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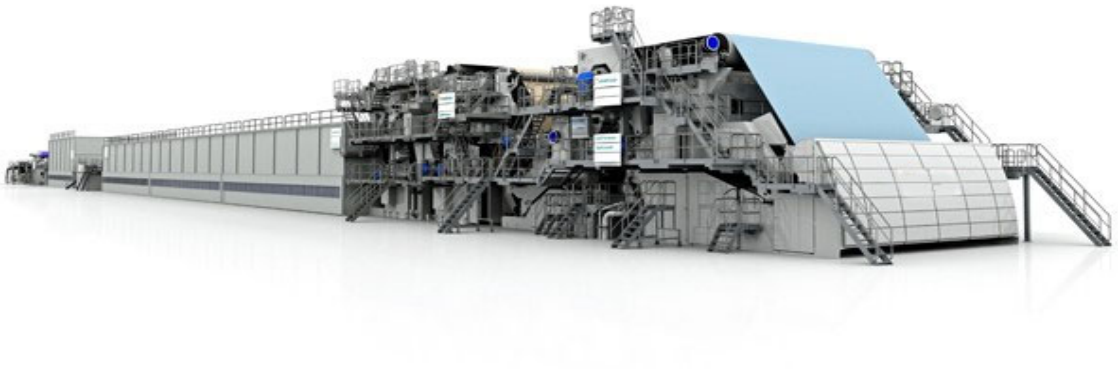
Opal Pty Ltd

Botany Paper Mill – EPL Compliance
May 2020 Quarterly noise monitoring report



1 June 2020

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Opal Pty Ltd
Botany Paper Mill - EPL Compliance

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Table of Contents

Glossary

Acoustic and vibration related terms:

- **Acoustic Spectrum:** A representation of a sound sample (usually short term) of the amount of energy or sound level per frequency.
- **Ambient Noise**: Ambient noise encompasses all sound present in a given environment, being usually a composite of sounds from many sources near and far.
- **dB(A):** A unit of sound measurement which has frequency characteristics weighted so that it approximates the response of the human ear to sound waves
- **Heavy Vehicle**: A truck, transport or other vehicle with a gross vehicle weight above a specified level (for example: over 8 tonnes)
- L_{A90}: Is the noise level that is exceeded 90 per cent of the measurement time. This parameter is commonly referred to as the background noise level
- L_{Aeq}: Noise level that represents the energy average noise from the source during a specified time period, and is the equivalent continuous sound pressure level for a given period
- $L_{Aeq(15hr)}$: The Leq noise level for the period from 7 am to 10 pm.
- $L_{Aeq(9hr)}$: The Leq noise level for the period from 10 pm to 7 am.
- **NCA**: Noise Catchment Area. Grouping dwellings or receivers together in terms of similar noise environment.
- **Noise barrier**: Generally a wall or an earth mound that obstructs or restricts the passage of sounds waves from a noise source
- **Noise Logger**: A data logging (data and audio in some cases) which records noise. Usually used for unattended noise monitoring of background or ambient noise.
- **NML**: Noise Management Level as detailed in the NSW Interim Construction Noise Guideline. The NML is the noise goal for construction activities.
- **Octave Bands**: Sounds that contain energy over a wide range of frequencies are divided into sections called bands. A common standard division is in 10 octave bands identified by their center frequencies 31.5, 63, 250, 500, 1000, 2000, and 4000 Hz
- **RBL**: Rating Background Level is the overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used for determining the appropriate construction noise criteria.
- **RNP**: Road Noise Policy (OEH, 2011)
- **Sound Level Meter**: An instrument consisting of a microphone, amplifier and data analysis package for quantifying and measuring noise.
- **Sound Power Level** (Lw): Sound power level or acoustic power level is a logarithmic measure of the sound power in comparison to a specified reference level.
- **Sound Pressure Level** (SPL or Lp): The level of noise, usually expressed in dB(A), as measured by a standard sound level meter.

1. Introduction

1.1 Background

OPAL operates a paper mill at its Botany site in Sydney, NSW. The paper mill is subject to operational noise conditions set out in the Ministers Conditions of Approval (MCoA) (including subsequent modifications) and the Environment Protection Licence (EPL) No. 1594.

As part of the EPL, there is a requirement to undertake quarterly monitoring at receivers surrounding the site to show compliance with set noise limits. This report covers the May 2020 – July 2020 quarter. At the time of monitoring, the B9 paper machine was operating at typical production capacity.

