

# Dublin Employment Code Amendment

## Environmental Noise Assessment

S8207C2

July 2024

sonus.

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Environmental Noise Assessment

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## 1 INTRODUCTION

An environmental noise assessment has been prepared for Leinad Land Developments (Dublin) Pty Ltd (**Leinad**) to inform the Dublin Employment Code Amendment (the **Code Amendment**).

Leinad is developing 'Dublin Park' as a new master planned community and South Australia's first Green Circular Economy Precinct. Leinad aims to position 'Dublin Park' at the forefront of sustainable residential and industrial development in Australia, through leveraging principles of circular economy and sustainability.

Leinad has prepared an 'Urban Framework Plan' to guide the future development 1,373 hectare (ha) land holding as the Dublin Green Circular Economy Precinct (the **Precinct**) comprising:

- An extension of the township for around 1,300 dwelling or 3,250 people
- 400 ha of employment land to accommodate a range of commercial and industrial activities integral to a Green Circular Economy
- A new 224 ha mine.
- Around 600 ha of green open space.

This assessment is for the land within the Precinct which is intended to be rezoned for employment uses and is shown in Figure 1. Other aspects of the Precinct are to be progressed separately.

Each of the allotments within the proposed rezoned land will be subject to their own Development Application and environmental noise assessment where relevant. Notwithstanding, this assessment has been made to demonstrate that the proposed rezoning under the Code Amendment is appropriate for the locality, and the proposed allotments can practically be designed to not adversely impact the amenity of the closest residences.

A *Proposal to Initiate* the Code Amendment was approved by the Minister for Planning on 22 March 2024. The following are noted in the Minister's approval (the **Minister's Requirements**):

- *Undertake investigations into potential noise, odour and air quality interface impacts of intended development on the site (bioreactor, mining), both in terms of impacts on the Dublin township as well as potentially sensitive uses within the affected area and identify mitigation measures. This could include zoning/ overlay choices and/or identification of mitigation measures on a Concept Plan.*
- *Undertake further investigations to confirm buffer requirements to address noise/odour associated with chicken broiler and, where necessary, reflect in zone/overlay choice and identify on a Concept Plan.*

