Cole Jarman

Stansted Airport, 102 Bartholomew Green

Noise Monitoring Report

Report 16/0321/R2-3

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Manchester Airport Group

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Noise Monitoring Report

Executive Summary

An extended noise survey has been undertaken during Summer 2016 at two locations to the east and south east of the Stansted Airport boundary, in the areas of High Easter and Bartholomew Green. This report relates to the monitoring undertaken at Bartholomew Green.

Analysis and compilation of the noise survey data has been undertaken by *Cole Jarman*. Where noise levels at the monitoring position were recorded as being above a set trigger level these were compared to Stansted Airport aircraft movements. If the elevated noise level correlated with an aircraft movement above the monitoring position the movement data and associated noise level were logged.

During the period, aircraft operated on south-westerly (Runway 22) movements for the majority of the time. North-easterly (Runway 04) operations took place on a small number of days. This reflects the prevailing weather conditions at Stansted. Analysis of the survey data indicates that, despite the distribution of movements at the airport, Runway 04 operations result in the majority of correlated aircraft movements above this monitoring position. Therefore, operations on Runway 04 control the noise impact of aircraft operations upon this location.

The measurements indicate that at Bartholomew Green the prevailing daytime noise levels are 49 dB $L_{Aeq,16h}$ on average and the analysis indicates this is only marginally influenced by aircraft movements. This level sits well below the WHO guideline limit of external amenity areas of 55 dB $L_{Aeq,16h}$.

Average daily N60 and N70 events which have been correlated to aircraft movements are seen to sit notably below a level where impact would typically be considered. Additional visual and numerical representations of L_{Amax} levels during correlated aircraft flyovers are provided for reference.

1 Introduction

1.1 Noise monitoring has been carried out during Summer 2016 at two locations to the east and south east of the Stansted Airport boundary, in the area of High Easter and Bartholomew Green.

1.2 The monitoring analysis is split into two reports, one for each measurement position, with this report focusing on the methodology employed and results recorded at Bartholomew Green, located east of the Airport.

1.3 The purpose of the monitoring is to determine typical levels and sources of ambient noise prevailing at the present time across an extended period. The aim is then to examine the data having specific regard to noise generated by operations at Stansted Airport at each location.

2 Site Description

2.1 The measurement position is on the edge of a farmers field at Bartholomew Green and is shown on attached figure 16/0321/F1.

2.2 The area would be generally described as rural in nature with individual dwelling settlements.

2.3 At Bartholomew Green the monitor is set up at the edge of a farmer's field with suitable power supplied via a nearby residence. Intermittent road traffic dominates the noise climate when present, and air traffic can also be heard when local noise levels are reduced. There were a number of local noise events during the monitoring period, primarily due to farm activities, some of which were identifiable and are highlighted within this report and its attachments.

2.4 This report concerns itself noise associated with Stansted Airport which is primarily apparent at this location when operating on Runway 04 (north easterly) for departing aircraft. There are also recorded events for aircraft arriving to both runways.

3 Survey Methodology

3.1 The noise monitoring to which this report relates commenced on Wednesday 15th June 2016 and continued until Wednesday 21st September 2016 covering a total of 99 days.

3.2 Measurements were made at the location shown on attached figure 16/0321/F1 and described below. Monitor positions are given the reference number set by Stansted Operations for ease of reference:

- [P102] Edge of farmer's field to the rear of dwelling in Bartholomew Green

3.3 All measurements were made at approximately 4 metres above ground level, in free field conditions.

3.4 The measurements were predominantly unattended. However, audio recording is enabled to allow a more detailed and subjective analysis of relevant periods if required. A trigger has also been set to allow the correlation of aircraft movements with the measured noise when it exceeds a certain level. The set level in the case of this monitoring was 60 dB(A) from 15th June to 25th June at which point it was then reduced to 55 dB(A) for the remainder of the survey period.

3.5 Measurements have been made of the L_{Aeq} and L_{Amax} indices (see attached Glossary of Acoustic Terms for explanation of noise units used).

3.6 Noise measurements were made using the following equipment:

Item	Manufacturer	Type
Sound Level Analyser	Bruel and Kjaer	3639 – A (portable)
Acoustic Calibrator	Bruel and Kjaer	Auto calibration

T1 Equipment used during noise surveys

3.7 The sound level analysers and their containers are designed specifically for this type of long term external noise monitoring. Each analyser is located in a locked, waterproof case and each microphone is fitted with a weather proof windshield.

3.8 The equipment auto-calibrates on a continual regular basis while in-situ and is manually calibrated annually.

4 Weather and Operating Conditions

4.1 Weather conditions at the commencement of the survey on Wednesday 15th June were observed to be warm and dry, with no precipitation. No significant wind was experienced, but a mild breeze from a south-westerly direction was apparent.

4.2 The weather conditions during the entirety of the survey are displayed on attached figures 16/0321/W03, W10, W99. The departure runway which was in use for any operations triggering the pre-set level at the noise monitoring locations is also shown on these figures. The locations of the monitoring equipment are shown on the attached site plan 16/0321/F1.

4.3 Due to data collection issues, the weather data at monitor 03 is not available after 18th August. However, sufficient data from monitors 10 and 99 is available to represent the weather conditions across the monitoring period.

4.4 The data collected by the Noise Monitoring Terminal is imported directly into the airport's noise and track keeping system, ANOMS[1]. This system also receives a radar feed directly from Air Traffic Control (for Stansted Operations only). All the data is processed including radar, noise, METAR and flight data. Operations that trigger a noise event are then correlated to that aircraft movement, enabling the system to be interrogated for directly correlated aircraft noise events and background noise events. In addition to the correlated data, the ANOMS system was setup to also capture the height and lateral tracks of aircraft by means of a 'Gate'.

4.5 Aircraft movements were established by use of this virtual gate above the monitoring position. Aircraft movements which passed through this gate from ground level up to 10,000ft above the monitoring position with a horizontal deviation of 3,000m to both sides of the position were recorded and correlated with any noise events which exceeded a trigger level of 60 dB(A) up to June 25th and 55 dB(A) thereafter. Further information is provided on the gate in Appendix A.

4.6 It can be seen from figures 16/0321/W03, W10, W99 that average conditions varied over the course of the measurement period, with changes in wind direction leading to changes in the operational mode for aircraft departures and arrivals. Over the course of the measurements, data from the gate analysis indicates that the majority of noted movements (78%) above the monitoring position were due to movements (both departures and arrivals) on Runway 04 (north-easterly direction). 22% of noted movements above the monitoring position were due to departure operations on Runway 22 (south-westerly direction).

4.7 Aircraft movements were also established for all airport operations during the monitoring period. For comparison with the above noted movements, the following table sets out details of the runway use for the airport over the monitoring period obtained directly from NATS[2]. It can be seen that the percentage of movements above the monitor indicated by the gate analysis does not correlate well with the total runway use during the monitoring period indicated by the NATS data. Operations on Runway 04 are seen to result in the majority of flyovers above this monitoring position, despite Runway 22 operations being the dominant airport movements in line with the prevailing weather conditions.

	NATS Log Movements		**Percentage Movements**	
	Runway 04	**Runway 22**	**Runway 04**	**Runway 22**
June (15 *days*)	1,031	7,438	12%	88%
July (*whole month*)	221	16,292	1%	99%
August *(whole month)*	4,755	11,980	28%	72%
September (*21 days*)	3,625	7,515	33%	67%
Total (85 days)	***9,632***	***43,225***	***18%***	***82%***

T2 Runway Use Summary

[1] Airport Noise and Operations Monitoring System
[2] National Air Traffic Services

4.8 In general, weather conditions were conducive to accurate measurement of typical noise conditions, with data recorded for both operating directions.

5 Measurement Results

5.1 Results of the L_{Aeq}, noise measurements at position P102 are presented in the attached figures:

5.2 16/0321/L2 sets out a comparison of the measured hourly $L_{Aeq,1h}$ levels with $L_{Aeq,1h}$ levels attributable solely to aircraft movements exceeding the pre-set trigger level as well as 'community' levels which are derived from a logarithmic subtraction of the aircraft level from the total measured level.

5.3 Identified periods which were confirmed to be controlled by noise sources other than Stansted aircraft are highlighted in the time history graphs, with description given. Where a shaded area has the description 'Local Noise Source', this period was identified using notes taken by local residents, and refer solely to farm operations in the adjacent field. Where a more detailed description is given, the noise event was identified using the audio recordings.

5.4 In addition to the above, noise indices relevant to various environmental and aircraft noise assessments have been calculated. The indices are set out in the attached 16/0321/SCH2 and are described below.

- $L_{Aeq,16h}$ is the standard A-weighted continuous sound pressure level used to represent day time noise levels covering the period 0700h-2300h, as referenced in *World Health Organisation* guidance[3] and BS8233:2014[4]
- L_{day} is the descriptor used under the European Environmental Noise Directive 2002 for the standard A-weighted continuous sound pressure level average across day time noise levels covering the period 0700h-1900h
- $L_{evening}$ is the descriptor used under the European Environmental Noise Directive 2002 for the standard A-weighted continuous sound pressure level average across evening time noise levels covering the period 1900h-2300h
- L_{night} is the descriptor used under the European Environmental Noise Directive 2002 for the standard A-weighted continuous sound pressure level average across night time noise levels covering the period 2300h-0700h. It is equivalent to the $L_{Aeq,8h}$ night time noise level referred to in *WHO* guidance and BS8233:2014.
- L_{den} is a logarithmic composite of the L_{day} $L_{evening}$, and L_{night} levels, being corrected for time and with the $L_{evening}$ and L_{night} levels subject to a 5 dB and 10 dB penalty respectively.

5.5 The following table presents a summary of the derived noise indices at the Bartholomew Green measurement position, averaged over the duration of the survey.

[3] *WHO Guidelines for Community Noise*, WHO headquarters 1999
[4] BS8233:2014 *Guidance on sound insulation and noise reduction for buildings*

Level	Average Levels as Measured (dB)	Average Levels with Aircraft Removed (dB)	Average Levels due to Aircraft Alone (dB)
$L_{Aeq,16h}$	49	49	25
L_{day}	50	49	23
$L_{evening}$	46	45	16
L_{night}	42	42	9
L_{den}	51	51	27

T3 Noise Indices Summary

5.6 Figures in the above table are given as an average across all days, including those where there were no correlated aircraft movements. It can be seen that the average levels due to aircraft alone are low which is reflective of the ratio of runway 04 operations noted above this site during the monitoring period, these providing the dominant aircraft movements above this position.

5.7 In addition to the above indices the N70 (number of noise events due to aircraft exceeding 70 dB) and N60 levels were established. The N70 was calculated by summing the number of aircraft incidences which caused the L_{Amax} level between 0700h and 2300h to exceed 70dB. A similar exercise was carried out for a 60 dB limit between 2300h and 0700h to establish the N60. The following table summarises these results.

	N70 (0700h-2300h)		**N60 (2300h-0700h)**	
	Total	**Daily Average**	**Total**	**Daily Average**
Total	14	0.1	145	1.5
	Daily Average	**Daily Max**	**Daily Average**	**Daily Max**
June (*16 days*)	<1	5	<1	6
July (*whole month*)	0	0	<1	1
August *(whole month)*	<1	2	3	15
September (*21 days*)	<1	3	3	11

T4 N70 and N60 Summary

5.8 As part of the analysis audio recordings of the highest measured L_{Amax} levels were examined in order to ensure these correlated with aircraft movements. Two events were identified which ascribed an L_{Amax} level to an aircraft flyover where the controlling source was clearly not an aircraft. Theses events are noted below:

- 20:02 25/08/16 – L_{Amax} 76.0 dB – elevated level due to motorbike passing
- 18:44 18/08/16 – L_{Amax} 73.4 dB – elevated level due to farm machine

5.9 These two occurrences were removed from the above N70 and N60 analysis, and from the L_{Amax} analysis presented below. However, the levels have not been removed from the above L_{Aeq} and daily noise index analysis as this calculation was undertaken automatically by the sound monitoring software. The analysis of the impact of aircraft noise upon the baseline ambient noise levels can therefore be considered pessimistic.

5.10 A third event was noted at 15:01 on 16/09/16 at 74.5 dB L_{Amax}. While audio analysis indicates that this event was influenced strongly by elevated wind at the monitor this could not be verified. Therefore this event is included in the analysis as an aircraft flyover.

5.11 Additional correlated events were also noted which may have been controlled by weather or local sources. This could not be confirmed therefore no further events were removed from the analysis. It is expected, therefore, that these numbers are pessimistic due to the inclusion of noise levels which may not be due to aircraft movements as noted above.

5.12 It is worth noting that with this pessimistic analysis the average daily N70 and N60 incidences are considered to be low; maps presenting such incidences in the vicinity of airports rarely indicate contours representing N values below 10, and where the analysis has been used for UK airports, '25 events per day' is typically the minimum contour.

6 Measurement Discussion

6.1 General Comments

6.1.1 The attached time history graph 16/0321/L2 sets out the hourly noise levels, with data processed in a manner that permits analysis of the influence on the prevailing ambient noise levels of aircraft operations.

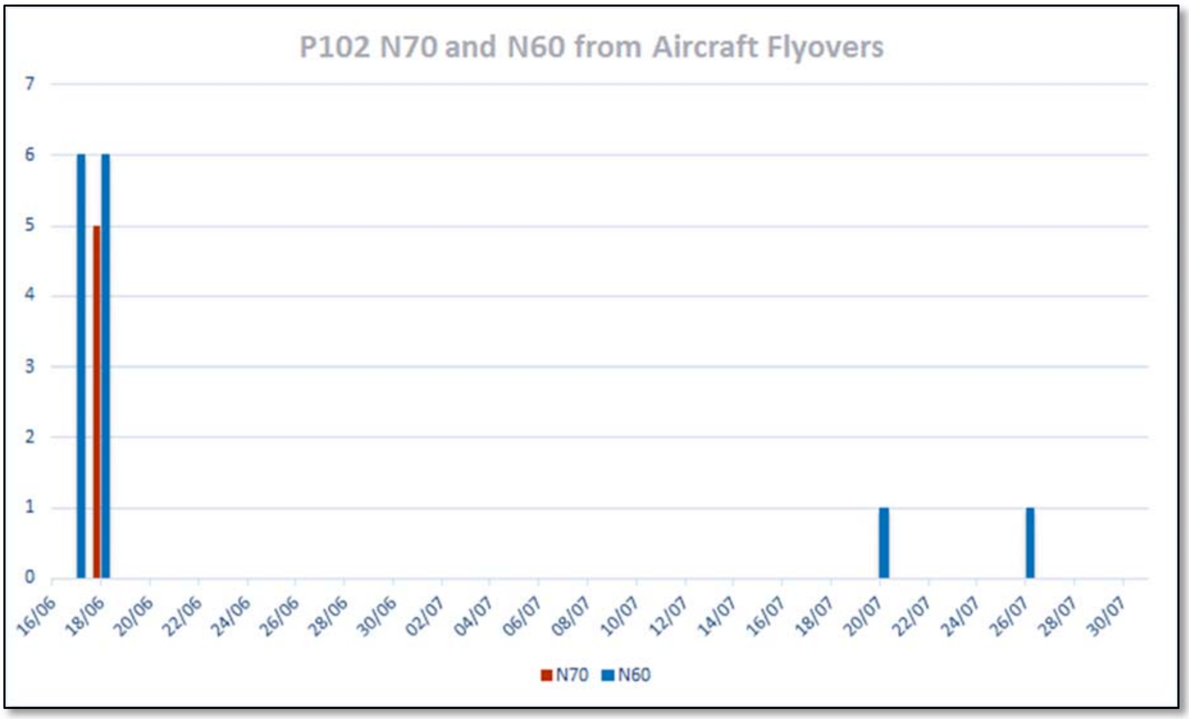
6.1.2 It is worth noting that there are periods of elevated noise levels which do not correlate with aircraft movements. Identified periods are highlighted in the time history graphs, with description given. Where a shaded area has the description 'Local Noise Source', this period was identified using notes taken by local residents, and refer solely to farm operations in the adjacent field. Where a more detailed description is given, the noise event was identified using the audio recordings.

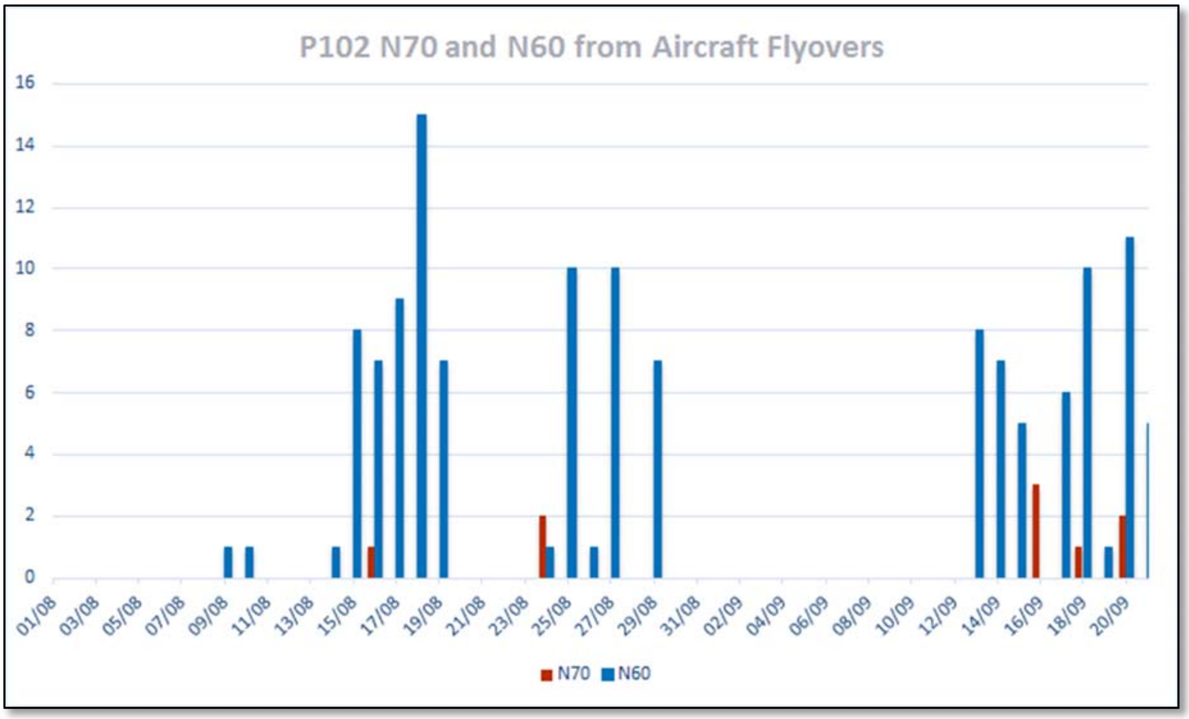
6.1.3 Aside from the two events noted above in Section 5.9, noise events were not removed from the analysis as it was not possible to confirm that the noise level measured was not due to the aircraft. For example, where a flyover correlated with a local noise event which controlled the measured level, this event level, which may have been due to the local noise event, is attributed to the flyover. The analysis is therefore considered pessimistic, but the approach is more robust than an analysis in which noise levels associated with such events were removed from the flyover data.

6.1.4 It can be seen from Table T3 above that on average there is an approximate 0-1dB difference between community noise indices with and without aircraft noise indicating a nominal effect at worst on the overall noise climate due to aircraft movements.

6.2 N70 and N60

6.2.1 The following graphs set out the daily daytime N70 and night time N60 results from the analysis:



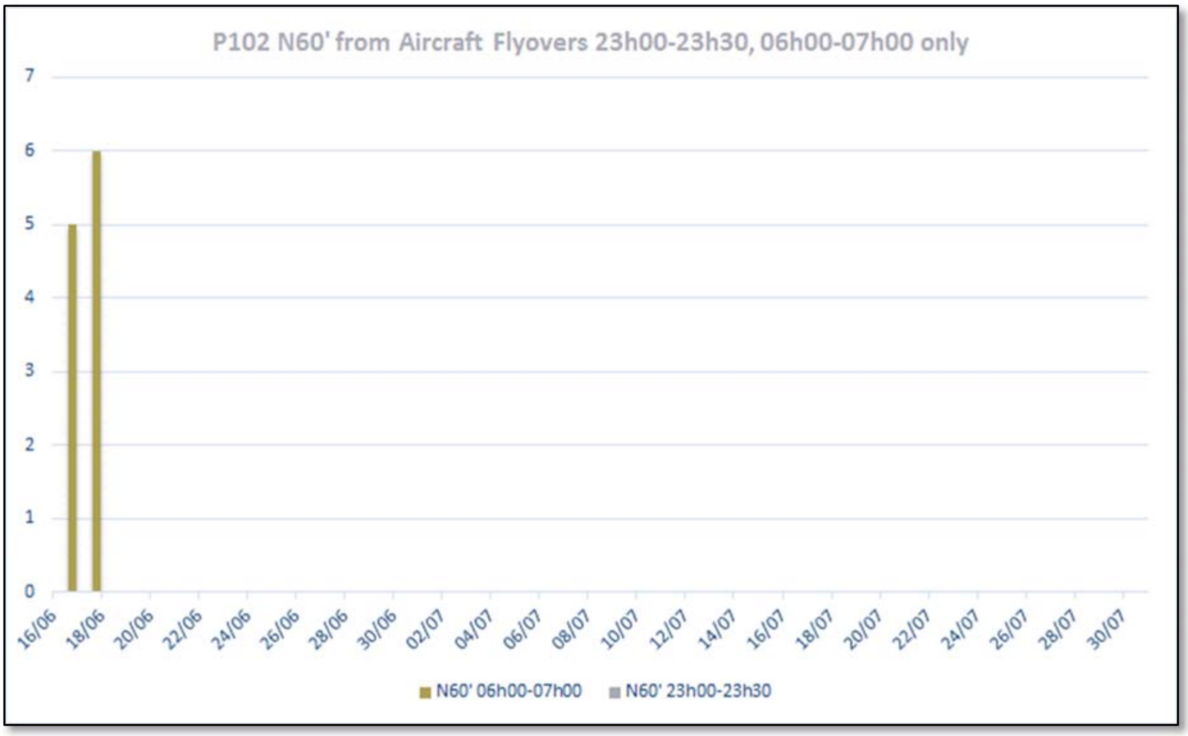


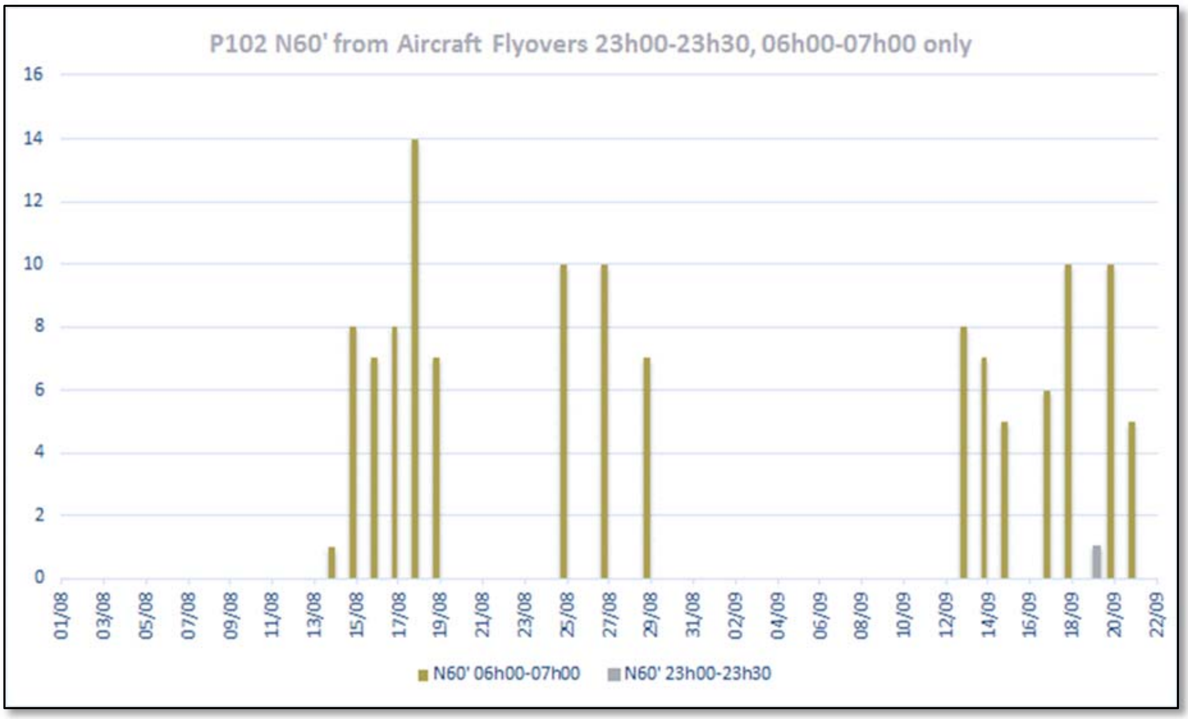
6.2.2 It is worth noting that while the elevated levels have been correlated with aircraft movements timing wise this does not absolutely confirm that the noise levels have been caused by aircraft movements.

6.2.3 As noted above, a number of occurrences have been correlated with non-aircraft noise events. While two were removed from analysis as it was possibly to clearly identify that an alternative source caused the elevated level, all other events have remained in the analysis as it cannot be definitively stated that the flyover at the same time did not result in the elevated level. Therefore, for robustness, these levels remain included in the data.

6.3 N60 and N70 Variations

6.3.1 In order to examine the aircraft flyovers in more detail the night time 60 dB L_{Amax} and day time 70 dB L_{Amax} levels were analysed in a manner that deviates from the standard N60 and N70 analysis. Firstly, the exceedances of 60 dB L_{Amax} was analysed during the night time 'shoulder periods' of 23h00 to 23h030 and 06h00 to 07h00. This index is referred to as N60' in the following figures.





6.3.2 It can be seen within the above figures, and from comparison of the N60′ figures with the N60 figures in Section 6.2, that the majority of night time exceedances of 60 dB L_{Amax} occur between 06h00 and 07h00.

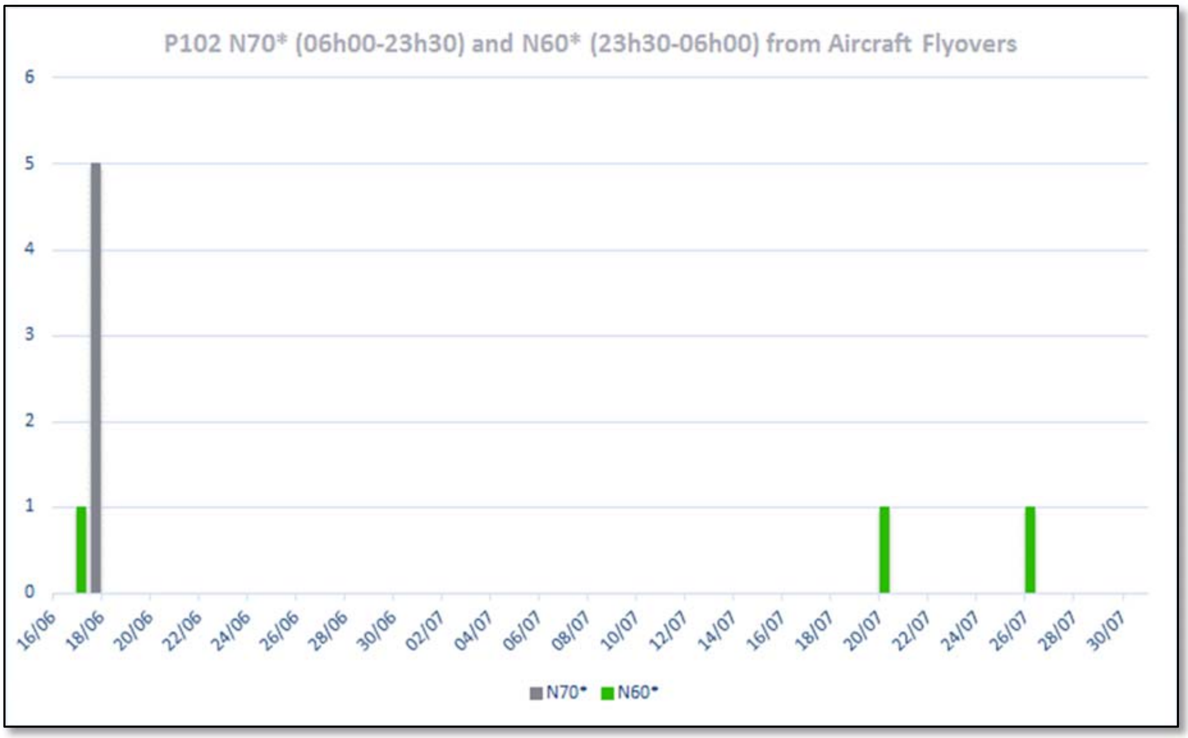
6.3.3 A second analysis has been undertaken with reference to the existing permitted flying hours at Stansted airport, with operations being allowed as standard between 06h00 and 23h30 and operations outside of these hours being subject to a night time quota.

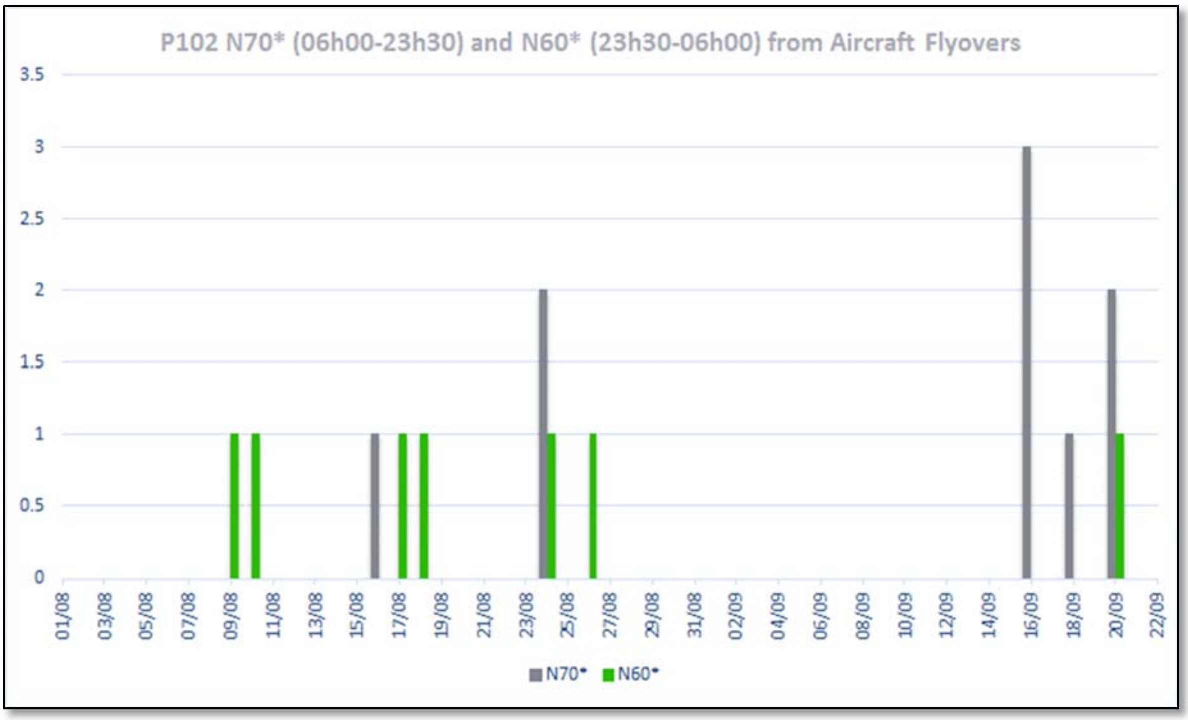
6.3.4 The number of exceedances of 70 dB L_{Amax} during the standard hours are referred to as N70* in the figures below while the number of exceedances of 60 dB L_{Amax} during the night time hours of 23h30 to 06h00 are referred to as N60*.

6.3.5 It can be seen from the figures below that the exceedance of 60 dB L_{Amax} due to aircraft outside of the standard airport permitted hours is intermittent and low in number.

6.3.6 It must be emphasised that while the analyses of the number of flights above 70dB and 60dB during non-standard periods provides useful information on the distribution of noise events throughout a full 24 hour day, the numerical results cannot easily be interpreted with regard to the community response. It is for this reason that current guidance from the CAA, as contained in CAP 725[5], does not recommend the inclusion of such analyses when assessing the noise effects of airspace changes at UK airports.

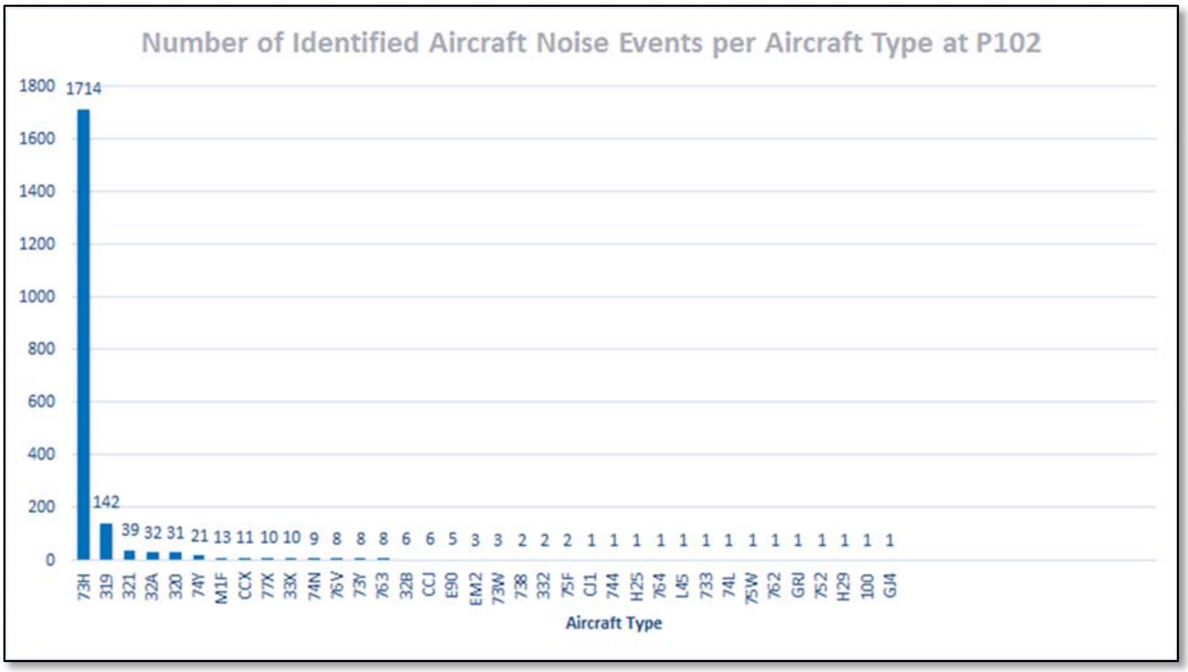
[5] CAA Guidance on the Application of the Airspace Change Process, CAP 725: March 2016


P102 N70* (06h00-23h30) and N60* (23h30-06h00) from Aircraft Flyovers
0
1
2
3
4
5
6
16/06
18/06
20/06
22/06
24/06
26/06
28/06
30/06
02/07
04/07
06/07
08/07
10/07
12/07
14/07
16/07
18/07
20/07
22/07
24/07
26/07
28/07
30/07
N70*
N60*

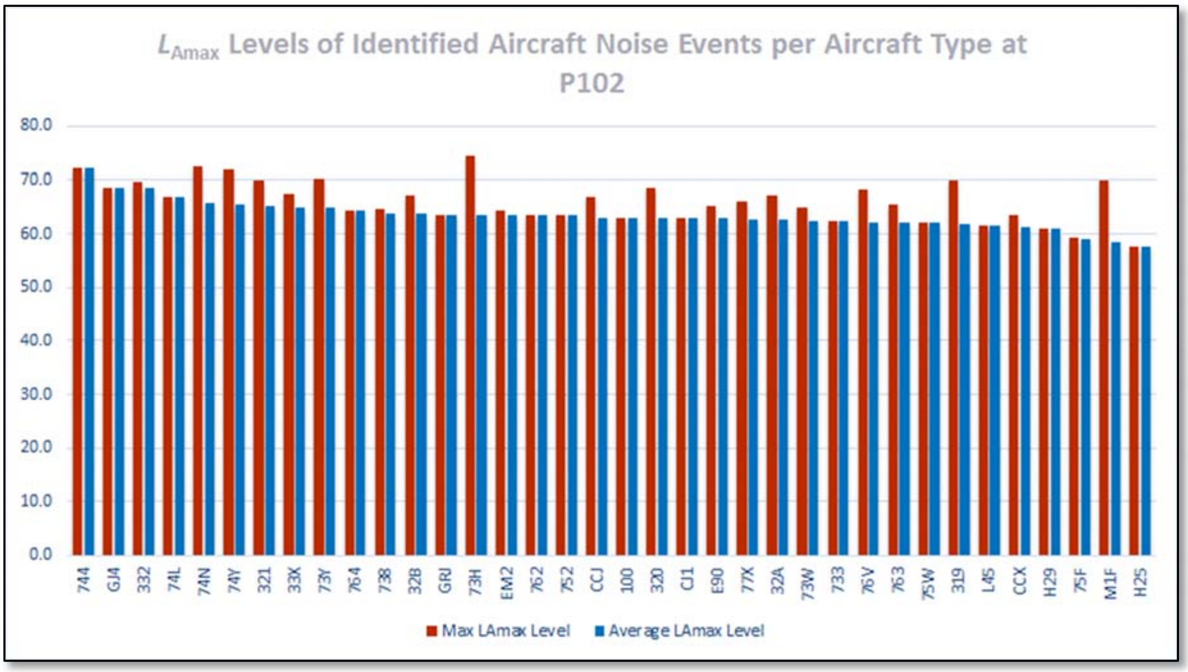

P102 N70* (06h00-23h30) and N60* (23h30-06h00) from Aircraft Flyovers
0
0.5
1
1.5
2
2.5
3
3.5
01/08
03/08
05/08
07/08
09/08
11/08
13/08
15/08
17/08
19/08
21/08
23/08
25/08
27/08
29/08
31/08
02/09
04/09
06/09
08/09
10/09
12/09
14/09
16/09
18/09
20/09
22/09
N70*
N60*

6.4 Noise Events by Aircraft Type

6.4.1 In the following graph it can be seen that aircraft type 73H (Boeing 737-800) undertake the majority of flights at this airport resulting in noise events at this site. Type 319 (Airbus 319) is the next most common aircraft.

