

Warehouse 1, Stage 3 Facilities-Sydney Business Park at Marsden  
Park

Construction Noise and Vibration Management Plan

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Attention To	FDC Construction (NSW) Pty Ltd

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# 1 INTRODUCTION

Acoustic Logic has been engaged by to prepare a Noise and Vibration Management Plan for the proposed Warehouse 1, Stage 3 Facilities - Sydney Business Park at Marsden Park.

This noise and vibration management plan has been prepared for the following stages:

- Piling stage
- Construction stage

This report has been prepared to satisfy Condition B15, Condition B16, Condition B17, Condition B18, and Condition B19 in the '*Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979*' by the Energy, Industry and Compliance, application no. SSD-10477, dated 28 January 2021. The conditions have been addressed as follow:

- Condition B15, Condition B16: '*Hours of Work*';
- Condition B17: '*Construction Noise Limits*';
- Condition B18 and Condition B19: '*Construction Noise Management Plan*'.

The report will address the following elements:

- Identification of the noise and vibration guidelines which will be applicable to this project;
- Identification of potentially impacted nearby development;
- Identify likely sources of noise and vibration generation and predicted noise levels at nearby development;
- Formulation of a strategy to comply with the standards identified and mitigation treatments in the event that compliance is not achievable.

This assessment is based on previous unattended noise monitoring data and engineering assumptions in the report of '*STAGE 3 FACILITIES - SYDNEY BUSINESS PARK, (MARSDEN PARK), SSD NOISE & VIBRATION IMPACT ASSESSMENT*', report No. 20232, VERSION B, provided by Wilkinson Murray Pty Limited, dated July 2020.

## 2 SITE DESCRIPTION


The project site is located at the Hollinsworth Road (future), Marsden Park and noise sensitive development in the vicinity of the project site consists of the following:


- Receiver 1: Ikea DC Sydney - existing industrial receivers, located to the north of the site;
- Receiver 2: Blacktown Waste Service – future industrial receiver currently under construction, located to the north-east of the site;
- Receiver 3: Tigerpak Packaging – existing industrial receiver adjoining the north-east boundary of the site;
- Receiver 4: Bucher Municipal – existing industrial receiver located to the north-east of the site;
- Receiver 5: Residential development - Ingenia Estate, located to the east of the site;
- Receiver 6: Logos Property - existing industrial receivers, located to the southeast of the site;
- Receiver 7: Existing residential receivers located to the south of the site; and
- Receiver 8: Existing residential receivers located to the north-west of the site.


It is noted that there is an existing 2.5 m high noise barrier constructed to the southern boundary of the Ingenia Estate (R2) (as highlighted in red in Figure 1 below).


A site map with measurement description is presented in below.


 Industrial receiver

 Residential receiver

 Project site (warehouse 1)

 Vehicle access onto the site

 Existing 2.5 m high noise barrier constructed to the southern boundary of the Ingenia Estate (R2)

 'A 2.4m high noise barrier is proposed to be located on the eastern boundary between Warehouse 2 and the caravan park in order to further reduce noise levels to this receiver.'

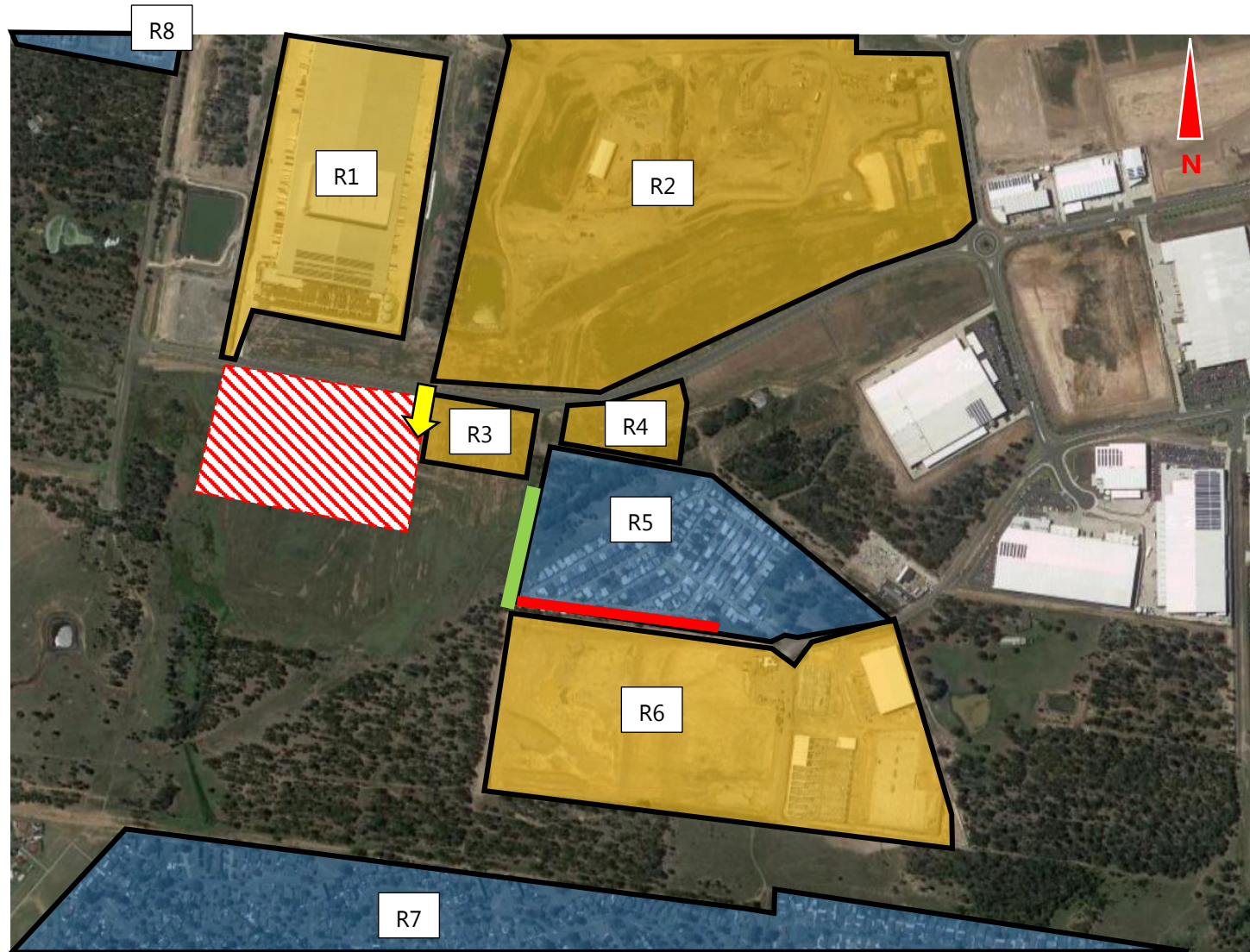


Figure 1: Site Map from SIXMaps

### 3 PROPOSED CONSTRUCTION WORKS

This office has been advised as following:

- The proposed works, and corresponding durations are summarised as following:
  - Piling: From 16/03/2021 to 31/03/2021.
  - Construction: From 22/02/2021 to 19/10/2021
- Vehicle access onto the site will be via Astoria Street, Marsden Park, as indicated in figure 1 above;

### 4 CONSTRUCTION HOURS

Condition B15 and Condition B16, in the draft 'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979' by the Energy, Industry and Compliance, application no. SSD-10477, states the following:

#### NOISE

##### Hours of Work

B15. The Applicant must comply with the hours detailed in Table 1, unless otherwise agreed in writing by the Planning Secretary.

**Table 1** Hours of Work

Activity	Day	Time
Earthworks and construction	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm
Operation	Monday – Sunday	24 hours

B16. Works outside of the hours identified in condition B15 may be undertaken in the following circumstances:

- (a) works that are inaudible at the nearest sensitive receivers;
- (b) works agreed to in writing by the Planning Secretary;
- (c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- (d) where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

#### 4.1 PROPOSED CONSTRUCTION HOURS

The proposed working hours (construction) are:

- 7:00am -6:00pm, Monday to Friday
- 8:00am -1:00pm, Saturday



## 5 BACKGROUND NOISE LEVELS

Existing environmental noise survey (see figure 1) was based on a long-term unattended monitoring summarized in the report of 'STAGE 3 FACILITIES - SYDNEY BUSINESS PARK, (MARSDEN PARK), SSD NOISE & VIBRATION IMPACT ASSESSMENT', report No. 20232, VERSION B, provided by Wilkinson Murray Pty Limited, dated July 2020.

### 5.1.1 Measured Background Noise Levels

Table 3-2 in Section 3.1 of 'STAGE 3 FACILITIES - SYDNEY BUSINESS PARK, (MARSDEN PARK), SSD NOISE & VIBRATION IMPACT ASSESSMENT' outlined the rating background levels of unattended noise monitoring (see table 2 below).

The background noise levels established from the unattended noise monitoring are detailed in table below.

**Table 1 – Measured Background Noise Level (Unattended Noise Monitors)**

<b>Location</b>	<b>Time of Day</b>	<b>Rating Background Level dB(A)<sub>L90</sub></b>
NL1 – 18 Aubusson St, Marsden Park	Day	35
	Evening	30
	Night	30
NL2 – 15 Roche Gr, Shalvey	Day	35
	Evening	33
	Night	30

Noise monitoring data is presented in Appendix 1 of the report.

## 6 NOISE LEVEL AND VIBRATION GUIDELINE

### 6.1 NOISE

Noise associated with piling and construction activities on the site will be assessed in accordance with the following guidelines:

- 'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979' by the Energy, Industry and Compliance, application no. SSD-10477, dated 28 January 2021; and
- NSW EPA Interim Construction Noise Guideline.

#### 6.1.1 Condition B18 & Condition B19

Conditions B18 and B19 of 'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979' by the Energy, Industry and Compliance, application no. SSD-10477, dated 28 January 2021, states:"

##### Construction Noise Management Plan

B18. The Applicant must prepare a Construction Noise Management Plan for the development to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with condition C2 and must:

- (a) be prepared by a suitably qualified and experienced noise expert;
- (b) be approved by the Planning Secretary prior to the commencement of construction of the development;
- (c) describe procedures for achieving the noise management levels in EPA's *Interim Construction Noise Guideline* (DECC, 2009) (as may be updated or replaced from time to time);
- (d) describe the measures to be implemented to manage high noise generating works such as piling;
- (e) include strategies that have been developed with the community for managing high noise generating works;
- (f) describe the community consultation undertaken to develop the strategies in condition B18(e); and
- (g) include a complaints management system that would be implemented for the duration of the development.

B19. The Applicant must:

- (a) not commence construction of any relevant stage of the development until the Construction Noise Management Plan required by condition B18 is approved by the Planning Secretary; and
- (b) implement the most recent version of the Construction Noise Management Plan approved by the Planning Secretary for the duration of construction.

#### 6.1.2 EPA Interim Construction Noise Guidelines

The "quantitative" assessment procedure, as outlined in the Interim Construction Noise Guideline (ICNG) will be used. The quantitative assessment method requires:

- Determination of noise and vibration management levels (based on ambient noise levels and receiver type)
- Prediction of operational noise and vibration levels at nearby development
- Recommendation of control strategies in the event that management levels are exceeded.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- "Noise affected level". (NML) Where construction noise is predicted to exceed the "noise affected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise affected level". For residential properties, the "noise affected" level occurs when construction noise exceeds ambient levels by more than 10dB(A)  $L_{eq(15min)}$  within Recommended standard hours (Monday to Friday, 7 am to 6 pm; Saturday 8 am to 1 pm; No work on Sundays or public holidays). The "noise effected" level occurs when construction noise exceeds ambient levels by more than 5dB(A) $L_{eq(15min)}$  within "outside recommended standard hours",

- "Highly noise affected level" (HNML). Where noise emissions are such that nearby properties are "highly noise affected", noise controls such as respite periods should be considered. For residential properties, the "highly noise affected" level occurs when construction noise exceeds 75dB(A)<sub>Leq(15min)</sub> at nearby residences.

In addition to the above goals for residential receivers, section 4.1.3 Commercial and industrial premises of the ICNG states the following:

*"Due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories. The external noise levels should be assessed at the most-affected occupied point of the premises: industrial premises: external  $L_{Aeq} (15 \text{ min})$  75 dB(A)"*

The project specific management levels determined using the ICNG are summarised in the following table.

**Table 2 -Summarised Noise Management Levels**

<b>Location</b>	<b>Day</b>	<b>Time</b>	<b>Noise Management Level dB(A)<sub>Leq, 15min</sub></b>	<b>Highly Affected Noise Management Level dB(A)<sub>Leq, 15min</sub></b>
Residential Receivers R5, R7, R8	Monday to Friday	7am-6pm	45	75
	Saturday	8am-1pm	45	
Industrial Premises R1, R2, R3, R4, R6	When in use	When in use	75 externally	N/A

## 6.2 VIBRATION

Vibration caused by construction at any residence or structure outside the subject site must be limited to the following:

- For human exposure to vibration, the acceptable vibration values set out in the *Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006)*; and
- For structural damage vibration, German Standard '*DIN 4150-3 Structural Vibration: Effects of Vibration on Structures*'.

### 6.2.1 Assessing Amenity

The NSW EPA document "*Assessing Vibration: A Technical Guideline*" provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings and is used in the assessment of vibration impact on amenity. Relevant vibration levels are presented below.

**Table 3 – EPA Recommended Vibration Levels**

		RMS acceleration (m/s <sup>2</sup> )		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices		0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices		0.64	1.28	13.0	26.0	18.0	36.0
Workshops		0.64	1.28	13.0	26.0	18.0	36.0

### 6.2.2 Structure Borne Vibrations (Building Damage Criteria)

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 4.

It is noted that the peak velocity is the value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

**Table 4 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration**

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms <sup>-1</sup> )			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

The industrial premises would be considered a Type 1 structure, whilst residences would be considered a Type 2 structure.

## 7 NOISE ASSESSMENT

### 7.1 NOISE SOURCE DATA

The piling and construction period has been divided into a number of work phases, along with the main noise producing equipment and activities likely to occur in each phase. Typical noise emission levels from equipment associated with the louder activities are provided in the following table.

**Table 5 - Sound Power Levels of the Proposed Equipment**

<b>CONSTRUCTION ACTIVITY</b>	<b>EQUIPMENT /PROCESS</b>	<b>SOUND POWER LEVEL - dB(A)</b>
Piling	Piling (Auger)	105
Construction	Hand tools	105
	Forklift	105
	Excavator (bucket attachment)	105
	Concrete Pump	105
	Truck (>20 tonne)	107
	Mobile Crane	105

The noise levels presented in the above table are derived from the following sources, namely:

- Table A1 of Australian Standard 2436-2010
- Data held by this office from other similar studies.
- On-site measurements

### 7.2 NOISE IMPACT ASSESMENT METHODOLOGY

The predicted noise levels during piling and construction will depend on:

- The activity undertaken.
- The distance between the work site and the receiver. For many of the work areas, the distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented below. Predictions take into account the following:

- Noise reduction as a result of distance.
- Depending on the management level adopted, noise emission is predicted to either external areas (property boundaries/building facades/most affected area) or internal areas.

