



Short Term Noise Monitoring Program, *Connelly's Marsh*

7 June 2024 – 12 December 2024

Version Control

Version	Date	Comments	Sections
1.0	20 December 2024	Initial Version	All

Summary

Deployment Purpose

This deployment aims to capture noise levels in support of the Noise Abatement Procedure (NAP) trial, which commenced in June 2024. Specifically, it focuses on capturing noise levels of arrivals using the RNP-AR approach and the longer RNAV approach to RWY 30.

Deployment monitoring Period

07 June 2024 – 12 December 2024

Monitoring Details

Capture zone: 2.5km radius x 13,123ft (4,000m) altitude.

Noise threshold settings by time of day: 00:00-04:59 = Threshold 43dB(A), 05:00-09:59 = Threshold 45dB(A), 10:00-11:59 = Threshold 50dB(A), 12:00-23:59 = Threshold 49dB(A).

Key Findings

- **Noise Correlation**
95.9% of the aircraft from Hobart Airport, as per the focus group, generated noise events that correlated to the aircraft.
- **Noise Daily Distribution**
The distribution of the maximum noise levels generated by aircraft falls within the following ranges:
 - 72.6% within the range of 60dB(A) to 70dB(A)
 - 26.7% less than 60dB(A)
 - 0.7% greater than 70dB(A).
- **Most Common aircraft**
The most prevalent aircraft type during the deployment period was the B738 aircraft.
- **Top loudest noise events**
The top 10 noise events for this deployment originated from community sources. Additionally, the top 10 correlated noise events were associated with community sources in addition to aircraft noise.
- **Busiest Day**
The purpose was to analyze the day that had the most significant impact on the community. The busiest day during the deployment period occurred on 29 November 2024. The focus group busiest day (YMHB jet aircraft arrivals to runway 30) occurred on 23 September 2024

Glossary of Terms

A	Arrivals
Background noise Level (L90)	The noise level in dB(A) that is exceeded 90% of the time. It is considered the background noise level of an environment.
Capture Zone	The region relative to the noise monitor that an aircraft can be within and be able to be correlated to a noise event.
Correlated Noise Event (CNE)	A noise event matched to an aircraft movement that flew through the capture zone.
D	Departures
Data Availability	The degree of data completeness achieved during the deployment period. The data availability percentage factors in any monitor outages that occur.
Day	6:00am-10:00pm
dB(A)	A-weighted decibel. It is an expression of the relative loudness of sounds as perceived by the human ear.
General Aviation	Movements other than scheduled commercial airline operations. This includes private, sports, charter and training operations.
H	Helicopter operations
LaMax	Each noise event will have a peak noise level which is referred to as the maximum sound level in dB(A) or LaMax
Movement	An aircraft operation, such as an arrival or departure
Night	10:00 pm to 6:00 am
NMT	Noise Monitoring Terminal also referred to as the noise monitor.
Noise Event	A noise event is created when the noise level exceeds the threshold settings for a specified period.
O	Overflight i.e. an aircraft movement that flew over the area but did not arrive or depart from the airport of concern.
Overall Correlation Percentage	The total number of correlated noise events (CNE) is divided by the total number of aircraft movements through the capture zone to calculate the overall correlation percentage.
RWY	Runway
T	An operation by an aircraft that arrives and departs on a runway without stopping or exiting the runway. It is also known as Touch and Go.
Threshold	The threshold represents the value that the noise level must surpass for a specified period to create a noise event.
YMHB	Hobart Airport, Tasmania

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1 Purpose

The short-term noise monitoring program targeted locations in suburbs chosen by Airservices Australia with consideration for community feedback. This deployment aims to capture noise levels in support of the Noise Abatement Procedure (NAP) trial, which commenced in June 2024. Specifically, it focuses on capturing noise levels during arrivals of the RNP-AR approach and the longer RNAV approach to RWY 30. Furthermore, an extensive analysis was conducted for the busiest day of the deployment period. This day was chosen for its potential to provide significant statistical data and insight into a day that had the greatest impact on the community during the deployment. The analysis provided details of the loudest noise events experienced and the most prevalent aircraft operations observed.

To adequately depict the variation in flight paths, weather conditions, and operational patterns from Hobart Airport movements during the trial, a monitoring period from 7 June 2024 to 12 December 2024 was deemed sufficient. However, the monitor will remain in place as part of the ongoing short term monitoring program.

This short-term monitor was deployed in Connellys Marsh. The noise monitoring terminal (NMT) was positioned to capture aircraft within a three-dimensional cylinder capture zone. The zone spans a radius of 2.5km and extends to 13,123ft (4,000m) above the NMT site level as depicted in Figure 1. Considering that the focus group of aircraft operates below 5,000ft (1,524m), a ceiling of 13,123 (4,000m) was adopted to accommodate potential variations.

The Focus Group for this deployment consists of aircraft operating to the east of Hobart Airport which include:

- Fixed-wing jet aircraft arriving to runway 30 of YMHB.