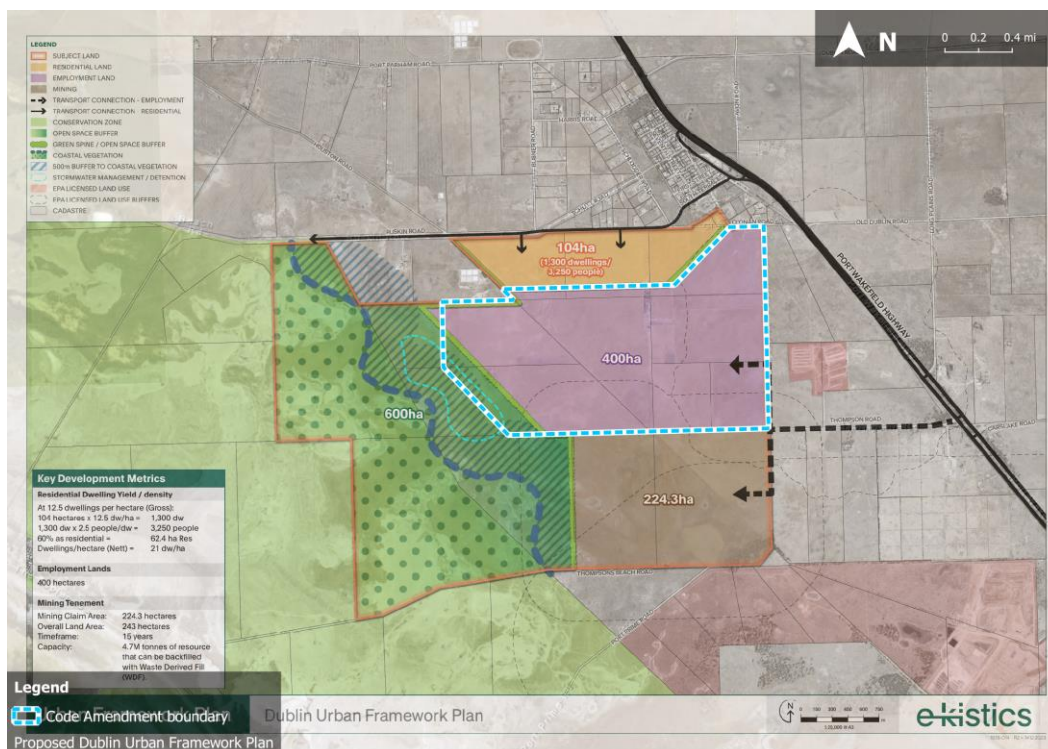


Figure 1: Code Amendment boundary within broader Dublin Urban Framework Plan

To address the Minister’s Requirements, the assessment considers the potential future land uses and typical noise generation which could occur. Assessment is made of noise levels from potential sources within the Affected Area at current and potential future residential locations. Consideration is also made of noise issues associated with the existing chicken broiler, such that the Code Amendment will not impede operation of this existing land use.

The assessment has been based on:

- *Dublin Employment Code Amendment* Project Brief by Ekistics, dated 24 May 2024
- *Proposal to Initiate an Amendment to the Planning and Design Code – Dublin Green Circular Economy Precinct* Report by Ekistics, Version 6, dated 19 December 2023
- *Dublin Urban Framework Plan – Preliminary Land Economics Assessment* by Deep End Services, dated 26 October 2023.
- Ekistics drawing *Dublin Urban Framework Plan*, Drawing 1618-014 Revision 2, dated 14 December 2023.
- Palumbo drawing *EMPLOYMENT LAND*, Drawing A0102, Job Number 11PR11-N, dated 01 July 2024

## 2 CRITERIA

### 2.1 Planning and Design Code

Future developments within the Affected Area will be subject to the provisions of the South Australian *Planning and Design Code* (the **Code**) under the *Planning, Development and Infrastructure Act 2016*.

Performance Outcome (**PO**) 4.1 of the *Interface between Land Uses* module of the *General Development Policies* of the Code specifically requires that noise from a development *does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers)*. In *Part 8 – Administrative Terms and Definitions* the Code defines Sensitive Receivers to include:

- a) any use for residential purposes or land zones primarily for residential purposes
- b) child care facility
- c) educational facility
- d) hospital
- e) supported accommodation
- f) tourist accommodation.

Sensitive Receivers in the vicinity of the Affected Area are therefore any existing uses of these types, including undeveloped land which is zoned primarily for residential purposes. The potential future 'Residential Land' (subject to a separate process) within the Precinct has also been considered as a location of potential future sensitive receivers. These Sensitive Receiver locations are identified in Figure 2.

The Deemed-to-Satisfy / Designated Performance Feature (**DTS/DPF**) for PO 4.1 references the *Environment Protection (Commercial and Industrial Noise) Policy 2023* (the **Policy**) for assessment of noise levels at Sensitive Receivers.

