

Nestle

Project Newcard

Noise impact assessment 2017

REP1

Issue | 10 March 2017

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1 Introduction

A detailed noise impact assessment has been undertaken for the Nestlé facility in Askeaton, Co Limerick to assess the potential noise impact due to the operational phases of the extension to the existing R&D pilot plant. The facility is licensed by the Environmental Protection Agency (EPA) with an Industrial Emissions (IE) Licence, Register No. P0395-03.

2 Methodology

2.1 Environmental noise survey methodology

The survey methodology followed the Environmental Protection Agency (EPA) 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities' NG4 and ISO 1996 'Description and Measurement of Environmental Noise'.

2.1.1 Monitoring locations

Figure 1 shows the six monitoring locations where baseline monitoring was undertaken. These locations are referred to as:

- NSL1 – New house approximately 200m north of the site, at roadside;
- NSL2 – 260m south, at lay-by beside B&B;
- NSL3 – Askeakon, 460m south, on the footpath at a retirement home;
- NSL4 – Ballysteen Road, 470m southeast, in gateway;
- NSL5 – Ballysteen Road, 870m east, in gateway; and
- NSL6 – 460m east, laneway at rear of house.

2.1.2 Instrumentation

The monitoring was carried out using a Bruel & Kjaer 2250 Type 1 sound level meter. The calibration was checked before and after the monitoring using a Bruel & Kjaer 4231 Calibrator.

2.1.3 Monitoring procedure

Measurement locations at residential properties were at the property boundaries. The measurement locations are shown in **Figure 1**.

2.1.4 Measurement parameters

At each location, the noise level was measured for a 30-minute period. The limits in IE licence P0395-03 refer to the noise emitted from the licensed activity only, i.e. the specific noise. During the survey, the specific noise levels due to noise emissions from the Nestle facility were established based primarily on the noise level statistics.

The “A” suffix denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

2.2 Assessment criteria

Nestle is licenced by the EPA to operate under their IE licence. The licence assigns a daytime noise limit ($L_{Aeq, 30min}$) of 55dB (07:00 to 19:00hrs.) and a 45dB night-time (23:00 to 07:00hrs.) limit at noise sensitive locations. Although not a specific limit of the site, the EPA ‘*Guidance Note for Noise: Licence Application, Surveys and Assessments in Relation to Scheduled Activities*’ NG4, 2016 applies a noise limit of 50dB for the evening time (19:00 to 23:00hrs.).

The impact of the development is assessed through the application of significance criteria based on predicted changes in noise level due to the operational phase of the development. This was achieved by calculating the change in L_{Aeq} and categorising the significance (refer to **Table 1**).

Table 1: Changes in Noise Level – Significance Criteria

Change in Sound Level (dB)	Subjective Reaction	Significance Level
<3	Inaudible	Imperceptible
4-5	Perceptible	Slight
6-10	Up to doubling of loudness	Moderate
11-15	Over a doubling of loudness	Significant
>16		Profound

Source: Based on a number of noise documents including *EPA Guidelines*, *BS4142* and *PPG24*

2.3 Assessment methodology

Calculations used to predict impacts associated with the operational impacts of the development have been completed using SoundPLAN modelling software, Version 7.4. The following input data was used to develop the noise model:

- Details of ground conditions;
- Location of noise sensitive locations (NSLs);
- Buildings; and
- Sound power levels of each individual plant source.

Noise predictions for the operational phase were made using this software according to guidelines specified in 'ISO 9613-2: Attenuation of Sound Propagation Outdoors: General Method of Calculation' (ISO, 1996). **Table 2** outlines the sound power level associated with new plant items.

All plant, with the exception of the cooling tower, has been assumed to in operation full time. The cooling tower is assumed to be in operation from 7am to 10pm.