### 7.3 PREDICTED NOISE LEVELS TO RECEIVERS

Noise emissions are assessed with reference to the relevant criteria in Section 6.1. Please see tables below for predicted noise levels for each receiver

#### 7.3.1 Prediction to Receiver 1: Existing Industrial Receiver to the North

Predicted noise levels to the existing industrial receivers, located to the north of the site are as follows:

**Table 6 – Predicted Noise Level to R1**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A) L<sub>eq</sub>(15min) (External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	46-63	Noise level will generally meet noise management level of 75dB(A)
Construction	Hand tools	46-63 prior to construction of building shell; 26-43 after construction of building shell	
	Forklift	46-63	
	Excavator (bucket attachment)	46-63	
	Concrete Pump	46-63	
	Truck (>20 tonne)	48-64	
	Mobile Crane	46-63	

The predictions indicate that all equipment will generally meet noise management level of 75dB(A).

### 7.3.2 Prediction to Receiver 2: Industrial Receiver (Currently Under Construction) to the North-East

Predicted noise levels to the industrial receivers, located to the north-east of the site are as follows:

**Table 7 – Predicted Noise Level to R2**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A) L<sub>eq</sub>(15min) (External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	43-54	Noise level will generally meet noise management level of 75dB(A)
Construction	Hand tools	46-63 prior to construction of building shell;  26-43 after construction of building shell	
	Forklift	43-54	
	Excavator (bucket attachment)	43-54	
	Concrete Pump	43-54	
	Truck (>20 tonne)	45-56	
	Mobile Crane	43-54	

The predictions indicate that all equipment will generally meet noise management level of 75dB(A).



### 7.3.3 Prediction to Receiver 3: Existing Industrial Receiver Adjoining the North-East Boundary of the Site

Predicted noise levels to the existing industrial receiver, adjoining the north-east boundary of the site are as follows:

**Table 8 – Predicted Noise Level to R3**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A)</b> <b>L<sub>eq</sub>(15min)</b> <b>(External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	46-73	Noise level will generally meet noise management level of 75dB(A)
Construction	Hand tools	46-73 prior to construction of building shell;  26-53 after construction of building shell	
	Forklift	46-73	
	Excavator (bucket attachment)	46-73	
	Concrete Pump	46-73	
	Truck (>20 tonne)	48-75	
	Mobile Crane	46-73	

The predictions indicate that all equipment will generally meet noise management level of 75dB(A).

**7.3.4 Prediction to Receiver 4: Industrial Receiver to the North-East**

Predicted noise levels of existing industrial receiver located to the north-east of the site are as follows:

**Table 9 – Predicted Noise Level to R4**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A) L<sub>eq</sub>(15min) (External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	38-48	Noise level will generally meet noise management level of 75dB(A)
Construction	Hand tools	38-48 prior to construction of building shell;  18-28 after construction of building shell	
	Forklift	38-48	
	Excavator (bucket attachment)	38-48	
	Concrete Pump	38-48	
	Truck (>20 tonne)	40-50	
	Mobile Crane	38-48	

The predictions indicate that all equipment will generally meet noise management level of 75dB(A). Also, it is noted that the existing building shell of Tigerpak Packaging (Receiver 3) will provide significant noise shielding to the receivers 4.

### 7.3.5 Prediction to Receiver 5: Existing Residential Receiver Located to the East of the Site

Predicted noise levels of existing residential receivers located to the east of the site are as follows:

**Table 10 – Predicted Noise Level to R5**

Stage	Activity	Predicted Level – dB(A) L <sub>eq(15min)</sub> (External Areas)	Comment
Piling	Piling (Auger)	38-49	Noise level will exceed noise management level of 45dB(A) when equipment is operating close to the receiver. Refer to Section 9.1 for Recommendations
Construction	Hand tools	38-49 prior to construction of building shell; 18-29 after construction of building shell	
	Forklift	38-49	
	Excavator (bucket attachment)	38-49	
	Concrete Pump	38-49	
	Truck (>20 tonne)	40-51	
	Mobile Crane	38-49	

The predictions indicate there will be exceedance of noise management level of 45dB(A), when most of the equipment is operating close to the east boundary. When operating away from the boundary, noise levels will be generally under the management level of 45dB(A). However, the predictions indicate noise levels will generally meet highly affected management level of 75dB(A).

It is noted that page 14 of the report of 'Stage 3 Facilities - Sydney Business Park, (Marsden Park), Ssd Noise & Vibration Impact Assessment', report No. 20232, Version B, provided by Wilkinson Murray Pty Limited, dated July 2020, states that:

*"A 2.4m high noise barrier is proposed to be located on the eastern boundary between Warehouse 2 and the caravan park in order to further reduce noise levels to this receiver. Previous discussions between SBP and this receiver for other approved developments have resulted in a commitment by SBP to further reduce impacts to this receiver by the installation of noise barriers."*

Therefore, it is recommended that the proposed 2.4m high noise barrier shall be erected on the eastern boundary between Warehouse 2 and the caravan park as soon as the any onsite work commenced (see Figure 1).

Also, it is recommended that the east façade of the building shell shall be erected as soon as possible. The erected building façade will provide significant noise shielding to receiver 5. Moreover, the noise impact from the site to the receiver 5 will be minimised by giving the manage impacts as recommended below are adopted (selecting quietest feasible plant, notification, etc.);

### 7.3.6 Prediction to Receiver 6: Existing Industrial Receivers, Located to the Southeast of the Site

Predicted noise levels of existing industrial receivers, located to the southeast of the site are as follows:

**Table 11 – Predicted Noise Level to R6**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A) L<sub>eq</sub>(15min) (External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	43-50	Noise level will generally meet noise management level of 75dB(A)
Construction	Hand tools	43-50 prior to construction of building shell;  23-30 after construction of building shell	
	Forklift	43-50	
	Excavator (bucket attachment)	43-50	
	Concrete Pump	43-50	
	Truck (>20 tonne)	45-52	
	Mobile Crane	43-50	

The predictions indicate that all equipment will generally meet noise management level of 75dB(A).

### 7.3.7 Prediction to Receiver 7: Existing Residential Receivers Located to the South of the Site

Predicted noise levels of existing residential receivers to the south of the site are as follows:

**Table 12 – Predicted Noise Level to R7**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A) L<sub>eq</sub>(15min) (External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	39-44	Noise level will generally meet noise management level of 45dB(A)
Construction	Hand tools	39-44 prior to construction of building shell;  19-24 after construction of building shell	
	Forklift	39-44	
	Excavator (bucket attachment)	39-44	
	Concrete Pump	39-44	
	Truck (>20 tonne)	40-45	
	Mobile Crane	39-44	

The predictions indicate that all equipment will generally meet noise management level of 45dB(A).

### 7.3.8 Prediction to Receiver 8: Existing Residential Receivers Located to the North-West of the Site

Predicted noise levels of existing residential receivers to the north-west of the site are as follows:

**Table 13 – Predicted Noise Level to R8**

<b>Stage</b>	<b>Activity</b>	<b>Predicted Level – dB(A)</b> <b>L<sub>eq</sub>(15min)</b> <b>(External Areas)</b>	<b>Comment</b>
Piling	Piling (Auger)	39-45	Noise level will generally meet noise management level of 45dB(A)
Construction	Hand tools	39-45 prior to construction of building shell;  19-25 after construction of building shell	
	Forklift	39-45	
	Excavator (bucket attachment)	39-45	
	Concrete Pump	39-45	
	Truck (>20 tonne)	38-44	
	Mobile Crane	39-45	

The predictions indicate that all equipment will generally meet noise management level of 45dB(A).

## **8 ASSESSMENT OF VIBRATION**

### **8.1 VIBRATION PRODUCING ACTIVITIES**

Proposed activities that have the potential to produce significant ground vibration is excavator and piling working.

### **8.2 SAFEGUARDS TO PROTECT SENSITIVE STRUCTURES**

It is impractical to predict the vibrations induced by the piling/construction operations on site at potentially affected receivers. This is because vibration level is principally proportional to the energy impact which is unknown nature of terrain in the area (type of soil), drop weight, height etc.

### **8.3 VIBRATION MONITORING (IF REQUIRED)**

The vibration monitoring equipment is to consist of a Texcel type monitor with externally mounted tri-axial geophone. The monitors are proposed to be fitted with GSM modem and remotely signal up to five mobile phones indicating any exceedance of the prescribed vibration criteria to enable immediate notification to be sent to the contractor when vibration thresholds are approached. Indicatively, an alarm level of 5mm/s PPV can be used, to be confirmed following structural engineer advice. In addition, it is impractical to predict the vibrations induced by the piling operations on site at potentially affected receivers. However, the total vibration emissions are to be limited with real-time alarm notification given to the plant operators to ensure that the vibration limits are not exceeded. Based on feedback from the real-time vibration monitoring system, the plant operators will be to ensure that the vibration limits are not exceeded. Based on feedback from the real-time vibration monitoring system, the plant operators will be able to modify their operations to ensure the vibration levels are kept within the acceptable limits.

In the event that complaints are made from neighbouring properties regarding vibration impacts from the subject site, vibration monitors will be installed at the property boundaries of the neighbouring properties nearest to the subject site to monitor vibration levels.

#### **8.3.1 Download of Vibration Logger**

Downloading of the vibration logger will be conducted on a regular basis. In the event exceedance of vibration criteria or alarms occurs, downloading of logger will be conducted more frequently. Results obtained from the vibration monitor will be presented in a graph format and will be forwarded to client for review. It is proposed that reports are provided fortnightly with any exceedance in the vibration criteria reported as detailed in this report.

#### **8.3.2 Presentation of Vibration Logger Results**

A fortnightly report will be submitted to client via email summarising the vibration events. The vibration exceedance of limit is recorded the report shall be submitted within 24 hours. Complete results of the continuous vibration logging will be presented in fortnight reports including graphs of collected data.

#### **8.3.3 Persons to Receive Alarms**

The following personnel will receive GSM alarms:

- Acoustic consultant/advisor (1 person)
- Excavation site foreman
- Main builder foreman (where applicable)
- Client nominated two representatives

## 9 AMELIORATIVE MEASURES

### 9.1 SITE SPECIFIC RECOMMENDATIONS

Site specific recommendations as follows:

#### 9.1.1 Piling

- Residents at receiver (R5) to be notified of anticipated period of piling.
- Piling (Auger):
  - No piling work before 8:00am to mitigate noise impact onto the neighbouring residents.

#### 9.1.2 Construction

- Concrete pumps:
  - Noise from concrete pumps is likely to result in minor exceedances of noise management levels at the receiver within R5. Pumps to be located as far from these receivers as possible.
  - Notification of adjacent residential development should be provided prior to days of concrete pours.
- Excavator (bucket attachment):
  - Fit more efficient silencer or exhaust silencer(engine).
  - Enclosure panels, when fitted, should be kept closed(engine).
- Mobile crane
  - Fit more efficient silencer or exhaust silencer(engine).
  - Enclosure panels, when fitted, should be kept closed(engine).
- Hand tools:
  - No powered hand tools allowed externally at southern boundary before 8:00am to mitigate noise impact onto the neighbouring residents.
  - East façade of the building shell shall be erected as soon as possible, in order to provide noise shielding to receiver 5.
- Vehicle noise:
  - Truck movements should not commence prior to 7am. Trucks are not to idle with their engines running outside the site prior to 7am.
  - Vehicle must turn off their engines during idling to reduce impacts on nearby residential receivers (unless truck ignition needs to remain on during concrete pumping)
  - Vehicles to use a non-tonal reversing beacon to minimise potential disturbance of neighbours.
- In the event of complaint, the procedures in section 11 are to be adopted.



## **9.2 ACTIVITIES OUTSIDE PERMITTED HOURS OF CONSTRUCTION**

Construction can occur outside of the permitted hours for a number of reasons including if noise is inaudible at the surrounding sensitive receivers. In this context, sensitive receivers would be the residential receivers to the south of the site and industrial receivers to the east of the site.

Activities that could be undertaken include maintenance of equipment using hand tools, internal works such as painting and other quiet works. Other works may be able to be undertaken but should be specifically assessed by an acoustic specialist before being undertaken.

## **9.3 GENERAL RECOMMENDATIONS**

Other noise management practices which may be adopted are discussed below. In addition, notification, reporting and complaints handling procedures should be adopted as recommended in section 11 of this report.

### **9.3.1 Acoustic Barrier (if required)**

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

The placement of barriers at the source is generally only effective for static plant (cranes). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15 dB(A) can be affected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8 dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance which is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10 or 15mm plywood would be acceptable for the barriers.

### **9.3.2 Silencing Devices**

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

### **9.3.3 Material Handling**

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

### **9.3.4 Treatment of Specific Equipment**

In certain cases, it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

### **9.3.5 Establishment of Site Practices**

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers.

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

### **9.3.6 Strategic Positioning of Processes On-Site**

Where practicable, particular processes of activities can be located in particular positions on site to minimise noise to surrounding sensitive receivers

For example, stationary plant may be positioned where direct line of sight shielding can be achieved using natural barriers or temporary screens or may maximise the distance to the nearest sensitive receiver.

### **9.3.7 Management Training**

All site managers should be made aware of noise and vibration limits, applicable control measures and methods. They should ensure that all agreed noise and vibration measures are carried out by employees and sub-contractors.

### **9.3.8 Combination of Methods**

In some cases, it may be necessary that two or more control measures be implemented to minimise noise.