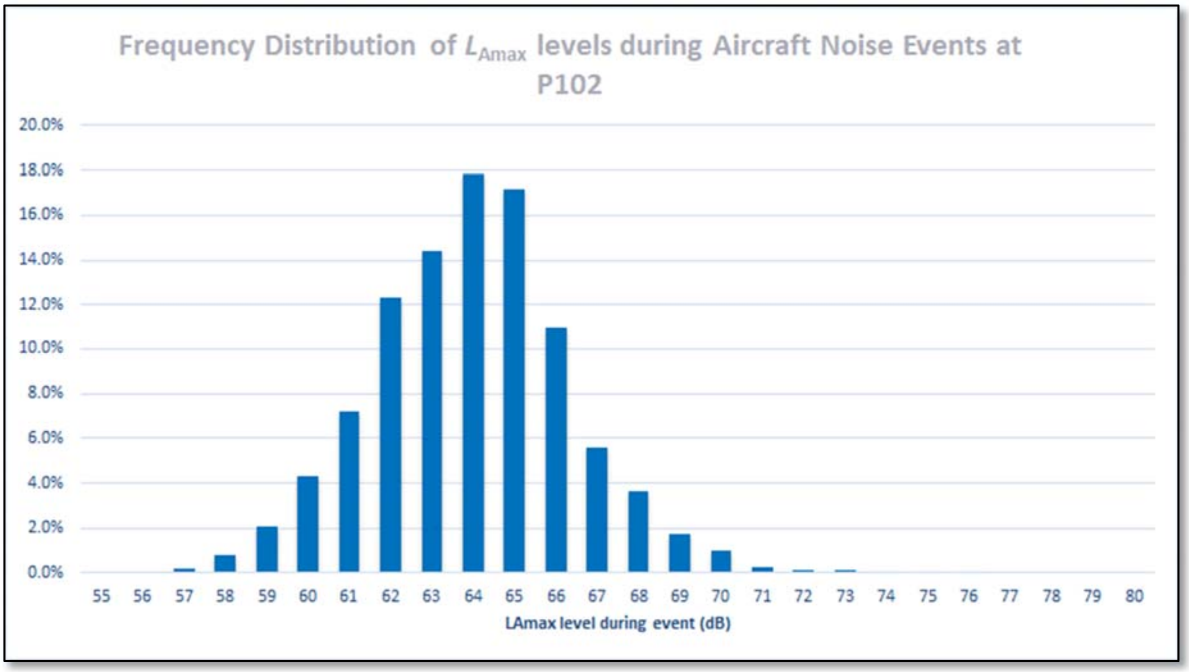


6.4.2 The graph below sets out the average and highest L_{Amax} level measured during flyovers attributed to the various aircraft. There is, inevitably, variation in the maximum levels generated with the Boeing 737-800 leading to the highest L_{Amax} flyover level at 74.5dB, and a number of smaller aircraft generating L_{Amax} flyover levels in the order of 58-62dB.



6.5 Noise Level Frequency Distribution

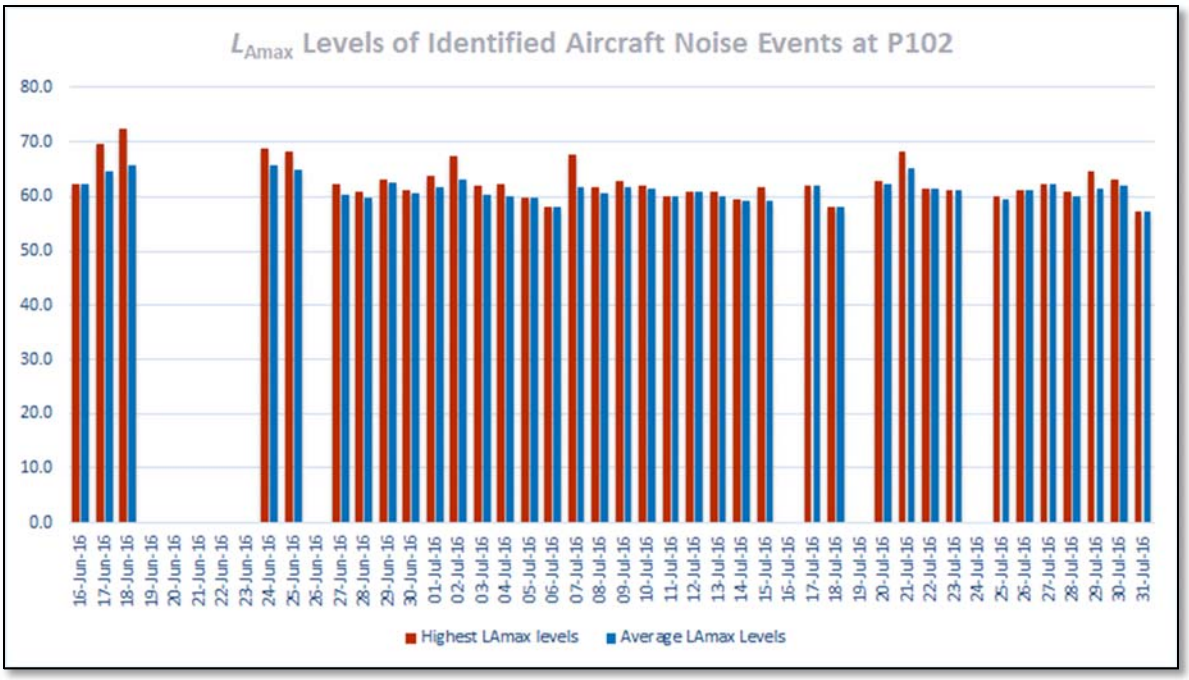
6.5.1 The graph below sets out the frequency distribution of L_{Amax} levels measured during correlated flyovers at this location. It can be seen that 78% of flyovers fall in the 62-67 dB L_{Amax} range.

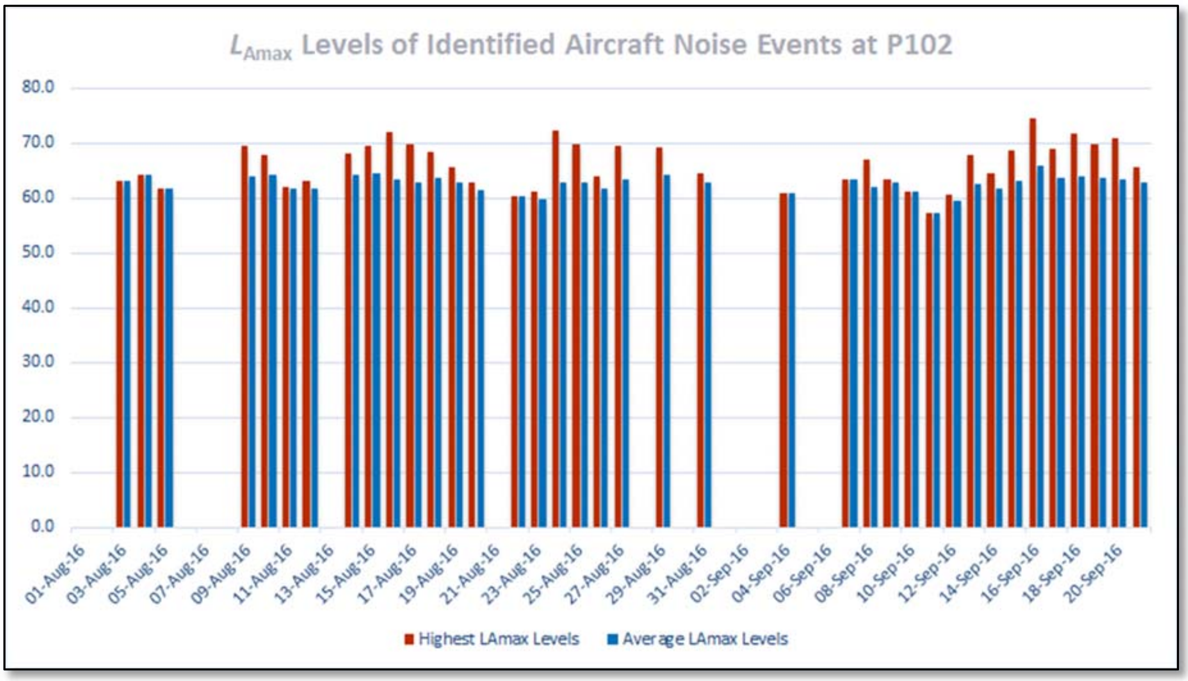


6.6 Aircraft Maximum Noise Levels

6.6.1 The following graphs show the highest and average measured L_{Amax} levels at P102 during the monitoring period. Breaks in the data are due to there being no correlated aircraft flyovers with noise events exceeding 55 dB(A).

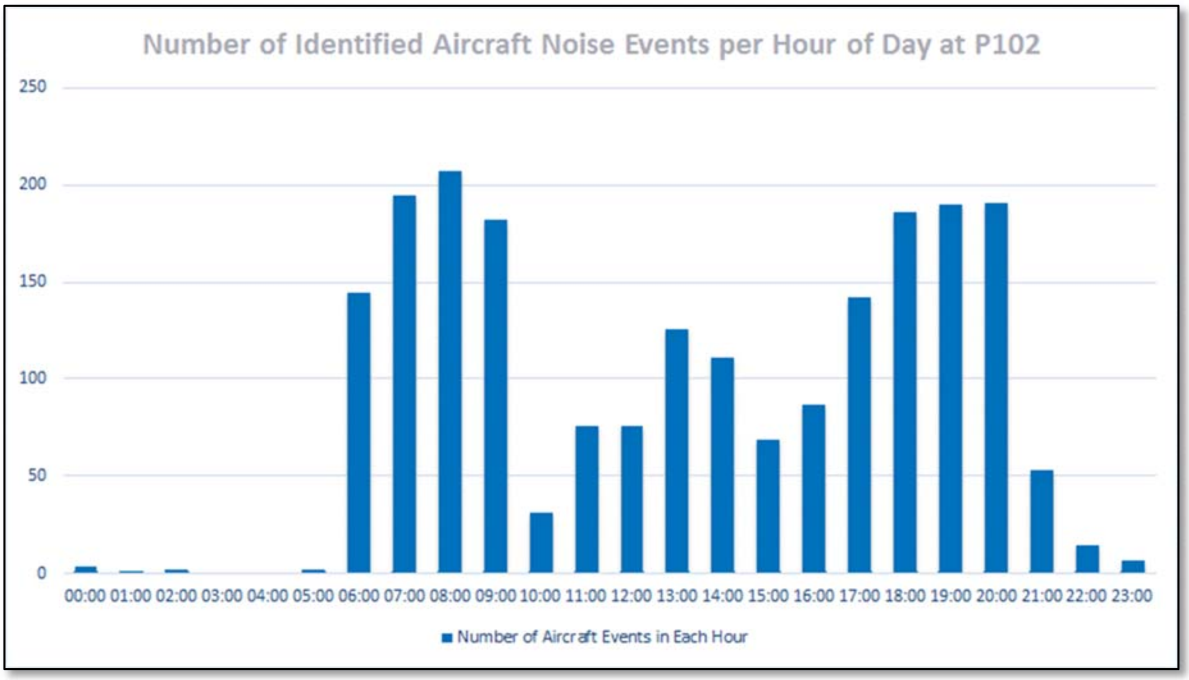
6.6.2 The range of levels is consistent with what is shown in the graph in paragraph 6.3.2 above, with 16th September having a highest L_{Amax} flyover level of 74.5dB while 10th September has a highest L_{Amax} flyover level of just over 57dB.

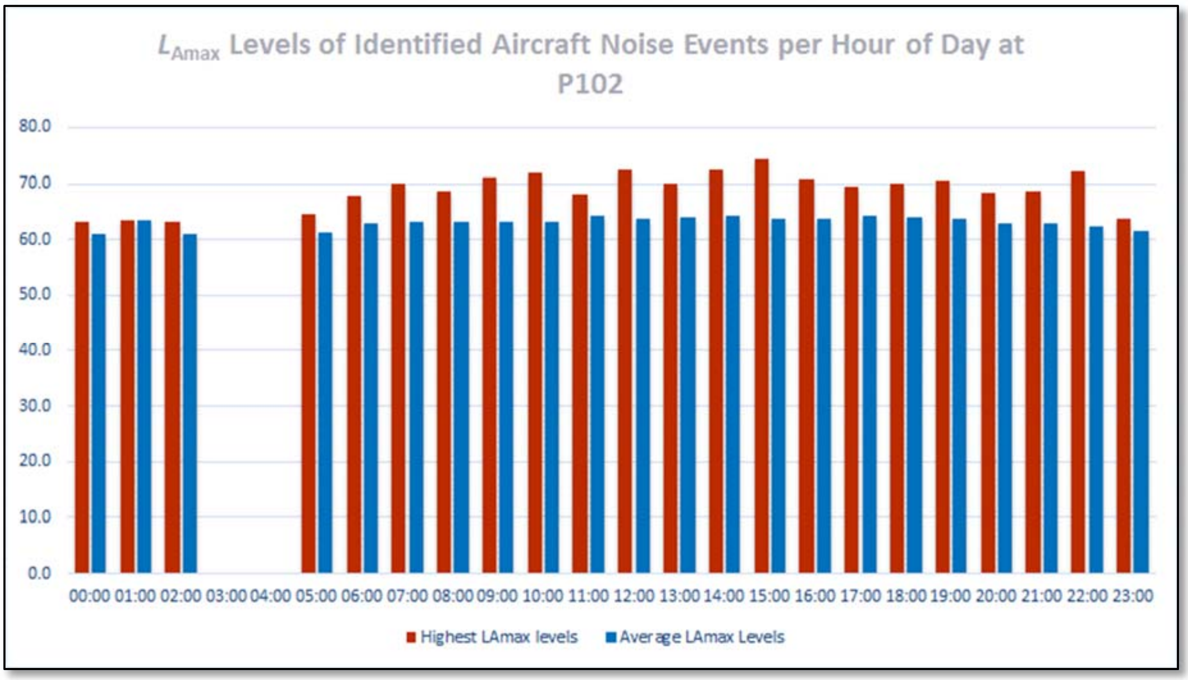




6.7 Noise Events Throughout the Day

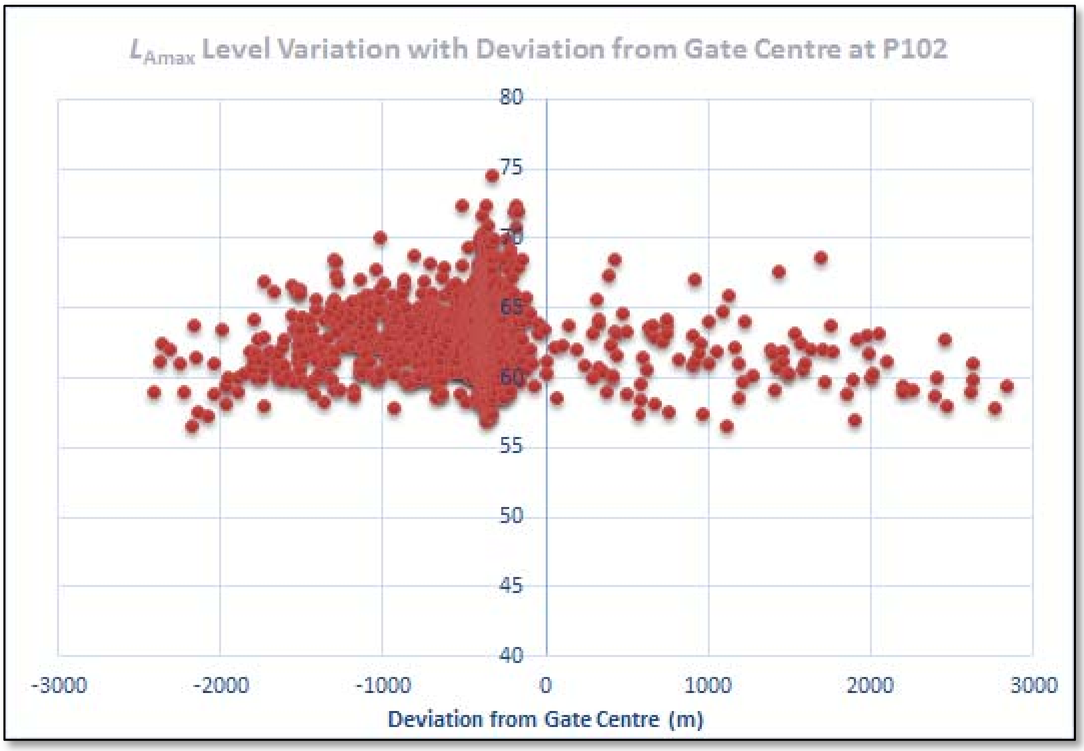
6.7.1 The following graphs provide a breakdown of the aircraft events measured during the 99-day monitoring period in terms of number of aircraft and in terms of highest and average L_{Amax} level measured during correlated events. It can be seen that 07:00-09:00 and 18:00-21:00 are the busiest periods, while the average L_{Amax} level remains quite constant at approximately 64 dB L_{Amax}.

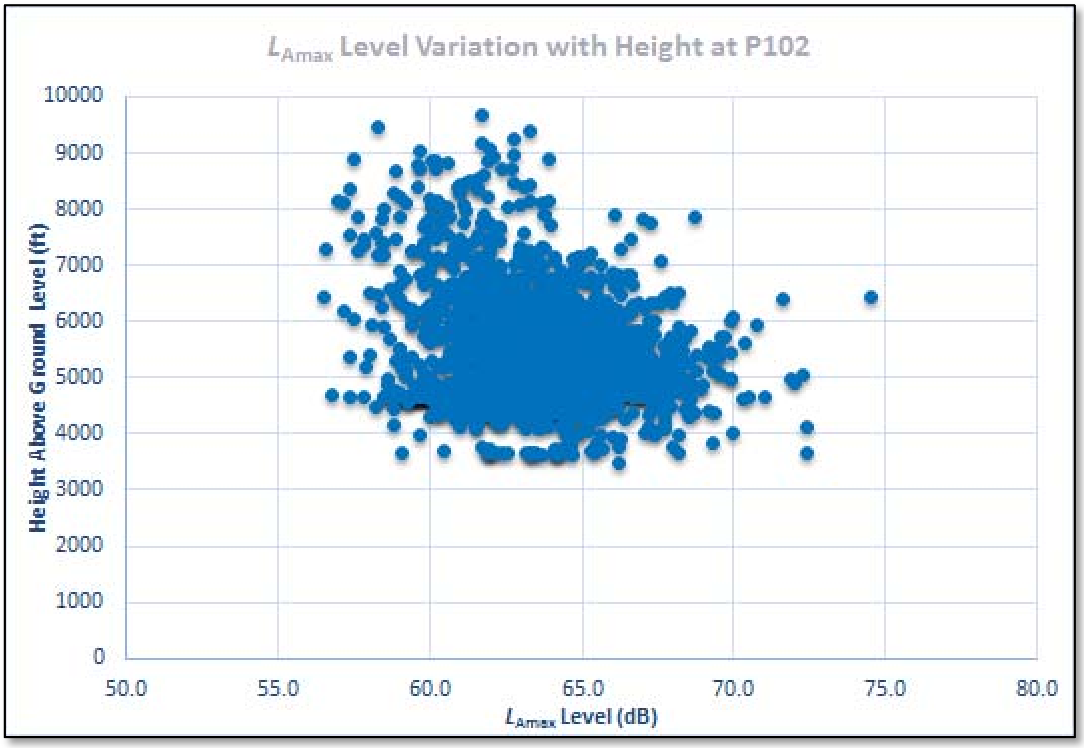




6.8 Aircraft Location

6.8.1 The following graphs set out the variation in measured L_{Amax} level with aircraft height and deviation from the gate centre point during flyovers, the gate being centred over the measurement position. Further information on the gate is set out in the attached Appendix A.


L_{Amax} Level Variation with Deviation from Gate Centre at P102
80
75
70
65
60
55
50
45
40
-3000
-2000
-1000
0
1000
2000
3000
Deviation from Gate Centre (m)

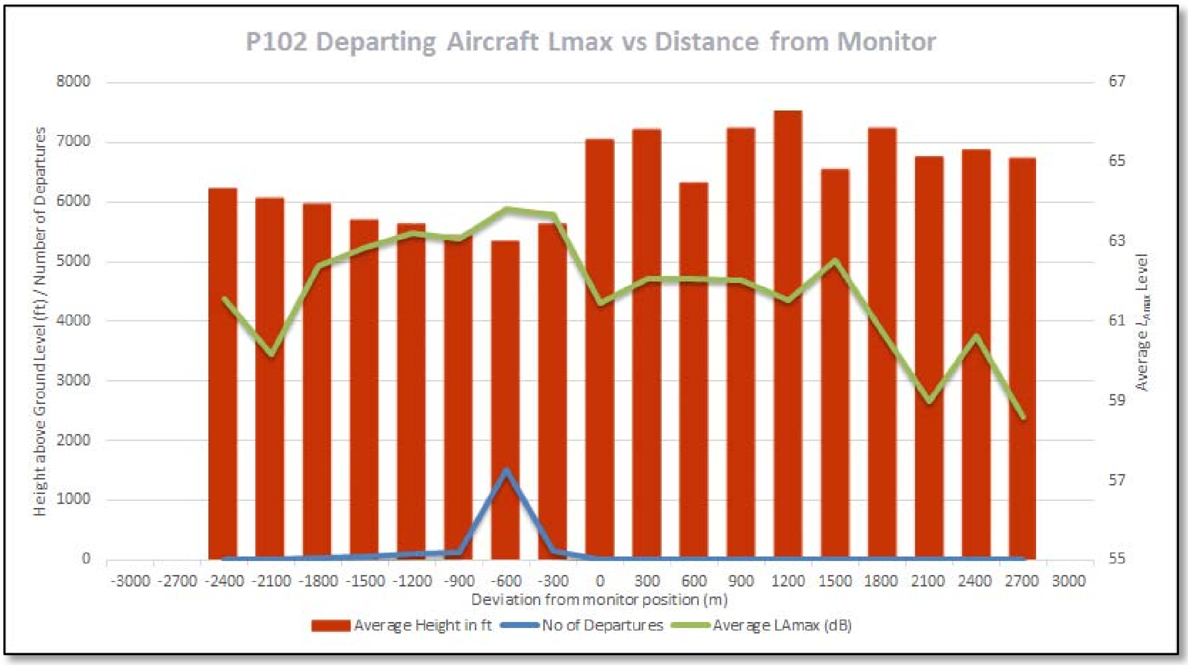

L_{Amax} Level Variation with Height at P102
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Height Above Ground Level (ft)
50.0
55.0
60.0
65.0
70.0
75.0
80.0
L_{Amax} Level (dB)

6.1

6.8.2 It can be seen from the above that there is not a strong correlation between aircraft height or deviation from gate centre and measured L_{Amax} level. It can also be seen that the majority of flyovers occur to the left of the gate, likely due to the monitoring position not being directly under the main flight path. Gate position and geometry is shown in the attached Appendix A.

6.8.3 The following figure sets out an analysis undertaken by the Stansted Flight Performance team of the variation in average L_{Amax} level with deviation from monitoring position. The analysis is undertaken on departure aircraft only with deviations grouped into 300m blocks.

6.8.4 With the analysis being undertaken of average levels per deviation block, it can be seen that the general trend is for higher levels 300-600m from the monitoring position. Due to the relatively low numbers of movements at this position, the trend is not as clear is it might be for a heavier trafficked location such as P104 as set out in 16/0321R1, with outliers here having a stronger effect on the overall levels. In particular, the trends to both extremes become less valid due to the lower number of movements occurring for these blocks.

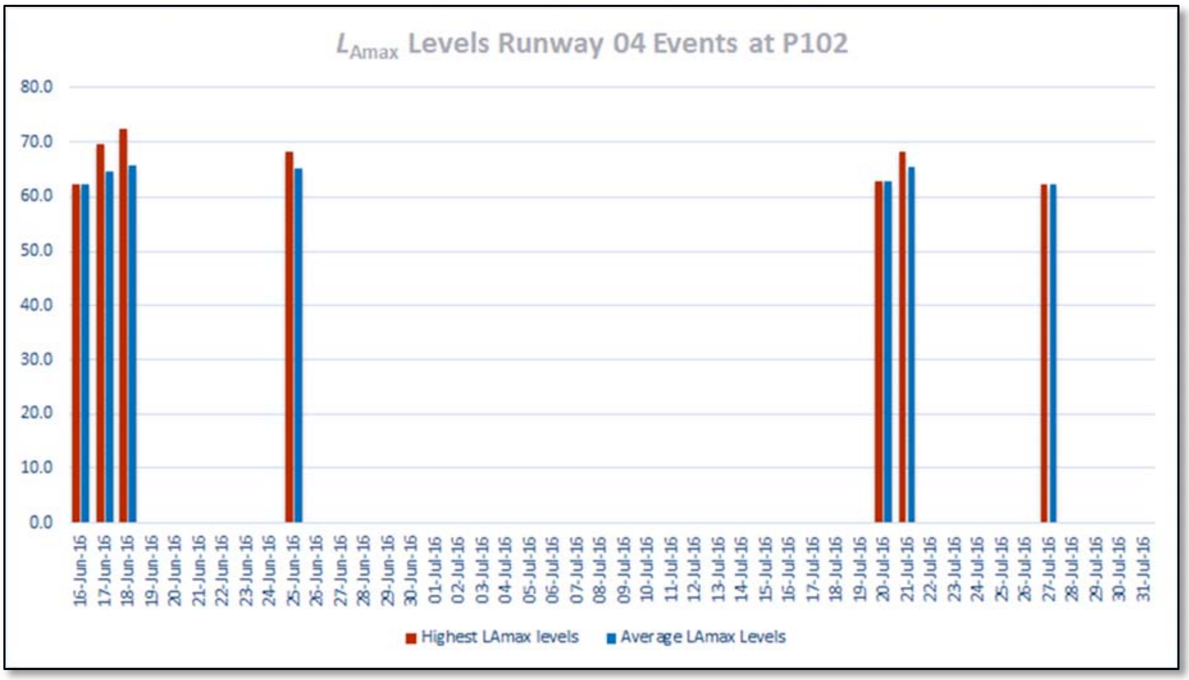


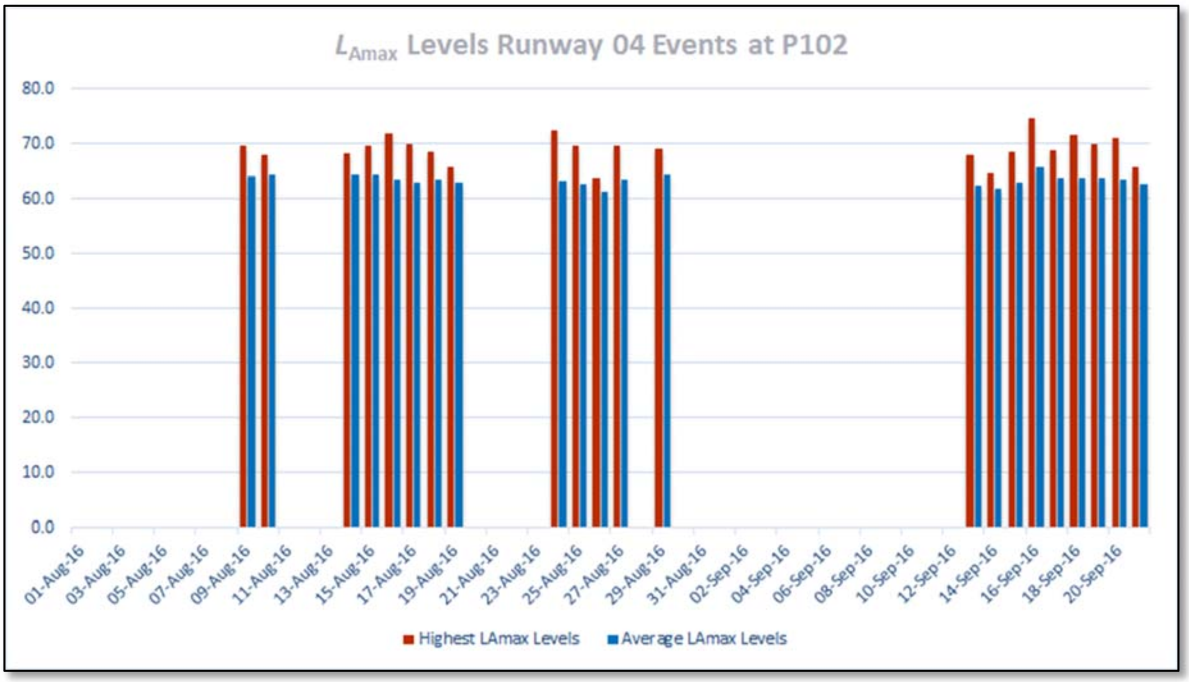
6.9 Weather and Runway Use

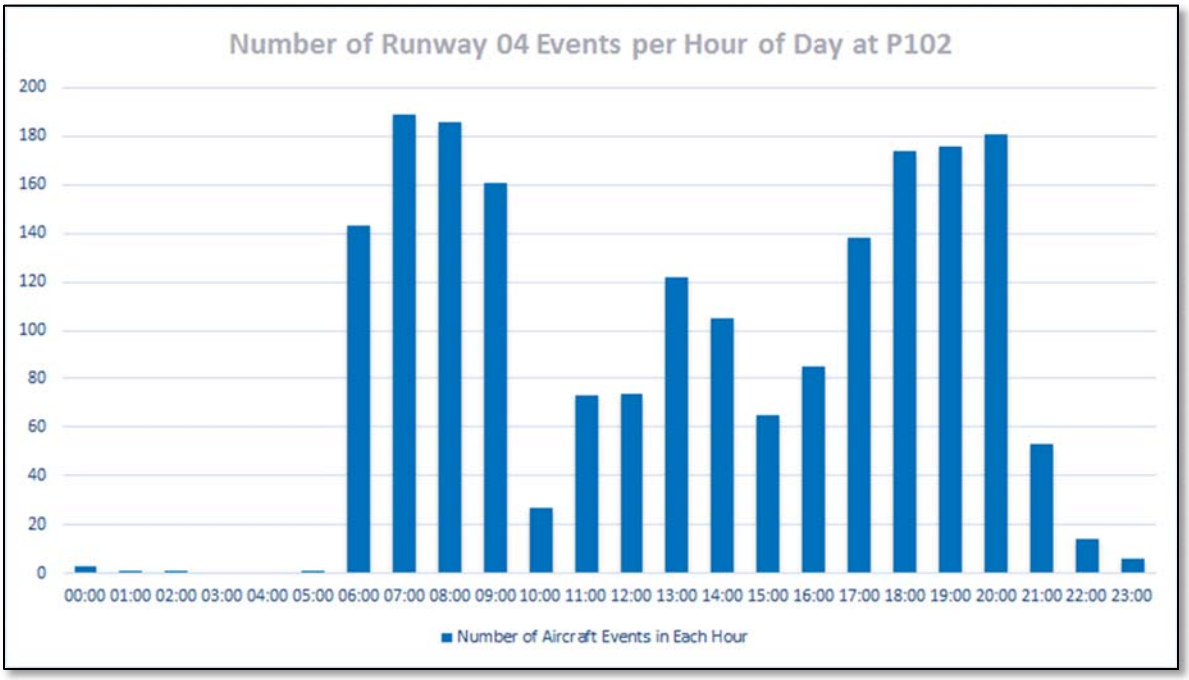
6.9.1 Due to the prevailing weather conditions, Runway 22 is in use the majority of the time at Stansted Airport as can be seen from the attached weather and runway use figures.

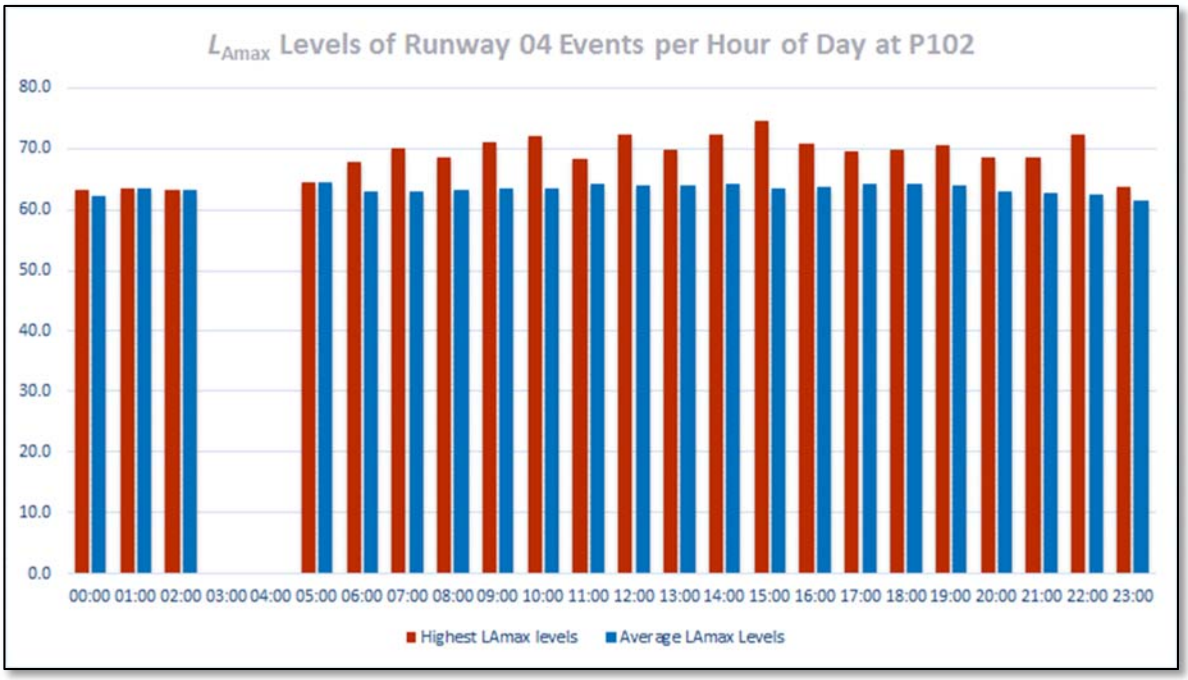
6.9.2 Runway 22 was in use approximately 82% of the time during monitoring while Runway 04 was in use approximately 18% of the time. The split of gate penetrations above this monitoring position, as described in Appendix A below, was 22% associated with Runway 22 and 78% associated with Runway 04.

6.9.3 It can therefore be seen that use of Runway 04 has a more notable effect on this location, due to the routing of aircraft using this runway causing them to be closer to the noise monitor. It should be noted however, that even during use of Runway 04 the occurrence of N60 and N70 events remain low. To ensure sufficient analysis of levels from the lesser used (but having greater effect on this location) Runway 04, a number of the above figures are reset below showing only data collected during Runway 04 movements.









6.9.4 It can be seen from the above that noise levels during Runway 04 correlated events are equivalent to the typical levels measured over the entirety of the survey. Therefore, it can be taken that the data presentation methodology used in this report suitably indicates the effect of Runway 04 movements on the measurement position.

7 Conclusions

7.1 Noise levels have been measured over an extended period at two locations to the east of Stansted Airport. During the period, aircraft operated on south-westerly (Runway 22) movements for the majority of the time at 82% of movements, with 18% of movements on the north-easterly Runway 04. This reflects the prevailing weather conditions at Stansted. Conversely, Runway 04 accounted for 78% of noted aircraft movements above the monitoring position. Runway 22 accounted for 22% of noted aircraft movements above the monitoring position.

7.2 The measurements indicate that at Bartholomew Green the prevailing daytime noise levels are 49 dB $L_{Aeq,16h}$ on average and the analysis indicates this is only marginally influenced by aircraft movements. It is worth noting that this level sits below the *WHO* guideline limit of external amenity areas of 55 dB $L_{Aeq,16h}$.

7.3 Average and maximum daily N60 and N70 events which have been correlated with aircraft movements are seen to sit notably below a level where impact would typically be considered. Additional visual representations of L_{Amax} levels during correlated aircraft flyovers are provided for reference.

End of Section

Glossary of Acoustic Terms

L_{Aeq}:

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq}.

L_{Amax}:

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the “fast” sound level meter response.

L_{A10} & L_{A90}:

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n.