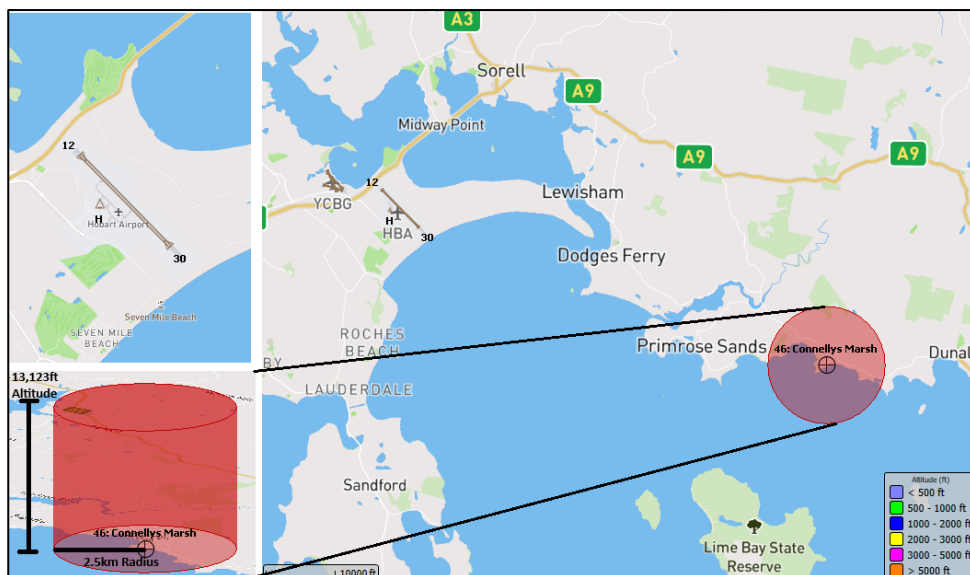


Figure 1: NMT Correlation Zone

2 Deployment Details

The Connellys Marsh monitor was installed on 06 June 2024. Complete data is available from 07 June 2024 to 12 December 2024.

NMT ID	46
Deployment Period	07/06/2024 – 12/12/2024
Location	Fulham Road, Dunalley, Tas 7177
NMT Altitude	66ft (20m)
Capture Zone	2.5km radius x 13,123ft (4,000m) altitude
Data Availability	99.9%
Threshold Settings¹	The noise detection thresholds which have been selected: <ul style="list-style-type: none"> • 00:00-04:59 = Threshold 43dB(A) • 05:00-09:59 = Threshold 45dB(A) • 10:00-11:59 = Threshold 50dB(A) • 12:00-23:59 = Threshold 49dB(A)

Table 1: NMT Details

3 Findings

3.1. Noise Correlation Summary

The total number of aircraft correlated noise events (CNEs) that were captured by the noise monitor during the 6-month deployment period is shown in Table 2 below.

	All Movements ²	Hobart Airport Movements	Hobart Airport Focus Group
Number of Movements through capture zone	3647	3386	2079
Number of CNE	3424	3219	1993
Correlation Summary	93.9%	95.1%	95.9%

Table 2: Aircraft correlation rate

92.8% of all operations that passed through the capture zone were Hobart Airport movements. A one-week sample of these movements is shown in Figure 2, below. Other operations included

¹ Threshold setting procedures are explained in section 6.1.1.

² All-movement tab accounts for operations to and from other airports (E.g. Hobart Cambridge and Edinburgh Airports) as well as YMHB operations.

traffic from other airports, such as Hobart Cambridge and Edinburgh Airports. A correlation of 95.9% was achieved for the focus group of Hobart Airport movements.

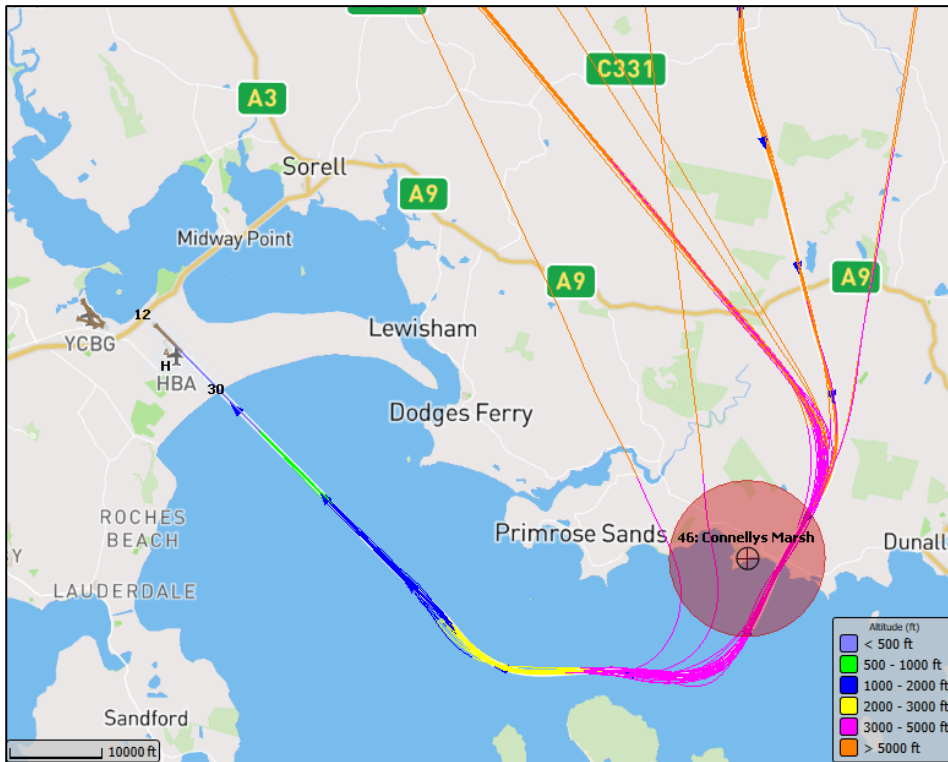


Figure 2: One week of Hobart Airport flight tracks passing through the correlation zone

The findings obtained during the short-term deployment at Connellys Marsh are as follows:

- Arrival runway 30 accounts for 62% of the operations from Hobart Airport over the noise monitor.
- Departure runway 12 accounts for 37% of the operations from Hobart Airport over the noise monitor.
- The average LaMax and highest LaMax for arrival and departure runways are detailed in Table 3, below.

Operation Type	Runway	Average LaMax noise dB(A)	Highest LaMax dB(A)
Hobart Airport Arrival	30	64.2	87.9
Hobart Airport Departure	12	63.9	79.6

Table 3: Average LaMax and highest LaMax noise levels corresponding to each runway.

3.2. Daily Distribution of Correlated Noise Events

A summary of the total number of correlated noise events by time of day, and the minimum to maximum number of CNE on any day, are summarized below in Table 4.