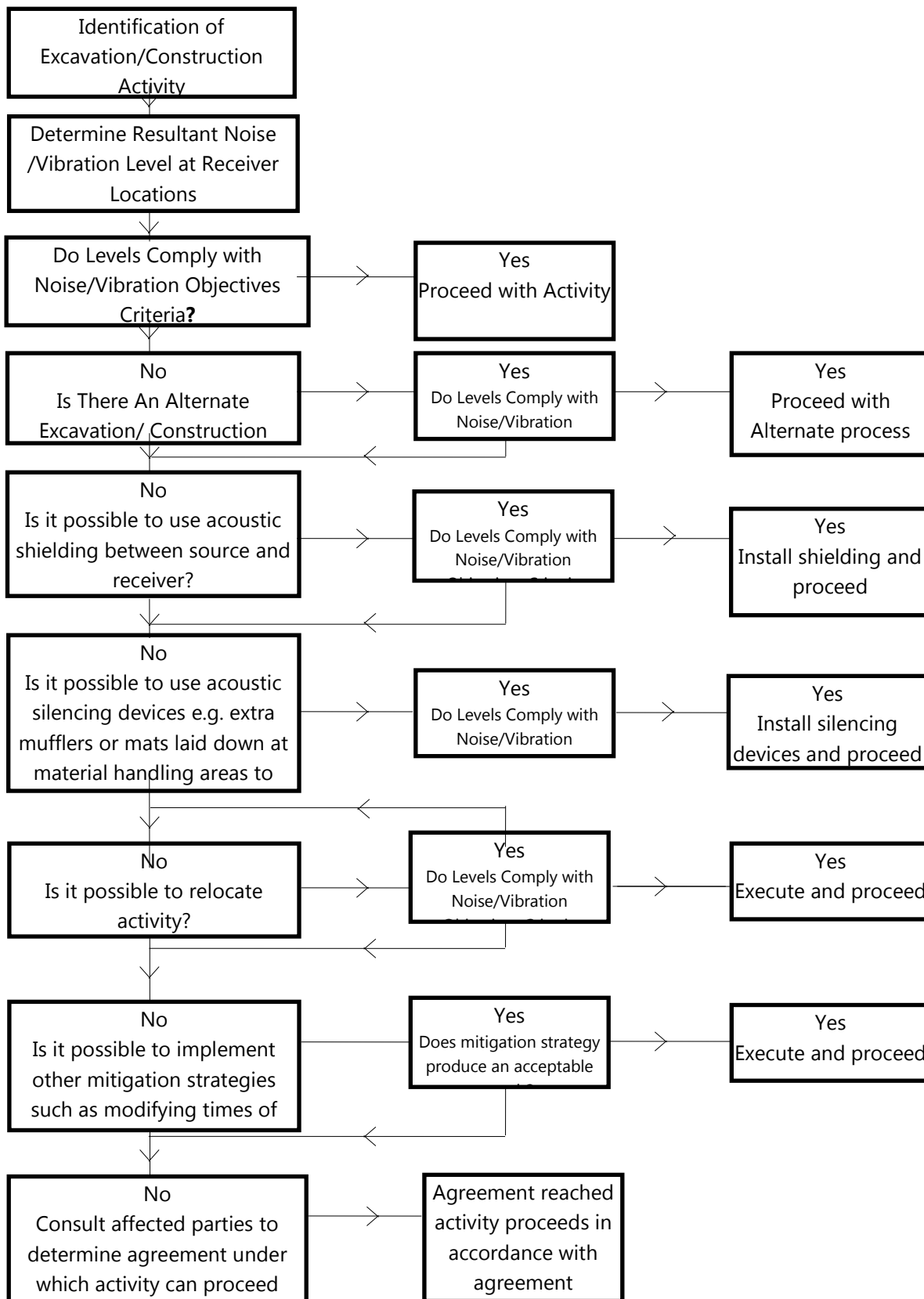
### **9.3.9 Maintenance of Plant, Equipment and Machinery**

Construction Profile will ensure all plant, equipment and machinery are regularly serviced and maintained at optimum operating conditions, to ensure excessive noise emissions are not generated from faulty, overused or unmaintained machinery.

## 10 ASSESSMENT METHODOLOGY AND MITIGATION METHODS

The flow chart that follows illustrates the process to be followed to minimise the impact associated with these activities.

Noise sources with the potential to exceed the management level set out in section 6 have been identified and discussed in section 7 and 9.



## 11 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

Should ongoing complaints of excessive noise, vibration or dust occur, immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration and dust limits, all work potentially producing vibration or dust shall cease until the exceedance is investigated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- If necessary, setup vibration monitoring at the location representing the nearest affected vibration receiver, with alarm device which can inform the project manager on site if the vibration exceedance happened.
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

### 11.1 COMMUNITY CONSULTATION

#### 11.1.1 Requirement

Condition B18 (f) and Condition B18 (g), in the 'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979' by the Energy, Industry and Compliance, application no. SSD-10477, dated 28 January 2021. states the following:"

- (f) describe the community consultation undertaken to develop the strategies in condition B18(e); and
- (g) include a complaints management system that would be implemented for the duration of the development.

#### 11.1.2 Community Consultation Undertaken

The community consultation undertaken and the processes to be implemented are provided in CEMP. The outcomes of the consultation undertaken to date have been incorporated into the management plan, and the outcomes of ongoing consultation during the construction period will be incorporated as necessary in the management of impacts.

## 12 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process
2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implement additional acoustic treatment in the form of localised barriers, silencers etc where practical.
4. Selecting alternative equipment/processes where practical
5. If necessary, setup noise/vibration and dust monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

Complaints associated with noise /vibration and dust generated by site activities shall be recorded on a Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the Site Manager to the general public and their contact telephone number.

## 13 CONCLUSION

This report presents an assessment of noise and vibration impacts associated with the piling and construction activities for the proposed Warehouse 1, Stage 3 Facilities - Sydney Business Park at Marsden Park.

An assessment of potential noise and vibration impacts resulting from the proposed piling and construction activities on site is summarised in Sections 7 and 8 of the report. The assessment was undertaken based on NSW EPA Interim Construction Noise Guideline and indicates there is generally a low to moderate risk of adverse impacts due to the nature of the works and the significant distance separation to sensitive receivers. The results of the assessment have been used to develop ameliorative treatments to further reduce these impacts, which are detailed in Section 9 and Section 10.

We trust this information is satisfactory. Please contact us should you have any further queries.

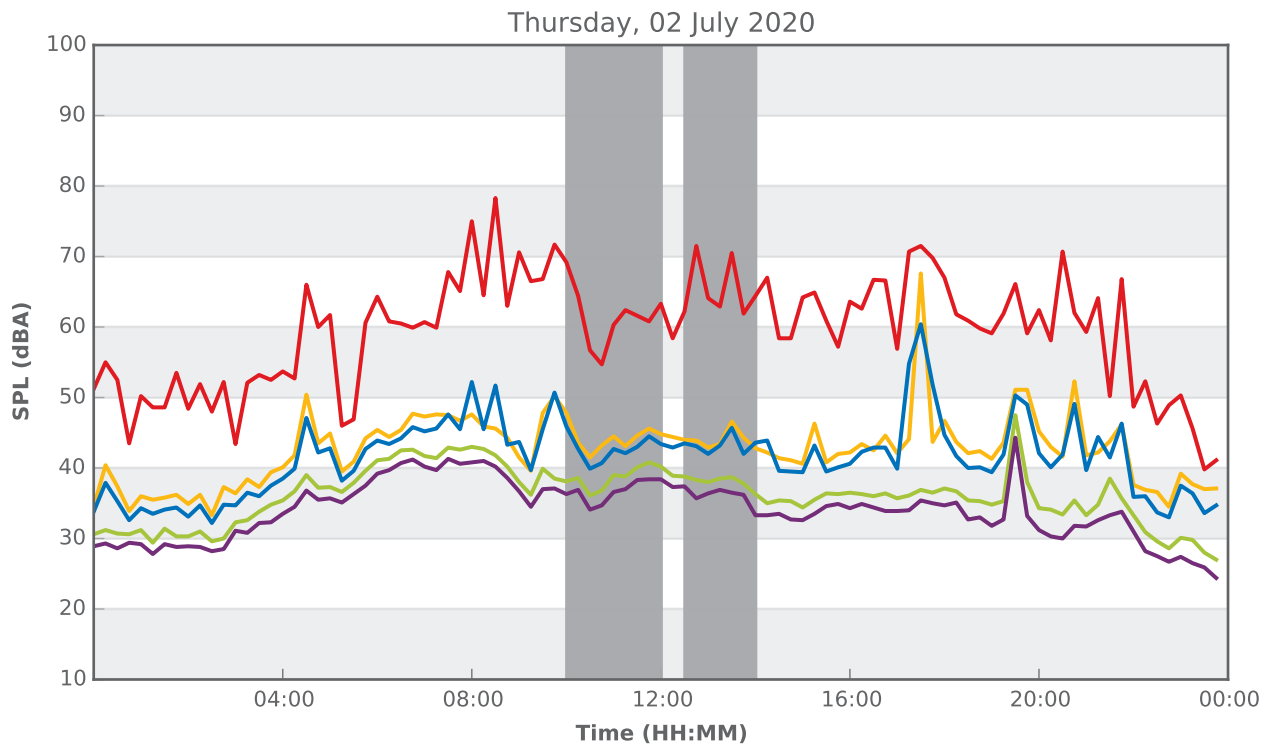
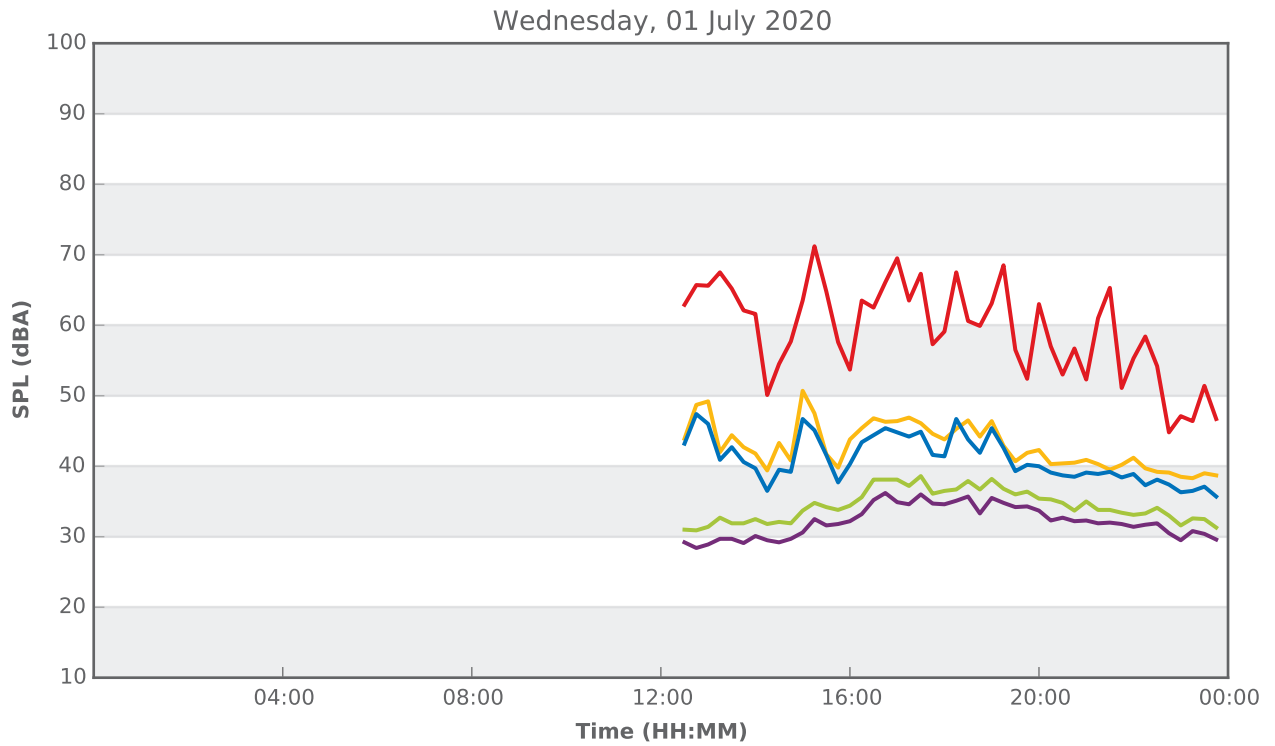
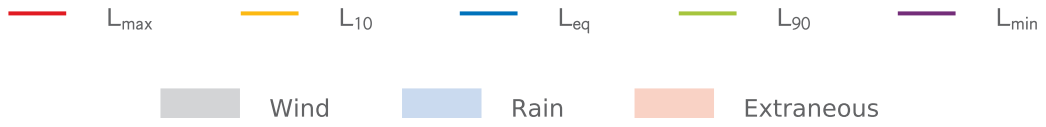
Yours faithfully,

A handwritten signature in black ink, appearing to be 'Hugh Cao', written in a cursive style.

