

Short Term Monitoring Program

Parafield Airport, SA

Version Control

Version 1: 29 June 2016	
Section	Summary

Glossary of Terms

A	Arrivals
Background noise level (L90)	The sound level in dB(A) that is exceeded 90% of the time
Capture Zone	The capture zone is the region that an aircraft can be within, to the noise monitor and be able to be correlated to a noise event.
Correlated Noise Event (CNE)	A noise event matched to an aircraft operation that flew through the capture zone
D	Departures
Day	6:00am to 11:00pm
EMU	Environmental Monitoring Unit
General Aviation	Operations other than scheduled commercial airline operations. This includes private, sports, charter and training operations.
H	Helicopters
LAm _{ax}	Maximum sound level in dB(A)
Local	Operation that departs and arrives at the same airport, including circuits and training flights.
Movement	An aircraft operation, such as a arrival or departure
Night	11:00 pm to 6:00 am
NFPMS	Noise and Flight Path Monitoring System
Noise Event	A noise that exceeds the threshold sound level for longer than the threshold time that is set
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 Ratio	Percentage of captured aircraft operations correlated with noise events recorded by the noise monitor
T	Local operation including Circuits (Departure and Arrival at the same airport)
Threshold	Determined level on noise monitor that triggers a noise event when exceeded

For further information on the metrics used in this report refer to Australian Standard 1055.1–1997 “Acoustics – Description and measurement of environmental noise”.

Airservices Noise Monitoring Program

Information about [Airservices noise monitoring program](http://www.airservicesaustralia.com/aircraftnoise/) is available on the Airservices website, including reports of the noise and operational data collected by the Noise and Flight Path Monitoring System, as well as fact sheets about topics related to aircraft noise. The website is available at: www.airservicesaustralia.com/aircraftnoise/

Contact Us

To lodge a complaint or make an enquiry about aircraft operations; you can go to WebTrak (www.airservicesaustralia.com/aircraftnoise/webtrak/), use our online form (www.airservicesaustralia.com/aircraftnoise/about-making-a-complaint/), telephone 1800 802 584 (freecall) or 1300 302 240 (local call – Sydney), fax (02) 9556 6641 or write to, Noise Complaints and Information Service, PO Box 211, Mascot ACT 1460.

© Airservices Australia. All Rights Reserved.

This report contains a summary of data collected over the specified period and is intended to convey the best information available from the NFPMS at the time. The system databases are to some extent dependent upon external sources and errors may occur. All care is taken in preparation of the report but its complete accuracy can not be guaranteed. Airservices Australia does not accept any legal liability for any losses arising from reliance upon data in this report which may be found to be inaccurate.

Deployment Purpose

Short term noise monitoring was conducted at five locations around Parafield Airport to measure noise events associated with Parafield Airport and specifically those related to circuit operations. The purpose of this report is to provide a technical summary of the recorded aircraft noise and operational data collected during July 2015 to January 2016 at the following five sites:

- Brahma Lodge
- Para Hills
- Mawson Lakes
- West Mawson Lakes
- Salisbury Downs

An explanation of terms used within this report can be found in the Glossary on page 2 of the report. Further information on noise monitoring is available from the Airservices Australia website at <http://www.airservicesaustralia.com/aircraftnoise/factsheets/>

