SECTION 8: NOISE AND VIBRATION

8.1 INTRODUCTION

This Environmental Impact Statement (EIS) provides supporting information to accompany a Waste Licence Application (WLA) to the Environmental Protection Agency (EPA) by Roadstone Dublin Limited for a proposed inert waste recovery facility at its worked-out quarry at Milverton, Skerries, Co. Dublin. The principal activity at the site will comprise backfilling of the quarry void using imported inert soil.

This Chapter of the EIS, prepared by SLR Consulting Ireland, addresses the potential impact of noise and vibration emissions associated with the operation of the proposed waste recovery facilities at the Milverton site.

In essence, waste recovery operations will comprise

- importation of inert soil waste from external sources (construction sites)
- stockpiling, placement and compaction of inert and site-won soil
- placement of minor quantities of imported inert / recovered construction and demolition waste along temporary haul roads
- stockpiling of topsoil pending final surface restoration works

The principal noise impact associated with the continued operation of the proposed waste recovery facility is a potential increase in noise nuisance. Noise is likely to be generated at the proposed facility by

- traffic movements along the existing access road to the facility and internally across Roadstone Dublin's landholding
- end-tipping, placement and compaction of imported inert soil
- excavation, placement and compaction of in-situ stockpiled soil
- operation of plant and equipment within the application site (principally bulldozers and/or mechanical excavators).

With respect to the potential for noise impacts, the key objective at the application site is to manage activities in order to ensure that any discernable increase in noise levels is prevented and the effect of any increase in noise emissions is minimised.

A description of the receiving environment around the waste recovery facility, where noise nuisance could potentially arise is provided in Section 8.2. The potential impacts of noise emissions on sensitive locations around the facility have been assessed and are presented and discussed in Section 8.3. The following issues are addressed separately for the potential impacts:

- methodology used to assess the potential impacts of activities at the facility on noise and vibration levels at local properties;
- baseline conditions pertaining to measured (or estimated) existing noise and vibration levels around the facility;
- evaluation criteria;
- prediction of the potential impacts;
- evaluation of these impacts;
- description of mitigation measures which will be incorporated into the design and operation of the facility to eliminate or reduce the potential for noise (or vibration) impacts;
- summary of any residual impacts and reinstatement;
- monitoring proposals.

Baseline studies and subsequent impact assessment were undertaken by:

- Aldona Binchy MSc.Eng.(Environmental Engineering) SLR Consulting Ireland
- Colin Doyle Environmental Technician Roadstone Dublin Limited

8.2 RECEIVING ENVIRONMENT

8.2.1 Outline of the Baseline Study

The noise impact arising from the proposed quarry backfilling scheme and operation of the inert soil recovery facility is assessed by comparing predicted noise levels from proposed activities with existing levels of ambient noise at the site. The existing background noise environment is characterised by undertaking a baseline noise measurement survey at a number of locations around the application site. The objectives of the baseline study are to:

- determine ambient noise levels at the site
- identify sources of noise
- determine impacts on the nearest noise sensitive receptors / residents
- use the data collected to predict noise levels associated with future activity at the site
- identify suitable and effective mitigation measures

8.2.2 Baseline Study Methodology

Noise surveys were undertaken on the 3 and 4 November 2008 and again on 26 January 2009. Noise measurements were obtained using Norsonic Nor 118 Model Sound Level Meters, which were calibrated using a Norsonic Calibrator 1443. Noise monitoring was carried out at two separate locations within Roadstone Dublin's existing landholding at Milverton. The monitoring locations, designated N1 and N2 are described below and are shown on a site plan in Figure 8.1.