Table 2: Sound power levels of new plant for pilot plant

Location of plant	Plant	Sound power level (Lw, dB)	Quantity	Location of plant	Plant	Sound power level (Lw, dB)	Quantity	
Internal	Water Pump	83	4	External	Purge air fan	90	1	
	Product Pump	82	4		Homogenizer	82	1	
	Product Pump	85	1		Feed pump	82	1	
	Product Pump	71	2		Hammer at Drying chamber	113	1	
	Mixers	78	5		Hammer at Cyclone	113	1	
	Homogeniser	85	2		Hammer at bag filter	113	1	
	Vacuum Mixer	93	1		Exhaust fan	79	1	
	Pumps	98	1		External	VF	88	1
	TVR	103	1			Sifter	88	1
	Vacuum Pump	98	1			Chemicals Pump	78	5
	Inlet fan	94	1			Cooling Tower	94	1
	Main Fan	90	1			CIP forward pump	85	1
	Nozzle cooling fan	94	1			CIP circulation pump	82	1
	Static fluid bed fan	91	1		Roof	Silencer	88	1
VF fan	92	1						
Fines return blower	80	1						

The external wall cladding for the development is Kingspan RW/80 panels. The noise reduction due to the cladding has been factored for internal noise sources, at a Weighted Sound Reduction Index (Rw) of 45dB. External and roof noise sources have been assumed to have no attenuation for modelling purposes. No account has been taken noise attenuation that will arise from the implementation of ducting or enclosing of internal or external noise sources.

3 Existing environment

3.1 Introduction

In order to establish the existing environment, a series of noise surveys were carried out during daytime evening time and night-time at six noise sensitive locations (see **Figure 1**). Measurements were undertaken on the 23rd and 24th of May 2016. Surveys were carried out on a week-day and during time periods which were selected in order to provide a typical snapshot of the existing baseline noise climate.

3.2 Weather report

Weather details for the daytime, evening time and night-time surveys are presented in **Table 4**.

Table 3: Weather conditions during monitoring

Period	Locations	Temp (°C)	Wind speed (m/s)	Precipitation
Daytime	All locations	18-23	1 - 2	None
Evening	All locations	14-16	0	None
Night-time	All locations	12-14	0 - 2	None

3.3 Noise sources during monitoring

A description of the noise sources audible during the surveys is provided below. Refer to **Figure 1** for the locations of noise monitoring points.

3.3.1 NSL1

This monitoring point is located approximately 200m to the north of the site at the roadside.

3.3.1.1 Daytime survey

Helicopter and airplane, distant traffic and birds were all audible during the survey, the plant was not audible.

3.3.1.2 Evening time survey

Local and distant traffic, birds chirping were all audible during the survey, the plant was barely audible.

3.3.1.3 Night-time survey

Local and distant traffic, birds chirping were all audible during the survey, the plant was barely audible.

3.3.2 NSL2

This monitoring point is a noise sensitive location (a B&B), situated 260m south of the site.

3.3.2.1 Daytime survey

Traffic noise from the N69, local traffic and birdsong were all audible during the survey, the plant was barely audible in traffic lulls.

3.3.2.2 Evening time survey

Traffic noise from the N69, local traffic and birdsong were all audible during the survey, low level plant noise was audible during traffic lulls.

3.3.2.3 Night-time survey

Traffic noise from the N69, local traffic and birdsong were all audible during the survey, low level plant noise was audible during traffic lulls.

3.3.3 NSL3

NSL3 is situated at a noise sensitive location located in Askeaton, 460m south of the plant, adjacent to a retirement home.

3.3.3.1 Daytime survey

The main source of noise at this point was the traffic noise from the N69 and local traffic. Birdsong and ventilation noise at a nearby nursing home was also audible. The plant was not audible.

3.3.3.2 Evening time survey

The main source of noise at this point was the traffic noise from the N69 and local traffic. Birdsong and ventilation noise at a nearby nursing home was also audible. The plant was barely audible.

3.3.3.3 Night-time survey

The main source of noise at this point was the traffic noise from the N69 and local traffic. Birdsong and ventilation noise at a nearby nursing home was also audible. The plant was barely audible.

3.3.4 NSL4

This monitoring location is positioned in the gateway of a house on Ballysteen Road, 470m southeast of the site.

3.3.4.1 Daytime survey

The greatest source of noise at this point was the traffic on the N69 and local traffic. Birds chirping were also audible. Low level steady plant noise was barely audible in traffic lulls.

3.3.4.2 Evening time survey

The greatest source of noise at this point was the traffic on the N69 and local traffic. Birds chirping were also audible. Low level steady plant noise was barely audible in traffic lulls.

3.3.4.3 Night-time survey

The greatest source of noise at this point was the traffic on the N69 and local traffic. Birds chirping were also audible. Low level steady plant noise was barely audible in traffic lulls.

3.3.5 NSL5

This monitoring location is positioned in the gateway of a house on Ballysteen Road, 870m east of the site.