L_{AX}, L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

End of Section

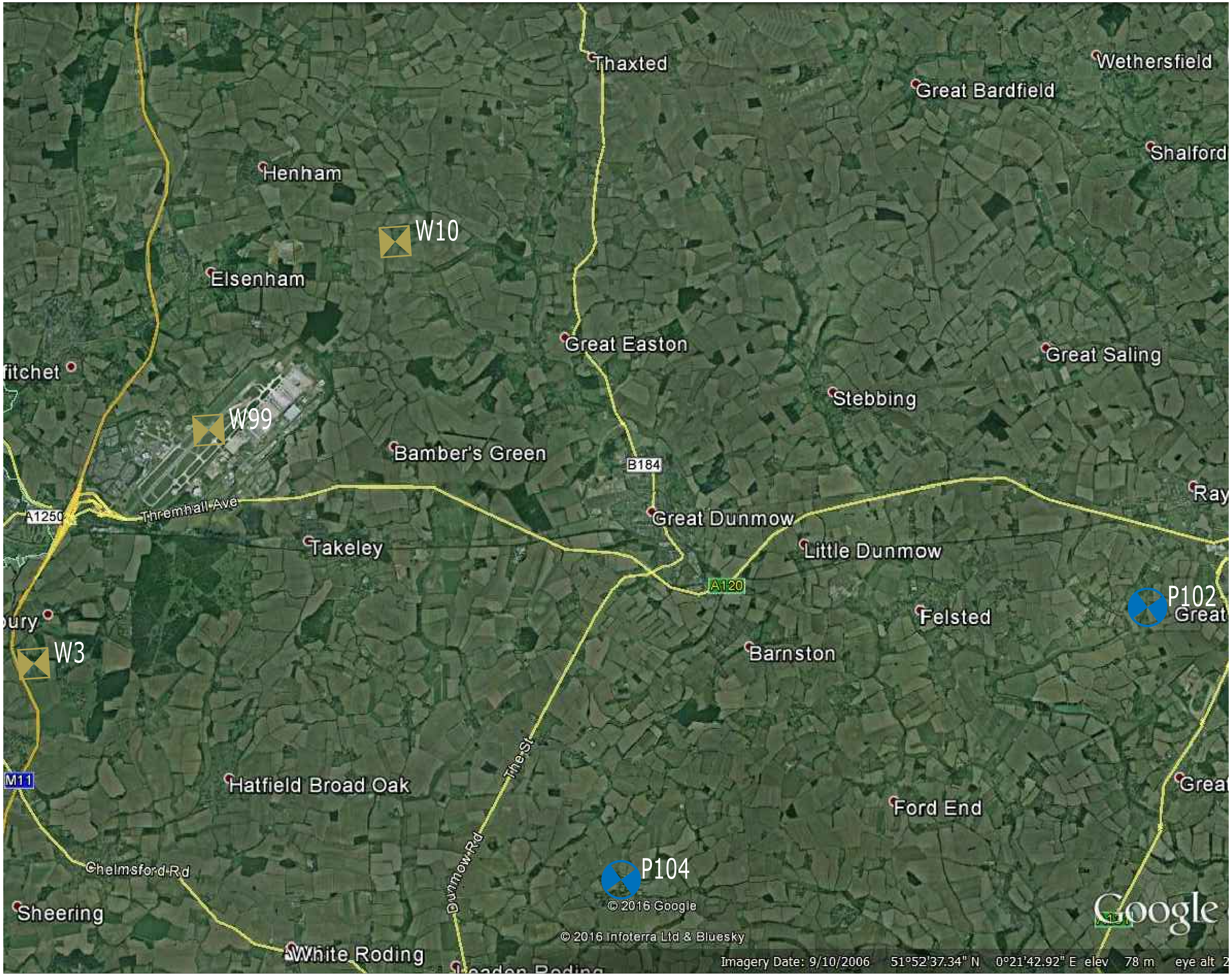


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Figure 16/0321/F1

Title:

Site Plan showing noise and weather monitoring locations

Figure Key

W Weather Monitoring Location

Noise Monitoring Locations

P102 Bartholomew Green

P104 High Easter

North

Project:

Stansted Airport Monitoring

Date: August 2016

Revision: -

Scale:

Not to scale

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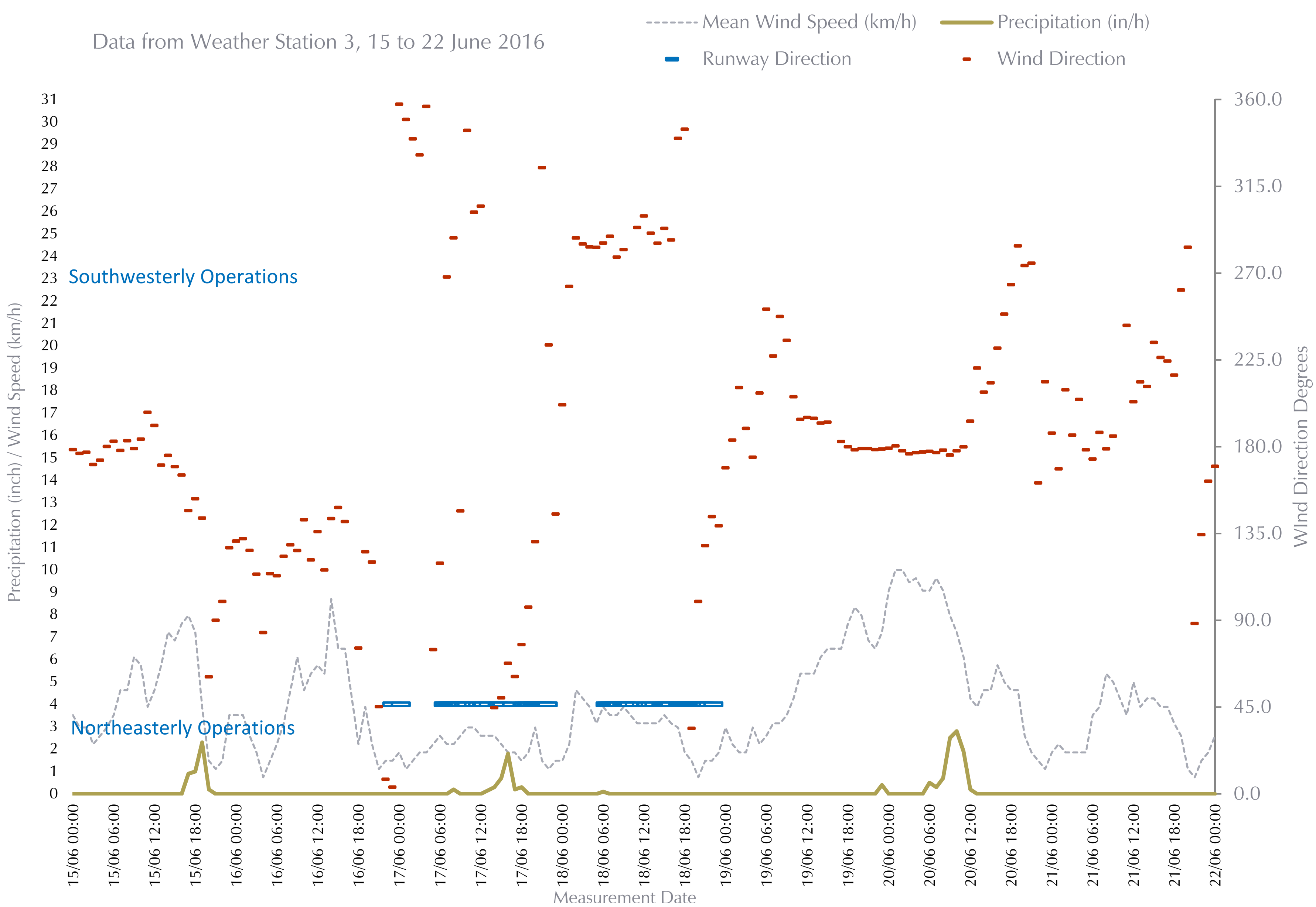


Figure 16/0321/W3A

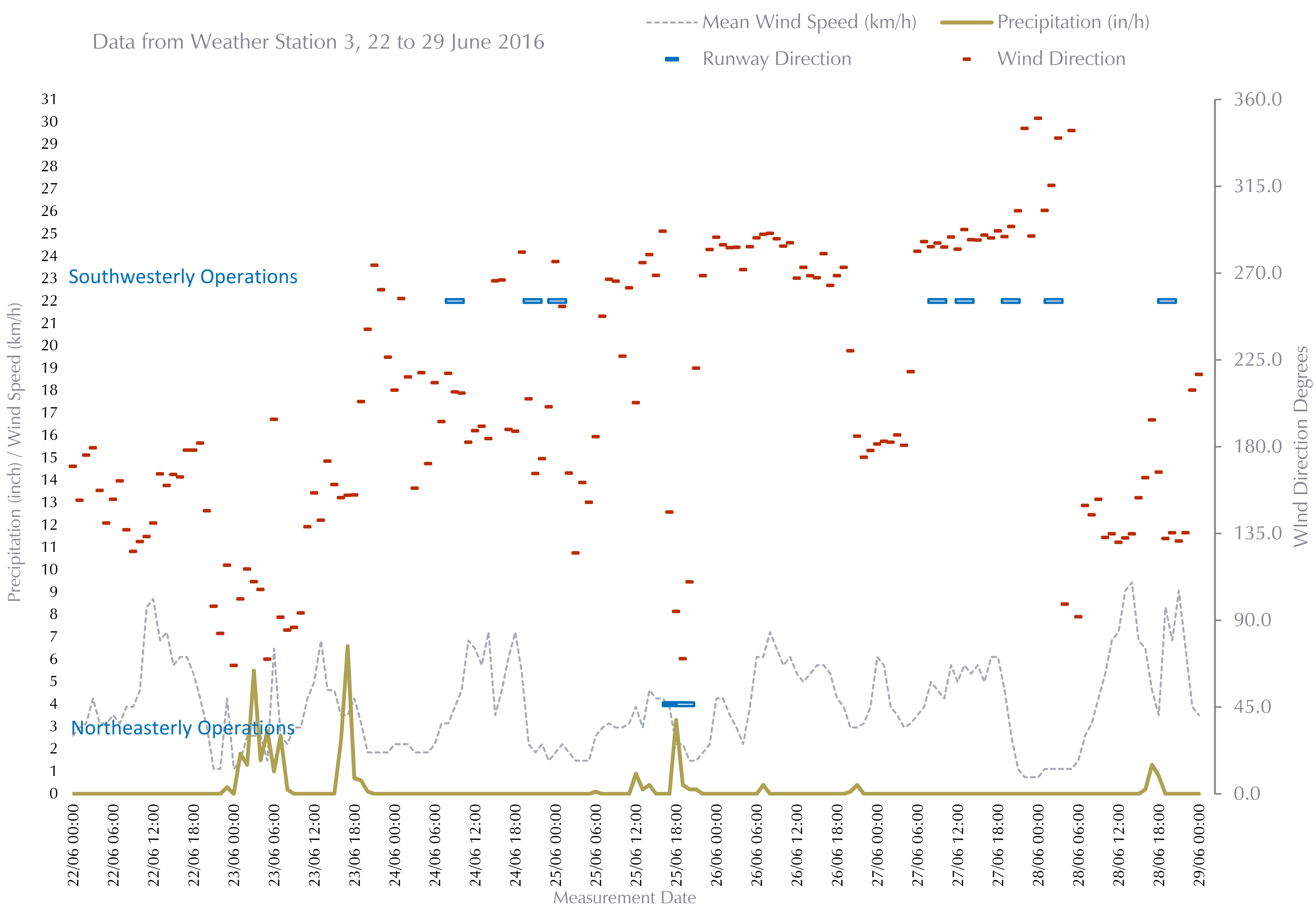


Figure 16/0321/W3B

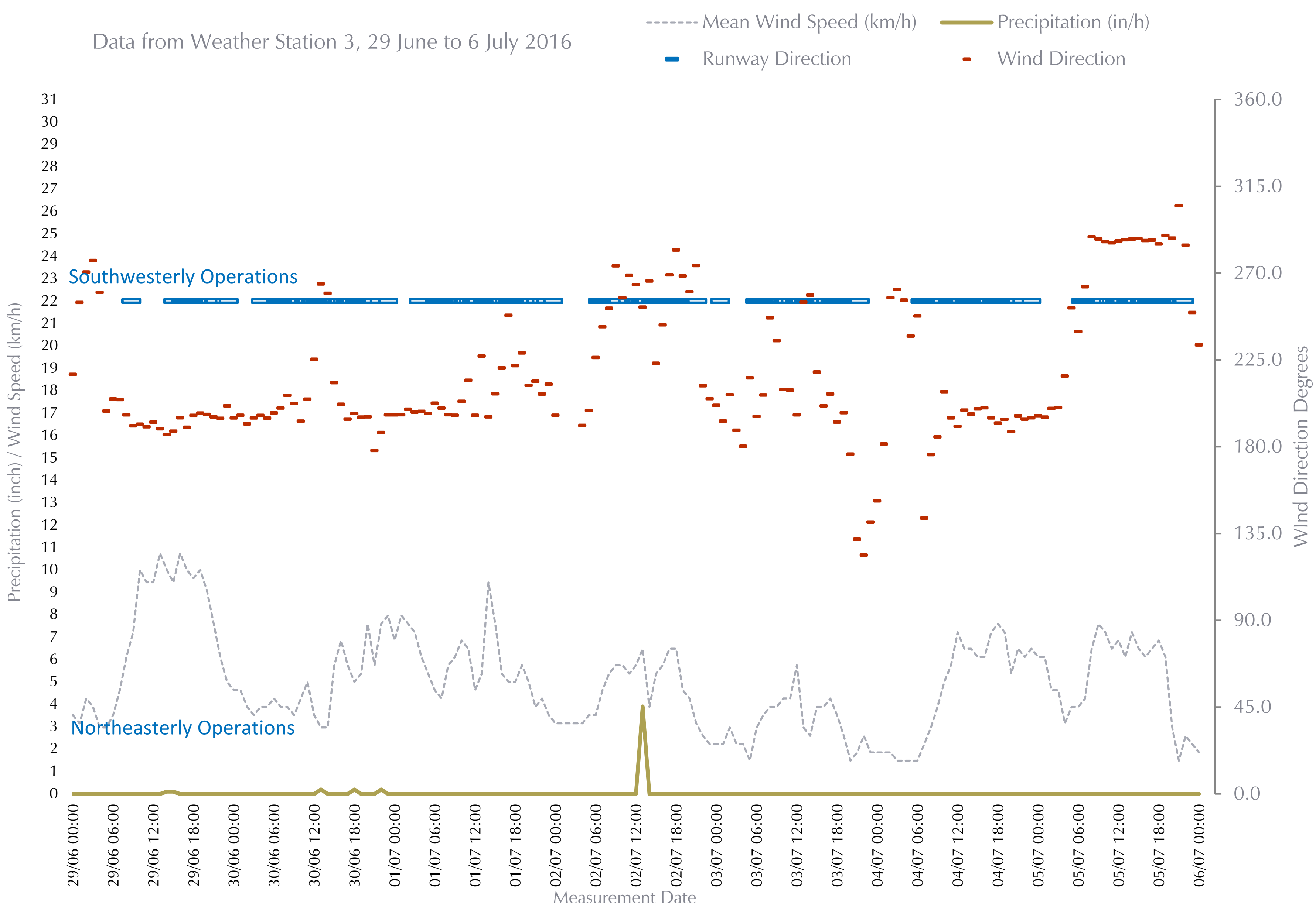


Figure 16/0321/W3C

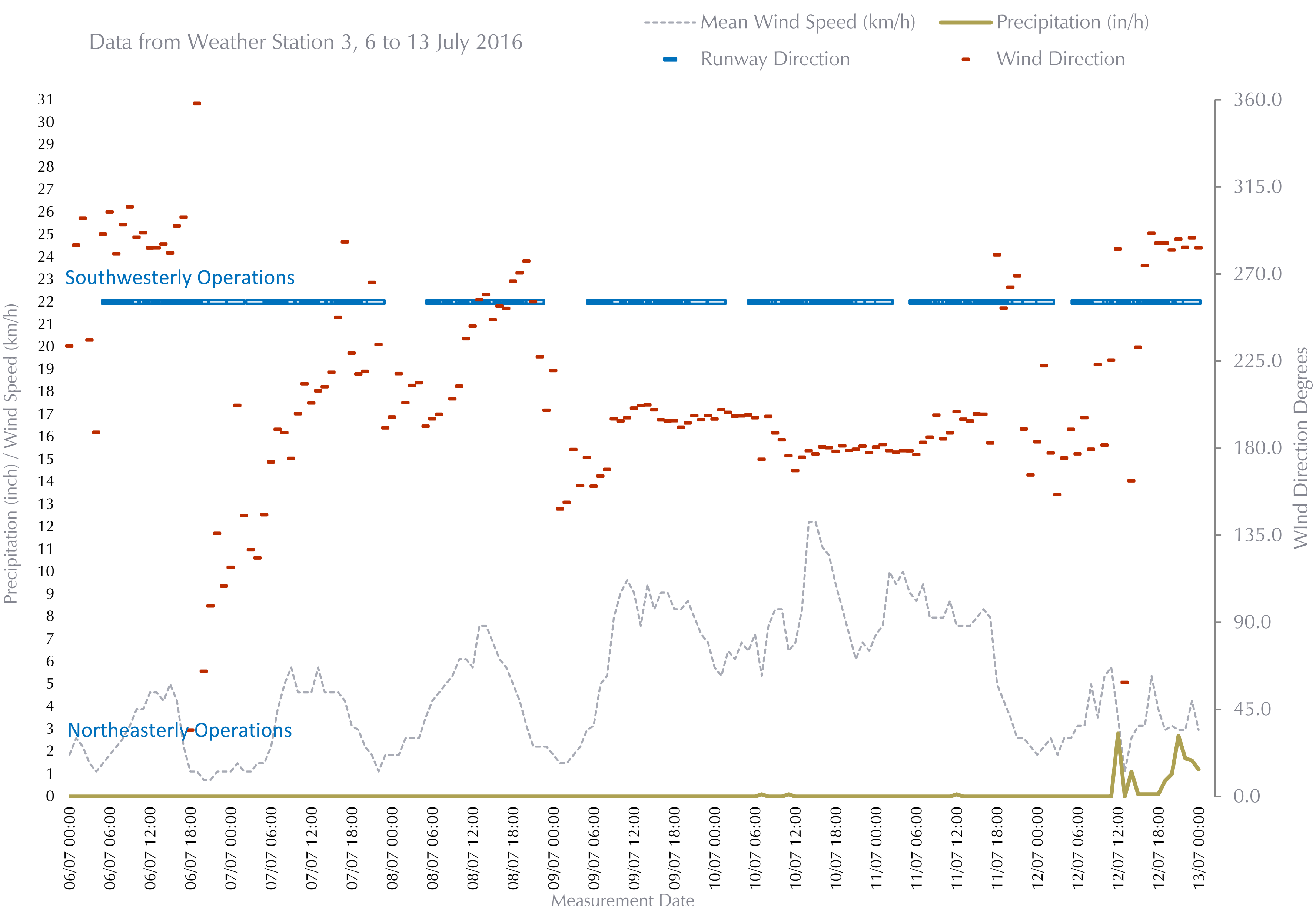


Figure 16/0321/W3D

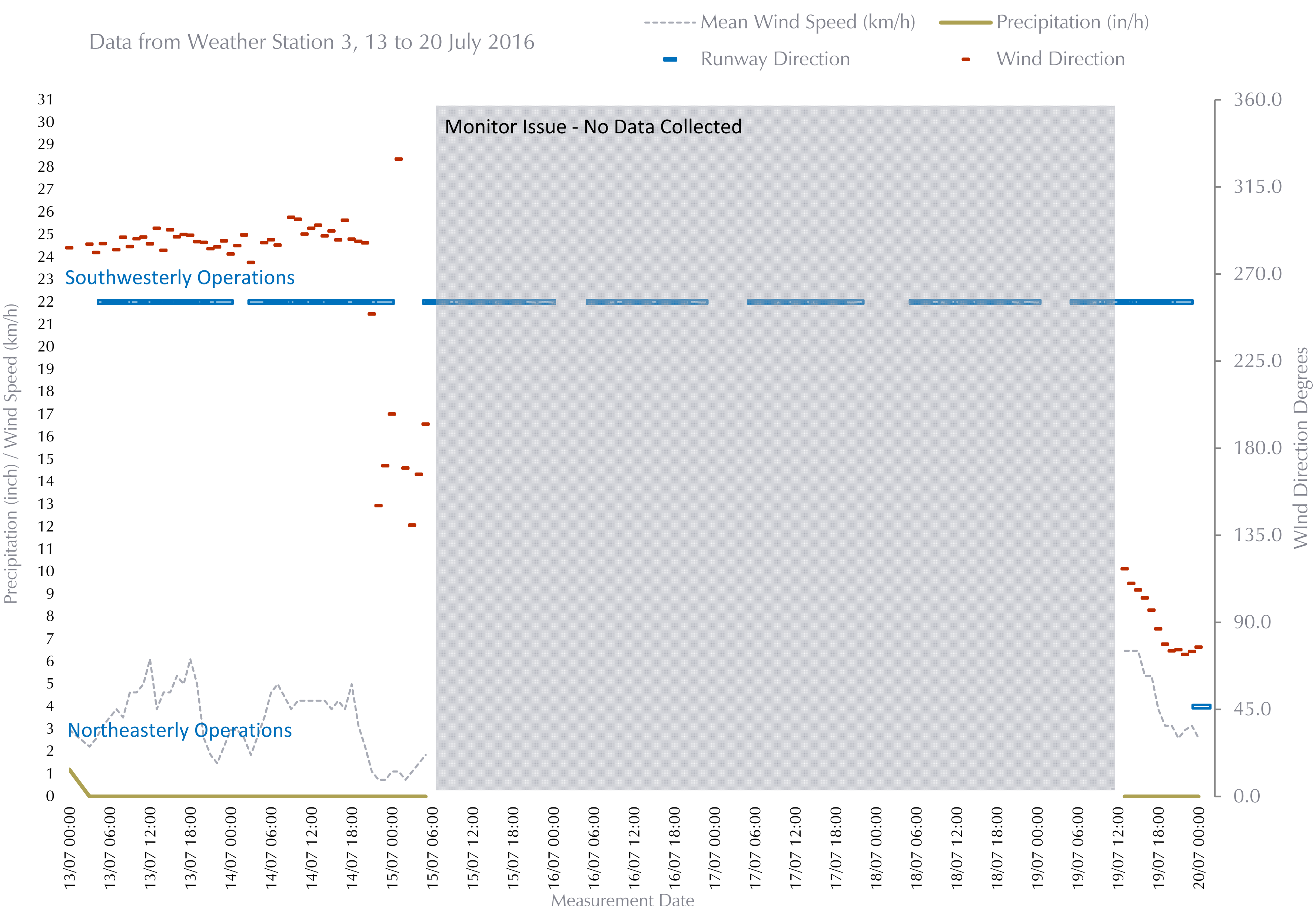


Figure 16/0321/W3E

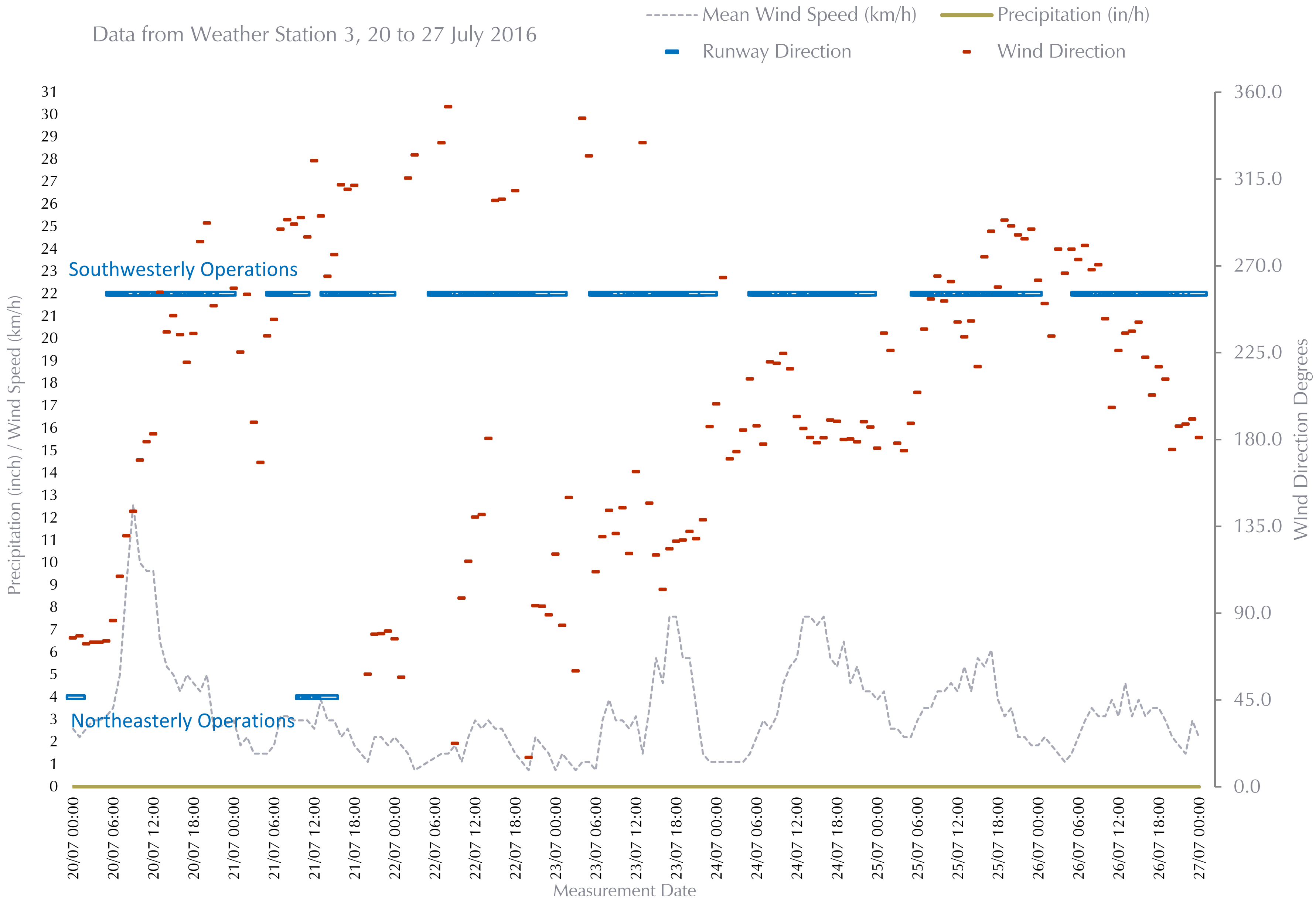


Figure 16/0321/W3F

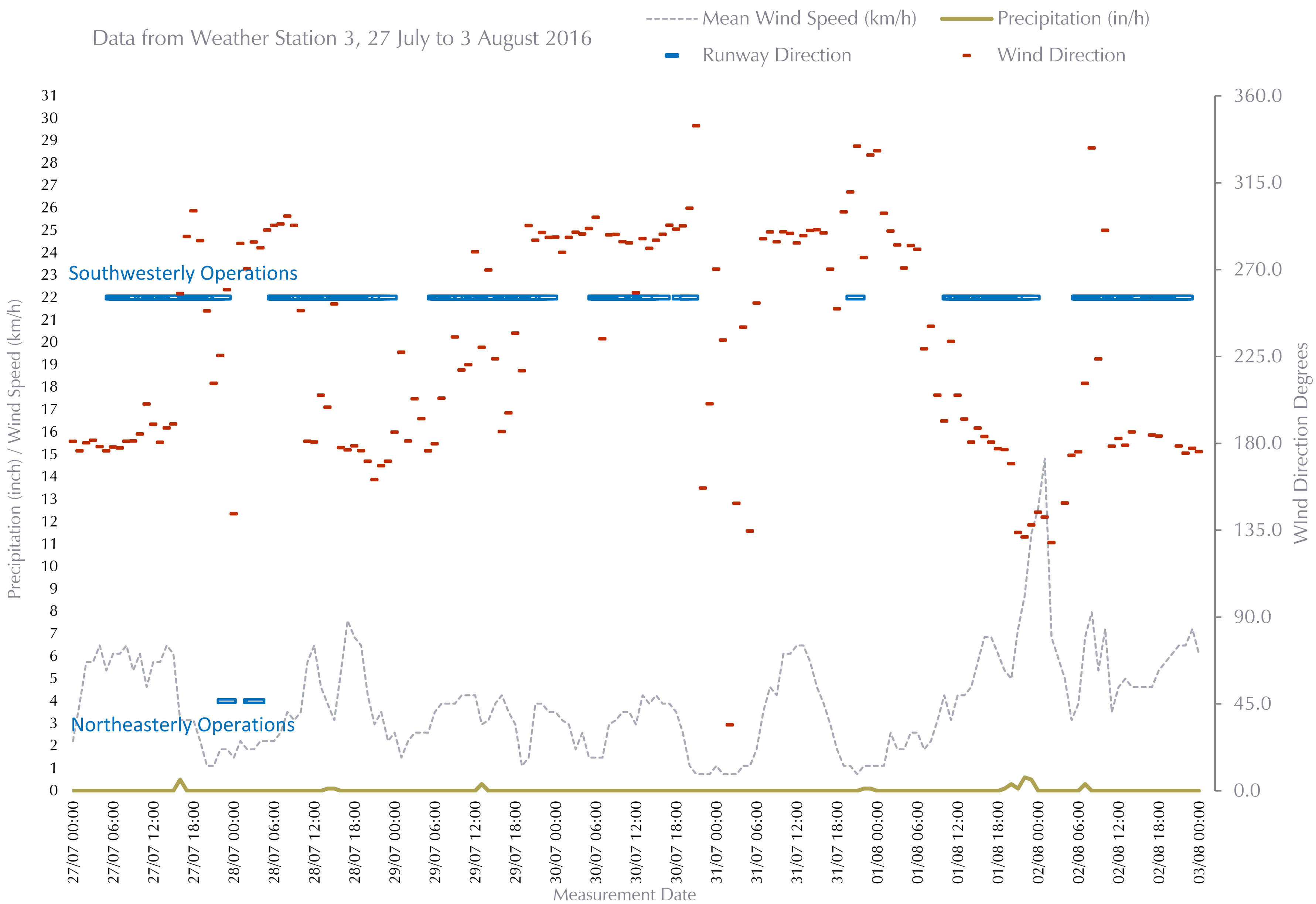


Figure 16/0321/W3C

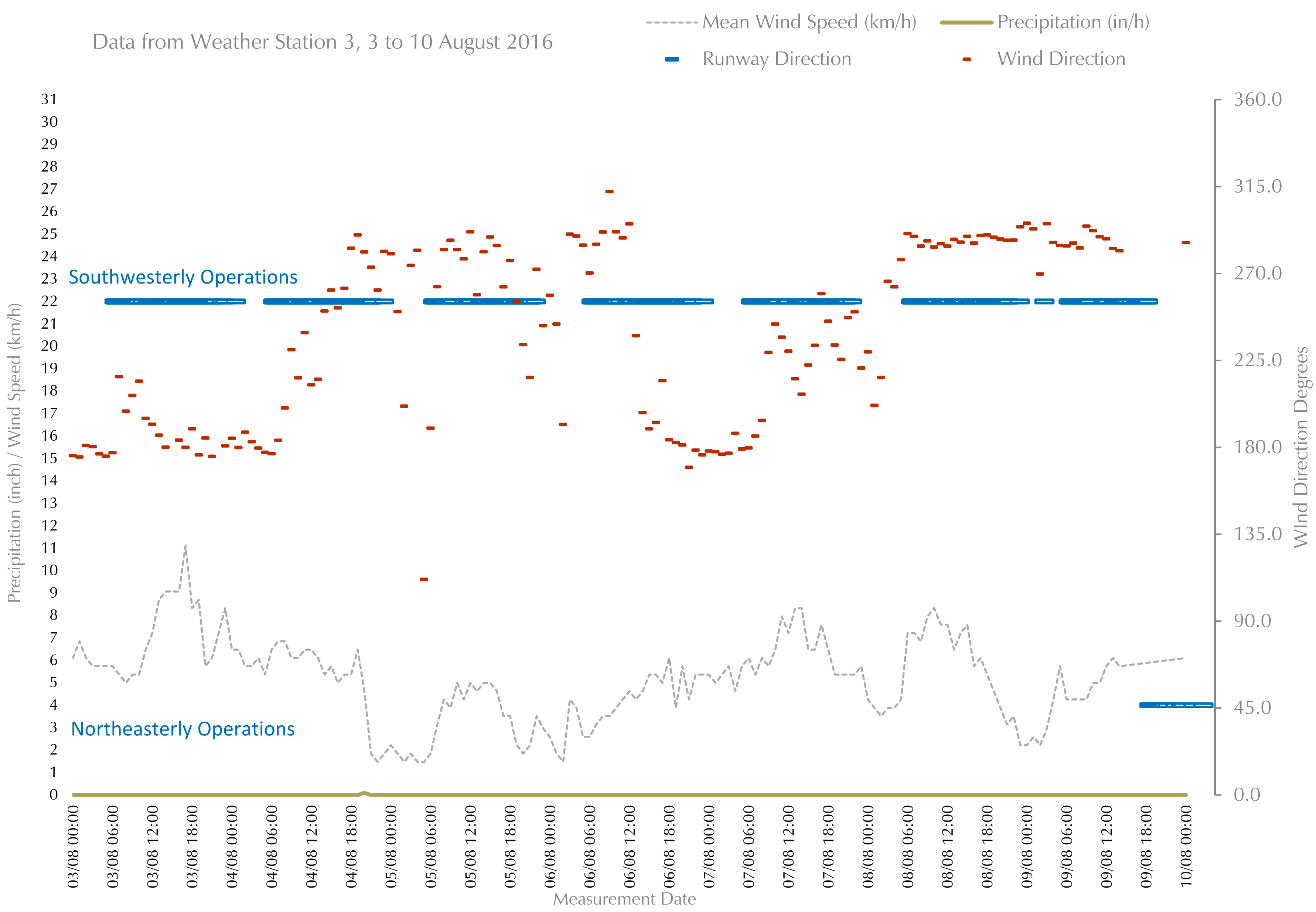


Figure 16/0321/W3H

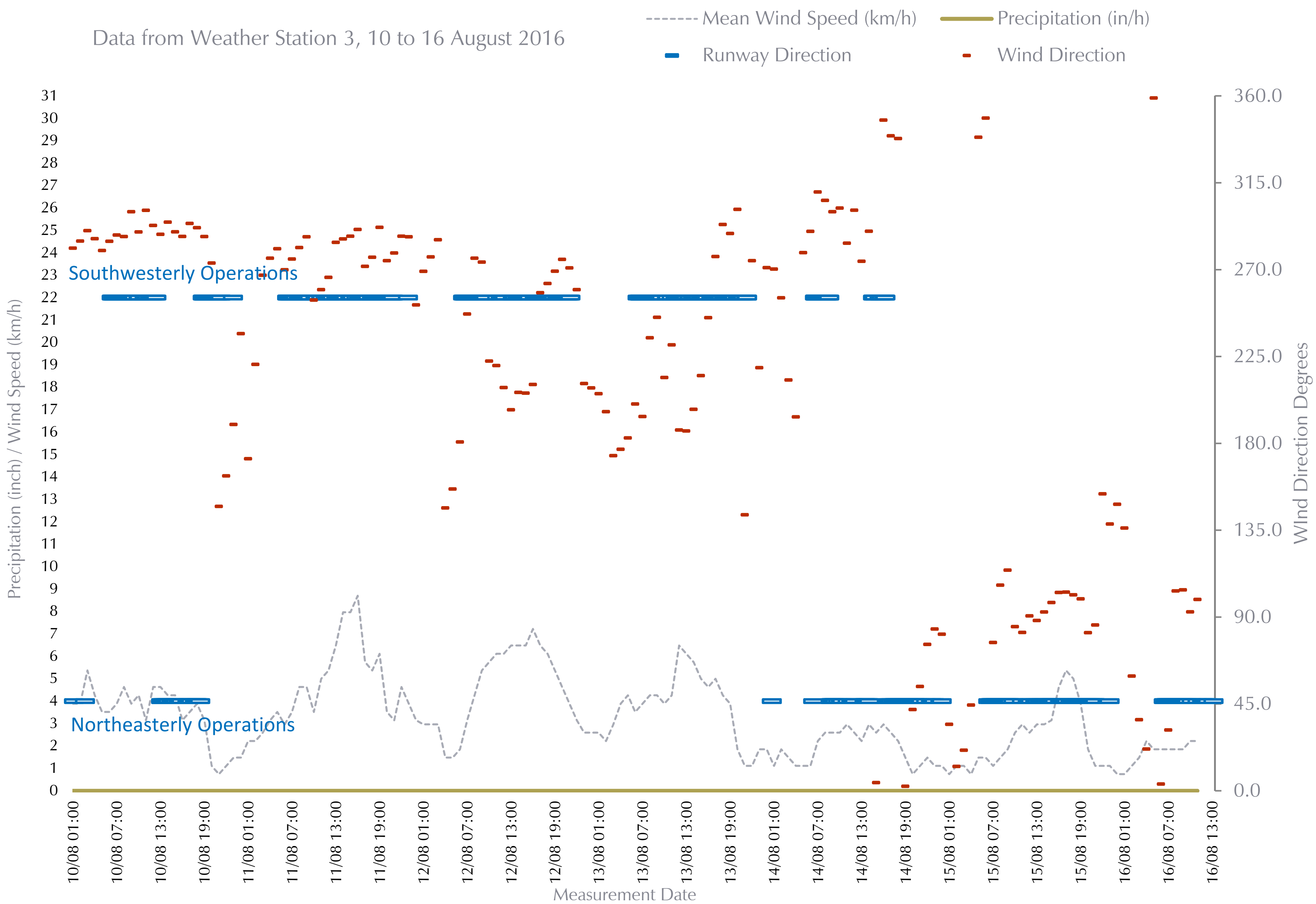
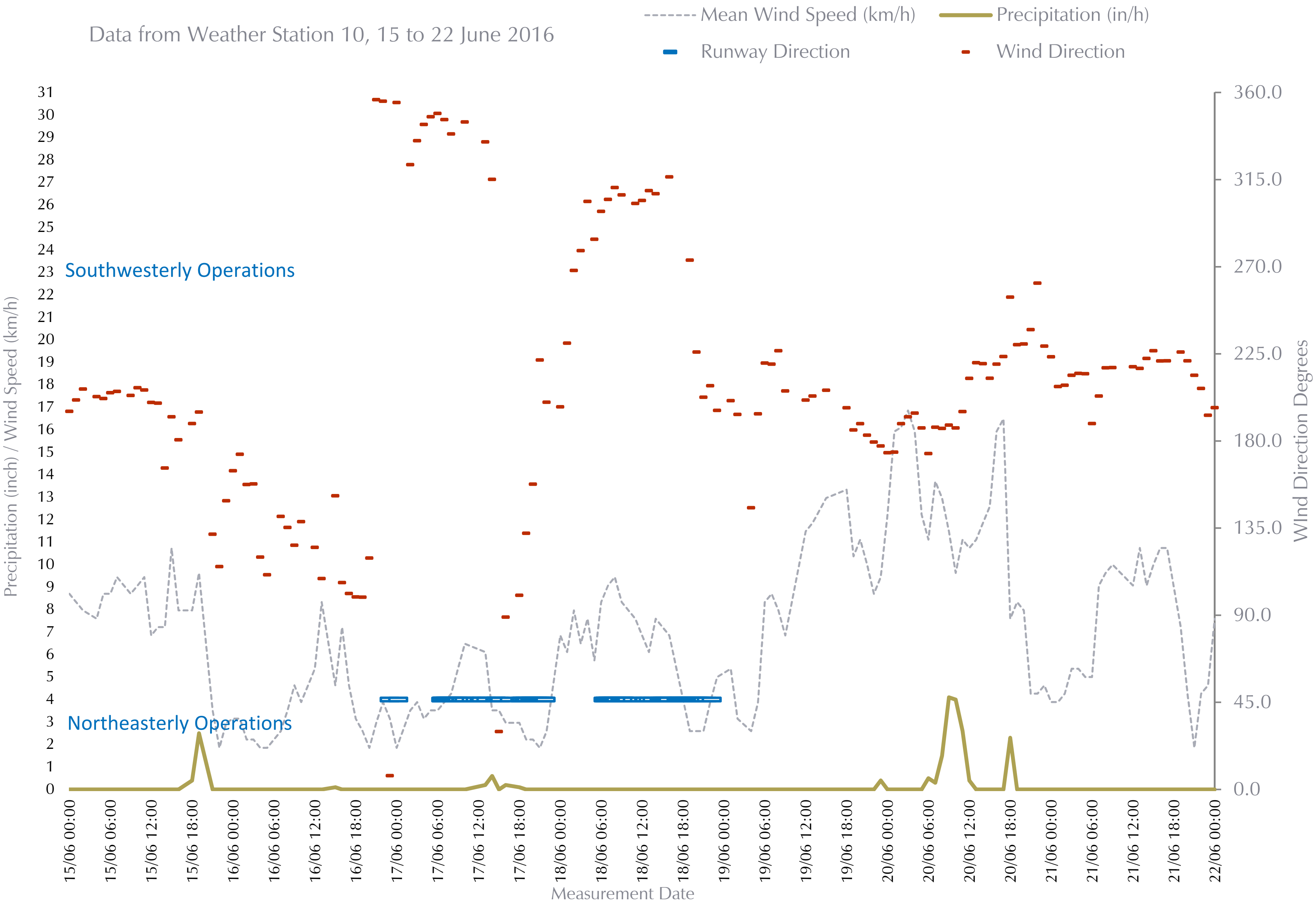