At the time of monitoring land adjacent to the south east of the Opal site known as the 'hanger block' is mostly cleared with minor earthworks around the creek and construction of some industrial and commercial units underway.

1.2 Objective

This report addresses operational licence conditions relating to measurements of the quarterly monitoring of the noise environment around the Opal site, i.e. Condition M6.1 and M6.2 of EPL 1594. These require:

- M6.1 The licensee must undertake noise monitoring at least once every three months to check compliance with the noise limits specified in Condition L4.1.
- M6.2 All monitoring required by this licence must be undertaken in accordance with Australian Standard 2659.1 – 1998: Guide to the use of sound measuring equipment – Portable sound level meters, or any revisions of that standard which may be made by Australian Standards Authority, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

1.3 Operational noise limits

Operational noise limits for the new Opal Paper Mill are detailed in condition L4.1 of EPL 1594 and Condition 10 of the MCoA. These have been replicated in **Table 1**.

Since the inception of the monitoring program dating back to as early as 2012, the same receiver locations have been used. This last noise monitoring survey only had access to 5 locations with the residence located at R3 (Murrabin Avenue) no longer available for access. A suitable alternative location is currently being investigated.

Table 1 Operational noise limits

ID	Location	Day $L_{Aeq,15min}$, dB(A)	Evening $L_{Aeq,15min}$, dB(A)	Night $L_{Aeq,15min}$, dB(A)	Night L_{Amax}, dB(A)
R1	Corner of McCauley Street and Australia Avenue	46	45	43	55
R2	Australia Avenue	45	45	43	55
R3*	Murrabin Avenue*	46	45	43	55
R4	Partanna Avenue	42	41	41	55
R5	Corner of Partanna Avenue and Moorina Avenue	42	42	39	55
R6	Moorina Avenue	43	43	39	55

*Receiver location no longer accessible

Regular quarterly monitoring surveys have demonstrated that direct measurement of Opal's contribution to the noise environment is not possible because their noise emissions are generally lower than the ambient measured L_{Aeq} noise levels, which masks the actual noise from the Opal site.

Ambient noise levels measured at the receiver locations using the L_{Aeq} noise parameter are therefore not a true representation of noise from the Opal site. The influence from Opal on the local noise environment may be better described using the L_{A90} statistical parameter. This additional parameter has been presented in the results summary to be considered in conjunction with the L_{Aeq} noise level when assessing compliance of the Opal site.

During the night time periods fewer extraneous noise influences are present providing lower overall noise levels in the area. Under these conditions constant noise sources such as Opal operations are more likely to be apparent in the background noise levels noting that the emission levels from the site remain relatively constant throughout the day, evening, and night time.

Maximum noise levels from the site are also captured under the EPL requiring a cap on noise emissions of L_{Amax} 55 dB(A) at all locations during the night time period. An L_{Amax} parameter for the monitoring period simply records the loudest noise level measured during the night time assessment period and does not distinguish the source of noise.

Maximum noise events are not generally observed from the Opal site unless equipment has broken down or maintenance activities are underway and neither of these scenarios reflect normal operation of the plant.

Maximum noise levels recorded during these surveys are, therefore, more representative of the broader noise environment which makes the distinction between external sources and Opal's emissions difficult. Furthermore, maximum noise levels measured during the monitoring surveys often, if not always, exceed the maximum noise limit from the site hindering the identification of Opal's contribution.

The addition of the L_{A1} noise level statistic is proposed in conjunction with the L_{Amax} parameter to compliment the maximum noise profile and provide a better representation of environmental noise influences.

An L_{A1} noise level above the night time criteria would not necessarily indicate an exceedance of the Opal noise goals however, long term measurements of this parameter may be useful in identifying changes to the local noise profile which can then be compared to any changes in functional operation within the Opal site.

2. Existing environment

The site is located at the boundary of an industrial area bounded by residential properties located to the north and east of the site, as illustrated in Figure 2-1. The local noise environment beyond the Opal boundary varies throughout the day depending on the contribution of sources including trucks on Botany Road, aircraft, port noise, local business activities on McCauley Road, and local traffic movements.

Noise emissions from the paper mill do not vary significantly as the operation of the plant has been demonstrated to be consistent and reliable.