Deployment Monitoring Period

06/07/2015 – 10/01/2016

Deployment Locations

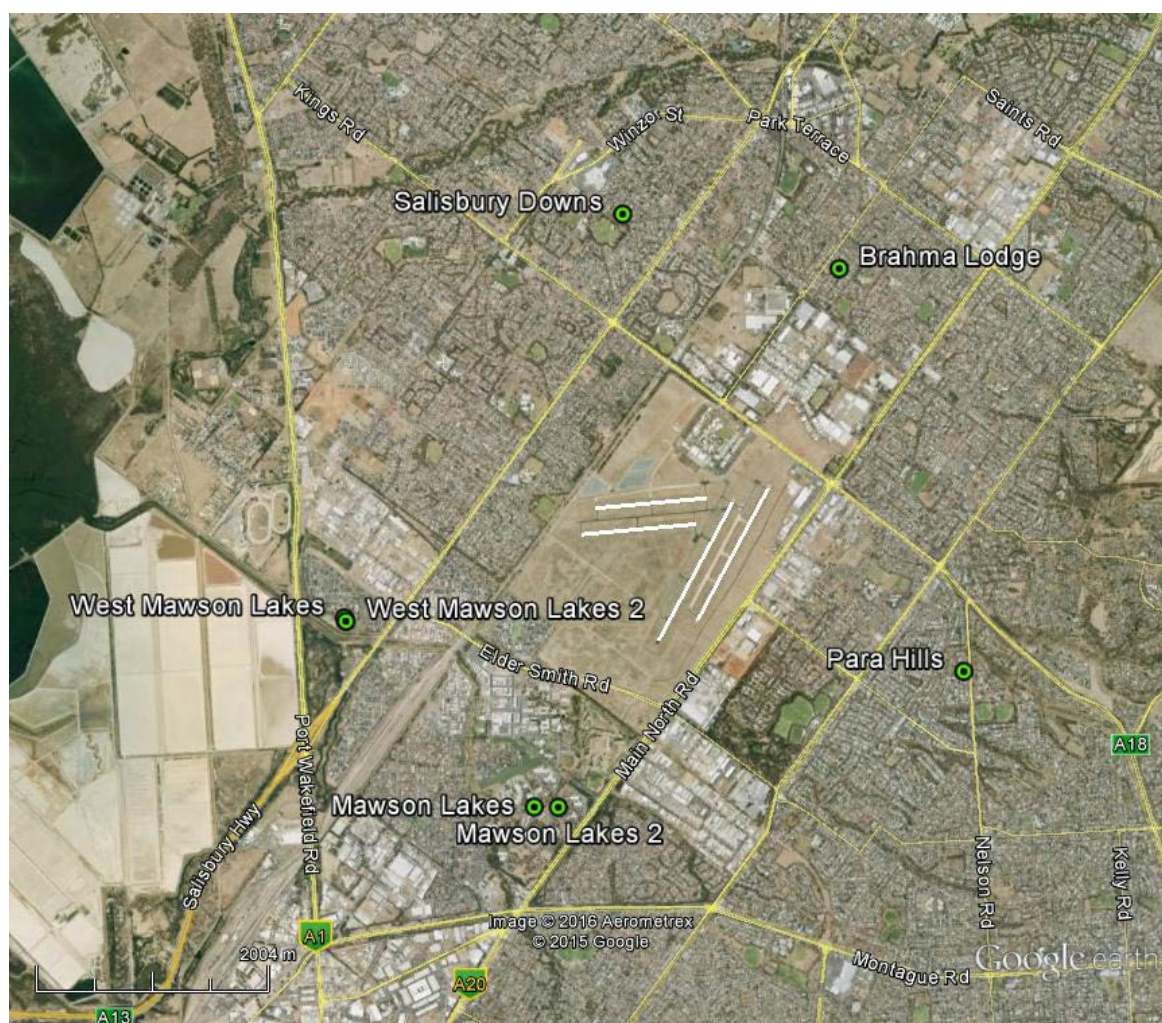


FIGURE 1: PARAFIELD AIRPORT INCLUDING 5 SHORT-TERM MONITORING LOCATIONS

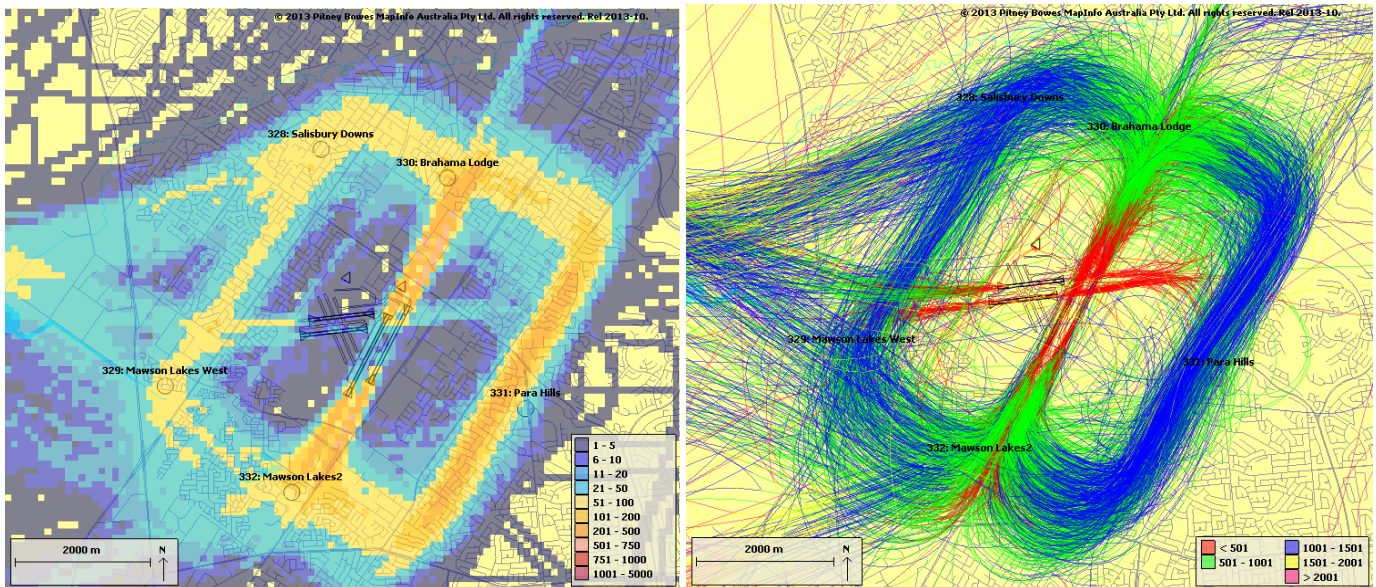


FIGURE 2: PARAFIELD AIRPORT OPERATIONS FOR 1-7 NOVEMBER 15 INCLUDING SHORT-TERM MONITORING LOCATIONS, WITH TRACK DENSITY (LEFT) AND BY ALTITUDE (RIGHT)

Parafield Airport Noise and Flight Path Monitoring System Improvement Program (NFPMS)

Aircraft movements from Parafield Airport have been visible in the Adelaide component of Airservices Noise and Flight Path Monitoring System (NFPMS) for many years. For example flight tracks in and out of Parafield Airport can be seen in WebTrak. The Adelaide component of the NFPMS was originally setup to monitor operations at Adelaide Airport and relied upon obtaining the details of the operations from a lodged flight plan.

Parafield Airport is a General Aviation airport with a high proportion of operations relating to training schools. As a result, the majority of movements at Parafield Airport do not have a detailed flight plan and therefore there is limited identification data captured in the NFPMS.

Airservices has developed new capability within the NFPMS to determine movement details in the absence of lodged flight plans at Parafield. This improved capability has been trialed since July 2015 and the short term monitoring included in this document has benefitted from the improved NFPMS at Parafield.

Environmental Monitoring Unit (EMU) Details

TABLE 1: DETAILS OF ENVIRONMENTAL MONITORING UNITS (EMUS)

EMU Name (EMU Number)	Brahma Lodge (330)	Para Hills (331)	Mawson Lakes (327) and (332)		West Mawson Lakes (329) and (337)		Salisbury Downs (328)
Details on placement	Placed to capture departures off Runway 03L and 03R, and arrivals to Runway 21L and 21R.	Placed to capture eastern circuits and in consideration of concerns regarding particularly loud aircraft noise experienced within Para Hills area.	Placed to capture departures off Runway 21L and 21R, and arrivals to Runway 03L and 03R Relocation of the Mawson Lakes Noise Monitor was requested by the property owner approximately 7 weeks into the monitoring period. The EMU was reinstalled 210m from its original location as Mawson Lakes 2 – EMU 332. EMU 332 was in place for the remaining four months of the monitoring period and the majority of the Mawson Lakes data was captured from this site. Data from both EMU 327 and EMU 332 have contributed to the findings of this report.		Placed to capture both western circuits, and arrivals from and departures to the south-west. EMU 329 was in place for first 5 months of the monitoring period until the property owner requested that the noise monitor be relocated. The majority of data was captured at the original location. The EMU was reinstalled 30m from its original location as West Mawson Lakes 2 – EMU 337. EMU 337 was in place for the remaining month of the monitoring period and the majority of the Mawson Lakes data was captured from this site. Data from both EMU 329 and EMU 337 have contributed to the findings of this report.		Placed to capture both western circuits and entry to and exits from the circuit to the north-west.
Installed period, if applicable	-	-	06/07/2015-28/08/2015	08/09/2015-11/01/2016	06/07/2015-20/11/2015	11/12/2015-11/01/2016	-
Location	Private Residence, Curuso Crescent, Brahma Lodge SA	Private Residence, Nelson Road, Para Hills SA	Private Residence, Park Way, Mawson Lake SA	Private Residence, Second Avenue, Mawson Lake SA	Private Residence, Fraser Lane, Mawson Lakes West SA	Private Residence, Sanctuary Drive, Mawson Lakes West SA	Private Residence, Waterford Street, Salisbury Downs SA
Latitude	34° 46' 29.83"S	34° 48' 21.79" S	34°48'59.49"S	34°48'59.57"S	34° 48' 6.93" S	34°48'07.87" S	34°46'14.68" S
Longitude	138° 38' 51.84"E	138° 39' 34.08" E	138°37'8.66"E	138°37'16.79 "E	138° 36' 4.39"E	138° 36'04.92" E	138°37'38.58" E
EMU Altitude	115 ft. above mean sea level	243 ft. above mean sea level	52 ft. above mean sea level	52 ft. above mean sea level	30 ft. above mean sea level	30 ft. above mean sea level	92 ft. above mean sea level
Capture Zone	1 km radius with 8,000 ft. (above ground level) height for noise data capture						
Threshold Setting	47.0 dB(A) to 55.0 dB(A) depending on time of day	47.0 dB(A) to 56.0 dB(A) depending on time of day	50.0 dB(A) to 57.0 dB(A) depending on time of day	50.0 dB(A) to 57.0 dB(A) depending on time of day	52.0 dB(A) to 58.0 dB(A) depending on time of day	52.0 dB(A) to 57.0 dB(A) depending on time of day	43.0 dB(A) to 54.0 dB(A) depending on time of day
Monitoring Outages	N/A	09/01/2016-11/01/2016	28/08/2015-08/09/2015 due to EMU relocation		11/09/2015 – 16/09/2015, 30/09/2015 and 09/10/2015	20/11/2015-11/12/2015 due to EMU relocation	14/12/2015 -15/12/2015

Brahma Lodge (EMU 330) Findings

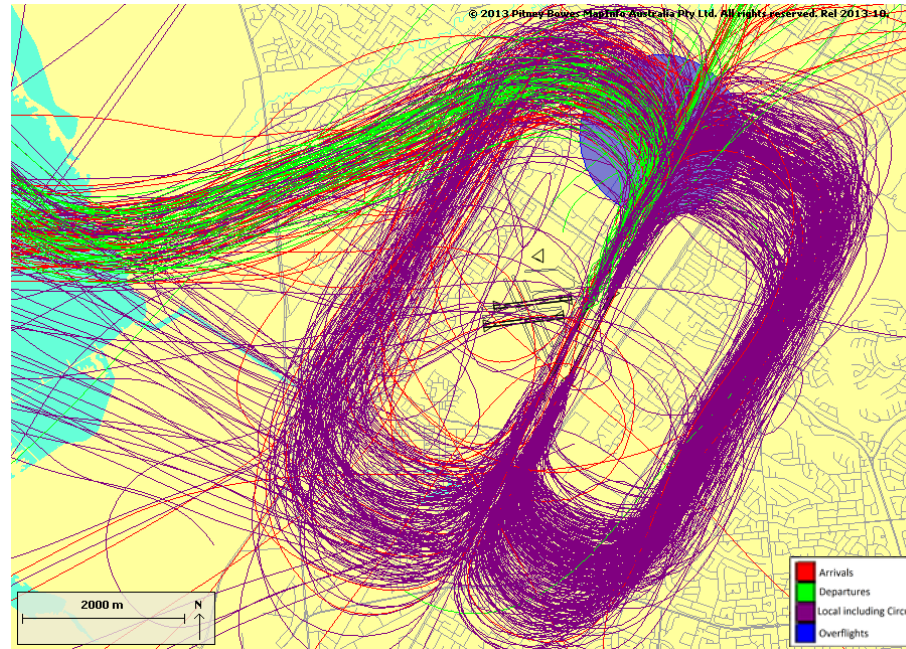


FIGURE 3: PARAFIELD AIRPORT OPERATIONS THAT TRAVERSED BRAHMA LODGE BETWEEN 01/11/2015 – 03/11/2015, INCLUDING CAPTURE ZONE (BLUE CIRCLE)

- 42, 821 movements flew through the capture zone (shown in Figure 3) during the 6 month reporting period. 42, 249 of these were Parafield Airport operations.
- 32% of total operations that flew through the capture zone were Runway 21L local operations.
- A summary of the total number of Correlated Noise Events (CNE) by time of day, and the minimum to maximum number of CNE in a day, are summarised within Table 2.

