landfill criteria and are usually in the range $L_{Aeq,1hour}$ 65 to 70 dB(A) for short-term daytime operations.

- 6.4 Ground vibration levels close to roads with poor road surfaces are less than 0.1 mm/s at 4 metres from the road. The ground vibration from the compaction operations generates higher levels than this on the Landfill Site but due to the distances involved there are no off-site vibration effects.

7 REMEDIAL MEASURES

- 7.1 The environmental noise from the site will be attenuated by the construction of landscaped earth embankments. These will be constructed early in the development stage to minimise the impact of the construction noise.
- 7.2 An embankment of height 3 metres will be constructed immediately south of Noise Sensitive Locations N1 and N3. The length of the embankment will be such that there will be no line of sight from these properties to the Landfill Activity area. The estimated attenuation due to this amelioration measure is in excess of 10 dB(A)
- 7.3 An embankment of height 3 metres will be constructed immediately north of Noise Sensitive Locations N6 and N7. The length of the embankment will be such that there will be no line of sight from these properties to the Landfill Activity area.

8 PREDICTED IMPACT OF PROPOSAL

- 8.1 The provision of amelioration measures will ensure that the residual impact of the landfill activity will be negligible.
- 8.2 The provision of the amelioration measures in the early stages of the development will minimise the impact of the construction phase of the Development
- 8.3 Earth moving machinery will be used to construct the noise control measures and for a very short period noise emissions will be in excess of normal operational criteria. Construction work is of a temporary nature, and the resulting higher noise levels are usually acceptable.
- 8.4 The ground vibration from the compaction operations generates high levels in the immediate vicinity but due to the distances involved there are no off-site vibration effects.
- 8.5 The impact of the development may be defined as:

Scheme	Degree of Impact
Proposed Landfill extension	Minor
Construction Phase	Moderate, temporary

Table 1

Noise Measurements Results

Location (see fig 1)	Date	Time end	Duration minutes	L _{Aeq} dB	L _{A01} dB	L _{A10} dB	L _{A90} dB	Comments T = 30 mins
A	30/04/03	13:30	30	50	61	54	37	No landfill machinery operating
	30/04/03	14:00	30	52	60	55	43	Landfill activity
	30/04/03	14:30	30	54	62	58	46	Landfill activity
	01/05/03	14:30	30	51	59	55	44	Landfill activity
	01/05/03	15:00	30	50	58	54	44	Landfill activity
B	30/04/03	13:40	30	42	51	45	35	No landfill machinery operating, 1 local car, distant traffic, birds
	30/04/03	16:00	30	49	58	52	43	Landfill machinery operating, 3 local cars, distant traffic, birds
	30/04/03	16:30	30	53	63	51	44	Landfill machinery operating, 2 local cars, distant traffic, birds
	01/05/03	12:20	30	48	56	51	40	Landfill machinery operating, No local traffic
	01/05/03	14:00	30	50	59	51	39	Landfill machinery operating, 1 passing tractor
C	01/05/03	12:00	30	63	77	57	37	Road traffic noise
	01/05/03	12:30	30	65	80	62	40	Road traffic noise
	01/05/03	13:00	30	62	77	54	36	Road traffic noise
	01/05/03	13:30	30	63	76	52	32	Road traffic noise
	01/05/03	14:00	30	65	79	56	38	Road traffic noise
D	01/05/03	12:00	30	61	75	58	37	Road traffic noise
	01/05/03	12:30	30	63	77	64	38	Road traffic noise

Table 2 Noise Emissions.

Sources 30/04/03	Time end	Duration minutes	LAeq dB	Distance metres	LA1 dB	LA10 dB	LA90 dB
Dozer & compactor +	15:00	30	54	180	61	57	48
Dozer & compactor +	15:30	30	52	180	61	56	45
Dozer & compactor +	16:00	30	52	180	61	56	43
Dozer & compactor +	16:30	30	48	180	56	51	44
Dozer & compactor +	17:00	30	50	180	58	43	43

Note: The noise levels are due to the entire operation, trucks reversing, unloading and landfill machinery in operation. At times they operate in close proximity to each other, on the eastern end of the current activity site.

Table 3 Octave Band Levels.

Sources 30/04/03	Location	LAeq 1min dB	Distance metres	Octave bands (Hz)								Impulsive / Tonal	Periods of Emission	Note	
				32	63	125	250	500	1k	2k	4k				8k
Dozer & compactor +	Mobile	54	180	68	63	54	52	52	49	46	37	28	no	daytime	
Gas Flare	Figure 1	58	25	80	67	59	59	55	54	51	43	31	no	continuous	