3.3.5.1 Daytime survey

The greatest source of noise at this point was distant traffic on the N69, local traffic and farmyard noise. The plant was not audible in traffic lulls.

3.3.5.2 Evening time survey

The greatest source of noise at this point was distant traffic on the N69, local traffic and farmyard noise, low level steady plant noise was audible.

3.3.5.3 Night-time survey

The greatest source of noise at this point was distant traffic on the N69, local traffic and farmyard noise. The plant was barely audible in traffic lulls.

3.3.6 NSL6

NSL6 is situated at a laneway to the rear of a house, 460m east of the plant.

3.3.6.1 Daytime survey

Farmyard noise, birdsong, trees rustling, distant and local traffic were audible during the survey period. Low level steady plant noise audible in traffic lulls.

3.3.6.2 Evening time survey

Farmyard noise, birdsong, trees rustling, distant and local traffic were audible during the survey period. Low level steady plant noise audible.

3.3.6.3 Night-time survey

Farmyard noise, birdsong, trees rustling, distant and local traffic were audible during the survey period. Low level steady plant noise audible.

3.4 Measurement results

Table 4 presents the specific noise level for each location based on the noise survey

Table 4: Specific noise level monitoring results for 2016

Monitoring location	Mean specific noise level dB L _{Aeq}		
	Daytime	Evening	Night-time
NSL1	<<32	<<25	38
NSL2	<<45	45	43
NSL3	<<44	<<40	34
NSL4	<45	<48	<34
NSL5	<<33	<<35	36
NSL6	33	34	36
<i>IE Limit</i>	55	50	45

< Plant barely audible

<< Plant not audible

The noise survey determined that the measured noise was broadband in character at all locations.

Measured specific noise levels are in compliance with licensed limits.

4 Potential impacts of the development

4.1 Noise sensitive locations

Six noise sensitive locations (in both upper and lower floors) were modelled to assess the impact of the development. Modelled results predicted at nearby residential receptors are presented and discussed below.

Baseline noise levels for each receptor were obtained from the onsite monitoring. Predicted noise levels are derived from the SoundPlan modelling assessment at each receptor. The change in noise level is then compared to the assessment criteria outline in Section 2.2. It should be noted that for the purposes of comparison to EPA limits the specific noise levels derived from the monitoring results are added to the predicted values. In some cases, the plant was not audible during monitoring.

Tables 5 to 7 below contains comparisons of predicted total noise levels to baseline values for daytime, evening time and night-time and apply a significance criteria to the change. **Figure 1** presents the noise contour map for the predicted noise levels.

4.1.1.1 Daytime assessment

Table 5 below contains comparisons of predicted total noise levels to baseline values for daytime and apply a significance criteria to the change.

Table 5: Assessment of change in noise levels for daytime

Receptor	Baseline noise level (dB)	Floor	Predicted noise level (dB)	Total noise level (dB)	Change in noise level (dB)	Compliant with EPA daytime limit? (55dB LAeq)	Significance level (see Table 2)
NSL1	<<32	Ground	18.8	32.0	0.0	Yes	Imperceptible
		1st	18.9	32.0	0.0	Yes	Imperceptible
NSL2	<<45	Ground	36.8	45.6	0.6	Yes	Imperceptible
		1st	36.9	45.6	0.6	Yes	Imperceptible
NSL3	<<44	Ground	31.4	44.2	0.2	Yes	Imperceptible
		1st	31.6	44.2	0.2	Yes	Imperceptible
NSL4	<45	Ground	29.2	45.1	0.1	Yes	Imperceptible
		1st	29.3	45.1	0.1	Yes	Imperceptible
NSL5	<<33	Ground	23	33.4	0.4	Yes	Imperceptible
		1st	23.1	33.4	0.4	Yes	Imperceptible
NSL6	33	Ground	20.7	33.2	0.2	Yes	Imperceptible
		1st	20.9	33.2	0.2	Yes	Imperceptible

< Plant barely audible

<< Plant not audible

As presented in **Table 5**, impacts associated with the development are considered imperceptible. Furthermore, the baseline stated at NSL1, 2, 3, 4 and 5 are overstated, as according to the noise surveys undertaken at these locations, plant from the facility was either barely audible or not audible.

The results for the assessment show that the maximum increase occurring at noise sensitive locations adjacent to the development is 0.6dBA. This change is deemed imperceptible and complies with the daytime noise limits stated in Section 2.2.