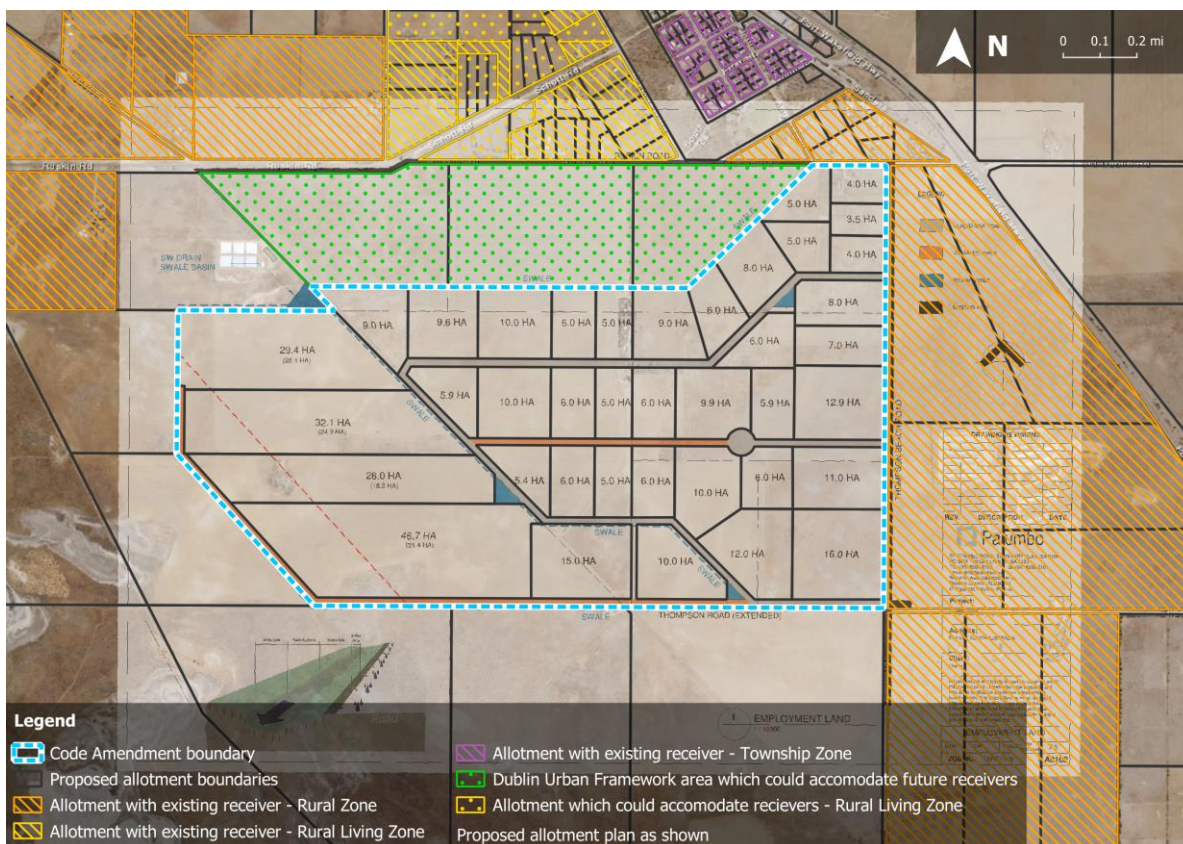


Figure 2: Locations of Sensitive Receivers for the Code Amendment

## 2.2 Environment Protection (Commercial and Industrial Noise) Policy 2023

The Policy provides objective noise criteria to assess the environmental noise emissions from a proposed development. The noise criteria provided by the Policy are based on the *World Health Organisation Guidelines for Community Noise (1999)* (the **WHO Guidelines**), which provides recommendations for appropriate noise levels to prevent community annoyance, sleep disturbance and adverse impact on the amenity of a locality. Therefore, compliance with the Policy is considered to satisfy the WHO Guidelines and the subjective requirements of the Code relating to environmental noise.

The Policy establishes indicative noise levels to be achieved at sensitive receivers based on the zones in which the noise source (the allotments in the Affected Area) and Sensitive Receivers are located. For new developments, Part 5 of the Policy provides goal noise levels which are 5 dB(A) more onerous than those which would otherwise apply when assessed at existing noise sensitive receivers.

Based on the Urban Framework Plan, the Affected Area will be entirely ‘Employment Land’ which is interpreted to correspond to one or more of the of zone types within the ‘Employment Zones’ group in the Code.

Existing sensitive receivers in Dublin are located within the either the Township Zone or the Rural Living Zone. The future ‘Residential Land’ shown in the Urban Framework Plan is anticipated to be zoned as either a Neighbourhood Zone or as a Rural Living Zone (this is not part of the current Code Amendment). A Rural Living Zone has been adopted for the assessment in this area, to demonstrate land use compatibility under the most-onerous receiver zoning.

Assuming a direct interface between the zones of the source and receiver (i.e. no intermediate buffer zone), the applicable receiver criteria for the various combinations of source and receiver zoning which could be applicable for the Code Amendment under the Policy are summarised in Table 1.