The source of maximum noise level events in the area are typically from the local road network and aircraft fly-overs. The nature of the processes within the Opal site means that there are typically no maximum noise level events associated with production activities. The exception to this may occur when equipment is not functioning properly during a breakdown or during maintenance activities, both of which are not common scenarios.

The influence of weather conditions on noise levels are apparent as seasonal variations which are forming data trends in the long-term monitoring for the local area.

2.1 Monitoring limitations

Total measured noise levels at monitoring locations are only partly due to Opal site operations. The local noise environment has been a feature of the area for many years. Direct monitoring of Opal noise emissions over this time has demonstrated that specific contribution from Opal cannot be provided with any certainty due to the contribution of other audible noise sources adjacent to the site.

2.2 Receiver locations

The EPL specifies six locations for quarterly monitoring. These are illustrated in Figure 2-1 and described further in **Table 2**.

Figure 2-1 Site location and compliance monitoring locations

Table 2 Description of monitoring locations

Monitoring location	Description
R1	This location has a large degree of acoustic shielding from local noise sources due to the development of a warehousing facility on the corner of McCauly Avenue and Australia Avenue. The noise environment at this location is heavily influenced by traffic on McCauley Street, Perry Street and Beauchamp Road. Local industrial noise from Raymond Avenue is also audible during the day and night time.
R2	This receiver is located opposite the bottom apex of the Purcell Park on Australia Avenue. At this location the residents have a clear line of sight to the paper mill. Noise walls have less effectiveness for the residences due to the large separation distances. Noise from port activities also has less shielding from the Opal site. Background noise levels are heavily dominated by road traffic noise from all sources.
R3*	This receiver is located adjacent to Purcell Park on Murrabin Avenue. At this location the residents have a partial line of sight to the paper mill although they are located closer to the boundary noise wall than receivers at R2. Noise from port activities are partially shielded by the Opal site. Background noise levels are heavily dominated by road traffic, aircraft and industrial noise from all surrounding sources.
R4	The receivers at Partanna Avenue are physically closest to the Opal site but have the benefit of significant shielding of operational activities from the noise barrier located on the northern boundary. Road traffic noise contributes to background noise for this receiver. Some construction work was in progress at the property during the monitoring period and therefore no measurements were taken for the May period.
R5	Furthest location from the Opal site, a higher degree of influence from Botany Road, Bunnerong Road and the port. Noise from the Opal site is generally inaudible at this location although significant noise from the Opal site has been observed here during adverse meteorological conditions.
R6	In this location receivers are well shielded from operational noise from the Opal site due to the presence of the noise barrier and No. 8 paper machine building. Noise levels at this location are heavily influenced by local bird colonies, port noise, traffic on Botany road and traffic on Bunnerong Road. Construction of industrial units on the adjacent vacant land (Hanger block) is well underway at the time of writing this report.

*Receiver location currently unavailable

3. Operational noise monitoring

3.1 Method

Operational noise monitoring for the May survey period was completed between 06 May and 13 May 2020, using automatic noise loggers deployed at five representative locations.

Monitoring was performed using Acoustic Research Laboratories brand Ngara Type 1 noise loggers and SVAN 958 SLMs, set to A-weighting, fast-response, and recording noise levels continuously over consecutive 24-hour periods at each location. This survey period coincided with typical continuous operations of paper mill.

Weather conditions during the survey period were obtained from the Automatic Weather Station (AWS) maintained by the Bureau of Meteorology at Sydney Airport. Weather conditions for the monitoring period have been plotted showing daily trends in wind direction and speed which are presented in Figure 3-1.