TABLE 2: SUMMARY OF CORRELATED NOISE EVENTS BY TIME OF DAY AND MINIMUM TO MAXIMUM RANGE OF OCCURRENCES, FOR THE MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (327 AND 332)

Correlated Noise Events (CNE) over the Reporting Period:	Day-time (6:00am to 11:00pm)	Night-time (11:00 pm to 6:00 am)	Number of Correlated Noise Events per day (min to max)
above 60 dB(A) (N60)	19,313	60	2 to 289
above 65 dB(A) (N65)	13,996	43	0 to 236
above 70 dB(A) (N70)	8,725	27	0 to 139
above 75 dB(A) (N75)	3,225	20	0 to 56

- Correlated noise events above 60 dB(A) were most common during the weekday hours of 10:00am and 11:00 am.
- The loudest correlated aircraft noise event with a max level of 90.2 dB(A) was an aircraft undertaking local circuit operations. The aircraft was departing off Runway 03R to the eastern circuit, when the noise event occurred.

Events as high as a max level of 96.7 dB(A) were recorded during the reporting period however these are not correlated to any aircraft operations, where community noise is believed to be either a contributing factor or responsible for these events. Community activities including construction, mowing and traffic can cause such events to be recorded on the monitor.

TABLE 3: 10 MOST FREQUENTLY CORRELATED AIRCRAFT TYPES OVER THE BRAHMA LODGE ENVIRONMENTAL MONITORING UNIT

Aircraft Type (Category)	Airport	Operation Type	RWY	No. Correlated Noise Events	LAmax dB(A)	
					Average	Maximum
General Aviation	Parafield	T	21R	6683	68.0	88.6
General Aviation	Parafield	T	03R	3639	66.2	90.2
General Aviation	Parafield	T	03L	2585	70.9	89
General Aviation	Parafield	T	21L	2259	64.6	84.9
General Aviation	Parafield	A	21R	1646	64.2	86.6
General Aviation	Parafield	D	03L	1006	70.7	87.2
Diamond Twin Star DA-42 (P)	Parafield	A	21R	546	71.4	83.6
General Aviation	Parafield	D	03R	399	67.4	81.5
Diamond Star DA-400 (P)	Parafield	A	21R	398	60.1	76.2
General Aviation	Parafield	T	HP1	378	64.9	82.1

Note: General Aviation operations do not include details of aircraft type or category. More information is available on page 4.

Aircraft Category: Jet (J), Turboprop (T), Propeller (P), Helicopter (H), Unknown (U)

Operation Type: Arrival (A), Departure (D), Local Operation including Circuits (T), Overflight (O)

- The overall correlation ratio for all movements was 52%. This is a similar correlation rate to that achieved at other secondary airports but lower overall than that achieved within the Parafield program.

Aircraft at a General Aviation airport operate differently and in closer proximity to that at major airports. There are noise events where two aircraft can be in the one capture zone at the same time.

Current technological limitations mean that the NFPMS must first have a noise event which it identified could be aircraft noise. Noise from aircraft which is within or similar to community noise cannot be separated including aircraft with a lower noise level or when there is an increase in community noise such as from sirens, traffic or loud conversations. In the future, it is anticipated that systems will be able to specifically identify community noise such as a dog barking and also look for noise events, when an aircraft is within the capture zone.

Figure 4 below is intended to support understanding of the noise monitor settings and monitoring limitations.

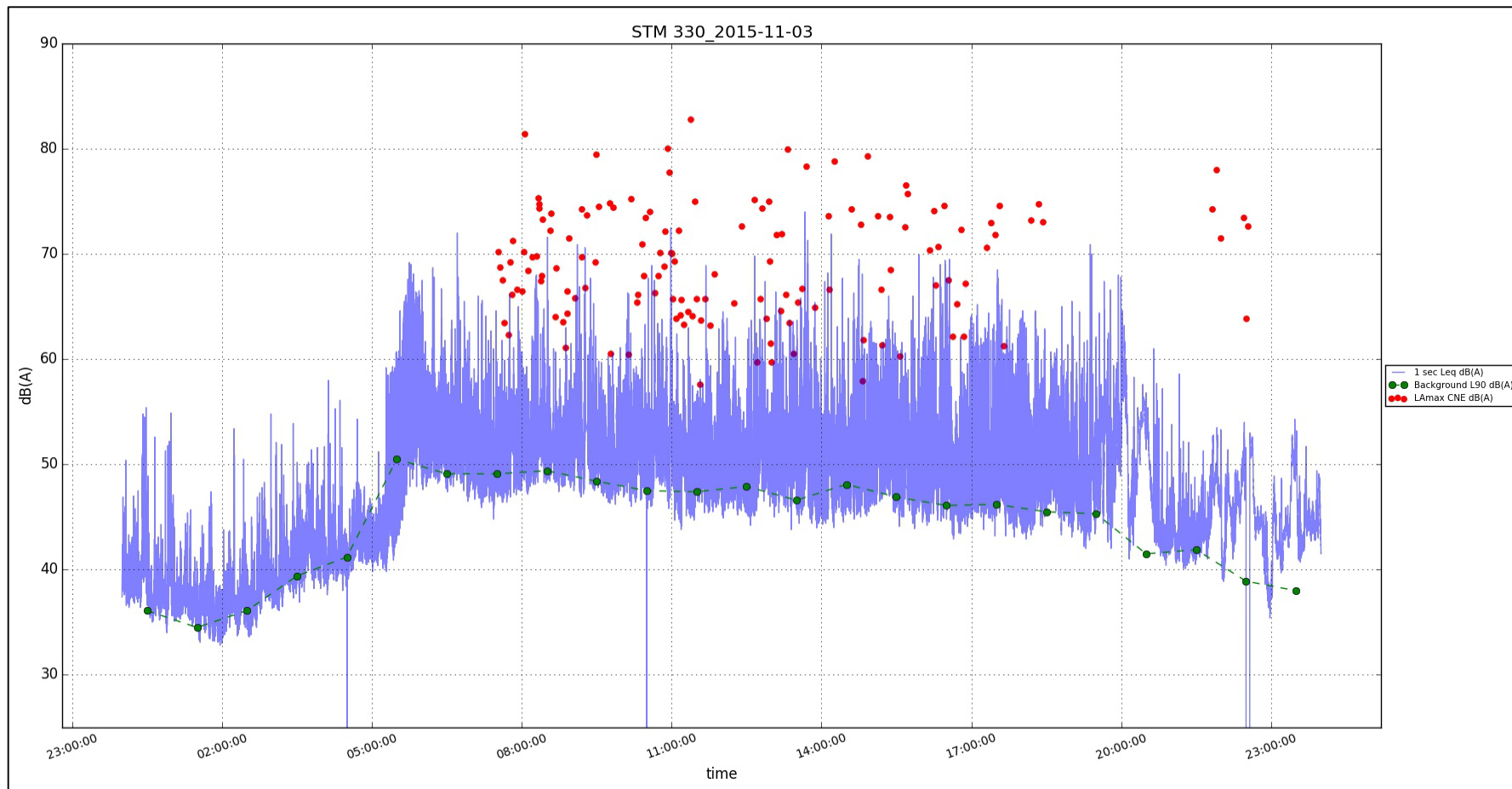


FIGURE 4: BRAHMA LODGE 1 SECOND NOISE DATA, BACKGROUND LEVEL AND LAMAX'S OF CORRELATED NOISE EVENTS (CNES) FOR 03/11/2016

Figure 4 shows 24-hour of noise data from EMU 330 for a day during the monitoring period. Correlated noise events (6 to 120 seconds in length) are removed from the daily noise data, with only the point of LMax shown in red. The background level (L90) is also shown as points representing the hourly average for this day.

This allows for comparison of noise contributions from community activities to correlated aircraft noise contributions, at the EMU location. On 3/11/2015, there were a total of 182 aircraft operations that passed through the capture zone and of these operations, 139 with a correlated noise event. Figure 4 shows that a proportion of noise events are above as well as within the noise made by community activity. Any operations without a correlated noise event would also be within the noise data.

Para Hills (EMU 331) Findings

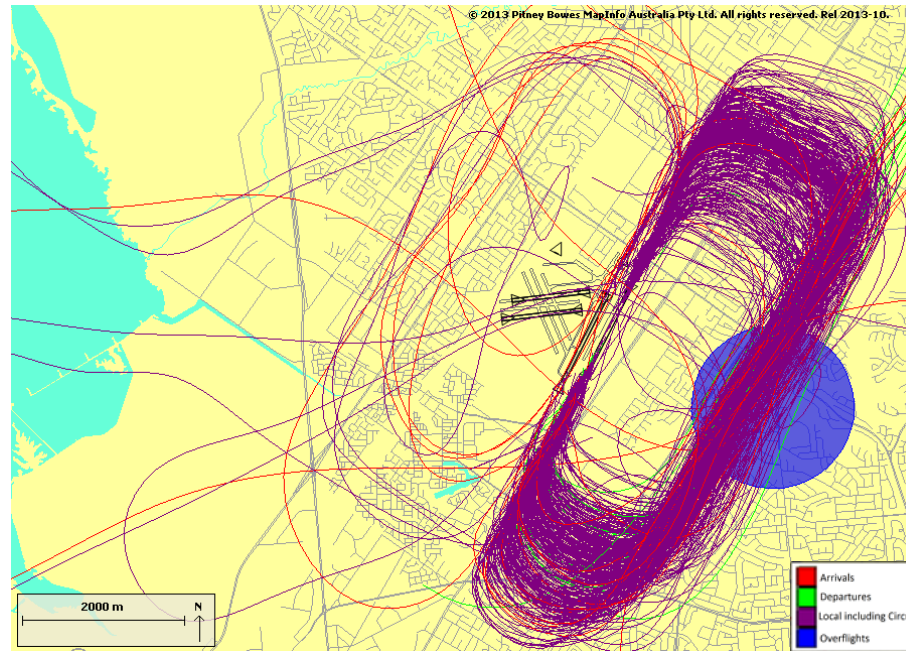


FIGURE 5: PARAFIELD AIRPORT OPERATIONS THAT TRAVERSED PARA HILLS BETWEEN 01/11/2015 – 03/11/2015, INCLUDING CAPTURE ZONE (BLUE CIRCLE)

- 25, 634 movements flew through the capture zone during the 6 month reporting period. 25, 326 of these were Parafield operations.
- 54% of total operations that flew through the capture zone (as shown in Figure 5) were Runway 21L Local operations.
- A summary of the total number of Correlated Noise Events (CNE) by time of day, and the minimum to maximum number of CNE in a day, are summarised within Table 6.

TABLE 4: SUMMARY OF CORRELATED NOISE EVENTS BY TIME OF DAY AND MINIMUM TO MAXIMUM RANGE OF OCCURRENCES, FOR THE MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (327 AND 332)

Correlated Noise Events (CNE) over the Reporting Period:	Day-time (6:00am to 11:00pm)	Night-time (11:00 pm to 6:00 am)	Number of Correlated Noise Events per day (min to max)
above 60 dB(A) (N60)	14,934	1	1 to 241
above 65 dB(A) (N65)	4,205	0	0 to 107
above 70 dB(A) (N70)	628	0	0 to 18
above 75 dB(A) (N75)	74	0	0 to 6

- Correlated noise events above 60 dB(A) were most common during the weekday hour of 10:00 am.
- The loudest correlated aircraft noise event with a max level of 81.7 dB(A) was a Beech Bonanza (BT36) turboprop aircraft departing off Runway 21L. There were only five correlated BT36 operations off Runway 21 so this aircraft type is not shown in Table 5.

Events as high as a max level of 100.2 dB(A) were recorded during the reporting period however these are not correlated to any aircraft operations, where community noise is believed to be either a contributing factor or responsible for these events. Community activities including construction, mowing and traffic can cause such events to be recorded on the monitor.

TABLE 5: 10 MOST FREQUENTLY CORRELATED AIRCRAFT TYPES OVER THE PARA HILLS ENVIRONMENTAL MONITORING UNIT

Aircraft Type	Airport	Operation Type	RWY	No. Correlated Noise Events	LAmax dB(A)	
					Average	Maximum
General Aviation	Parafield	T	21L	9897	62.1	80.8
General Aviation	Parafield	T	03R	5930	63.6	79.6
General Aviation	Parafield	D	21L	520	63.3	77.5
General Aviation	Parafield	T	26L	472	61.2	74.3
General Aviation	Parafield	T	21R	429	62.3	74.5
General Aviation	Parafield	T	03L	380	63.9	74.9
General Aviation	Parafield	A	03R	371	62.5	72.6
General Aviation	Parafield	T	08R	185	66.0	78.4
General Aviation	Parafield	T	HP1	75	63.6	79.9
Cessna Skyhawk (P)	Parafield	D	21L	61	63.2	74

Note: General Aviation operations do not include details of aircraft type or category. More information is available on page 4.

Aircraft Category: Jet (J), Turboprop (T), Propeller (P), Helicopter (H), Unknown (U)

Operation Type: Arrival (A), Departure (D), Local Operation including Circuits (T), Overflight (O)

- The overall correlation ratio for all movements was 73%. This is considered an improvement on similar studies conducted at secondary airports.

Aircraft at a General Aviation airport operate differently and in closer proximity to that at major airports. There are noise events where two aircraft can be in the one capture zone at the same time.

Current technological limitations mean that the NFPMS must first have a noise event which it identified could be aircraft noise. Noise from aircraft which is within or similar to community noise cannot be separated including aircraft with a lower noise level or when there is an increase in community noise such as from sirens, traffic or loud conversations. In the future, it is anticipated that systems will be able to specifically identify community noise such as a dog barking and also look for noise events, when an aircraft is within the capture zone.

Figure 6 below is intended to support understanding of the noise monitor settings and monitoring limitations.

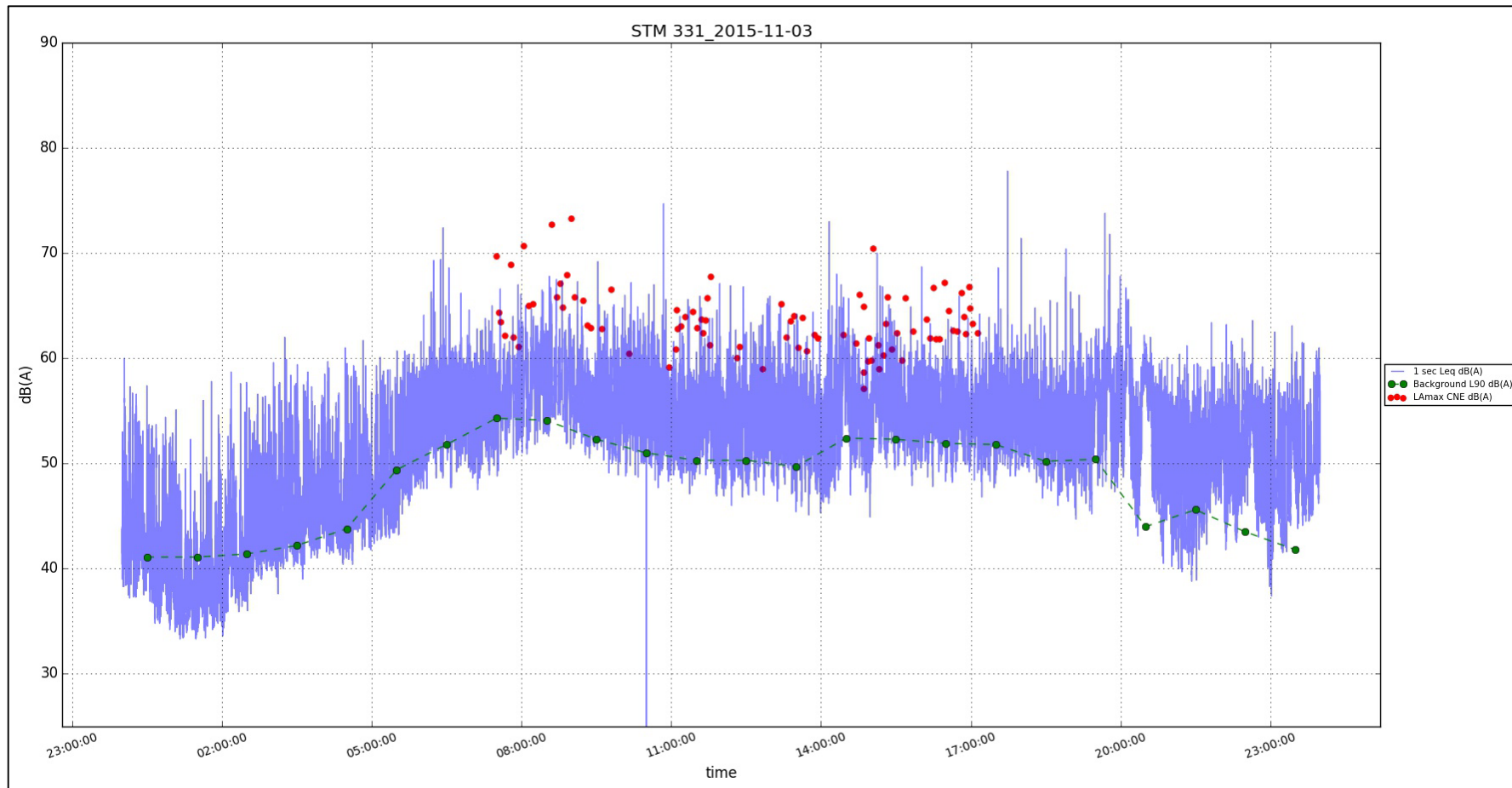


FIGURE 6: PARA HILLS 1 SECOND NOISE DATA, BACKGROUND LEVEL AND LAMAX'S OF CORRELATED NOISE EVENTS (CNE) FOR 03/11/2016

Figure 6 shows 24-hours of noise data from EMU 331 for a day during the monitoring period. Correlated noise events (6 to 120 seconds in length) are removed from the daily noise data, with only the point of LAmex shown in red. The background level (L90) is also shown as points representing the hourly average for this day.

This figure allows for comparison of noise contributions from community activities to correlated aircraft noise contributions, at the EMU location. On 3/11/2015, there were a total of 112 aircraft operations that passed through the capture zone and of these operations, 85 with a correlated noise event. Figure 6 shows that a proportion of noise events are above as well as within the noise made by community activity. Any operations without a correlated noise event would also be within the noise data.

Mawson Lakes (EMU 327 and 332) Findings

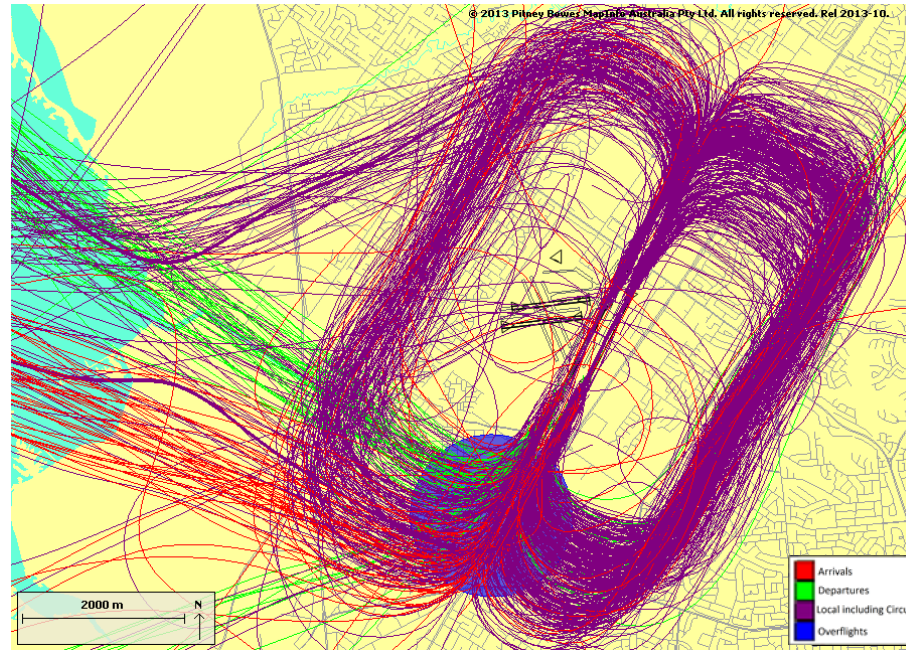


FIGURE 7: PARAFIELD AIRPORT OPERATIONS THAT TRAVERSED MAWSON LAKES (332) BETWEEN 01/11/2015 – 03/11/2015, INCLUDING CAPTURE ZONE (BLUE CIRCLE)

- 38,290 movements flew through the capture zone during the 6 month reporting period. 37,456 of these were Parafield Airport operations.
- 29% of total operations that flew through the capture zone (as shown in Figure 7) were Runway 21L local operations.
- A summary of the total number of Correlated Noise Events (CNE) by time of day, and the minimum to maximum number of CNE in a day, are summarised within Table 6.

TABLE 6: SUMMARY OF CORRELATED NOISE EVENTS BY TIME OF DAY AND MINIMUM TO MAXIMUM RANGE OF OCCURRENCES, FOR THE MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (327 AND 332)

Correlated Noise Events (CNE) over the Reporting Period:	Day-time (6:00am to 11:00pm)	Night-time (11:00 pm to 6:00 am)	Number of Correlated Noise Events per day (min to max)
above 60 dB(A) (N60)	24, 159	44	3 to 349
above 65 dB(A) (N65)	17, 173	28	1 to 283
above 70 dB(A) (N70)	8,501	15	1 to 157
above 75 dB(A) (N75)	3,375	10	0 to 79

- Correlated noise events above 60 dB(A) were most common during the weekday hours of 10:00 am and 11:00 am.
- The loudest correlated aircraft noise event with a max level of 93.4 dB(A) was a Cessna Skymaster (C337) propeller aircraft departing off Runway 21R. There were only nine correlated C337 operations off Runway 21 so this aircraft type is not shown in Table 7.

TABLE 7 : 10 MOST FREQUENTLY CORRELATED AIRCRAFT TYPES OVER THE MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (327 AND 332)

Aircraft Type	Airport	Operation Type	RWY	No. Correlated Noise Events	LMax dB(A)	
					Average	Maximum
General Aviation	Parafield	T	21L	7132	66.5	89.6
General Aviation	Parafield	T	21R	6101	70.8	90.1
General Aviation	Parafield	T	03L	2458	68.8	86.6
General Aviation	Parafield	T	03R	2290	63.9	86
General Aviation	Parafield	D	21R	1449	70.5	87.1
General Aviation	Parafield	A	03L	805	65.2	84.1
Diamond Star DA-400 (P)	Parafield	D	21R	577	70.6	79.5
General Aviation	Parafield	T	26L	554	64.1	81.6
General Aviation	Parafield	D	21L	412	66.6	81.9
Diamond Twin Star DA-42 (P)	Parafield	D	21R	390	70.5	84.2

Note: General Aviation operations do not include details of aircraft type or category. More information is available on page 4.

Aircraft Category: Jet (J), Turboprop (T), Propeller (P), Helicopter (H), Unknown (U)

Operation Type: Arrival (A), Departure (D), Local Operation including Circuits (T), Overflight (O)

- The overall correlation ratio for all movements was 64%. This is considered an improvement on similar studies conducted at secondary airports.

Aircraft at a General Aviation airport operate differently and in closer proximity to that at major airports. There are noise events where two aircraft can be in the one capture zone at the same time.

Current technological limitations mean that the NFPMS must first have a noise event which it identified could be aircraft noise. Noise from aircraft which is within or similar to community noise cannot be separated including aircraft with a lower noise level or when there is an increase in community noise such as from sirens, traffic or loud conversations. In the future, it is anticipated that systems will be able to specifically identify community noise such as a dog barking and also look for noise events, when an aircraft is within the capture zone.

Figure 8 below is intended to support understanding of the noise monitor settings and monitoring limitations.

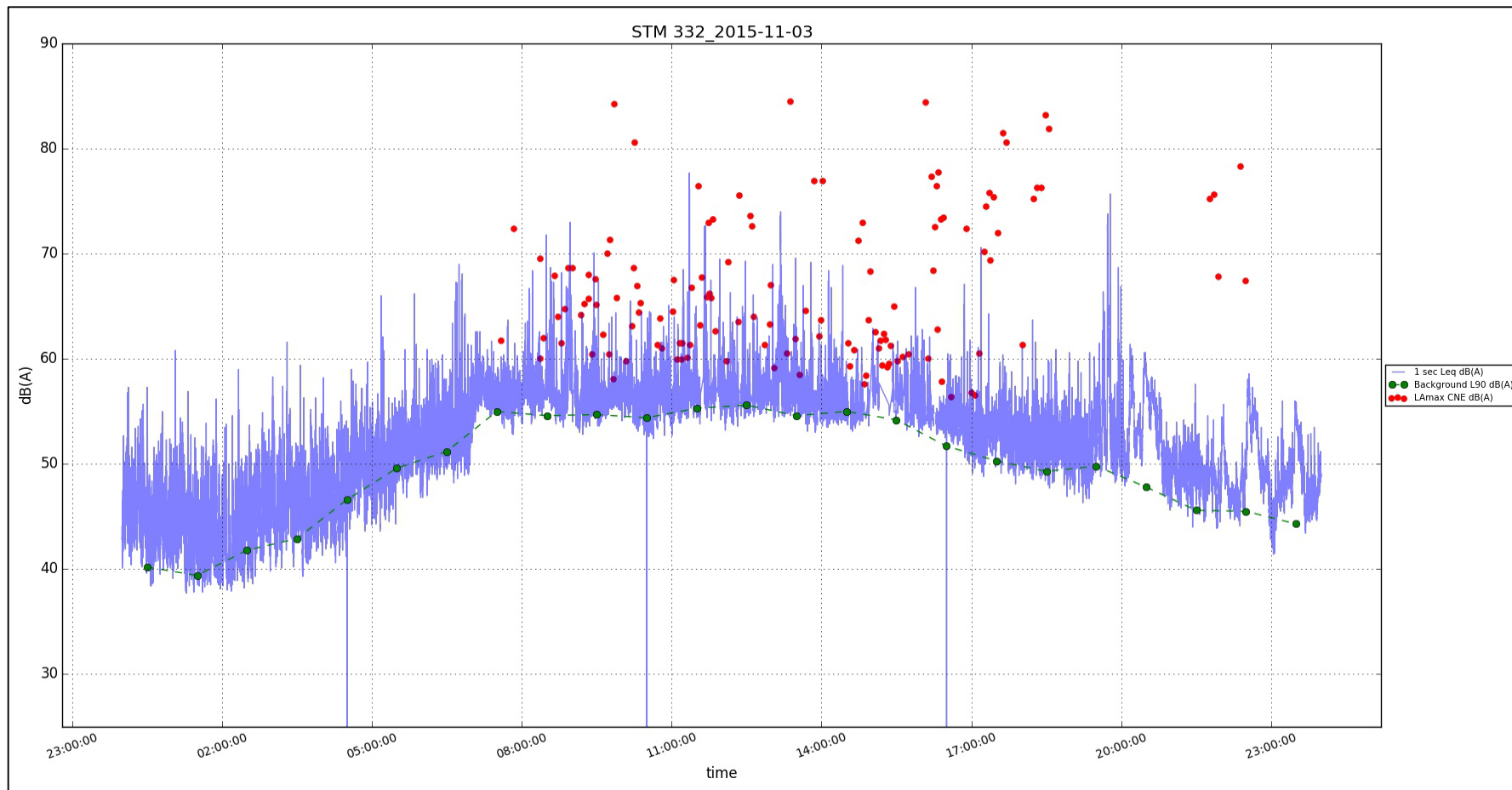


FIGURE 8: MAWSON LAKES 1 SECOND NOISE DATA, BACKGROUND LEVEL AND LAMAX'S OF CORRELATED NOISE EVENTS (CNES) FOR 03/11/2016

Figure 8 shows 24-hours of noise data from EMU 332 for a day during the monitoring period. Correlated noise events (6 to 120 seconds in length) are removed from the daily noise data, with only the point of LAmx shown in red. The background level (L90) is also shown as points representing the hourly average for this day.

This allows for comparison of noise contributions from community activities to correlated aircraft noise contributions, at the EMU location. On 3/11/2015, there were a total of 187 aircraft operations that passed through the capture zone and of these operations, 130 with a correlated noise event. Figure 8 shows that a proportion of noise events are above as well as within the noise made by community activity. Any operations without a correlated noise event would also be within the noise data.

West Mawson Lakes (EMU 329 and 337) Findings

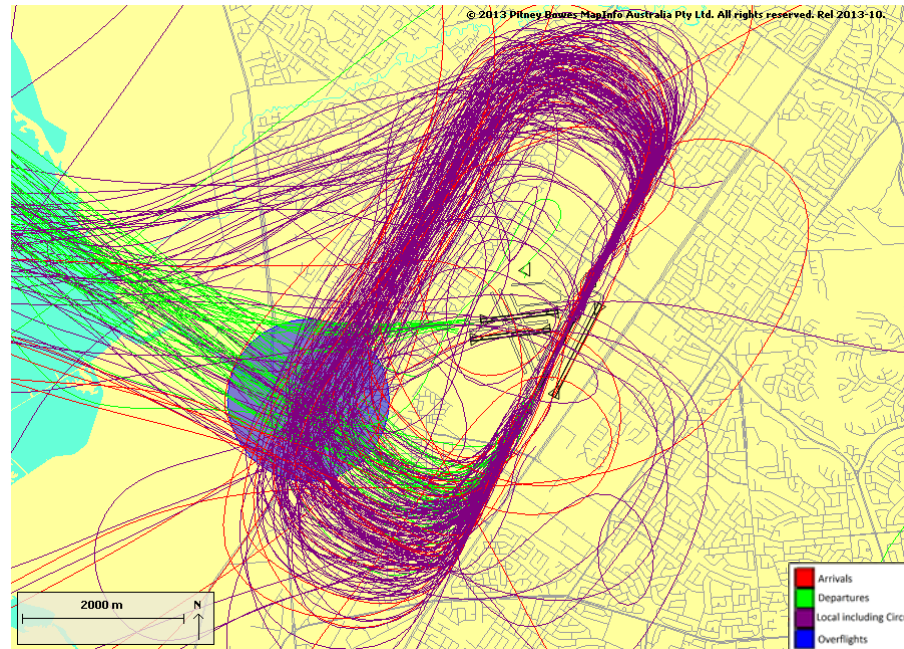


FIGURE 9: PARAFIELD AIRPORT OPERATIONS THAT TRAVERSED WEST MAWSON LAKES (329) BETWEEN 01/11/2015 – 3/11/2015 INCLUDING CAPTURE ZONE (BLUE CIRCLE)

- 17, 363 movements flew through the capture zone during the 6 month reporting period. 16, 488 of these were Parafield airport operations.
- 40% of total operations that flew through the capture zone (as shown in Figure 9) were Runway 21R Local operations.
- A summary of the total number of Correlated Noise Events (CNE) by time of day, and the minimum to maximum number of CNE in a day, are summarised within Table 8.

TABLE 8: SUMMARY OF CORRELATED NOISE EVENTS BY TIME OF DAY AND MINIMUM TO MAXIMUM RANGE OF OCCURRENCES, FOR THE WEST MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (329 AND 337)

Correlated Noise Events (CNE) over the Reporting Period:	Day-time (6:00am to 11:00pm)	Night-time (11:00 pm to 6:00 am)	Number of Correlated Noise Events per day (min to max)
above 60 dB(A) (N60)	11,648	33	3 to 194
above 65 dB(A) (N65)	6,825	16	1 to 123
above 70 dB(A) (N70)	1,533	1	0 to 34
above 75 dB(A) (N75)	284	0	0 to 12

- Correlated noise events above 60 dB(A) were most common during the weekday hour of 03:00 pm.
- The loudest correlated aircraft noise event with a max level of 84.4 dB(A) was a Bell 412 (B412) helicopter departing from Parafield Airport. There were only three correlated B412 operations departing Parafield Airport so this aircraft type is not shown in Table 9.

TABLE 9: 10 MOST FREQUENTLY CORRELATED AIRCRAFT TYPES OVER THE WEST MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (329 AND 337)

Aircraft Type	Airport	Operation Type	RWY	No. Correlated Noise Events	LAmax dB(A)	
					Average	Maximum
General Aviation	Parafield	T	21R	5401	65.6	81.9
General Aviation	Parafield	T	03L	2081	66.6	82.7
General Aviation	Parafield	D	21R	1228	65.5	82.7
General Aviation	Parafield	T	26L	418	68.9	79.2
Diamond Star DA-400 (P)	Parafield	D	21R	247	64.5	74.7
Boeing 737-800 (J)	Adelaide	A	23	210	65.7	78.9
Diamond Star DA-400 (P)	Parafield	A	21R	175	61.9	70.7
General Aviation	Parafield	T	21L	172	66.5	76.6
Diamond Twin Star DA-42 (P)	Parafield	A	21R	171	65.1	78.6
General Aviation	Parafield	T	HP1	160	64.9	79.1

Note: General Aviation operations do not include details of aircraft type or category. More information is available on page 4.

Aircraft Category: Jet (J), Turboprop (T), Propeller (P), Helicopter (H), Unknown (U)

Operation Type: Arrival (A), Departure (D), Local Operation including Circuits (T), Overflight (O)

- The overall correlation ratio for all movements was 68%. This is considered an improvement on similar studies conducted at secondary airports.

Aircraft at a General Aviation airport operate differently and in closer proximity to that at major airports. There are noise events where two aircraft can be in the one capture zone at the same time.

Current technological limitations mean that the NFPMS must first have a noise event which it identified could be aircraft noise. Noise from aircraft which is within or similar to community noise cannot be separated including aircraft with a lower noise level or when there is an increase in community noise such as from sirens, traffic or loud conversations. In the future, it is anticipated that systems will be able to specifically identify community noise such as a dog barking and also look for noise events, when an aircraft is within the capture zone.

Figure 10 below is intended to support understanding of the noise monitor settings and monitoring limitations.

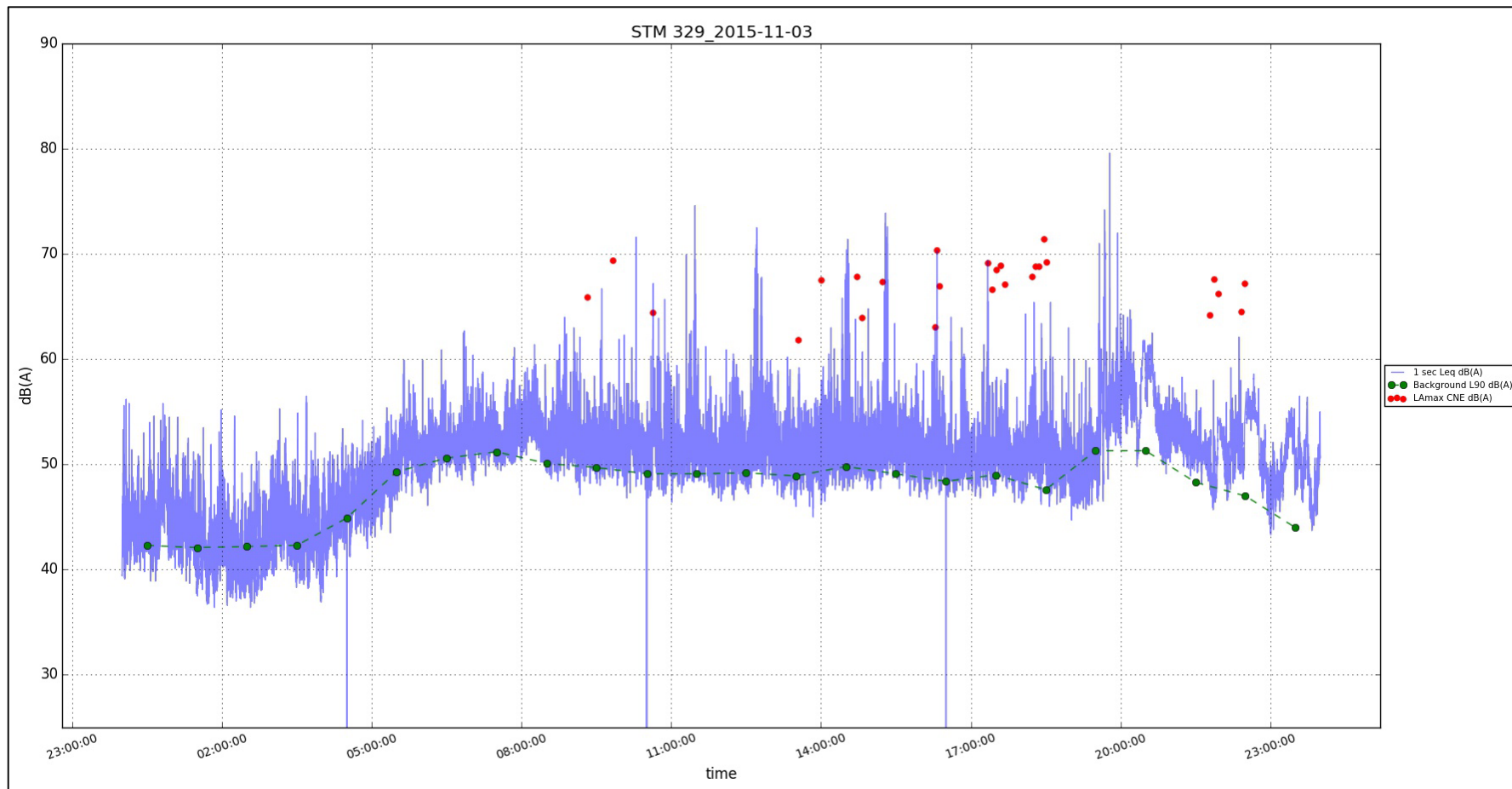


FIGURE 10: WEST MAWSON LAKES 1 SECOND NOISE DATA, BACKGROUND LEVEL AND LAMAX'S OF CORRELATED NOISE EVENTS (CNES) FOR 03/11/2016

Figure 10 shows 24-hours of noise data from EMU 329 for a day during the monitoring period. Correlated noise events (6 to 120 seconds in length) are removed from the daily noise data, with only the point of LMax shown in red. The background level (L90) is also shown as points representing the hourly average for this day.

This allows for comparison of noise contributions from community activities to correlated aircraft noise contributions, at the EMU location. On 3/11/2015, there were a total of 36 aircraft operations that passed through the capture zone and of these operations, 26 with a correlated noise event. Figure 10 shows that a proportion of noise events are above as well as within the noise made by community activity. Any operations without a correlated noise event would also be within the noise data.

Salisbury Downs (EMU 328) Findings

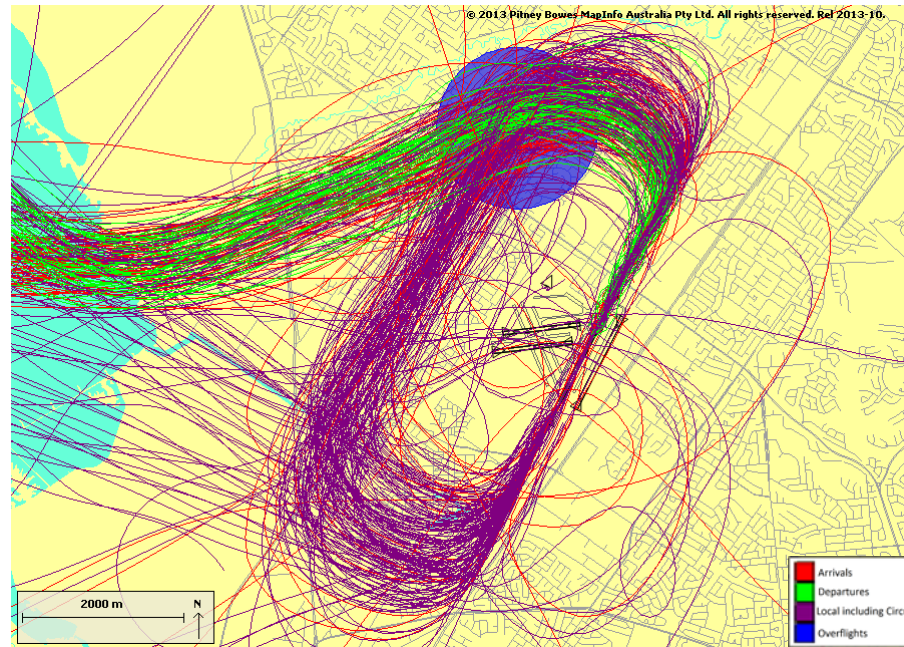


FIGURE 11: PARAFIELD AIRPORT OPERATIONS THAT TRAVERSED SALISBURY DOWNS BETWEEN 01/11/2015 – 03/11/2015, INCLUDING CAPTURE ZONE (BLUE CIRCLE)

- 21, 469 movements flew through the capture zone during the 6 month reporting period. 20,266 of these were Parafield airport operations.
- 41% of total operations that flew through the capture zone (as shown in Figure 11) were Runway 21R Local operations.
- A summary of the total number of Correlated Noise Events (CNE) by time of day, and the minimum to maximum number of CNE in a day, are summarised within Table 10.