Table 1: Noise criteria by zone

Receiver zone	Source zone									
	Employment Zone		Strategic Innovation		Employment (Enterprise) Zone		Strategic Employment		Resource Extraction	
	Applicable noise criteria [dB(A)]									
<b>Rural Zone<sup>(1)</sup></b>	Day	L <sub>eq</sub> 53	Day	L <sub>eq</sub> 55	Day	L <sub>eq</sub> 56	Day	L <sub>eq</sub> 56	Day	L <sub>eq</sub> 56
	Night	L <sub>eq</sub> 46	Night	L <sub>eq</sub> 48	Night	L <sub>eq</sub> 48	Night	L <sub>eq</sub> 48	Night	L <sub>eq</sub> 48
<b>Township Zone</b>	Day	L <sub>eq</sub> 52	Day	L <sub>eq</sub> 52	Day	L <sub>eq</sub> 52	Day	L <sub>eq</sub> 52	Day	L <sub>eq</sub> 52
	Night	L <sub>eq</sub> 45	Night	L <sub>eq</sub> 45	Night	L <sub>eq</sub> 45	Night	L <sub>eq</sub> 45	Night	L <sub>eq</sub> 45
		L <sub>max</sub> 60		L <sub>max</sub> 60		L <sub>max</sub> 60		L <sub>max</sub> 60		L <sub>max</sub> 60
<b>Future Neighbourhood Zone<sup>(2)</sup></b>	Day	L <sub>eq</sub> 56	Day	L <sub>eq</sub> 57	Day	L <sub>eq</sub> 59	Day	L <sub>eq</sub> 59	Day	L <sub>eq</sub> 59
	Night	L <sub>eq</sub> 49	Night	L <sub>eq</sub> 50	Night	L <sub>eq</sub> 50	Night	L <sub>eq</sub> 50	Night	L <sub>eq</sub> 50
<b>Future Rural Living Zone<sup>(2)</sup></b>	Day	L <sub>eq</sub> 53	Day	L <sub>eq</sub> 55	Day	L <sub>eq</sub> 56	Day	L <sub>eq</sub> 56	Day	L <sub>eq</sub> 56
	Night	L <sub>eq</sub> 46	Night	L <sub>eq</sub> 48	Night	L <sub>eq</sub> 48	Night	L <sub>eq</sub> 48	Night	L <sub>eq</sub> 48
<b>Rural Living Zone</b>	Day	L <sub>eq</sub> 48	Day	L <sub>eq</sub> 50	Day	L <sub>eq</sub> 51	Day	L <sub>eq</sub> 51	Day	L <sub>eq</sub> 51
	Night	L <sub>eq</sub> 41	Night	L <sub>eq</sub> 43	Night	L <sub>eq</sub> 43	Night	L <sub>eq</sub> 43	Night	L <sub>eq</sub> 43
		L <sub>max</sub> 60		L <sub>max</sub> 60		L <sub>max</sub> 60		L <sub>max</sub> 60		L <sub>max</sub> 60

Notes:

- (1) Allotments in Rural Zone are considered to have a sensitive receiver if there is a dwelling within the allotment.
- (2) Applicable at the closest boundary of the receiver zone to the source.

Ekistics has advised that the Code Amendment will likely seek to zone the entire ‘Employment Land’ allocation within the Code Amendment boundary to the Strategic Employment Zone. As such, criteria from the Strategic Employment column of Table 1 have been applied for the assessment.

When predicting noise levels for comparison with the Policy, adjustments may be made to the average noise levels for each “annoying” characteristic of tonality, impulsiveness, intermittency, low frequency, and modulation of the noise source. The characteristic must be dominant in the acoustic environment and therefore the application of penalties can vary depending on the assessment location, time of day, the noise source being assessed, and the predicted noise level. The application of penalties is discussed further in the Assessment section.



### 3 ASSESSMENT

#### 3.1 Methodology

A noise model of the site and surrounding area has been developed using SoundPLAN version 9.0 software. The noise model was used to predict future noise levels from operation of the typical noise generating activities at the allotments as described above. As the operating hours of any allotments are not yet known, it has been assumed that each allotment operates consistently over a 24-hour period, and as such the assessment is made against the more onerous night criteria.

The noise model uses the CONCAWE prediction algorithm, and Weather Category 6 for night conditions, as is required by the SA EPA document: *Guidelines for use of the Commercial and Industrial Noise Policy 2023*. The model accounts for the level of activity at the land use being considered, the separation distance to the receivers, the shielding of barriers and on-site buildings and meteorological conditions which are highly conducive to noise propagation. Importantly, the model assumes acoustically hard ground, and no other attenuation from buildings or structures within the Affected Area, to provide a conservative prediction of future noise levels.