Acoustic Logic Pty Ltd  
Hugh Cao

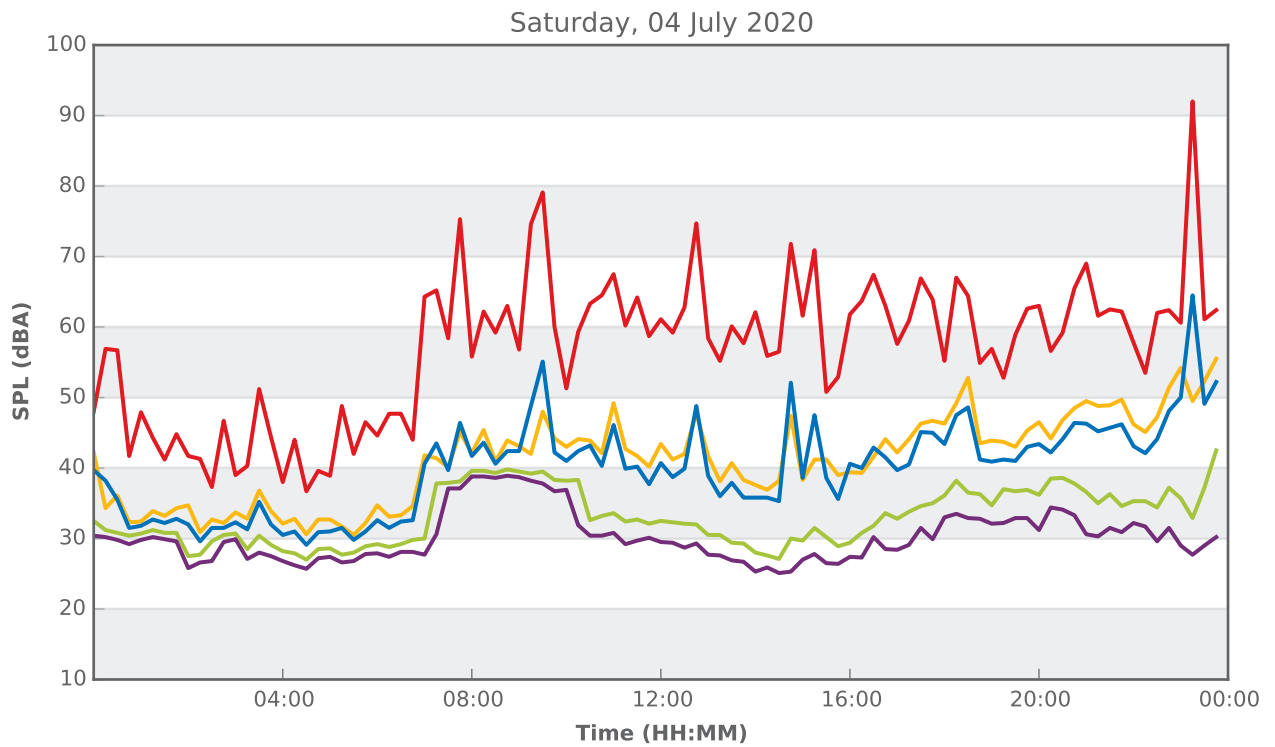
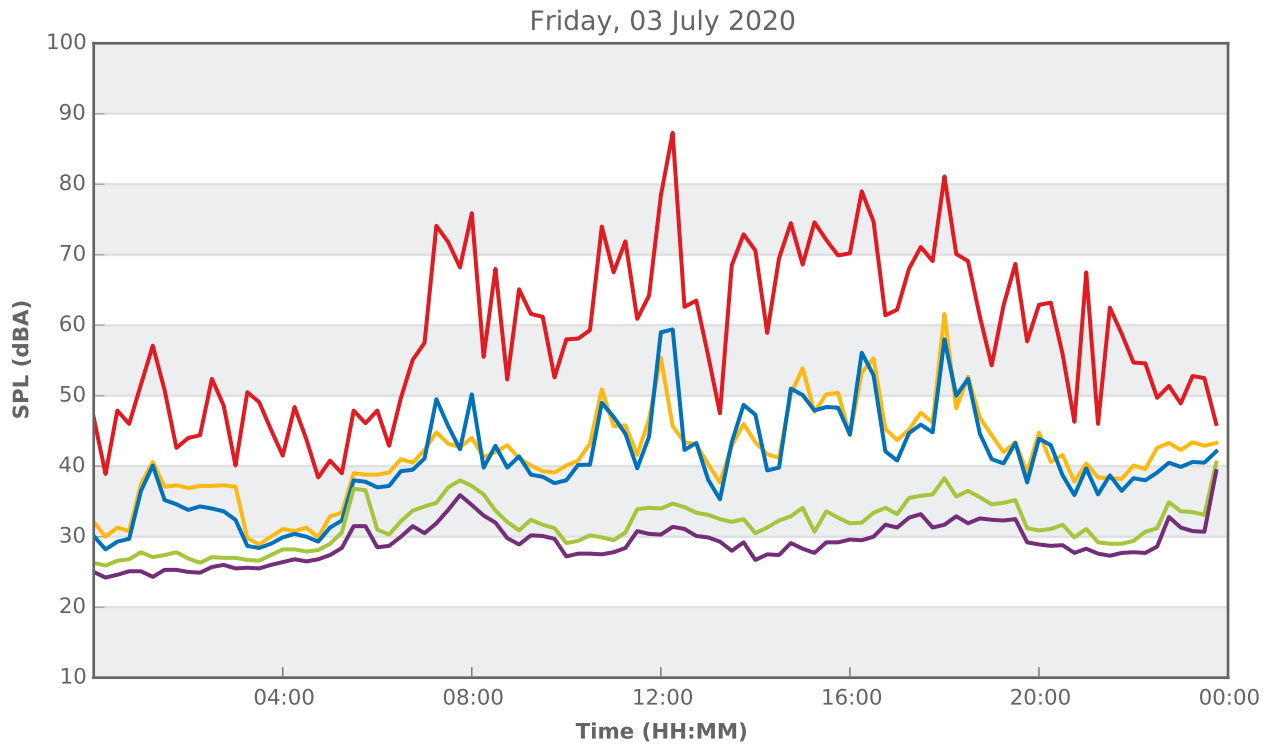
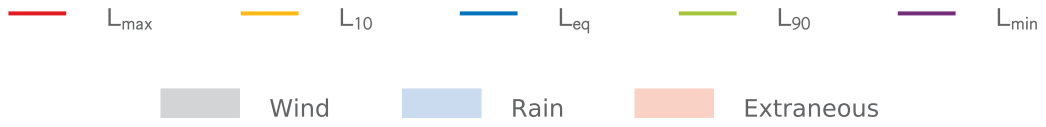
## APPENDIX 1: NOISE MONITORING DATA

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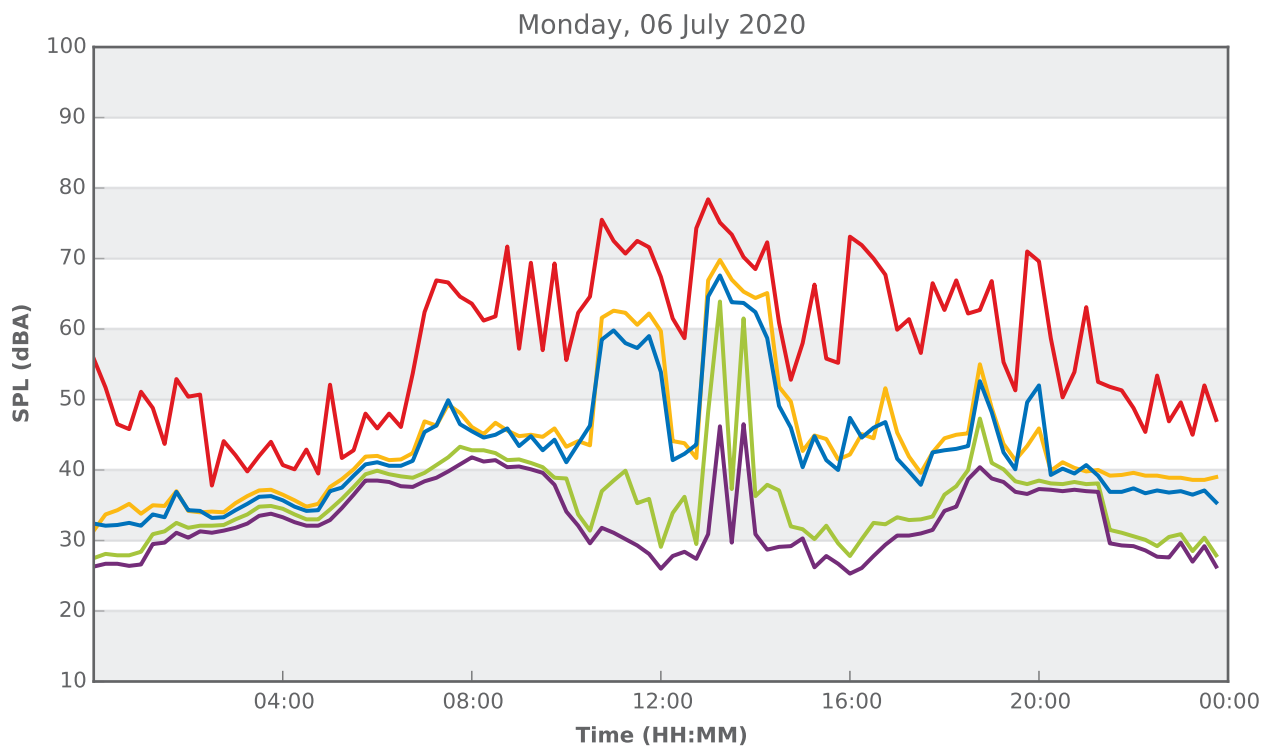
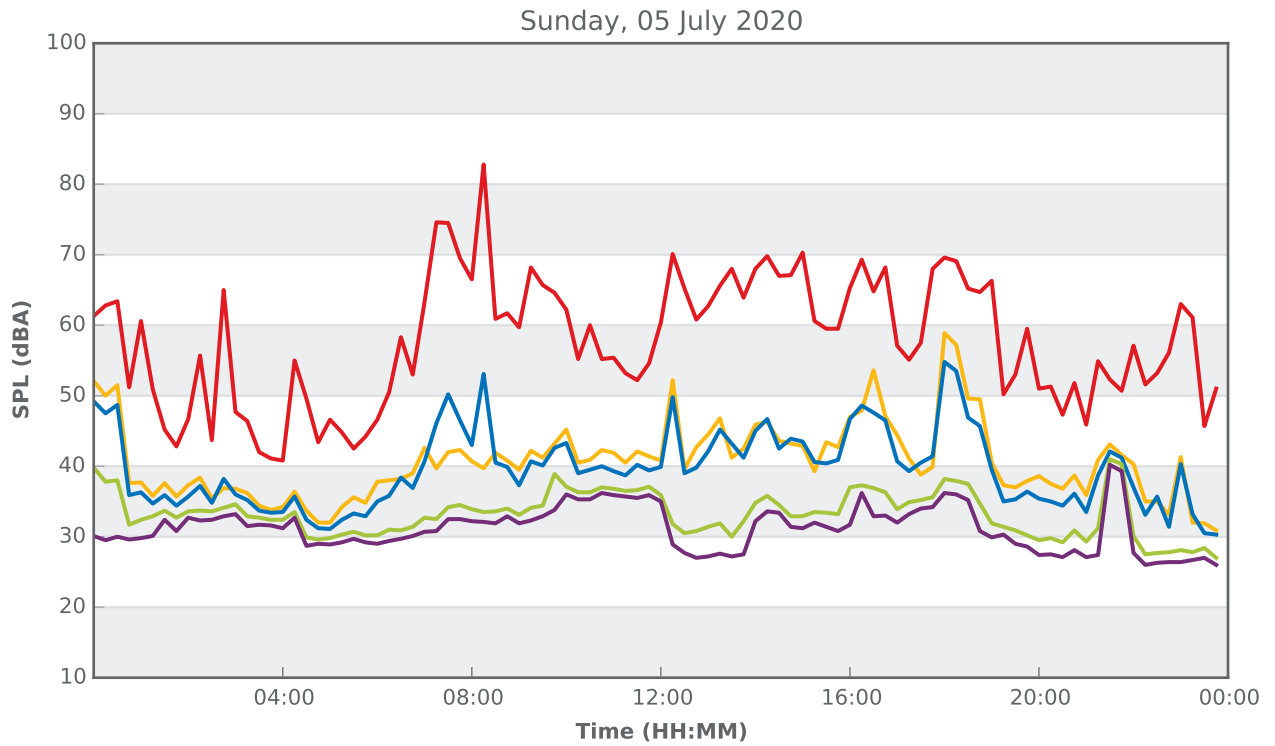
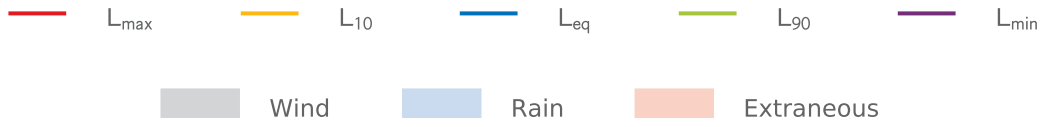