N1 - at the north-eastern boundary of the site,
N2 - at the south-western boundary of the site,

Station	Date	Monitoring Period	$L_{Aeq(1hr)}$	$L_{A10(1hr)}$	$L_{A90(1hr)}$
N1	3/11/2008	11:39-12:39	47.8	51.2	36.2
N2	4/11/2008	12:54-13:54	43.9	45.3	31.1
N1	26/01/2009	11:45-12:45	48.8	55.2	37.3
N2	26/01/2009	12:47-13:47	42.9	44.4	32.9

Table 8.1 Baseline Noise Monitoring Survey (2008)

8.2.3 Results of Baseline Monitoring

3 November 2008 : *Weather Conditions: Overcast and Still*
4 November 2008 : *Weather Conditions: Overcast and Still*

At the time of initial baseline noise survey in November 2008, there was no noise emanating from the site as all quarrying and associated concrete production activities had been suspended.

Location N1
At the time of the initial baseline survey, noise levels at location N1 were predominantly influenced by

- traffic movements along the nearby R127 Regional Road

26 January 2008 : *Weather Conditions: Sunny with no breeze*

At the time of the follow up baseline survey in January 2009, there was no noise emanating from the site.

Location N1
At the time of the follow-up baseline survey, noise levels at location N1 were predominantly influenced by

- traffic movements along the nearby R127 Regional Road

Intermittent noise was recorded at the application site throughout the noise monitoring periods. This was principally associated with traffic movements along the adjacent road R127 Regional Road. Noise monitoring data indicates that average ambient noise levels around the site typically range between 43 dBA L_{Aeq} and 49 dBA L_{Aeq}. These noise levels are consistent with daytime noise levels which would be expected around suburban parts of the Greater Dublin Area. Intermittent noise levels immediately east of the application site will be higher due to the occasional passing of a train along the nearby Dublin to Belfast railway line .

8.3 IMPACT OF THE SCHEME

8.3.1 Short Term Impacts

When the waste recovery facility is operational, the principal sources of noise emanating from the application site will be generally from bulldozer activity and truck movements across the worked-out quarry. Some noise may also be generated on an occasional basis by mechanical excavators. To determine the noise impact at the site, SLR Consulting carried out a noise prediction assessment, whereby the levels of noise were calculated at the nearest noise sensitive receptors (residences) shown on Figure 8.2.

The noise assessment methodology used was based on BS5228: Part 1 (1997) "Noise and vibration control on construction and open sites – Code of Practice for Basic Information and Procedure for Noise Control".

For the purposes of this assessment, a reduction of -10 to -15dB(A) for full noise screening by existing berms has been adopted. A reduction of -5 dB(A) has been adopted for partial noise screening. Monitoring of the effects of actual full noise screening by berms indicates that a reduction of -15 to -20 dB(A) is often more realistic. In addition, for the purposes of this noise assessment, it is assumed that all of the noise sources are active for 100% of the time, at the distances stated during the working hours of the development. On this basis it is considered that the noise assessment is very conservative and represents a worst case scenario.

The following noise sources have been considered in the noise assessment for the facility operation:

- Bulldozer
- HGV truck

For the purposes of the noise assessment, it is assumed that a bulldozer will be used to spread the imported inert natural materials when backfilling and restoring the void. HGV trucks will be used to transport the material onto and around the site.

A noise prediction assessment has been undertaken, whereby the levels of noise arising from the development were calculated at the nearest sensitive receptors R1, R2 and R3 shown on Figure 8.2. Detailed noise assessment calculations are provided in Appendix 8.1

The worst case scenario in relation to the above noise sources occurs when quarry backfilling activity takes place closest to each sensitive receptor, when bulldozers spreading and compacting the soil and HGV trucks are at the shortest distance, refer to Figure 8.2

The noise assessment indicates that the cumulative noise levels arising from the backfilling activities and operation of the bulldozer plant at the nearest noise sensitive receptors will, in the worst case scenario, be as follows :

a) Soil placement and compaction at the Northern Boundary Worst Case I
(Refer to Appendix 8.1 – Table (i)):

1 No. Bulldozer and HGV Truck

Combined Noise Level at R1 = **49 dB L_{Aeq}**

Combined Noise Level at R2 = **47 dB L_{Aeq}**

Combined Noise Level at R3 = **41 dB L_{Aeq}**

b) Soil placement and compaction at the Southern Boundary Worst Case II

(Refer to Appendix 8.1– Table (ii)):