#### 3.2 Compliance of noise from within the Affected Area

##### 3.2.1 Typical noise generating activities

Predictions of noise from the proposed allotments are based on the following level of activity for each of the potential future land uses and the assumption that they may operate in the early morning hours (prior to 7:00am)

- At a transportation logistics allotment:
  - 10x B-double truck movements in 15 minutes<sup>1</sup>
  - 5x Forklifts operating outside
  - A warehouse building with internal noise level of 75 dB(A), with an open loading bay on the Northern side.
  - Mechanical plant consisting of office building condensing units and evaporative cooling units for warehouse building
  - Carparking for 10 site staff and visitors

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<sup>1</sup> The default assessment period of the Policy

- At a manufacturing or industrial allotment
  - A manufacturing building with internal noise level of 80 dB(A), two 6x4 metre open doors on each facade.
  - 3x B-double truck movements in 15 minutes
  - 3x Forklifts operating outside
  - Mechanical plant consisting of office building condensing units and evaporative cooling units for manufacturing building
  - Carparking for 20 site staff and visitors
- At a plastics or specialist recycling site
  - An industrial warehouse building with internal noise level of 85 dB(A)
  - 2x delivery truck movements in 15 minutes
  - 2x front end loaders in outdoor areas
  - 1x excavator in outdoor areas
  - Mechanical plant consisting of office building condensing units and evaporative cooling units for the recycling building
  - Carparking for 10 site staff and visitors
- At a food production or farming allotment example:
  - Heavy mobile equipment including 3x forklifts, a backhoe tractor, front end loader
  - 3x B-double truck movements in 15 minutes
  - Mechanical plant consisting of office building condensing units and evaporative cooling units for vertical farm buildings.
  - Carparking for 10 staff and visitors
- At an Infrastructure Contractor allotment:
  - Movement of heavy mobile equipment such as excavator and front end loaders in an outdoor storage yard to shift material stockpiles and heavy equipment.
  - Mechanical plant consisting of office building condensing units
  - Carparking for 50 staff and visitors
- At the bioreactor site:
  - Bioreactor equipment with cumulative sound power of 117 dB(A), controlled by two blower units (Sound Power Level for an unenclosed blower unit advised by the Project team)
  - Mechanical plant consisting of office building condensing units
  - Carparking for 20 staff and visitors

### 3.2.2 Positioning of example land usages

Positioning of the example land usages was based upon information in the *Dublin Urban Framework Plan* drawing, the allotments shown in the *Palumbo Employment Land* drawing, and anticipated lot size requirements provided in the *Preliminary Land Economics Assessment*. These requirements are summarised in Table 2.

Table 2: Positioning requirements for land usages

Example Land Usage	Required allotment size	Other desired features
Bioreactor	4 Hectares	Central within 'Employment Land' Proximity to Port Wakefield Road
Manufacturing facility	8 Hectares	
Infrastructure contractor	10 Hectares	
Specialist recycling facility	12 Hectares	
Transportation logistics	10 Hectares	Proximity to Port Wakefield Road
Vertical farm	20 Hectares	

To provide a conservative assessment, the example land usages were positioned in the closest allotments to the planned 'Residential Land' and the existing Dublin township which would meet the requirements above. This positioning is shown in Figure 3.