Figure 16/0321/W3I



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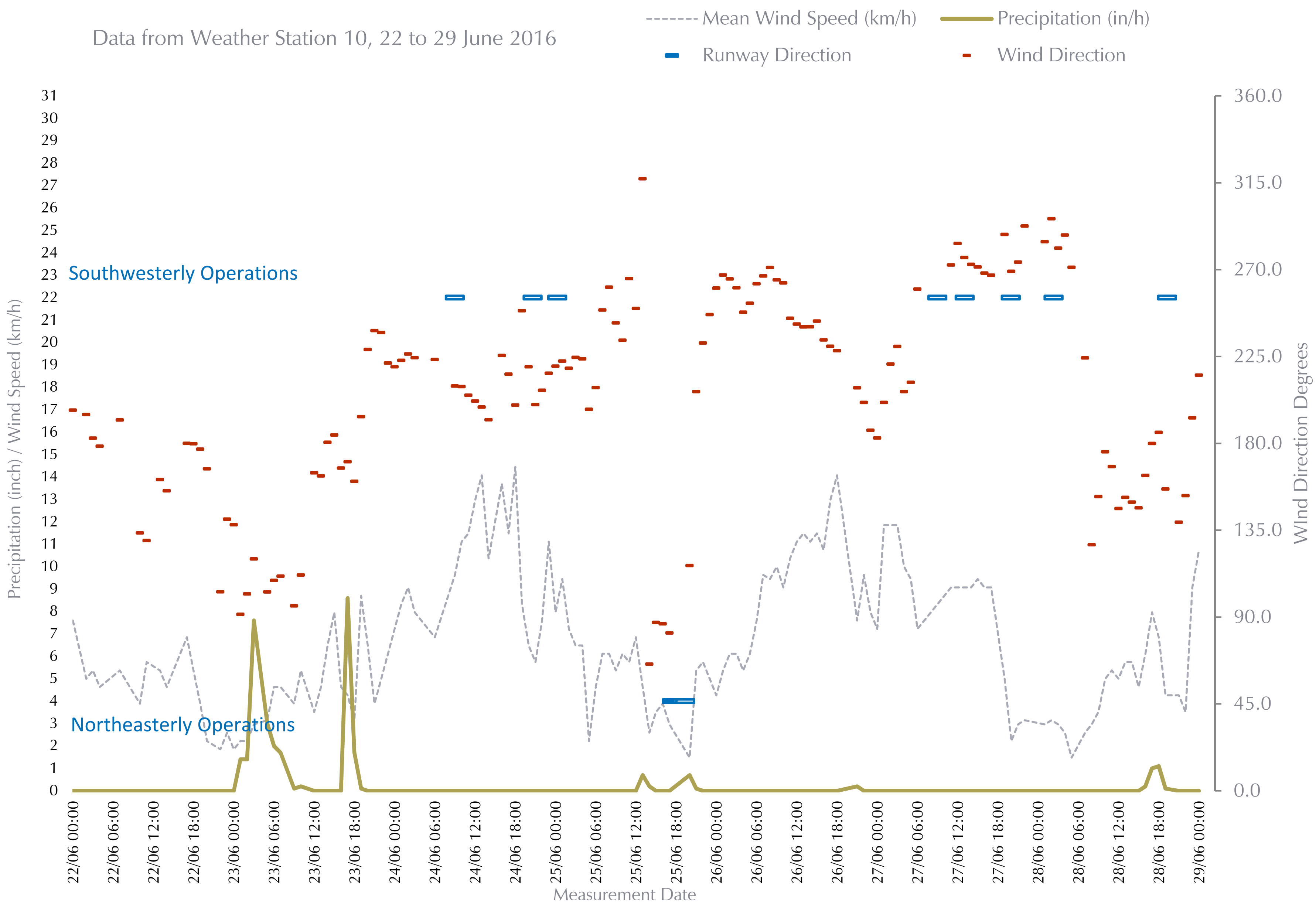

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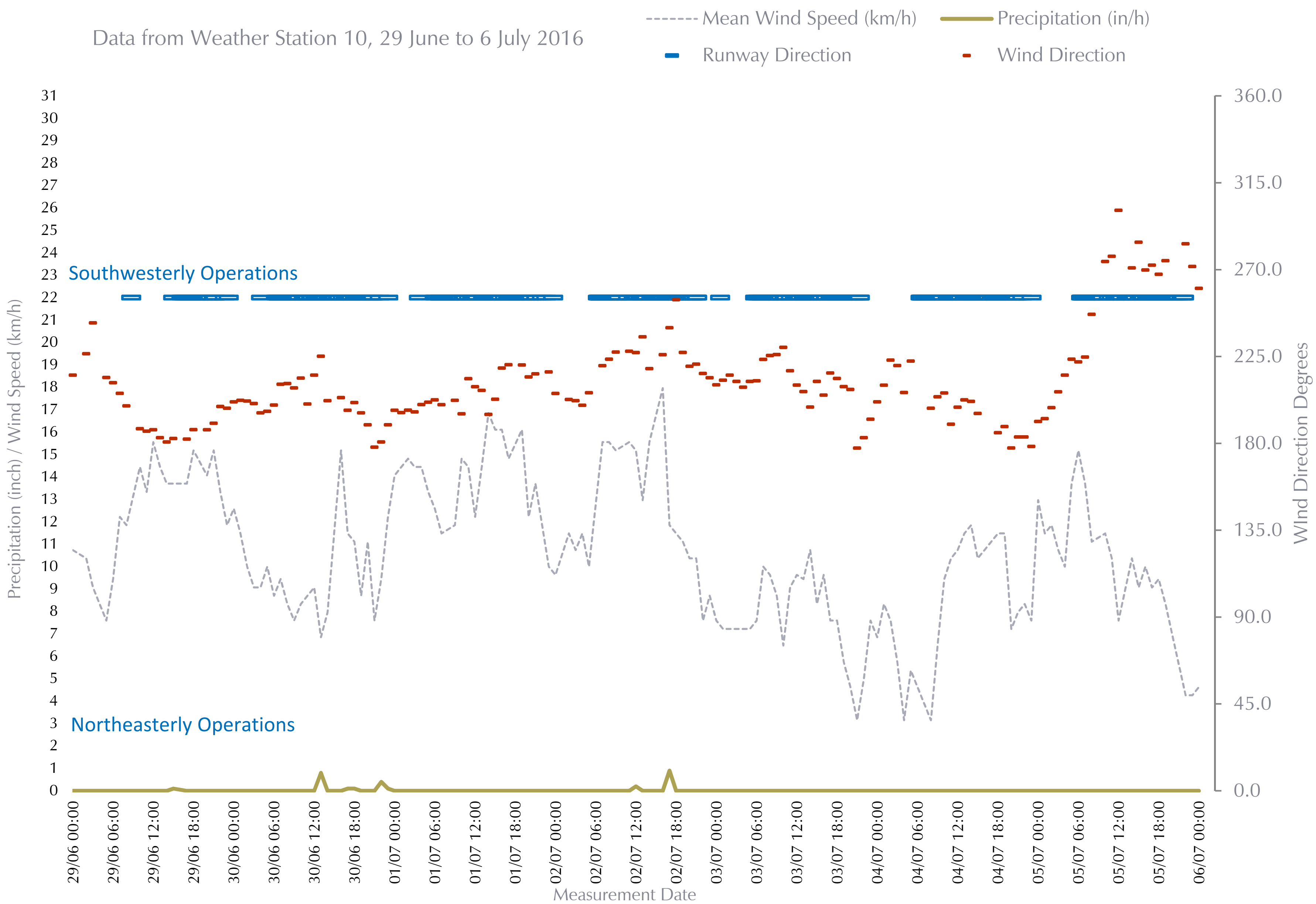
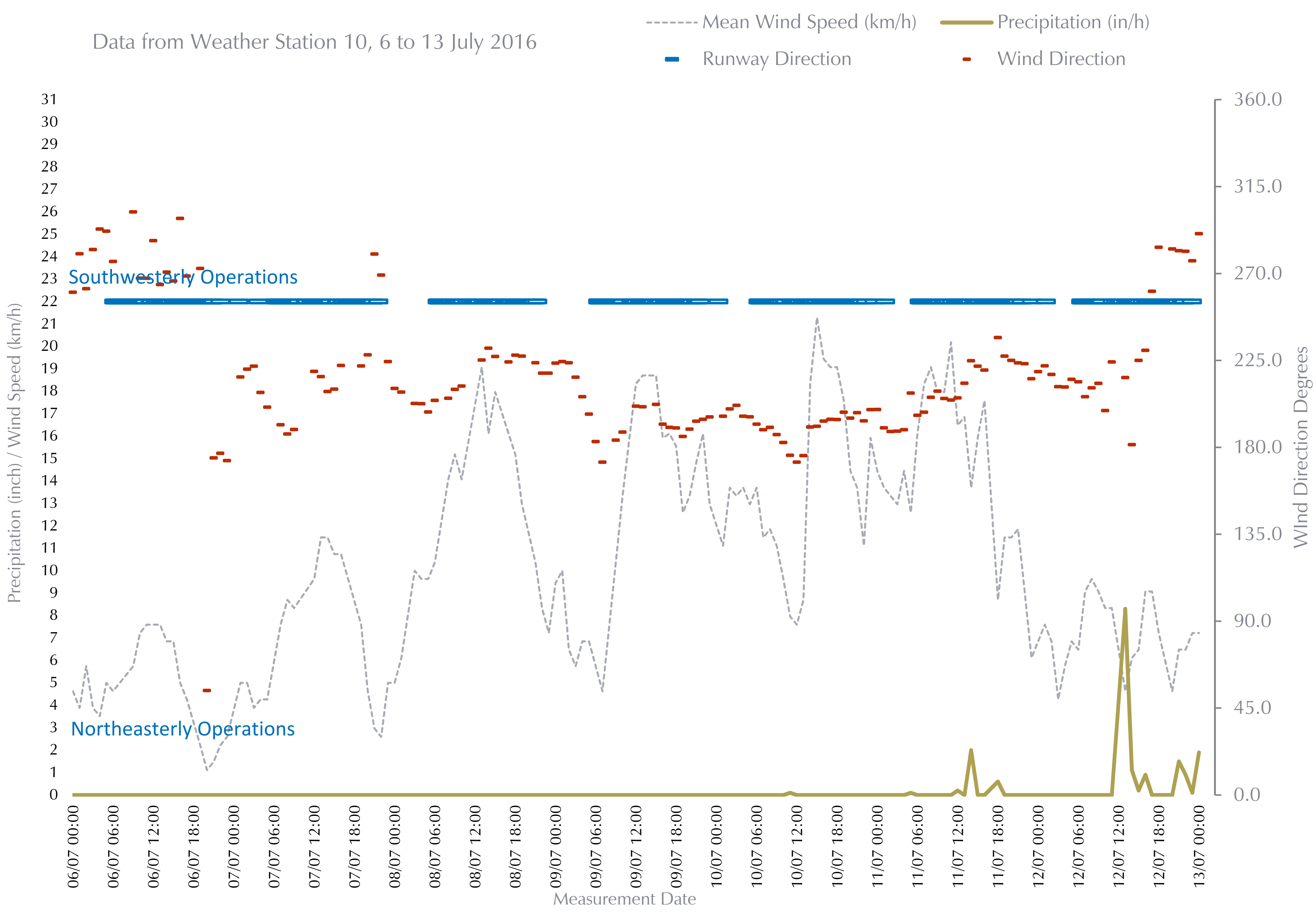


Figure 16/0321/W10C



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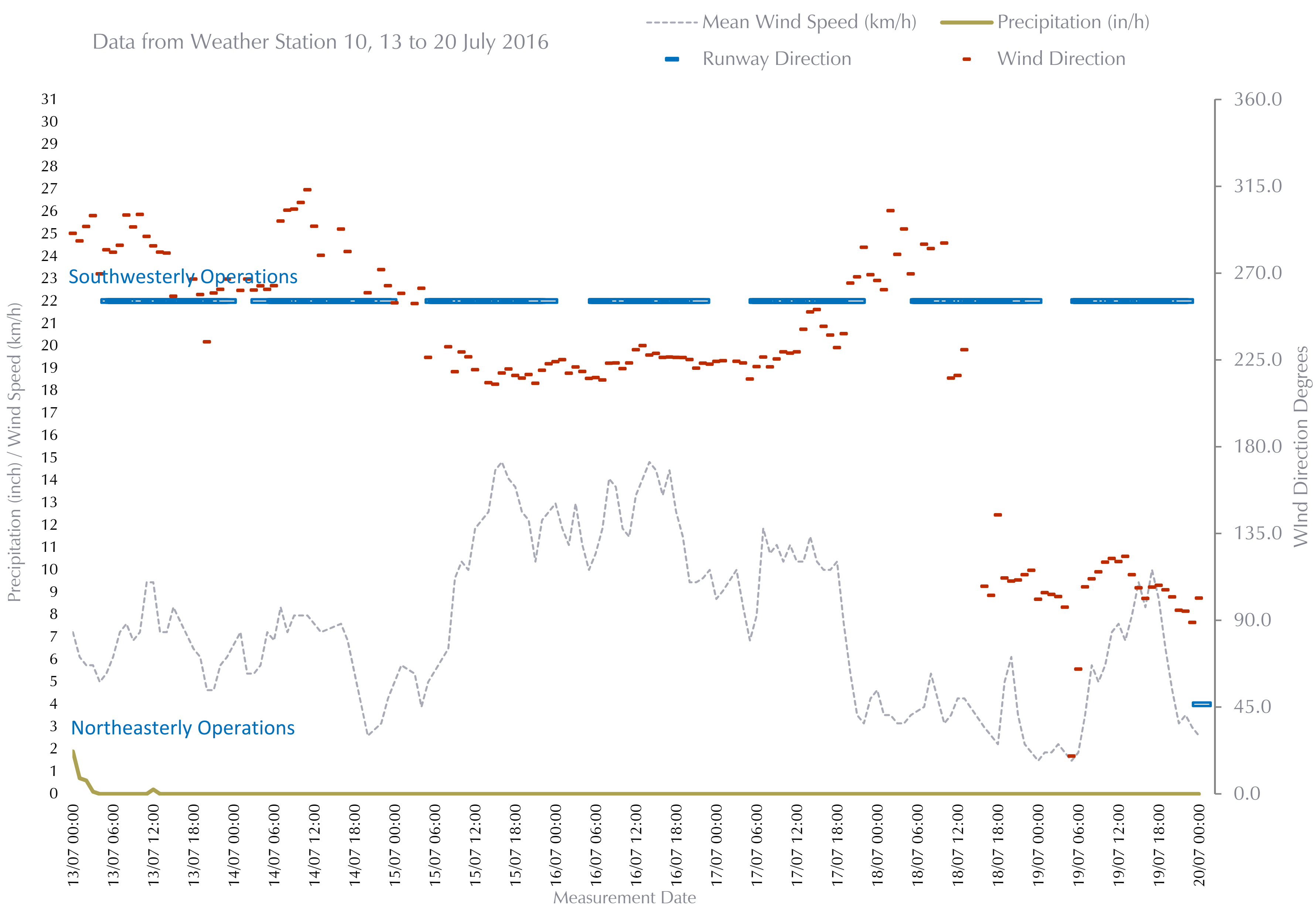

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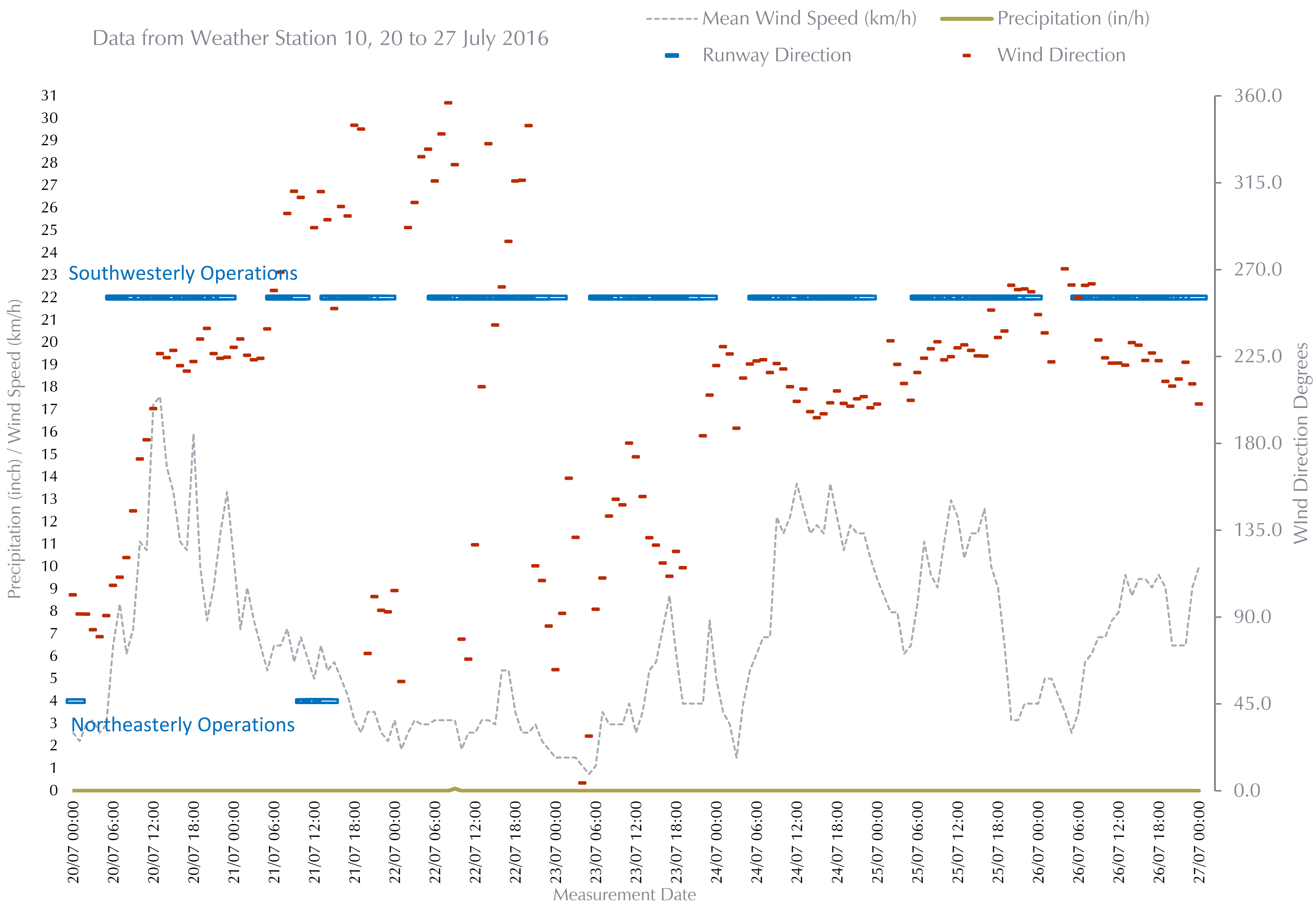
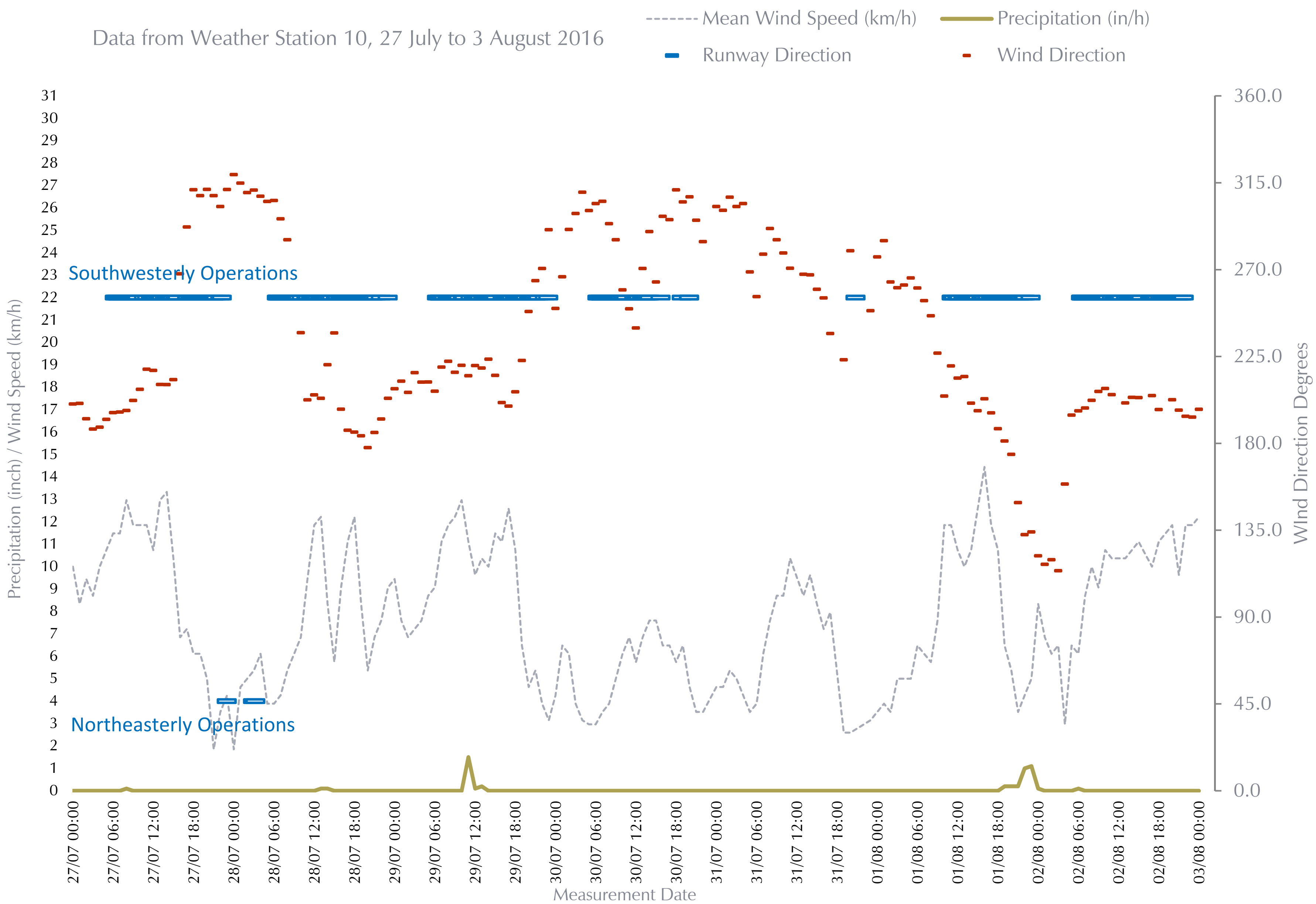


Figure 16/0321/W10F


Data from Weather Station 10, 27 July to 3 August 2016
Mean Wind Speed (km/h)
Precipitation (in/h)
Runway Direction
Wind Direction
Southwesterly Operations
Northeasterly Operations
Precipitation (inch) / Wind Speed (km/h)
Wind Direction Degrees
Measurement Date
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
360.0
315.0
270.0
225.0
180.0
135.0
90.0
45.0
0.0
27/07 00:00
27/07 06:00
27/07 12:00
27/07 18:00
28/07 00:00
28/07 06:00
28/07 12:00
28/07 18:00
29/07 00:00
29/07 06:00
29/07 12:00
29/07 18:00
30/07 00:00
30/07 06:00
30/07 12:00
30/07 18:00
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03/08 00:00

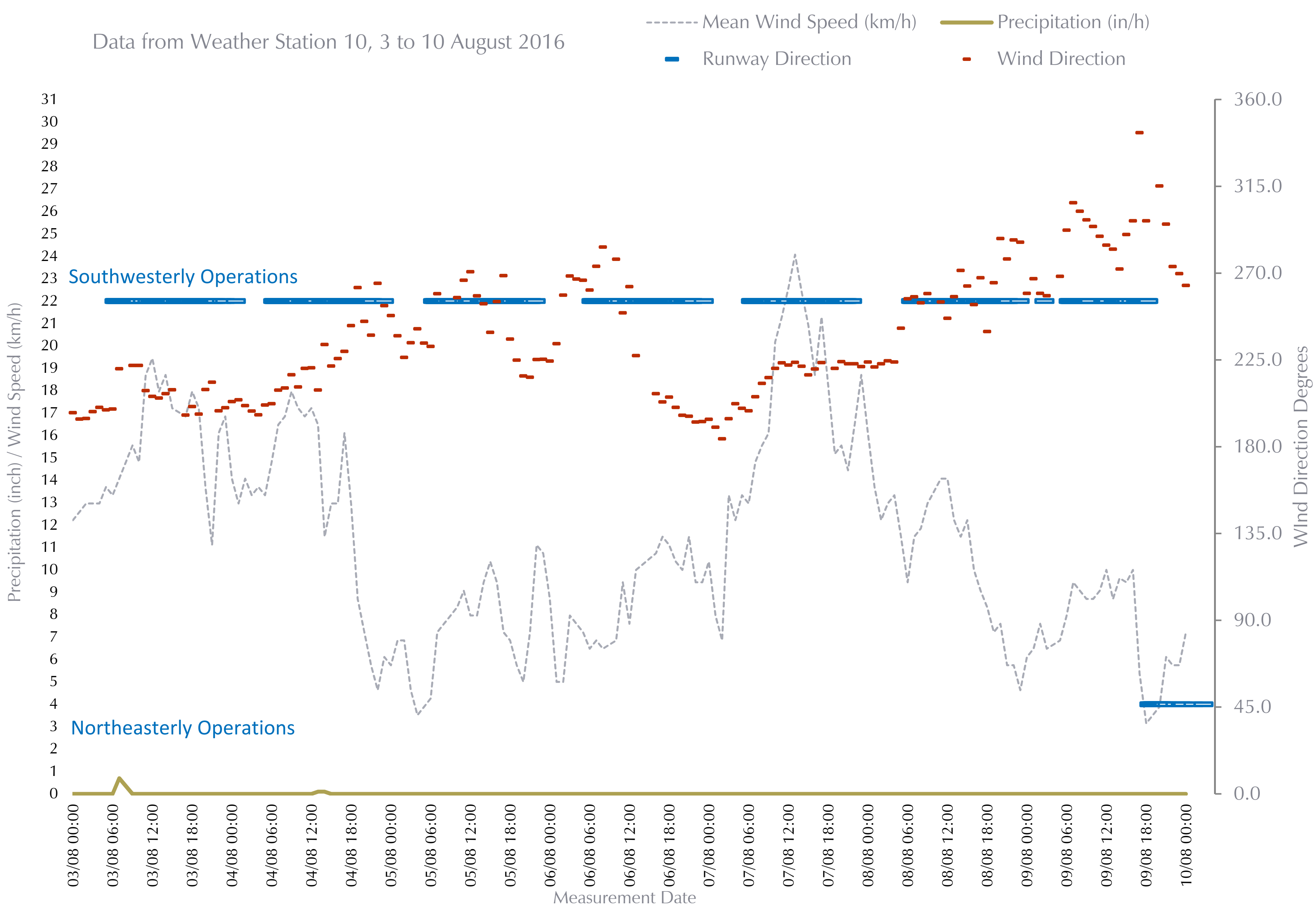


Figure 16/0321/W10H

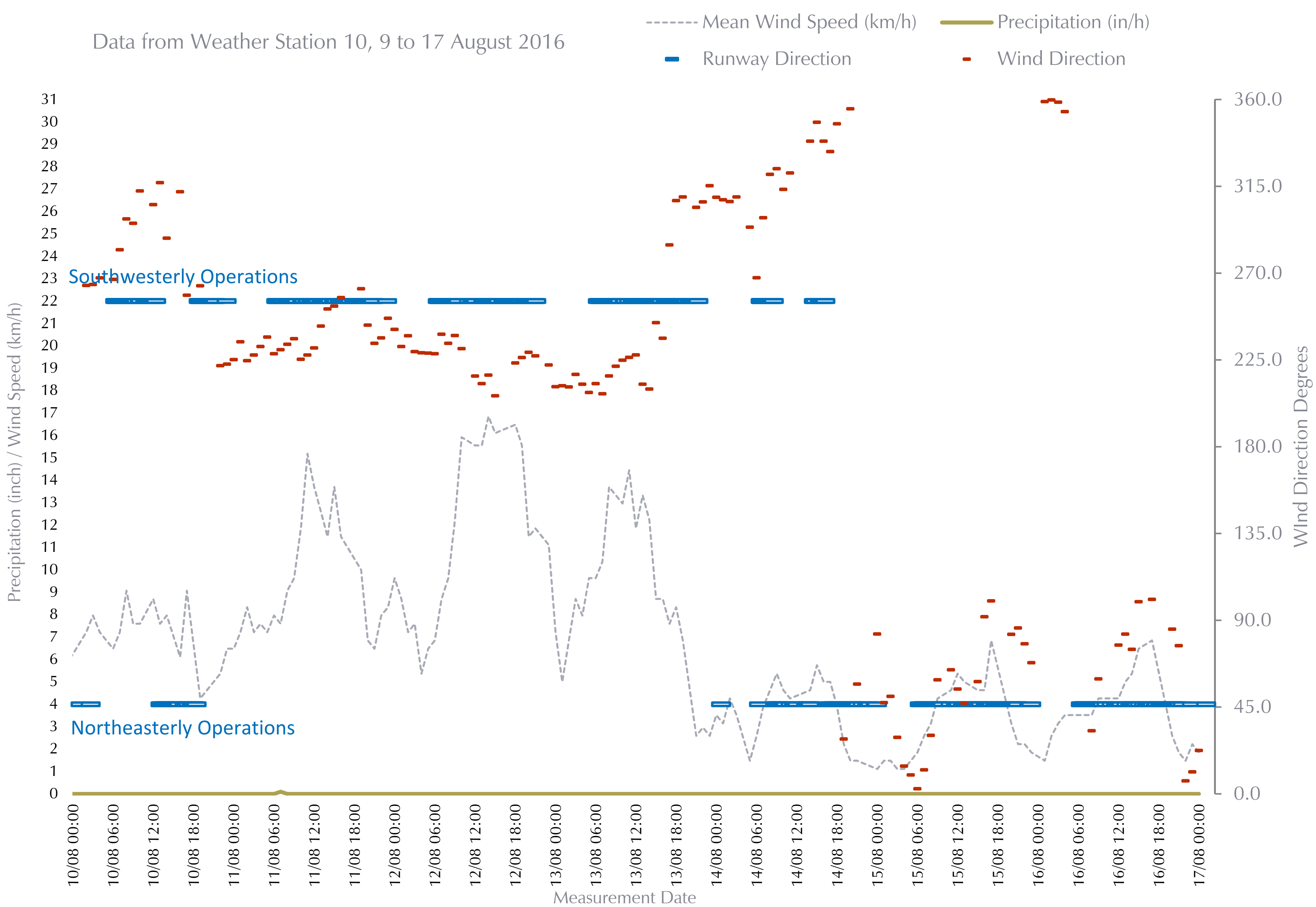
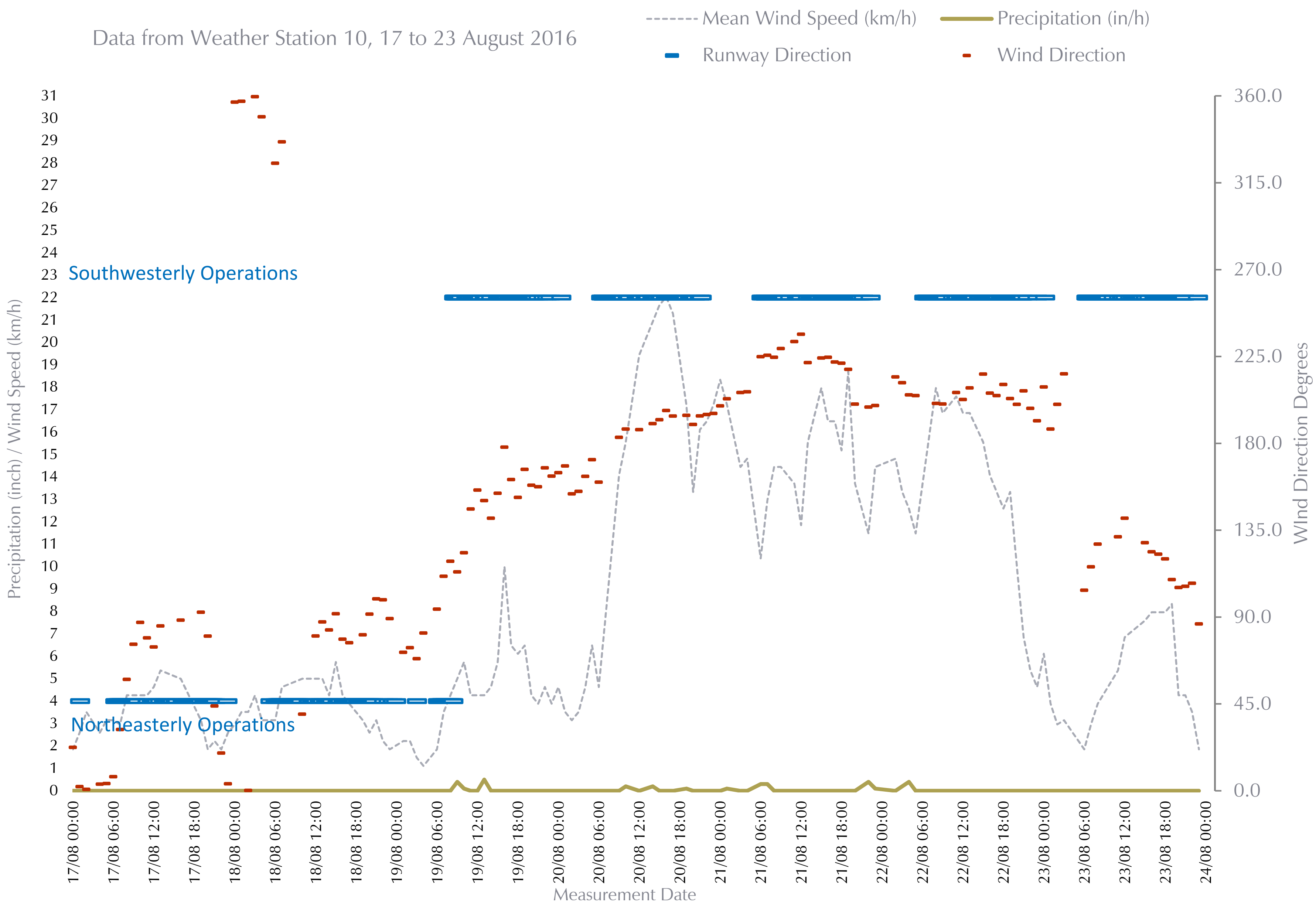