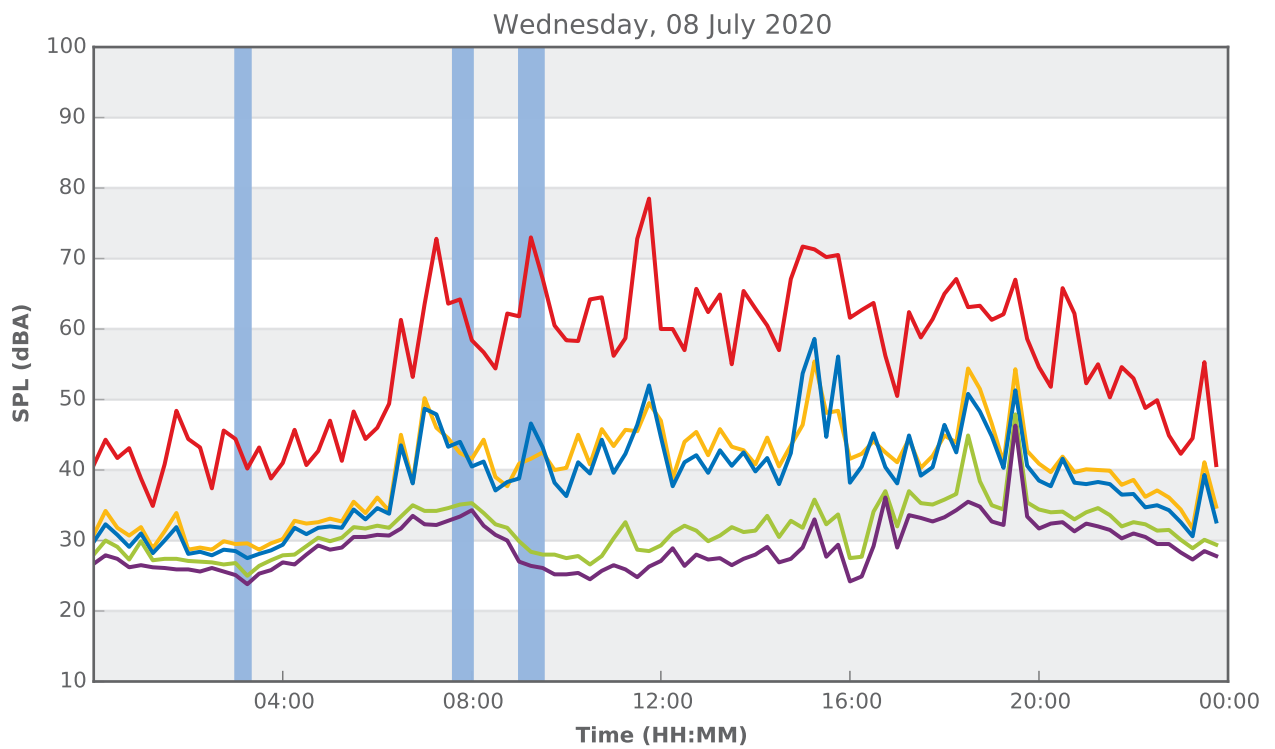
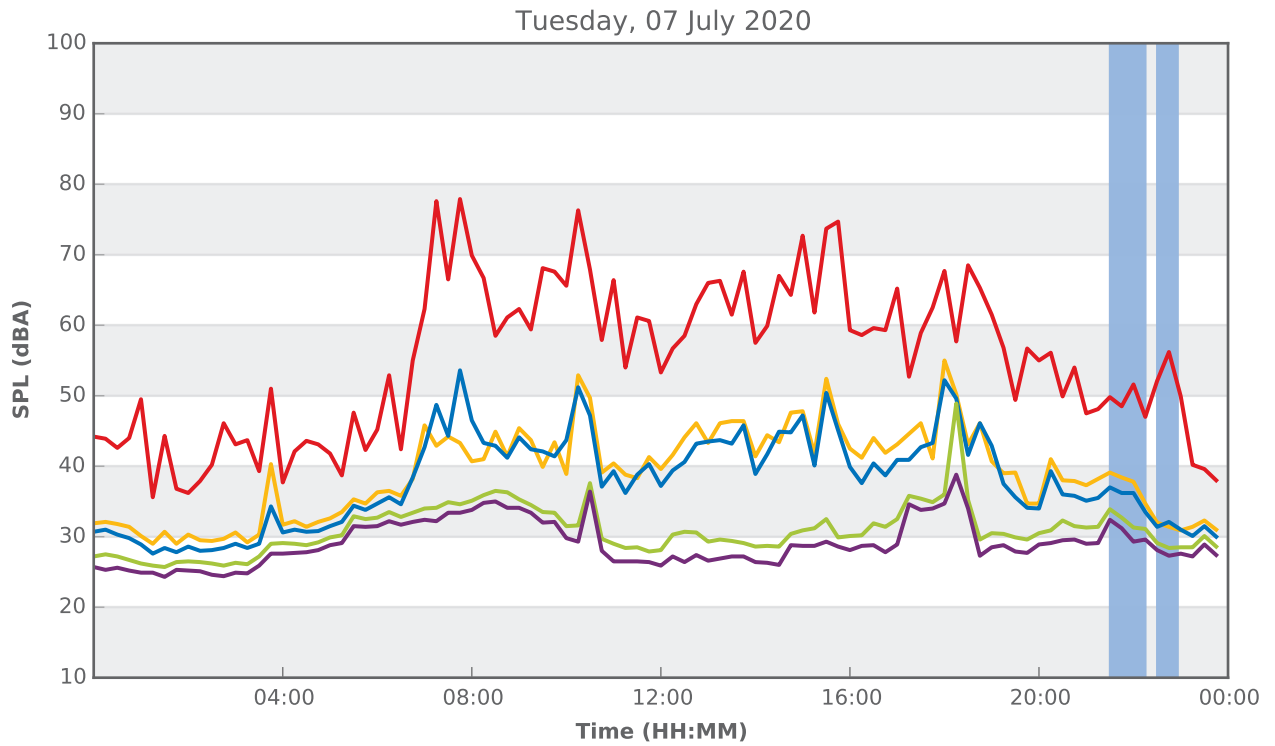
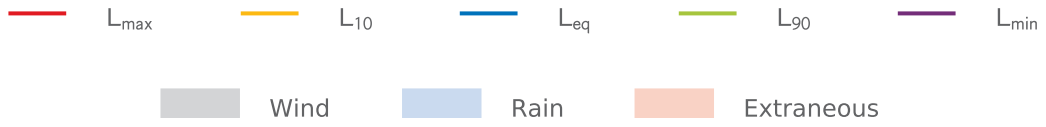
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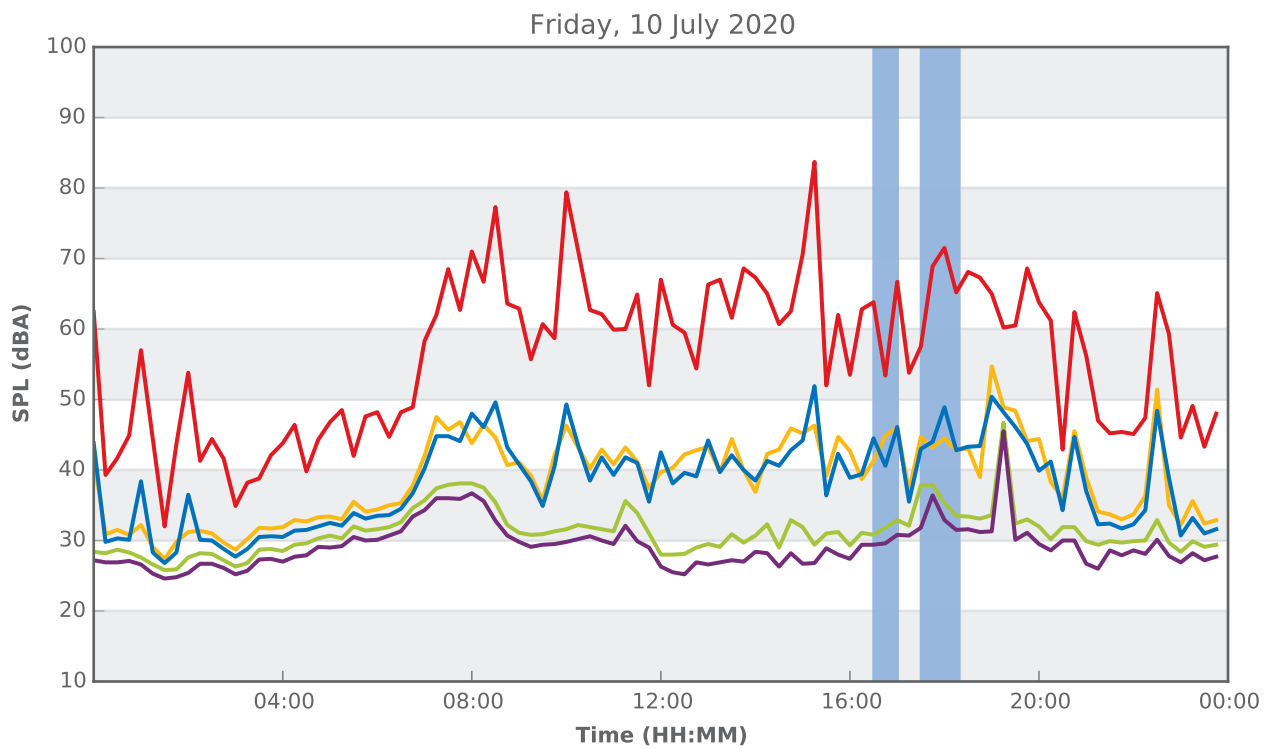
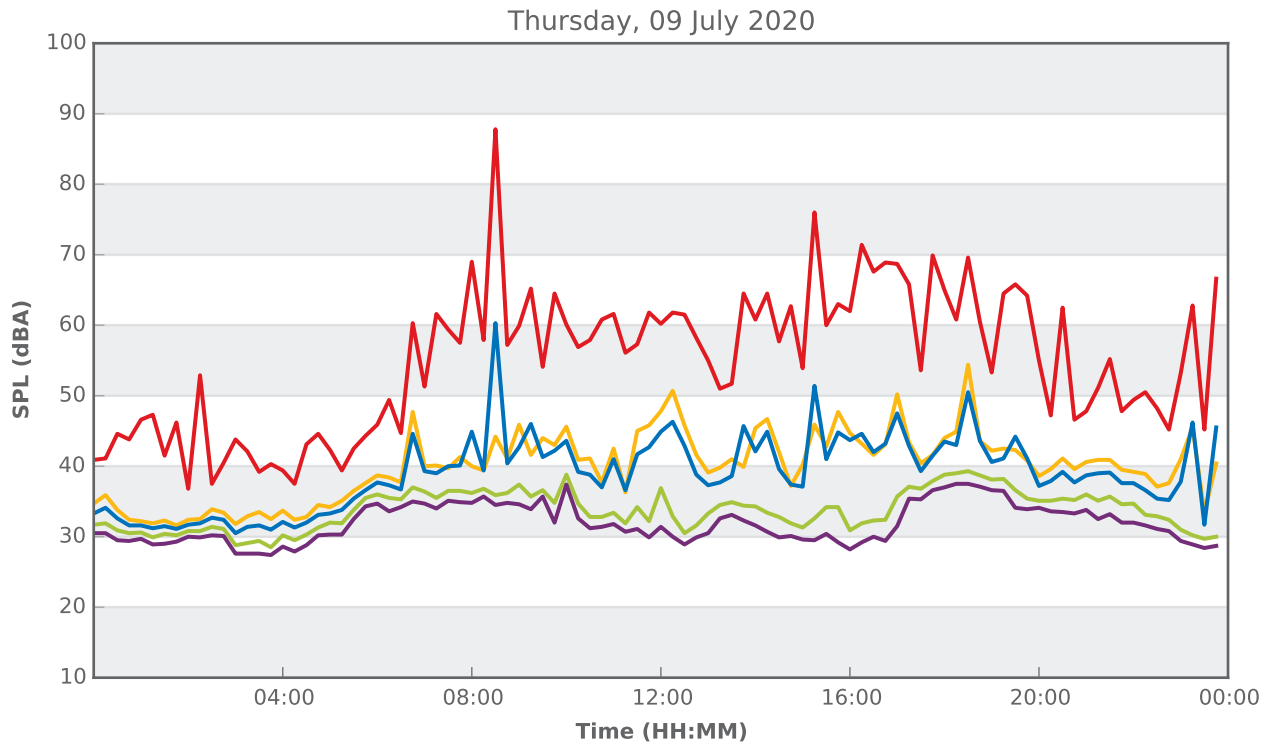
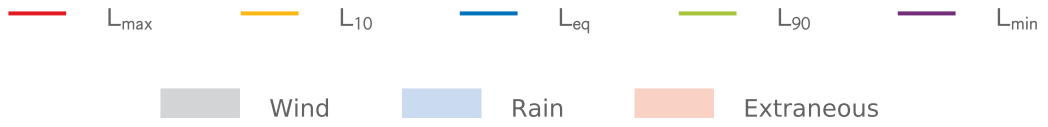
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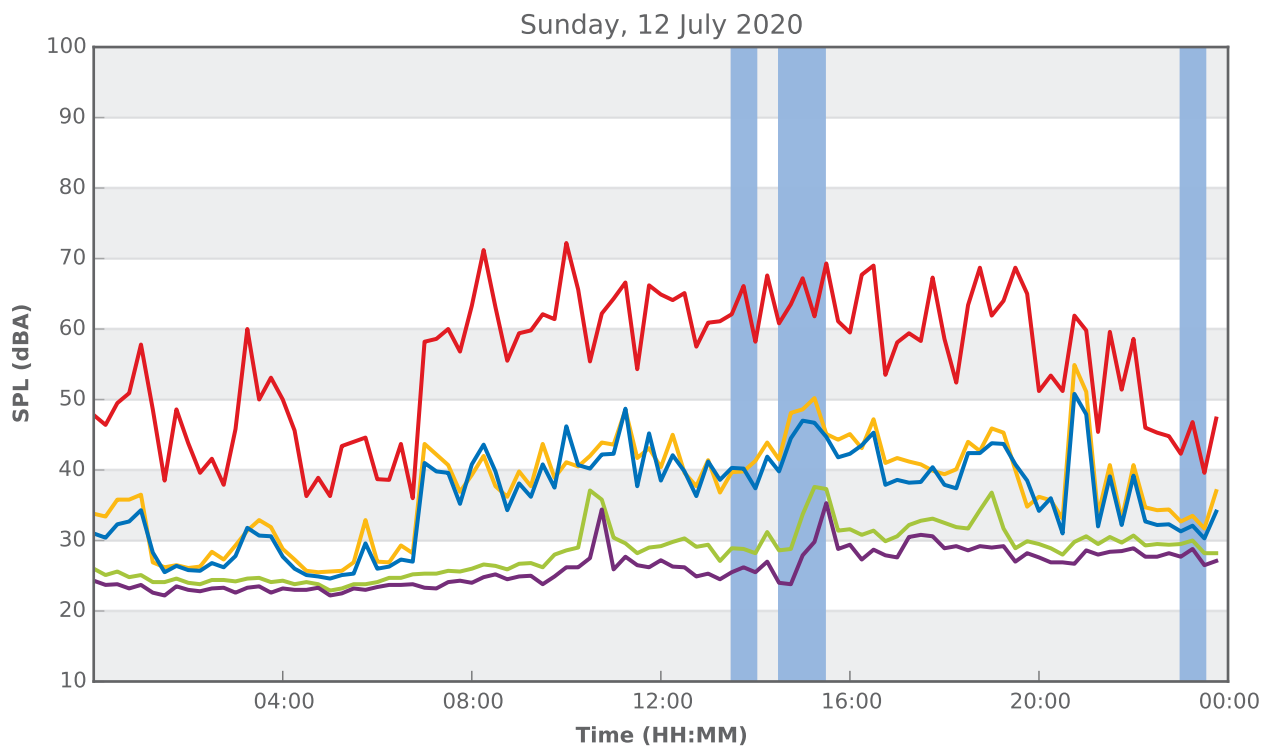
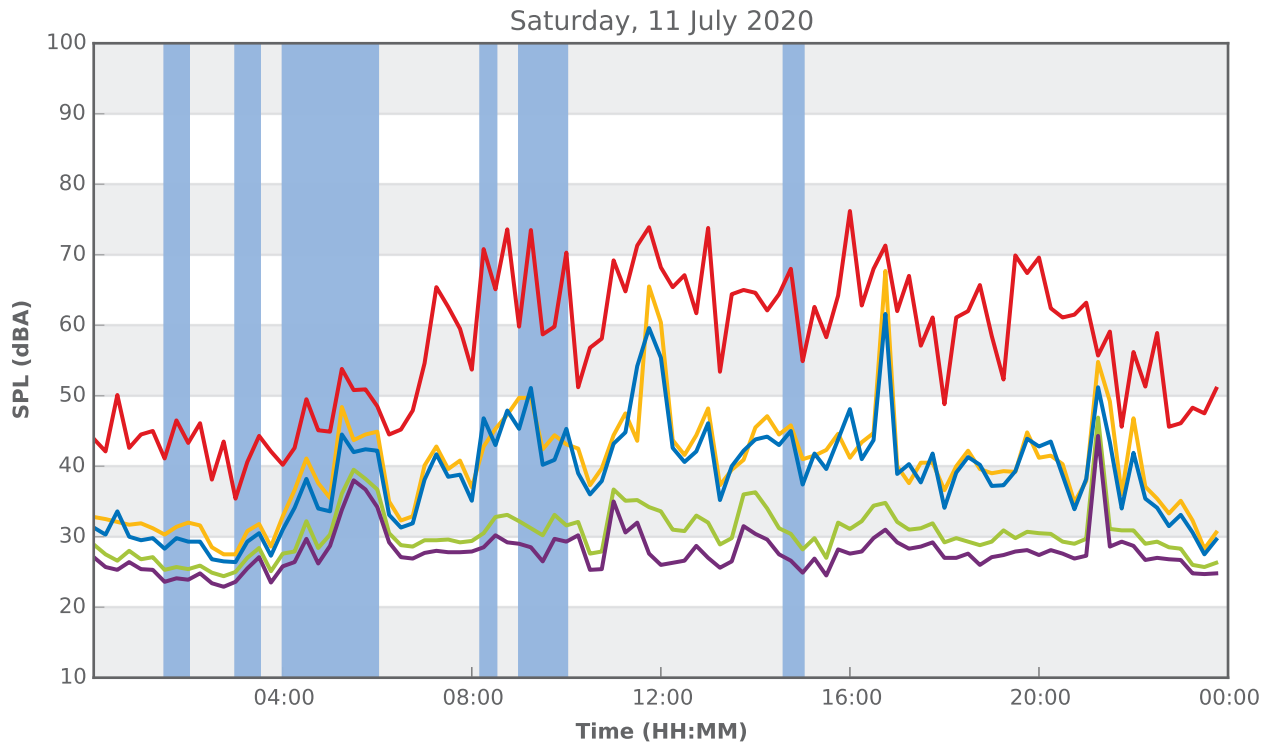
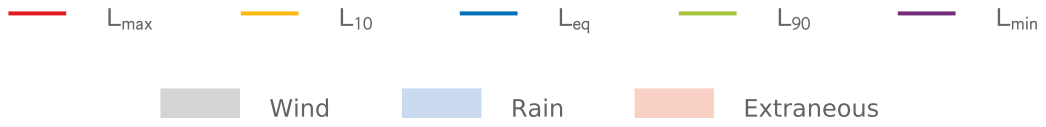
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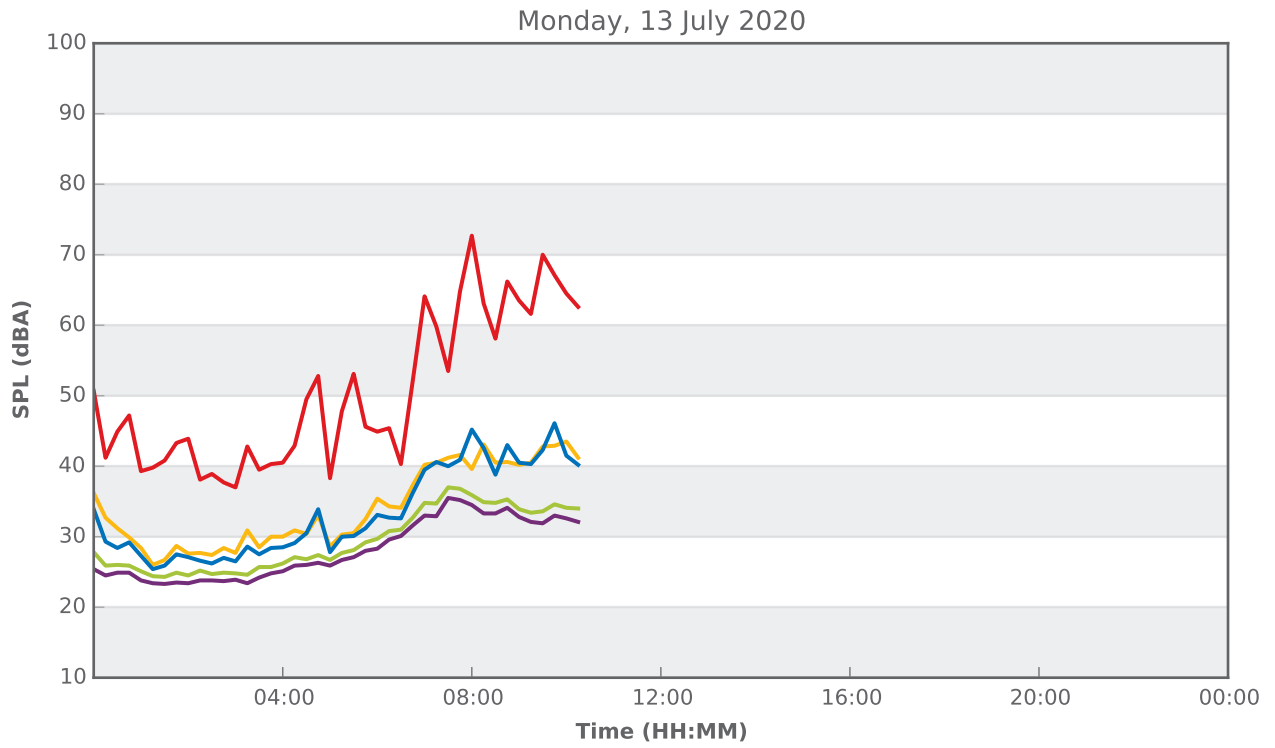