1 No. Bulldozer and HGV Truck

Combined Noise Level at R1 = **43 dB L_{Aeq}**

Combined Noise Level at R2 = **46 dB L_{Aeq}**

Combined Noise Level at R3 = **46 dB L_{Aeq}**

c) Soil placement and compaction at the Eastern Boundary Worst Case III
(Refer to Appendix 8.1 – A Table (iii)):

1 No. Bulldozer and HGV Truck

Combined Noise Level at R1 = **44 dB L_{Aeq}**

Combined Noise Level at R2 = **50 dB L_{Aeq}**

Combined Noise Level at R3 = **45 dB L_{Aeq}**

In relation to noise thresholds, projections show that even in a worst case scenario, the proposed remediation works can progress *without* exceeding the recognised threshold average ambient noise level of 55dBA L_{Aeq} recommended in the EPA (2006) Environmental Management Guidelines for the Extractive Sector at the three closest receptors identified around the application site. The resultant noise levels assessed above are likely to be considerably lower than those which were generated up until recently by quarrying and related concrete production activity.

The resultant noise levels identified above are very much a worst case scenario, as it assumes plant and machinery will be running for 100% of the time, rather than intermittently. In reality this will not occur and average ambient noise levels would be expected to be significantly below those predicted.

Notwithstanding this, it should be noted that the predicted noise levels are comparable or only very slightly elevated above the baseline noise levels recorded in the course of the recent baseline noise survey. Arising out of this assessment and considering recent land-usage site and the limited operational life of the proposed waste facility (estimated at 10-15 years), the noise impact of the proposed waste recovery facility at surrounding residences is assessed as slight and negative.

8.3.2 Long-Term Impacts

The nature of the proposed backfilling and restoration scheme is such that there will be no long-term impacts in relation to noise. Once quarry backfilling works are complete, there is likely to be significantly less operational and/or traffic noise generated across the application site. The reduction in traffic levels along the internal haul roads and over public roads, coupled with the reduction in waste recovery activity at the application site should result in average ambient noise levels falling back to existing levels, with negligible long-term impact on the local environment.

8.3.3 Interaction with other Environmental Receptors

There are no interactions of the identified impacts with other environmental receptors.

8.4 MITIGATION MEASURES

A number of mitigation measures will be put in place to ensure noise impacts arising from the proposed waste recovery activities are minimised at each of the noise sensitive receptors.

It is proposed to monitor average ambient noise levels as backfilling works at the quarry proceed close to residences at the northern, south-western and western boundaries of the application site (proposed noise monitoring locations N1, N2 and N3 are shown on Figure 8.1).

Should noise monitoring at these locations indicate that threshold average ambient noise limits are exceeded (or likely to be exceeded), provision will be made for a combination of one or more of the following mitigation measures in order to ensure that noise levels are maintained below threshold limits :

(i) construction of temporary screening embankments,
(ii) installation of a temporary noise barrier between noise source(s) and receptor(s)
(iii) reduction of noise emissions at source
(iv) management of activities to minimise vehicular movements and/or duration of activities in the vicinity of affected residences.

A screening embankment (or noise barrier), should it be required, will serve to reduce the projection of noise beyond the site boundary as well as screen site activities from view.

Providing mitigation measures outlined are implemented if and when required, predicted residual noise levels experienced at each of the three closest receptors will be maintained at or lower than the noise threshold level of 55dBA. This impact is considered acceptable in view of the long-term environmental benefit that will accrue by backfilling and restoring the existing quarry.

It is currently envisaged that noise monitoring will be undertaken at the monitoring locations identified above on a quarterly basis while waste recovery activities are ongoing. This monitoring regime is in line with standard conditions attaching to EPA licences for waste facilities.