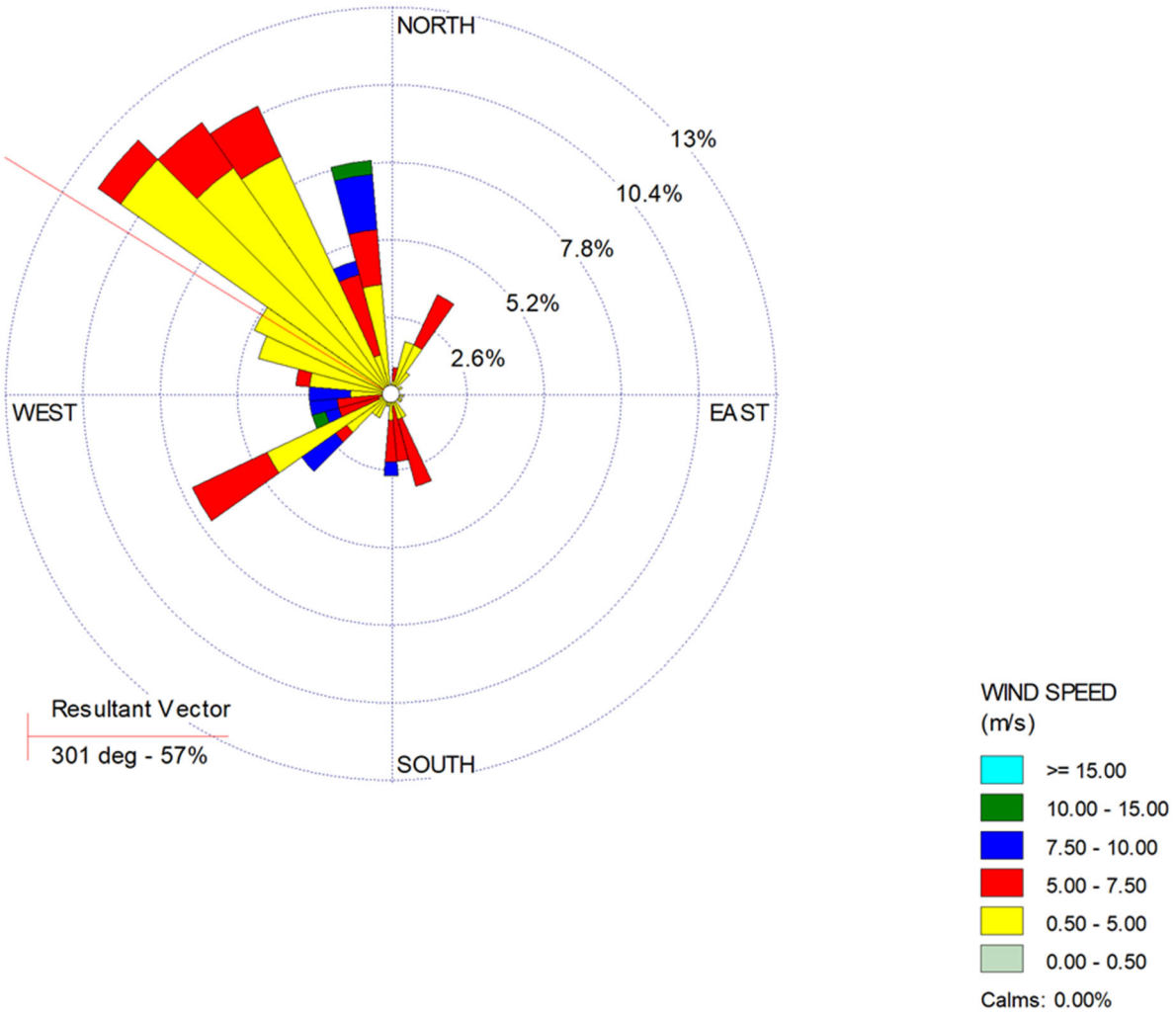


Figure 3-1 Wind speed and direction during monitoring period (6 May – 13 May 2020, source BoM 2020)

The plotted data from the wind rose indicates that for about 30% of the time the wind speeds during the monitoring were typically higher than 5 m/s (see Figure 3-2) with the overall resultant wind vector for the monitoring period concentrated in the north west. Winds from this direction would tend to minimise the influence of the Opal operations on residences to the north and east of the site.