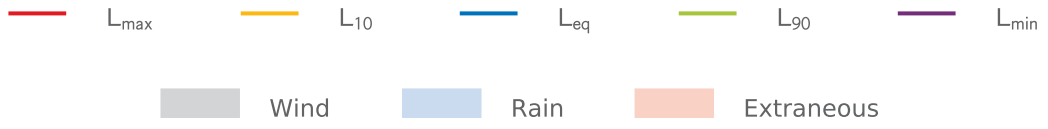
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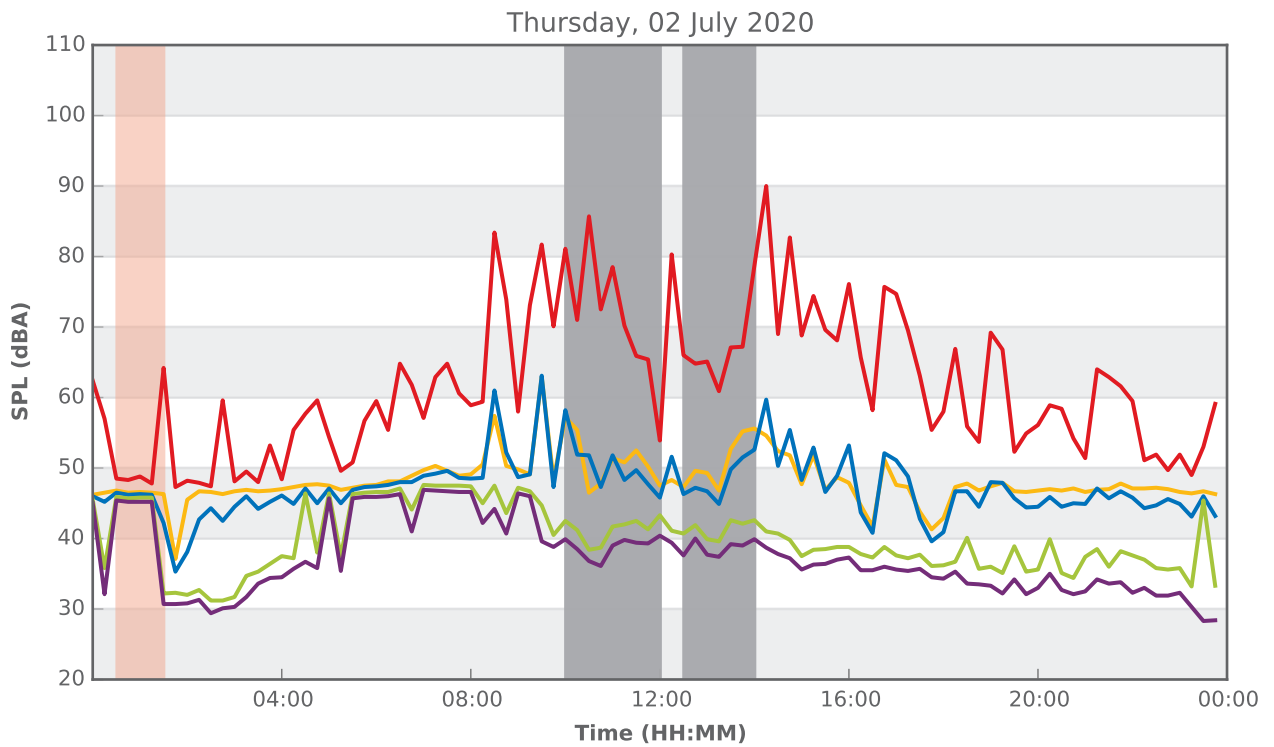
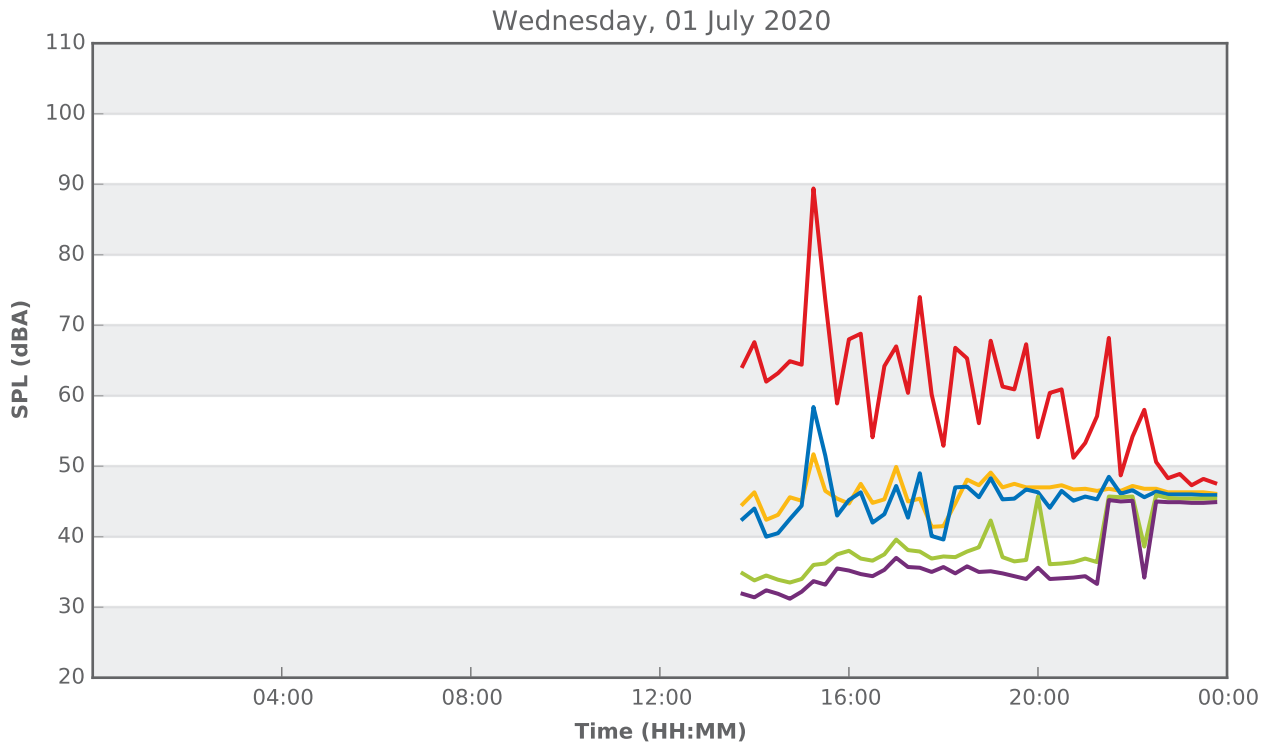
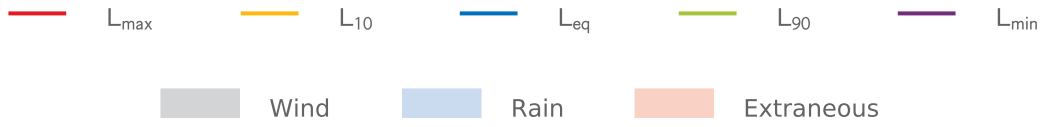
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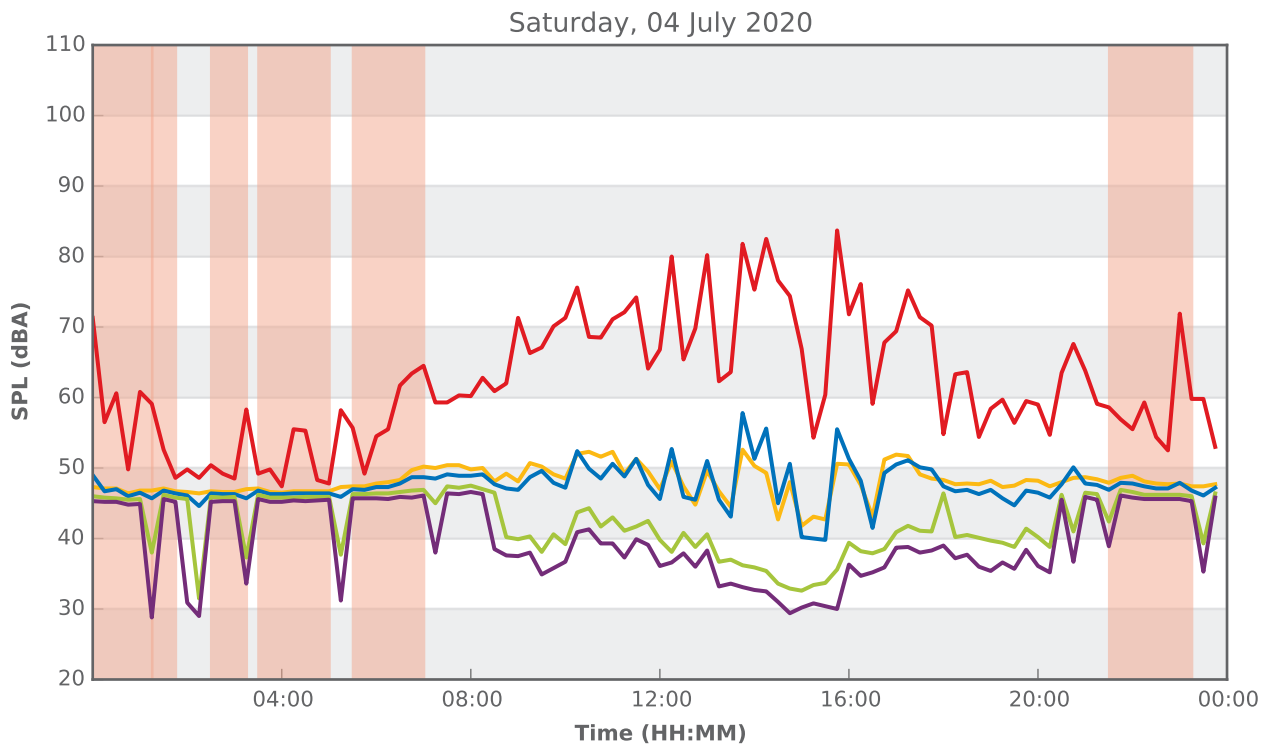
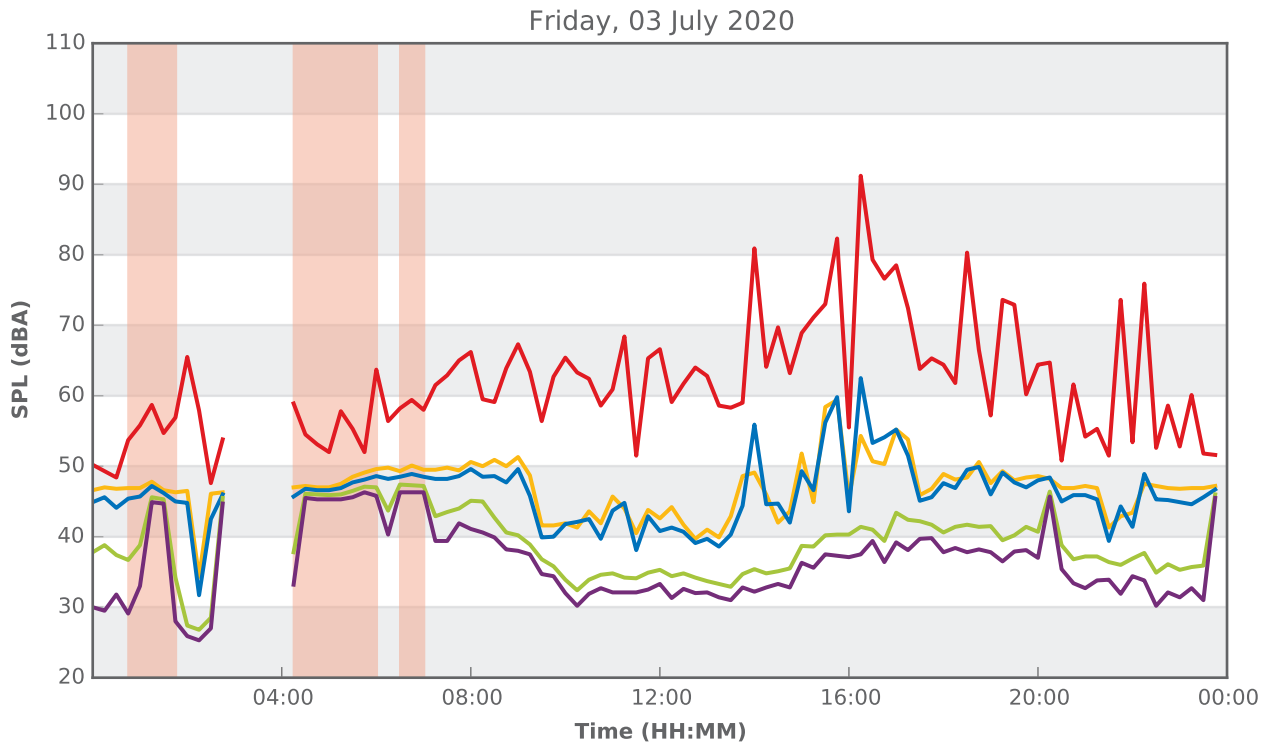
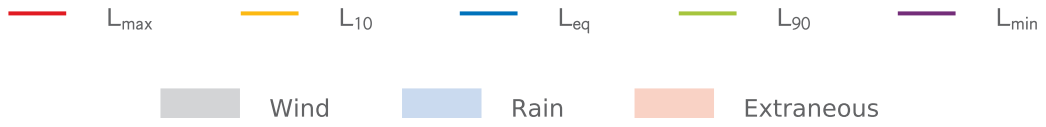
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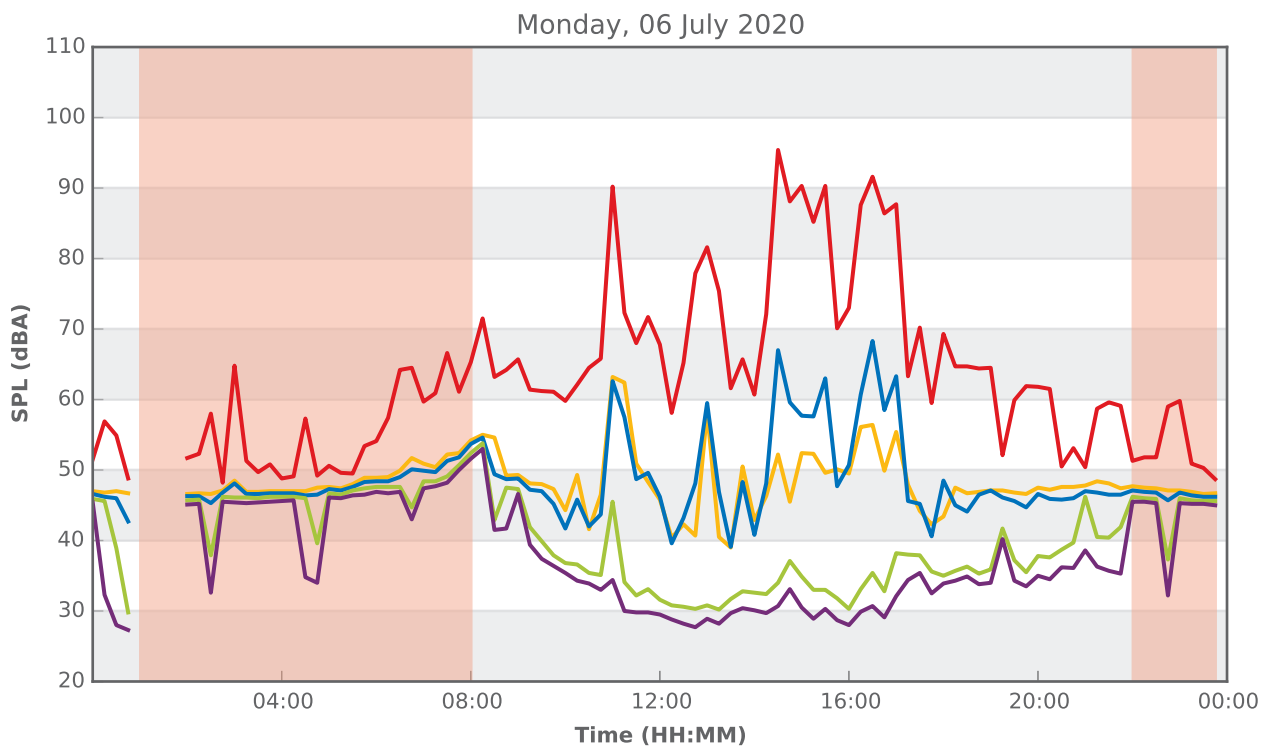
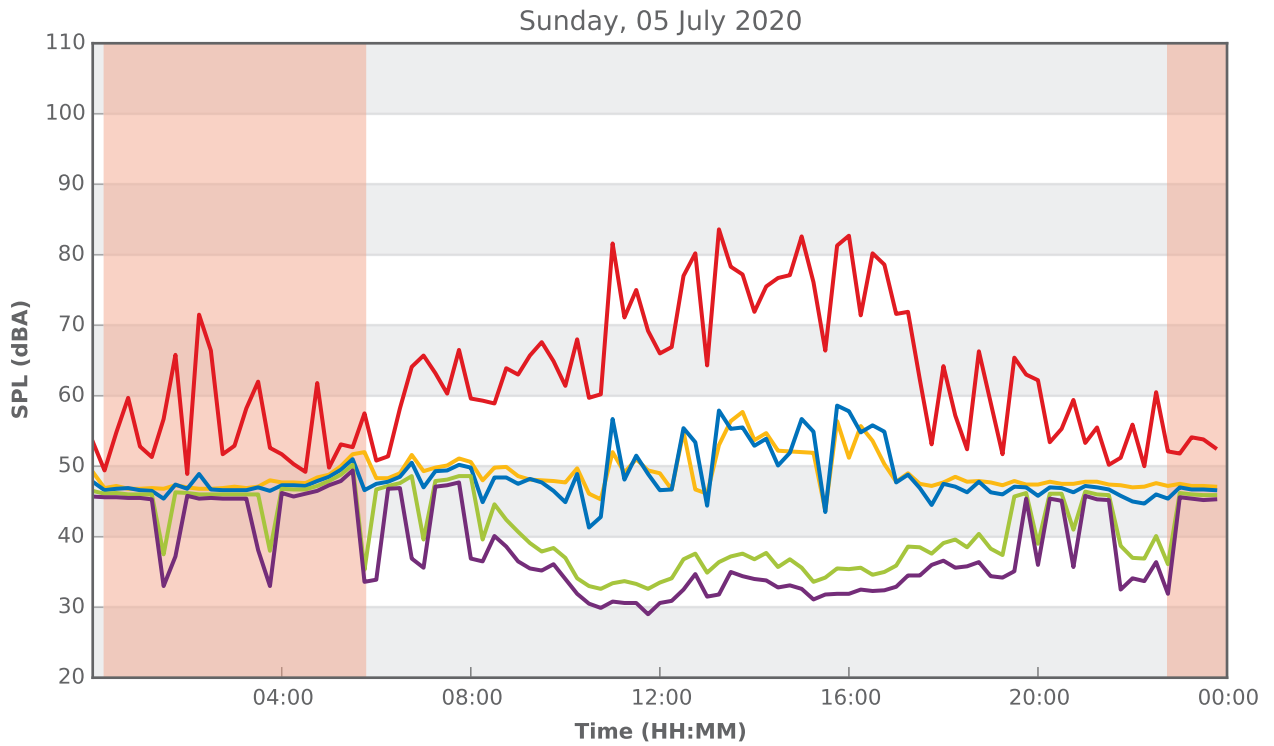
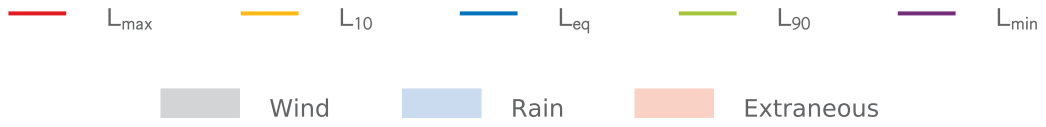