REFERENCES

British Standards Institute (1997) : *British Standard 5228 : Noise and Vibration Control on Construction and Open Sites*

Environmental Protection Agency (EPA) (1995) *Integrated Pollution Control Licensing – Guidance Notes for Noise in Relation to Scheduled Activities*

Department of Environment (UK) (1993) *Minerals Planning Guidance : The Control of Noise at Surface Mineral Workings (MPG)*

FIGURES

APPENDIX 8.1

DETAILED NOISE ASSESSMENT

Appendix 8.1 – Noise Assessment (Refer to Figure 8.2)

Table (i) Soil placement and compaction at the Northern Boundary Worst Case I

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))			Reflection (dB(A))			Activity Distance (m)			Attenuation with Distance (dB(A))			Activity L_{Aeq} (dB(A))		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
Bulldozer	73	-10	-10	-10	+3	+3	+3	163	213	404	24	26	32	42	40	34
HGV/Dumper Truck	80	-10	-10	-10	+3	+3	+3	163	213	404	24	26	32	49	47	41

Combined Noise Level at R1 = **49 dB L_{Aeq}**

Combined Noise Level at R2 = **47 dB L_{Aeq}**

Combined Noise Level at R3 = **41 dB L_{Aeq}**

Table (ii) Soil placement and compaction at the Southern Boundary Worst Case II

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))			Reflection (dB(A))			Activity Distance (m)			Attenuation with Distance (dB(A))			Activity L_{Aeq} (dB(A))		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
Bulldozer	73	-10	-10	-10	+3	+3	+3	321	238	238	30	27	27	36	39	39
HGV/Dumper Truck	80	-10	-10	-10	+3	+3	+3	321	238	238	30	27	27	43	46	46

Combined Noise Level at R1 = **43 dB L_{Aeq}**

Combined Noise Level at R2 = **46 dB L_{Aeq}**

Combined Noise Level at R3 = **46 dB L_{Aeq}**

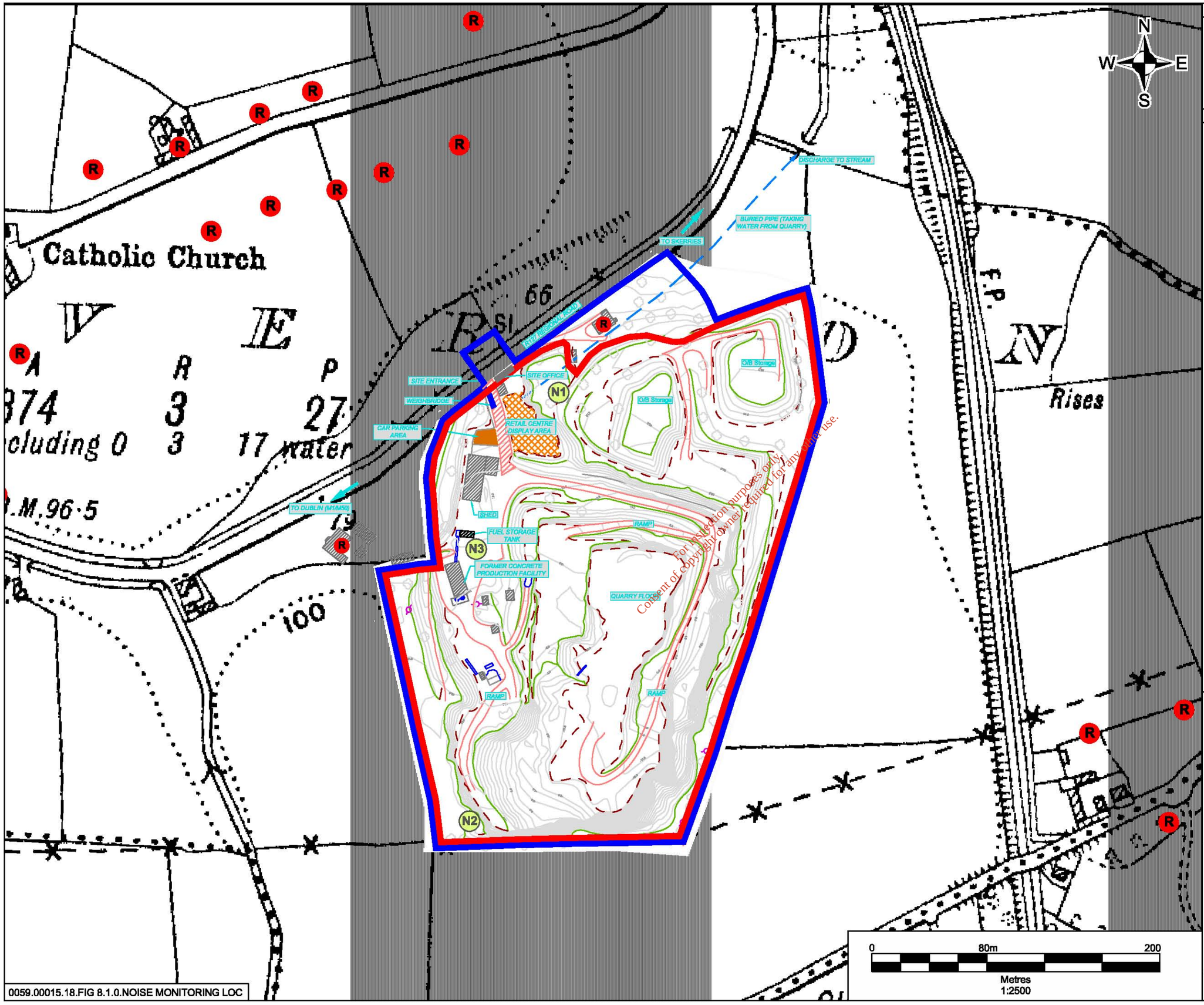
Table (iii) Soil placement and compaction at the Eastern Boundary Worst Case III