Figure 16/0321/W10I



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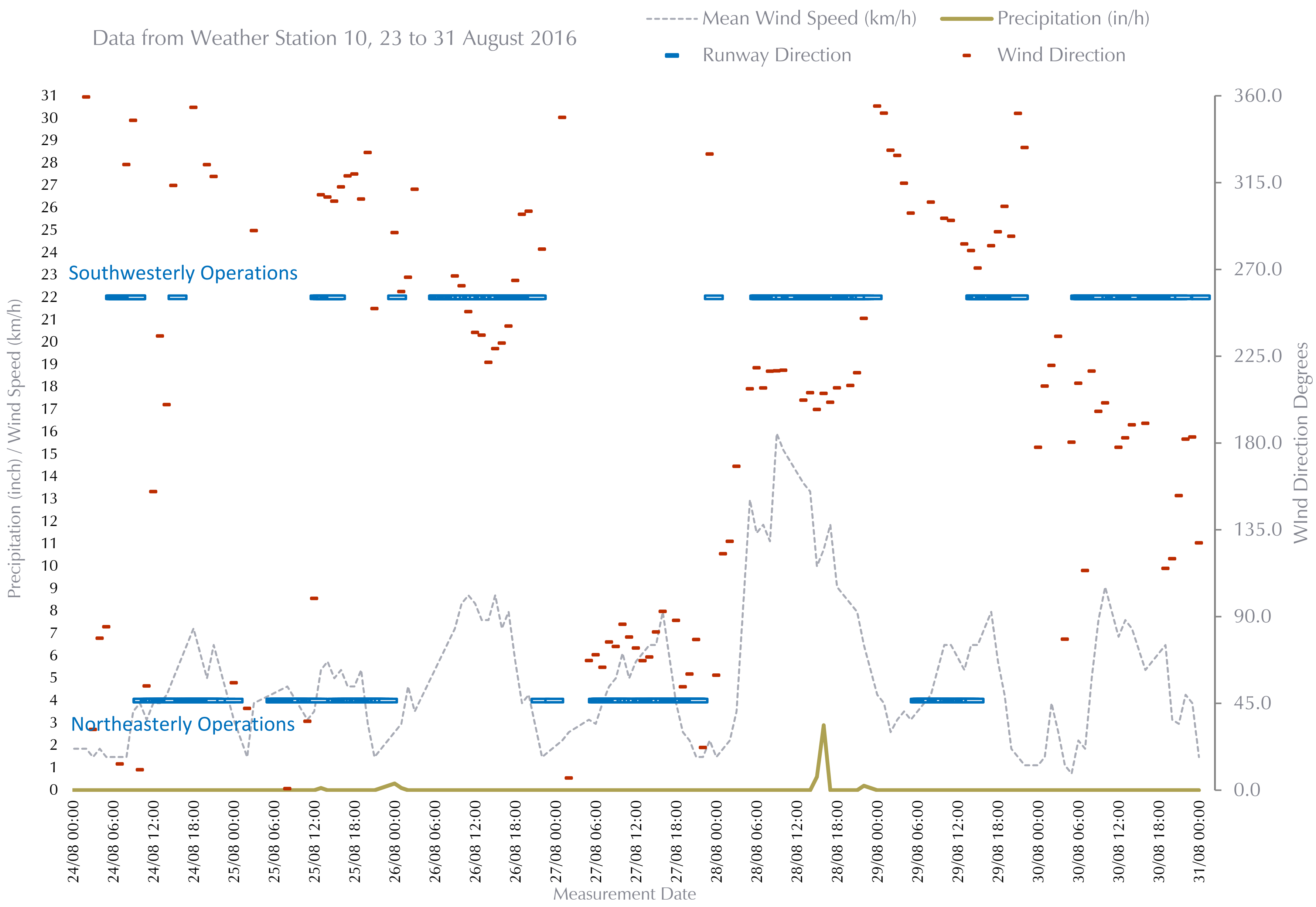

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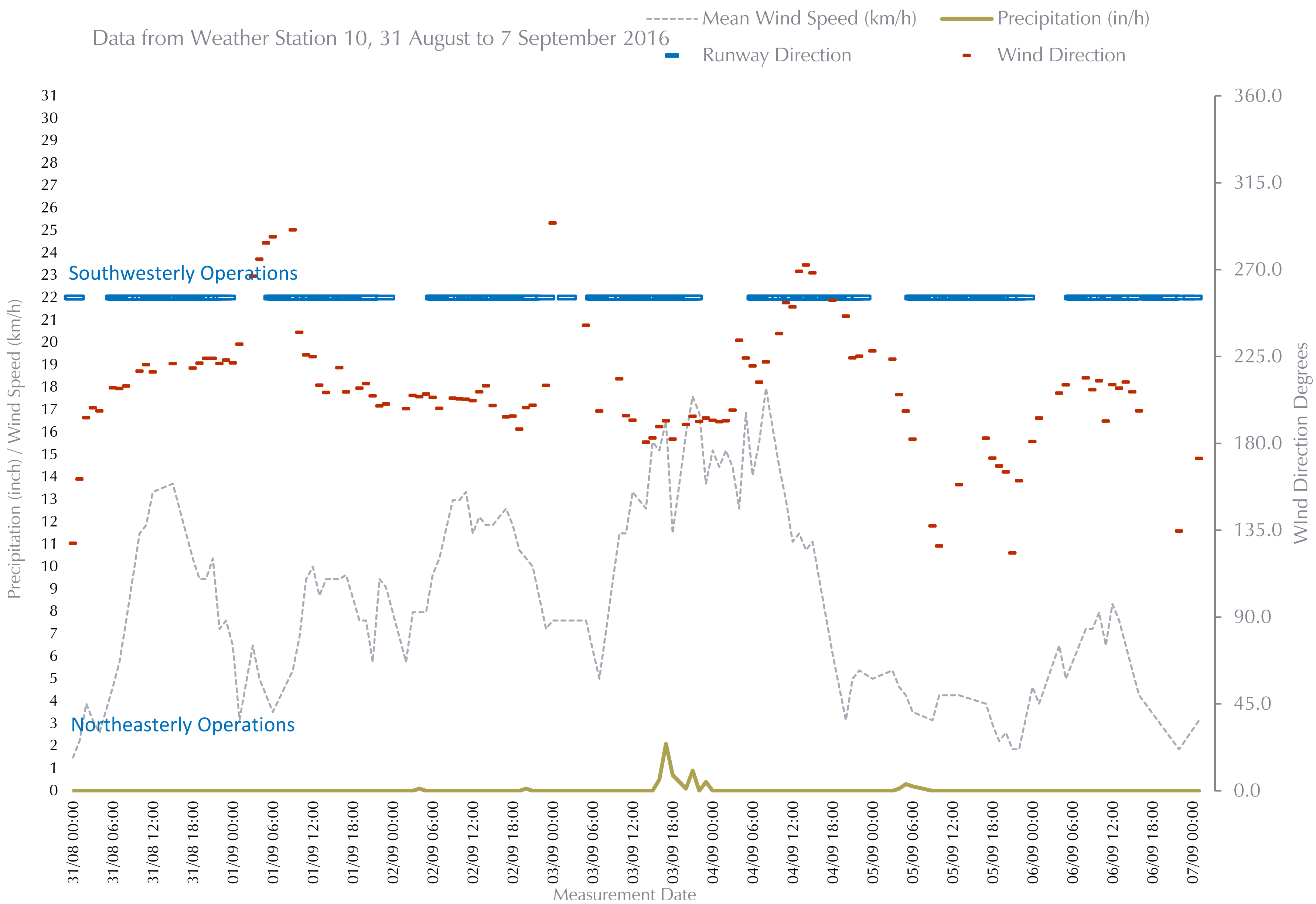

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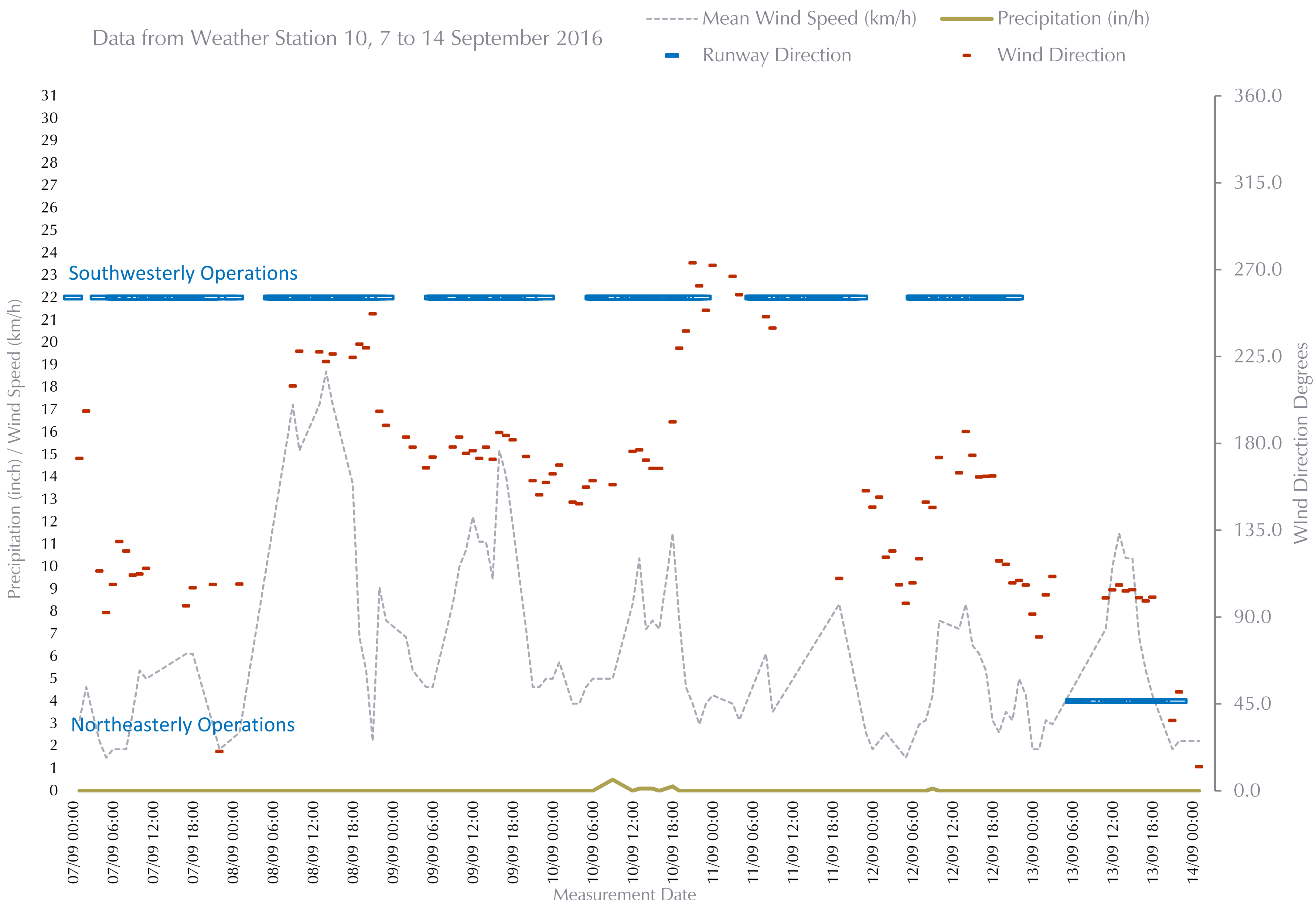

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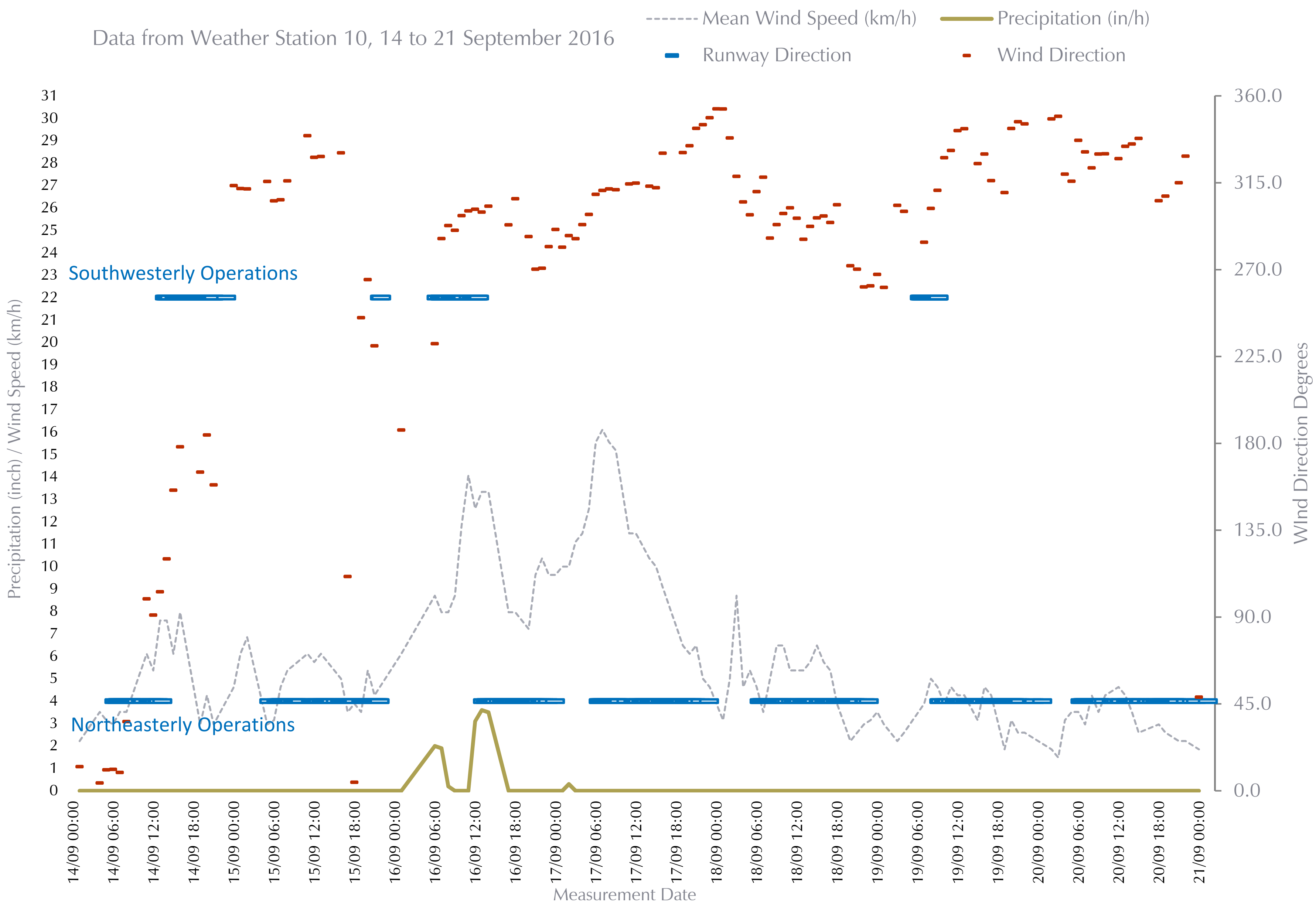

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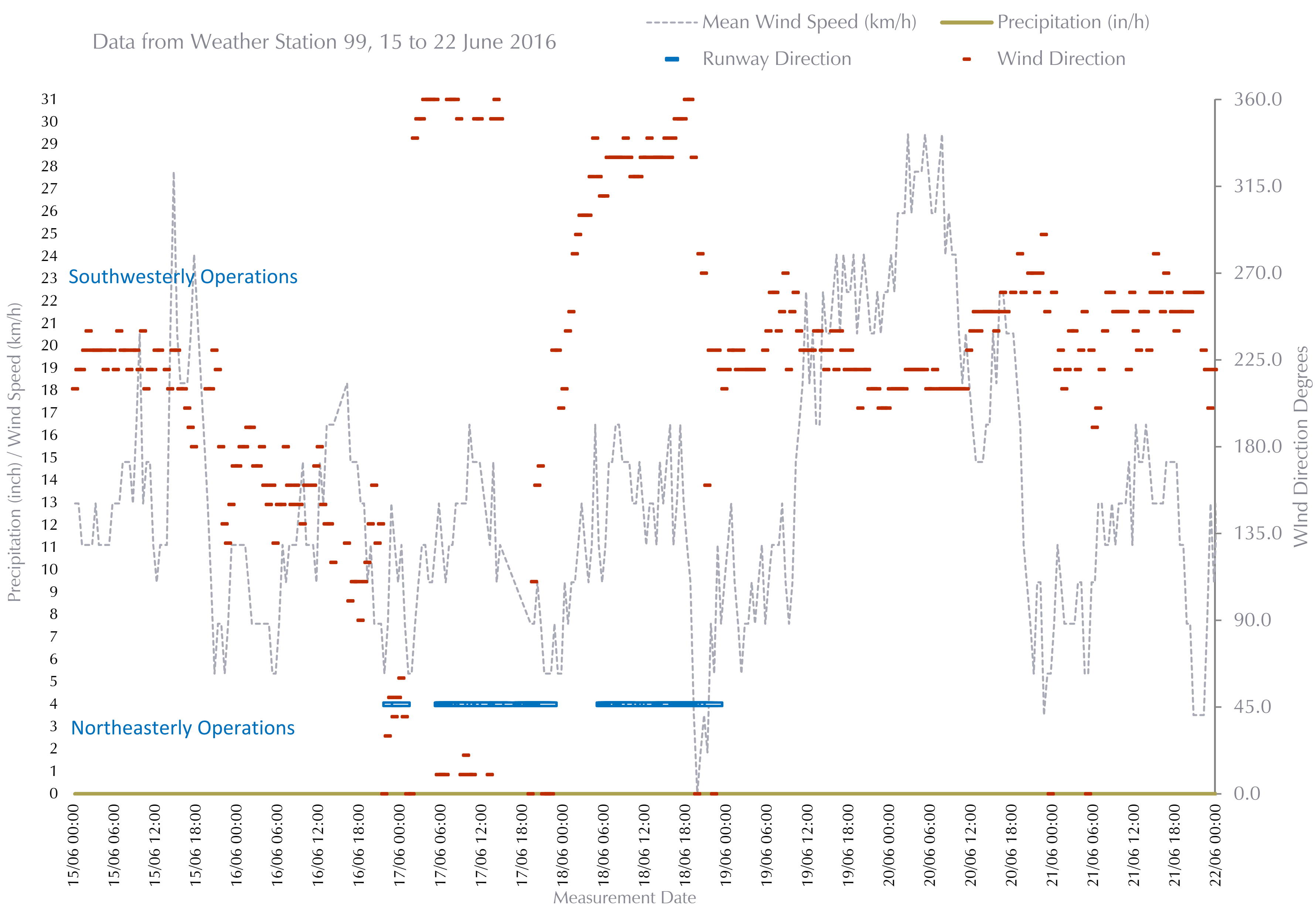
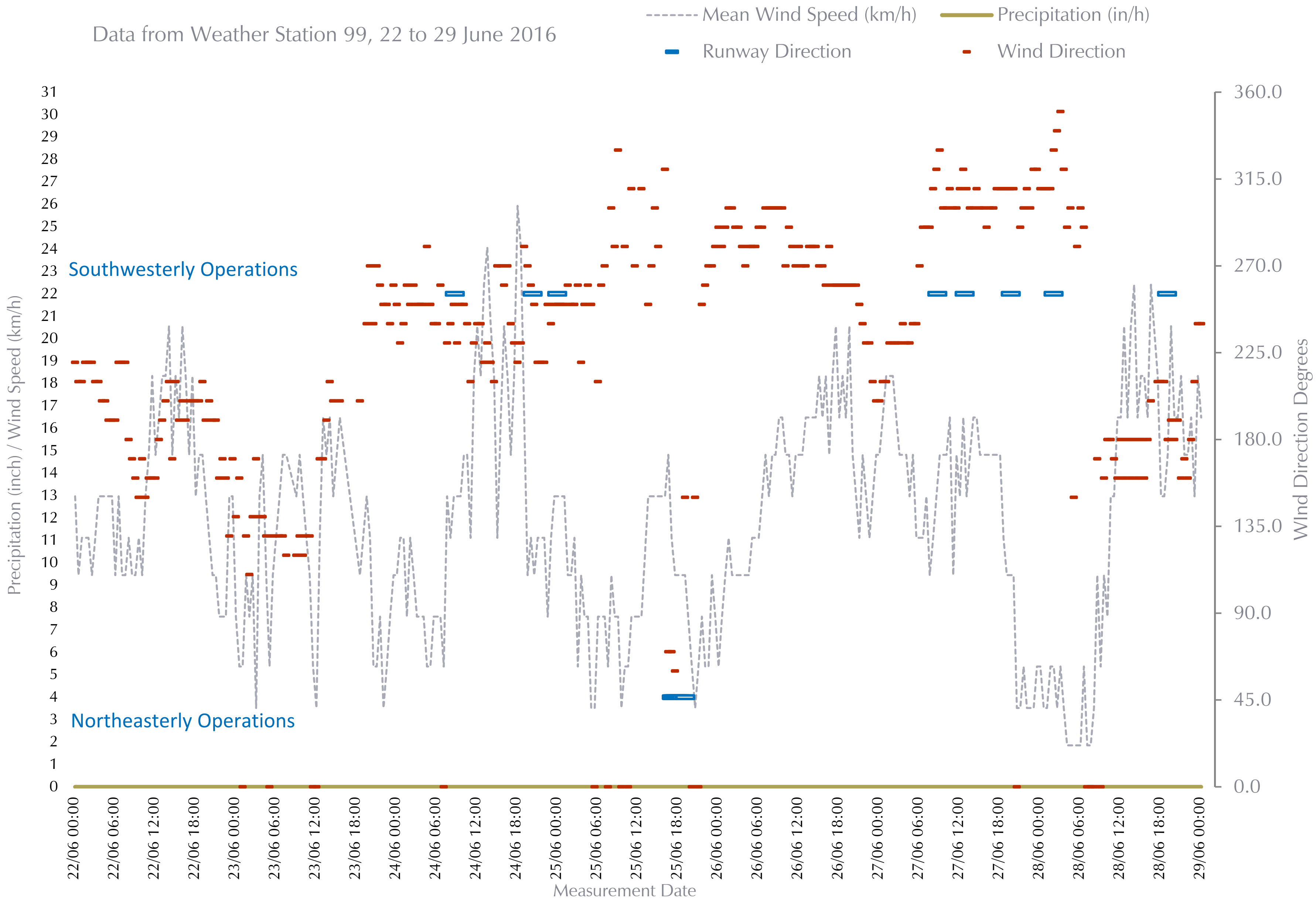


Figure 16/0321/W99A



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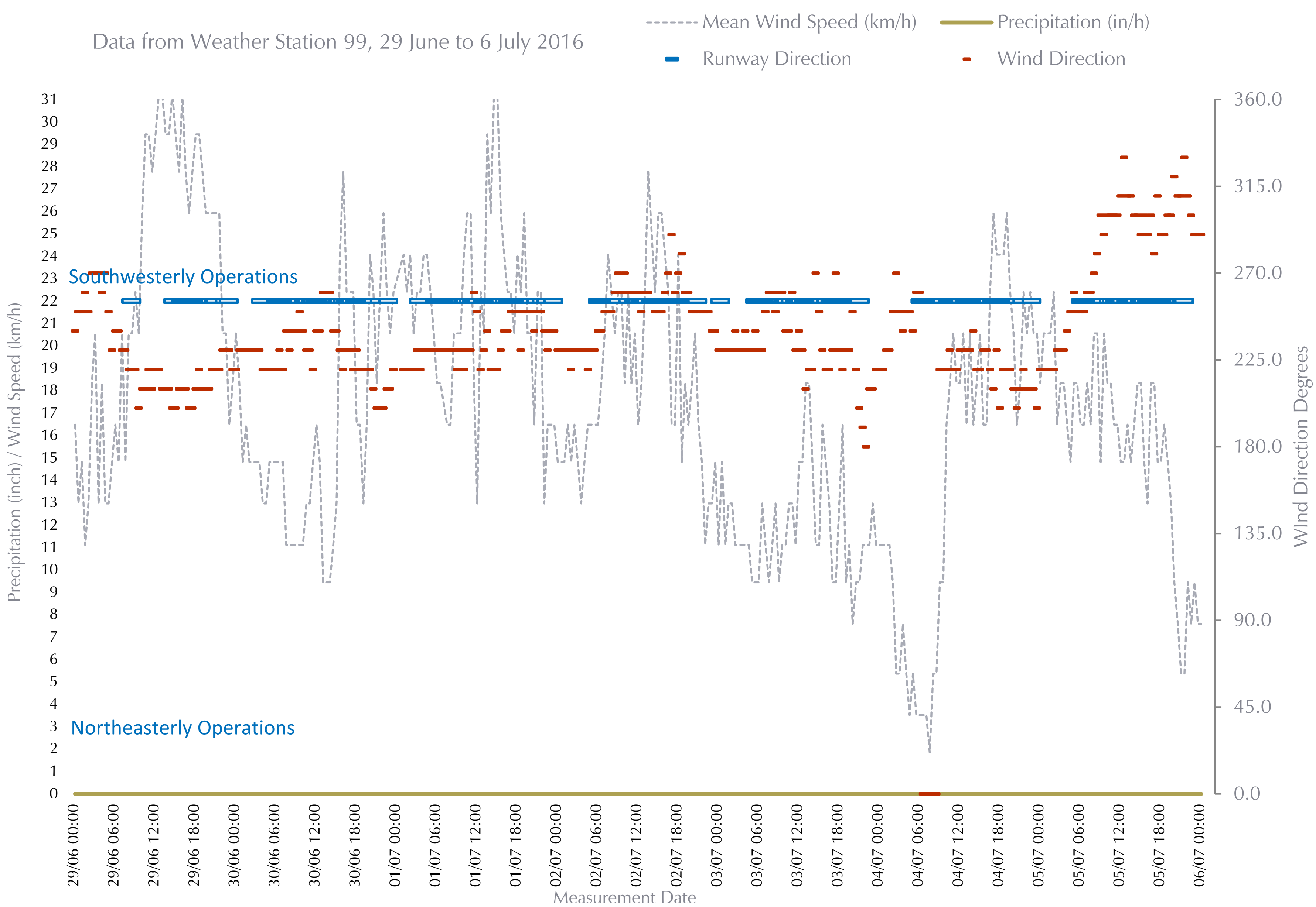
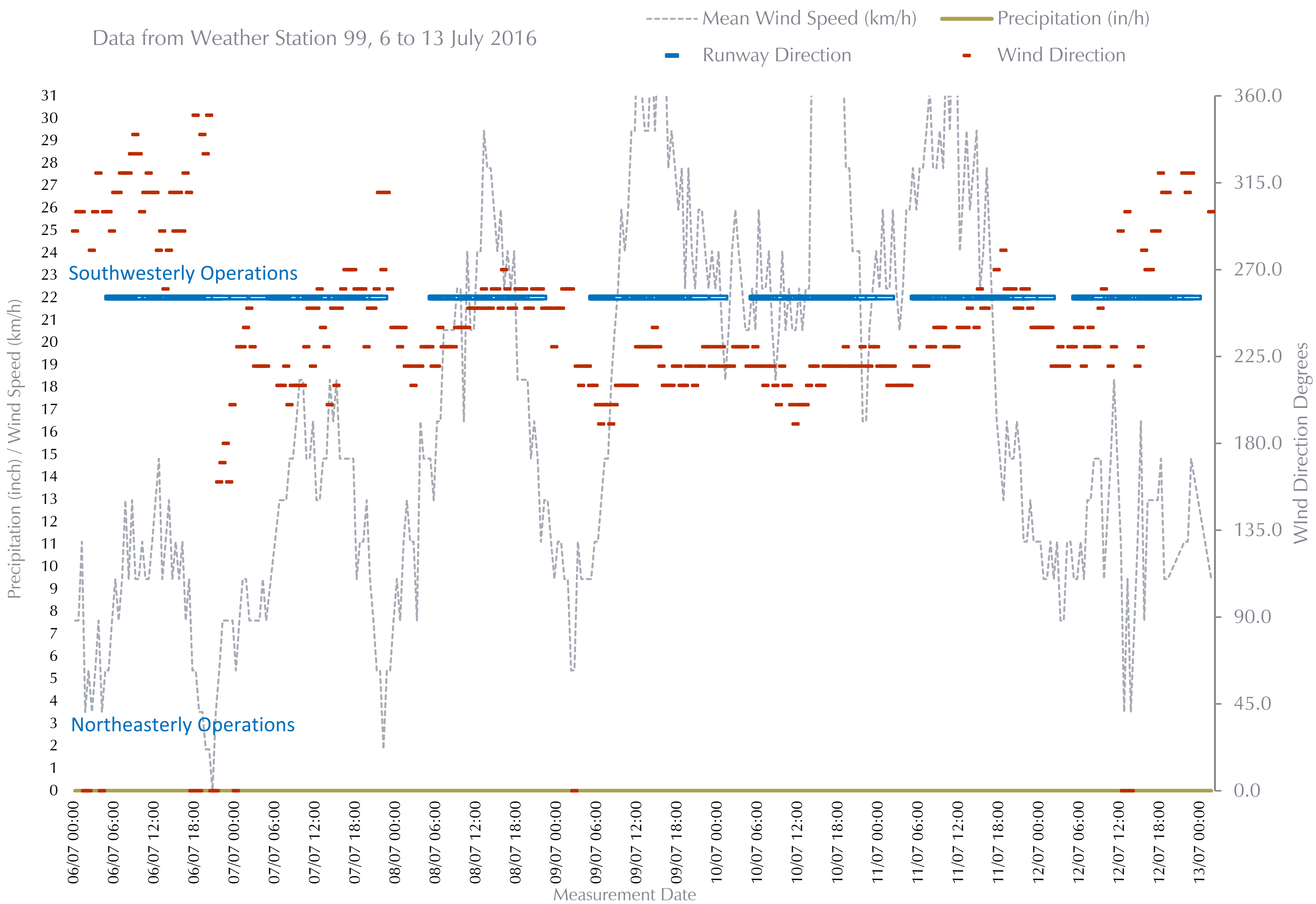


Figure 16/0321/W99C



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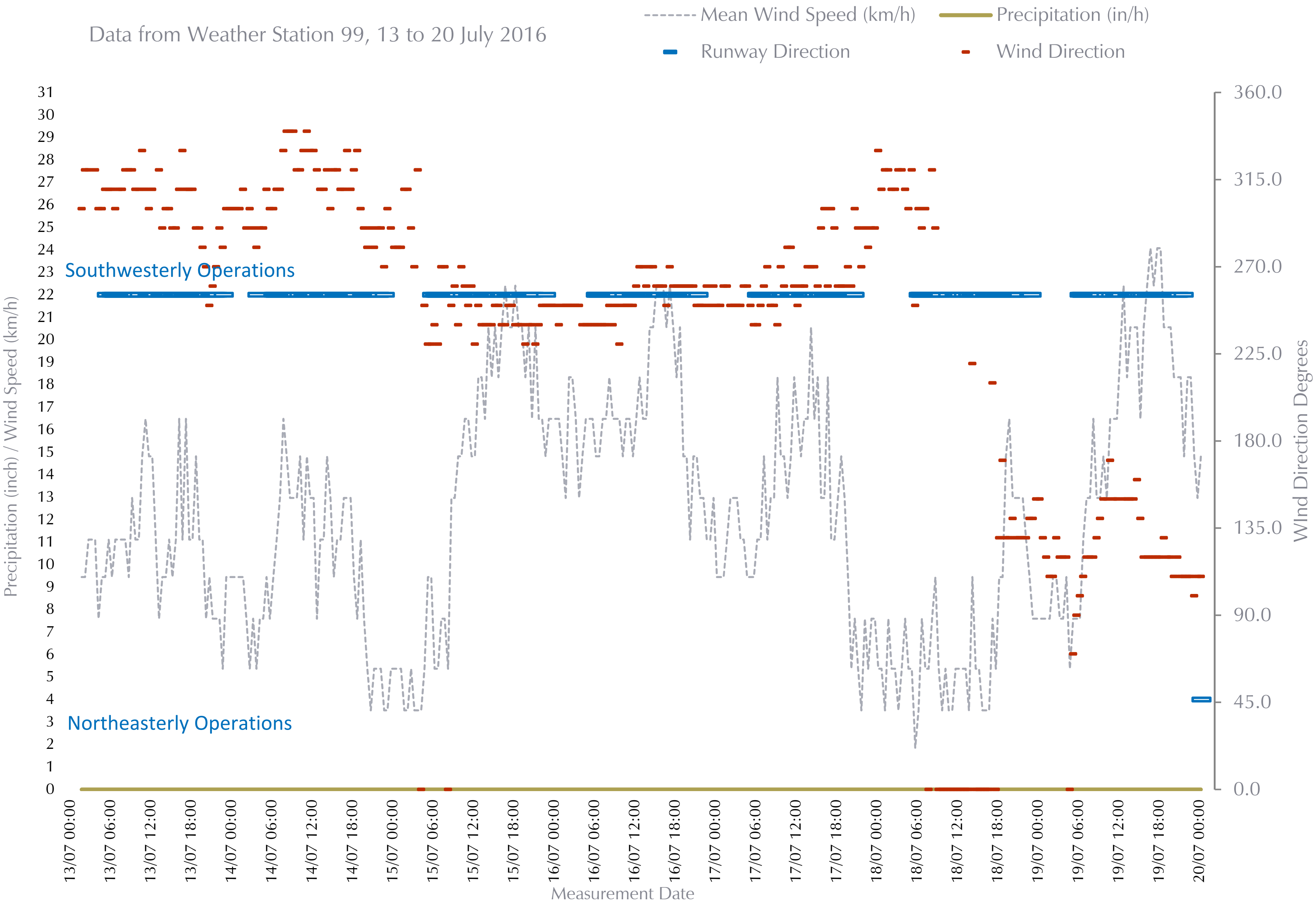