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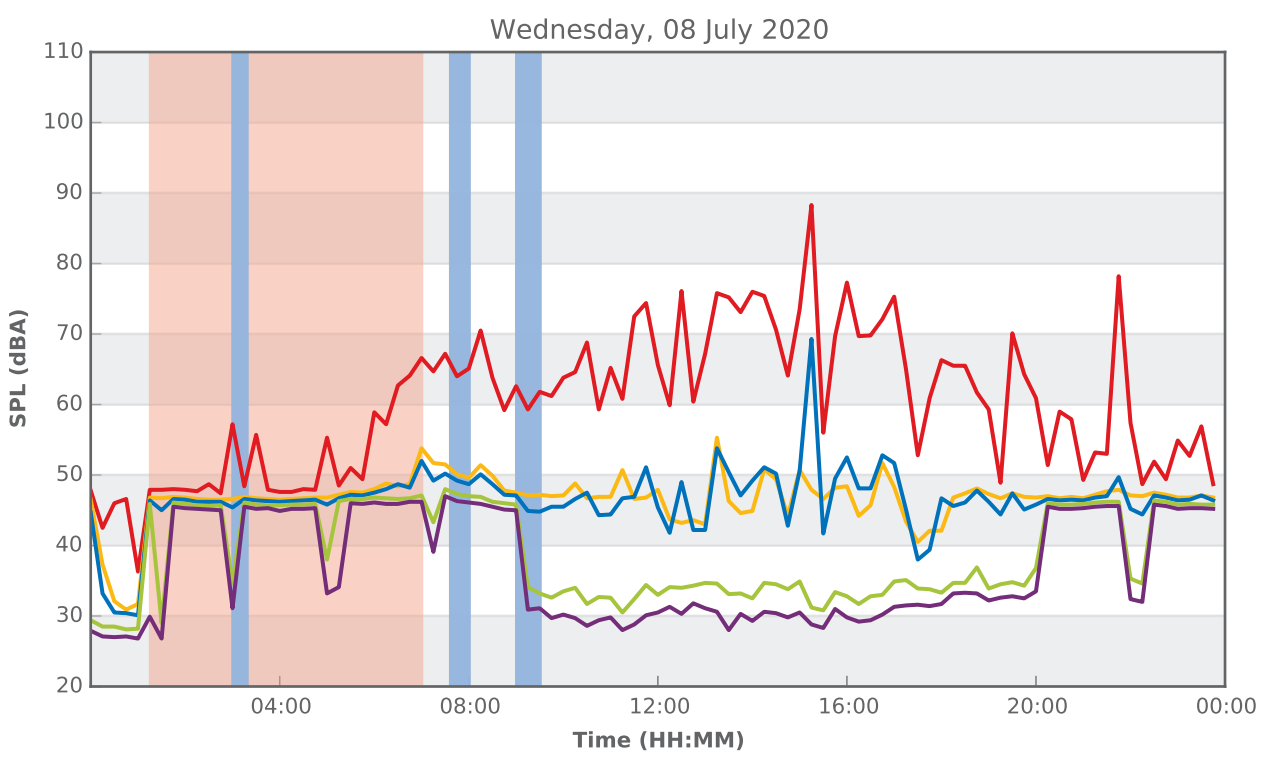
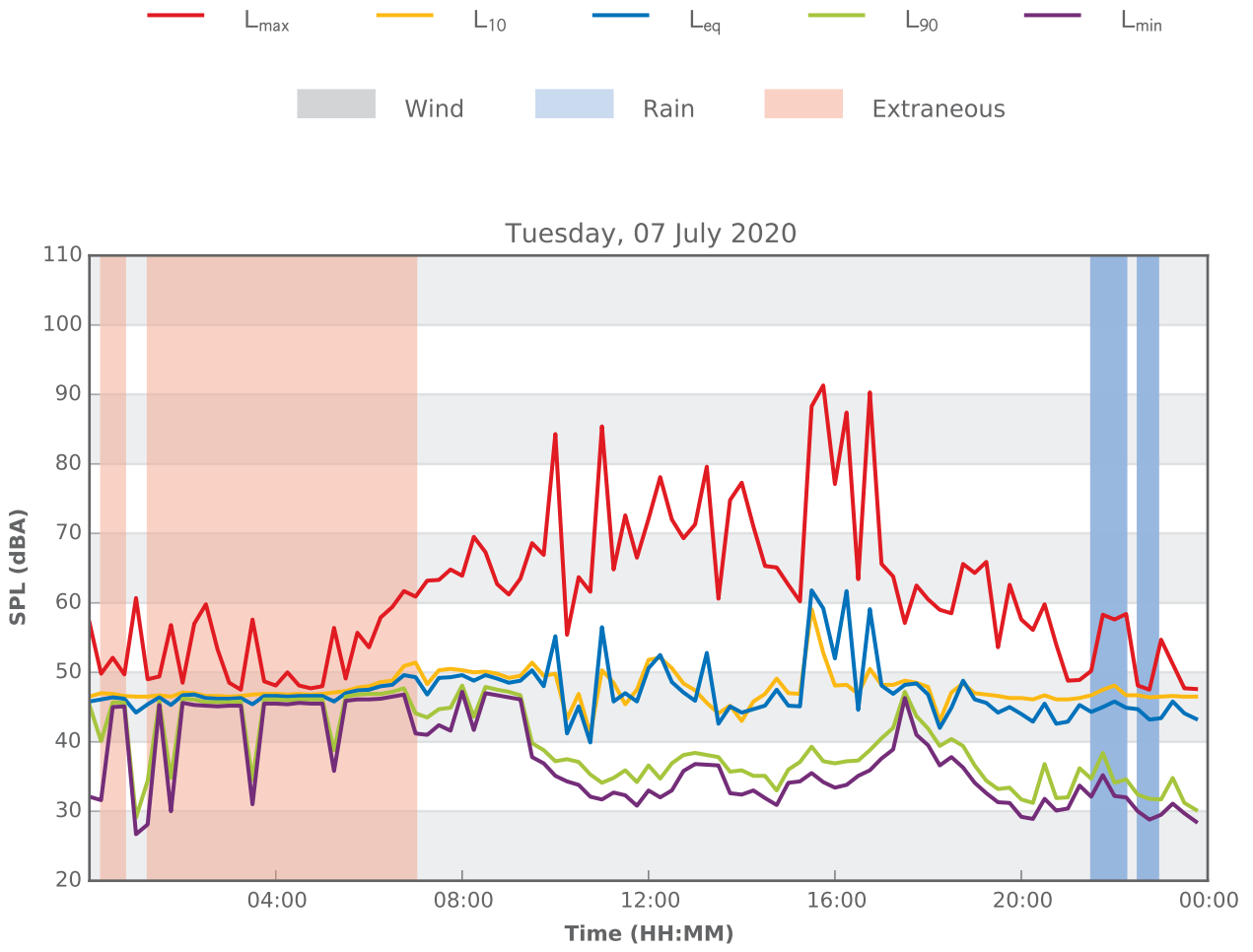