TABLE 10: SUMMARY OF CORRELATED NOISE EVENTS BY TIME OF DAY AND MINIMUM TO MAXIMUM RANGE OF OCCURRENCES, FOR THE MAWSON LAKES ENVIRONMENTAL MONITORING UNITS (327 AND 332)

Correlated Noise Events (CNE) over the Reporting Period:	Day-time (6:00am to 11:00pm)	Night-time (11:00 pm to 6:00 am)	Number of Correlated Noise Events per day (min to max)
above 60 dB(A) (N60)	13,889	43	2 to 184
above 65 dB(A) (N65)	8,164	19	0 to 142
above 70 dB(A) (N70)	2,069	4	0 to 53
above 75 dB(A) (N75)	338	1	0 to 16

- Correlated noise events above 60 dB(A) were most common during the weekday hour of 03:00 pm.
- The loudest correlated aircraft noise event with a max level of 84.3 dB(A) was an aircraft arriving onto Runway 21R.

TABLE 11: 10 MOST FREQUENTLY CORRELATED AIRCRAFT TYPES OVER THE SALISBURY DOWNS ENVIRONMENTAL MONITORING UNIT

Aircraft Type	Airport	Operation Type	RWY	No. Correlated Noise Events	LA _{max} dB(A)	
					Average	Maximum
General Aviation	Parafield	T	21R	7494	64.9	81.7
General Aviation	Parafield	T	03L	2711	65.5	78.3
General Aviation	Parafield	A	21R	1806	62.3	84.3
General Aviation	Parafield	D	03L	1043	65.4	79.6
Diamond Star DA-400 (P)	Parafield	A	21R	439	61.5	78
Diamond Twin Star DA-42 (P)	Parafield	A	21R	397	66.2	79.4
General Aviation	Parafield	T	HP1	311	60.6	73.5
General Aviation	Parafield	T	21L	233	66.1	78.9
Diamond Star DA-400 (P)	Parafield	D	03L	181	65.0	72.6
General Aviation	Parafield	T	26R	170	63.4	71.8

Note: General Aviation operations do not include details of aircraft type or category. More information is available on page 4.

Aircraft Category: Jet (J), Turboprop (T), Propeller (P), Helicopter (H), Unknown (U)

Operation Type: Arrival (A), Departure (D), Local Operation including Circuits (T), Overflight (O)

- The overall correlation ratio for all movements was 77%. This is considered an improvement on similar studies conducted at secondary airports.

Aircraft at a General Aviation airport operate differently and in closer proximity to that at major airports. There are noise events where two aircraft can be in the one capture zone at the same time.

Current technological limitations mean that the NFPMS must first have a noise event which it identified could be aircraft noise. Noise from aircraft which is within or similar to community noise cannot be separated including aircraft with a lower noise level or when there is an increase in community noise such as from sirens, traffic or loud conversations. In the future, it is anticipated that systems will be able to specifically identify community noise such as a dog barking and also look for noise events, when an aircraft is within the capture zone.

Figure 12 below is intended to support understanding of the noise monitor settings and monitoring limitations.

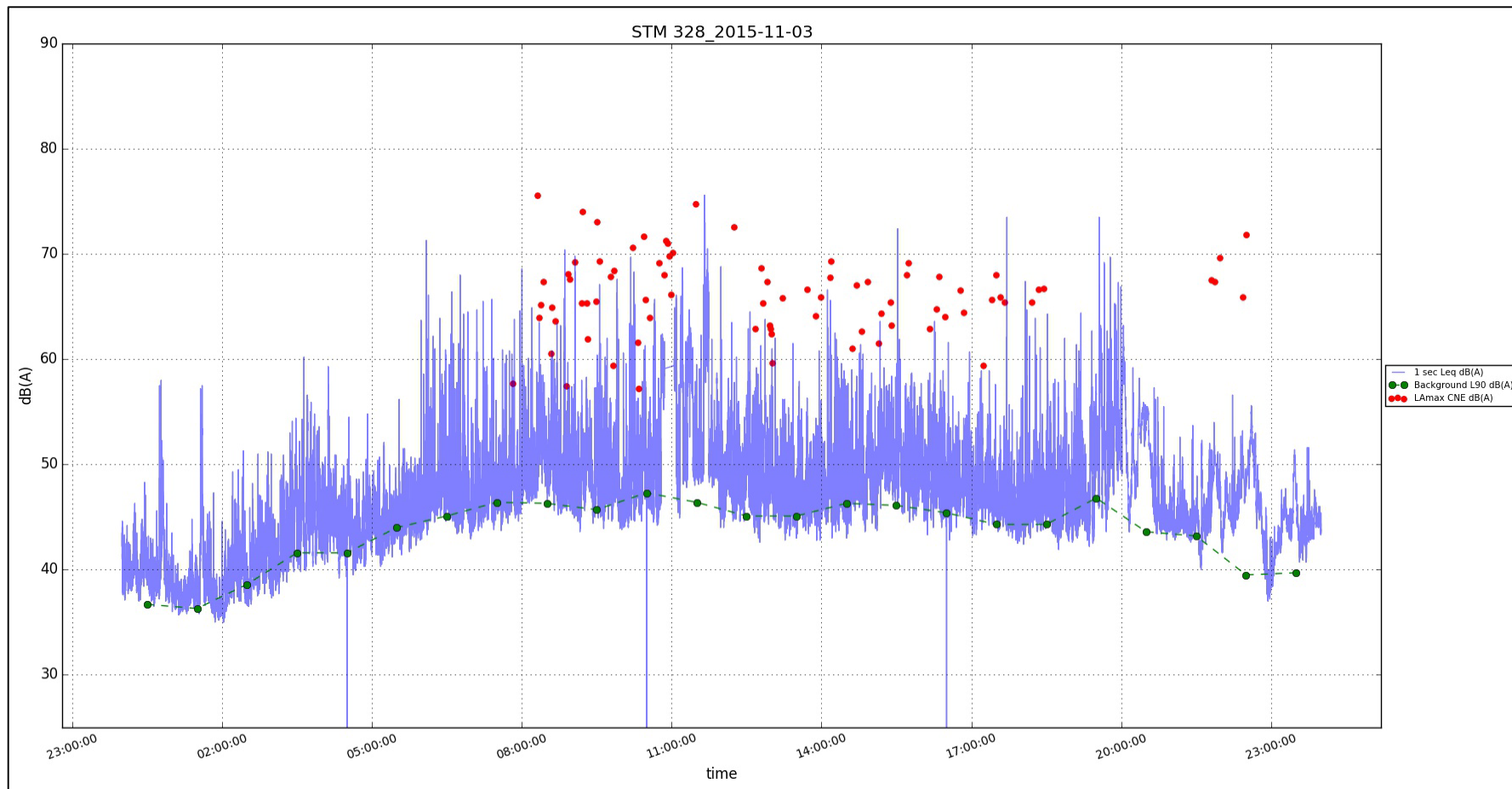


FIGURE 12: SALISBURY DOWNS 1 SECOND NOISE DATA, BACKGROUND LEVEL AND LAMAX'S OF CORRELATED NOISE EVENTS (CNES) FOR 03/11/2016

Figure 12 shows 24-hours of noise data from EMU 328 for a day during the monitoring period. Correlated noise events (6 to 120 seconds in length) are removed from the daily noise data, with only the point of LMax shown in red. The background level (L90) is also shown as points representing the hourly average for this day.

This allows for comparison of noise contributions from community activities to correlated aircraft noise contributions, at the EMU location. On 3/11/2015, there were a total of 92 aircraft operations that passed through the capture zone and of these operations, 80 with a correlated noise event. Figure 12 shows that a proportion of noise events are above as well as within the noise made by community activity. Any operations without a correlated noise event would also be within the noise data.