4.1.1.2 Evening time assessment

Table 6 below contains comparisons of predicted total noise levels to baseline values for evening time and apply a significance criteria to the change.

Table 6: Assessment of change in noise levels for evening time

Receptor	Baseline noise level (dB)	Floor	Predicted noise level (dB)	Total noise level (dB)	Change in noise level (dB)	Compliant with EPA evening time limit? (50dB L _{Aeq})	Significance level (see Table 2)
NSL1	<<25	Ground	18	25.8	0.8	Yes	Imperceptible
		1st	18.1	25.8	0.8	Yes	Imperceptible
NSL2	45	Ground	36.3	45.5	0.5	Yes	Imperceptible
		1st	36.4	45.5	0.5	Yes	Imperceptible
NSL3	<<40	Ground	30.6	40.5	0.5	Yes	Imperceptible
		1st	31.1	40.5	0.5	Yes	Imperceptible
NSL4	<48	Ground	28.6	48.1	0.1	Yes	Imperceptible
		1st	28.7	48.1	0.1	Yes	Imperceptible
NSL5	<<35	Ground	22.2	35.2	0.2	Yes	Imperceptible
		1st	22.3	35.2	0.2	Yes	Imperceptible
NSL6	34	Ground	20	34.2	0.2	Yes	Imperceptible
		1st	20.2	34.2	0.2	Yes	Imperceptible

< Plant barely audible

<< Plant not audible

As presented in **Table 6**, impacts associated with the development are considered imperceptible. Furthermore, the baseline stated at NSL1, 3, 4 and 5 are overstated, as according to the noise surveys undertaken at these locations, plant from the facility was either barely audible or not audible.

The results for the assessment show that the maximum increase occurring at noise sensitive locations adjacent to the development is 0.8dBA. This change is deemed imperceptible and complies with the evening time noise limits stated in Section 2.2.

4.1.1.3 Night-time assessment

Table 7 contains comparisons of predicted total noise levels to baseline values for night-time and apply a significance criteria to the change.

Table 7: Assessment of change in noise levels for night-time

Receptor	Baseline noise level (dB)	Floor	Predicted noise level (dB)	Total noise level (dB)	Change in noise level (dB)	Compliant with EPA night-time limit? (45dB LAeq)	Significance level (see Table 2)
NSL1	38	Ground	14	38	0.0	Yes	Imperceptible
		1st	14.1	38	0.0	Yes	Imperceptible
NSL2	43	Ground	34.5	43.6	0.6	Yes	Imperceptible
		1st	34.6	43.6	0.6	Yes	Imperceptible
NSL3	31	Ground	29.1	33.1	2.1	Yes	Imperceptible
		1st	29.3	33.1	2.1	Yes	Imperceptible
NSL4	<34	Ground	26.2	34.8	0.8	Yes	Imperceptible
		1st	26.3	34.8	0.8	Yes	Imperceptible
NSL5	36	Ground	17.8	36.0	0.0	Yes	Imperceptible
		1st	17.8	36.0	0.0	Yes	Imperceptible
NSL6	36	Ground	16.8	36.0	0.0	Yes	Imperceptible
		1st	16.8	36.0	0.0	Yes	Imperceptible

< Plant barely audible

As presented in **Table 7**, impacts associated with the development are considered imperceptible.

The results for the assessment show that the maximum increase occurring at noise sensitive locations adjacent to the development is 2.1dBA. This change is deemed imperceptible and complies with the night-time noise limits stated in Section 2.2.