Correlated Noise Event (CNE)	Day Time Count (6:00am-10:00pm)	Night-time Count (10:00pm-6:00am)	Min number of CNE per day	Max number of CNE per day
N- Above ³ 50 dB(A) (N50+ ⁴)	3125	219	2	31
N- Above 60 dB(A) (N60+ ⁴)	2299	116	0	27
N- Above 70 dB(A) (N70+ ⁴)	24	0	0	3

Table 4: Total correlated noise events during deployment period by time

Examination of the N-above distribution values in Figure 3 and Figure 4 (below) show that the highest daytime noise levels (N70+) were recorded on 1 August 2024. 72.6% of the maximum noise level generated by aircraft falls within a range of 60dB(A) to 70dB(A), 26.7% of the maximum noise level generated by aircraft is less than 60dB(A) and 0.7% of the maximum noise level generated by aircraft is greater than 70dB(A).

³ N-above (or Number-above) is defined as the number of noise event with a LaMax above the specified (eg.N50+) value.

⁴ N50+, N60+, N70+ are expressed as number of noise events with a LaMax above 50dB(A), 60 dB(A) and 70 dB(A), respectively.

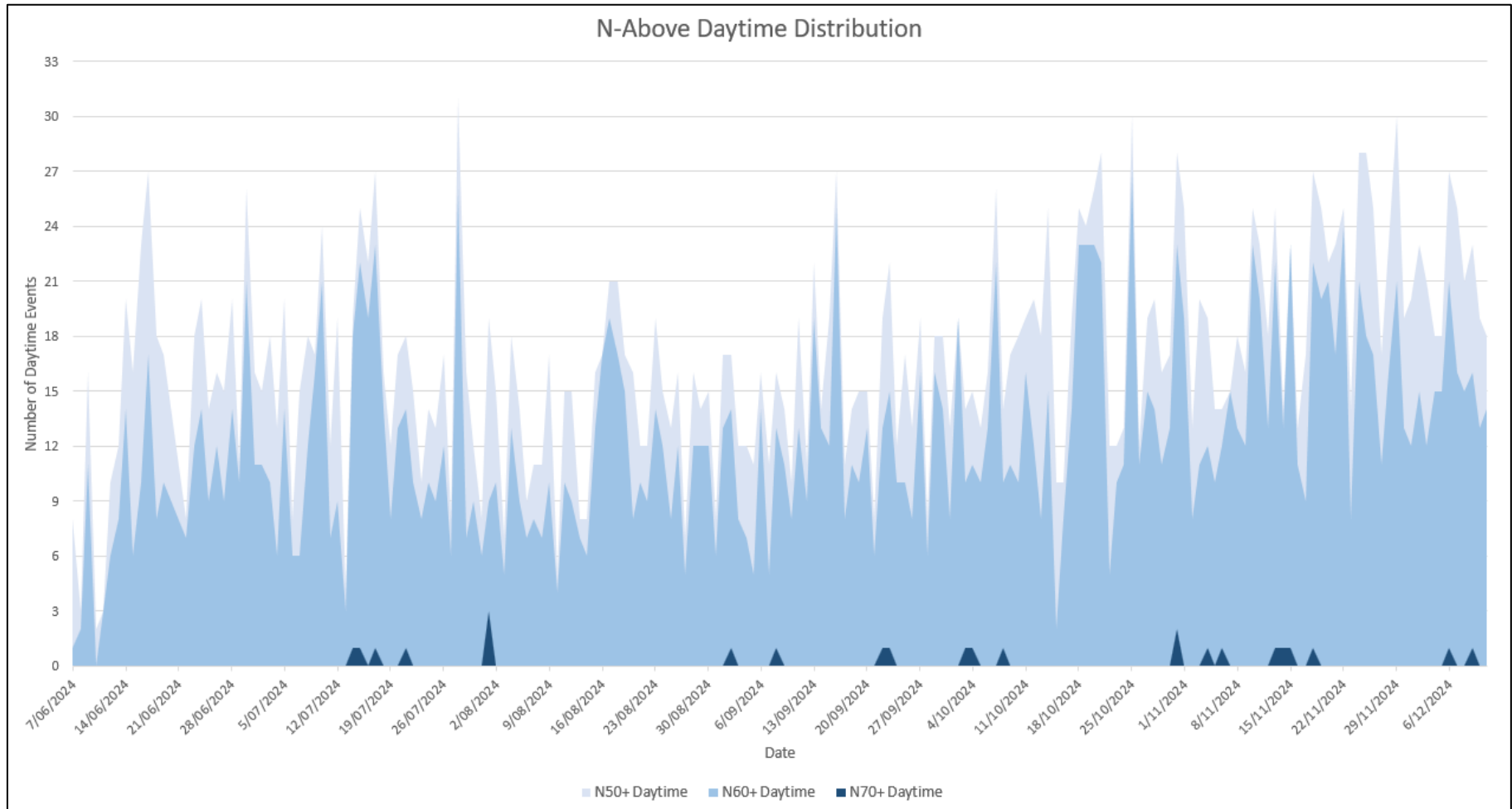


Figure 3: Daytime Daily N-Above Distribution Graph

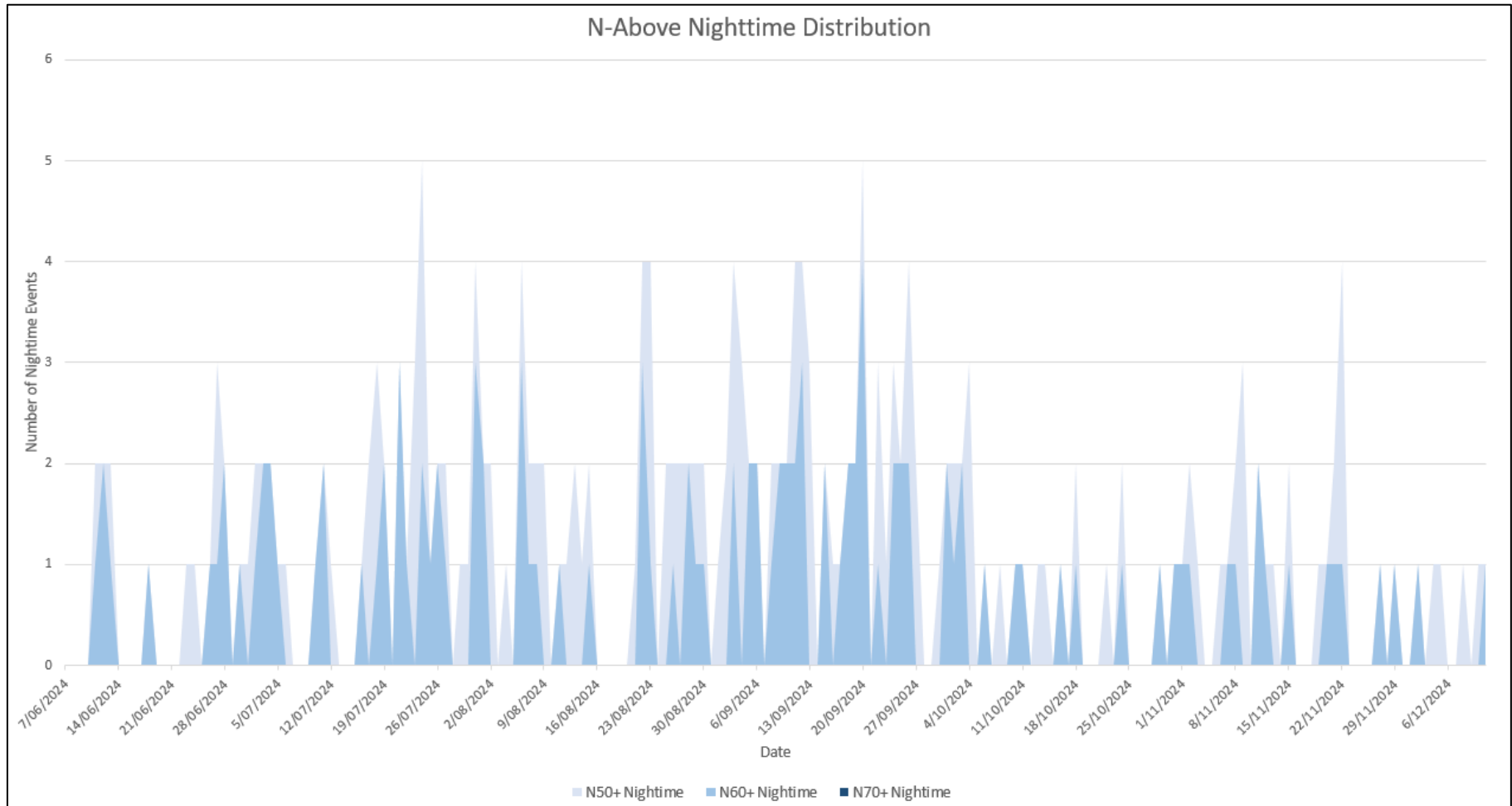


Figure 4: Nighttime Daily N-Above Distribution Graph

3.3. Most Common Aircraft

The most common aircraft type that flew through the zone during the deployment period is a B738 aircraft as shown in Table 5, below.

Hobart Airport Operation Type	Operations	Correlated %
Arrival	610	98%
Departure	503	95%
Touch and Go	0	0%
Overflight	0	0%

Table 5: B738 correlation percentage across the deployment period

3.4. Top 10 Correlated Aircraft

The following table shows the top 10 average and maximum noise levels of correlated noise events (CNEs) for the deployment period from 07 June 2024 to 12 December 2024. The highest average LaMax of 68.6 dB(A) is attributed to A321 jets arriving onto runway 30, shown in Table 6.

Aircraft Type	Aircraft Category	Airport Code	Operation Type	Runway	Total CNE	Average LaMax dB(A)	Max ⁵ dB(A)
A320	J	YMHB	A	30	712	66.2	87.6
B738	J	YMHB	A	30	605	61	74.9
B738	J	YMHB	D	12	503	65.3	79.6
A320	J	YMHB	D	12	406	62.6	70.3
B712	J	YMHB	A	30	170	61	68.7
A321	J	YMHB	A	30	108	68.6	87.9
BCS3	J	YMHB	A	30	97	63.1	75.7
BCS3	J	YMHB	D	12	87	60.1	65.5
BE20	T	YMHB	A	30	85	57.4	62.4
A321	J	YMHB	D	12	74	64	68.3

Table 6: Top 10 aircraft in the deployment period by total CNE

Aircraft Category: J = Jets, T = Turboprop. **Operation Type:** D = Departure, A = Arrival

⁵ Correlated noise events contaminated by community noise have not been uncorrelated, so it remains possible that the maximum dB value should be lower, as the Maximum Lmax value in the table may be caused by community noise rather than the aircraft. Examples shown in Figure 5.

3.5. Noise Event Analysis

The audio verification process involved listening to and confirming the accuracy of the top 20 loudest (LaMax) noise events.

Table 7 outlines the top 10 noise events from all sources. The maximum noise levels (LaMax) of the noise events for this deployment originated from community sources such as dog noise.

Table 8 outlines the top 10 correlated noise events (that is, correlated with aircraft noise). The maximum noise levels (LaMax) of correlated noise events for this deployment originated from other nearby local airport movements (Overflights) as well as Hobart Airport movements.

Some correlated noise events were associated with community sources in addition to aircraft. This can be seen in the ‘noise source’ details in Table 8 and Figure 5. Consequently, there may be a benefit in conducting further noise monitoring in this location to explore and confirm the spectrum of noise levels attributed to aircraft, with the exclusion of any impact from community noise contamination.

Future aircraft noise monitoring in the Connellys Marsh area can achieve greater precision by:

- Choosing a location where there’s no dog noise to minimise contamination of the aircraft noise events.

Start Date/Time	Correlated to Aircraft?	LaMax dB(A)	Noise Source	Aircraft Type ⁶	Operation Type	Runway
18/09/2024 16:25	No	90.4	Dog	-	-	-
19/10/2024 16:51	No	89.6	Dog	-	-	-
27/08/2024 16:43	No	89.4	Dog	-	-	-
24/08/2024 15:06	No	89.0	Dog	-	-	-
10/11/2024 16:37	No	88.7	Dog	-	-	-
02/11/2024 17:06	No	88.6	Dog	-	-	-
09/10/2024 16:16	No	88.5	Dog	-	-	-
04/09/2024 16:11	No	88.5	Dog	-	-	-
27/09/2024 17:10	No	88.3	Dog	-	-	-
28/08/2024 16:20	No	88.2	Dog	-	-	-

Table 7: Top 10 loudest noise events during the deployment period by LaMax

⁶ Dash (-) indicates the details are not publicly available.

Short Term Noise Monitoring – Connellys Marsh, December 2024

Start Date/Time	Movement Airport ⁷	LaMax dB(A)	Noise Source	Aircraft Type ⁸	Operation Type ⁹	Runway
04/11/2024 14:35	Hobart	87.9	Dog and aircraft	A321	A	30
04/10/2024 16:07	Hobart	87.6	Dog and aircraft	A320	A	30
22/09/2024 16:08	Hobart	86.5	Dog and aircraft	A320	A	30
21/07/2024 15:50	Hobart	84.2	Dog and aircraft	A320	A	30
09/12/2024 17:24	Hobart	82.9	Dog and aircraft	E190	A	30
06/12/2024 10:30	Hobart	79.6	Machinery	B738	D	12
30/10/2024 21:46	Overflight	79.2	Aircraft (Heli)	B412	O	-
20/08/2024 13:47	Overflight	77.2	Aircraft (Heli)	-	O	-
19/06/2024 10:59	Overflight	75.7	Aircraft (Heli)	-	O	-
31/10/2024 21:29	Overflight	75.7	Aircraft (Heli)	-	O	-

Table 8: Top 10 loudest aircraft correlated noise events during the deployment period by LaMax

⁷ Overflights refers to movements from Hobart Cambridge and Edinburgh Airports etc.

⁸ Dash (-) indicates the details are not publicly available

⁹ Operation types A = Arrival, O = Overflight

Short Term Noise Monitoring – Connells Marsh, December 2024

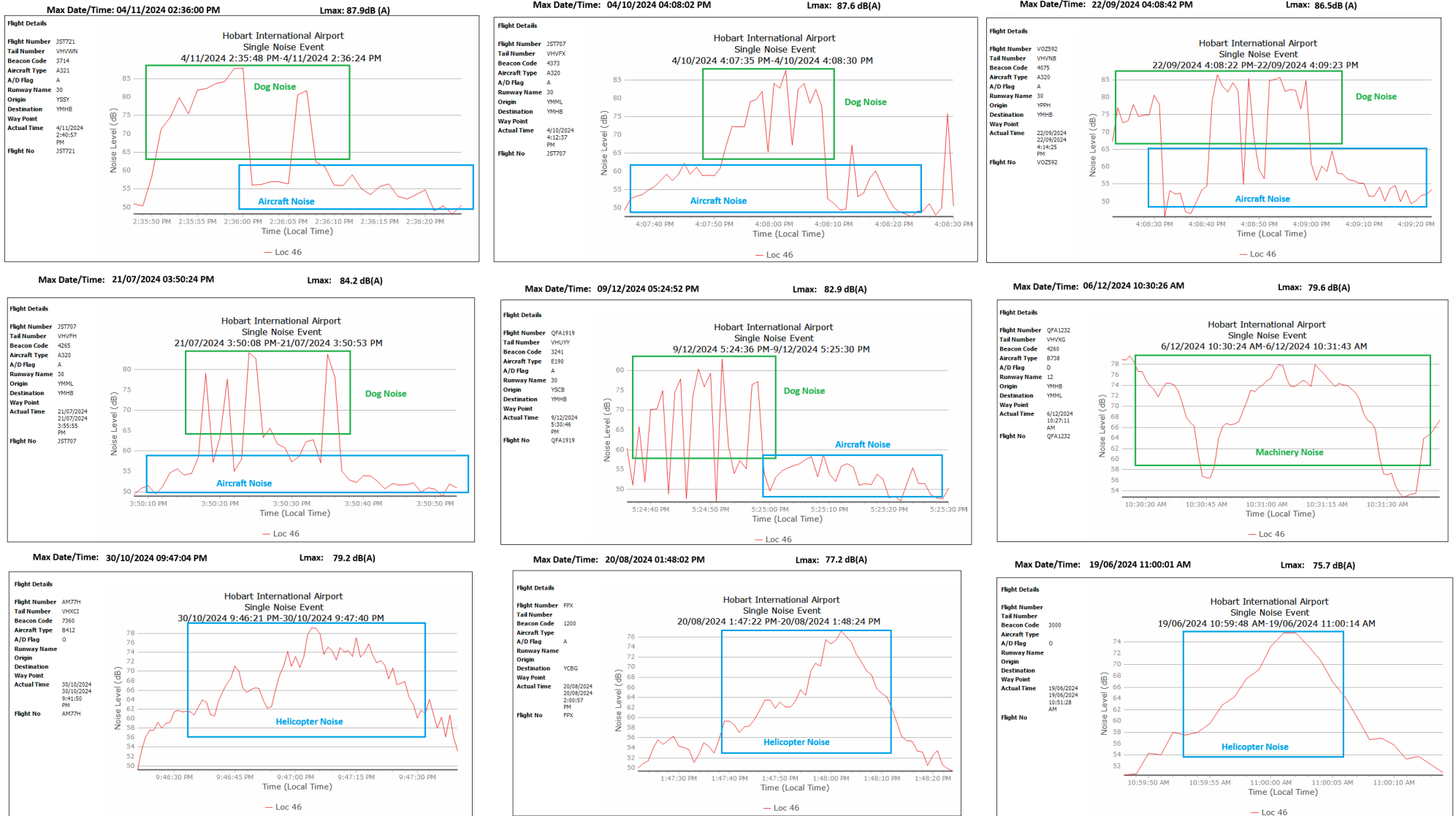


Figure 5: Top 9 correlated noise event from Table 8 graphed and analysed.

4 Busiest Day Analysis

4.1. Discussion

4.1.1 All Aircraft Busiest Day Discussion

The busiest day during the deployment occurred on 29 November 2024, with a total of 253 noise events. The noise events consisted of jet, dog, bird, machinery, and vehicle noise. There were 32 aircraft captured passing through the zone from Hobart Airport movements, of which 0% were from the focus group. All the movements over the capture zone were from departure runway 12 jet operations.

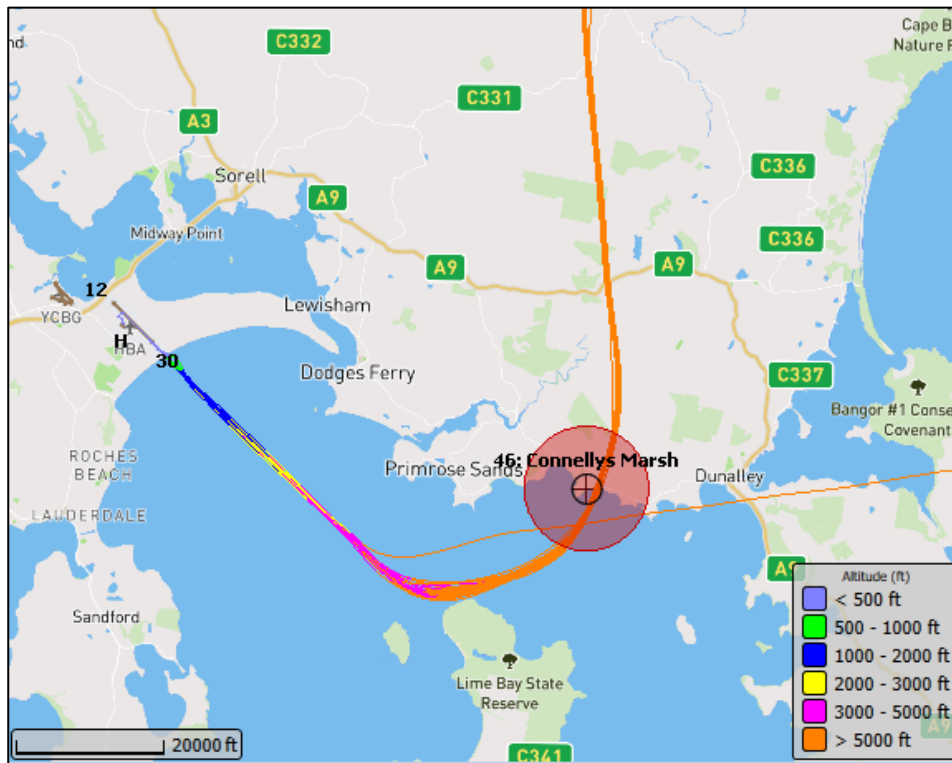


Figure 6: Busiest day flight tracks on 29 November 2024

4.1.2 Focus Group Busiest Day Discussion

However, the focus group busiest day (YMHB jet aircraft arrivals to runway 30) occurred on 23 September 2024, with a total of 817 noise events. The noise events consisted of turboprop, jet, bird, and wind noise. There were 28 aircraft captured passing through the zone from Hobart Airport movements, of which 26 aircraft were from the focus group.

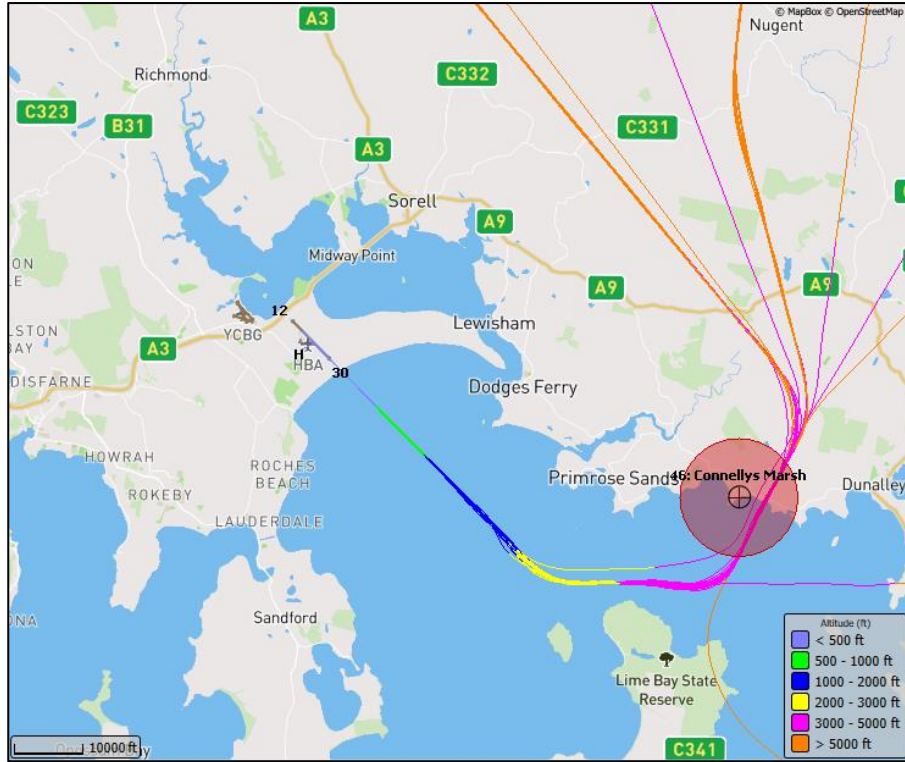


Figure 7: Focus group busiest day flight tracks 23 September 2024

4.2. Busiest Day Graph

4.2.1 All Aircraft Busiest Day Graph

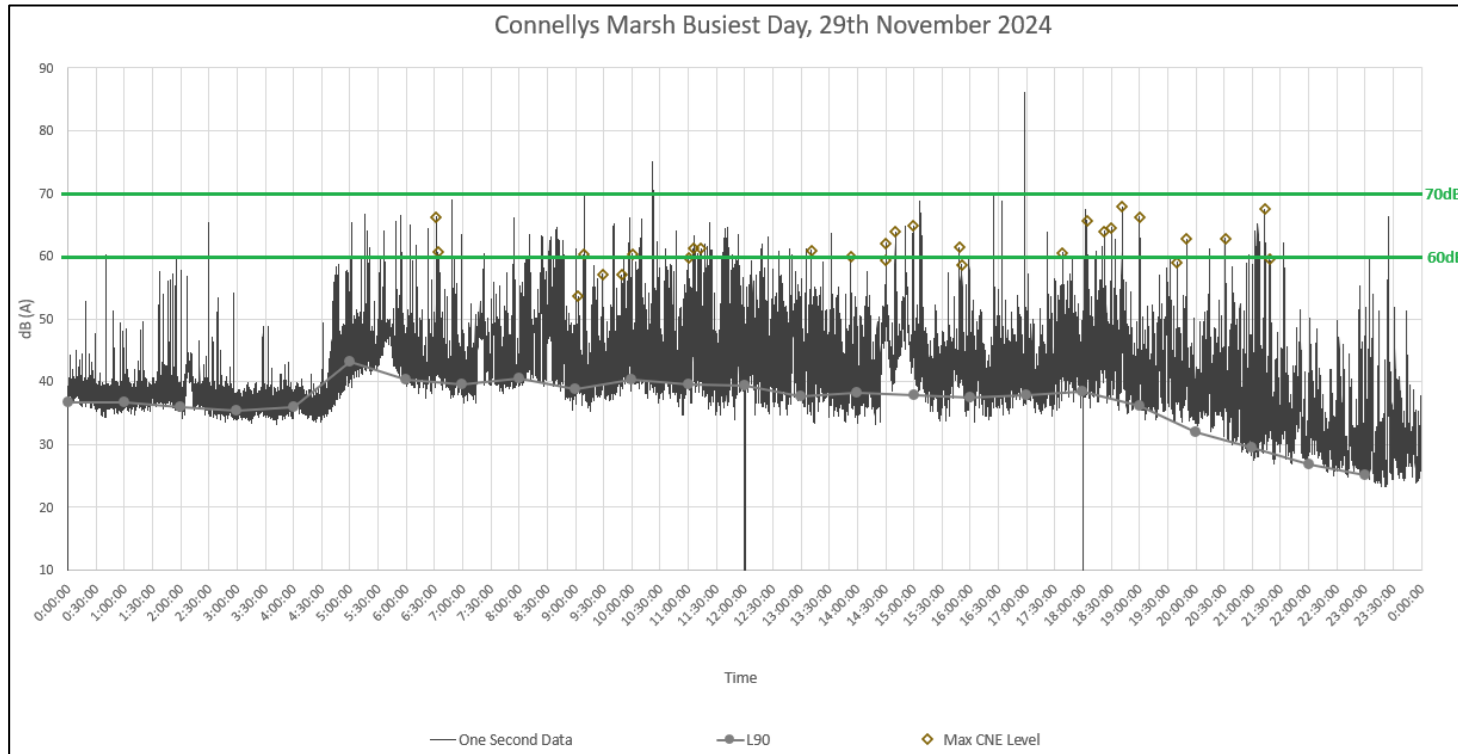


Figure 7: Distributions of hourly L90, max CNE level and one-second noise data on the busiest day. Hourly L90 refers to background noise levels; see Section 6.1.1 for more information. Max CNE level refers to the maximum noise level of the noise event, known as LaMax, which occurs when the aircraft is within the capture zone of the noise monitor; see Section 6.1.2 for more information. One-second noise data refers to the sound levels that are recorded every second by the noise monitor.