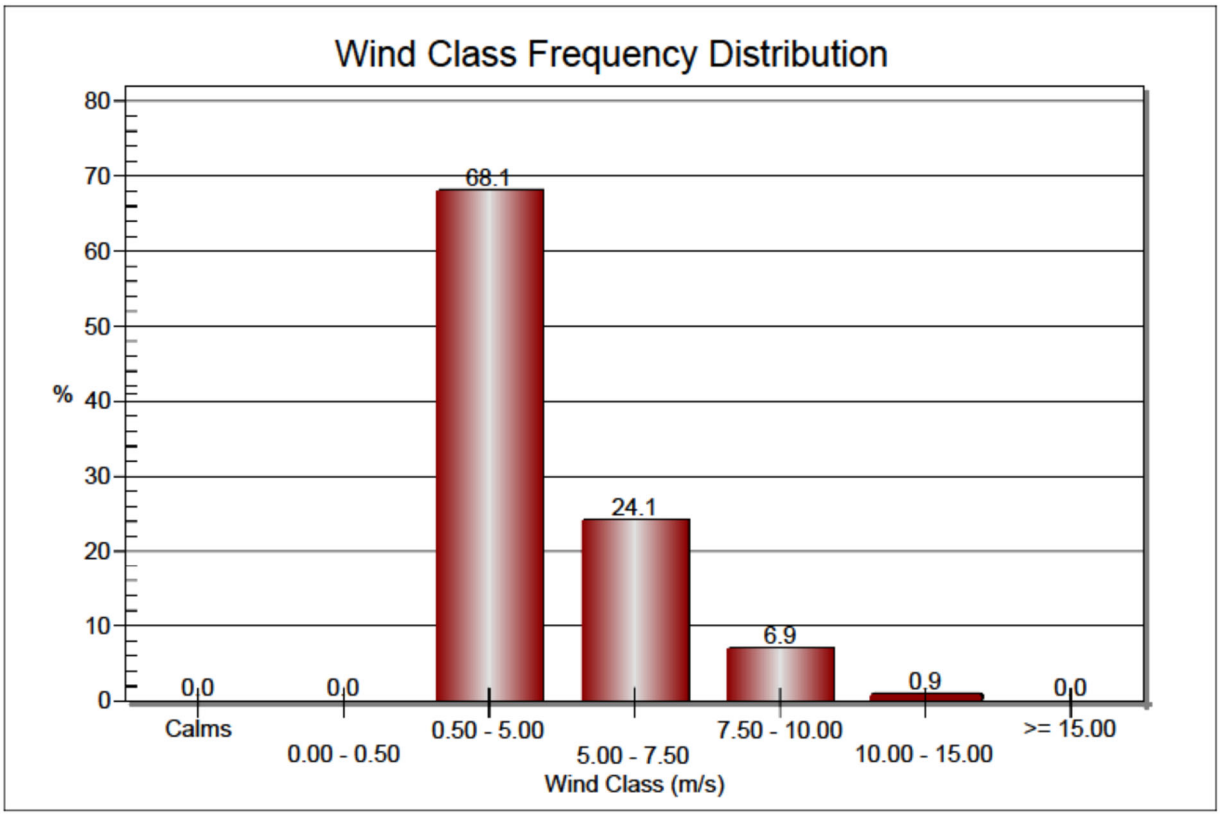


Figure 3-2 Wind speed frequency distribution

Wind blowing from around the north westerly direction during the May noise monitoring survey would tend to minimise noise levels originating from the Opal site at the closest receiver locations. For around 8% of the time, wind from the south west would enhance noise from the Opal site as well as Port Botany and its servicing roads.

Wind speeds greater than 5 m/s will tend to increase overall measured noise levels at all receiver locations.

3.2 Monitoring results

During the May 2020 quarterly noise survey, the paper mill was operating under normal conditions and no breakdowns or noisy events are noted during this period.

The measured L_{Amax}, L_{A1}, L_{Aeq}, and L_{A90} noise levels taken across several days are affected by all noise sources in the local area such as road traffic, loud short-term noise (birds), aircraft, and local industry and heavy vehicle movements.

Access to Location R3 was not available during this round of monitoring and is unlikely to be available for future noise surveys.

The results of the analysis indicate that the L_{Aeq} noise levels exceed the EPL noise goals for each assessment period at all of the survey locations.

When compared to other seasonal monitoring results, the measured L_{A90} and L_{Aeq} noise levels from the May 2020 monitoring data are on par with measured noise levels from previous surveys at corresponding times of the year.

Night time periods were assessed to provide additional information of the paper mill noise contributions using the median L_{A90} noise levels as a benchmark as rating background noise levels provide a good proxy for L_{Aeq} levels from steady state noise emitters.

The most recent round of compliance measurements has been added to the historical data collected during compliance noise surveys, providing about 7 ½ years of seasonal data. This data includes measurements of the noise environment both with the Opal site both operational and shut down for maintenance over this period.

The results of monitoring survey for May 2020 have been graphed and are shown in Appendix A. The parameters of L_{Aeq} and L_{A90} presented in Table 3 are used to provide information for comparison against the project criteria and the background noise environment.