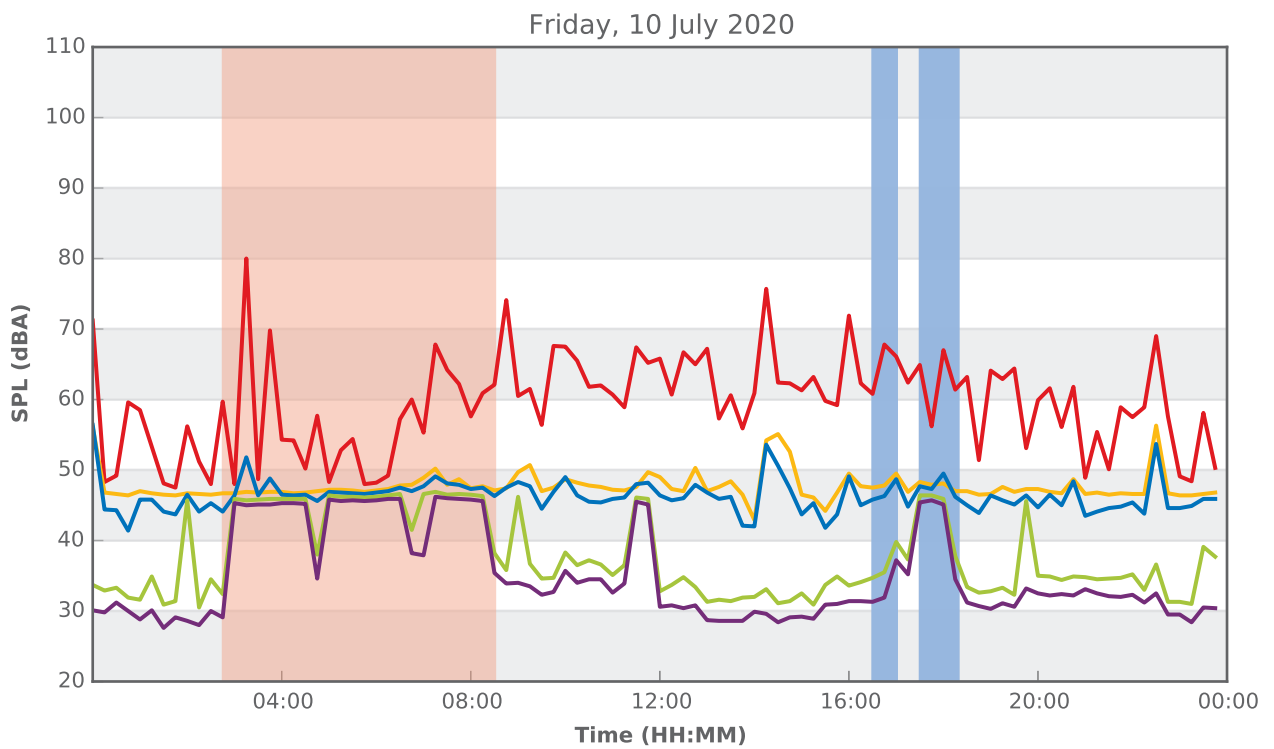
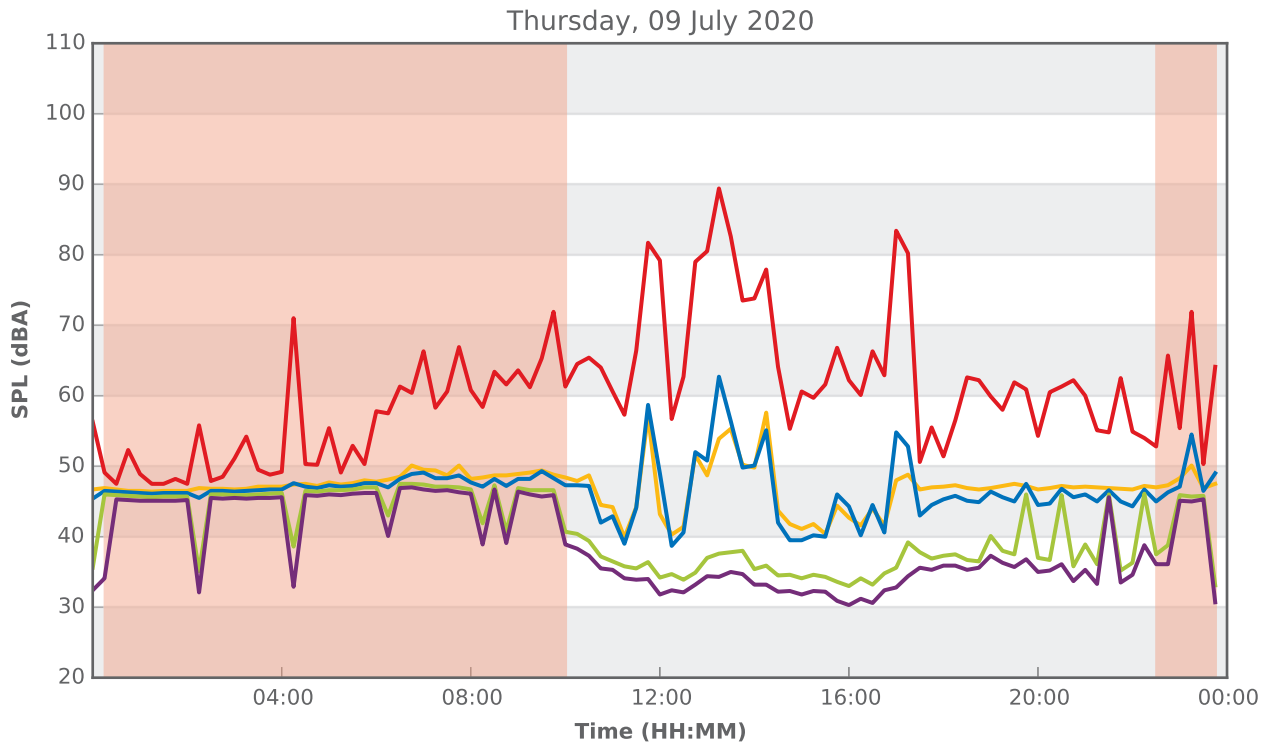
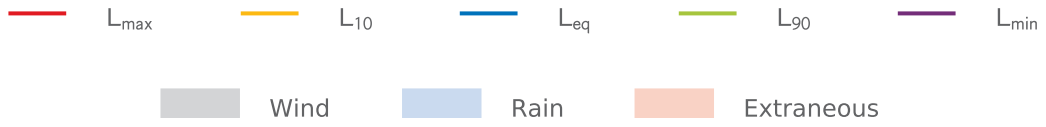
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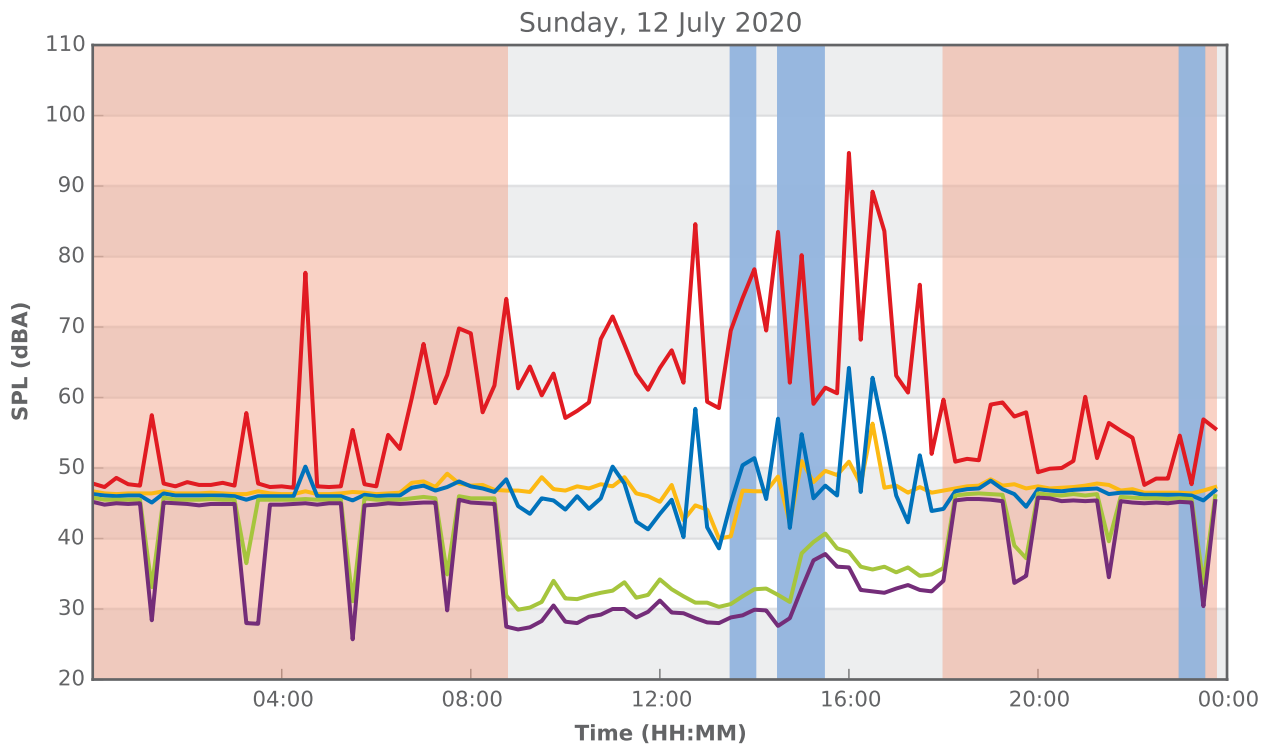
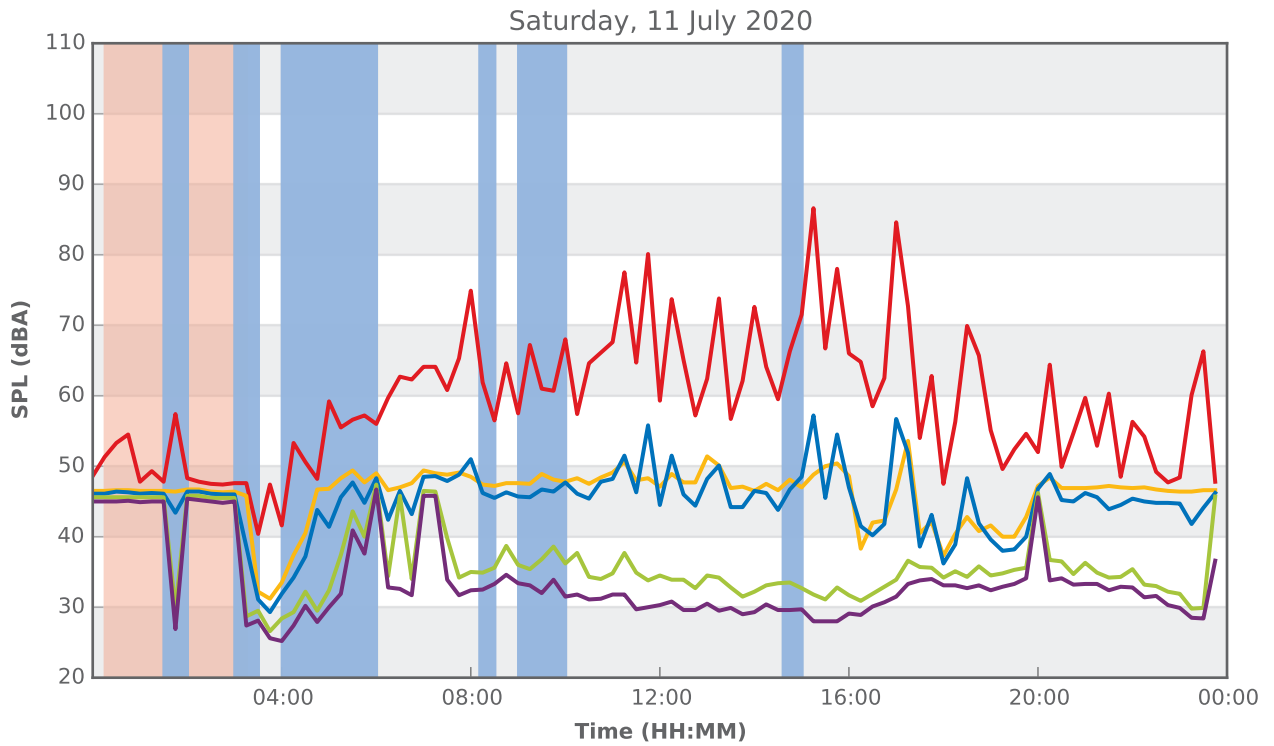
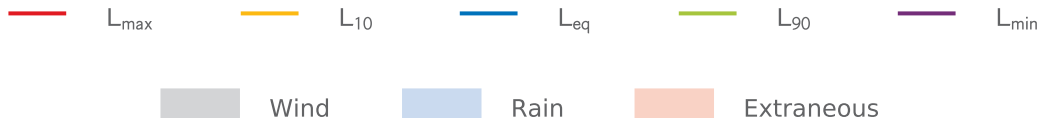
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