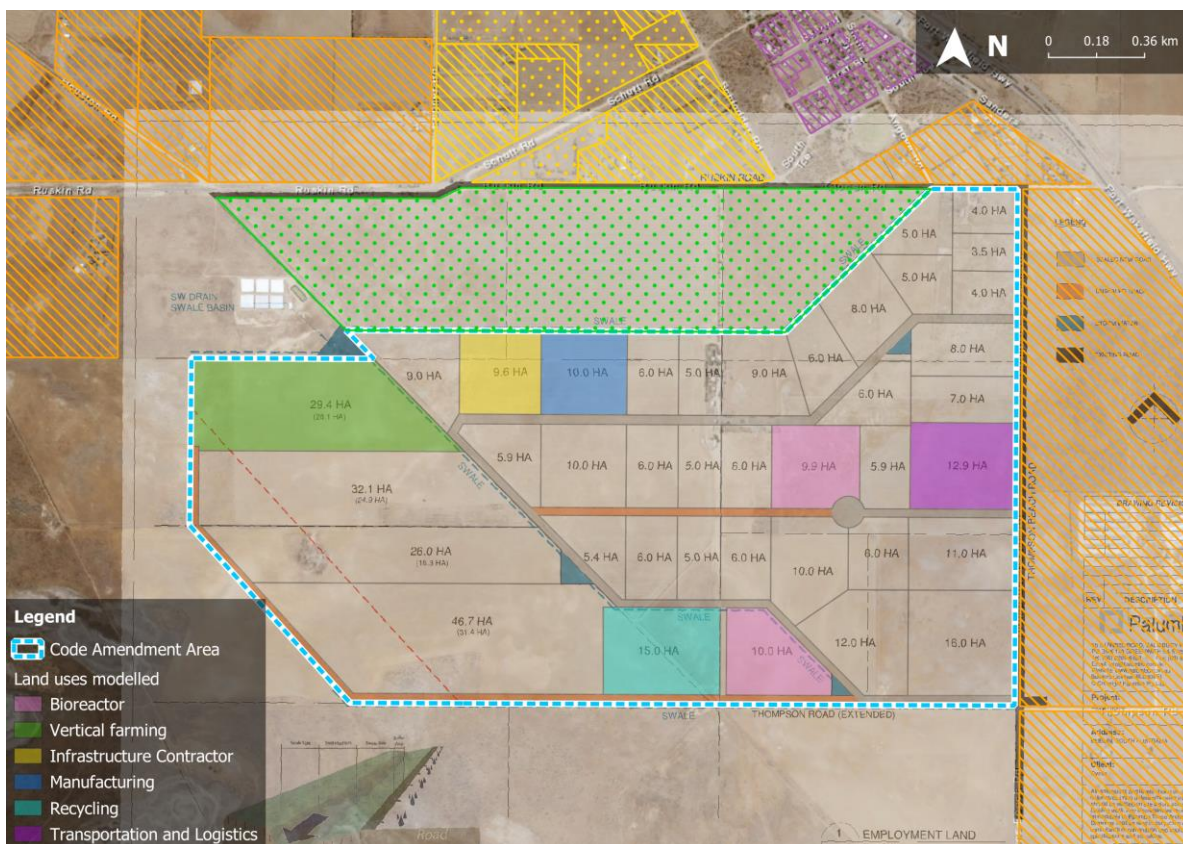


Figure 3: Location of modelled land uses

### 3.2.3 Recommendations

Although the final land uses and operating times are not yet known, the noise model demonstrates that each of the assumed land uses can achieve the noise criteria with provision of appropriate acoustic treatments. Indicative treatments which have been included in the model are:

- Positioning of a 5-metre tall acoustic barrier along the northern boundary to the ‘Residential Land’. The acoustic barrier could be comprised of a 5-metre fence/wall, a 5-metre berm, or combination of fence/wall on a berm with a combined total height of 5 metres (e.g. 1.8 metre fence on 3.2 metre berm).
- Fitting all on-site mobile plant (forklifts, loaders, etc) with broadband reverse alarms.
- Acoustic treatment for the bioreactor, comprised of one of the following options:
  - Restricting cumulative sound power for the bioreactor to 106 dB(A) if located at a central allotment, or 112 dB(A) if located on an allotment on the southern edge of the Affected Area.
  - Positioning of local shielding or an acoustically-treated enclosure around the bioreactor controlling noise sources. This enclosure should achieve an insertion loss of 11 dB(A) if the bioreactor is located in a central allotment within the Affected Area, or 5 dB(A) if it is located on an allotment on the southern edge of the Affected Area.

### 3.3 Predicted noise levels

With the indicative acoustic treatments incorporated and the level of activity described above, the noise level from each of the land uses is predicted to achieve the project noise criteria. Table 3 summarises the highest noise level predicted at receivers from each land use and provides a comparison of these to the applicable criteria.

Table 3: Highest predicted noise levels

Land Use	Night Period (10:00pm to 7:00am)			
	L <sub>eq,15min</sub>		L <sub>max</sub>	
	Criteria	Predicted Noise Level	Criteria	Predicted Noise Level
<b>Existing Rural Receivers</b>				
Bioreactor (central location)	48	42	–	N/A
Bioreactor (southern location)	48	42	–	N/A
Infrastructure contractor	48	38	–	N/A
Manufacturing	48	33	–	N/A
Recycling plant	48	36	–	N/A
Transport facility	48	39	–	N/A
Vertical farming	48	34	–	N/A
<b>Existing Rural Living Receivers</b>				
Bioreactor (central location)	43	43	60	45
Bioreactor (southern location)	43	43	60	45
Infrastructure contractor	43	41	60	43
Manufacturing	43	38	60	41
Recycling plant	43	37	60	38
Transport facility	43	36	60	39
Vertical farming	43	32	60	36