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))			Reflection (dB(A))			Activity Distance (m)			Attenuation with Distance (dB(A))			Activity L_{Aeq} (dB(A))		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
Bulldozer	73	-10	-10	-10	+3	+3	+3	296	158	259	29	23	28	37	43	38
HGV/Dumper Truck	80	-10	-10	-10	+3	+3	+3	296	158	259	29	23	28	44	50	45

Combined Noise Level at R1 = **44 dB L_{Aeq}**

Combined Noise Level at R2 = **50 dB L_{Aeq}**

Combined Noise Level at R3 = **45 dB L_{Aeq}**



NOTES

1. Based on OSi 25inch Dublin Sheet No. 5 & 5a

2. Ordnance Survey of Ireland Licence No. SU 0000709 (c) Ordnance Survey of Ireland & Government of Ireland

LEGEND

- Applicant's Land Interest (c. 8.6ha)
- Waste Licence Application Area (c. 7.9ha)
- N1 Noise Monitoring Locations
- Buried Pipe
- Top of Bank
- Bottom of Bank
- Road
- Contour Line
- Building
- Internal Unpaved Road
- Internal Paved Road
- R Location of Residence

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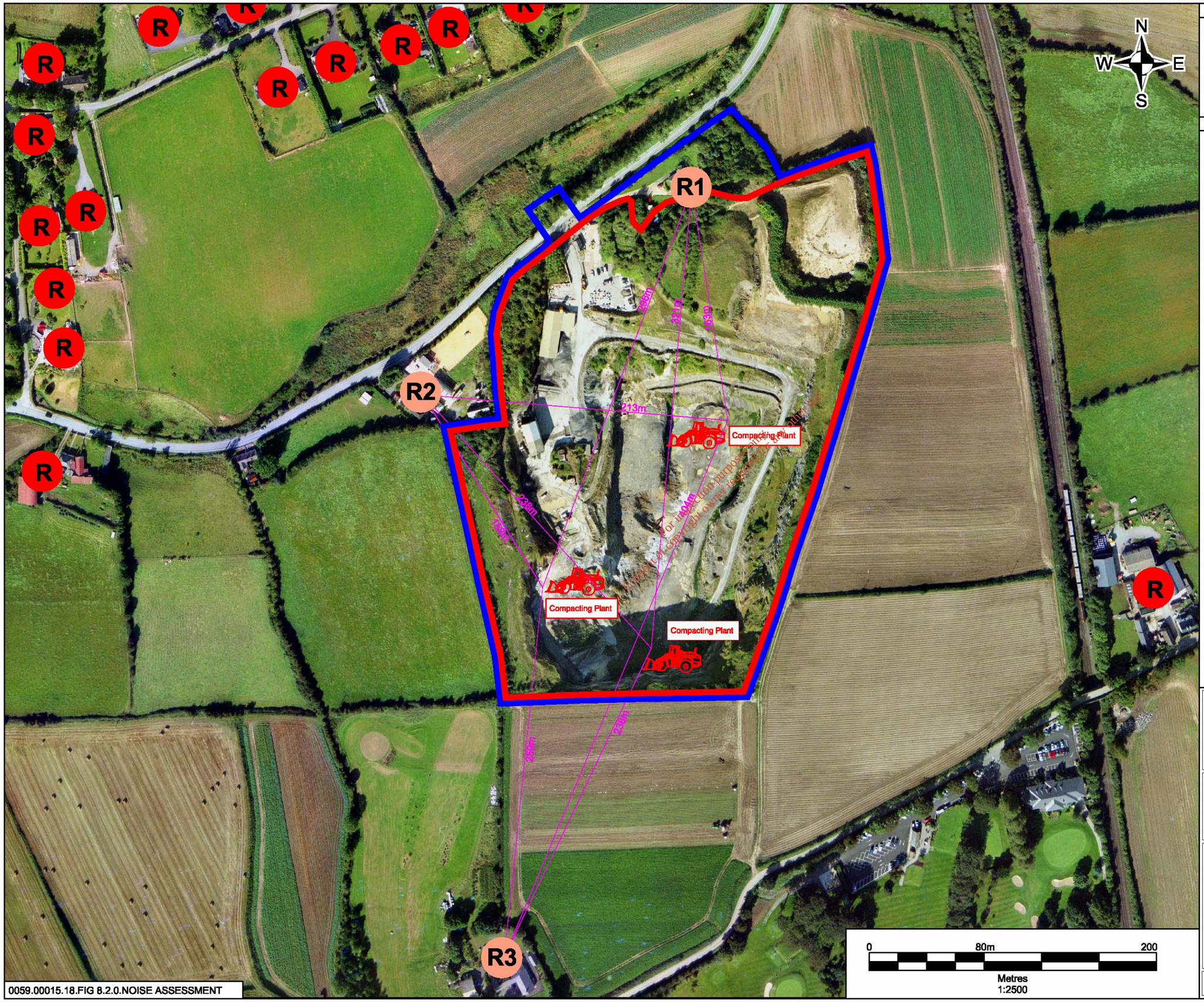
NOISE MONITORING LOCATIONS

FIGURE 8.1

Scale	Date
1:2,500 @ A3	AUGUST 2009

0059.00015.18.FIG 8.1.0.NOISE MONITORING LOC



NOTES

1. Ordnance Survey of Ireland Licence No. SU 0000709 (c) Ordnance Survey of Ireland & Government of Ireland

2. Based on Aerial Photography produced by European Air Surveys

LEGEND

- Applicant's Land Interest (c. 8.6ha)
- Waste Licence Application Area (c. 7.9ha)
- R1 — Noise Receptor Locations
- R — Location of Residences
- Building
- 420 — Distances (in metres)

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NOISE ASSESSMENT

FIGURE 8.2

Scale	Date
1:2500 @ A3	AUGUST 2009

0059.00015.18.FIG 8.2.0.NOISE ASSESSMENT