Figure 16/0321/W99E

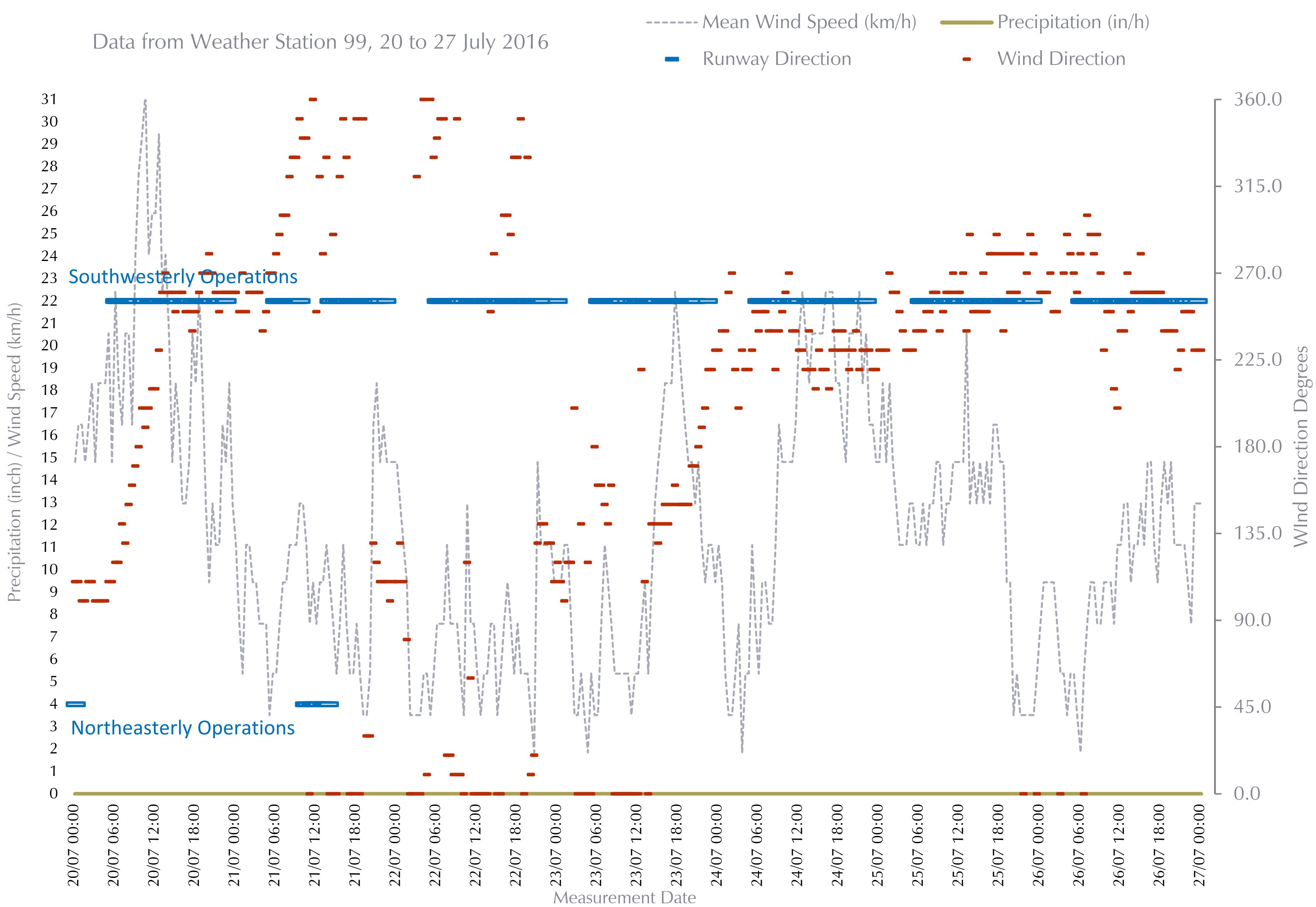


Figure 16/0321/W99F

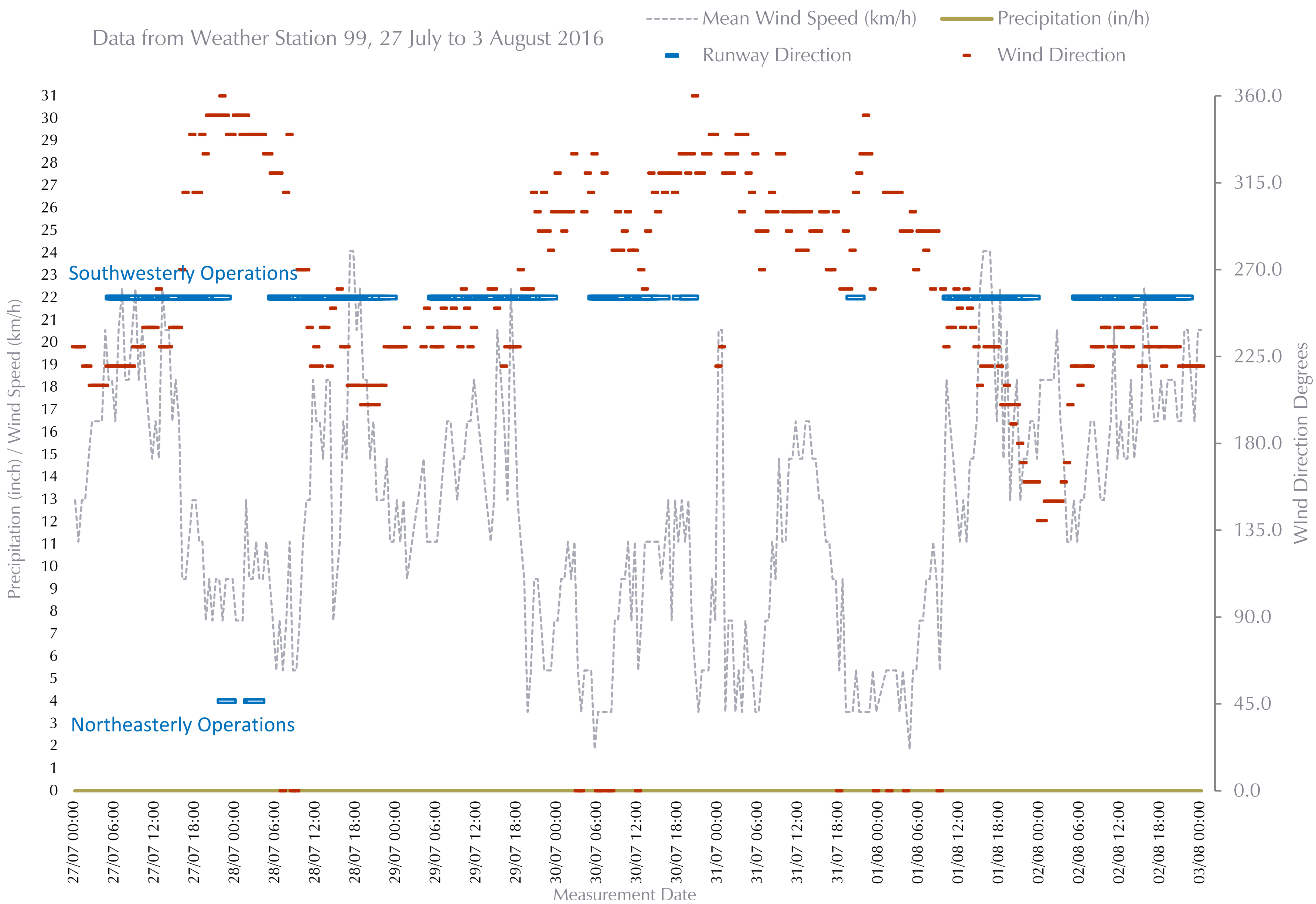


Figure 16/0321/W99C

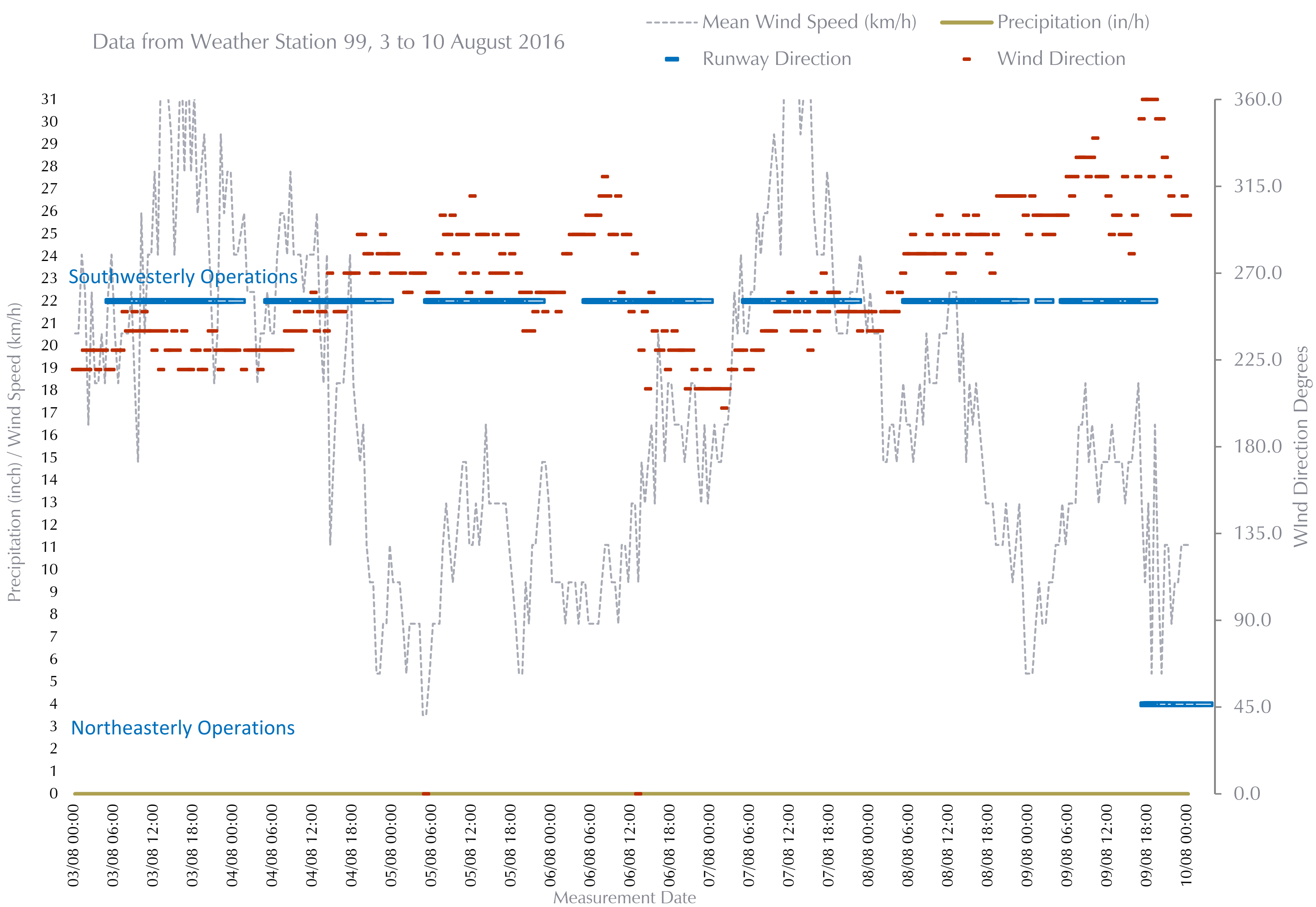


Figure 16/0321/W99H

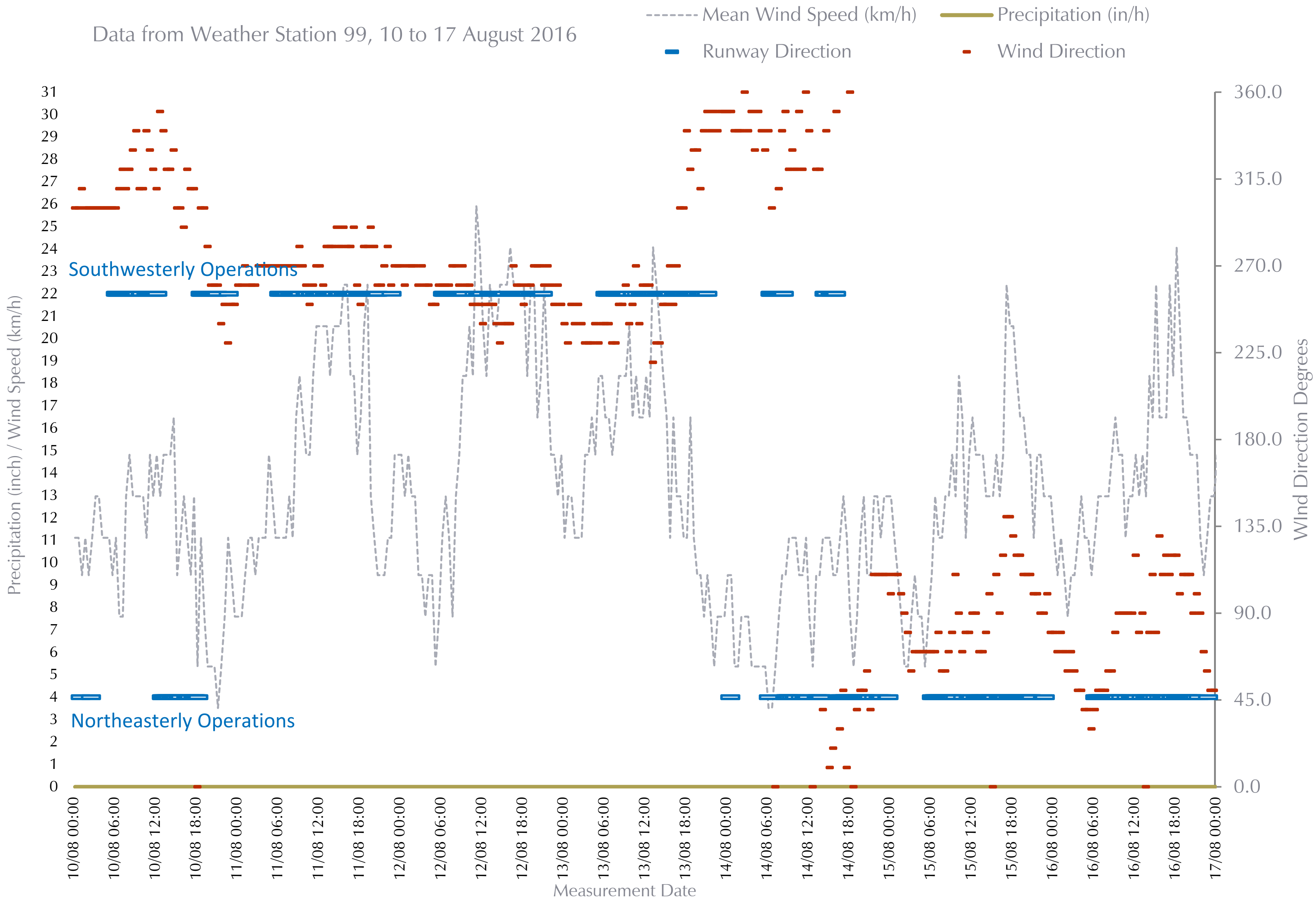


Figure 16/0321/W99I

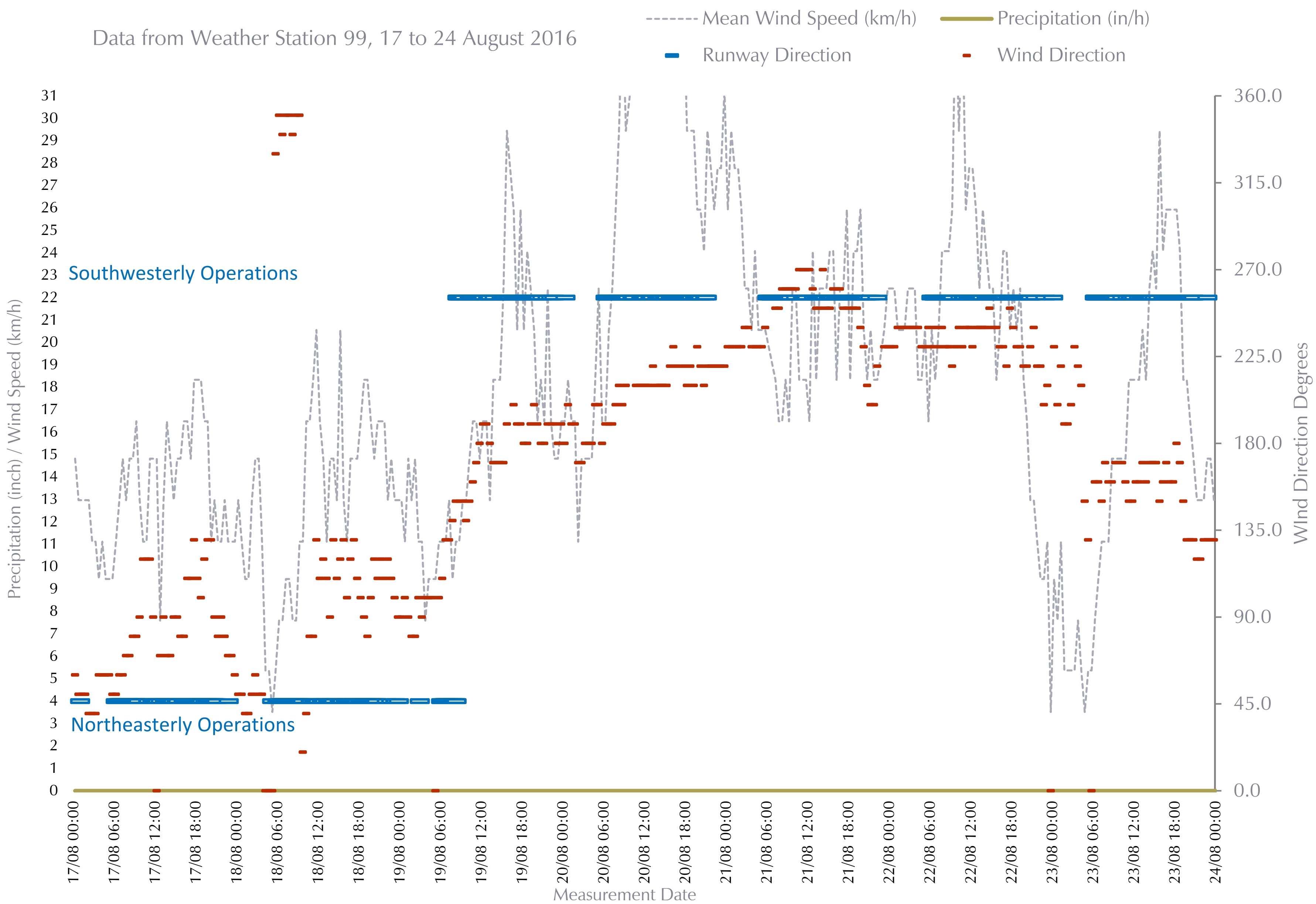


Figure 16/0321/W99J

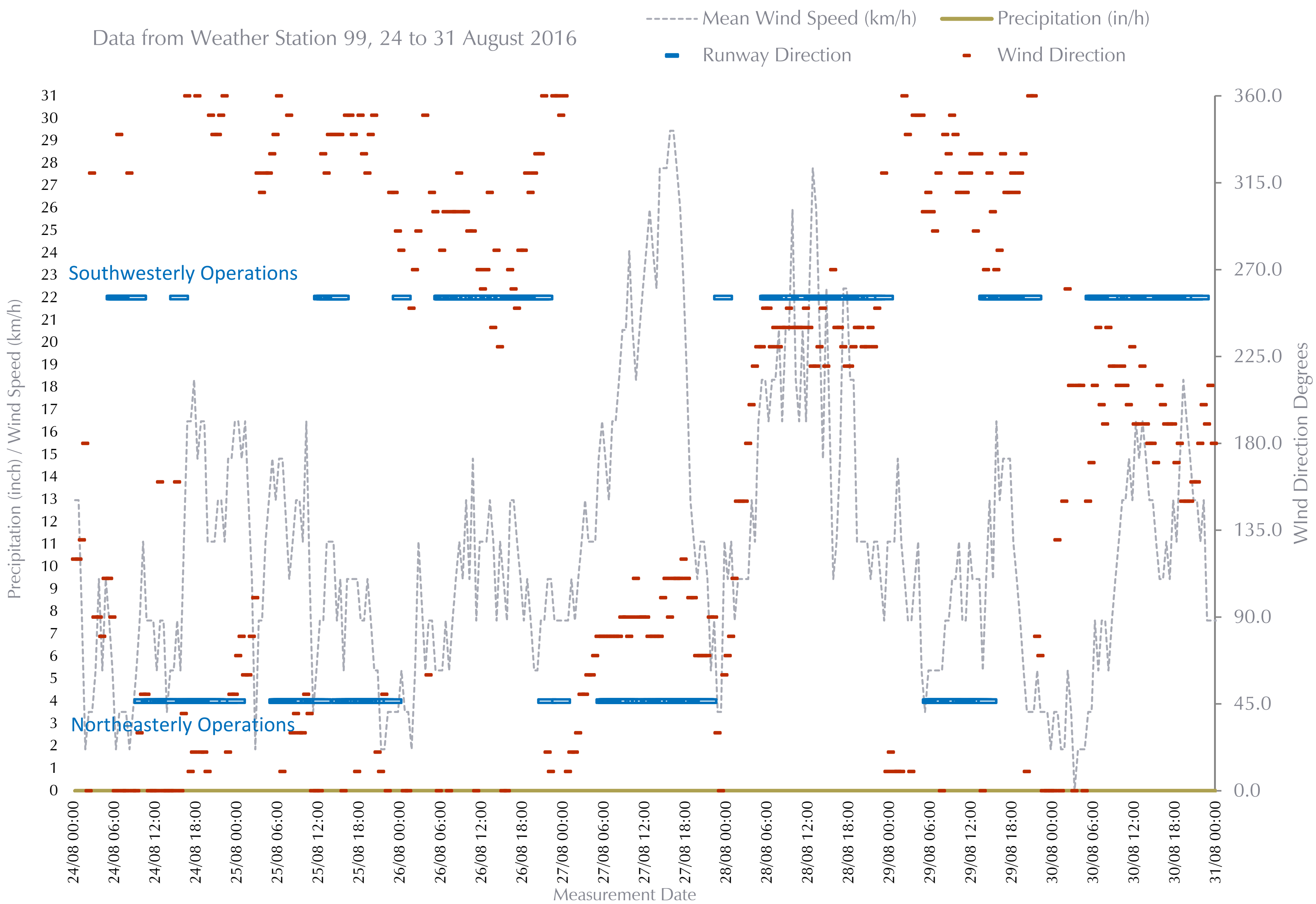


Figure 16/0321/W99K

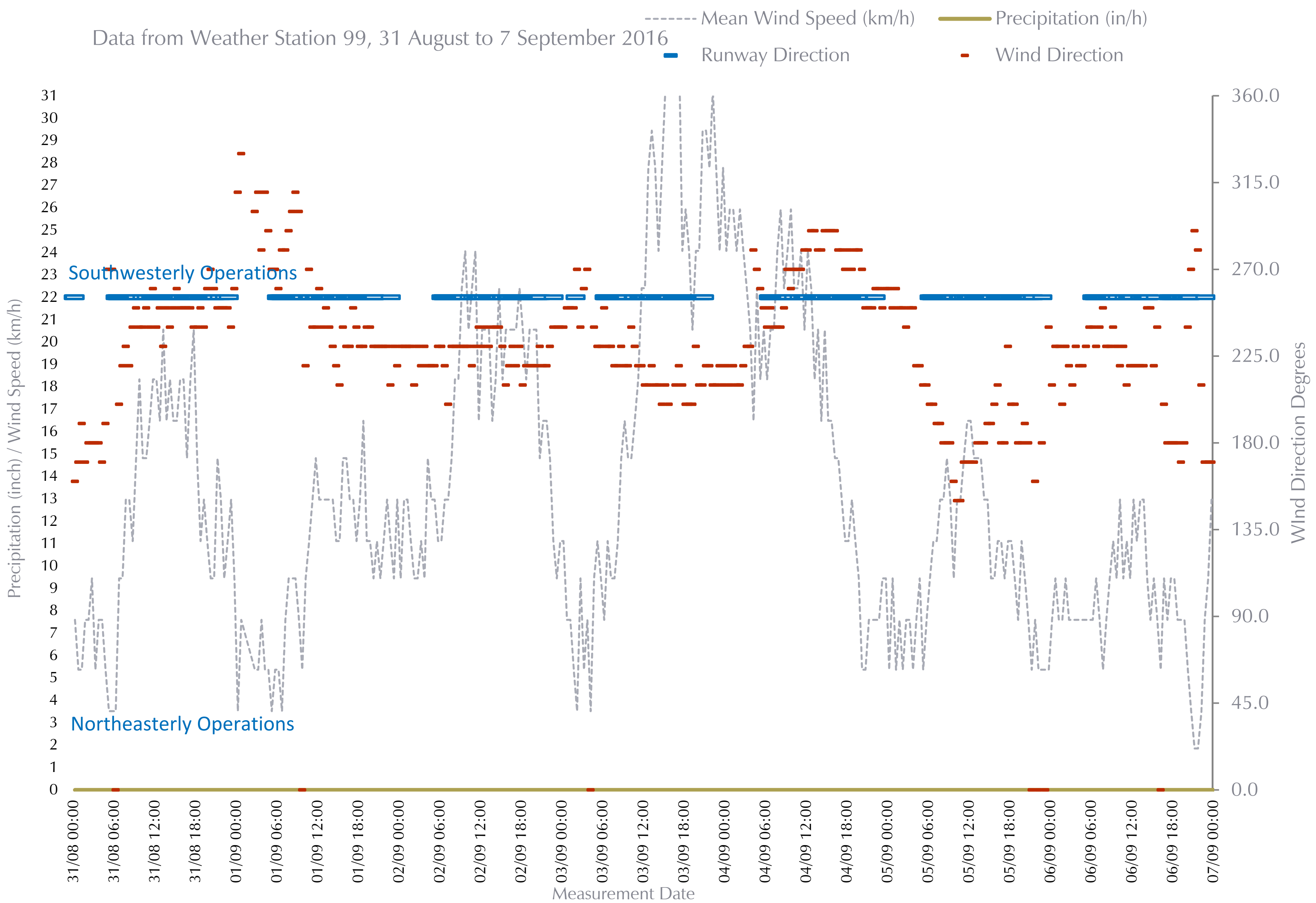
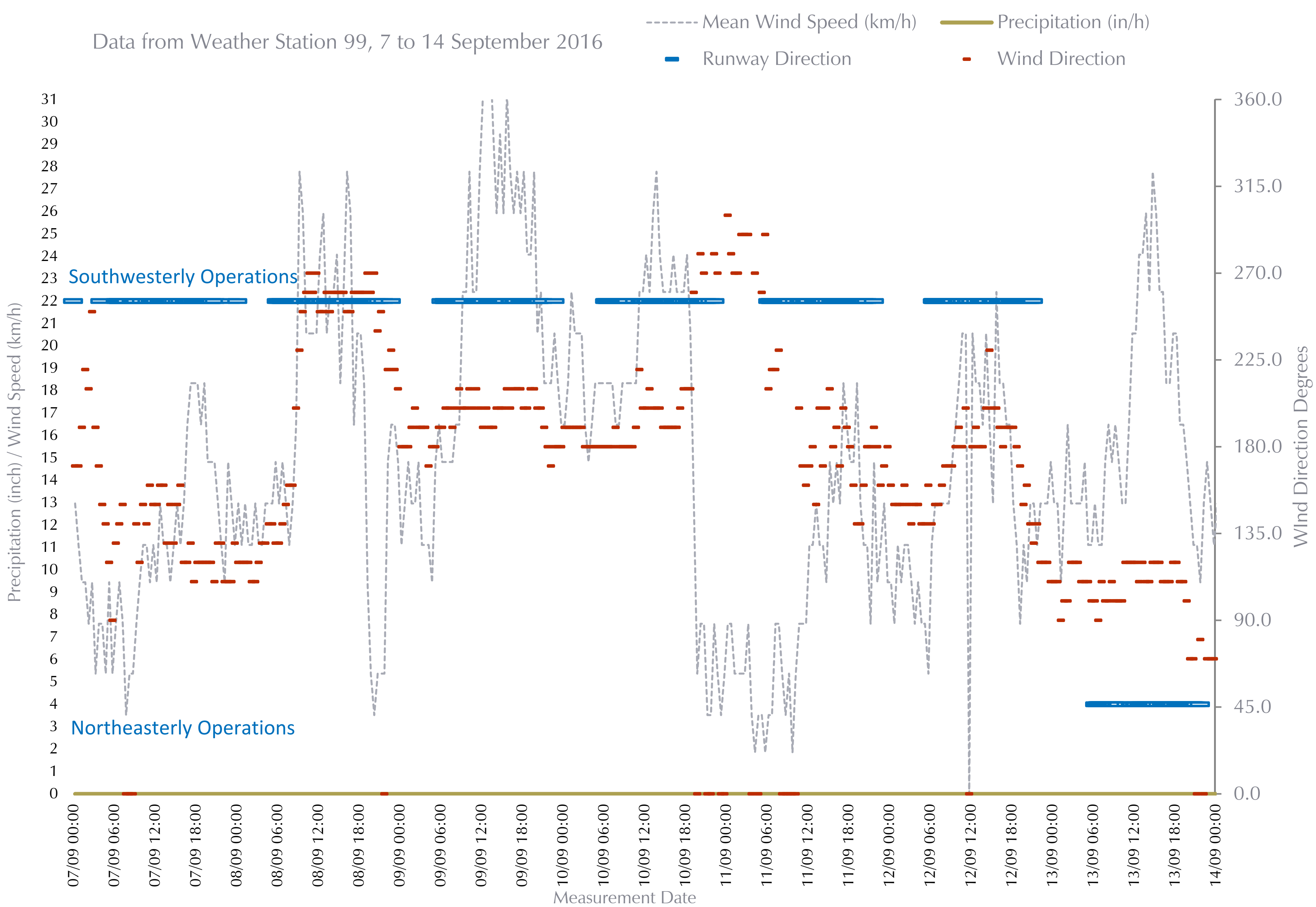


Figure 16/0321/W99L



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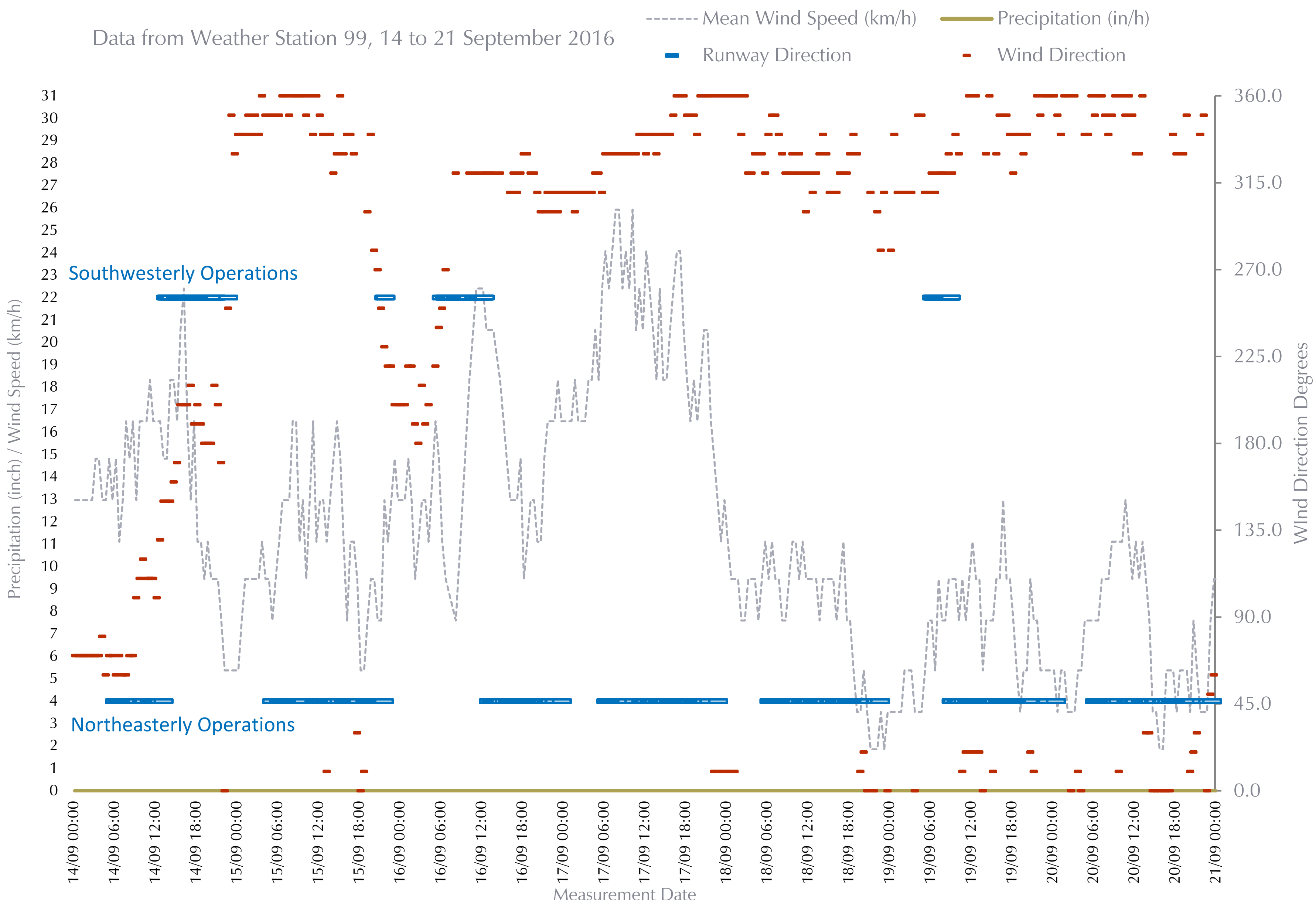
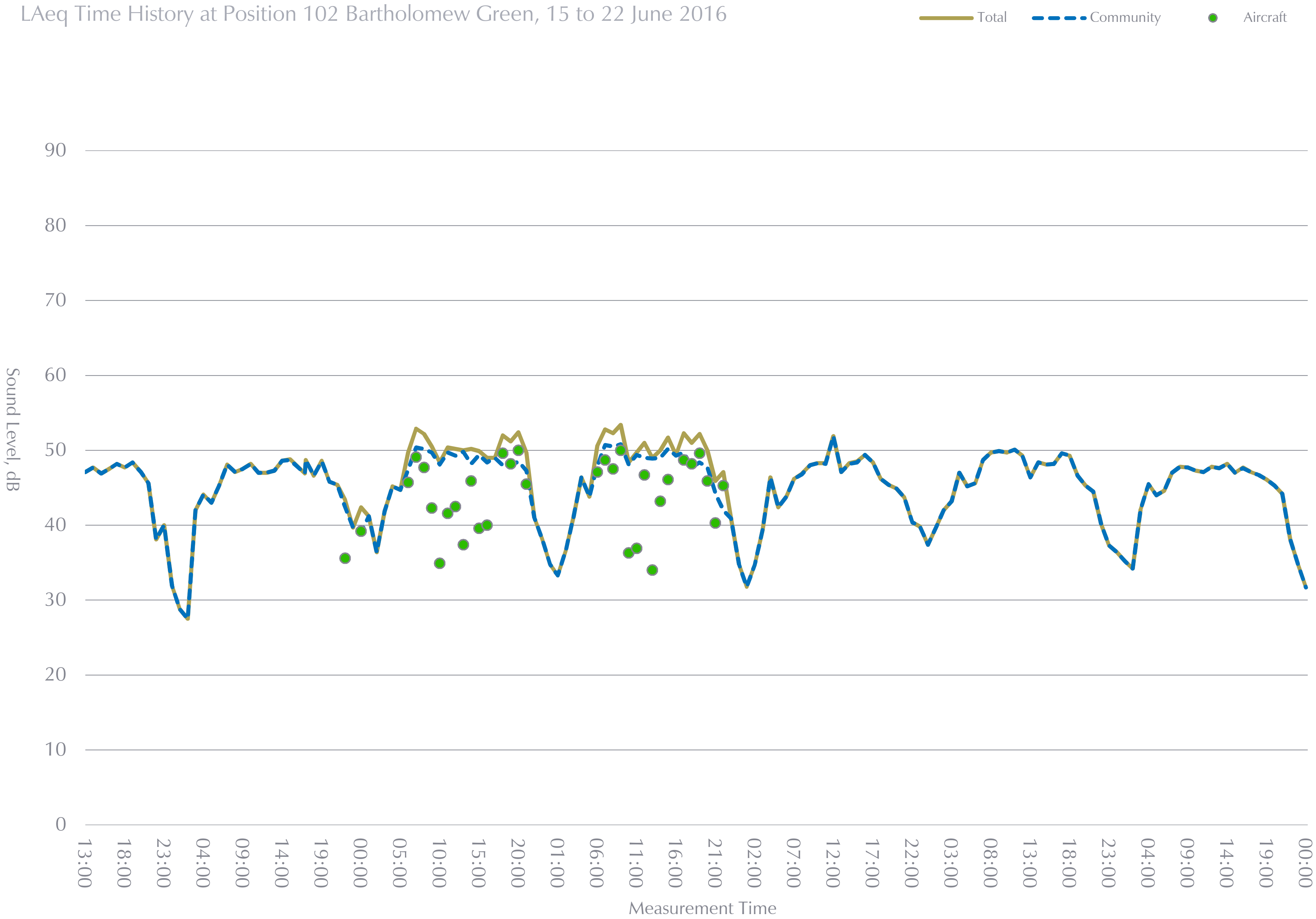


Figure 16/0321/W99N

Figure 16/0321/L2A

LAeq Time History at Position 102 Bartholomew Green, 15 to 22 June 2016



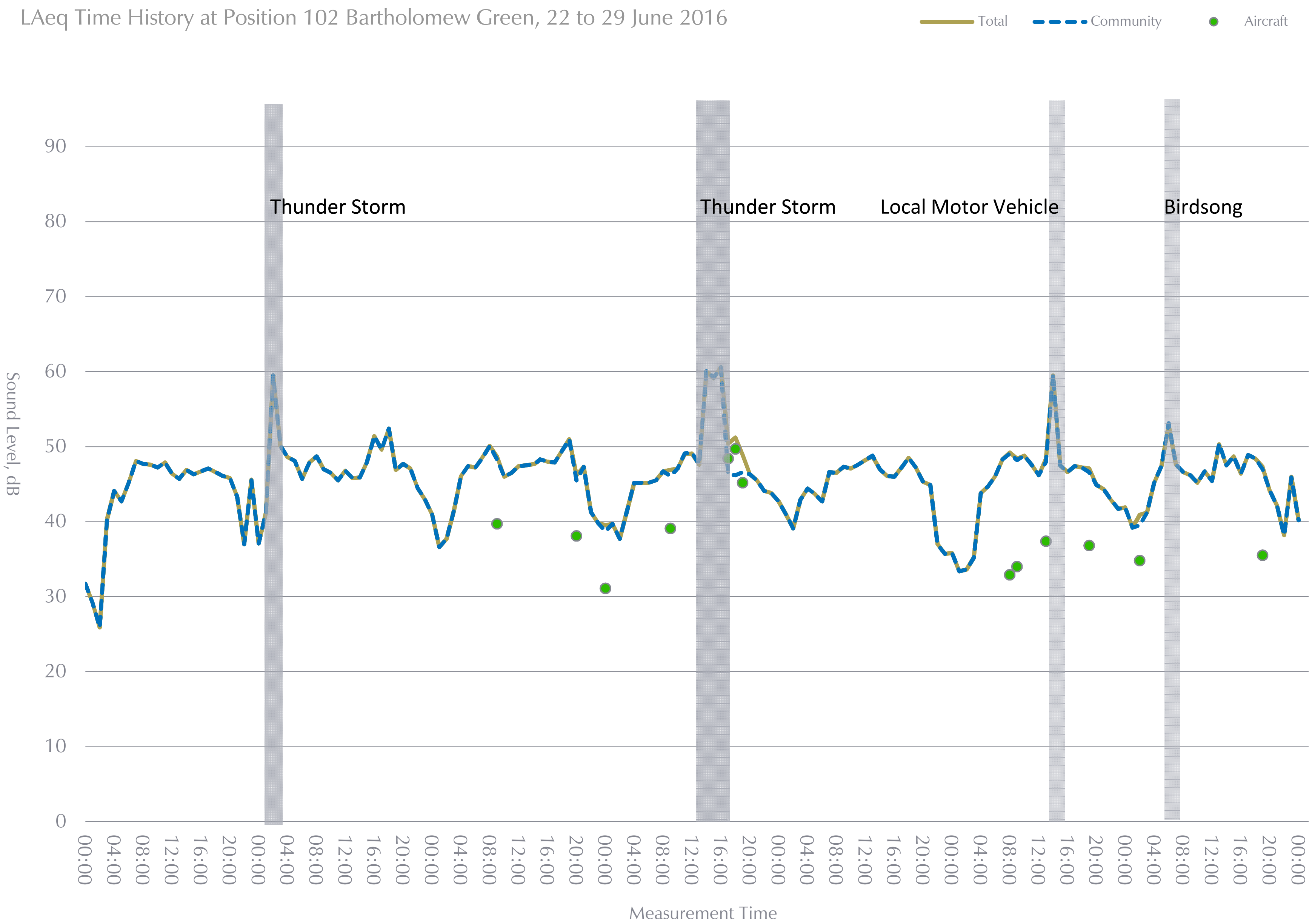
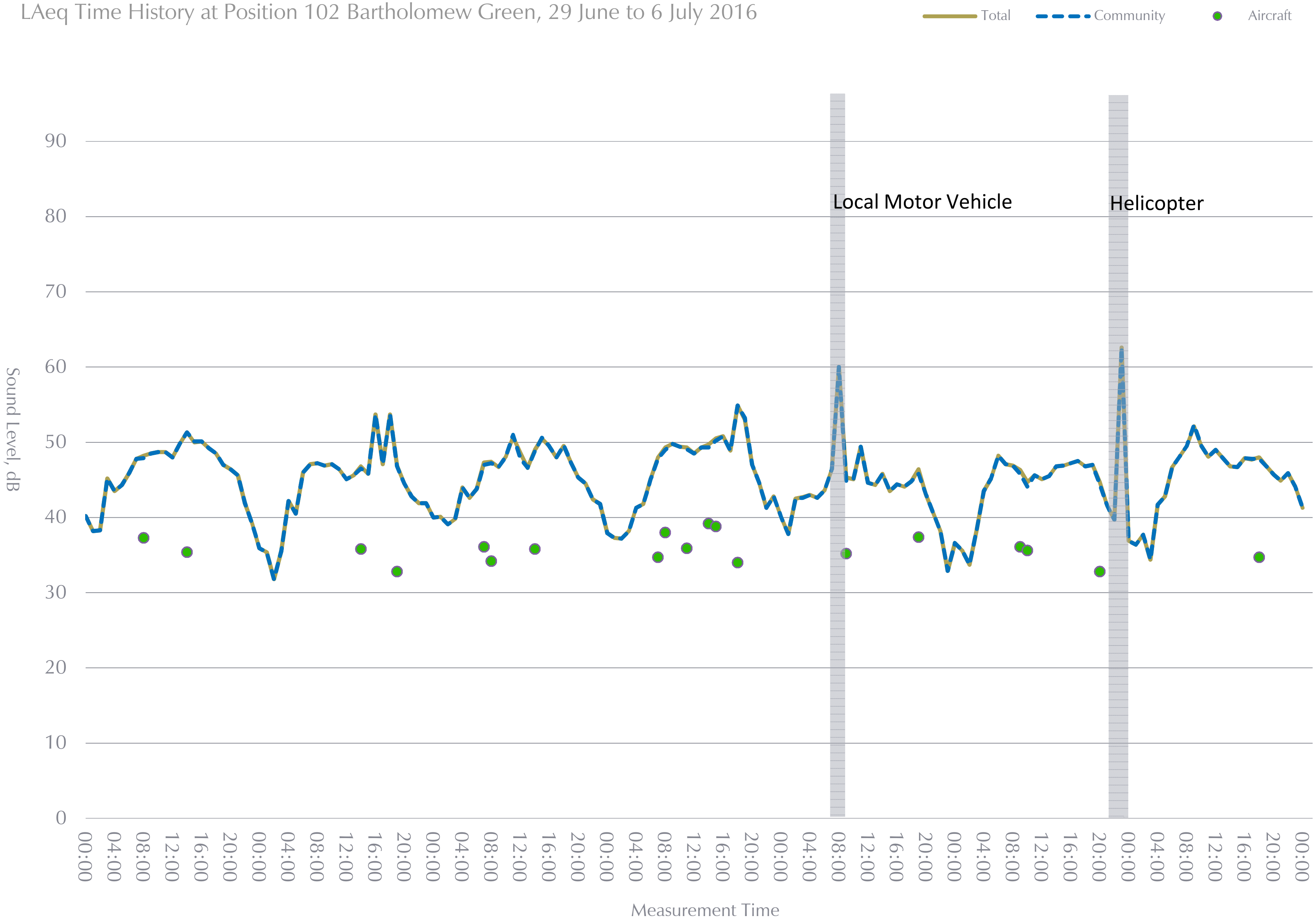