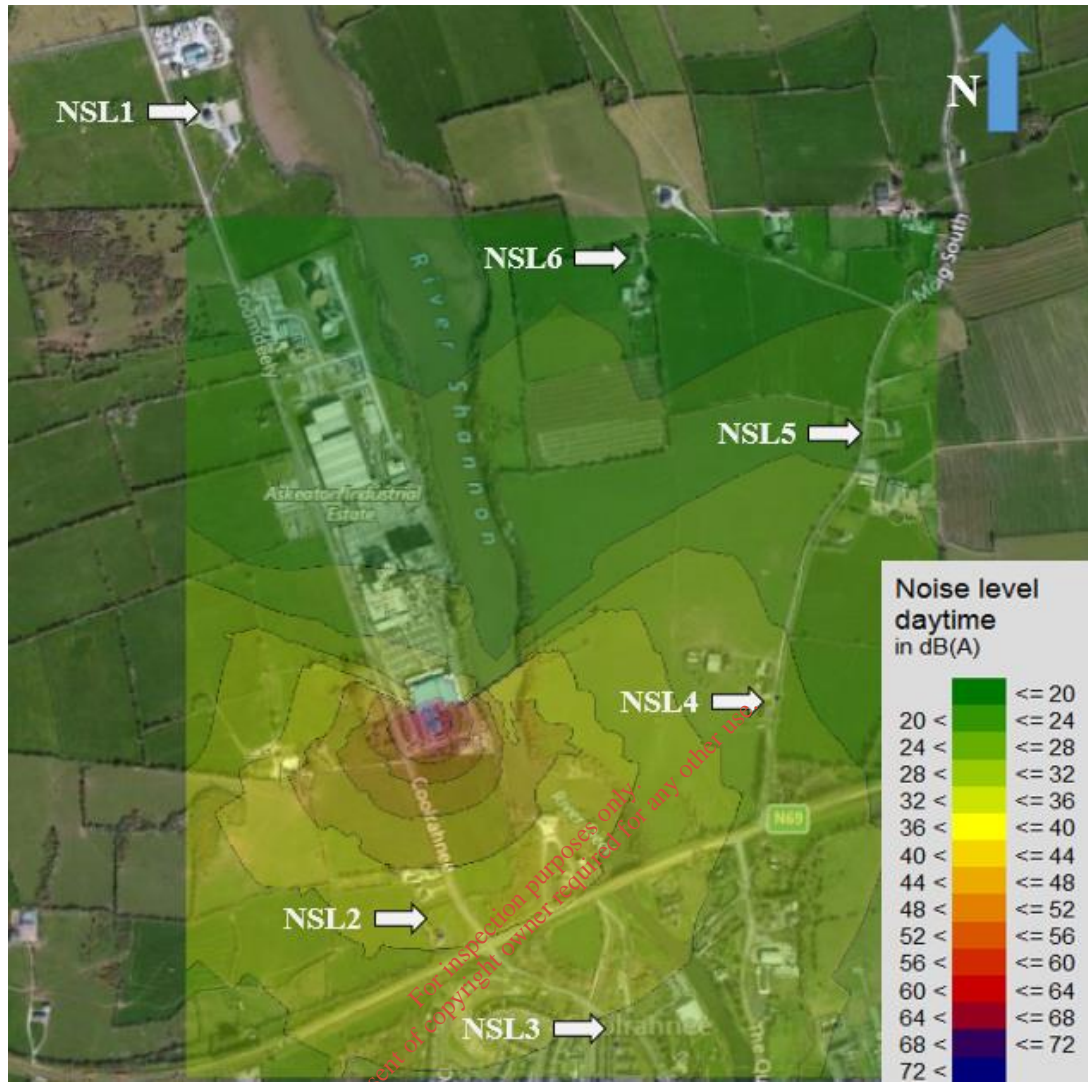


Figure 1: Operational phase noise levels at noise sensitive locations

[background mapping © Microsoft Corporation © 2017 Bing Maps] not to scale

5 Conclusions

A noise assessment was carried out to assess the potential noise impact for the extension to the existing R&D pilot plant at the Nestlé facility in Askeaton, Co Limerick.

The results of the assessment show that the maximum increase occurring at noise sensitive locations adjacent to the development is considered imperceptible and complies with the daytime, evening time and night-time noise limits stated in Section 2.2.

Furthermore, the inclusion of noise reduction measures such as ducting and internal structures, which are not included in this assessment, will reduce noise emissions further.

Ultimately, the facility will be obliged to comply with the noise limits outlined in Section 2.2 of this report as stated in IE Licence P0395-03. Noise monitoring results are reported annually via the facility's Annual Environmental Report which is submitted to the EPA.

6 References

Environmental Protection Agency (EPA) 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities' NG4

International Standards Organisation (ISO), 1996:2007: *Acoustics – Description, measurement and assessment of environmental noise - Part 1-4*. ISO, Geneva, Switzerland.

Ossian Geraghty & Associates, 2016. *IED Licence Environmental Noise Survey 2016*.

Transport Infrastructure Ireland (TII), (formerly the National Roads Authority (NRA)), 2004. *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* NRA, 2004.

TII (formerly the NRA), 2014. *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*. NRA, Dublin, Ireland.

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise