S. 37

File With \_\_\_\_\_

050500

SECTION	131	FORM
---------	-----	------

Appeal NO:_ABP_3\4485-22	Defer Re O/H
Having considered the contents of the submission from  Liam O'Gradaigh  I recommend that so be not be invoked at this stage for the following real E.O.:  Liam O'Gradaigh  I recommend that so be not be invoked at this stage for the following real than the stage for the stage for the following real than the stage for the sta	ection 131 of the Planning and Development Act. 2000
For further consideration by SEO/SAO	
Section 131 not to be invoked at this stage.	
Section 131 to be invoked – allow 2/4 weeks for rep	ly. 🔲
S.E.O.:	Date:
S.A.O:	Date:
M Please prepare BP Section 131 not submission  to: Task No: Allow 2/3/4weeks – BP	
EO:	Date:
AA:	Date:

M. A. ar

### Malication Checklist

Lodgement Number: LDG-069131-24

Case Number: ABP-314485-22 Customer: Liam O'Gradaigh

Lodgement Date: 14/12/2023 08:51:00 Validation Officer: Patrick Buckley

PA Name: Fingal County Council
PA Reg Ref: F20A/0668
Case Type: Normal Planning Appeal PDA2000 Lodgement Type: Observation / Submission



Validation Checklist	Value	
Confirm Classification	Confirmed - Correct	
Confirm ABP Case Link	Confirmed-Correct	
Fee/Payment	Valid – Correct	
Name and Address available	Yes	
Agent Name and Address available (if engaged)	Not Applicable	
Subject Matter available	Yes	
Grounds	Yes	
Sufficient Fee Received	Yes	
Received On time	Yes	
Eligible to make lodgement	Yes	
Completeness Check of Documentation	Yes	

Run at:

02/01/2024 09:01

Run by: Patrick Buckley



# odgement Cover Sheet - LDG-069131-24



LDG-069131-24

Lodgement ID

Patrick Buckley

ŝ

Generate Acknowledgement

Letter

Customer Ref. No.

PA Reg Ref

Physical Items included

Created By

Map ID

O 30%

<u>sii</u>	
eta	

dgement Date	14/12/2023
stomer	Liam O'Gradaigh
dgement Channel	Email
dgement by Agent	No
ent Name	
rrespondence Primarily Sent to	
gistered Post Reference	

## ategorisation

	Observation / Submission
ction	rocessing

Normal Planning Appeal PDA2000

Case Type (3rd Level Category)

PA Name

Yes

Observation/Objection Allowed?

Payment

Related Payment Details Record

Fingal County Council

F20A/0668

# e and Payments

ecified Body	No
al Hearing	No.
e Calculation Method	System
rrency	Euro
e Value	50.00
fund Amount	0.00

### servation

1 at: 02/01/2024 09:01

n by: Patrick Bucklev

A proposed development comprising the taking of a 'relevant action' only within the meaning of Section 34C of the Planning and Development Act 2000, as amended, at Dublin Airport,

i) (5) 10

landing at Dublin Airport between 2300 6am and also to allow flights to take off number stipulated in condition no. 5 of from and/or land on the North Runway (Runway 10L 28R) for an additional 2 hrs and 0700 hrs over and above the Planning Permission and to replace it with an annual night-time noise quota the hours of 11pm and 7am daily that PL06F.217429 as amended by Fingal County Council F19A/0023, ABP Ref. restriction set out in condition no. 3(d) Little and Rock on a site of c. 580 ha. (Fingal County Council Reg. Ref. No. measures. Conditions no. 3(d) and 5 and the replacement of the operating The proposed relevant action relates operation, as the construction of the number of flights permitted between Collinstown, Toberbunny, Commons, Cloghran, Corballis, Coultry, Portmellick, Harristown, Shanganhill, system at Dublin Airport. It involves Sandyhill, Huntstown, Pickardstown, between the hours of 11.30pm and North Runway Planning Permission accordance with the North Runway Barberstown, Forrest Great, Forrest nours i.e. 2300 hrs to 2400hrs and 0600 hrs to 0700 hrs. Overall, this to the night-time use of the runway North Runway on foot of the North would allow for an increase in the number of flights taking off and/or restriction in condition no. 5 of the remove the numerical cap on the ongoing. The proposed relevant No. ABP-305289-19), as well as the amendment of the operating Runway Planning Permission is have not yet come into effect or action, if permitted, would be to proposing new noise mitigation Dunbro, Millhead, Kingstown, is due to come into effect in the North Runway Planning F04A/1755; ABP Ref. No.

CO. DUDIIII, III IIIE IOWIIIAIIUS OI

lun at: 02/01/2024 09:01

Run by: Patrick Buckley

reminssion, in accordance with the annual night time noise quota. The relevant action pursuant to Section 34C (1) (a) is: To amend condition no. 3(d) of the North Runway Planning Permission (Fingal County Council Reg. Ref. No. F04A/1755; ABP Ref. No. PL06F.217429 as amended by Fingal County Council F19A/0023,	ABP Ker. No. ABP-305289-19). Condition 3(d) and the exceptions at the end of Condition 3 state the following: '3(d). Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports.	Permission is being sought to amend the above condition so that it reads: 'Runway 10L-28R shall not be used for take-off or landing between 0000 hours and 0559 hours except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10L-28R length is required for a specific aircraft type.' The net effect	of the proposed change, if permitted, would change the normal operating hours of the North Runway from the 0700hrs to 2300 hrs to 0600 hrs. The relevant action also is: To replace condition no. 5 of the North Runway Planning Permission (Fingal County Council Reg. Ref. No. F04A/1755; ABP Ref. No.: PL06F.217429 as amended by Fingal County Council F19A/0023, ABP Ref. No. ABP-305289-19) which provides as follows: 5. On completion of construction of the runway hereby permitted, the average number of night
an a	Sharing Sharin	The training of the training o	Development Description of 1 wo wo hou 070 070 070 070 070 070 070 070 070 07
			F20A/0668

Case Number

e de la

n at: 02/01/2024 09:01

n by: Patrick Buckley

d i	ÿ	$\beta^{\frac{1}{2}})$	95

passenger capacity of the Terminals at nighttime use, namely conditions no. 3 The proposed relevant action does not PL06F.220670) and condition no. 2 of <sub>fu</sub>rther information request received by submitted concerning future night time be subject to an annual noise quota of reported annually to the Aircraft Noise seek any amendment of conditions of Dublin Airport. Condition no. 3 of the frequency of night flights at the airport following noise mitigation measures: -(Fingal County Council Reg. Ref. No. March, 2007. Reason: To control the Monitoring Framework to monitor the Runway Planning Permission) or any proposed night time noise quota, the eligible dwellings within specific night noise performance with results to be Dublin Airport) Regulation Act 2019. measured over the 92 day modelling operation of the runway system (i.e. noise at the airport. The airport shall 7990 between the hours of 2330hrs A noise insulation grant scheme for conditions which are not specific to he Terminal 1 Extension Planning An Bord Pleanála on the 5th day of shall not exceed 65/night (between period as set out in the reply to the so as to protect residential amenity compliance with the Aircraft Noise 2300 hours and 0700 hours) when noise contours; - A detailed Noise Permission governing the general use of the existing parallel runway' With the following: A noise quota relevant action also proposes the system is proposed for night time Competent Authority (ANCA), in (a), 3(b), 3(c) and 4 of the North amendment of permitted annual Ferminal 2 Planning Permission having regard to the information and 0600hrs. In addition to the the North Runway Planning F04A/1755; ABP Ref. No.

ume ancian movemens at me anpon

02/01/2024 09:01 n at:

Dublin Airport, Co. Dublin

velopment Address

pellant

velopment Type

Decision Date

unty

pporting Argument

Patrick Buckley n by:

Patrick

### **Karen Hickey**

From:

Liam.OGradaigh@lamresearch.com Thursday 14 December 2023 13:21

Sent: To:

Appeals2

Subject:

ABP-314485-22 F20A/0668

**Attachments:** 

283C.NT.01.01 EIAR noise review.pdf;

iAcoustics\_AirTrafficNoiseMonitoring\_LiamOGradaigh\_2022\_11\_10.pdf; Liam\_OGradaigh\_ABP\_Letter.pdf; Submission\_ABP\_RFI\_LiamOGradaigh

14-12-2023.pdf; WDA230104TN\_1\_A\_02 Noise Survey and Assessment (Teresa

Sweeney).pdf

### Dear ABP,

Please find attached my submission on the further information request from the Board on case ABP-314485-22. I made a submission on the appeal and so do not have to pay to make a response now. I attach the letter I received from the Board. I also attach a noise review, and two noise monitoring reports.

I would appreciate it if I could get a confirmation email on this submission. Many thanks

Liam

LAM RESEARCH CONFIDENTIALITY NOTICE: This e-mail transmission, and any documents, files, or previous e-mail messages attached to it, (collectively, "E-mail Transmission") may be subject to one or more of the following based on the associated sensitivity level: E-mail Transmission (i) contains confidential information, (ii) is prohibited from distribution outside of Lam, and/or (iii) is intended solely for and restricted to the specified recipient(s). If you are not the intended recipient, or a person responsible for delivering it to the intended recipient, you are hereby notified that any disclosure, copying, distribution or use of any of the information contained in or attached to this message is STRICTLY PROHIBITED. If you have received this transmission in error, please immediately notify the sender and destroy the original transmission and its attachments without reading them or saving them to disk. Thank you.

Confidential - Limited Access and Use



### Note

Title	EIAR 2023 Document Review		
Project	Dublin Airport – North Runway	/	
Reference	283C.NT.1.1	Author(s)	BHo, DB
Date	12 December 2023	Reviewer	VC

### 1.0 Overview

### Introduction

- 1.1 This note sets out Suono's initial review of the noise chapter submitted as part of the revised September 2023 supplement to the Environmental Impact Assessment Report (EIAR) for Dublin Airport's North Runway, together with its appendices and specific documents referenced within.
- 1.2 Particular attention has been paid to the air noise assessments due to the nature of the application and the likelihood of significant effects arising.
- 1.3 The note focusses on issues which are fundamental to the noise assessments.

### **Planning Conditions**

### Permitted Conditions

- Planning permission for Dublin Airport's new North Runway, which became operational on 22 August 2022, was granted in 2007<sup>1</sup>. This permission contained conditions restricting the night-time use of the runway, which are summarised below:
  - Condition 3(d) Runway 10L-28R (North) shall not be used for take-off or landing between 2300 hours and 0700 hours;
  - Condition 5 The average number of night-time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period (16 June to 15 September).

### **Proposed Conditions**

- 1.5 In June 2022, the Airport Noise Competent Authority (ANCA) of Fingal County Council made a Regulatory Decision<sup>2</sup> directing the planning authority to replace the original operating restrictions with the conditions summarised below. Condition 3(d) would be amended and condition 5 would be revoked and replaced with an annual noise quota scheme.
  - Condition a: The airport shall be subject to a Noise Quota Scheme (NQS) with an annual limit of 16,260 between the night-time hours of 2300 and 0659 (inclusive, local time) with noise-related limits on the aircraft permitted to operate at night. The annual noise scheme shall be applied as detailed in Schedule A.

<sup>&</sup>lt;sup>1</sup> An Bord Pleanála decision 2007, Reference Number: PL06F,217429

<sup>&</sup>lt;sup>2</sup> ANCA Regulatory Decision Ref F20A/0668, 22 June 2022



- Condition b: Runway 10L-28R (North) shall not be used for take-off or landing between 0000 and 0559 (inclusive, local time) except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10L-28R length is required for a specific aircraft type.
- 1.6 Implementation of **Condition b** effectively means that aircraft can use the North Runway during the "shoulder" hours of the night-time (2300-0700) period, these being 2300-0000 and 0600-0700.
- 1.7 Prior to ANCA's request, an original Environmental Impact Assessment Report (EIAR) was submitted in September 2021 to Fingal County Council. Permission was granted on 8 August 2022 and an appeal lodged on 24 August 2022.
- 1.8 Following the opening of the North Runway, however, a number of operational changes have occurred that could affect the assessment outcomes reported in the 2021 EIAR. The EIAR Supplement was therefore issued by the Applicant in September 2023 and as stated in 13.1.1, is a replacement noise chapter, rather than an addendum.

### **Condition Commentary**

- 1.9 The decision to grant planning permission for the northern runway by An Bord Pleanála (ABP), as stated in ABP decision notice D217429, acknowledged that the application contained inconsistencies and deficiencies in information. For noise, these shortcomings are set out in R217429A [Volume 2 Consultants' Reports], as summarised by Mr Rupert Thornley-Taylor.
- 1.10 Mr Thornley-Taylor concludes:

In the absence of counterbalancing advantages, which are outside the scope of my report, I do not consider that the applicants' mitigation proposals would offset the effects of noise from the development sufficiently to leave no residual significant effects. It follows that on strict grounds of noise alone, the application should in those circumstances be refused.

- 1.11 Mitigation proposals are also taken to represent a substantial shortcoming of the current application, and this is discussed in more detail later in this note [see Section 7: Noise Insulation]. As a consequence, we would expect for the same recommendation to be made on noise grounds for this application.
- 1.12 ABP state in D217429 (page 3 of 13):

In deciding not to accept the Inspector's recommendation to refuse permission, the Board considered that sufficient information had been submitted in the Environmental Impact Statement, in further information submitted both to the planning authority and the Board and at the oral hearing to enable it to make an assessment of the significant impacts of the proposed development on the environment and its acceptability in terms of proper planning and sustainable development. The Board considered that in overall terms, the inconsistencies or deficiencies in information referred to by the Inspector were not so significant as to warrant a refusal of permission and could be addressed by way of condition. In particular, the Board was satisfied, on the basis of the information submitted and the conditions attached, and, having regard to the fact that there are no planning restrictions on the current operation of the airport runways, that -

(1) there would be no significant deterioration in noise conditions at night time in the vicinity of the airport due to the proposed Option 7b operating mode for the runways (non-use of new runway and of cross runway at night) and the restriction on night time aircraft movements by way of condition,



- (2) in relation to day time noise, there would be some improvements relative to current or future noise impacts with the existing runway system to be offset against disimprovements in other areas/respects and the net effects would not be significant in terms of public health and safety such as to warrant a refusal of permission,
- (3) in relation to schools affected (including pre-school facilities), the mitigation measures proposed, reinforced by conditions and monitoring would ensure that a suitable noise environment can be maintained within classrooms and school buildings generally.

In coming to the above decision, the Board noted that, in addition to planning controls, Dublin Airport would in the future be subject to the new noise control regime introduced under the EU Environmental Noise Directive 2002/49/EC and the Environmental Noise Regulations, 2006.

- 1.13 We note that for each of the three points above, given by ABP as reasons to grant permission despite shortcomings, that:
  - (1) is one of the specific conditions proposed to be changed in this application, moving from the northern runway not being used for any night-time flights to flights in the first and last hours of the night (2300-0000 and 0600-0700).

ANCA's decision would also allow the largest of commercial aircraft to use the northern runway at any time of night, through inclusion of the text, "or where Runway 10L-28R length is required for a specific aircraft type", meaning that the period between midnight and 0600 cannot truly be considered respite.

(2) and (3) are both potentially affected by this current application, as no specific daytime assessment has been carried out, despite acknowledged changes in the daytime forecasts [see Section 2.14 onwards, 'Non-residential Receptors'].

### 2.0 ANP Requests for Information

### Requests

- In a letter dated 27 April 2023, ANP set out several requests for information to assist them in making a decision on the current application. These were:
  - 1 Impact of Peak LAmax Noise Levels from Air Traffic Movements (ATMs) on sleep;
  - 2 Sensitivity Testing of the Population Numbers Covered by the Noise Contour Predictions:
  - 3 Baseline years assumed in the assessment.
- 2.2 The Developer has sought to answer these RFIs in *Noise Modelling Report ABP RFI 27 APR 2023 A11267\_23\_RP060\_3.0*, dated 13 September 2023 ('the RFI report'). We have the following comments on this information.

### Request 1: L<sub>Amax</sub> levels on sleep

### Obfuscation of Results

2.3 The Developer states in the RFI report:

"The probability of additional awakenings has been determined for the population in the same study area as the EIAR Supplement, which contains over 1 million people. The probability of additional awakenings is computed for each person, and expressed as overall totals of the expected number of additional awakenings across the total population."



2.4 Through taking this approach, the % awakening comparison and the overall results are difficult to comprehend. The air noise study area, taken from EIAR Figure 13B-1, can be seen below:

Ratinfeigh

Garristown

Kilmensian

Dunshaughlin Ashbourne

Dublin Airport
2-terminal international airport

Durboyne

Kilcock

Mayneoth

Lucan

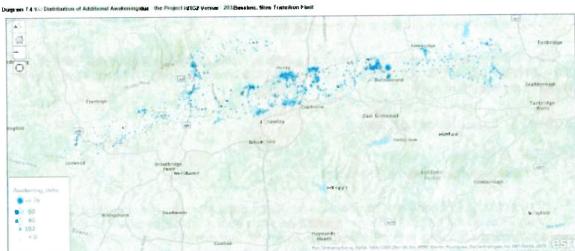
Du blin

Ceibridge

Clane

- 2.5 Through the inclusion of most of Dublin's population, any results, whether by way of comparison or standalone, do not allow for a detailed inspection of awakening changes arising from changes to the use of the northern runway. We are concerned that this could lead to an underestimation of effects for those living in close proximity to the northern runway.
- Other airport applications have taken an approach that allows for effects at specific locations to be taken into account. For example, the current Gatwick Airport DCO application has provided information, such as that shown in the figure below.

### **Gatwick Airport DCO awakenings location figure**



### suono

- 2.7 The benefit of such an approach is that it can be used to check against noise insulation scheme coverage, provide useful information to local communities and the results compared against local Airport Noise Zones [Noise Zones are discussed in more detail later, see Section *6.11*].
- 2.8 Given that some communities will be newly exposed to night-time aviation noise, should permission be granted, a location-based approach is key, as opposed to a % change over the extended study area.

### Criteria

- 2.9 The RFI report states, "While there are no specific criteria by which to judge the significance of the number of additional awakenings, the relative values for the scenarios can be compared."
- 2.10 While we agree that there is no specific guidance from which to derive criteria, the Heathrow Airport Third Runway Preliminary Environmental Impact Report (PEIR) identifies a key assessment standard, namely that an air noise Significant Observed Adverse Effect Level (SOAEL) arises at any location newly experiencing one additional awakening due to aircraft noise as a yearly average.
- 2.11 The Developer makes no reference to this threshold. Therefore, if this is the Developer's position, justification should be provided as to why it is not relevant to this application. Alternatively, the Developer should incorporate such a threshold.

### Noise Modelling

2.12 The RFI report states within the last paragraph under the heading of Noise Modelling:

"To convert the predicted external noise levels to internal noise levels a reduction of 21 dB has been assumed [within WHO Environmental Noise Guidelines for the European Region]. This is the value selected in the WHO Europe Night Noise Guidelines for Europe (2009). It is a composite value with an allowance for windows not always being closed. The guidelines note that this is a relatively low value and is subject to national and cultural differences. The assessment therefore makes an allowance for the existing and proposed enhancement of the sound insulation scheme at the airport."

- 2.13 It is not clear how the assessment makes an allowance for the existing and proposed enhancement of the sound insulation scheme at the airport, given that these schemes are not proposed to cover the whole study area, nor would insulation be installed at many properties before effects occurred.
- 2.14 The Developer should clearly set out what values have been used to convert external noise levels to internal levels and justify these, including assumptions about the percentage of time for which windows would be open.

### Additional information

2.15 The above awakening assessment, and the application generally, would materially benefit from inclusion of figures showing SEL and  $L_{Amax}$  contours for key aircraft types using the northern runway. These have not been included.

### Request 3: Baseline years

- 2.16 Part a of the request with regards to baseline years is, "a) the baseline figures for 2019 were not used for the purposes of analysis."
- 2.17 The Developer's full response within the RFI report is:

"When undertaking environmental assessment, the approach is to set out the current situation and then to consider what may happen in the future with or without the change being sought.



This allows changes that are going to happen irrespective of the change being sought to be accounted for. Information on the current and past situations is included to provide context but is not part of the analysis. Information on past activity, both in 2018 and 2019 was included in the 2020 EIAR."

2.18 This response would suggest that the current EIAR submitted as a replacement should also consider 2021 or 2022 as the representing the most current situation in order to provide context, rather than relying solely on 2018, which occurred some five (5) years ago.

### 3.0 Significance Criteria

### **Absolute Air Noise Impact Criteria**

3.1 Table 13-2 of the EIAR sets out the air noise impact criteria for residences:

Table 13-2: Air Noise Impact Criteria (absolute) -- residential

Scale Description	Annual dB Lden	Annual dB Lnight	
N egligible	<45	<40	
Very Low	45 – 49 9	40 - 44.9	
Low	50 - 54.9	45 – 49.9	
Medium	55 - 64.9	50 54.9	
High	65 - 69.9	55 - 59 9	
VeryHigh	≥70	≥60	

- 3.2 Justification for the above values have been provided and appear reasonable, with thresholds taken from relevant guidance and policy. Comparable schemes in the UK, have used similar thresholds as the above, such as Heathrow's third runway, Gatwick's second runway and Luton's capacity expansion.
- 3.3 Focussing specifically on night-time noise (given the reasons for this application), comparable thresholds are set out in the table below, with LOAEL<sup>3</sup> approximately equating to "Very Low / Low", SOAEL<sup>4</sup> to "Medium / High" and UAEL<sup>5</sup> to "Very High" thresholds.
- 3.4 The Consultation Response on UK Airspace Policy 2017 document takes the L<sub>night</sub> level to be approximately equal to the L<sub>Aeq,8hour</sub> level without correction. Assuming summer average day ATM numbers are only slightly higher than for the annual average day, values in the table below can be compared against those used within this application.

<sup>&</sup>lt;sup>3</sup> LOAEL - Lowest Observable Adverse Effect Level

<sup>&</sup>lt;sup>4</sup> SOAEL - Significant Observable Adverse Effect Level

<sup>&</sup>lt;sup>5</sup> UAEL - Unacceptable Adverse Effect Level

### suono

Table 1 Comparable air noise assessment criteria (dB) - night

Airport	NIGHT				
	LOAEL	SOAEL	UAEL		
Luton DCO (proposed) LAeq,8hour	45	55	63		
Gatwick DCO (proposed) LAeq,8hour	45	55	66		
Bristol (permitted) LAeq,8hour	45	55	63		
Heathrow DCO (PEIR) LAeq,8hour	45	55	66		
Stansted (permitted) L <sub>Aeq,8hour</sub>	45	54	63		
Luton 19 mppa (permitted) L <sub>Aeq,8hour</sub>	45	55	66		

### **Relative Air Noise Impact Criteria**

3.5 Table 13-3 of the EIAR sets out the scale for level of relative change in air noise impact criteria for residences:

Table 13-3: Air Noise Impact Criteria (relative)

Scale Description	Change in noise level, dB(A)		
Negligible	C ~ 0.9		
Very Low	1 – 1-9		
Low	2 – 2.9		
Medium	3 – 5.9		
High	6 – 8.9		
Very High	≥9		

3.6 This scale is reasonable and mirrors the approach taken at comparable UK airport schemes.

### Magnitude of Effect for Air Noise

Abenhera

3.7 Table 13-4 of the EIAR sets out how the above two scales combine to provide the magnitude of effect for air noise on residences:

Table 13-4: Summary of magnitude of effect - air noise

Noise Level Rating	Negligible	Very Low	Low	Medium	High	Very High
Negligible	Imperceptible	Imperceptible	Imperceptible	Not Significant	Slight	Moderate
Very Low	Imperceptible	Imperceptible	Not Significant	Slight	Moderate	Significant
Low	Imperceptible	Not Significant	Slight	Moderate	Significant	Significant
Medium	Not Significant	Slight	Moderate	Significant	Significant	Very Significant
High	Slight	Moderate	Significant	Significant	Very Significant	Profound
Very High	Moderate	Significant	Significant	Very Significant	Profound	Profound



3.8 There is no precise guidance on how this table should be completed, but we note that **the magnitudes put forward by the Developer are likely to underestimate effects in several areas**. We would recommend the amended table below be used instead for the reasons set out below. Where these effect ratings differ from the Developer's scale, they have been highlighted.

Table 2 Alternative summary of magnitude of effect

Absolute	Change in noise level rating								
noise level rating	Negligible	Very Low	Low	Medium	High	Very High			
Negligible	Imperceptible	Imperceptible	Imperceptible	Not significant	Slight	Moderate			
Very Low	Imperceptible	Imperceptible	Not significant	Slight	Moderate	Significant			
Low	Imperceptible	Not significant	Moderate	Significant	Significant	Significant			
Medium	Not significant	Slight	Moderate	Signifcant	Significant	Very Significant			
High	Slight	Sign ficant	Significant	Significant	Very Significant	Profound			
Very High	Sig nficant	Significant	Significant	Very significant	Profound	Profound			

- 3.9 These changes would bring the magnitude of effect ratings in line with other comparable, recent UK airport schemes and would assist in preventing any underestimating of effects.
- 3.10 A "Medium" change (3-5.9dB) in noise level resulting in absolute noise levels of "Low" would be classed as significant, rather than moderate. Using the wording within the EIAR Guidelines 6, a 3 dB change is generally taken to lead to an effect which alters a sensitive aspect of the environment but above that which is consistent with existing and emerging baseline trends. Without this change, residences are essentially given the same sensitivity as all non-residential receptors, which isn't justified.
- 3.11 Where noise levels are "Very High", even a "Negligible" change would be significant, as measures should be in place to avoid these noise effects at any residence already subject to these noise levels. Such an approach would then be in line with Planning Practice Guidance (PPG), which the Developer references themselves.
- 3.12 The final amendment is a more relaxed suggestion than the above recommendations and is where recent airport schemes have taken changes of "Very Low" noise levels (1dB+) leading to "High" absolute levels to be significant. The Developer should justify why a more cautious approach has not been taken.
- 3.13 These recommendations would allow for significance to be taken into account from both the EU/598/2014 perspective (in terms of % Highly Annoyed), as well as EIA.

### **Non-residential Receptors**

3.14 The approach for non-residential noise sensitive receptors is a simplified version of that proposed for residences (detailed above). For daytime receptors, an absolute threshold of 55 dB

<sup>&</sup>lt;sup>6</sup> Guidelines on the information to be contained in Environmental Impact Assessment Reports, May 2022; Environmental Protection Agency



L<sub>den</sub> is taken, and a change in level of 3 dB or more is also required to give rise to a significant effect.

- 3.15 There is the potential that some key noise effects are being underestimated through this approach, particularly those that apply to schools.
- 3.16 Appendix 13A states in section 13A.6.20:

"For schools the medium threshold has been based on the guidance in Building Bulletin 93, specifically that the internal noise levels for classrooms and teaching spaces that it contains can be achieved with natural ventilation if the external noise level does not exceed 55 dB LAeq, 30min. Reviewing the distribution of flights at Dublin Airport it has been estimated that this criterion corresponds to approximately 55 dB L<sub>den</sub>, which is the level where WHO 2018 reports evidence of an effect on reading skills and oral comprehension in children."

- 3.17 No further information is provided for how this comparison has been reached, which requires additional justification or further supporting evidence.
- 3.18 Although the application is focussed on night-time operational changes, an increase in flights being able to land at night-time would then enable an increase in day-time departures. This is explicitly stated in section 13.3.7:

"The Relevant Action specifically relates to controls at activity at night, however the effect on movements is not confined to the night period, as for example an aircraft that becomes able to arrive at night may then depart during the following day. The  $L_{den}$  metric also takes into account activity at night so both it and the  $L_{night}$  metric respond to changes in activity at night and so are considered directly relevant."

- 3.19 It is possible therefore that large noise changes occur in the daytime without these being demonstrated in the L<sub>den</sub> metric used by the Developer. This is as a result of the corrections applied to evening and night-time noise components of the metric.
- 3.20 More information is therefore required to ensure that daytime healthcare facilities and schools are not being unduly disturbed by increases in air noise which have not been identified.

### **Ground Noise**

- 3.21 No reference appears to be made to ground noise magnitude of effects in the main EIAR body. In Appendix 14A submitted in 2021, the same matrix as that used for air noise above is set out for ground noise.
- 3.22 This should be updated to match the air noise recommendations provided above with regards to magnitude of effects.

### 4.0 Limitations and Assumptions

4.1 Section 13.3.43 sets out that some aircraft types currently have limited or no noise data available and assumptions have been made to allow these aircraft to be modelled. The assumptions are set out in the replacement Appendix 13B in Table 13B-14 and section 13B.3.73. These are as follows:

### suono

Table 3 Expected Change in Noise Levels between Current and Modernised Aircraft Types

Current Aircraft Type	Modernised Aircraft Type	Expected change in noise levels betweer current and modernised aircraft types (dE		
		Arrival	Departure	
Embraer E190	Airbus A220-300	-0.1	-3.8	
Airbus A330-300	Airbus A330neo	-0.3	-4.7	
Embraer E190	Embraer E195-E2	-0.7	-5.7	
Boeing 777-200	Boeing 777X	-1.6	-6.4	

- 4.2 It is stated that the first three rows of corrections in the table are based on a comparison of certification information between the current and modernised type.
- 4.3 For the 777X, noise levels have been based on historic trends of 0.05 dB per year for arrivals and 0.2 dB per year for departures. This has resulted in materially different expected changes for the 777X to the other three types set out in the table above.
- Given that the 777X and the A330neo are comparably sized aircraft, changes in arrival and departure noise levels would be expected to be closer, especially for arrival noise. Comparison against the A350, a comparably sized new generation aircraft, may also assist this exercise.
- 4.5 We recognise that the 777X represents a small portion of movements, as stated in 13.3.43 of the EIAR. We note, however, that the 777X is a materially larger aircraft than the majority of aircraft in the fleet and would have the potential to increase absolute arrival and departure noise levels.
- 4.6 In 2035, as set out in Table 13B-4, there are proposed to be 630 movements of the 777X in both the evening and night periods, out of a total of 47,581 and 35,922 movements, respectively. This amounts to 1.3% and 1.75% of fleet movements in the respective time periods. However, in spite of these small percentages, the following factors would mean that the 777X is expected to have an impact on contour sizes:
  - the nature of the L<sub>den</sub> metric, where evening and night-time noise levels have substantial corrections applied;
  - the 777X having higher noise levels than the smaller aircraft in the fleet;
  - it does not appear that the 777X is modelled with a custom departure profile, which
    otherwise might be expected to lead to a lower noise impact.
- The noise contours should therefore be updated with more conservative expected changes for the 777X, or it be proved that the 777X has negligible impact on the contour sizes.
- 4.8 This is an important matter, as more generous expected changes would typically lead to smaller noise contours being signed up to by the Developer. If the expected noise reductions do not materialise, the onus should be on the Developer to keep to the lower noise contours, rather than permitting a larger noise impact on the local community. Any risks associated with not meeting agreed noise limits would rightly be placed on the Developer.
- 4.9 However, in this instance, it doesn't appear that the Developer is proposing any constraints, operating controls or limits that would ensure the potentially lower noise impact occurs. The submitted documentation could therefore underestimate the noise impact from aircraft in flight on the local community.



### 5.0 Current State of the Environment

### 2016 Measurements

- The EIAR sets out that the noise climate around Dublin Airport was quantified by a noise measurement campaign in 2016. Comparison between 2016 and 2018 Noise and Track Keeping data from the Airport's monitoring terminals have been compared and the Developer uses this comparison to conclude that the 2016 data is acceptable.
- At no point does the Developer appear to set out what the noise measurements are used for within the noise assessment. We believe that they are merely used to assist in explaining impacts, as it is stated that they are not used for the air noise assessment and that the ground noise assessment has its own survey positions.
- However, irrespective of the purpose for which the noise measurements have been used, they must be considered out of date.
- Tables 13-8 and 13-9 of the EIAR, as shown below, are used to justify that noise levels across the two years are comparable (despite both being over 5 years old now).
- However, examination of noise levels across both years shows that there is not a good correlation between noise levels at locations further away from flightpaths. These noise measurements cannot therefore be used to assist in describing noise impacts and effects in 2018, let alone anything more recent.
- The Developer has not sought to undertake any additional noise measurements in 2022 or 2023, which would be much more beneficial to local communities who are seeking to understand what the proposals mean to them.
- We also note the following points that do not assist in understanding the information 5.7 presented:
  - The measurement positions are referenced by number within the tables and letters within the text.
  - Descriptive text is unclear, for example, "Aircraft noise was occasionally dominant" in section 13.4.19. This could mean a number of things and does not clarify matters for
  - A measurement position was located in school grounds (River Valley AS11) during term time and it is not clear if measurements of children have been omitted or included in
- We also note that the Application is for an expansion of use of the northern runway at nighttime; the measurement positions do not focus on specific areas that would be expected to be most significantly impacted, but rather are situated generally all around the Airport.



Table 13-8: Average Measured Noise Levels (2016)

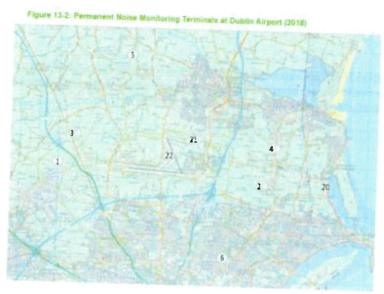
	Daytme	No ise Level	dB L <sub>Aeq,19hr</sub>		Night Time Noise Level, dB LAeq.8hr				
NMT	Jan-Jun	Jan-Jun 2016		Jul-Dec 2016		Jan-Jun 2016		Jul-Dec 2016	
	Total	Aircraft	Total	Aircraft	Total	Aircraft	Total		
1	63.8	62.5	63.7	62.4	58 .4	57. 1	58.1	Aircraft 57.0	
2	62.4	60.7	61.8	603	56.8	55.4	56.8	55.6	
3	62.9	49.6	-	-	54.9	47.0		33.6	
4	56 .6	41.5	56.8	41.2	52.1	3 8.3	49.7	20.4	
5	54.9	49.2	55.3	48.6	57.3	48.1	51.3	39.4	
6	61.6	46.7	58.1	44.2	56.5	45.5	51.6	49.7	
20	63.7	57.2	62.4	54.9	57.6	52.2	56.3	43.4	
Tel							00.0	50.2	

Table 139: Average Measured Noise L evels(,2018)

NMT	Daytim	Daytime Noise Level, dB L <sub>Aeq,16hr</sub>				Night Time NoiseLeve I, dB L <sub>Aeq,8hr</sub>		
	J an-Jun	J an-Jun2018		Jul-Dec 20 8		Jan-Jun2018		2018
	Total	Aircraft	Total	Aircraft	Total	Aircraft	Total	Aircraft
1	63.9	62 8	64.0	62.9	58.9	57.2	58 1	56.6
2	61.1	60.5	61.9	61.1	56.5	54.9	57 5	
4	57.2	46.9	55. 3	43.8	54.2	36.7		56.5
5	58 3	49.5	54 .8	48 .5	55.1		51.0	33.7
6	57.7	45.8	60.9			50.2	54.3	50.4
20	64.3			48 .9	58.0 —————	45.1	59 .2	47.0
20	04.3	58.7	63.4	59.6	58.6	47.7	58.9	54.8

### **Permanent Noise Monitors**

5.9 In addition to the monitoring set out above, there were seven permanent noise monitors installed in 2016 (noting 21 and 22 are mobile locations). Locations can be seen in the image below.



### suono

- 5.10 The results of measurements at these noise monitors can be seen in Tables 13-8 and 13-9 above for January to June and July to December 2016. This approach is adopted due to the data being reported biannually and it is stated in section 13.4.29 that, "These averages are not directly comparable to noise contours produced by computer modelling as noise contours are typically based on an average summer or annual day, and also include all aircraft movements rather than just those which produce a correlated noise event".
- 5.11 If an aircraft has not generated a noise level high enough to be a correlated event, then it is unlikely to have an impact on a noise contour and this reason does not seem to warrant much weight.
- 5.12 The other reason given for why these noise levels cannot be compared to noise contours is that no effort has been made to translate the data provided by the noise monitors into summer and annual periods, which clearly should be possible with the data held. Direct comparison would then be possible, and the data would add some value to the document.

### 6.0 Air noise model

### **Flightpaths**

- The air noise modelling methodology is set out in Appendix 13B and has been materially updated following the previous submissions.
- 6.2 The original northern runway application stated in section 16.1.3.4:
  - "The flight tracks associated with the existing 10/28 runway, the existing 16/34m runway and the existing 11/29 runway are in accordance with AIP Ireland as published by the Irish Aviation Authority. For the proposed runway, it was assumed that the aircraft would join up with the tracks used for the existing 10/28 runway which was agreed with the Irish Aviation Authority to be a reasonable assumption at this stage."
- 6.3 For the 2021 application, the original Appendix 13B sets out a high level of detail of how the flightpaths were considered within the model, culminating in section 13B.3.42:
  - "A set of departure routes from the North Runway was then developed that replicated the current routes as closely as possible, while allowing for these initial turns."
- 6.4 The noise assessments for both applications are based on these two different sets of assumed flightpaths.
- 6.5 The northern runway first began operations at the end of August 2022. Updated departure routes on the northern runway were implemented on 23<sup>rd</sup> February 2023, six months later.
- 6.6 The actual flown radar data associated with these most up to date flightpaths has been used in the latest noise modelling, an approach we consider correct.
- 6.7 It is not clear whether any noise assessment has been undertaken to quantify the impacts of the northern runway based on the actual flown flightpaths. This could result in additional or different significant impacts being identified, which then impacts on the acceptability of the scheme set out in the latest application.
- 6.8 We note that, due to the fact that different flightpaths were being flown compared to those described to the local communities, material time and financial outlay has been spent in attempting

<sup>&</sup>lt;sup>7</sup> Dublin Airport Environmental Impact Statement Northern Parallel Runway Part 2 - Text; 2004

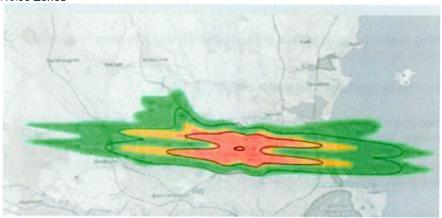


to demonstrate the noise impacts actually occurring. Long-term unattended noise monitoring was commissioned by our client at three locations to the west of the northern runway, in order to highlight that the noise levels reported in the 2021 application were not what was occurring in reality.

- 6.9 The EIAR assessment has now been updated, with stronger correlation between measured and modelled noise levels, but the point remains that there needs to be a higher degree of certainty available to local residents as to the noise levels to which they will be subject. There are lingering concerns about the accuracy of modelling of northern runway departures. Additional controls have been recommended later in this note.
- 6.10 While the flightpaths may have been updated, there is a knock-on effect on information based on these. The Airport Noise Zones, which assist residential developers in knowing what level of insulation would be required and where development would be resisted, no longer cover the expected impacts of this proposal.

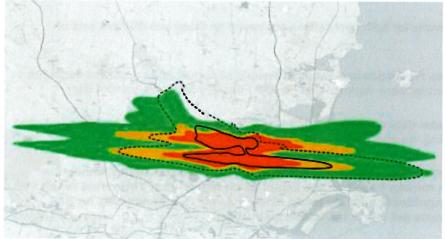
### Lnight contours against Noise Zones (previously)

Black dotted line showing 48 dB contour; black solid line showing 55 dB; green, orange and red areas are Noise Zones



### L<sub>night</sub> contours against Noise Zones (current)

Black dotted line showing 48 dB contour; black solid line showing 55 dB; green, orange and red areas are Noise Zones

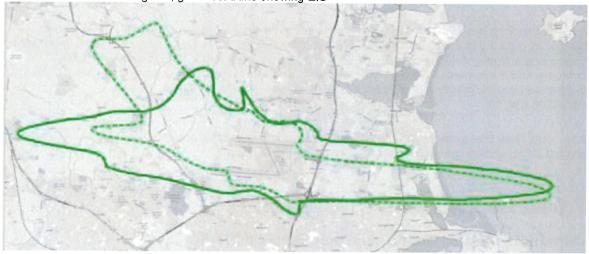




- 6.11 The current proposals show that the 55 dB L<sub>night</sub> contour (marking significant adverse effects at night) now falls outside the Red Zone (where development would be resisted). The 48 dB L<sub>night</sub> contour falls outside the green zone, where noise sensitive development would be managed and is expected to need noise insulation incorporated.
- Not only is there the obvious concern that properties now proposed to be covered by noise contours outside of zones may not be appropriately designed, but there is also the substantial, more hidden, risk that properties are also affected by daytime noise from the second runway but were not considered by the 2007 permission assessment. The figures below demonstrate this by showing the current proposals (RFI) against the 2007 permission (original EIS).

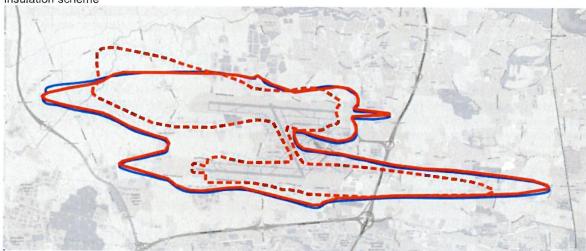
### LAeq,16hour 54 dB contours from current proposals against original

Green dashed line showing RFI; green solid line showing EIS



### LAeq,16hour 63 dB contours from current proposals against original

Red dashed line showing RFI; red solid line showing EIS; blue solid line showing existing residential sound insulation scheme



6.13 As can be seen in the four figures above, significant noise effects are expected during both the day and night-time in areas not covered by any sound insulation scheme.



### **Validation**

- 6.14 Given the uncertainty with flightpaths, it is of concern that only one portable noise monitor has been used to validate northern runway movements. It is assumed this is Location 21 shown on Figure 13-2 above, but this is not explicitly stated.
- 6.15 The focus of this application is to increase movements on the northern runway, yet little attention appears to have been paid to ensuring this aspect of the noise model is as accurate as possible.
- 6.16 The Airport has been instructed by ANCA to install and maintain 23 noise monitoring stations by 24 August 2024, 15 of which are currently in place. Multiple noise monitors are now installed to the west of the northern runway, allowing such a validation to take place, especially considering the tight turn some of these aircraft are undertaking on departure.
- 6.17 Monitoring has been undertaken by the client at three locations over the 92-day summer period, as detailed in the three Technical Notes produced by Wave Dynamics Acoustic Consultants. These notes highlight differences in the noise levels used to produce the Developer's noise contours and those measured. The notes are included within the submission and are titled 'Noise Survey and Assessment', with references 'WDA230104\_1', 'WDA230104\_11' and 'WDA230104\_13'.
- 6.18 It is clear that further validation of the noise model should be sought, to ensure noise effects are not being underestimated anywhere within the study area.

### 7.0 Noise Insulation

### **Current Residential Sound Insulation Scheme (RSIS)**

- 7.1 As set out in section 13.6.13 of the EIAR, the existing insulation scheme for residences covers the 63 dB L<sub>Aeq,16hour</sub> contour. This would represent the absolute minimum requirement for a UK airport and the threshold is expected to be lowered to 60 dB L<sub>Aeq,16hour</sub> in upcoming policy releases.
- 7.2 Both the recent applications for Luton and Gatwick Airports are proposing Noise Insulation Schemes which offer compensation for mitigation down to the 54 dB L<sub>Aeq,16hour</sub> contours, with a tapering grant size.
- 7.3 Section 13.6.14 states that participation in the scheme is 98%, but this includes 17% of households not participating "because of ongoing legal action at the time they were contacted, and their later request to extend the opt-in deadline could not be accommodated". It should therefore only be assumed that 81% of properties are in line to receive the noise insulation works, and it is not made clear when these properties will actually have the insulation installed.

### **Current Schools Sound Insulation Scheme (SSIS)**

- 7.4 As set out in section 13.6.20 of the EIAR, the existing insulation scheme for schools covers the 60 dB L<sub>Aeq,16hour</sub> contour and aims to design schools to levels no higher than 45 dB L<sub>Aeq,8hour</sub> (over a typical school day).
- 7.5 The EIAR recognises in setting thresholds for schools that the L<sub>Aeq,30minutes</sub> metric is most appropriate for schools, and it is not clear if this is achieved by the works.

### **Dwelling Purchase Scheme**

7.6 A scheme to purchase dwellings within the 69 dB L<sub>Aeq,16hour</sub> contour is available, which is also standard practice.



### **Proposed Night Scheme (RSIGS)**

7.7 Section 13.8.1 states:

"In addition to the mitigation measures already in place at Dublin Airport which are detailed in Section 13-6, as part of this application the Applicant is proposing the following mitigation measures and controls which will help to ensure that the noise effects assessed in the EIAR are not exceeded:

- A night noise insulation scheme.
- A detailed framework for monitoring the noise performance of Dublin Airport."
- 7.8 A night noise insulation scheme should be on offer to "avoid and reduce" significant effects, rather than to ensure the assessed noise effects are not exceeded. It is clear that additional limits should be enforced to ensure assessed noise effects are not exceeded, and the RSIGS should be expanded to minimise significant effects.
- 7.9 The eligibility thresholds for the proposed RSIGS are:
  - Exposed to night-time noise levels of at least 55 dB L<sub>night</sub> once the North Runway is operational,
  - or exposed to a "very significant" rating arising from forecast noise levels of at least 50 dB L<sub>night</sub> in the first full year when the Relevant Action comes into operation, with a change of at least +9 dB when compared with the current permitted operation in the same equivalent year. For the purpose of this assessment a comparison of the 2025 Permitted and Proposed Scenarios has been used to estimate which dwellings would be eligible.
- 7.10 This is as per section 13.8.2, which also states that a grant of up to €20,000 would be available per property.
- 7.11 Section 13.8.5 states:

The basis for 55 dB  $L_{night}$  as a criterion is that it is the level at which a high impact arises. This follows from the 2009 WHO Night Noise Guidelines which describe it as the threshold at which "Adverse health effects occur frequently" and "a sizeable proportion of the population is highly annoyed and sleep disturbed". The noise level is also comparable with the level of 55 dB  $L_{Aeq,8h}$  commonly used at airports in the UK for eligibility for sound insulation schemes.

- 7.12 55 dB L<sub>Aeq,8hour</sub> is commonly used at UK airports, as this is taken to be the SOAEL at night, above which significant effects are predicted meaning that mitigation must be applied to avoid these effects.
- 7.13 The Developer does not seek to address the significant effects predicted in the EIAR, only those rated "very significant" or "profound".
- 7.14 Under section 3.8 Mitigation and Monitoring of the EPA's EIAR Guidelines, it quotes Annex IV(7) of the amended directive for such assessments:
  - "A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment..."
- 7.15 The Developer has not included any avoidance, preventative measures, or noise reductions to those expected to be impacted by significant changes in noise levels. This falls short of the requirements.



- 7.16 For instance, as per Table 13-46, the locations at Tyrellstown and Ridgewood would be subject to changes in noise level of +12 dB and +11 dB L<sub>night</sub>, with the absolute noise level rising to 47 dB L<sub>night</sub> at both locations.
- 7.17 As per the Developer's own magnitude of effects (table 13-4), this amounts to a significant effect, yet no mitigation would be proposed.
- 7.18 Indeed, as per the Developer's own statements in section 13.9, the insulation is only assumed to offer a 5 dB(A) reduction in noise, meaning that even with insulation installed, residents at these two locations would still be subject to significant effects.
- 7.19 There are multiple other locations in Table 13-46 that would be subject to a significant effect, even before taking into account our views on the potential underestimation of these effects set out above, yet none would receive noise insulation grants.
- 7.20 There is also a clear argument to be made that the significant effects are assessed using the  $L_{den}$  metric, which is expected to cover a larger extent than the corresponding  $L_{Aeq,16hour}$  metric, meaning that the RSIGS should incorporate qualifying criteria that use the  $L_{den}$  metric to ensure all significant effects are covered.
- 7.21 No information has been provided highlighting which dwellings the noise insulation scheme applies to in the replacement EIAR, as was provided in the original application.
- 7.22 The proposed noise insulation scheme should be materially enhanced, to ensure that all significant effects are avoided, prevented or reduced.
- 7.23 Noting that the Airport's masterplan is to expand capacity to allow a higher passenger throughput, **it would likely also be sensible to enhance the Dwelling Purchase Scheme**. Without this, there is potential for multiple smaller noise increases over time to build up to profound effects, without these being properly quantified. All the while, residents would be living in properties with potentially falling values due to the airport's increasing emissions.
- 7.24 It is also not clear whether any allowance has been made to insulate the residential healthcare facilities subject to significant effects. This represents another shortcoming of the application.
- 7.25 Every effort must be made to insulate qualifying properties in good time before they actually experience significant effects, expected to occur in 2025 (two years in the future). It is anticipated to be unlikely that this will occur, especially as the current noise insulation works are also ongoing. This must be seen as a material shortcoming of the scheme.

### **Residual Effects**

- 7.26 It is not clear how the figures in Table 13-52 have been calculated, as it appears that the benefits of sound insulation schemes have been applied to properties but this is not explicit. More information should be provided to show which properties have been assumed to have received noise insulation, which have already benefitted, and which simply will not qualify.
- 7.27 We also note it is not possible to identify any properties on the provided contours due to the low-quality resolution of the base maps. We would request updated figures in which high resolution mapping shows residential properties, preferably on an individual basis.
- 7.28 Ultimately, Table 13-52 identifies that 371,883 people will experience some degree of noise change (both positive and negative) and that approximately 9,000 people will experience significant residual adverse effects.

### suono

Table 13-52: Summary of Residual Air Noise Effects, Proposed vs Permitted

Year	L <sub>den</sub> Residual Effects			L <sub>nlight</sub> Residual Effects			
	Significant Beneficial	Significant Adverse	Not Significant	Significant Beneficial	Significant Adverse	Not Significant	
2025	7,047	10	<b>371</b> ,883	6,414	8,970	206,643	
2035	102	0	236,946	94	8,301	111,182	

7.29 We also note that within section 2.3 of EPA's EIAR Guidelines it states:

"Significant adverse effects identified in the EIAR can also be used as reasons for a decision to refuse consent."

7.30 Section 3.9.1 of the same document then states:

"It will not always be possible or practical to mitigate all adverse effects. The effects that remain after all assessment and mitigation are referred to as 'Residual Effects'. These are the remaining environmental 'costs' of a project that could not be reasonably avoided. These are a key consideration in deciding whether the project should be permitted or not." (our emphasis)

### 8.0 Noise Abatement Objective

8.1 The objectives of the NAO set for Dublin Airport are:

The number of people highly sleep disturbed and highly annoyed shall reduce so that compared to conditions in 2019:

- The number of people highly sleep disturbed and highly annoyed in 2030 shall reduce by 30% compared to 2019;
- The number of people highly sleep disturbed and highly annoyed in 2035 shall reduce by 40% compared to 2019
- The number of people highly sleep disturbed and highly annoyed in 2040 shall reduce by 50% compared to 2019

and;

- The number of people exposed to aircraft noise above 55 dB L<sub>night</sub> and 65 dB L<sub>den</sub> shall be reduced compared to 2019.
- We understand that Dublin Airport was in breach of its 32 million passengers per year cap in 2019 and that noise at Dublin is expected to increase up to 2025 before having to reduce.
- 8.3 The NAO reductions are only met by this application if future residential developments are not accounted for in the comparison (i.e. the 2019 baseline figures are used). One might expect this approach, given that these developments are outside the control of the Airport, but it does not account for noise above the significant effect thresholds extending beyond the Airport Noise Zones



[see Section 6.11 above], nor the shortcomings of the Airport's insulation schemes [see Section 7: Noise Insulation].

- Until the Airport's noise insulation scheme is materially improved to cover the whole of the qualifying area, the application cannot be considered to be compliant with the NAO in our view.
- 8.5 We note that ANCA have also stated that the NAO was not achieved in 2022, as set out in their report, 'A review of the effectiveness of noise mitigation measures at Dublin Airport for the year 2022 on achieving the noise abatement objective', dated 27 July 2023. This report highlights an issue raised within this note, in that the noise mitigation measures in place cannot be taken to be effective.

### 9.0 Proposed Constraints

### **Noise Insulation Scheme**

- 9.1 As was included within the second runway permission, a condition should be attached that ensures noise insulation is applied to all dwellings (who voluntarily accept the offer) within the 55 dB L<sub>night</sub> contour, or who would be exposed to significant increases in noise, before the northern runway can operate at night.
- 9.2 Our comments on expansion of the voluntary purchase scheme may also mean that a similar condition is required to ensure any purchasing offers are made in advance of the scheme beginning.

### ATM Cap

- 9.3 A Quota Count (QC) control is proposed, and is discussed in the section below. This control is best supplemented by a cap or limit on the number of movements allowed over the same timeframe. A movement cap is simple, easily enforceable and transparent and should be included to provide certainty to local communities.
- 9.4 A movement cap also can be considered to address the often-stated view of those living near to an airport that the number of flyovers is a key consideration, irrespective of the noise generated by these movements.
- 9.5 When implemented with a QC control, a movement cap provides a backstop. Should the QC sufficiently incentivise aircraft with reduced noise levels, benefits can be shared between the Airport and the local community by the movements cap ensuring a limit to the additional flights allowed under the QC scheme.
- 9.6 Movement limits are in place at Stansted, Gatwick and Heathrow Airports for precisely these reasons, fitting alongside their summer and winter QC 'budgets'. A movement cap should be imposed on Dublin Airport if this application is approved.

### QC and Shoulder Period Movement Cap

- 9.7 A night-time QC budget is proposed for Dublin Airport, named the Annual Noise Quota (ANQ). This was previously proposed over the core night period of 2330 to 0600, but has been updated to the whole night period of 2300 to 0700, given that it is proposed to replace the 65 flights a night average limit over the whole night period.
- 9.8 There may be benefit in reverting to an ANQ in the core night period (2330-0600) while placing a separate control (whether QC or movement cap) on the shoulder periods. This would ensure that movements are subject to reasonable controls in the shoulder periods, when sleep is potentially more subject to disturbance. A more precise approach to noise controls through several limits would provide additional protection to key noise-sensitive periods.



- 9.9 The existing limit for the core night is an ANQ of 7,990, which it is proposed be increased to 16,260 over the whole night period. Given that the proposed change is from an average of 65 flights per night on one runway (maximum 23,725 movements per year), there is clearly no consideration given to limiting flights.
- 9.10 Given that this note sets out multiple shortcomings associated with this latest application, it is clear that a more comprehensive assessment is required in all regards to ensure that noise effects are not being underestimated and the local population is not exposed to levels of noise higher than are represented by the application.

\*\*\* \*\*\* -- --



### Air Traffic Noise Monitoring

iAcoustics

Report Issued: 16/09/2022

www.iacoustics.net info@iacoustics.net



### AirTraffic Noise Monitoring, The Ward Lower, Dublin 11, D11 TX25

Project:	Liam O'Gradaigh
Author:	Eoghan Tyrrell
Title:	Air Traffic Noise Monitoring
Reference Code:	J1950
Version Number:	1

Revision Tracker						
Version	Date issued	Revision by	Reviewed by	Section(s) affected		
V.1	16/09/2022	E. Tyrrell	G. Plunkett	-		
V.2	10/11/2022	E. Tyrrell	-	Table 3.		

### **Table of Contents**

Glossa	ary of Terms	2
	ntroduction	
1.1		
2. In	nstrumentation and Measurement Procedure	
3. M	leasurement Results	5
4. A <sub>1</sub>	ppendix I – Equipment Calibration Certificates	18
4.1	Outdoor Meter	
4.2	Indoor Meter	19
4.3	Outdoor Microphone / Preamplifier	20
4.4	Indoor Microphone / Preamplifier	
4.5	Calibrator	24
5 A <sub>1</sub>	nnendiy II _ Naise Manitar Photographs	25



### Air Traffic Noise Monitoring, The Ward Lower, Dublin 11, D11 TX25

### **Glossary of Terms**

A-weighted	Measurements that correlate well with the perceived noise level.	
Background Noise (L90):	The in-situ, or ambient level of noise in the environment	
Competent Person:	Someone with appropriate training, qualifications, experience, and skill. The person was normally have a diploma or degree in acoustics or a related subject.	
Decibel (dB):	The decibel is used as a measure of acoustic units.	
dB(A):	A single-figure rating to a sound, which represents the human-ear frequency response.	
Frequency (Hz):	The number of sound waves to pass a point in one second. Correlated to the perceived pitch a sound.	
LAeq:	Commonly regarded as the A-weighted "average" noise level over a period of time.	
LAFmax:	A-weighted, maximum, sound level measured with a fast time-constant - maximum is not peal	
Lday:	The A-weighted, Leq (equivalent noise level), over the 16-hour day period (07:00-23:00), als known as the day noise indicator.	
Ldn:	The day-night noise level, the LAeq (equivalent noise level) over a 24 hour period, also know as the day night indicator.	
Leq:	The linear (not A-weighted) equivalent continuous sound pressure level.	
Lnight	The A-weighted, Leq (equivalent noise level) over the 8 hour night period of 23:00 to 07:0 hours, also known as the night noise indicator.	
Noise intrusion:	Noise from external noise sources.	
Octave bands:	A convenient division of the frequency scale, identified by their centre frequency. Typically 63, 125, 250, 500, 1000, 2000, 4000, 8000 Hz.	

1. Introduction

iAcoustics were engaged to carry out noise monitoring for the measurement of air traffic noise at the home of Liam O'Gradaigh, The Ward Lower, D11 TX25. This dwelling location in relation to Dublin Airport is indicated in Figure 1 with a yellow dot. There is an approximate distance of 4 kilometres between the dwelling and the closest runw ay



Figure 1: Dwelling Location

Unattended noise monitoring was carried out for approximately 24 hours, between 20:00 on 28<sup>th</sup> July 2022 and 20:00 on 29<sup>th</sup> July 2022. The survey was carried out prior to the launch and operation of the new North Runway (10L/28R) at Dublin Airport. Following a review of the audio recordings captured during the survey, air traffic was observed to be the dominant noise source.

### 1.1 Professional Competency

This report, including the noise survey element, has been undertaken and drafted by Eoghan Tyrrell, an Associate Member of the Institute of Acoustics (AMIOA), an accreditation gained through the completion of the Post-Graduate Diploma in Acoustics & Noise Control and MSc in Applied Acoustics. These qualifications comply with the requirements of a 'competent tester' under the EPA Guidance NG-4.

### 2. Instrumentation and Measurement Procedure

Measurements were captured through daytime and nighttime periods. All measurements were taken with calibrated precision grade, Type Approved (Class 1) sound level meters as per *IEC 61672-1:2013*. All equipment has calibration certificates traceable to the relevant standard. Measurements were captured in line with *ISO 1996-1:2016 Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures.* 

Туре	Make & Model	Serial No.
Sound Level Meter Outdoors	NTI XL2	A2A-06528-E0
Sound Level Meter Indoors	NTI XL2	A2A-12398-E0
Microphone / Preamp Outdoors	NTI M2230 / MA220	A22043 / 6471
Microphone / Preamp Indoors	NTI M2230 / MA220	A14300 / 6337
Calibrator	01dB CAL 01	11756

Table 1: Measurement E quipment

Two monitors were deployed for the survey period - one monitoroutdoors and the other indoors.



The outdoor monitor was positioned on grass, 2 meters above ground, away from any reflective surfaces. The topography and surrounding areas were predominantly flat. An all-weather kit was employed on the monitor to ensure the wind did not interfere with the accuracy of the measurement microphone.

The indoor monitor was positioned in a bedroom on the first floor. All windows were closed. The façade-located wall vent was open to provide normal levels of ventilation. The indoor monitor was positioned 1.5 meters above the floor in the centre of the room.

Photographs of each monitor are presented in the appendix of this report. The meters were calibrated before and after the survey to ensure no drift in the measurement accuracy. Weather conditions were calm for the duration of the survey. On the evening of the survey at the dwelling location, with a hand-held Pro Anemometer (HP-866B), temperatures were measured at 21 degrees Celsius. Wind speeds were measured to be less than 1 meter per second. There was relatively little cloud cover. According to the Met Eireann data from the Casement weather station, temperatures ranged from 13.5 degrees Celsius to 20.5 degrees Celsius over the survey period. Wind speeds ranged from 2 knots (1 m/s) to 12 knots (6 m/s) over the survey period. The predominant wind direction was 200 degrees (South South-West). 0.7mm of precipitation fell at 4am on 29<sup>th</sup> July.

Figure 1 indicates the meter positions. The red circle indicates the outdoor monitoring position. The blue circle is positioned over the bedroom in which the indoor monitor was located.



Figure 2: Monitoring Locations

Both meters were set to report on spectral data in one-third octaves at one-minute intervals. Each meter also logged noise levels every second. Audio recordings were captured so air traffic noise events could be identified, and the air traffic measurements dissociated from other potential noise occurrences.

### 3. Measurement Results

The daytime and nighttime equivalent noise levels are presented in Table 2 and Table 3. All detected air traffic noise events and associated levels are presented in Table 4 and Table 5. Each individual event from Table 4 and Table 5 were auditioned and verified as air traffic noise.

Table 2: Outdoor Day Night Levels

Outdoors			
Period	Result		
Daytime	52 dB Lday		
Nighttime	47 dB Lnight		
Day-Night	49 dB Ldn		

Table 3: Indoor Day Night Levels

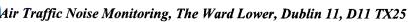
Indoors		
Period	Result	
Daytime	37 dB Lday	
Nighttime	22 dB Lnight	
Day-Night	36 dB Ldn	

Table 4: Individual Identified Air Traffic Noise Events and Associated Levels

Time	Duration	LAeq	LAFmax
2022-07-28 20:02:38	0:01:13	54.0	63.6
2022-07-28 20:14:31	0:00:51	50.8	57.9
2022-07-28 20:24:50	0:01:24	54.1	64.0
2022-07-28 20:26:44	0:01:07	56.3	63.4
2022-07-28 2029:09	0:01:00	51.0	57.9
202207-28 20:30:22	0:01:07	51.7	59.5
2022-07-28 20:31:44	0:01:13	52.8	60.3
2022-07-28 20:33:25	0:00:14	50.0	56.9
2022-07-28 20:33:47	0:00:33	50.4	57.2
2022-07-28 20:34:57	0:01:17	53.9	62.9
2022-07-28 20:38:22	0:01:20	51.3	58.7
2022-07-28 20:39:59	0:00:33	52.2	59.6
2022-07-28 20:43:20	0:01:26	54.9	65.2
2022-07-28 20:47:47	0:00:58	50.9	59.7
2022-07-28 20:57:35	0:01:00	48.4	57.1
2022-07-28 21:00:54	0:02:06	52.5	61.0
2022-07-28 21:03:19	0:01:57	51.1	58.5
2022-07-28 21:05:54	0:01:22	53.1	61.4
2022-07-28 21:07:30	0:01:50	52.9	62.5
2022-07-28 21:10:02	0:02:41	58.7	68.4



2022-07-28 21:16:42	0:01:10	55.9	62.2
2022-07-28 21:10:42	0:01:35	54.4	62.8
2022-07-28 21:28:15	0:01:15	56.7	67.1
2022-07-28 22:00:55	0:01:13	57.6	65.2
2022-07-28 22:00:55		54.3	64.5
	0:00:59	A SAME OF THE CONTRACT OF THE	58.3
2022-07-28 22:21:15	0:01:09 0:01:10	52.1	63.1
2022-07-28 22:44:18		54.4 50.7	61.3
2022-07-28 22:46:40 2022-07-28 22:50:37	0:02:40 0:01:46	54.0	70.5
	0:01:48	51.1	56.2
2022-07-28 22:56:53	HAN AND AND AND AND AND AND AND AND AND A		
2022-07-28 22:58:11	0:01:07	53.4	59.3 62.3
2022-07-28 23:01:42	0:00:57	55.4	
2022-07-28 23:05:43	0:01:05	56.6	62.9
2022-07-28 23:07:35	0:00:37	46.6	49.0
2022-07-29 00:16:23	0:00:17	53.2	61.2
2022-07-29 01:01:00	0:01:06	55.3	61.1
2022-07-29 01:04:15	0:00:57	49.6	54.5
2022-07-29 01:08:45	0:01:13	53.2	59.4
2022-07-29 01:26:20	0:00:50	44.7	50.0
2022-07-29 01:45:35	0:01:17	52.6	60.9
2022-07-29 01:47:47	0:00:50	53.2	57.7
2022-07-29 02:07:01	0:01:23	52.0	57.7
2022-07-29 02:14:30	0:01:05	47.6	53.1
2022-07-29 02:16:44	0:00:40	50.5	54.2
2022-07-29 02:25:10	0:01:10	47.2	56.4
2022-07-29 03:37:20	0:00:50	43.2	48.9
2022-07-29 03:38:30	0:02:10	50.7	58.1
2022-07-29 04:17:55	0:01:50	44.9	54.3
2022-07-29 04:35:30	0:01:25	46.4	56.9
2022-07-29 04:37:20	0:01:20	46.9	51.9
2022-07-29 05:54:18	0:01:09	54.3	64.4
2022-07-29 05:55:34	0:01:14	51.0	58.8
2022-07-29 05:57:12	0:01:03	51.2	58.5
2022-07-29 05:58:37	0:00:54	52.5	59.4
2022-07-29 06:00:08	0:01:03	52.6	61.3
2022-07-29 06:03:53	0:00:52	51.5	57.8
2022-07-29 06:08:09	0:01:18	53.0	60.6
2022-07-29 06:23:05	0:01:15	52.1	59.2
2022-07-29 06:27:31	0:01:12	54.1	60.7
2022-07-29 06:29:08	0:00:51	57.0	63.6
2022-07-29 06:30:37	0:00:45	53.6	60.4
2022-07-29 06:32:14	0:01:01	55.1	63.0
2022-07-29 06:33:38	0:00:54	58.6	65.2
2022-07-29 06:35:06	0:01:05	54.5	63.4
2022-07-29 06:36:34	0:01:14	57.4	67.3
2022-07-29 06:38:04	0:00:49	54.6	61.2
2022-07-29 06:39:18	0:01:03	56.2	65.1



2022-07-29 06:40:55	0:00:55	56.8	63.0
2022-07-29 06:42:19	0:00:58	56.8	62.8
2022-07-29 06:43:50	0:00:54	56.2	62.2
2022-07-29 06:45:13	0:00:54	57.5	65.6
2022-07-29 06:46:40	0:00:41	54.5	60.8
2022-07-29 06:49:16	0:01:00	56.6	66.0
2022-07-29 06:50:49	0:00:41	58.4	63.7
2022-07-29 06:53:57	0:00:59	55.8	63.3
2022-07-29 06:55:21	0:00:58	55.8	64.5
2022-07-29 06:56:47	0:00:50	56.0	64.6
2022-07-29 06:57:45	0:00:13	57.2	61.8
2022-07-29 06:58:19	0:00:55	57.9	64.6
2022-07-29 07:00:46	0:00:53	53.0	59.1
2022-07-29 07:00:40	0:01:02	54.8	61.4
2022-07-29 07:03:36	0:00:56	55.8	62.8
2022-07-29 07:05:01	0:00:56	57.4	66.3
2022-07-29 07:06:24	0:00:53	55.7	63.0
2022-07-29 07:09:59	0:00:56	54.7	62.1
2022-07-29 07:11:25	0:0036	56.0	62.7
2022-07-29 07:13:41	0:00:16	51.9	59.3
2022-07-29 07:15:36	0:01:04	57.5	66.7
2022-07-29 07:17:07	0:01:54	55.8	63.3
2022-07-29 07:18:27	0:00:44	57.6	67.2
2022-07-29 07:23:22	0:00:44	56.9	62.5
2022-07-29 07:24:45	0:00:51	56.9	62.2
2022-07-29 07:27:13	0:00:50	55.7	63.5
2022-07-29 07:28:28	0:00:29	51.4	60.7
2022-07-29 07:31:11	0:00:57	55.0	63.4
2022-07-29 07:32:41	0:00:42	54.9	61.4
2022-07-29 07:33:52	0:00:49	57.3	62.7
2022-07-29 07:35:12	0:00:50	59.0	63.9
2022-07-29 07:37:13	0:01:00	56.9	66.0
2022-07-29 07:38:30	0:01:00	56.6	64.3
2022-07-29 07:41:41	0:01:15	54.8	64.5
2022-07-29 07:43:11	0:01:00	56.2	64.2
2022-07-29 07:49:00	0:00:32	52.9	60.5
2022-07-29 07:51:28	0:01:06	56.0	64.5
2022-07-29 07:53:59	0:00:53	54.6	60.3
2022-07-29 07:58:59	0:01:00	57.1	63.8
2022-07-29 08:00:32	0:00:54	56.8	64.1
2022-07-29 08:02:00	0:00:41	53.3	59.7
2022-07-29 08:03:11	0:00:59	55. 7	61.9
2022-07-29 08:06:37	0:01:00	55.8	62.6
2022-07-29 08:07:48	0:00:58	55.1	62.1
2022-07-29 08:09:12	0:01:09	54.4	61.9
2022-07-29 08:11:57	0:01:08	57.3	65.8
2022-07-29 08:16:29	0:01:01	60.4	66.0



2022-07-29 08:19:12	0:01:03	53.5	61.0
2022-07-29 08:21:22	0:01:22	54.4	61.1
2022-07-29 08:28:11	0:01:32	62.6	73.3
2022-07-29 08:30:40	0:00:43	48.6	54.2
2022-07-29 08:49:07	0:00:15	44.8	49.1
2022-07-29 08:51:24	0:00:14	57.4	65.1
2022-07-29 08:51:48	0:00:14	44.7	52.9
2022-07-29 08:55:30	0:00:26	46.3	52.1
2022-07-29 08:57:15	0:00:31	48.9	54.0
2022-07-29 09:00:59	0:00:32	46.9	58.5
2022-07-29 09:03:51	0:00:34	45.1	51.8
2022-07-29 09:14:41	0:00:17	45.1	52.0
2022-07-29 09:18:41	0:00:25	50.8	57.1
2022-07-29 09:29:16	0:00:26	49.1	53.9
2022-07-29 09:29:58	0:00:18	48.6	55.8
2022-07-29 09:51:29	0:00:16	50.4	55.5
2022-07-29 09:56:13	0:00:29	47.3	53.1
2022-07-29 09:59:26	0:00:13	49.6	55.4
2022-07-29 10:07:11	0:00:19	43.8	49.3
2022-07-29 10:15:55	0:00:32	43.7	48.3
2022-07-29 10:36:27	0:00:13	51.5	56.7
2022-07-29 10:42:08	0:00:24	45.1	55.8
2022-07-29 10:58:21	0:00:23	53.7	59.5
2022-07-29 11:05:04	0:00:22	46.2	53.9
2022-07-29 11:05:29	0:00:28	47.9	54.8
2022-07-29 11:06:11	0:00:24	44.2	50.2
2022-07-29 11:08:16	0:00:26	42.4	46.0
2022-07-29 11:13:39	0:00:25	44.3	50.8
2022-07-29 11:15:21	0:00:07	44.5	50.6
2022-07-29 11:23:05	0:00:30	48.3	54.2
2022-07-29 11:25:17	0:00:32	41.8	45.8
2022-07-29 11:29:22	0:00:18	45.0	52.1
2022-07-29 11:31:31	0:00:15	46.9	51.0
2022-07-29 11:32:02	0:00:16	44.5	50.4
2022-07-29 11:48:35	0:00:13	53.3	58.4
2022-07-29 11:49:40	0:00:19	46.2	51.6
2022-07-29 11:53:32	0:00:27	43.4	48.5
2022-07-29 12:03:26	0:00:14	55.3	59.9
2022-07-29 12:10:16	0:00:54	46.0	52.9
2022-07-29 12:23:39	0:00:23	46.5	51.1
2022-07-29 12:26:51	0:00:25	44.0	50.2
2022-07-29 12:29:26	0:00:45	46.3	53.3
2022-07-29 12:37:29	0:00:32	49.9	53.9
2022-07-29 12:43:34	0:00:30	53.4	57.7
2022-07-29 12:48:36	0:01:00	49.9	55.3
2022-07-29 12:51:19	0:00:29	48.0	53.7
2022-07-29 12:58:52	0:00:21	45.8	52.5



2022-07-29 13:03:27	0:00:36	49.4	56.5
2022-07-29 13:20:40	0:00:13	53.6	59.3
2022-07-29 13:25:14	0:00:24	51.2	56.0
2022-07-29 13:28:37	0:00:17	51.1	56.5
2022-07-29 13:29:47	0:00:39	50.4	56.3
2022-07-29 13:30:35	0:00:11	47.6	51.1
2022-07-29 13:31:05	0:00:10	50.6	55.1
2022-07-29 13:35:12	0:00:25	50.5	56.0
2022-07-29 13:36:01	0:00:26	44.1	47.4
2022-07-29 13:36:52	0:00:04	45.7	50.5
2022-07-29 13:37:48	0:00:13	50.8	55.8
2022-07-29 13:40:48	0:00:14	49.8	54.5
2022-07-29 13:56:04	0:00:29	45.0	51.4
2022-07-29 14:04:46	0:00:14	51.5	56.1
2022-07-29 14:10:39	0:00:27	47.3	50.8
2022-07-29 14:13:19	0:00:25	53.5	58.8
2022-07-29 14:15:15	0:00:25	50.0	54.4
2022-07-29 14:18:49	0:00:30	53.3	58.5
2022-07-29 14:18:49	0:00:14	49.5	53.2
2022-07-29 14:25:05	0:00:13	54.1	57.8
2022-07-29 14:26:35	0:00:15	48.1	50.5
2022-07-29 14:48:53	0:00:36	50.6	58.8
2022-07-29 14:48:55	0:00:36	48.6	52.2
			57.8
2022-07-29 14:54:55	0:00:32	50.1 51.0	55.7
2022-07-29 15:04:35	0:00:10	50.8	55.2
2022-07-29 15:07:15	0:00:20	54.1	57.0
2022-07-29 15:10:13	0:00:07		
2022-07-29 15:10:46	0:00:23	53.7	58.5
2022-07-29 15:11:36	0:00:13	50.4	53.8
2022-07-29 15:16:08	0:00:16	51.9	57.4
2022-07-29 15:19:40	0:00:20	49.6	54.1
2022-07-29 15:21:16	0:00:19	50.7	54.7
2022-07-29 15:22:18	0:00:15	51.1	56.1
2022-07-29 15:40:17	0:00:16	54.6	57.6
2022-07-29 15:43:23	0:00:11	50.6	55.5
2022-07-29 15:46:18	0:00:58	56.9	65.2
2022-07-29 15:47:49	0:01:09	55.5	65.3
2022-07-29 15:49:42	0:00:31	51.4	59.4
2022-07-29 15:55:45	0:00:58	57.0	66.8
2022-07-29 15:58:02	0:01:01	54.5	61.5
2022-07-29 16:03:46	0:00:36	55.3	62.6
2022-07-29 16:06:33	0:00:49	56.1	61.8
2022-07-29 16:08:38	0:00:43	54.1	60.2
2022-07-29 16:10:42	0:00:12	54.5	59.1
2022-07-29 16:12:49	0:00:22	50.9	58.4
2022-07-29 16:13:16	0:00:13	49.9	53.1
2022-07-29 16:16:22	0:01:20	58.6	69.6



2022-07-29 16:19:02	0:00:43	54.5	62.2
2022-07-29 16:20:31	0:00:47	55.6	63.0
2022-07-29 16:23:08	0:00:57	50.6	57.8
2022-07-29 16:25:11	0:00:20	52.4	57.4
2022-07-29 16:25:44	0:00:46	55.3	62.0
2022-07-29 16:27:28	0:01:10	53.7	60.2
2022-07-29 16:30:26	0:01:06	55.2	63.0
2022-07-29 16:33:09	0:00:26	53.9	62.9
2022-07-29 16:34:01	0:00:19	56.3	61.6
2022-07-29 16:35:25	0:01:03	55.1	63.5
2022-07-29 16:37:49	0:01:20	56.1	63.6
2022-07-29 16:40:36	0:01:15	56.1	65.3
2022-07-29 16:43:38	0:01:22	52.5	59.2
2022-07-29 16:46:14	0:01:26	58.2	76.3
2022-07-29 16:48:45	0:01:35	51.3	60.6
2022-07-29 16:51:29	0:00:56	56.8	64.3
2022-07-29 16:58:27	0:00:42	48.0	56.4
2022-07-29 17:00:05	0:00:59	57.0	69.8
2022-07-29 17:03:30	0:01:12	55.7	65.2
2022-07-29 17:07:18	0:00:52	55.3	63.7
2022-07-29 17:09:59	0:01:10	56.2	68.2
2022-07-29 17:12:42	0:00:56	56.4	63.4
2022-07-29 17:15:20	0:00:55	55.6	72.7
2022-07-29 17:17:40	0:00:57	61.5	71.4
2022-07-29 17:19:53	0:01:00	55.6	62.1
2022-07-29 17:22:10	0:01:33	53.8	63.3
2022-07-29 17:25:30	0:00:37	52.0	59.0
2022-07-29 17:27:29	0:00:54	54.3	61.1
2022-07-29 17:30:20	0:01:05	53.8	64.5
2022-07-29 17:32:50	0:01:17	60.5	73.0
2022-07-29 17:35:31	0:00:45	51.6	58.9
2022-07-29 17:38:15	0:01:17	57.6	70.9
2022-07-29 17:41:40	0:01:15	55.4	64.6
2022-07-29 17:43:05	0:01:11	54.2	64.1
2022-07-29 17:44:28	0:00:55	57.0	68.4
2022-07-29 17:47:46	0:00:33	52.8	60.9
2022-07-29 17:49:30	0:01:27	55.8	65.8
2022-07-29 17:53:26	0:01:01	55.3	65.1
2022-07-29 17:55:55	0:00:53	55.4	66.3
2022-07-29 18:01:29	0:01:08	52.3	63.4
2022-07-29 18:05:22	0:00:53	54.0	61.0
2022-07-29 18:08:40	0:01:18	54.7	64.6
2022-07-29 18:11:08	0:01:01	57.2	68.0
2022-07-29 18:21:50	0:00:58	55.8	64.6
2022-07-29 18:24:39	0:00:46	55.8	65.0
2022-07-29 18:26:50	0:00:46	52.0	59.2



2022-07-29 18:32:00	0:01:17	53.9	65.4
2022-07-29 18:35:18	0:00:51	52.6	60.2
2022-07-29 18:37:00	0:00:36	61.1	70.3
2022-07-29 18:40:45	0:01:22	53.6	62.7
2022-07-29 18:43:50	0:01:04	56.7	67.5
2022-07-29 18:45:22	0:01:02	56.5	64.0
2022-07-29 18:46:52	0:01:06	56.1	64.7
2022-07-29 18:50:13	0:00:47	56.0	62.7
2022-07-29 18:52:11	0:01:11	60.9	72.9
2022-07-29 18:55:08	0:01:14	51.8	62.6
2022-07-29 18:57:30	0:01:04	51.7	60.1
2022-07-29 18:59:02	0:01:04	51.7	59.6
2022-07-29 19:02:26	0:01:19	56.4	69.2
2022-07-29 19:03:52	0:01:17	54.8	62.3
2022-07-29 19:05:50	0:01:22	54.1	63.2
2022-07-29 19:07:56	0:01:22	54.2	64.3
2022-07-29 19:11:13	0:01:05	56.5	64.9
2022-07-29 19:13:19	0:00:50	55.3	65.0
2022-07-29 19:14:49	0:01:13	55.1	64.8
2022-07-29 19:16:10	0:00:35	51.9	58.7
2022-07-29 19:17:57	0:01:10	53.9	64.2



Table 5: Individual Air Traffic Noise Event Levels, Indoors

Time	Duration	LAeq	LAFmax
2022-07-28 20:02:38	0:01:13	24.9	30.0
2022-07-28 20:14:31	0:00:51	22.5	29.1
2022-07-28 20:24:50	0:01:24	25.7	31.4
2022-07-28 20:26:44	0:01:07	27.3	34.0
2022-07-28 20:29:09	0:01:00	23.3	28.4
2022-07-28 20:30:22	0:01:07	24.0	34.9
2022-07-28 20:31:44	0:01:13	25.3	36.8
2022-07-28 20:33:25	0:00:14	24.8	29.9
2022-07-28 20:33:47	0:00:33	24.7	35.2
2022-07-28 20:34:57	0:01:17	25.9	34.8
2022-07-28 20:38:22	0:01:20	26.1	37.5
2022-07-28 20:39:59	0:00:33	24.8	30.6
2022-07-28 20:43:20	0:01:26	25.2	36.3
022-07-28 20:47:47	0:00:58	23.0	28.7
022-07-28 20:57:35	0:01:00	23.7	30.6
022-07-28 21:00:54	0:02:06	25.4	32.0
022-07-28 21:03:19	0:01:57	25.4	33.5
022-07-28 21:05:54	0:01:22	24.2	29.7
022-07-28 21:07:30	0:01:50	25.5	31.1
022-07-28 21:10:02	0:02:41	30.5	38.2
022-07-28 21:16:42	0:01:10	25.9	30.3
022-07-28 21:20:20	0:01:35	27.1	45.5
022-07-28 21:28:15	0:01:15	27.5	32.6
022-07-28 22:00:55	0:00:52	26.3	31.2
022-07-28 22:18:56	0:00:59	24.2	30.5
022-07-28 22:21:15	0:01:09	31.2	38.8
022-07-28 22:44:18	0:01:10	23.6	31.8
022-07-28 22:46:40	0:02:40	23.7	30.9
022-07-28 22:50:37	0:01:46	29.1	44.2
022-07-28 22:56:53	0:00:28	23.6	29.3
022-07-28 22:58:11	0:01:07	23.5	35.5
022-07-28 23:01:42	0:00:57	24.9	31.9
022-07-28 23:05:43	0:01:05	26.9	32.5
022-07-28 23:07:35	0:00:37	21.3	24.0
022-07-29 00:16:23	0:00:17	26.6	32.1
022-07-29 01:01:00	0:01:06	24.4	28.7
022-07-29 01:04:15	0:00:57	32.4	56.6
022-07-29 01:08:45	0:01:13	23.1	36.3
022-07-29 01:26:20	0:00:50	23.9	27.9
022-07-29 01:45:35	0:01:17	25.5	28.9
022-07-29 01:47:47	0:00:50	31.8	38.2
022-07-29 02:07:01	0:01:23	29.3	37.4
022-07-29 02:14:30	0:01:05	21.0	25.3
022-07-29 02:16:44	0:00:40	29.3	34.4



2022-07-29 02:25:10	0:01:10	20.2	25.1
2022-07-29 03:37:20	0:00:50	20.8	25.9
2022-07-29 03:37:20	0:02:10	26.6	34.4
2022-07-29 04:17:55	0:01:50	21.7	26.5
2022-07-29 04:35:30	0:01:25	22.5	30.6
2022-07-29 04:37:20	0:01:20	25.2	32.4
2022-07-29 05:54:18	0:01:09	24.1	33.2
2022-07-29 05:55:34	0:01:14	22.0	28.6
2022-07-29 05:57:12	0:01:03	21.7	30.0
2022-07-29 05:58:37	0:00:54	22.2	28.7
2022-07-29 06:00:08	0:01:03	21.8	28.9
2022-07-29 06:03:53	0:00:52	21.5	28.2
2022-07-29 06:08:09	0:01:18	23.3	30.0
2022-07-29 06:23:05	0:01:15	23.7	32.1
2022-07-29 06:23:03	0:01:12	24.2	30.9
2022-07-29 06:27:31	0:00:51	26.2	32.7
2022-07-29 06:29:08	0:00:45	24.5	31.1
2022-07-29 06:32:14	0:01:01	24.5	30.6
2022-07-29 06:33:38	0:00:54	26.6	34.2
2022-07-29 06:35:06	0:01:05	24.3	29.4
2022-07-29 06:36:34	0:01:14	26.9	30.9
2022-07-29 06:38:04	0:00:49	26.4	32.2
2022-07-29 06:39:18	0:01:03	26.1	32.2
2022-07-29 06:40:55	0:00:55	27.5	32.6
2022-07-29 06:42:19	0:00:58	28.1	35.2
2022-07-29 06:43:50	0:00:54	26.3	31.6
2022-07-29 06:45:13	0:00:54	26.5	34.2
2022-07-29 06:46:40	0:00:41	24.4	30.6
2022-07-29 06:49:16	0:01:00	26.3	34.3
2022-07-29 06:50:49	0:00:41	27.7	33.6
2022-07-29 06:53:57	0:00:59	25.1	31.1
2022-07-29 06:55:21	0:00:58	25.6	34.3
2022-07-29 06:56:47	0:00:50	24.1	28.5
2022-07-29 06:57:45	0:00:13	29.0	32.8
2022-07-29 06:58:19	0:00:55	28.0	33.3
2022-07-29 07:00:46	0:00:51	22.5	29.2
2022-07-29 07:00:48	0:01:02	24.2	29.0
2022-07-29 07:03:36	0:00:56	25.7	30.8
2022-07-29 07:05:01	0:00:56	27.9	34.1
2022-07-29 07:06:24	0:00:53	25.8	31.5
2022-07-29 07:09:59	0:00:56	24.1	32.7
2022-07-29 07:11:25	0:00:36	25.3	28.7
2022-07-29 07:11:23	0:00:16	22.4	27.3
2022-07-29 07:15:36	0:01:04	28.0	32.9
2022-07-29 07:17:07	0:00:53	25.8	32.6
2022-07-29 07:18:27	0:00:44	27.2	33.2
2022-07-29 07:18:27	0:00:44	26.2	33.4
2022-01-23 01.23.22	0.00.44	- Company of the Comp	



2022-07-29 07:24:45	0:00:51	27.0	33.1
2022-07-29 07:27:13	0:00:50	25.4	31.3
2022-07-29 07:28:28	0:00:29	25.0	30.4
2022-07-29 07:31:11	0:00:57	24.6	31.7
2022-07-29 07:32:41	0:00:42	26.2	33.6
2022-07-29 07:33:52	0:00:49	27.4	34.7
2022-07-29 07:35:12	0:00:50	30.0	40.1
2022-07-29 07:37:13	0:01:00	27.2	44.2
2022-07-29 07:38:30	0:01:00	26.8	33.8
2022-07-29 07:41:41	0:01:15	25.7	33.7
2022-07-29 07:43:11	0:01:00	26.8	34.2
2022-07-29 07:49:00	0:00:32	23.3	28.8
2022-07-29 07:51:28	0:01:06	25.6	33.4
2022-07-29 07:53:59	0:00:53	24.7	29.1
2022-07-29 07:58:59	0:01:00	28.6	36.9
2022-07-29 08:00:32	0:00:54	27.7	34.0
2022-07-29 08:02:00	0:00:41	25.0	30.3
2022-07-29 08:03:11	0:00:59	25.9	32.1
2022-07-29 08:06:37	0:01:00	27.4	35.8
2022-07-29 08:07:48	0:00:58	25.0	29.5
2022-07-29 08:09:12	0:01:09	26.2	35.7
2022-07-29 08:11:57	0:01:08	27.7	34.1
2022-07-29 08:16:29	0:01:01	30.7	37.6
2022-07-29 08:19:12	0:01:03	25.1	32.5
2022-07-29 08:21:22	0:01:22	24.6	34.6
2022-07-29 08:28:11	0:01:32	75.1	86.3
2022-07-29 08:30:40	0:00:43	27.1	35.8
2022-07-29 08:49:07	0:00:15	19.9	21.7
2022-07-29 08:51:24	0:00:14	29.4	35.2
2022-07-29 08:51:48	0:00:14	20.9	25.4
2022-07-29 08:55:30	0:00:26	19.3	22.5
2022-07-29 08:57:15	0:00:31	21.2	28.4
2022-07-29 09:00:59	0:00:32	19.4	22.3
2022-07-29 09:03:51	0:00:34	21.5	40.2
2022-07-29 09:14:41	0:00:17	19.7	The first of the second
2022-07-29 09:18:41	0:00:25	23.7	23.1
2022-07-29 09:29:16	0:00:26	21.3	29.9
2022-07-29 09:29:58	0:00:18	19.5	26.5
2022-07-29 09:51:29	0:00:16	24.9	22.9
2022-07-29 09:56:13	0:00:29	22.0	33.1 25.2
2022-07-29 09:59:26	0:00:13	25.5	38.6
2022-07-29 10:07:11	0:00:19	22.0	
022-07-29 10:15:55	0:00:32	19.2	39.0
022-07-29 10:36:27	0:00:13	24.1	22.7
022-07-29 10:42:08	0:00:24	21.6	28.1
022-07-29 10:58:21	0:00:23	27.0	38.0
022-07-29 11:05:04	0:00:22	21.0	33.9



2022-07-29 11:05:29	0:00:28	21.5	29.6
2022-07-29 11:06:11	0:00:24	21.8	28.6
2022-07-29 11:08:16	0:00:26	20.9	26.6
2022-07-29 11:13:39	0:00:25	22.8	31.7
2022-07-29 11:15:21	0:00:07	27.5	33.2
2022-07-29 11:23:05	0:00:30	24.7	32.3
2022-07-29 11:25:17	0:00:32	18.9	24.9
2022-07-29 11:29:22	0:00:18	18.4	21.3
2022-07-29 11:31:31	0:00:15	19.5	22.5
2022-07-29 11:32:02	0:00:16	18.8	20.1
2022-07-29 11:48:35	0:00:13	26.6	31.8
2022-07-29 11:49:40	0:00:19	20.4	24.7
2022-07-29 11:53:32	0:00:27	19.9	22.7
2022-07-29 12:03:26	0:00:14	28.0	32.7
2022-07-29 12:03:26	0:00:54	20.4	33.5
2022-07-29 12:10:10	0: 0023	19.8	21.8
2022-07-29 12:26:51	0:00:25	18.8	23.1
2022-07-29 12:29:26	0:00:45	19.6	24.3
2022-07-29 12:23:20	0:00:32	25.1	34.8
2022-07-29 12:37:29	0:00:30	28.7	44.4
2022-07-29 12:48:36	0:01:00	22.1	39.3
2022-07-29 12:51:19	0:00:29	22.1	37.8
2022-07-29 12:51:19	0:00:21	19.3	29.6
2022-07-29 12:58:52	0:00:36	23.2	31.4
	0:00:13	26.2	31.0
2022-07-29 13:20:40	0:00:24	24.8	29.6
2022-07-29 13:25:14	0:00:24	23.6	29.4
2022-07-29 13:28:37	0:00:39	23.3	29.7
2022-07-29 13:29:47	0:00:39	21.8	25.4
2022-07-29 13:30:35	0:00:10	22.8	28.1
2022-07-29 13:31:05	0:00:10	24.3	29.5
2022-07-29 13:35:12	0:00:25	20.1	33.2
2022-07-29 13:36:01	0:00:13	25.7	35.1
2022-07-29 13:37:48	0:00:14	22.9	26.8
2022-07-29 13:40:48		19.0	26.1
2022-07-29 13:56:04	0:00:29	25.8	30.1
2022-07-29 14:04:46	0:00:14	23.3	29.1
2022-07-29 14:16:15	0:00:10	26.3	32.0
2022-07-29 14:18:49	0:00:30	24.0	28.5
2022-07-29 14:22:24	0:00:14	26.9	31.4
2022-07-29 14:25:05	0:00:13	24.2	32.9
2022-07-29 14:48:53	0:00:36	23.7	27.1
2022-07-29 14:49:56	0:00:11	24.3	32.3
2022-07-29 14:54:55	0:00:32	THE RESIDENCE OF THE PARTY OF T	27.6
2022-07-29 15:04:35	0:00:10	23.9	28.7
2022-07-29 15:07:15	0:00:20	26.1	30.1
2022-07-29 15:10:13	0:00:07	27.7	31.3
2022-07-29 15:10:46	0:00:23	27.3	31.3



2022-07-29 15:11:36	0:00:13	23.5	26.4
2022-07-29 15:16:08	0:00:16	25.7	26.4
2022-07-29 15:19:40	0:00:20		31.0
2022-07-29 15:21:16	0:00:19	23.9	28.9
2022-07-29 15:22:18	POR CONTRACTOR OF THE PROPERTY	25.1	28.2
2022-07-29 15:22:18	0:00:15	26.0	30.6
2022-07-29 15:40:17	0:00:16	27.0	30.0
2022-07-29 15:45:25	0:00:11	23.9	29.2
2022-07-29 15:47:49	0:00:58	26.8	32.9
2022-07-29 15:47:49	0:01:09	26.8	33.4
2022-07-29 15:49:42	0:00:31	24.9	32.6
	0:00:58	27.0	33.8
2022-07-29 15:58:02	0:01:01	26.9	38.6
2022-07-29 16:03:46	0:00:36	28.8	37.9
2022-07-29 16:06:33	0:00:49	27.3	33.4
2022-07-29 16:08:38	0:00:43	26.2	29.7
2022-07-29 16:10:42	0:00:12	26.7	31.1
2022-07-29 16:12:49	0:00:22	23.7	29.8
2022-07-29 16:13:16	0:00:13	23.7	27.3
2022-07-29 16:16:22	0:01:20	29.2	38.4
2022-07-29 16:19:02	0:00:43	25.7	32.0
2022-07-29 16:20:31	0:00:47	26.4	32.3
2022-07-29 16:23:08	0:00:57	25.0	38.9
2022-07-29 16:25:11	0:00:20	26.1	29.8
2022-07-29 16:25:44	0:00:46	25.2	31.6
2022-07-29 16:27:28	0:01:10	26.1	32.0
2022-07-29 16:30:26	0:01:06	25.8	31.5
2022-07-29 16:33:09	0:00:26	25.7	30.9
2022-07-29 16:34:01	0:00:19	29.2	34.0
2022-07-29 16:35:25	0:01:03	26.7	33.1
2022-07-29 16:37:49	0:01:20	27.6	35.7
2022-07-29 16:40:36	0:01:15	27.8	36.9
2022-07-29 16:43:38	0:01:22	34.7	59.6
2022-07-29 16:46:14	0:01:26	27.9	36.2
2022-07-29 16:48:45	0:01:35	24.2	31.9
2022-07-29 16:51:29	0:00:56	27.8	38.7
2022-07-29 16:58:27	0:00:42	20.2	23.2
2022-07-29 17:00:05	0:00:59	27.2	35.9
2022-07-29 17:03:30	0:01:12	26.0	31.5
2022-07-29 17:07:18	0:00:52	27.1	38.2
2022-07-29 17:09:59	0:01:10	27.7	37.7
2022-07-29 17:12:42	0:00:56	27.3	33.7
2022-07-29 17:15:20	0:00:55	37.2	59.3
2022-07-29 17:17:40	0:00:57	32.2	40.3
2022-07-29 17:19:53	0:01:00	27.7	34.8
2022-07-29 17:22:10	0:01:33	25.5	32.2
2022-07-29 17:25:30	0:00:37	27.2	41.4
2022-07-29 17:27:29	0:00:54	25.1	33.3



2022-07-29 17:30:20	0:01:05	24.7	37.7
2022-07-29 17:32:50	0:01:17	30.2	39.3
2022-07-29 17:35:31	0:00:45	23.6	36.9
2022-07-29 17:38:15	0:01:17	29.0	43.3
2022-07-29 17:41:40	0:01:15	25.9	33.2
2022-07-29 17:43:05	0:01:11	25.0	31.1
2022-07-29 17:44:28	0:00:55	26.8	34.6
2022-07-29 17:47:46	0:00:33	24.4	32.2
2022-07-29 17:49:30	0:01:27	27.7	36.8
2022-07-29 17:53:26	0:01:01	26.2	31.5
2022-07-29 17:55:55	0:00:53	24.6	30.0
2022-07-29 18:05:22	0:00:53	25.8	34.4
2022-07-29 18:08:40	0:01:18	26.9	36.3
2022-07-29 18:11:08	0.01:01	28.0	35.4
2022-07-29 18:21:50	0:00:58	27.2	40.4
2022-07-29 18:24:39	0:00:46	26.4	36.6
2022-07-29 18:26:50	0:00:46	24.3	31.3
2022-07-29 18:29:22	0:01:01	26.6	35.5
2022-07-29 18:32:00	0:01:17	25.4	37.8
2022-07-29 18:35:18	0:00:51	24.9	38.1
2022-07-29 18:37:00	0:00:36	32.7	39.5
2022-07-29 18:40:45	0:01:22	26 .2	42.1
2022-07-29 18:43:50	0:01:04	27.7	40.8
2022-07-29 18:45:22	0:01:02	27.3	34.1
2022-07-29 18:46:52	0:01:06	27.2	36.8
2022-07-29 18:50:13	0:00:47	27.0	35.1
2022-07-29 18:52:11	0:01:11	30.7	41.1
2022-07-29 18:55:08	0:01:14	24.1	30.9
2022-07-29 18:57:30	0:01:04	23.8	31.0
2022-07-29 18:59:02	0:01:04	24.9	36.8
2022-07-29 19:02:26	0:01:19	26.6	32.8
2022-07-29 19:03:52	0:01:17	26.5	31.3
2022-07-29 19:05:50	0:01:22	25.4	34.2
2022-07-29 19:07:56	0:01:22	25.1	35.2
2022-07-29 19:11:13	0:01:05	27.5	32.5
2022-07-29 19:13:19	0:00:50	25.3	32.7
2022-07-29 19:14:49	0:01:13	25.8	31.7
2022-07-29 19:16:10	0:00:35	26.0	32.7
2022-07-29 19:17:57	0:01:10	24.8	34.6

The entire survey data is too large to append to this report. However, the full survey data set can be downloaded at the following link: <a href="https://www.iacoustics.net/house3\_noisedata/">https://www.iacoustics.net/house3\_noisedata/</a>

### Appendix I - Equipment Calibration Certificates

#### **Outdoor Meter**

## ERTIFICATE OF CALIBRATION

Gracey & Associates

**BSI CERTIFICATE** 

FS 25913

PAGE 1 OF 1

DATE OF ISSUE

26 November 2021 DATE OF CALIBRATION 25 November 2021 CERTIFICATE NUMBER 2021-1139

**Gracey & Associates** Barn Court Sheiton Road

Upper Dean PE28 0NQ Tel: 01234 708835 www.gracey.co.uk

**TEST ENGINEER** Jamie Bishop

APPROVING SIGNATORY

CALIBRATION INTERVAL 24 months

Equipment Description NTi XL2, s/n: a2a-06528-e0 Acoustic Analyser, NTi Audio

Customer

**iAcoustics** 

Unit A16, Kingswood Business Park, Clondalkin, Dublin, D22 A990

Standards BS EN 61672

Conditions

Atmospheric Pressure 101.0kPa

Temperature

22.0°C

Relative Humidity

34.5%

Calibration Reference Sources

Equipment

s/n

Last Cal

Equipment

S/N

Last Cal

Vaisala HMP23 S2430007

Druck DPI 141 479

06-Aug-20 03-Aug-20 HP 34401

3146A16728

30-Mar-21

Notes

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.

Copyright of this certificate is owned by Gracey & Associates and may not be reproduced other than in full except with their prior written approval.

Gracey & Associates is the trading name of W T Gracey Ltd. Registered in Upper Dean England No 1176412. Est. 1972 Hire and calibration of noise and vibration instruments under a BSI ISO 9001 quality management system, Cert No. FS 25913.

#### **Indoor Meter** 4.2

## ERTIFICATE OF CALIBRATION

ISSUED BY

Gracey & Associates

**BSI CERTIFICATE** 

DATE OF ISSUE

19 February 2021 DATE OF CALIBRATION 19 February 2021

CERTIFICATE NUMBER 2021-0302

**Gracey & Associates** Barn Court Shelton Road

PAGE 1 OF 1

Upper Dean PE28 0NQ

Tel: 01234 708835 Fax: 01234 252332

www.gracey.com

TEST ENGINEER

CALIBRATION INTERVAL 24 months

APPROVING SIGNATORY

Greg Rice

**Greg Rice** 

Equipment

NTi XL2 .s/n: a2a-12398-e0

Description

Hand Held Acoustic Analyser - Class 1, NTi Audio

Customer

**iAcoustics** 

Unit A16, Kingswood Business Park, Clondalkin, D22 A990

Standards

IEC 61672 Class 1

Conditions

Atmospheric Pressure 99.9 kPa

Temperature

24.8°C

Relative Humidity

34.6%

Calibration Reference Sources

Equipment S/N

Last Cal 06-Aug-20 Equipment

S/N

Last Cal

Druck DPI 141 479 Vaisala HMP23 S2430007

03-Aug-20

3146A29376 HP 34401

11-Feb-20

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.

Copyright of this certificate is owned by Gracey & Associates and may not be reproduced other than in full except with their prior written approval.

Gracey & Associates is the trading name of W T Gracey Ltd. Registered in Upper Dean England No 1176412. Est. 1972 Hire and calibration of noise and vibration instruments under a BSI ISO 9001 quality management system, Cert No. FS 25913.

#### 4.3 Outdoor Microphone / Preamplifier

## **Manufacturer Calibration Certificate**

The following instrument has been tested and calibrated to the manufacturer specifications. The calibration is traceable in accordance with ISO/IEC 17025 covering all instrument functions.

· Device Type:

M2230

**Measurement Microphone** 

consisting of

PreAmp

Serial Number:

6471

Capsule

Serial Number:

A22043

Customer:

**Integrated Acoustic Solution** 

Kingwood Business Park

Baldonell, Dublin

Ireland

· Date of Calibration:

08 March 2022

· Certificate Number:

44628-A22043-M2230

· Results:

**PASSED** 

(for detailed report see next page)

Tested by:

B.Dohmen

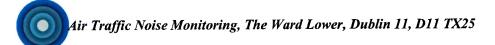
Signature:

Stamp:

NTI Audio GmbH
Frielingsdorfweg 4
45239 Essen
info@nti-audio.de

NTi Audio GmbH • Frielingsdorfweg 4 • 45239 Essen • Tel: +49 (0)201 6470 1900 www.nti-audio.de • info@nti-audio.de

1/2



Date.

08 March 2022

Calibration of:

M2230 consisting of

PreAmp

Serial Number:

6471

Capsule

Serial Number:

A22043

· Peformance on receipt:

defect

· Detailed Calibration Test Results:

System calibration

before

actual

calibration uncertainty<sup>1</sup>

Sensitivity @ 1 kHz, 114 dBSPL

41,4 mv/Pa

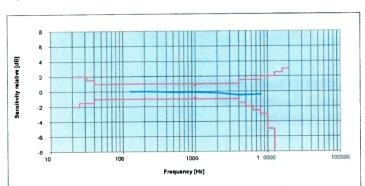
45,2 mV/Pa

t2 85%

Frequency response

Class 1

acc. IEC 61672



· Test Conditions:

Temperature:

23,9 °C

±0.5 °C

Relative Humidity:
Air Pressure:

27,4% 1008,9 hPa ±2% ±0.25 kPa

· Calibration Equipment Used:

- MTG Sound Calibrator, Type 4000, S/No. 32519 Last Calibration: 09.09.2021, Next Calibration: 09.09.2022 Kalibrierschein D-K-15008-01-00 2021-09
- NTi Audio Microphone M2230, S/No. 10485
   Last Calibration: 21.12.2021, Next Calibration: 21.12.2022
   Calibrated by NTi Audio meeting product specifications
- NT Audio Flexus FX 100, SN 11347
   Last Calibration: 03.09.2021, Next Calibration: 03.09.2022
   Calibrated by NTi Audio meeting product specifications
- NTi Audio XL2, S/No. A2A-14907-E0

NTi Audio GmbH • Frielingsdorfweg 4 • 45239 Essen • Tel: +49 (0)201 6470 1900 www.nti-audio.de • info@nti-audio.de

2/2

<sup>&</sup>lt;sup>1</sup> The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with the regulations of the GUM.



#### **Indoor Microphone / Preamplifier** 4.4

### CERTIFICATE OF CALIBRATION

ISSUED BY DATE OF ISSUE

Gracev & Associates 19 February 2021

**BSI CERTIFICATE** 

DATE OF CALIBRATION 19 February 2021

CALIBRATION INTERVAL 24 months

CERTIFICATE NUMBER 2021-0303

**Gracey & Associates** Barn Court Shelton Road

PAGE 1 OF 2

**TEST ENGINEER** 

APPROVING SIGNATORY

**Greg Rice** 

Upper Dean PE28 0NQ Tel: 01234 708835

> Fax: 01234 252332 www.gracey.com

Equipment

NTi MC230, s/n: A14300

Description

Microphone - 1/2" FF 48V, NTi Audio

Customer

**iAcoustics** 

Unit A16, Kingswood Business Park, Clondalkin, D22 A990

Standards

BS EN 61672 Class 1

Conditions

Atmospheric Pressure 99.9 kPa

Temperature

24.8°C

Relative Humidity

34.6%

**Calibration Data** 

Sensitivity

-27.44 dB

Calibration Reference Sources

Equipment S/N B&K 4134 T.

Stanford DS36 33213

HP 34401

1675305 3146A29376

Last Cal 14-Ju1-20 11-Feb-20 17-Aug-20

Equipment Druck DPI 141 479

S/N Nor 1253 20848 Vaisala HMP23 S2430007 Last Cal 06-Aug-20

14-Jul-20 03-Aug-20

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.

Copyright of this certificate is owned by Gracey & Associates and may not be reproduced other than in full except with their prior written approval.

Gracey & Associates is the trading name of W T Gracey Ltd. Registered in Upper Dean England No 1176412. Est. 1972 Hire and calibration of noise and vibration instruments under a BSI ISO 9001 quality management system, Cert No. FS 25913.

## CERTIFICATE OF CONFORMANCE

ISSUED BY DATE OF ISSUE **Gracey & Associates** 19 February 2021

**BSI CERTIFICATE** 

CERTIFICATE NUMBER 2021-0304

DATE OF CALIBRATION 19 February 2021

CALIBRATION INTERVAL 24 months

PAGE 1 OF 1

**Gracey & Associates** Barn Court Shelton Road Upper Dean PE28 0NQ

Tel: 01234 708835 Fax: 01234 252332

www.gracey.com

TEST ENGINEER

APPROVING SIGNATORY

Greg Rice

**Greg Rice** 

Equipment

NTi MA220, s/n: 6337

Description

Preamplifier - XL2, NTi Audio

Customer

**iAcoustics** 

Unit A16, Kingswood Business Park, Clondalkin, D22 A990

Standards

Manufacturer's Original Specifications

Atmospheric Pressure 99.9 kPa

Temperature

24.8°C

Relative Humidity

Conditions

34.6%

Calibration Reference Sources

Equipment

S/N

Last Cal

Equipment

S/N

Last Cal

Druck DPI 141 479

HP 34401

3146A29376

11-Feb-20

Vaisala HMP23 S2430007

06-Aug-20 03-Aug-20

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.

Copyright of this certificate is owned by Gracey & Associates and may not be reproduced other than in full except with their prior written approval.

Gracey & Associates is the trading name of W T Gracey Ltd. Registered in Upper Dean England No 1176412. Est. 1972 Hire and calibration of noise and vibration instruments under a BSI ISO 9001 quality management system, Cert No. FS 25913.



#### 4.5 Calibrator

Unit 2, Goldenbridge Industrial Estate, Tyrconnell Rd, Inchicore, Dublin, D08 YY38 www.sonitussystems.com Email: info@sonitussystems.com



**Calibration Report** 

**Equipment Information** 

Model:

CAL01

Serial Number:

11756

**Ambient Conditions** 

Measurement conditions were within the tolerances defined in BS EN 60942.

**Barometric Pressure:** 

1030 hPa

Temperature:

21.0 °C

**Relative Humidity:** 

49 %

#### Results

Calibrator Setting	Measured Parameter	Measured Value	Tolerance	Uncertainty +/-
94 dB, 1kHz	Sound pressure level (dB)	94.26	0.4 dB	0.14 dB
	Frequency (Hz)	1000.06	10 Hz	0.25 Hz
	Distortion (%)	0.20	3.0 %	0.3 %
114 dB, 1kHz	Sound pressure level (dB)	114.20	0.4 dB	0.14 dB
	Frequency (Hz)	1000.06	10 Hz	0.25 Hz
	Distortion (%)	0.35	3.0 %	0.3 %

RESULT: F

PASS

As public evidence was available, from a testing organization responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003

The manufacturers guidelines concerning free-field correction should be obvserved when using the calibrator.

#### Notes

- 1. All measurements were made with the half-inch configuration of the calibrator in place.
- 2. The measurement uncertainty is reported as a standard uncertainty multiplied by a coverage factor k=2 which, for a normal probability distribution, corresponds to a coverage probability of approximately 95%.
- 3. The given uncertainty corresponds to measured values only and does not relate to the long term stability of the device under test.
- 4. The user manual for the device under test was obtained from the manufacturer's website.

DA315.2 Acoustic Calibrator Calibration Certificate

2

## 5. Appendix II - Noise Monitor Photographs







Our Case Number: ABP-314485-22

Planning Authority Reference Number: F20A/0668



Liam O'Gradaigh Ward Cross The Ward Co. Dublin

Date: 08 November 2023

Re: A proposed development comprising the taking of a 'relevant action' only within the meaning of Section 34C of the Planning and Development Act 2000, as amended, which relates to the night-time use of the runway system at Dublin Airport.

Dublin Airport, Co. Dublin

Dear Sir / Madam.

Further to the Board's letter of 3rd October 2023 in which you were informed that the Board had received significant further information from the applicant in relation to the above appeal, the Board is publishing a newspaper notice in accordance with Article 113 of the Planning and Development Regulations, 2001 (as amended). The notice will be published in the Irish Times newspaper on 10th November 2023.

This notice will enable written submissions in relation to the further information to be made to the Board within 5 weeks beginning on the date of publication of the notice. The further information will be available for inspection and purchase at the offices of Fingal County Council and An Bord Pleanála. The further information will also be posted on the website of An Bord Pleanála at <a href="https://www.pleanala.ie/en-ie/case/314485">www.pleanala.ie/en-ie/case/314485</a>.

As you are an existing participant in this appeal, there is no requirement for you to pay a fee when submitting any further submission you may wish to make in this case.

Please contact the undersigned if you need any further information in respect of this process and quote the above appeal reference in any further telephone or written correspondence.

Yours faithfully,

Derne

Patrick Buckley Executive Officer

Direct Line: (01) 8737167

**BP77** 

Liam O'Gradaigh Ward Cross The Ward Co. Dublin

The Secretary
An Bord Pleanála
64 Marlborough Street
Dublin 1
D01 V902
14th December 2023

# RE: FURTHER INFORMATION PROVIDED TO AN BORD PLEANALA BY THE DAA ON PLANNING APPLICATION F20A/0668

Dear Sir/ Madam,

I welcome the letter from An Bord Pleanála, dated November 8<sup>th</sup>, 2023, requesting written submissions on the further information request from the Board to the daa. I note the information provided by the daa was deemed 'significant'. This information is highly complex and one that should be adjudicated on via an Oral Hearing.

The significant information provided by the daa fails to address the questions raised by the Board. The inclusion the revised EIAR Supplement highlights significant changes to the previous EIAR, mainly that whole new flight paths have been submitted. This is the third revision of the EIAR, and one must ask the Board how many chances an applicant gets. In previous submissions to the Planning Authority, ANCA and the Board, it has been highlighted that the flight paths in operation are not the ones used in the original planning permission. They were based on straight out flight routes and all the environmental assessments and baselines were based on these straight-out routes. In 2018, Fingal County Council signed off on compliance for Condition 7 on planning permission in relation to the dwelling insulation scheme. Fingal County Council employed AWN Consulting to review the insulation scheme and no issues were raised at that time in relation to the noise contours as they were based on straight-out flight paths. In the intervening years, the daa decided they wanted to use divergent flight paths. They presented a 15/75-degree option in a consultation in 2016. At this point in time the daa intended to submit a revised EIS and planning application to the Board. However, that was dropped in favour of the Relevant Action approach as part of the Aircraft Noise (Dublin Airport) Regulation Act 2019. But somewhere along the way the daa forgot to include flight paths changes in their planning application. They began operations on the North Runway in August 2022 and immediately it was noticeable to the public that the flight paths were incorrect. It took the daa 2 weeks before they made contact with the IAA to understand what had happened. Then in February 2023 they revised their flight paths once more. But still these flight paths did not adhere to the ones that were environmentally assessed in 2004-2007 and which formed part of Condition 1 of planning. Enforcement investigations have been underway with Fingal County Council for 16 months now and it's evident that they do not want to rule on this and are leaving up to the Board to decide. This is a terrible indictment of the local Planning

Authority and calls into question its independence. On that point, the Director of ANCA, Ms Ethna Felten, is also Deputy CEO of Fingal County Council. This is a clear breach of EU598/2014 and the Aircraft Noise (Dublin Airport) Regulation Act 2019.

(13) The competent authority responsible for adopting noise-related operating restrictions should be **independent** of any organisation involved in the airport's operation, air transport or air navigation service provision, or representing the interests thereof and of the residents living in the vicinity of the airport. This should not be understood as requiring Member States to modify their administrative structures or decision-making procedures.

#### Article 3:

2. The competent authorities shall be **independent** of any organisation which could be affected by noise-related action. That independence may be achieved through a functional separation.

The flight paths issue is just one condition of planning that Fingal County Council's enforcement department are dealing with. Fingal has taken enforcement proceedings against the daa over breaching Condition 5 and not adhering to 65 nighttime flights. This matter is subject of a Judicial Review early in 2024.

The daa have also breached the 32m passenger cap conditioned by the Board as part of Terminal 2's planning. They breached it in 2019 and are going to breach it again by the end of 2023. This once again shows the lack of respect for the Board by the daa and they believe they are above the planning laws of this country.

Another major issue central to the nighttime flights application and the expansion of aviation is the significant increase in Green House Gases (GHG) emissions. GHG emissions were never assessed for significance in the original planning for the North Runway and therefore no Baseline for emissions were established. Therefore, all emissions from the proposed Relevant Action need to be accounted for and these are 'major adverse' when accounted for based on the IEMA Guidelines. It is highly significant that the SEAI recently published a report, Energy in Ireland 2023 (<a href="https://www.seai.ie/publications/Energy-in-Ireland-2023.pdf">https://www.seai.ie/publications/Energy-in-Ireland-2023.pdf</a>), showing that International aviation accounted for 8.2% of Ireland's 2022 emissions, having risen 128% compared to 2021.

Table 7.1: Energy-related CO<sub>2</sub> by sector with comparison to previous years

	Quantity (MtCO <sub>2</sub> )				Share (%)			Change to 2022 (%)			
	2022	2021	2018	2012	2022	2021	2018	2012	2021	2018	2012
Electricity generation	10.07	10.27	10.64	12.93	27.6%	29.1%	27.0%	33.7%	-2.0%	-5.3%	-22.1%
Transport (excl. int. aviation)	11.48	10.82	12.07	10.58	31.5%	30.6%	30.6%	27.6%	+6.1%	-4.8%	+8.6%
Industry	3.74	4.02	4.06	3.17	10.3%	11.4%	10.3%	8.3%	-6.9%	-7.9%	+18.0%
Residential	5.65	6.71	6.79	7.05	15.5%	19.0%	17.2%	18.4%	-15.7%	-16.7%	-19.8%
Services	1.37	1.39	1.49	1.41	3.8%	3.9%	3.8%	3.7%	-1.4%	-8.0%	-2.7%
Agriculture	0.79	0.57	0.54	0.62	2.2%	1.6%	1.4%	1.6%	+39.0%	+46.9%	+27.3%
Fisheries	0.05	0.06	0.08	0.07	0.1%	0.2%	0.2%	0.2%	-7.9%	-36.6%	-23.3%
Other	0.30	0.21	0.42	0.79	0.8%	0.6%	1.1%	2.1%	+45.5%	-27.3%	-61.4%
Total (excl. int. aviation)	33.47	34.05	36.09	36.62	91.8%	96.3%	91.7%	95.5%	-1.7%	-7.2%	-8.6%
International aviation	3.00	1.32	3.28	1.74	8.2%	3.7%	8.3%	4.5%	+128%	-8.5%	+72.8%
Total (incl. int. aviation)	36.48	35.37	39.37	38.36	100.0%	100.0%	100.0%	100.0%	+3.1%	-7.4%	-4.9%

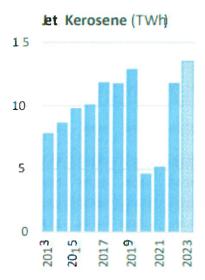
It also showed that Jet kerosene contributed 20.9% of energy related CO2 emission in transport:

Table 7.3: Growth rates, quantities and shares of energy-related CO₂ emissions in transport

		Quantity	(MtCO <sub>2</sub> )			Share (%)		Change to 202		2 (%)	
	2022	2021	2018	2012	2022	2021	2018	2012	2021	2018	2012
Diesel / gas oil	9.357	8.965	9.580	6.826	64.3%	73.6%	62.3%	55.3%	+4.4%	-2.3%	+37.1%
Jet kerosene	3.042	1.332	3.296	1.751	20.996	10.9%	21.4%	14.2%	+128%	-7.7%	+73.8%
Gasoline	2.044	1.795	2.414	3.727	14.0%	14.7%	15.7%	30.2%	+13.9%	-15.3%	-45.2%
Electricity	0.069	0.052	0.026	0.024	0.5%	0.4%	0.2%	0.2%	+33.1%	+170%	+185%
Natural gas	0.039	0.039	0.053	0.010	0.3%	0.3%	0.3%	0.1%	-0.1%	-25.4%	+299%
LPG	0.004	0.003	0.005	0.003	0.0%	0.0%	0.0%	0.0%	+39.2%	-12.4%	+62.2%
Fuel oil	0.0	0.0	0.0	0.0	0%	0%	0%	0%	-	-	-
Total	14.556	12.186	15.374	12.341	100.0%	100.0%	100.0%	100.0%	+19.4%	-5.3%	+17.9%

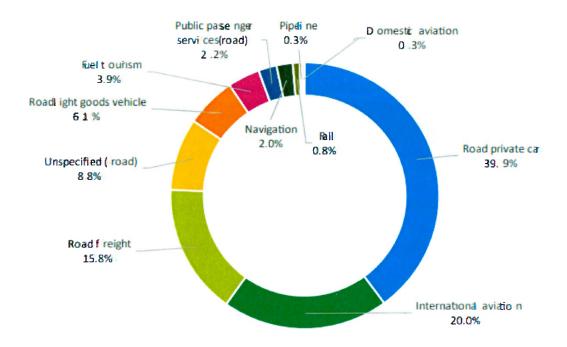
The SEAI also extrapolated the Jet kerosene use for the whole of 2023 based on the usage from January to September. It states:

"If the best estimate for 2023 jet kerosene demand proves accurate, then 2023 demand will be higher than pre-COVID 2019-levels."



International aviation contributed 20% of all transport energy use:

Figure 5.9: Sharesof sub-sectors in transport final energy



It's imperative that these highly significant GHG emissions from aviation are kept in line with Ireland's obligation under the Paris Agreement.

Significance of effects was never established in the original planning application. As a result, the daa has no baseline on which to determine significance with their proposal. It is not just the difference between the Permitted and Proposed scenarios that determines those significantly affected as the Permitted scenario was never assessed for significance. It also needs to be pointed out that the Permitted scenario is not equal to the baseline situation in 2007 or the consented scenario with straight out flight paths. It is also of note that the change to the new flight paths, acknowledged by the daa, was not stated on the Public Notice for the Relevant Action or on the Public Notice from An Bord Pleanála. This is a grave error and totally misleads the public who were not anticipated divergent flight paths.

Another serious concern with the daa's submission is that the health impacts of nighttime noise have not been assessed. The public have gone to great lengths to point out the stron recommendations of the WHO and the submissions from the HSE, yet the daa and ANCA fail to address health. Neither the daa nor ANCA assess the health costs and other negative impacts of increased aviation activity. Aviation cannot be subsidised, and the impact and cost picked up by the public and Health system.

The AA assessment by the applicant and the AA assessment from ANCA fail to assess the impacts on the Red Kite, which is an Annex I species. A full NIS was never carried out on the whole North Runway project. This is classic project-splitting and piecemeal development.

Another major flaw in the daa's proposal is that it is contrary to the objectives of Project Ireland 2024 and Balanced Regional Development. 90% of international aviation into Ireland is via Dublin Airport. The other airports must fight for the remaining 10%. As a result, the economic benefits of Dublin Airport are totally lob sided to Fingal, Dublin, and the Leinster region. How can Fingal County council be independent in its decision making when the economic benefits of Dublin Airport are felt strongest in Fingal?

ANCA reviewed the mitigation effectiveness at Dublin Airport for 2022 and reported that Dublin Airport failed the Noise Abatement Objective (NAO). This was mainly due to more of the population exposed to >55dB Lnight in close proximity to Dublin Airport. Those exposed to >55dB Lnight grew 7% compared to 2019, even though there were fewer aircraft movements. This is expected to grow in 2023 with higher movements again.

Notwithstanding this breach of the NAO in 2022, 2019 is a flawed year to use as the NAO baseline year. As mentioned above, in 2019, Dublin Airport facilitated 32.9m passengers, breaching the planning condition of 32m imposed by An Bord Pleanála. The Baseline year for the NAO should be in line with the EU Action Plan 'Towards a Zero Pollution for Air, Land and Soil', which refers to 2017.

It is also worth highlighting the population statistics exposed to noise from the EIAR Supplement.

- 326k people above the WHO 45dB Lden safe limit
- 168k people above the WHO 40dB Lnight safe limit
- 23,844 people Highly Sleep Disturbed
- 53,854 people Highly Annoyed

- 9,380 people significantly adversely affected, 553 very significantly affected and 176 profoundly affected at night.
- 6,805 more people subjected to > 50 N60 noise events compared to 2025
   Permitted.

It is very apparent that the Relevant Action leads to a serious deterioration in the noise situation for Fingal residents. Serious questions need to be asked about the daa's noise modelling. Only one portable noise monitor used to calibrate the North Runway. They have used fixed monitors from the South Runway to attempt to calibrate divergent flight paths on the North Runway. The North Runway has been in operation for over 16 months now. The daa and ANCA have had plenty of time to collect reliable real measurements from under the North Runway.

Due to the lack of monitoring the local community have had to go to great lengths and cost to carry out their own independent monitoring. Monitoring was performed at 3 locations under the North Runway flight paths for the entire 92-day summer period. The results of this monitoring show that the modelling presented in the EIAR Supplement is unreliable and very inaccurate. This modelling cannot be trusted. The community engaged independent Acoustic experts to provide an expert opinion on the modelling and that evidence is attached to this submission.

The proposed insulation scheme and mitigation measures proposed by the daa are insufficient to ensure that all significant effects are avoided, prevented, or reduced. The effects of aircraft noise on the cardiovascular system are indisputable and it can exacerbate preexisting cardiovascular disease. The WHO 2018 Guidelines evaluated the scientific literature up to 2015. Since then, there is increasing evidence supporting the adverse effects of aircraft noise, nighttime noise in particular, on health. The vulnerable in society are more susceptible. Aircraft noise can have long term and permanent effects on children's cognitive ability, mental and physical well-being. Sleep is disrupted by aircraft noise. The pattern and frequency of aircraft noise renders it more likely to cause sleep disturbance. With the proposal, communities impacted by the North Runway are somehow expected to get their full night's sleep in a restricted 6-hour timeframe (24:00-06:00). This is extremely unhealthy when sleep is disturbed and limited. This additional use of the North Runway at night also increases the significant adverse effects of the North Runway, contrary to the planning permission conditioned by ABP in 2007. Why increase the number of people significantly adversely affected and inflict serious noise and health problems or a whole new cohort of the population when there are alternatives available?

The regulatory decision has approved the NQS proposal from the daa. This is the only such NQS that doesn't have an associated movement limit. This is a farcical situation. ANCA's noise consultants, NCL, are based in the UK and are fully aware of the quota systems in use there. In fact, such schemes originated in the UK. To not assign a movement limit casts serious doubts on the independence of ANCA and their consultants.

Noise monitoring was conducted at our house prior to the North Runway coming into operation. The intent was to get a baseline without the North Runway. Note we are currently impacted by the South Runway operations and are part of a cohort of people who now find themselves trapped between both Runways. The noise impact is unavoidable as all rooms in the house are oriented to one or other of the Runways. There is no escaping the noise.

Below is a summary of the noise monitoring:

Table 2: Outdoor Day Night Levels

Outdoors				
Period	Result			
Daytime	52 dB Lday			
Nighttime	47 dB Lnight			
Day-Night	-19 dB Ldn			

Table 3: Indoor Day Night Levels

Indoors				
Period	Result			
Daytime	37 dB Lday			
Nighttime	22 dB Lnight			
Day-Night	36 dB Ldn			

These results show the impact of the South Runway operations on our dwelling prior to the North Runway coming into operation. We were already being exposed to 47dB Lnight which is above the WHO safe recommended limit of 40dB Lnight. The indoor measurement was taken in a bedroom at the back of the house oriented away from the South Runway.

We haven't commissioned new noise monitoring since the North Runway opened. With arrivals from the west to the North Runway it can be seen via WebTrak that LAmax values averaging 80dB are common at NMT3 (Bishopswood) which is in line and close to our house. These levels of noise are unbearable without any mitigation. Unfortunately, to date the daa have refused to provide us with a full insulation package.

I attach noise monitoring results from Ms Teresa Sweeney's house which is 1km from our home. The results show a LAeq16 value of 65dB for the 92-day summer period and 48dB Lnight for the same period. This dwelling is not impacted by North Runway arrivals from the West and so the Lnight would be far larger at our dwelling. But these noise measurements do show the contribution of the North Runway departures to the West and how they are reaching an average LAeq16 value of 65dB which is intolerable.

The biggest impact on our lives is the result of arrivals into the North Runway. The aircraft are so low and noisy, and it impacts severely on the use of our house. The external amenity of our house is obliterated during these westerly arrivals. Thankfully we are only exposed to these westerly arrivals on the North Runway 30% of the time due to the Wind direction.

However, the daa and ANCA average out these extremes of noise into annual averages. This takes no account of the extreme torment suffered during the 30% of the year. It should be noted that the Planning Authority took account of 100% directional use when developing the Noise Zones to ensure that on any given day that no new dwelling would be exposed to high levels of noise. Unfortunately, neither ANCA nor the Planning Authority applied this same logic to existing dwellings. The Planning Authority has deemed it a serious health risk for any new dwellings in Zone A, yet they see it as ok to inflict this same level of noise on existing dwellings in Zone A. This is a serious issue, and the noise zones show that existing dwellings in Zone A should be afforded immediately relief from the severe noise levels. Failure to do so contravenes the Fingal Development Plan.

Also included in this submission is a noise review conducted by Suono, taking account of the 92-day monitoring performed at 3 residential dwellings under the current North Runway flight paths. One would have expected either ANCA or the Planning Authority to have carried out such monitoring in order to independently validate the noise model presented by the daa in their EIAR Supplement. Unfortunately, neither body undertook this work and that in itself is very revealing. It has been left to the community to fund such monitoring and the results show that the noise model from the daa is not reliable and not calibrated correctly. The Board cannot trust the modelling from the daa and will have no alternative but to dismiss their application.

Notwithstanding the complexity of this application, we urge the Board to make a swift decision on this case. The local communities are suffering severe physical health, mental health and emotional health issues in relation to ongoing breaches by the daa of planning conditions imposed by the Board in 2007 when granting permission for the North Runway. How many breaches of planning are acceptable by the Board? Why are the daa allowed to carry on with impunity? An Bord Pleanála has a duty to ensure all planning and environmental laws are respected in their decision making. They also should take into account the proven track record of the daa breaching the very conditions laid down by the Board.

Previous submissions to the Planning Authority and ANCA from the 'St Margaret's The Ward Residents Group' included relocation options for the dwellings most impacted by noise and where ANCA's decisions would leave these people vulnerable to the adverse effects of Aircraft Noise. ANCA/ABP have the power to remove/amend the night-time restrictions and therefore the onus is on ANCA/ABP to find a safe environment for these people and their families to live. In their current Regulatory decision, ANCA have not explored relocation options or taken on board the residual health effects and costs associated with their decision. The community has proposed Thornton Hall as such a site that would be acceptable to the community and ANCA/ABP need to explore this option in depth. To finance this relocation scheme, the community has advocated an increase to the passenger charge imposed on travellers along the lines of the 'Polluter Pays' principal. The monies raised from such a charge could be ring fenced to purchase Thornton Hall or equivalent site and provide housing for the displaced residents. The cost is borne by the 'Polluter' and not by Government or the daa. The community most impacted knows that it cannot stand in the way of Dublin Airport but it wants proper recognition for the harms inflicted on them and for the community to be provided with proper relocation so they can continue to live amongst their community and families. The option of voluntary purchase is meaningless if you are displaced from your family and community.

In conclusion, we call on An Bord Pleanála to reject this Planning application and regulatory decision as there's no justification for it except inflicting health costs and carbon costs on the public. Planning is an afterthought for the daa. Their actions show they do not respect the decisions of the Board. It is 16 months now since the North Runway opened. Fingal County Council has taken enforcement proceedings against the daa in relation to the breach of Condition 5 (65 nighttime flights). The Council is also investigating the alleged illegal divergent flight paths off the North Runway. Unfortunately, for residents, the Council seems incapable of coming to a swift decision and appears to be waiting on the Board's decision in this Relevant Action application. It is therefore of upmost importance that the Board makes a decision in a timely manner to refuse permission for the Relevant Action application.

Yours sincerely,

Liam O'Gradaigh



### **Technical Note**

Project:

Newpark, The Ward,

Dublin

Job Number:

WDA230104

Date:

08/12/2023

Reference:

WDA230104TN\_1\_A\_02

Title:

Noise Assessment

Prepared By:

Sean Rocks

Reviewed By:

James Cousins

Client:

Teresa Sweeney

## Introduction

Following the commencement of operations of the new Dublin Airport North Runway, Wave Dynamics were engaged by Teresa Sweeney to assess the noise levels from aircraft flyovers using long term (92 Day) noise monitoring at Newpark, The Ward, Dublin, D11 EF2R.

The objective of the assessment was to quantify the existing noise environment and the current noise levels from aircraft noise from the operation of the new North Runway at Dublin Airport. The measured noise levels have been compared with the predicted noise levels from the DAA noise contours and industry criteria.

### 1.1 Statement of Competence

This assessment and report were completed by Wil Oshoke, Principal Consultant with Wave Dynamics, who has extensive experience assessing noise impact. His qualifications include a PhD in Acoustics (Dublin City University – School of Electronic Engineering). Wil is a member of Engineers Ireland (MIEI), a Corporate member of the Institute of Acoustics (MIOA), and a Chartered Engineer (CEng) with the UK Engineering Council Via the Institute of Acoustics.

The assessment and report were peer-reviewed by Sean Rocks, Director | Senior Consultant; Sean has experience with aircraft noise, particularly for planning and complaints investigation. Sean's qualifications include a BEng (Hons) in Mechanical and Manufacturing Engineering, a Diploma in Acoustics and Noise Control (Institute of Acoustics), an IOA Certificate of Competence in Environmental Noise Measurement and SITRI certified sound insulation tester. Sean is a member of both Engineers Ireland and the Institute of Acoustics.

This project was led by James Cousins, Managing Director | Principal Consultant with Wave Dynamics who has extensive experience in assessing noise and vibration from road and rail infrastructure on commercial and residential developments. James is an experienced consultant. His qualifications include; BSc (Hons) in Construction Management and Engineering, Pg Cert in Construction Law and Diploma in Acoustics and Noise Control (Institute of Acoustics) and an IOA Competence Cert in Building Acoustic Measurements. James is a member of both Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA) and is the current SITRI Chairman.



# 2 Baseline Noise Survey

Attended and unattended noise surveys were undertaken to quantify the noise levels from aircraft flyovers at the residence of Teresa Sweeney D11 EF2R. The attended noise measurements were conducted from 08:45hrs to 10:35hrs on 13<sup>th</sup> of September 2023 and from 12:00hrs to 14:00hrs on 19<sup>th</sup> October 2023. The unattended noise measurements were taken continuously from 00:00hrs on 14<sup>th</sup> of June 2023 to 20:00hrs on 17/09/2023. Sound exposure level measurements were also taken for aircraft flyovers during the attended noise survey.

## 2.1 Site Description and Measurement Locations

The site is on the R121 in Newpark, The Ward, Dublin as shown in Figure 1 below. The area is mainly agricultural, with sporadic residential dwellings and commercial properties. Dublin Airport is located to the residence's southeast, approximately 3 km from the edge of the new North Runway.



Figure 1: Site location and monitoring location L1 and SEL measurement location A1.

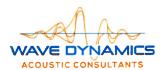




Figure 2: Site location in Relation to Dublin Airport and the new North Runway.

#### **Unattended Noise Measurements**

The unattended noise logger was deployed in location L1, as per Figure 1, to the rear garden of the residence. The logger was calibrated before and after the measurements, and no significant drift was noted. The logger was deployed at a height of approximately 4 m above the ground.

On review of the measurement data by WDA, days of unsuitable weather conditions had negligible effect on the daily L<sub>Aeq,16hour</sub> values and L<sub>ASmax,1min</sub> measurements. One night (night starting 18<sup>th</sup> of August) was affected by extraneous noise which has been filtered.



Figure 3: Noise Logger Setup



#### 2.1.1 Survey Period

Based on the data review, the measurements commenced at 00:00hrs on Wednesday, the 14<sup>th</sup> of June 2023 and finished at 20:00hrs on Sunday, the 17<sup>th</sup> of September 2023. The measurement duration was set to 1-minute intervals. It is understood that the North Runway was operational throughout the measurement period, initially between 09:00hrs and 20:00hrs until 4 July 2023, after which the operating hours of the North Runway were expanded to 07:00hrs to 23:00hrs.

The measurement period was set in line with Dublin Airport's busiest 92 day period, 16<sup>th</sup> of June to 15<sup>th</sup> September, around which the DAA contour maps are developed. Many of the Dublin Airport planning conditions have been set based on the predictions of noise levels over this 92-day period such as the home insulation scheme. Therefore the unattended noise monitoring undertaken allows for direct comparison of the measured noise levels to the DAA noise contour maps.

#### 2.1.2 Noise Measurement Equipment

A Class 1 sound level meter/noise logger, in general accordance with IEC 61672-1:2013, was used for the attended measurements. Table 1 below summarises the measurement equipment used.

Table 1: Noise Measurement Eq uipment

Description	WD Asset Number	Model	Serid No.	Calibration Certificate No.	Calibration Due Date
Sound Level Meter	SLM4	NTI XL2-TA	A2A-23316-E1	UK-23-100	01/09/2025
Calibrator	CAL1	Nor 1251	31056	AC230226	16/10/2024
Noise Monitor	-	EM2030-AO	01593	2201593	24/06/2024
Calibrator	Cal 2	Cirrus	99866	183284	16/11/2023
Sound Level Meter	SLM1	Nor 140	1405554	U38505/U38506 /U38507/U4495 3	27/07/2025
Calibrator	CAL3	Nor 1251	32096	U44813	10/07/2024

#### 2.1.3 Subjective Noise Environment

Based on the information provided during the attended noise survey and logger deployment, the following noise sources were identified:

- Aircraft Noise from Aircraft Fly Overs.
- Road noise from the R121
- Birdsong
- · Occasional activity from residents (cars arriving/departing, voices, etc.)

#### 2.2 Noise Measurement Results

This section outlines the results of the attended noise survey.

#### **Unattended Monitoring Results**

Table 4 in Appendix C of this report outlines the results of the noise levels recorded at the noise monitoring location L1 over the full monitoring period averaged over the following periods:

- LAeq,16hour 07:00 23:00
- LAeq.8hour 23:00 07:00



Figure 4 below highlights each of the daytime  $L_{Aeq,16hour}$  values and number of times they occurs over the full 92 day monitoring period. The graph indicates a significant median value of 66dBA with a total of 41 occurrences. This is 30 more occurrences than the next highest value at 65dBA (11 occurrences).

Based on the daily L<sub>Aeq,16hour</sub> measurements undertaken at the Teresa Sweeney residence as shown in Figure 4, the logarithmically averaged L<sub>Aeq,16hour</sub> for the full 92 day period is 65dBA.

A full breakdown of all the unattended measurement results is available on request.

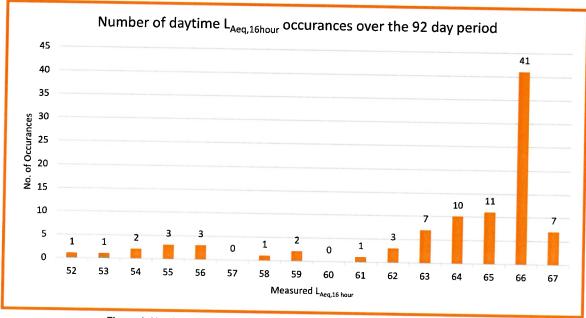


Figure 4: Number of daytime LAEQ.16hour occurrences over the full monitoring period

 $L_{\text{night}}$  values ranged from 43 to 54 dB with an average of 48dB  $L_{\text{night}}$ . An  $L_{\text{den}}$  level was also calculated for the 92 day period and was 65 dB  $L_{\text{den}}$ .

#### **Attended Monitoring Results**

Table 2 outlines the results of the attended measurements for aircraft flyover noise levels at location A1. The flyover sound exposure levels have been calculated from the measured  $L_{Aeq}$  levels.

The sound exposure level (SEL) from aircraft flyovers has been calculated using the following equation to allow direct comparison of the measured levels with the DAA predicted SEL contour maps:

$$L_{AX} = LAeq + 10*log_{10} (d1/d2) - 10*log_{10}(N) + 10*log_{10}(T)$$

Where:

L<sub>Ax</sub> measured SEL

N number of vehicle movements

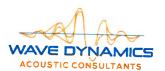
T time (seconds)

d1 distance from the source to the receiver

d2 distance from the source to the measurement



Table 2: Aircraft Flyover Noise Levels  Measurement		Aircraft Type	Measured Noise Levels		Sound Exposure Level		
Location	Date	Time (hrs)	D uration (sec)		LAeddB	L <sub>AFmax</sub> dB	L <sub>AX</sub> dB
A1	13/09/2023	08:45	43	Boeing 787-8	72	80	88
	13/09/2023	08:47	38	Boeing 737-8AS	74	80	90
A1	13/09/2023	08:49	36	Boeing 737-8AS	75	81	91
	13/09/2023	08:50	41	Boeing 737-8AS	74	81	90
A1	13/09/2023	09:00	29	Airbus A320-214	74	79	89
	13/09/2023	09:04	33	Airbus A320	66	73	81
 A1	13/09/2023	09:08	32	Embraer El80STD	73	80	88
	13/09/2023	09:10	44	Boeing 737-8AS	73	80	89
	13/09/2023	09:12	39	Embraer E190SR	72	79	88
 A1	13/09/2023	09:15	41	Boeing 737-8AS	74	81	90
	13/09/2023	09:16	48	Boeing 737-8AS	72	81	89
 A1	13/09/2023	09:18	41	Boeing 737 Max 8.200	69	79	85
A1	13/09/2023	09:20	39	Embraer EI80STD	72	82	88
	13/09/2023	09:24	39	ATR 72-600	64	71	80
	13/09/2023	09:33	46	Boeing 787-8	70	78	87
	13/09/2023	09:37	53	Dreamliner Boeing 737-8AS	76	84	93
A1	13/09/2023	09:40	40	Embraer Practor	66	72	82
	13/09/2023	09:42	42	600 Boeing 737-8AS	72	80	88
A1	13/09/2023	09:42	52	Boe ing 787-9	68	76	85
A1		09:50	36	Dreamliner Airbus A320-214	72	78	88
A1	13/09/2023	09:51	34	Boeing 737 Max	71	78	86
A1	13/09/2023		39	8 200 Boeing 737 Max	69	77	85
A1	13/09/2023	10:01	43	8.200 Airbus A321-	67	75	83
A1	13/09/2023	10:03		251NX Airbus A320-	64	70	80
A1	13/09/2023	10:10	40	291N Boeing 737-8AS	74	80	90
A1	13/09/2023	10:12	36		74	83	90
A1	13/09/2023	10:13	44	Boeing 737-8AS		81	90
A1	13/09/2023	10:17	42	Boeing 737-8AS	74		



Measurement			Aircraft Type	Measured Noise Levels		Sound Exposure Level		
Location	Date	Time (hrs)	Duration (sec)		L <sub>Aeq</sub> dB	L <sub>AFmax</sub> dB	L <sub>AX</sub> dB	
A1	13/09/2023	10:22	37	ATR 72-600	66	73	82	
A1	13/09/2023	10:24	39	Airbus A321- 211CP2F7	69	75	85	
A1	13/09/2023	10:28	41	Boeing 787-8 Dreamliner	71	79	87	
A1	13/09/2023	10:32	42	Airbus A320-214	70	77	86	
A1	13/09/2023	10:34	38	Boeing 787-8 Dreamliner	71	80	87	
A1	19/10/2023	12:13	41	Airbus A330	79	88	95	
A1	19/10/2023	13:08	45	Airbus A330-302	78	87	95	
A1	19/10/2023	13:34	44	Airbus A330-202	79	89	95	

SELs calculated on the rounded LAeq values measured.

#### **Analysis of Results** 3

#### 3.1 LAeq, 16hr Noise Levels

The most recently predicted noise contours for the North Runway operation as per the 2007 planning permission are the compliance contours submitted to Fingal County Council in 2016. Here, the predicted L<sub>Aeq,16hour</sub> (07:00hrs to 23:00 hrs) noise contours for Dublin Airport with the North Runway operational can be seen in Figure 5. The noise contours are developed by DAA based on the busiest 92 day period of the year for the airport, 16th June to 15th September.

Based on the DAA contour maps, Teresa Sweeney's residence is outside the lowest predicted contour therefore noise from aircraft flyovers would be expected to be below 60 dB LAeq,16hour. From the results of the unattended noise monitoring outlined in Table 4 (see Appendix C), the corresponding  $L_{\text{Aeq,16hour}}$  averaged over the same 92 day period as the DAA contour maps are developed is 65dB with a median value of 66dB. This demonstrates that the measured levels at the residence exceed the predicted levels by a minimum of 5dB when compared to the 92 day monitoring period of which the contours are based on.



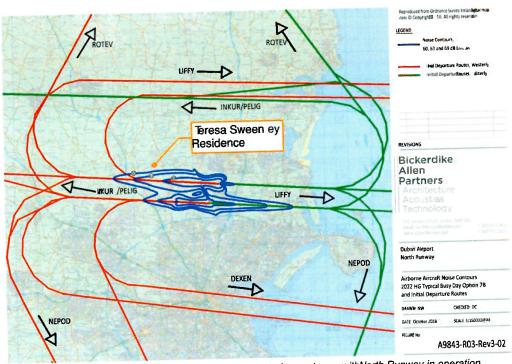


Figure 5: Predicted L<sub>Aeq,16hour</sub> (07:00 – 23:00) airport noise contours withNorth Runway in operation.

Noise contour maps presented in the most recently submitted EIAR supplement by DAA provided to ABP place Teresa Sweeney's dwelling outside the 63 dB L<sub>Aeq,16hr</sub> contour for the 2025 year scenario. Given that the measurements were undertaken during the summer of 2023 and they find noise levels are 65dB L<sub>Aeq,16hr</sub> it would indicate that the predicted noise contours from the aircraft flyovers do not match the actual measured values. This would place doubts on the accuracy of the predicted DAA contours when compared to real live measured data.

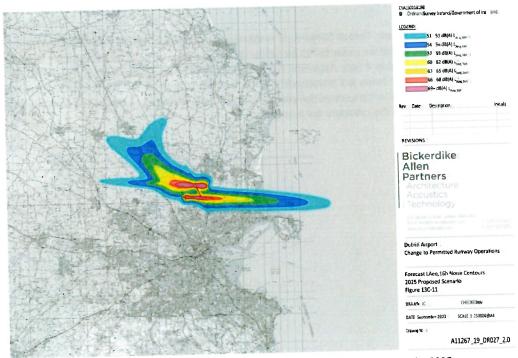


Figure 6: DAA predicted LAeq,16hour (07:00 - 23:00) airport noise contours for 2025.



An inward noise impact assessment was undertaken on the site previously as part of the planning application for the house which is outlined in AWN report JH/14/SSNR01 (Decision No. PF/1409/14 Reg Ref. F14A/0416). The assessment included a noise survey on the site. The survey was undertaken on 4<sup>th</sup> and 5<sup>th</sup> December 2014 prior to the commencement of the North Runway. The daytime recorded noise levels at the site (07:00hrs – 23:00hrs) were 52-53dBA for both days.

Comparing this to the current daytime noise levels at the site over the 92-monitoring period of 65dBA shows a significant increase in the onset noise levels at the dwelling from aircraft take offs on the North Runway. This equates to an increase of 12-13dBA of the onset noise levels on the site for the daytime period. A noise increase of that magnitude is very significant.

### 3.2 Lnight Noise Levels

As discussed the measured L<sub>night</sub> noise levels at Teresa Sweeney's property is relatively low often in the range of 43 to 45 dB L<sub>night</sub>. The proposed Relevant Action application will see an increase in night noise at the property. In the year 2025, the L<sub>night</sub> noise levels with the proposed development in place will result in noise levels increasing to be of the order of 55 to 59dB L<sub>night</sub>. This is a significant increase on the existing onset noise levels from aircraft on the dwelling.

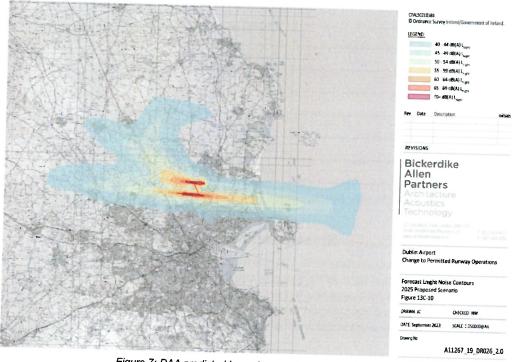


Figure 7: DAA predicted Lnight airport noise contours for 2025.

To establish the aircraft noise impact of the North Runway, Tables 13-2 and 13-3 (shown below in Figure 8 and Figure 9) of the *Dublin Airport North Runway EIAR Volume 2 – Main Report* can be used to determine both the absolute noise level and the change in noise level due to the North Runway operations.

Based on the predicted L<sub>night</sub> noise at the residence with the proposed development in place, as outlined in this section, an air noise impact scale description of "High" is appropriate for L<sub>night</sub>. Pairing this with a change in noise level of greater than 9dB due to North Runway operations to give a relative noise impact scale of "Very High" the magnitude of the effect of the North Runway can be described as "Profound" as per Table 13-4 of the *Dublin Airport North Runway EIAR Volume 2 – Main Report*.



Given the discrepancy between daytime noise levels measured versus contours predicted by DAA it is likely that the  $L_{night}$  noise impact here is being underestimated.

Table 13-2: Air Noise Impact Criteria (ab soute) - residential

Scale Description	Annual dB Lden	Annual dB Lnight	
Negligible	<45	<40	
Very Low	45 – 49.9	40 – 44.9	
Low	50 – 54.9	45 – 49.9	
Medium	55 – 64.9	50 – 54.9	
High	65 – 69.9	55 – 59.9	
Very High	≥70	≥60	

Figure 8: Dublin Airport North Runway EIAR Volume 2 – Main Report Table 13-2: Air Noise Impact Criteria (absolute)

## Table 13-3: Air Noise Imp actCri'eria (re latve)

Scale Description	Change in noise level, dB(A)		
Negligible	0 – 0.9		
Very Low	1 – 1-9		
Low	2 – 2.9		
Medium	3 – 5.9		
High	6 -8.9		
Very High	≥9		
,			

Figure 9: Dublin Airport North Runway EIAR Volume 2 - Main Report Table 13-3: Air Noise Impact Criteria (relative)

## 3.2.1 Calculation of LAeq,16hr Noise Levels from SEL Measurements

Based on the SEL measurements undertaken at the residence in combination with the information submitted by DAA to ANCA as part of the response to ANCA's review of the 2022 airport noise emission outlining the number of flights per aircraft type (included in Appendix B) the Laeq,16hr noise levels at the residence can be calculated to be compared with the unattended measurement results to confirm validity. The noise level for each aircraft type can be calculated using the following formula and then logarithmically added to predict the daily Laeq,16hour level as follows:

 $LAeq = L_{AX} - 10*log_{10} (d1/d2) + 10*log_{10}(N) - 10*log_{10}(T)$ 

Where:

L<sub>Ax</sub> measured SEL

N number of vehicle movements

T time (seconds)

d1 distance from the source to the receiver

d2 distance from the source to the measurement

A correction was then applied to the results to account for days of Easterly winds which totalled 12 days over the 92 day duration. Based on the above calculation and the recorded SEL for each aircraft type outlined in Table 2 the predicted L<sub>Aeq,16hour</sub> during the 92 day summer period in 2023 is 65dB(A).



This shows good agreement with the typical L<sub>Aeq,16hour</sub> measured over the full 92 day period of 65dB(A). Both the predicted L<sub>Aeq,16hour</sub> calculated from the attended measurements and the measured L<sub>Aeq,16hour</sub> exceed the DAA predicted 92 day contour map level at the residence which predicted less than 60 dBA for aircraft noise exposure.

## 3.3 Comparison of SEL Noise Levels

Sound exposure level (SEL) contours have been predicted by the DAA and their acoustic consultants Bickerdike Allen in relation to the noise abatement departure procedures (NADP) for the North Runway for the most common aircraft types:

- Boeing 737-800
- Airbus A320
- Airbus A330

The predicted SEL contours are shown for the above referenced aircraft type in Figure 10, Figure 11 and Figure 12 below, respectively.

For the DAA predicted SEL contours for the Boeing 737-800 as shown in Figure 10 below, Teresa Sweeney's residence currently lies just inside the 80dB(A) contour. Based on the recorded noise levels at the residence and calculated SELs as outlined in Table 2, the sound exposure level ranged 88-93 dB(A) for the Boeing 737-8AS with a logarithmical average SEL of 90dB(A), and 85-86 dB(A) for the Boeing 737-8200. This highlights a significant exceedance of the predicted SEL noise levels by up to 13dB(A).

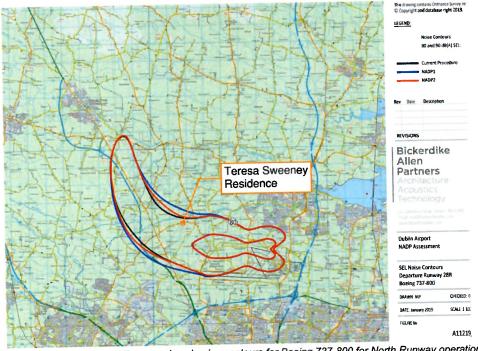


Figure 10: Predicted Sound Exposure Level noise contours for Boeing 737-800 for North Runway operation.

For the DAA predicted SEL contours for the Airbus A320 as shown in Figure 11 below, Teresa Sweeney's residence currently lies just outside the 80dB(A) contour for all departure procedures. Based on the recorded noise levels at the residence and calculated SELs as outlined in Table 2, the sound exposure level ranged 80 – 88 dB(A) for the Airbus A320 with a logarithmical average SEL of 86dB(A). This highlights a significant exceedance of the predicted SEL noise levels by up to 8dB(A).



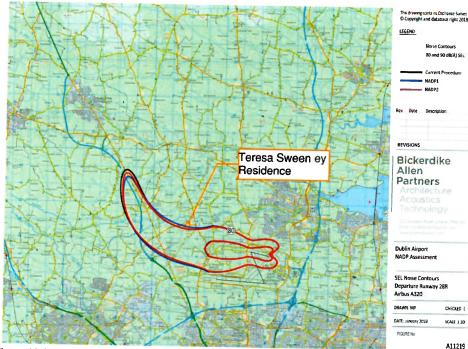


Figure 11: Predicted Sound Exposure Level noise contours for Airbus A320 for North Runway operation .

For the DAA predicted SEL contours for the Airbus A330 as shown in Figure 12 below, Teresa Sweeney's residence currently lies between the 80dB(A) and 90dB(A) contour all departure procedures. Based on the recorded noise levels at the residence and calculated SELs as outlined in Table 2, the sound exposure level was 95 dB(A) for the Airbus A330 for all measurements. This highlights a significant exceedance of the predicted SEL noise levels in excess of 5dB(A).

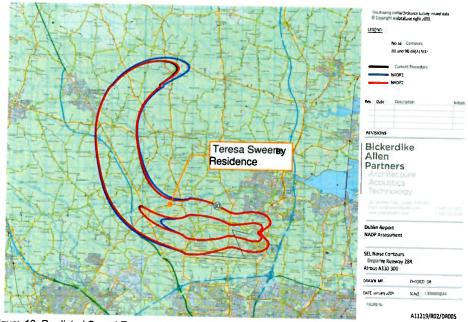


Figure 12: Predicted Sound Exposure Level noise contours for Airbus A320 for North Runway operation .



#### **LAmax Noise Levels** 3.4

Based on the unattended measurement results, the Lasmax,1min measurement data has been correlated to the aircraft type for each takeoff over the monitoring period. This section outlines a comparison of the DAA predicted L<sub>Amax</sub> noise levels with the measured L<sub>ASmax</sub> noise levels recorded at the Teresa Sweeney residence for the four most common aircraft types.

- Boeing 737-800
- Boeing 737max
- Airbus A320
- Airbus A330

#### **Boeing 737**

Figure 13 below outlines the number of LASmax occurrences for Boeing 737 aircraft over the full 92 day period at the monitoring location. The DAA predicted L<sub>Amax</sub> noise levels for the Boeing 737-800 are shown further below in Figure 14 which place Teresa Sweeney's residence on the edge of the 70dB contour for all departure procedures. A comparison of the DAA predicted maximum noise levels with the measured levels show a significant increase at the residence due to aircraft takeoffs. The modal LASmax value recorded at the residence for Boeing 737 aircraft was 80dB, with 691 occurrences. This is a significant increase over the DAA predicted maximum noise levels by 10dB.

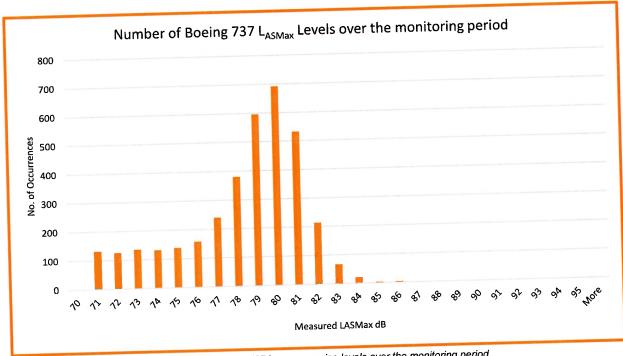


Figure 13: Number of Boeing 737 LASmax,1min noise levels over the monitoring period



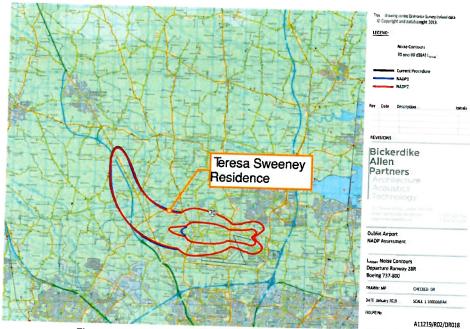


Figure 14: DAA predicted LAmax noise contours for Boeing 737-800

In addition, the recorded L<sub>ASmax</sub> noise levels for the Boeing 737-max aircraft have been plotted as shown in Figure 15 below which shows a modal L<sub>ASmax</sub> of 76dB with 283 occurrences. This shows an exceedance of 6dB over the DAA predicted maximum noise levels.

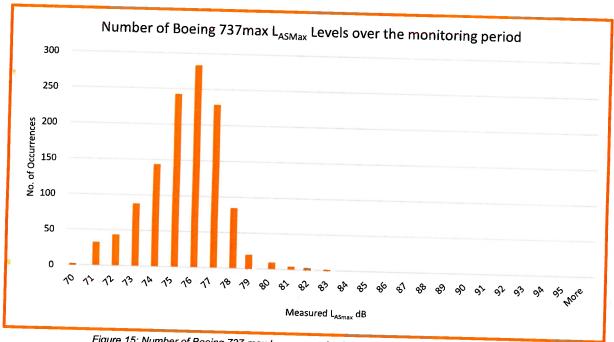


Figure 15: Number of Boeing 737-max L<sub>ASmax,1min</sub> noise levels over the monitoring period

#### Airbus A320

Figure 16 below outlines the number of Lasmax occurrences for Airbus A320 aircraft over the full 92 day period at the monitoring location. The DAA predicted Lamax noise levels for the Airbus A320 are shown further below in Figure 17 which place Teresa Sweeney's residence outside the 70dB contour for all departure procedures. A comparison of the DAA predicted maximum noise levels with the measured levels show a significant exceedance at the residence due to aircraft takeoffs. The modal Lasmax value recorded at the residence for Airbus A320



aircraft was 78dB, with 677 occurrences. This is an exceedance of the DAA predicted maximum noise levels by a minimum of 8dB however in reality the exceedance is likely higher than this.

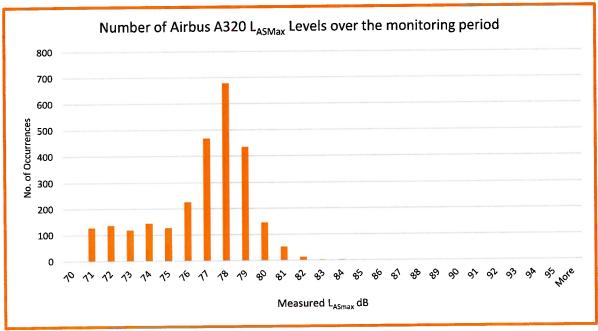


Figure 16: Number of Airbus A320 LASmax, 1min noise levels over the monitoring period

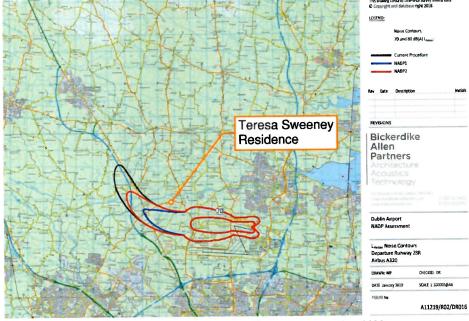
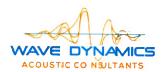


Figure 17: DAA predicted LAmax noise contours for Airbus A320

#### Airbus A330

Figure 18 below outlines the number of LASMAX occurrences for Airbus A320 aircraft over the full 92 day period at the monitoring location. The DAA predicted LAMAX noise levels for the Airbus A320 are shown further below in Figure 19 which place Teresa Sweeney's residence on the edge of the 70dB contour for all departure procedures. A comparison of the DAA predicted maximum noise levels with the measured levels show a significant exceedance at the residence due to aircraft takeoffs. The modal LASMAX value recorded at the



residence for Airbus A330 aircraft was 83dB, with 78 occurrences. This is an exceedance of the DAA predicted maximum noise levels by a minimum of 13dB, in addition to many recorded levels higher than 83dB.

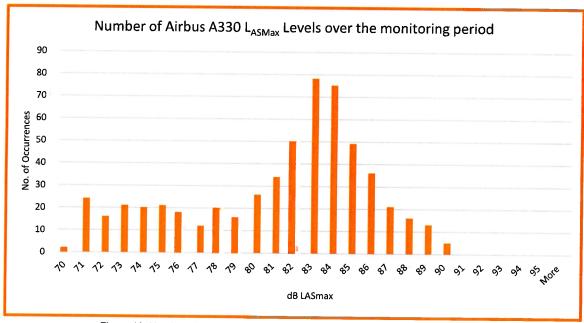


Figure 18: Number of Airbus A330 L<sub>ASmax, 1min</sub> noise levels over the monitoring period

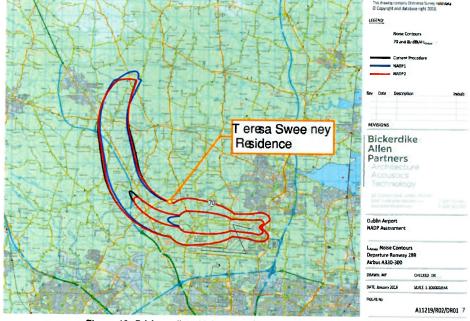


Figure 19: DAA predicted LAmax noise contours for Airbus A330

### 3.5 External Amenity Spaces

To consider the noise impact of aircraft noise on the residence, the recorded noise levels have been compared to the industry criteria for the external amenity spaces. ProPG 2017 and BS8233:2014 provide the following guidance in relation to external amenity spaces which state that:



"the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range  $50 - 55 \, dB \, L_{Aeq,16hr}$ ".

Based on the noise monitoring results where the prevailing wind was easterly and therefore aircraft were taking off to the east from the South Runway, it can be determined that the  $L_{Aeq,16hour}$  noise levels at the residence were typically in the range of 53 - 55dB(A). This is in line with the ProPG 2017 and BS8233 criteria for external amenity noise levels. The noise levels recorded during days of easterly winds indicate that the noise levels at the residence are so low such that the higher noise levels caused by aircraft take offs during westerly winds are not affected by any other non-aircraft noise sources.

As outlined in Section 3.1, the average daytime noise levels at the residence rose to 65dB(A) when averaged over the full 92 day period and had a median value of 66dB(A). This is an increase of approximately 10-12dB due to North Runway operations and is an exceedance of the industry criteria for external amenity noise levels based on the measured noise levels without aircraft. This is an increase of 12-13 dB when compared with the 2014 site survey.

## 4 Conclusion

Following the commencement of operations of the new Dublin Airport North Runway, Wave Dynamics were engaged by Teresa Sweeney to review the 92-day unattended noise monitoring results and undertake sound exposure level measurements at Newpark, The Ward, Dublin, D11 EF2R

The objective of the assessment was to quantify the existing noise environment and the current noise levels from aircraft noise following the commencement of the operation of the North Runway. The measured noise levels have been compared with the predicted noise levels from the DAA noise contours and industry criteria.

Based on the results of the unattended noise monitoring at the residence, a 92 day average L<sub>Aeq,16hour</sub> of 65dB(A) was recorded which shows a significant exceedance of the DAA predicted contour maps which predict a level of less than 60dB(A) over the same 92 day period.

Sound exposure level measurements have also been taken at the residence and thus used to calculate the 92 day average  $L_{Aeq,16hour}$  based on the number of aircraft types over the 92 day period which predicted an  $L_{Aeq,16hour}$  of 65dB(A).

Both the predicted L<sub>Aeq,16hour</sub> calculated from the attended measurements and the measured L<sub>Aeq,16hour</sub> exceed the DAA predicted 92 day contour map level at the residence which predicted less than 60 dBA for aircraft noise exposure. In addition these have been compared to the DAA 2025 predicted noise contours which are 63dBA at the dwelling. The measurements undertaken in 2023 do not correlate with the most recent DAA noise contours this places doubts over the accuracy of the DAA contours when compared to actual measured data from the same period.

The DAA predicted L<sub>night</sub> contours have been compared to the existing nighttime noise levels at the dwelling. Based on the *Dublin Airport North Runway EIAR Volume 2 – Main Report* it is likely that commencement of nighttime flights will have a "Profound" impact on the noise levels at the residence.

Sound exposure level measurements for the three most common aircraft types were also compared to the DAA predicted noise contours for the same aircraft types which showed exceedances for all three aircraft types of up to 13dB(A).

Lasmax values over the full 92 day monitoring period for the three most common aircraft types were compared to the DAA predicted noise contours for the same aircraft types. All three aircraft types showed exceedances over the predicted maximum noise levels with the worst case aircraft having a modal Lasmax value of 13dBA in excess of the predicted noise levels.



## Appendix A-Glossary of Terms

Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the dB

logarithm of the ratio between the RMS pressure of the sound field and the reference pressure

of 20 micro-pascals (20 μPa).

An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible dB(A)

frequency range (20 Hz - 20 kHz) with A-frequency weighting (i.e. 'A'-weighting) to

compensate for the varying sensitivity of the human ear to sound at different frequencies.

The unit of sound frequency in cycles per second. Hertz

A-weighted sound level just exceeded for 90% of the measurement period and calculated by L<sub>A90</sub>

statistical analysis. See also the background noise level.

A-weighted, equivalent continuous sound level. LAeq

A-weighted, maximum, sound level measured with a fast time-constant - maximum is not LAFmax

peak



# **Appendix B – Volume of Flights per Aircraft Type**

The volume of flights per aircraft type have been submitted to DAA by ANCA and are outlined below in Table 3.

Table 3: Volume of each aircraft type over the entire year and over summer period

	2023							
Aircraft Type		Annual	Average		S	ummers Per	iod	
	Annual Day	Annual Eve	Annual Night	Annual 24hr	Summer Day 16hr	Summer Night	Summer 24hr	
Airbus A300	0	0	0	0	0	0	0	
Airbus A306	595	298	298	1190	262	87	350	
Airbus A319	2083	0	0	2083	612	0	612	
Airbus A320	38379	10115	4165	52659	14246	1224	15470	
Airbus A320neo	3273	1488	298	5058	1398	87	1486	
Airbus A321	1785	893	595	3273	787	175	961	
Airbus A321neo	5355	0	595	5950	1573	175	1748	
Airbus A330	8628	0	893	9520	2535	262	2797	
Airbus A330neo	0	0	0	0	0	0	0	
Airbus A350	0	0	0	0	0	0	0	
ATR 42	0	0	0	0	0	0	0	
ATR 72	9223	2083	0	11305	3321	0	3321	
BAe 146/Avro RJ	0	0	0	0	0	0	0	
Boeing 737-400	595	1190	595	2380	524	175	699	
Boeing 737-500	0	0	0	0	0	0	0	
Boeing 737-700	0	0	0	0	0	0	0	
Boeing 737-800	38974	10710	4463	54147	14596	1311	15907	
Boeing 737 MAX	17553	6545	2975	27073	7079	874	7953	
Boeing 757	2380	298	298	2975	787	87	874	
Boeing 767	1190	1190	595	2975	699	175	874	
Boeing 777	1190	0	595	1785	350	175	524	
Boeing 777X	0	0	0	0	0	0	0	
Boeing 787	3570	0	595	4165	1049	175	1224	
Bombardier CS300	1190	595	0	1785	524	0	524	
Bombardier Dash 8	595	0	0	595	175	0	175	
Convair 580	0	0	0	0	0	0	0	
Embraer E190/195	4165	1785	298	6248	1748	87	1835	
Embraer E190-E2	595	0	0	595	175	0	175	
HS748A	0	0	0	0	0	0	0	
Lockheed C130	0	0	0	0	0	0	0	
McDonnell Douglas	0	0	0	0	0	0	0	
MD83	0	0	0	0	0	0	0	
Piper PA34	0	0	0	0	0	0	0	
Shorts SD330/360	0	0	0	0	0	0	0	



				2023			
		Annual	Summers Period				
Aircraft Type	Annual Day	Annual Eve	Annual Night	Annual 24hr	Summer Day 16hr	Summer Night	Summer 24hr
Other	1488	298	0	1785	524	0	524
Total	142804	37486	17255	197546	52964	5069	58034



# **Appendix C - Unattended Noise Monitoring Results**

Table 4 below outlines the noise levels recorded at location L1 over the period 14th of June 2023 to 17th of September 2023. The results are averaged over the following periods:

- LAeq,16hour 07:00 23:00
- LAeq.8hour 23:00 07:00

Table 4: Unattended Measurement Results

Date	Start Time	End Time	Average L <sup>Aeq,</sup>
44/06/0000	07.00		
14/06/2023	07:00	23:00	53
14/06/2023	23:00	07:00	48
15/06/2023	07:00	23:00	54
15/06/2023	23:00	07:00	48
16/06/2023	07:00	23:00	58
16/06/2023	23:00	07:00	47
17/06/2023	07:00	23:00	53
17/06/2023	23:00	07:00	43
18/06/2023	07:00	23:00	52
18/06/2023	23:00	07:00	47
19/06/2023	07:00	23:00	64
19/06/2023	23:00	07:00	47
20/06/2023	07:00	23:00	59
20/06/2023	23:00	07:00	47
21/06/2023	07:00	23:00	64
21/06/2023	23:00	07:00	48
22/06/2023	07:00	23:00	56
22/06/2023	23:00	07:00	47
23/06/2023	07:00	23:00	65
23/06/2023	23:00	07:00	47
24/06/2023	07:00	23:00	64
24/06/2023	23:00	07:00	46
25/06/2023	07:00	23:00	65
25/06/2023	23:00	07:00	48
26/06/2023	07:00	23:00	65
26/06/2023	23:00	07:00	48
27/06/2023	07:00	23:00	64
27/06/2023	23:00	07:00	48
28/06/2023	07:00	23:00	65
28/06/2023	23:00	07:00	49
29/06/2023	07:00	23:00	64
29/06/2023	23:00	07:00	47
30/06/2023	07:00	23:00	64
30/06/2023	23:00	07:00	48
01/07/2023	07:00	23:00	64
01/07/2023	23:00	07:00	46
02/07/2023	07:00	23:00	65
02/07/2023	23:00	07:00	48
03/07/2023	07:00	23:00	64





D ate	Start Time	End Time	Average L <sup>Aeq,T</sup>
03/07/2023	23.00	07:00	49
04/07/2023	07:00	23:00	66
04/07/2023	23:00	07:00	49
05/07/2023	07:00	23:00	66
05/07/2023	23:00	07:00	48
06/07/2023	07:00	23:00	63
06/07/2023	23:00	07:00	49
07/07/2023	07:00	23:00	56
07/07/2023	23:00	07:00	49
08/07/2023	07:00	23:00	64
08/07/2023	23:00	07:00	45
09/07/2023	07:00	23:00	65
09/07/2023	23:00	07:00	46
10/07/2023	07:00	23:00	62
10/07/2023	23:00	07:00	55
11/07/2023	07:00	23:00	65
11/07/2023	23:00	07:00	53
12/07/2023	07:00	23:00	66
12/07/2023	23:00	07:00	48
13/07/2023	07:00	23:00	66
	23:00	07:00	46
13/07/2023	07:00	23:00	59
14/07/2023		07:00	48
14/07/2023	23:00	23:00	65
15/07/2023	07:00		49
15/07/2023	23:00	07:00	66
16/07/2023	07:00	23:00	49
16/07/2023	23:00	07:00	
17/07/2023	07:00	23:00	66
17/07/2023	23:00	07:00	46
18/07/2023	07:00	23:00	62
18/07/2023	23:00	07:00	46
19/07/2023	07:00	23:00	66
19/07/2023	23:00	07:00	51
20/07/2023	07:00	23:00	66
20/07/2023	23:00	07:00	51
21/07/2023	07:00	23:00	66
21/07/2023	23:00	07:00	47
22/07/2023	07:00	23:00	66
22/07/2023	23:00	07:00	45
23/07/2023	07:00	23:00	61
23/07/2023	23:00	07:00	45
24/07/2023	07:00	23:00	66
24/07/2023	23:00	07:00	47
25/07/2023	07:00	23:00	66
25/07/2023	23:00	07:00	48
26/07/2023	07:00	23:00	63
26/07/2023	23:00	07:00	47
27/07/2023	07:00	23:00	66
27/07/2023	23:00	07:00	47
28/07/2023	07:00	23:00	66





	BARBAR BARBARA BARBARA		
Date	Start Time	End Time	Average L <sup>Aeq,T</sup>
28/07/2023	23:00	07:00	47
29/07/2023	07:00	23:00	66
29/07/2023	23:00	07:00	46
30/07/2023	07:00	23:00	67
30/07/2023	23:00	07:00	47
31/07/2023	07:00	23:00	65
31/07/2023	23:00	07:00	48
01/08/2023	07:00	23:00	66
01/08/2023	23:00	07:00	47
02/08/2023	07:00	23:00	64
02/08/2023	23:00	07:00	46
03/08/2023	07:00	23:00	66
03/08/2023	23:00	07:00	47
04/08/2023	07:00	23:00	66
04/08/2023	23:00	07:00	53
05/08/2023	07:00	23:00	65
05/08/2023	23:00	07:00	45
06/08/2023	07:00	23:00	66
06/08/2023	23:00	07:00	46
07/08/2023	07:00	23:00	66
07/08/2023	23:00	07:00	47
08/08/2023	07:00	23:00	
08/08/2023	23:00	07:00	66
09/08/2023	07:00	23:00	47
09/08/2023	23:00	07:00	66 45
10/08/2023	07:00	23:00	54
10/08/2023	23:00	07:00	
11/08/2023	07:00	23:00	48
11/08/2023	23:00	07:00	66
12/08/2023	07:00	23:00	47
12/08/2023	23:00	07:00	66
13/08/2023	07:00	23:00	45
13/08/2023	23:00		66
14/08/2023	07:00	07:00	47
14/08/2023	23:00	23:00	66
15/08/2023	07:00	07:00	46
15/08/2023	23:00	23:00	66
16/08/2023	07:00	07:00	48
16/08/2023	23:00	23:00	63
17/08/2023	07:00	07:00	46
17/08/2023	23:00	23:00	55
18/08/2023	07:00	07:00	46
18/08/2023	23:00	23:00	56
19/08/2023	07:00	07:00	54
19/08/2023		23:00	66
20/08/2023	23:00	07:00	46
20/08/2023	07:00	23:00	67
21/08/2023	23:00	07:00	48
	07:00	23:00	66
21/08/2023	23:00	07:00	48
22/08/2023	07:00	23:00	66





Date	Start Time	End Time	Average L <sup>Aeq,T</sup>
22/08/2023	23:00	~ 07:00	48
23/08/2023	07:00	23:00	66
23/08/2023	23:00	07:00	47
24/08/2023	07:00	23:00	66
24/08/2023	23:00	07:00	48
25/08/2023	07:00	23:00	67
25/08/2023	23:00	07:00	46
26/08/2023	07:00	23:00	66
26/08/2023	23:00	07:00	45
27/08/2023	07:00	23:00	66
27/08/2023	23:00	07:00	47
28/08/2023	07:00	23:00	66
28/08/2023	23:00	07:00	48
29/08/2023	07:00	23:00	66
29/08/2023	23:00	07:00	48
30/08/2023	07:00	23:00	67
30/08/2023	23:00	07:00	46
31/08/2023	07:00	23:00	63
31/08/2023	23:00	07:00	46
01/09/2023	07:00	23:00	67
01/09/2023	23:00	07:00	45
02/09/2023	07:00	23:00	65
02/09/2023	23:00	07:00	45
03/09/2023	07:00	23:00	66
03/09/2023	23:00	07:00	46
04/09/2023	07:00	23:00	63
04/09/2023	23:00	07:00	50
05/09/2023	07:00	23:00	55
05/09/2023	23:00	07:00	49
06/09/2023	07:00	23:00	63
06/09/2023	23:00	07:00	50
07/09/2023	07:00	23:00	55
07/09/2023	23:00	07:00	49
08/09/2023	07:00	23:00	62
08/09/2023	23:00	07:00	46
09/09/2023	07:00	23:00	66
09/09/2023	23:00	07:00	44
10/09/2023	07:00	23:00	66
10/09/2023	23:00	07:00	46
11/09/2023	07:00	23:00	63
11/09/2023	23:00	07:00	46
12/09/2023	07:00	23:00	66
12/09/2023	23:00	07:00	48
13/09/2023	07:00	23:00	66
13/09/2023	23:00	07:00	48
14/09/2023	07:00	23:00	67
	23:00	07:00	47
14/09/2023	07:00	23:00	67
15/09/2023	23:00	07:00	44
15/09/2023	07:00	23:00	65
16/09/2023	07.00	25.00	