Figure 16/0321/L2B

Figure 16/0321/L2C

LAeq Time History at Position 102 Bartholomew Green, 29 June to 6 July 2016



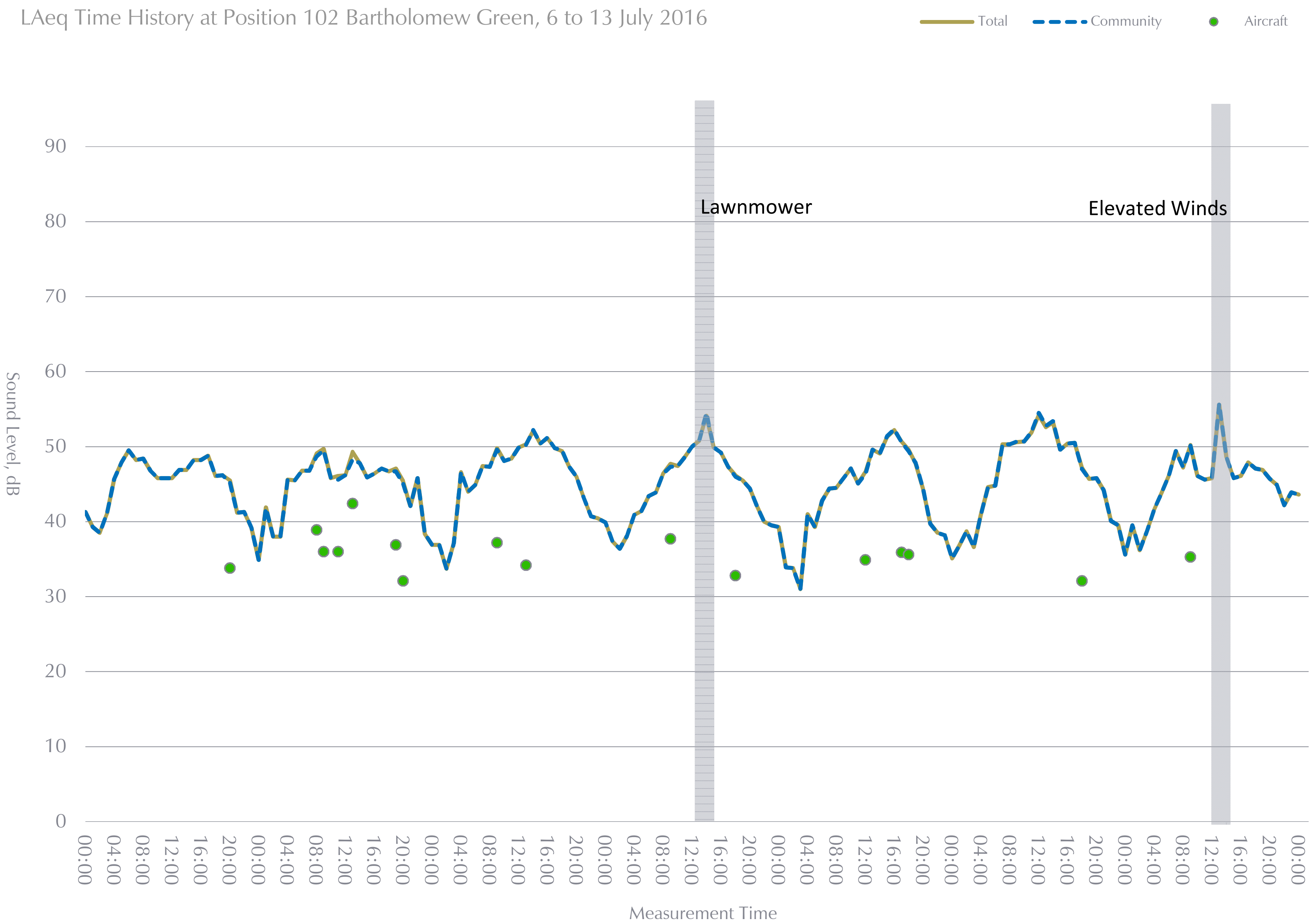


Figure 16/0321/L2D

LAeq Time History at Position 102 Bartholomew Green, 13 to 20 July 2016

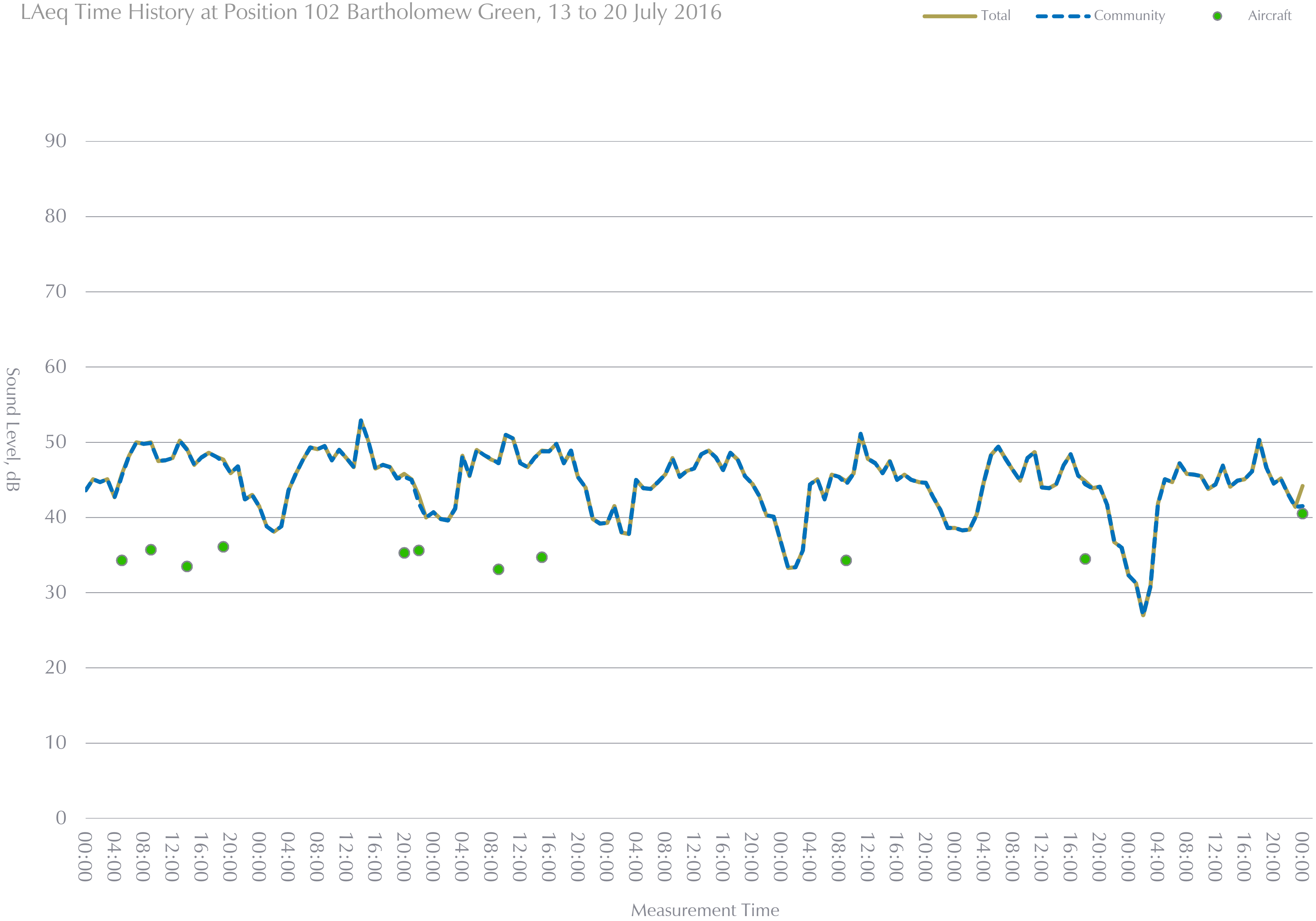


Figure 16/0321/L2E

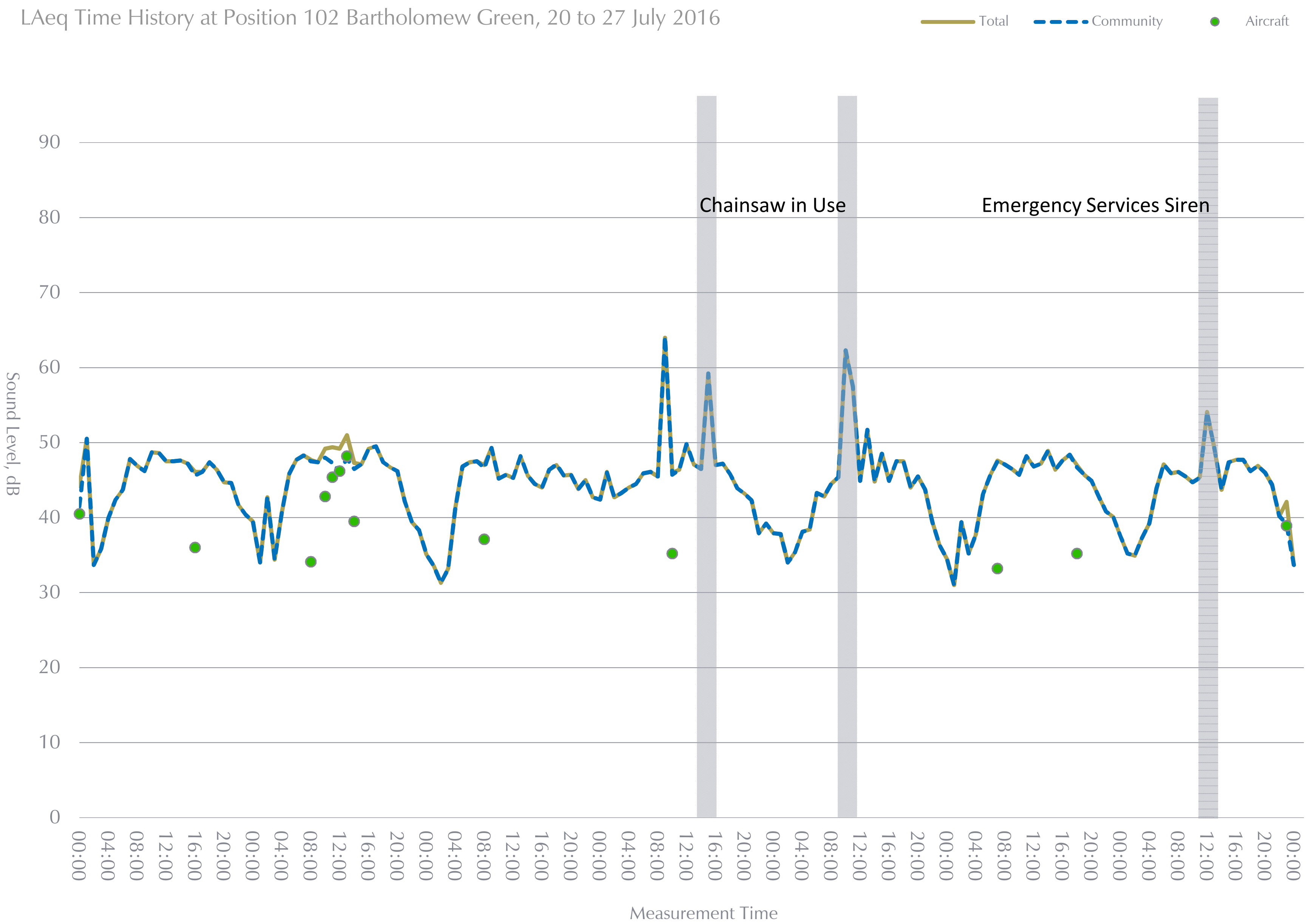
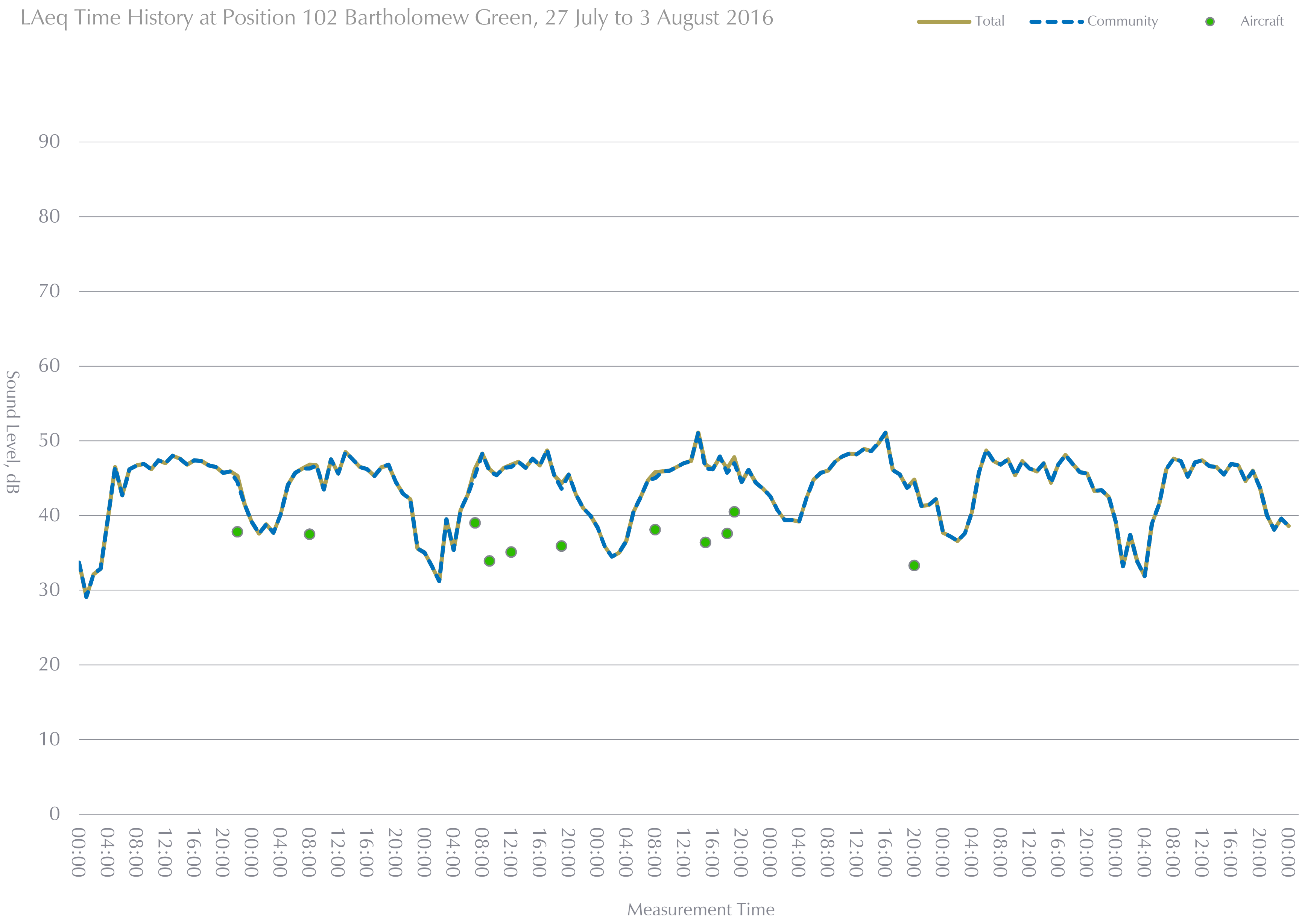


Figure 16/0321/L2F


LAeq Time History at Position 102 Bartholomew Green, 27 July to 3 August 2016
Total
Community
Aircraft
Sound Level, dB
0
10
20
30
40
50
60
70
80
90
00:00
04:00
08:00
12:00
16:00
20:00
Measurement Time

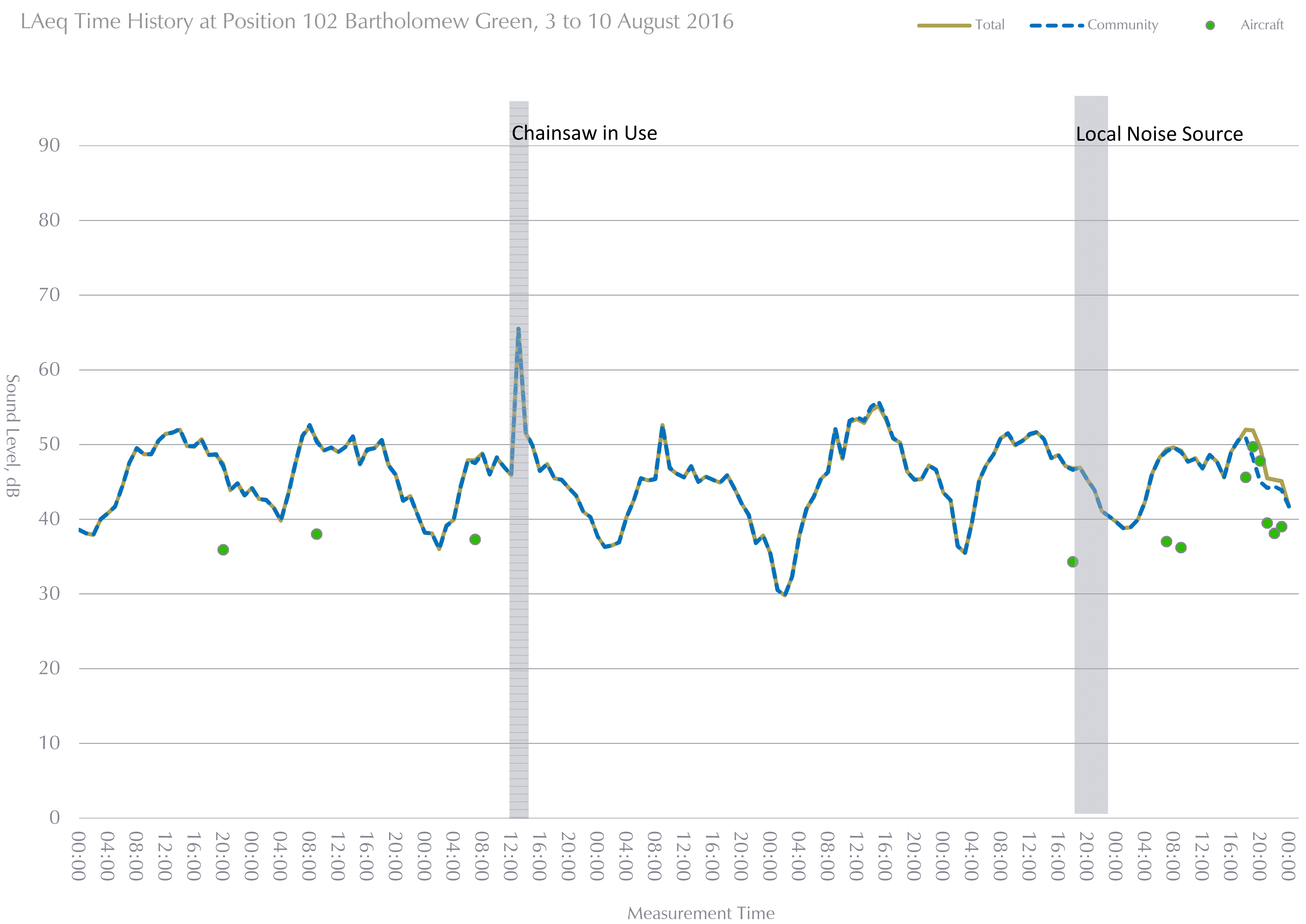
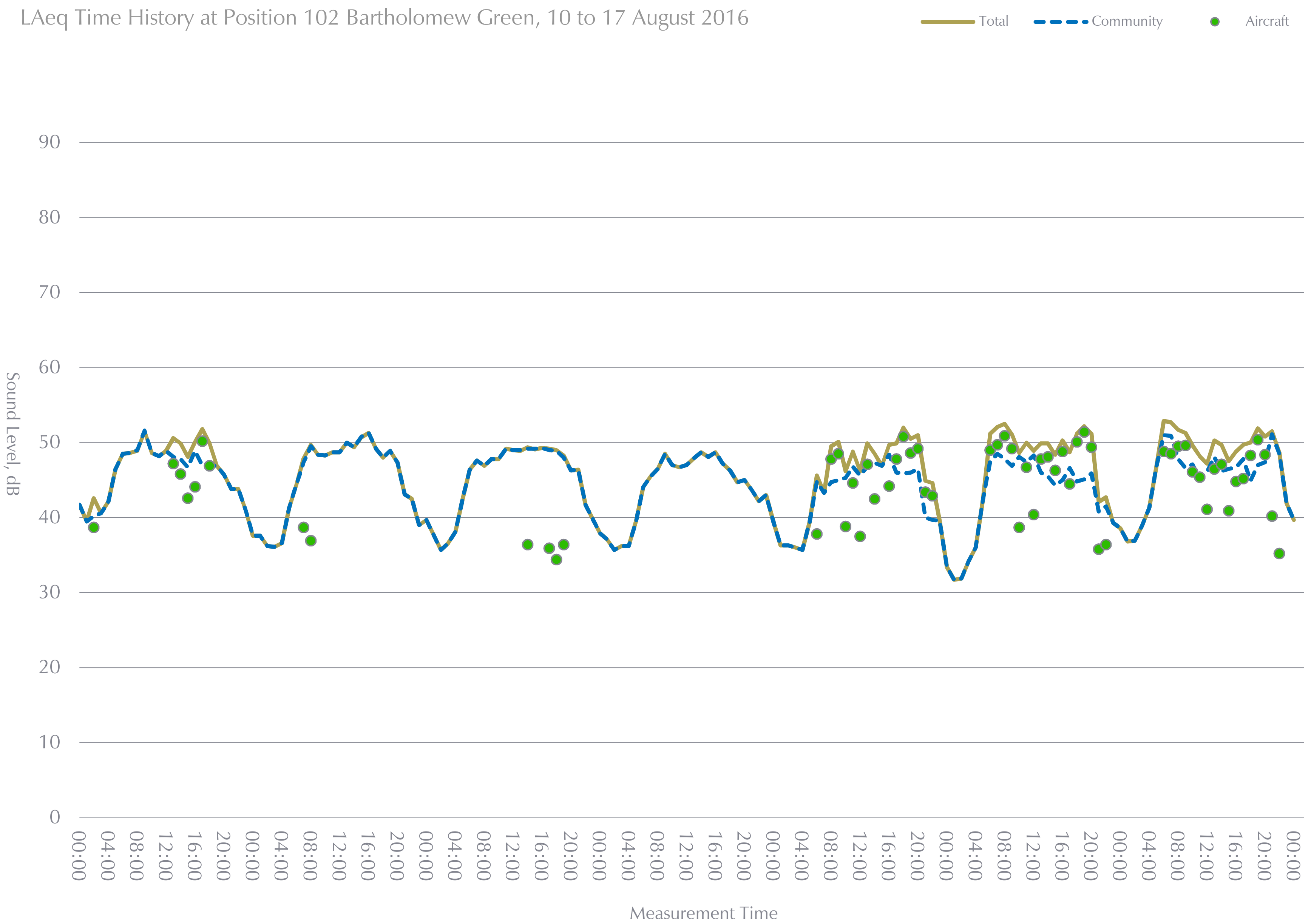


Figure 16/0321/L2H

Figure 16/0321/L21



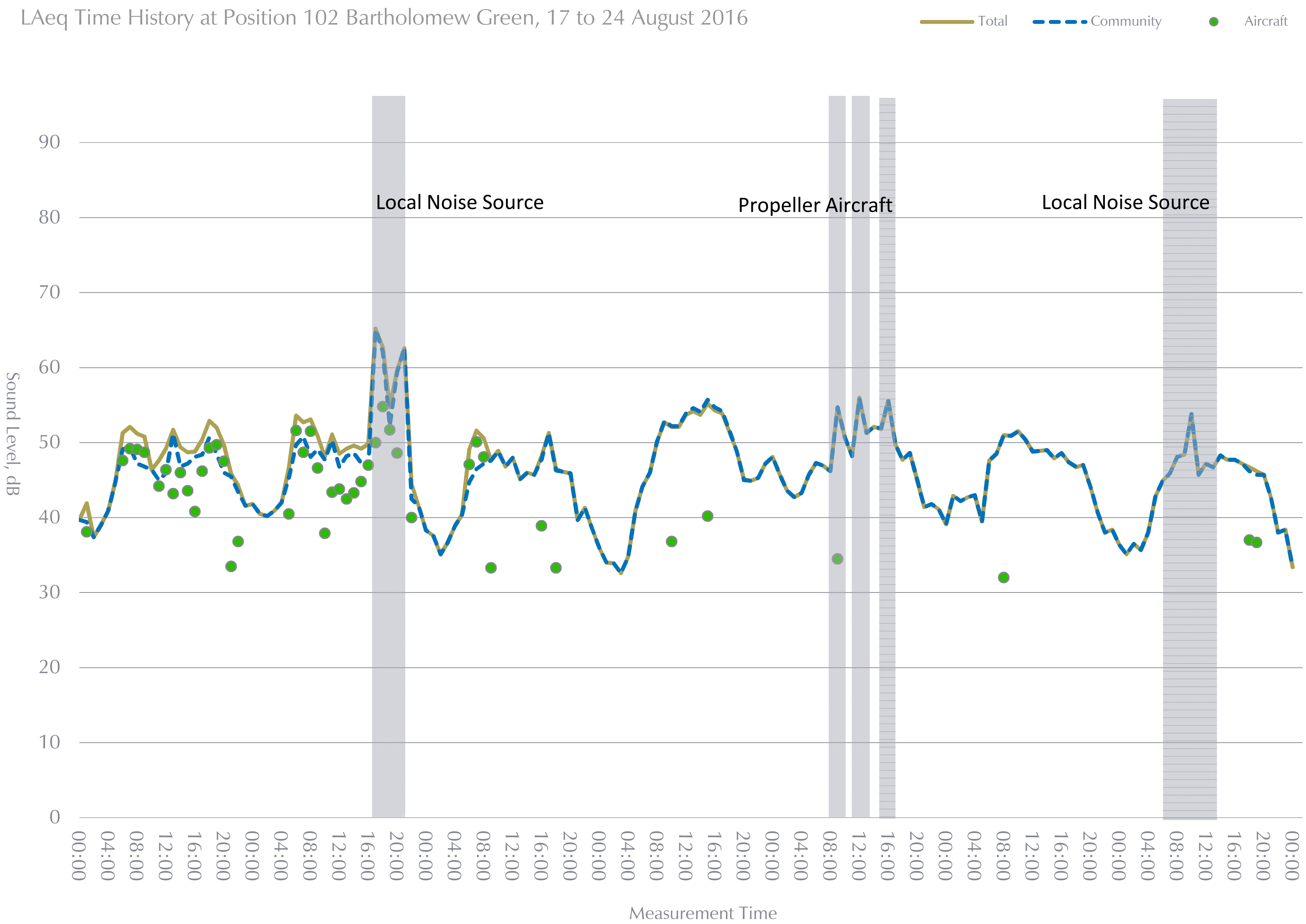


Figure 16/0321/L2J

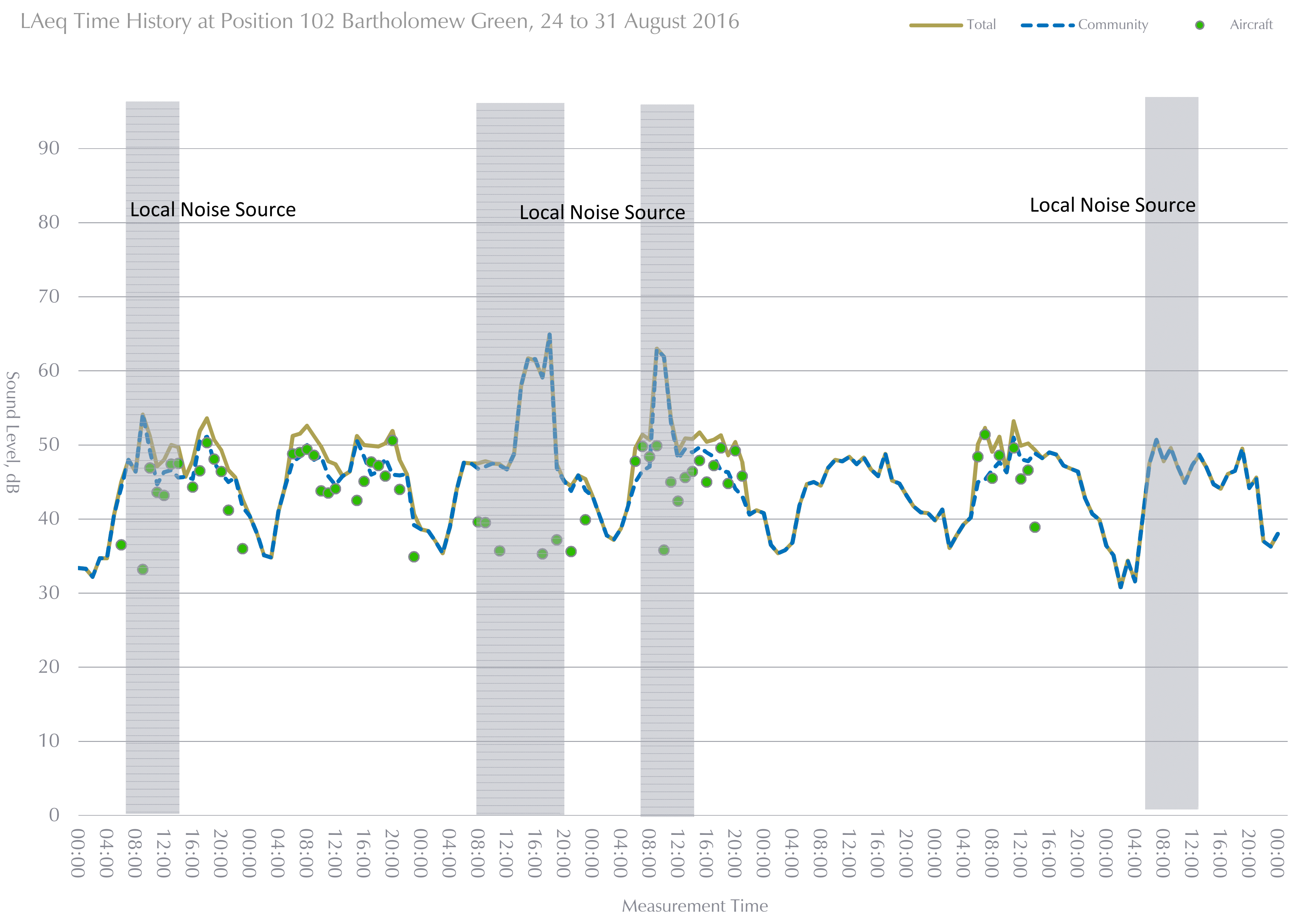


Figure 16/0321/L2K

Figure 16/0321/L2L

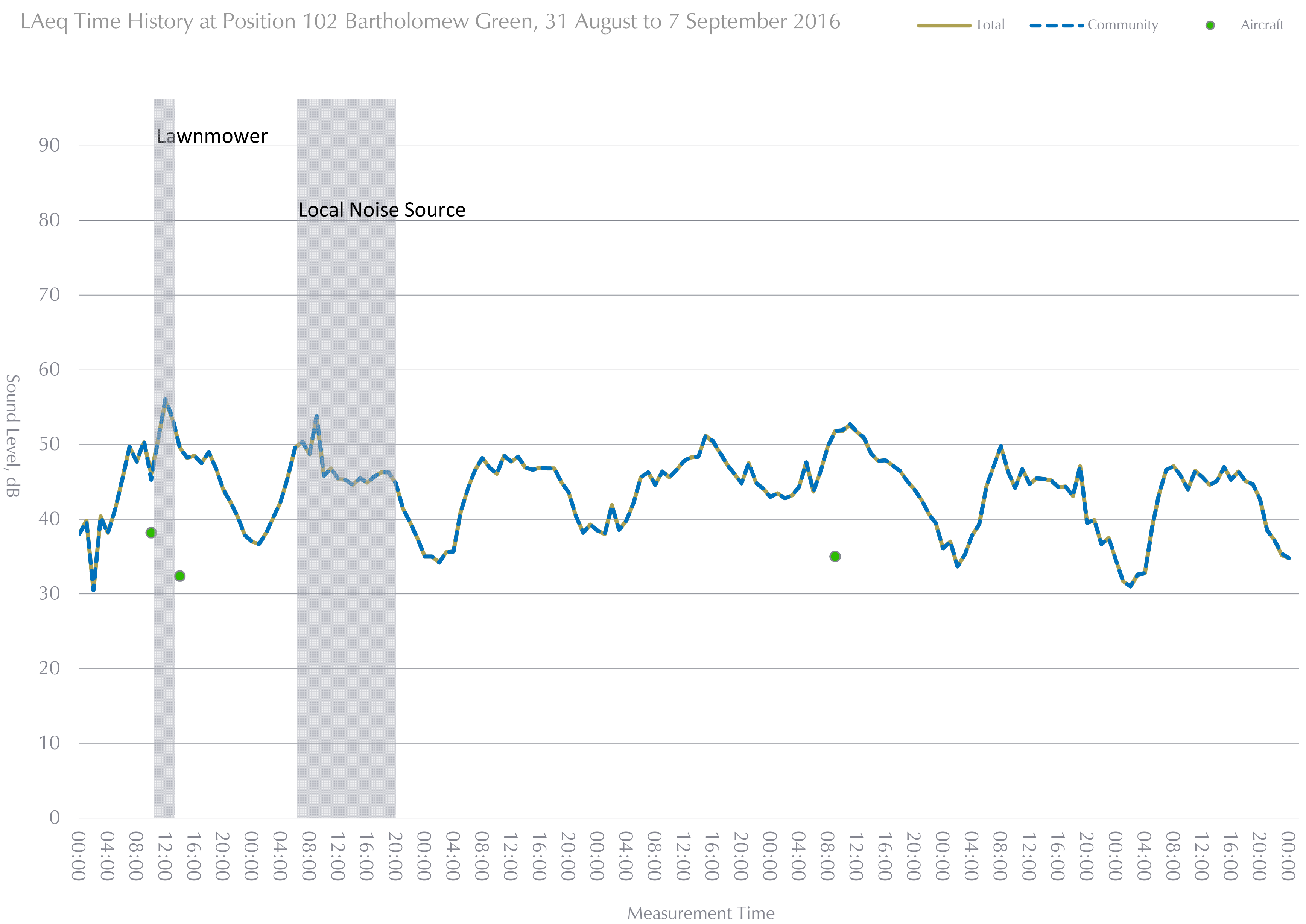
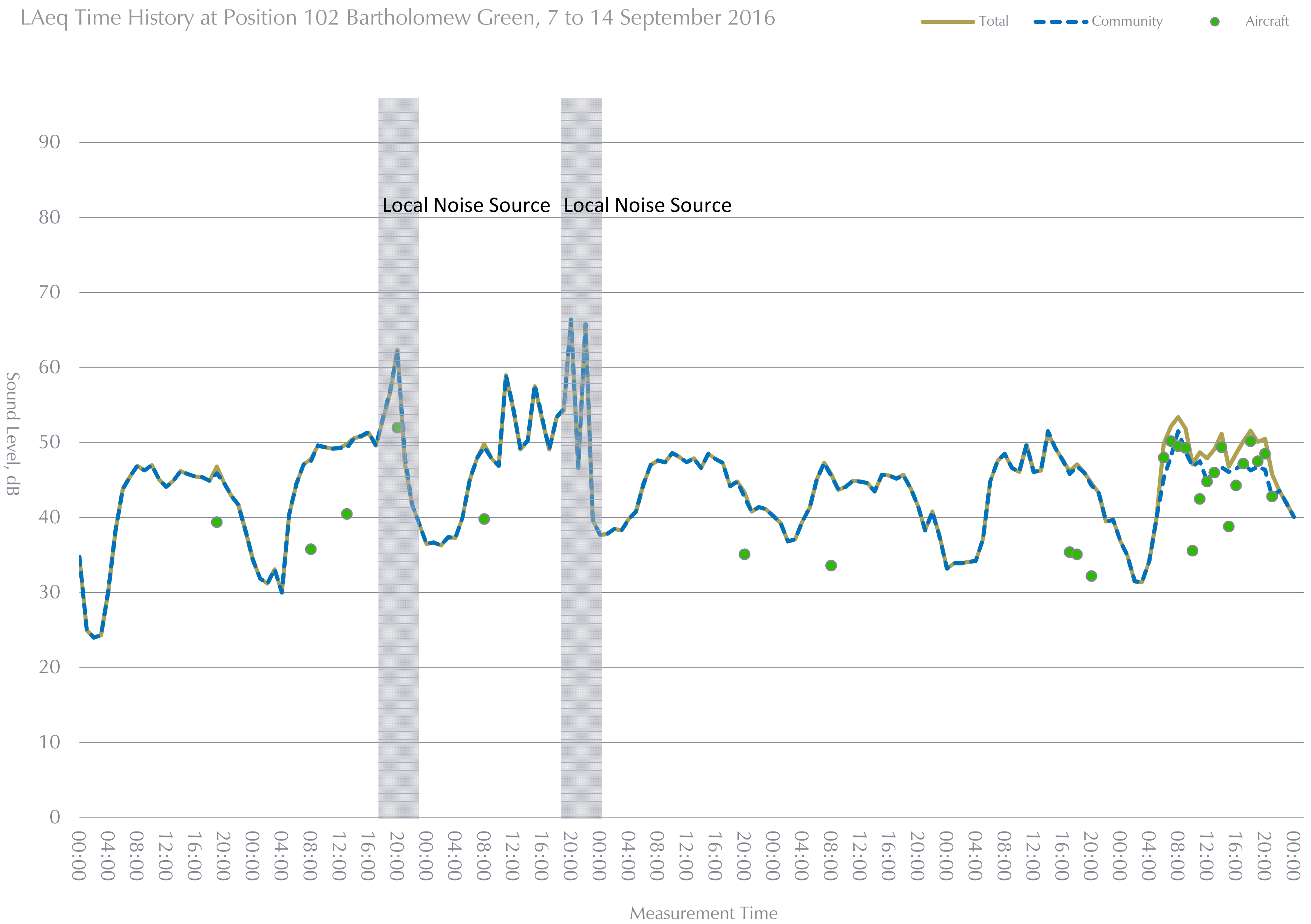