4.2.2 Focus Group Busiest Day Graph

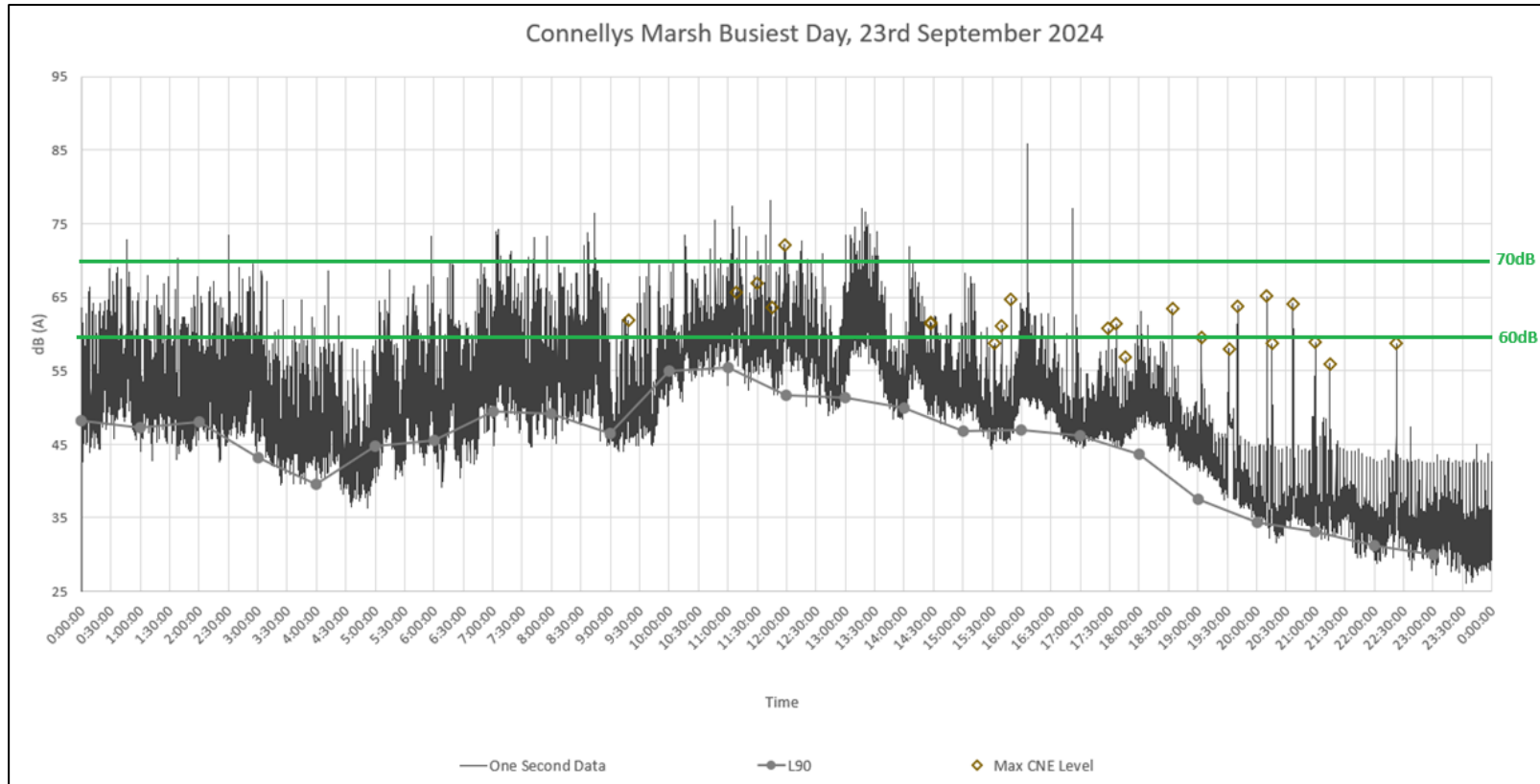


Figure 9: Distributions of hourly L90, max CNE level and one-second noise data on the busiest day. Hourly L90 refers to background noise levels; see Section 6.1.1 for more information. Max CNE level refers to the maximum noise level of the noise event, known as LaMax, which occurs when the aircraft is within the capture zone of the noise monitor; see Section 6.1.2 for more information. One-second noise data refers to the sound levels that are recorded every second by the noise monitor.

4.3. Busiest Day Noise Levels

4.3.1 All Aircraft Busiest Day Noise Levels

The loudest event on the 29 November 2024 was created by a dog, reaching a maximum noise level of 86.0 dB(A) at 16:58:07 in the afternoon, lasting for 17 seconds. The loudest Hobart airport movement on 29 November 2024 was created during the departure of a E190 jet from runway 12 at 18:41:10, registering a maximum noise level of 67.9 dB(A).

4.3.2 Focus Group Busiest Day Noise Levels

The loudest event on the 23 September 2024 was created by a dog bark, reaching a maximum noise level of 85.9 dB(A) at 16:06:21 in the afternoon, lasting for 80 seconds. The loudest Hobart airport movement on 23 September 2024 was created during the arrival of a B738 jet to runway 30 at 11:58:14, registering a maximum noise level of 72.1 dB(A).

5 Further Information

The following platforms provide further information on Hobart aircraft noise monitoring.

5.1. Airservices Australia

Information on the noise and flight path monitoring system including approach to noise monitoring and frequently asked questions:

<https://www.airservicesaustralia.com/community/environment/aircraft-noise/monitoring-aircraft-noise/>

5.2. WebTrak

Aircraft noise data is displayed from live noise monitors across Hobart, along with historical data:

<https://webtrak.emsbk.com/hba3>

6 Appendix

6.1. Noise Event Detection Details:

ISO 20906 provided technical guidance in this short-term noise monitoring. The NMT (i.e., sound level monitor) used for testing passed the Class 1 periodic calibration tests outlined in clauses of IEC 61672-3:2013 and IEC 61260-3:2016. The placement of NMT considered the vicinity of reflective surfaces and the height of the NMT relative to the target aircraft operations to minimise potential unintended anomalies. The NMT height is fixed on a supporting pole and the captured noise events were observed acceptable throughout the deployment. The background noise levels were taken into account in the monitoring area, to appropriately capture aircraft noise levels.

6.1.1. Threshold Settings

Noise monitor threshold settings are established by collecting hourly average L90 data over a period of two to five days following installation of the noise monitor. L90 represents noise level which are exceeded 90% of the time. It is considered the background noise level of an environment. For instance, if the L90 hourly noise level reads 50dB(A), it means that for 90% of that hour, the noise level is above 50dB(A). The threshold is set close to the average L90+10dB(A). The addition of 10dB(A) effectively filters out most community noise, such as birds and animal sounds, machinery, and vehicle noises. As a result, the created noise event will predominantly contain aircraft noise with minimal community noise.

6.1.2. Aircraft and Noise Event Correlation

The correlation of a noise event with an aircraft requires meeting the following conditions:

- The aircraft passes through the defined capture zone set by the monitor as shown in Figure 1.
- The rise and fall time of the measured event matches a sound pattern representative of an aircraft flyover.
- Noise levels are greater than the specified threshold for a specified period when aircraft flies over, this creates a noise event.
- Maximum noise level of the noise event known as LaMax must occur while the aircraft is within the capture zone of the noise monitor.

Aircraft that flew within the vicinity of the monitor but did not trigger a correlated noise event may have failed to meet some of the parameters above. In other instances, this could be attributed to the lack of air traffic control data (ATC). This occurs when aircraft do not have an operating transponder or when there are radar outages. Despite a noise event being created by the aircraft, without available ATC data, there will be no aircraft to correlate with the noise event.

6.2. Calibration Check

The integrity of the noise monitor relies on regularly verifying the accuracy of the microphone recording levels and time synchronisation of samples with radar data. The microphones are replaced with laboratory certified microphones every 12 months and electrostatic calibration tests are automatically performed daily to ensure data quality.