Land Use	Night Period (10:00pm to 7:00am)			
	Leq,15min		Lmax	
	Criteria	Predicted Noise Level	Criteria	Predicted Noise Level
<b>Existing Township Receivers</b>				
Bioreactor (central location)	45	42	60	44
Bioreactor (southern location)	45	41	60	43
Infrastructure contractor	45	34	60	36
Manufacturing	45	33	60	38
Recycling plant	45	29	60	31
Transport facility	45	36	60	39
Vertical farming	45	23	60	30
<b>Future 'Residential Land' receivers<sup>(1)</sup></b>				
Bioreactor (central location)	48	48	–	N/A
Bioreactor (southern location)	48	47	–	N/A
Infrastructure contractor	48	47	–	N/A
Manufacturing	48	44	–	N/A
Recycling plant	48	39	–	N/A
Transport facility	48	40	–	N/A
Vertical farming	48	39	–	N/A

Notes:

- (1) Criteria applicable for vacant land in a Rural Living Zone have been adopted for the 'Residential Land' area to provide a conservative assessment.

Given the undeveloped nature of the land considered in this assessment, the predicted noise levels are considered to be a conservative upper estimate of the receiver noise levels, due to a lack of shielding and masking noise which will be provided by Developments as the Employment Area is infilled.

It is noted that the noise level from each of the tenancies will be subject to an individual Development Application and an environmental noise assessment where relevant. The final noise generating activities and noise character will be considered in the context of the broader development. The indicative acoustic treatment measures and assumed operating hours will be refined for the particular proposal, taking into account any noise character, masking and shielding.

Based on the above, noise from all example land uses within the Affected Area can practically achieve the requirements of the Policy at all existing and future Sensitive Receivers in the vicinity.

### **3.3.1 Strategies to encourage land compatibility and reduce noise mitigation requirements**

Predicted noise levels indicate that the assumed rural living zoning for the Residential Land will accommodate the envisaged Employment Land use within the Affected Area. However, zoning the 'Residential Land' as a Neighbourhood Zone (or other similar zones promoting residential use) instead of a Rural Living Zone would provide better compatibility of land uses (from a noise perspective) at the interface with the Employment Land, reducing potential noise mitigation requirements for individual allotments developed within the Employment Land.

## **3.4 Protection of existing approved land uses**

### **3.4.1 Protection of chicken broiler**

The Minister's Requirements request confirmation of the buffer distance required to address noise from the from the established chicken broiler on Thompson Road.

None of the land uses proposed for the Affected Area would be considered Sensitive Receivers under the Planning and Design Code, and as such, their development would not constrain the use of the chicken broiler.

Noise levels predicted at the dwelling located on the chicken broiler allotment are predicted to comply with the Policy for the proposed land use types considered in this assessment.

### **3.4.2 Protection of proposed mining use**

None of the land uses proposed for the Affected Area would be considered Sensitive Receivers under the Planning and Design Code, and as such, their development would not constrain the operation of the proposed mining use shown in the Dublin Urban Framework Plan.

#### 4 CONCLUSION

An environmental noise assessment has been made of the proposed Employment Areas Code Amendment, which forms part of the Dublin Green Circular Economy Precinct.

The assessment considers the noise from the proposed land uses, being primarily industrial tenancies. Noise levels from similar land uses, such as transportation logistics, manufacturing, and vertical farming have been predicted for the closest existing and potential future residences.

The predictions have been compared against the Planning and Design Code, and objective noise criteria derived in accordance with the *Environment Protection (Commercial and Industrial Noise) Policy 2023*.

With the inclusion of indicative acoustic treatments, the noise from the 'Employment Land' can achieve the requirements of the Planning and Design Code at all Sensitive Receivers in the vicinity. In addition, each of the tenancies will be subject to individual assessments, once the land uses and noise generating activities are known.

Based on the above, it is considered that the existing provisions of the Planning and Design Code will result in future developments within the Affected Area being compatible with existing and future land uses.



**APPENDIX A: SOUND POWER LEVELS**

Item	Sound Power Level [dB(A)]
Carparking - General activity	83 dB(A)
Carparking - Moving car	82 dB(A)
Mechanical services – Air conditioning condenser	76 dB(A)
Mechanical services – Evaporative Cooler	73 dB(A)
Semi trailer movement	101 dB(A)
Forklift loading	89 dB(A)
Bioreactor Blower	117 dB(A)
Front End Loader	103 dB(A)
Backhoe Tractor	97 dB(A)
Manufacturing facility internal noise level	80 dB(A) <sup>(1)</sup>
Recycling facility	85 dB(A) <sup>(1)</sup>

Notes:

(1) Internal reverberant noise level