Figure 16/0321/L2M



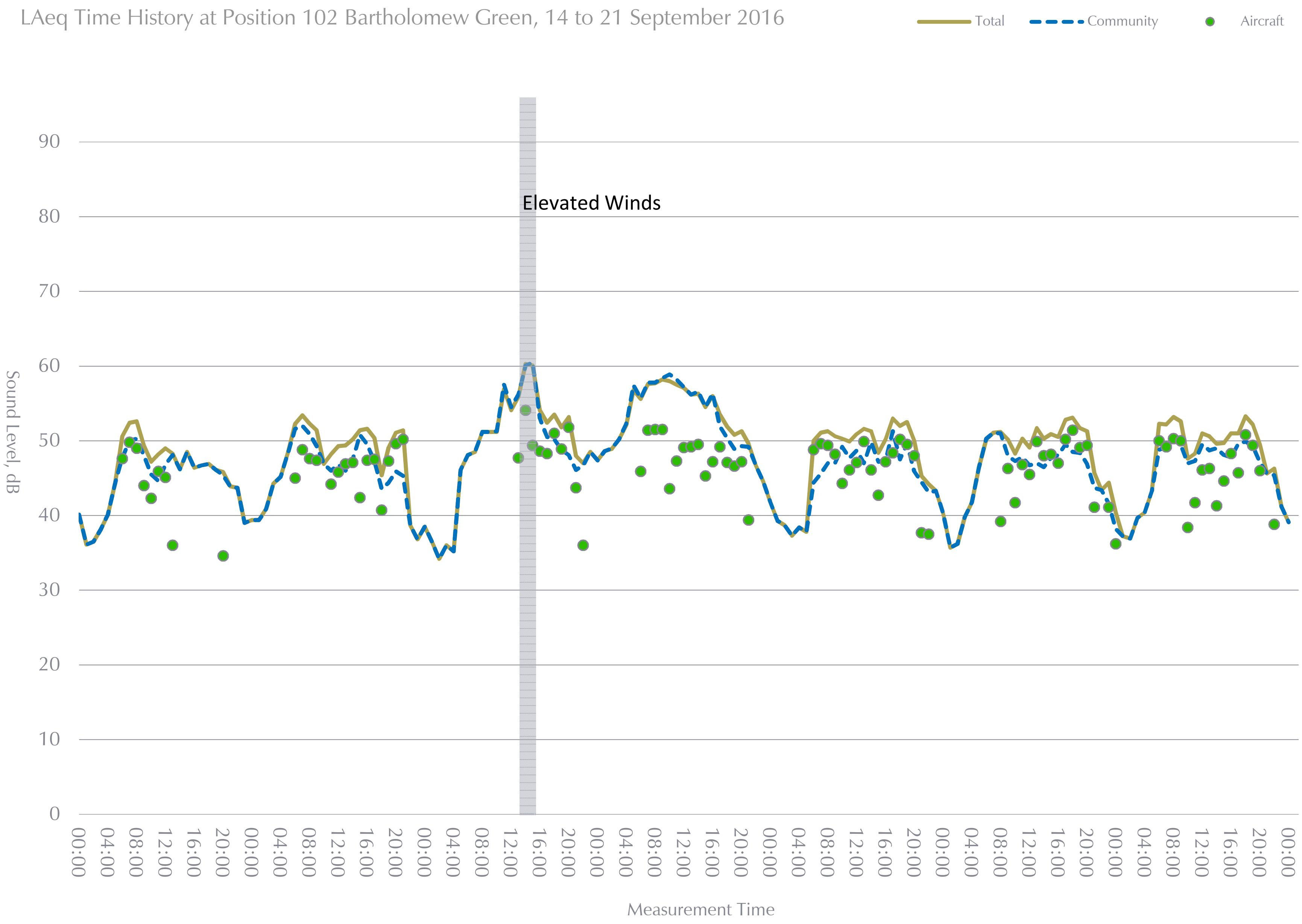


Figure 16/0321/L2N

Noise Levels at Bartholomew Green (P102) as Measured

Period	$L_{Aeq,16h}$ [i]	L_{Day} [ii]	$L_{Evening}$ [iii]	L_{Night} [iv]	L_{den} [v]
Average	**49**	**50**	**46**	**42**	**51**
15-16 June	-	-	46.2	41.4	-
16-17 June	47.5	47.8	46.3	44.4	51.6
17-18 June	50.6	50.7	50.2	44.3	53.1
18-19 June	50.9	51.3	49.6	41.6	52.1
19-20 June	47.8	48.5	44.1	43.6	51.0
20-21 June	48.4	49.2	44.8	41.9	50.4
21-22 June	46.9	47.5	44.4	40.8	49.2
22-23 June	46.6	47.2	44.3	51.9	57.5
23-24 June	48.2	48.6	46.8	44.2	51.7
24-25 June	48.1	48.2	47.8	42.7	51.0
25-26 June	53.8	54.9	46.7	42.9	53.9
26-27 June	46.9	47.4	45.0	41.5	49.6
27-28 June	50.3	51.3	45.2	46.5	53.7
28-29 June	47.0	47.7	44.2	43.7	50.8
29-30 June	48.6	49.3	45.7	40.5	50.0
30 June - 1 July	48.2	49.0	44.6	41.9	50.3
1-2 July	48.1	48.8	45.3	41.0	49.9
2-3 July	50.0	50.4	48.7	42.3	51.8
3-4 July	49.8	50.8	43.2	42.6	51.2
4-5 July	46.1	46.6	44.2	53.9	59.3
5-6 July	48.3	48.8	46.0	45.1	52.2
6-7 July	46.8	47.4	44.2	43.1	50.4
7-8 July	47.1	47.6	45.5	42.1	50.1
8-9 July	49.0	49.8	45.1	40.4	50.1
9-10 July	48.5	49.3	43.6	39.1	49.1
10-11 July	48.1	48.9	44.2	41.0	49.8
11-12 July	50.4	51.4	44.6	41.6	51.2
12-13 July	48.6	49.2	45.3	45.3	52.4
13-14 July	48.4	48.9	46.2	43.5	51.3
14-15 July	48.3	49.0	45.0	44.8	52.0
15-16 July	48.2	48.8	45.7	42.0	50.4
16-17 July	46.7	47.3	43.8	41.1	49.2
17-18 July	46.3	46.9	43.6	44.6	51.2
18-19 July	45.8	46.6	42.5	40.4	48.4
19-20 July	46.0	46.3	45.1	44.3	51.1
20-21 July	46.9	47.5	44.8	42.9	50.4
21-22 July	48.1	48.8	44.6	42.3	50.4
22-23 July	46.3	46.7	45.2	44.3	51.2
23-24 July	54.0	55.1	42.4	38.9	52.9
24-25 July	52.5	53.6	43.8	40.3	52.1
25-26 July	46.8	47.5	44.0	41.6	49.5

Period	$L_{Aeq,16h}$ [i]	L_{Day} [ii]	$L_{Evening}$ [iii]	L_{Night} [iv]	L_{den} [v]
26-27 July	47.5	48.1	45.1	40.9	49.6
27-28 July	46.9	47.1	46.0	41.7	49.8
28-29 July	46.2	46.7	44.5	38.3	47.8
29-30 July	46.4	47.0	43.8	38.9	48.0
30-31 July	46.9	47.2	46.0	42.1	50.1
31 July-1 August	47.4	48.2	43.2	43.1	50.5
1-2 August	46.4	46.8	44.8	38.8	48.1
2-3 August	46.0	46.7	43.1	40.8	48.7
3-4 August	49.5	50.2	46.7	43.7	51.9
4-5 August	49.4	50.2	45.2	42.4	51.1
5-6 August	54.4	55.6	43.8	40.8	53.7
6-7 August	46.2	47.1	41.7	38.3	47.5
7-8 August	51.4	52.3	46.2	43.9	52.8
8-9 August	49.2	50.0	44.9	43.4	51.4
9-10 August	49.1	49.1	49.1	44.4	52.4
10-11 August	49.1	49.9	45.4	40.0	50.0
11-12 August	48.8	49.4	46.4	41.0	50.4
12-13 August	48.3	48.8	46.4	39.4	49.5
13-14 August	46.9	47.6	44.1	40.6	49.1
14-15 August	49.0	49.0	48.8	43.4	51.8
15-16 August	50.2	50.4	49.3	45.7	53.5
16-17 August	50.4	50.1	51.0	44.7	53.3
17-18 August	50.1	50.4	49.1	46.6	54.0
18-19 August	57.8	57.3	58.9	42.4	58.7
19-20 August	47.9	48.7	44.2	38.8	48.8
20-21 August	52.1	53.1	46.5	46.0	54.1
21-22 August	51.2	52.2	45.3	43.2	52.3
22-23 August	48.6	49.5	43.8	40.0	49.6
23-24 August	47.7	48.5	44.2	39.0	48.8
24-25 August	50.0	50.4	48.6	44.4	52.7
25-26 August	49.9	50.0	49.7	42.0	51.8
26-27 August	57.1	58.2	46.0	43.9	56.4
27-28 August	55.1	56.2	48.1	40.5	54.5
28-29 August	46.5	47.2	43.0	43.3	50.3
29-30 August	49.2	50.1	45.0	40.5	50.2
30-31 August	47.2	47.5	46.0	40.5	49.4
31 August – 1 September	49.8	50.7	44.1	43.6	51.7
1-2 September	47.3	48.0	43.9	38.9	48.5
2-3 September	46.6	47.4	42.6	41.4	49.2
3-4 September	47.7	48.2	46.1	44.4	51.7
4-5 September	49.1	50.1	43.5	39.2	49.6
5-6 September	45.4	46.0	42.8	37.6	46.9
6-7 September	45.2	46.0	41.9	37.0	46.5

Period	$L_{Aeq,16h}$ [i]	L_{Day} [ii]	$L_{Evening}$ [iii]	L_{Night} [iv]	L_{den} [v]
7-8 September	45.5	45.8	44.5	38.4	47.6
8-9 September	53.5	50.2	57.7	39.8	56.0
9-10 September	58.5	53.5	63.4	40.3	61.1
10-11 September	46.8	47.6	43.0	40.9	49.0
11-12 September	44.6	45.3	41.7	38.3	46.7
12-13 September	47.4	48.1	44.0	42.2	50.0
13-14 September	50.1	50.5	48.5	43.9	52.4
14-15 September	48.4	49.1	45.1	46.3	53.0
15-16 September	50.4	50.6	49.6	42.3	52.1
16-17 September	54.9	55.7	50.8	52.5	59.3
17-18 September	55.7	56.7	50.0	43.6	55.6
18-19 September	50.7	51.1	49.4	44.4	53.1
19-20 September	50.7	51.1	49.4	45.2	53.4
20-21 September	50.9	51.3	49.3	44.0	52.9

[i] Equivalent continuous sound pressure level (L_{Aeq}) over the 16-hour day period of 0700h to 2300h
[ii] Equivalent continuous sound pressure level (L_{Aeq}) over the 12-hour day period of 0700h to 1900h
[iii] Equivalent continuous sound pressure level (L_{Aeq}) over the 4-hour evening period of 1900h to 2300h
[iv] Equivalent continuous sound pressure level (L_{Aeq}) over the 8-hour night period of 2300h to 0700h
[v] Composite level to represent single day with weighting to represent impact during evening and night time periods

Community Noise Levels at Bartholomew Green (P102) – Aircraft Incidences Removed

Period	$L_{Aeq,16h}$ [vi]	L_{Day} [vii]	$L_{Evening}$ [viii]	L_{Night} [ix]	L_{den} [x]
Average	**49**	**49**	**45**	**42**	**51**
15-16 June	-	-	46.2	41.4	-
16-17 June	47.4	47.8	46.1	43.3	50.9
17-18 June	48.9	49.4	47.1	43.1	51.4
18-19 June	49.0	49.6	46.4	41.6	50.7
19-20 June	47.7	48.5	44.1	43.6	51.0
20-21 June	48.4	49.2	44.8	41.9	50.4
21-22 June	46.9	47.5	44.4	40.8	49.2
22-23 June	46.6	47.2	44.3	51.9	57.5
23-24 June	48.2	48.6	46.8	44.2	51.7
24-25 June	48.1	48.2	47.7	42.7	51.0
25-26 June	53.7	54.8	45.8	42.9	53.7
26-27 June	46.9	47.4	45.0	41.5	49.6
27-28 June	50.4	51.3	45.0	46.5	53.7
28-29 June	47.0	47.7	44.0	43.7	50.8
29-30 June	48.6	49.3	45.7	40.5	50.0
30 June - 1 July	48.2	48.9	44.5	41.9	50.2
1-2 July	48.1	48.8	45.3	41.0	49.9
2-3 July	50.0	50.3	48.9	42.3	51.8
3-4 July	49.7	50.7	42.9	42.6	51.1
4-5 July	46.0	46.5	44.1	53.9	59.3
5-6 July	48.3	48.8	46.0	45.1	52.2
6-7 July	46.8	47.4	44.1	43.1	50.4
7-8 July	46.9	47.3	45.3	42.1	49.9
8-9 July	49.0	49.8	45.1	40.4	50.1
9-10 July	48.5	49.4	43.6	39.1	49.2
10-11 July	48.1	48.9	44.3	41.0	49.8
11-12 July	50.5	51.5	44.6	41.6	51.3
12-13 July	48.6	49.3	45.3	45.2	52.3
13-14 July	48.3	48.9	46.1	43.5	51.3
14-15 July	48.3	49.0	44.7	44.8	51.9
15-16 July	48.2	48.8	45.7	42.0	50.4
16-17 July	46.7	47.3	43.8	41.1	49.2
17-18 July	46.3	46.9	43.6	44.6	51.2
18-19 July	45.8	46.5	42.5	40.4	48.3
19-20 July	46.0	46.3	45.1	44.0	50.9
20-21 July	46.9	47.5	44.8	42.9	50.4
21-22 July	47.3	47.9	44.6	42.3	50.1
22-23 July	46.3	46.6	45.2	44.3	51.1
23-24 July	54.0	55.2	42.4	38.9	53.0

Period	$L_{Aeq,16h}$ [vi]	L_{Day} [vii]	$L_{Evening}$ [viii]	L_{Night} [ix]	L_{den} [x]
24-25 July	52.6	53.7	43.8	40.3	52.2
25-26 July	46.8	47.4	44.0	41.6	49.5
26-27 July	47.5	48.1	45.1	40.5	49.4
27-28 July	46.8	47.1	45.8	41.7	49.8
28-29 July	46.2	46.6	44.6	38.3	47.8
29-30 July	46.3	46.9	43.6	38.9	48.0
30-31 July	46.8	47.1	45.7	42.1	50.0
31 July - 1 August	47.4	48.2	43.1	43.2	50.5
1-2 August	46.4	46.8	44.8	38.8	48.1
2-3 August	46.0	46.7	43.0	40.8	48.7
3-4 August	49.6	50.2	46.6	43.7	51.9
4-5 August	49.4	50.3	45.2	42.4	51.1
5-6 August	54.4	55.6	43.8	40.8	53.7
6-7 August	46.2	47.1	41.7	38.3	47.5
7-8 August	51.7	52.6	46.2	43.9	52.9
8-9 August	49.2	50.1	44.9	43.4	51.5
9-10 August	48.3	48.9	45.9	44.1	51.6
10-11 August	48.0	48.7	45.4	40.0	49.5
11-12 August	48.8	49.4	46.4	41.0	50.4
12-13 August	48.2	48.7	46.2	39.4	49.4
13-14 August	46.9	47.6	44.1	40.3	48.9
14-15 August	45.9	46.3	44.2	40.8	48.8
15-16 August	46.3	46.9	44.0	44.5	51.2
16-17 August	47.8	47.4	48.9	43.4	51.5
17-18 August	47.8	48.3	46.3	44.2	51.6
18-19 August	57.3	56.8	58.7	40.2	58.2
19-20 August	47.0	47.7	44.2	38.8	48.4
20-21 August	52.4	53.4	46.5	46.0	54.2
21-22 August	51.2	52.2	45.3	43.2	52.3
22-23 August	48.6	49.5	43.8	40.0	49.6
23-24 August	47.7	48.5	44.0	38.6	48.6
24-25 August	48.4	49.0	46.3	42.5	50.8
25-26 August	47.6	47.9	46.8	41.9	50.3
26-27 August	57.1	58.3	45.7	41.9	56.1
27-28 August	54.5	55.7	44.1	40.5	53.7
28-29 August	46.5	47.2	43.0	40.9	48.9
29-30 August	47.6	48.2	45.0	40.5	49.4
30-31 August	47.2	47.6	46.0	40.4	49.4
31 August – 1 September	49.9	50.8	44.1	43.6	51.8
1-2 September	47.3	48.1	43.9	38.9	48.5
2-3 September	46.6	47.4	42.6	41.4	49.2
3-4 September	47.7	48.2	46.1	44.4	51.7
4-5 September	49.2	50.1	43.5	39.2	49.6

Period	$L_{Aeq,16h}$[vi]	L_{Day}[vii]	$L_{Evening}$[viii]	L_{Night}[ix]	L_{den}[x]
5-6 September	45.4	46.0	42.8	37.6	46.9
6-7 September	45.2	46.0	41.9	37.0	46.5
7-8 September	45.5	45.8	44.2	38.4	47.5
8-9 September	53.5	50.2	57.6	39.8	55.9
9-10 September	58.5	53.5	63.4	40.3	61.1
10-11 September	46.8	47.6	42.8	40.9	49.0
11-12 September	44.6	45.3	41.7	38.3	46.7
12-13 September	47.4	48.1	43.9	39.3	48.7
13-14 September	47.2	47.7	45.3	42.4	50.2
14-15 September	47.2	47.8	45.0	46.0	52.5
15-16 September	48.0	48.8	44.4	42.3	50.4
16-17 September	54.6	55.6	47.7	52.8	59.3
17-18 September	55.8	56.9	48.7	41.3	55.2
18-19 September	48.0	48.3	46.6	44.4	51.8
19-20 September	48.1	48.6	46.2	42.8	50.9
20-21 September	48.6	49.0	47.2	42.8	51.2

[vi] Equivalent continuous sound pressure level (L_{Aeq}) over the 16-hour day period of 0700h to 2300h
[vii] Equivalent continuous sound pressure level (L_{Aeq}) over the 12-hour day period of 0700h to 1900h
[viii] Equivalent continuous sound pressure level (L_{Aeq}) over the 4-hour evening period of 1900h to 2300h
[ix] Equivalent continuous sound pressure level (L_{Aeq}) over the 8-hour night period of 2300h to 0700h
[x] Composite level to represent single day with weighting to represent impact during evening and night time periods

Aircraft Noise Levels at Bartholomew Green (P102) – Aircraft Incidences only

Period	$L_{Aeq,16h}$ [xi]	L_{Day} [xii]	$L_{Evening}$ [xiii]	L_{Night} [xiv]	L_{den} [xv]
Average	**25**	**23**	**17**	**9**	**27**
15-16 June	-	-	-	-	-
16-17 June	23.7	-	29.7	37.6	42.9
17-18 June	45.5	44.7	47.1	38.2	48.0
18-19 June	46.3	46.2	46.5	-	46.5
19-20 June	-	-	-	-	-
20-21 June	-	-	-	-	-
21-22 June	-	-	-	-	-
22-23 June	-	-	-	-	-
23-24 June	-	-	-	-	-
24-25 June	30.0	29.0	32.2	22.2	32.6
25-26 June	41.2	41.6	39.3	-	40.7
26-27 June	-	-	-	-	-
27-28 June	29.7	29.3	30.9	25.9	33.7
28-29 June	23.6	-	29.6	-	26.9
29-30 June	27.5	28.8	-	-	25.8
30 June - 1 July	25.6	25.1	26.9	-	26.3
1-2 July	28.3	29.5	-	-	26.5
2-3 July	33.1	34.3	-	-	31.3
3-4 July	27.5	24.5	31.5	-	29.5
4-5 July	27.9	28.2	26.9	-	27.7
5-6 July	22.8	24.0	-	-	21.1
6-7 July	21.9	-	27.9	-	25.2
7-8 July	34.0	34.5	32.2	-	33.6
8-9 July	27.0	28.3	-	-	25.3
9-10 July	27.0	28.2	-	-	25.2
10-11 July	28.3	29.6	-	-	26.6
11-12 July	20.2	21.4	-	-	18.6
12-13 July	23.4	24.6	-	25.4	31.1
13-14 July	28.1	27.1	30.2	-	29.1
14-15 July	26.5	-	32.5	-	29.7
15-16 July	25.1	26.3	-	-	23.4
16-17 July	-	-	-	-	-
17-18 July	22.4	23.6	-	-	20.7
18-19 July	22.6	23.8	-	-	20.9
19-20 July	-	-	-	31.6	36.8
20-21 July	24.1	25.3	-	-	22.4
21-22 July	40.4	41.7	-	-	38.7
22-23 July	25.2	26.4	-	-	23.5
23-24 July	23.3	24.5	-	-	21.6
24-25 July	-	-	-	-	-

Period	$L_{Aeq,16h}$ [xi]	L_{Day} [xii]	$L_{Evening}$ [xiii]	L_{Night} [xiv]	L_{den} [xv]
25-26 July	25.4	26.6	-	-	23.7
26-27 July	-	-	-	30.0	35.2
27-28 July	25.9	-	31.9	-	29.1
28-29 July	25.6	26.8	-	-	23.9
29-30 July	30.5	30.7	30.0	-	30.5
30-31 July	32.5	31.5	34.6	-	33.5
31 July - 1 August	21.4	-	27.4	-	24.7
1-2 August	-	-	-	-	-
2-3 August	-	-	-	-	-
3-4 August	24.0	-	30.0	-	27.2
4-5 August	26.1	27.3	-	-	24.4
5-6 August	25.4	26.6	-	-	23.7
6-7 August	-	-	-	-	-
7-8 August	-	-	-	-	-
8-9 August	22.4	23.6	-	-	20.7
9-10 August	41.4	35.9	46.4	32.9	45.0
10-11 August	42.7	43.9	-	-	40.9
11-12 August	29.0	30.2	-	-	27.2
12-13 August	29.9	29.7	30.5	-	30.3
13-14 August	-	-	-	28.9	34.1
14-15 August	46.2	45.8	47.0	40.1	49.0
15-16 August	47.9	48.0	47.8	39.9	49.8
16-17 August	46.9	46.9	46.9	39.1	48.9
17-18 August	46.4	46.6	46.0	43.0	50.4
18-19 August	48.3	48.5	47.7	38.2	49.5
19-20 August	40.6	41.8	-	-	38.8
20-21 August	29.9	31.1	-	-	28.1
21-22 August	22.6	23.8	-	-	20.9
22-23 August	20.1	21.3	-	-	18.5
23-24 August	27.9	26.3	30.8	27.6	34.4
24-25 August	45.1	45.2	44.9	40.1	48.3
25-26 August	46.2	46.1	46.6	26.0	46.6
26-27 August	33.4	33.3	33.6	39.5	45.0
27-28 August	47.0	47.3	45.9	-	46.8
28-29 August	-	-	-	39.5	44.7
29-30 August	44.3	45.6	-	-	42.6
30-31 August	-	-	-	-	-
31 August – 1 September	27.3	28.5	-	-	25.5
1-2 September	-	-	-	-	-
2-3 September	-	-	-	-	-
3-4 September	-	-	-	-	-
4-5 September	23.1	24.3	-	-	21.4
5-6 September	-	-	-	-	-

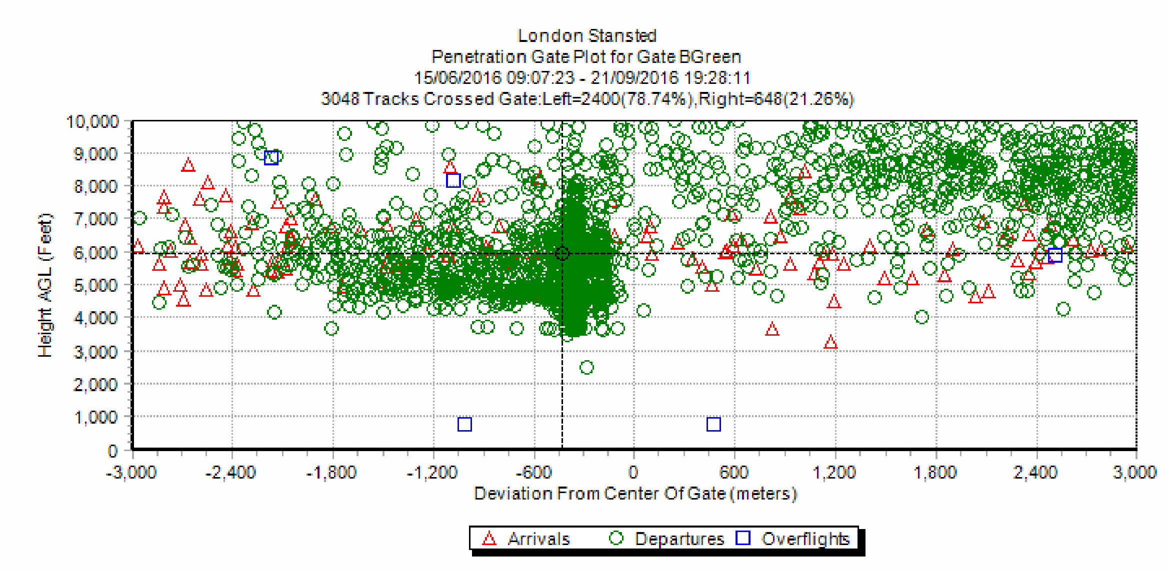
Period	$L_{Aeq,16h}$ [xi]	L_{Day} [xii]	$L_{Evening}$ [xiii]	L_{Night} [xiv]	L_{den} [xv]
6-7 September	-	-	-	-	-
7-8 September	27.5	-	33.5	-	30.7
8-9 September	40.5	31.1	46.1	-	43.4
9-10 September	27.9	29.1	-	-	26.1
10-11 September	23.2	-	29.2	-	26.5
11-12 September	21.7	22.9	-	-	20.1
12-13 September	27.3	27.6	26.3	39.1	44.4
13-14 September	47.1	47.4	45.7	38.7	48.6
14-15 September	42.8	44.0	28.7	36.1	44.2
15-16 September	46.8	46.2	48.1	-	47.4
16-17 September	47.7	47.6	48.2	37.0	49.0
17-18 September	48.4	49.2	44.4	39.9	49.5
18-19 September	47.7	48.0	46.2	-	47.3
19-20 September	47.4	47.6	46.7	41.8	50.2
20-21 September	47.1	47.5	45.4	38.1	48.3

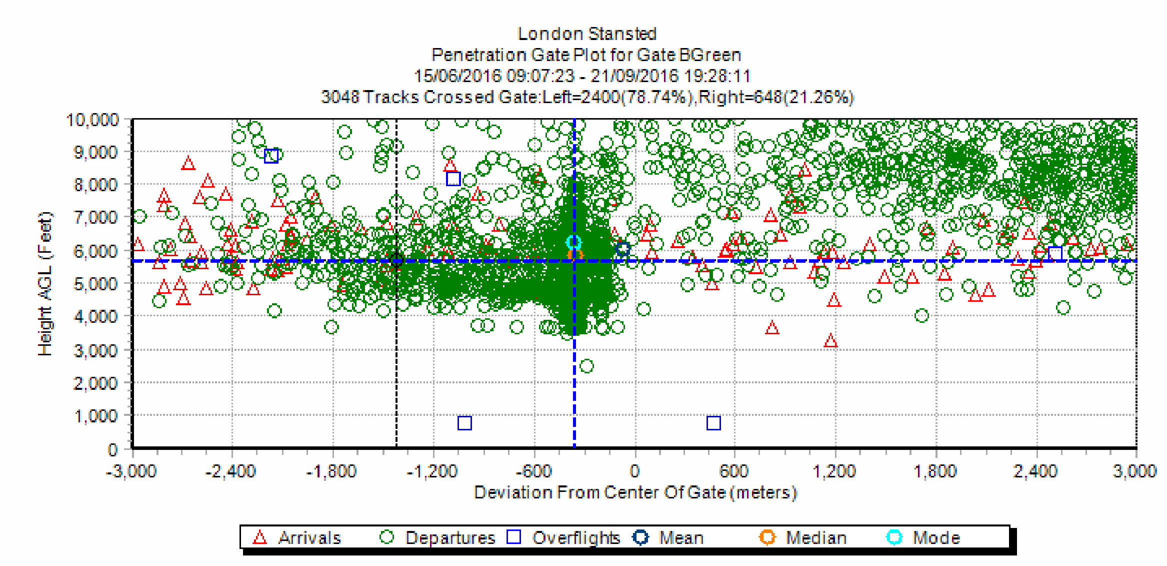
[xi] Equivalent continuous sound pressure level (L_{Aeq}) over the 16-hour day period of 0700h to 2300h
[xii] Equivalent continuous sound pressure level (L_{Aeq}) over the 12-hour day period of 0700h to 1900h
[xiii] Equivalent continuous sound pressure level (L_{Aeq}) over the 4-hour evening period of 1900h to 2300h
[xiv] Equivalent continuous sound pressure level (L_{Aeq}) over the 8-hour night period of 2300h to 0700h
[xv] Composite level to represent single day with weighting to represent impact during evening and night time periods

Appendix A

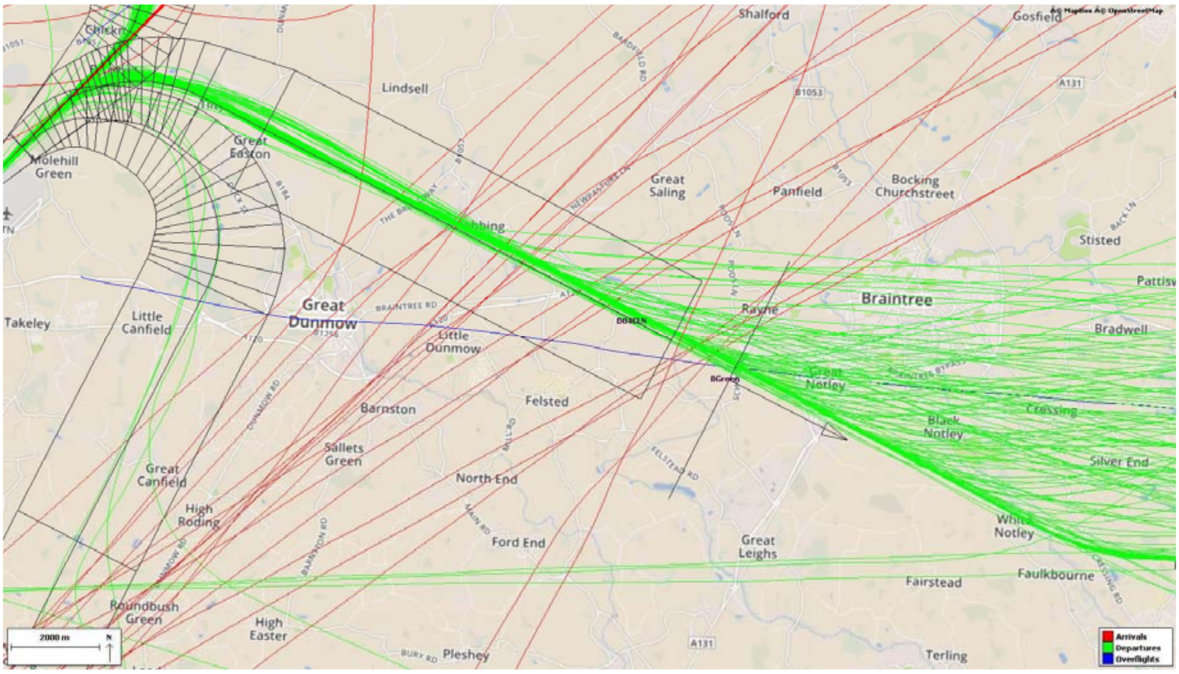
Gate Penetration Information for P102 Bartholomew Green

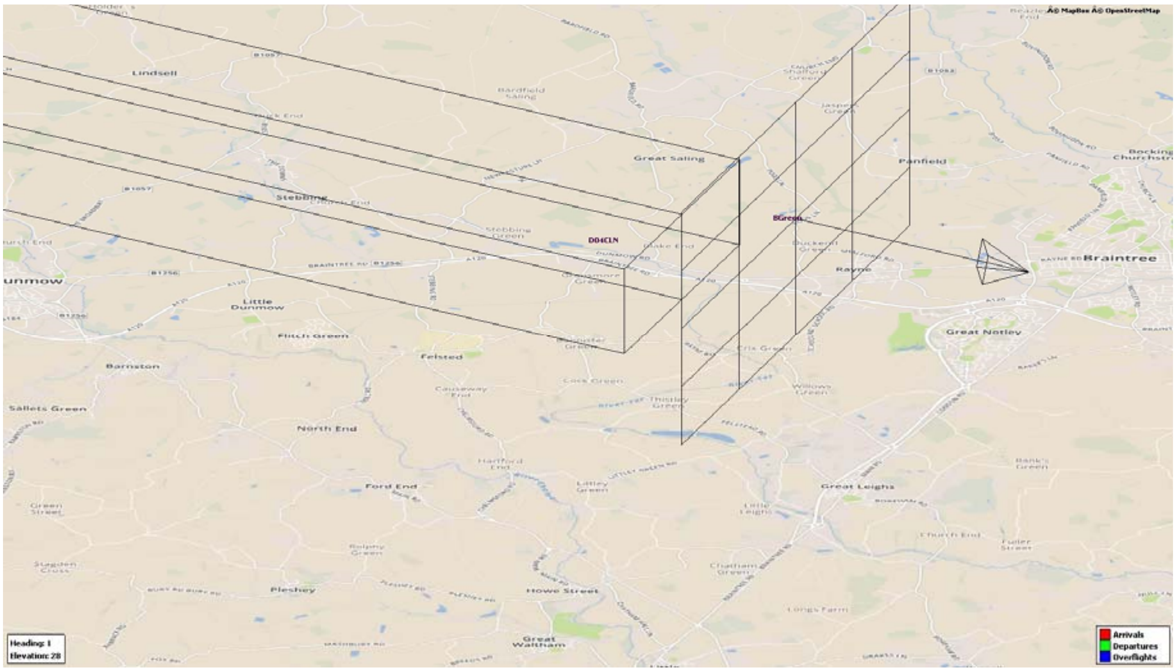
The following graphs set out the height and lateral position of aircraft passing through the gate above the measurement position at Bartholomew Green.





7.4 The following images set out the gate location at Bartholomew Green. The gate was centred above the monitor locations and was set to capture any movements associated with Stansted Airport from ground level to 10,000ft with a width of 6,000m (i.e. gat penetration is ± 3,000m.





End of Section

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