A separate table of L_{Amax} and L_{A1} noise levels has been generated for the recent monitoring survey and in future once sufficient data is acquired, will be graphed to demonstrate data trends for each of the monitoring locations.

3.3 Comparison with previous monitoring surveys

The data in Figure 3-3 and Figure 3-4 provides a chronological progression of the measured noise levels during shutdown and normal operations summarised for monitoring from 2012 to present.

Historical background noise levels from Figure 3-3 and Figure 3-4 are not directly related to the L_{Aeq} criteria from the EPL; however, they provide an indication of the increase in background environmental noise levels corresponding to the regular noise surveys undertaken for the Opal site.

Table 3 Summary of noise monitoring

Time and date	Profile of Noise Environment - Noise Monitoring Location											
	R1		R2		R3		R4		R5		R6	
Daytime: 7:00:00 AM to 6:00:00 PM Date	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**
Wednesday 6 May	40.1	50.7	38.3	51.2	-	-	41.9	53.4	39.7	51.4	40.4	60.9
Thursday 7 May	40.4	50.2	39.2	50.8	-	-	42.1	61.8	39.5	54.2	40.5	55.0
Friday 8 May	41.3	52.9	38.7	54.2	-	-	42.1	64.2	40.0	54.2	42.5	49.6
Saturday 9 May	43.1	50.7	42.7	53.1	-	-	41.8	53.7	43.7	53.4	41.5	47.3
Sunday 10 May	41.7	52.5	45.8	53.0	-	-	44.4	53.0	40.1	54.5	42.1	49.7
Monday 11 May	42.7	49.4	46.3	52.9	-	-	44.1	51.3	40.0	52.3	42.0	51.2
Tuesday 12 May	-	-	38.3	50.6	-	-	42.4	66.7	-	-	46.1	48.6
Median	**41.5**	**50.7**	**42.7**	**52.9**	**-**	**-**	**42.4**	**60.5**	**40.0**	**53.8**	**42.0**	**49.7**

Evening: 6:00:00 PM to 10:00:00 PM Date	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**
Wednesday 6 May	40.8	48.9	38.7	48.9	-	-	40.3	48.4	40.6	47.3	39.8	48.8
Thursday 7 May	42.4	48.1	44.5	48.5	-	-	42.1	45.9	44.9	48.8	41.7	47.8
Friday 8 May	42.0	48.1	40.9	48.1	-	-	41.3	45.6	43.5	51.4	41.1	48.0
Saturday 9 May	40.2	50.6	41.4	48.0	-	-	41.7	51.7	41.5	49.9	39.3	46.0
Sunday 10 May	41.5	48.2	47.6	51.4	-	-	45.0	50.0	42.7	47.9	40.2	45.1
Monday 11 May	-	-	48.5	51.7	-	-	44.2	47.9	42.0	46.3	43.0	48.2
Tuesday 12 May	-	-	38.7	45.5	-	-	38.8	42.2	-	-	-	-
Median	**41.5**	**48.2**	**43.0**	**48.7**	**-**	**-**	**41.9**	**46.9**	**42.4**	**48.4**	**40.7**	**47.9**

Time and date	Profile of Noise Environment - Noise Monitoring Location											
	R1		R2		R3		R4		R5		R6	
Night 10:00:00 PM to 7:00:00 AM Date	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**	**L90 (10th Percentile)**	**LAeq**
Wednesday 6 May	41.7	47.2	46.8	52.0	-	-	42.7	46.9	44.2	49.1	39.7	43.6
Thursday 7 May	41.2	48.9	43.2	50.9	-	-	41.5	45.8	43.8	49.3	40.2	44.1
Friday 8 May	39.9	44.5	40.8	46.2	-	-	39.1	44.3	41.8	47.1	39.1	42.6
Saturday 9 May	42.5	49.1	48.1	50.7	-	-	43.9	49.3	42.7	49.9	39.8	47.1
Sunday 10 May	40.0	48.1	46.2	50.8	-	-	42.4	45.5	41.7	45.5	39.1	42.0
Monday 11 May	-	-	49.0	53.4	-	-	44.1	48.6	44.5	47.8	40.9	44.4
Tuesday 12 May	-	-	39.2	49.3	-	-	39.2	44.8	-	-	-	-
Median	**41.2**	**48.1**	**46.5**	**50.9**			**42.5**	**46.3**	**43.3**	**48.5**	**39.7**	**43.9**

Table 4 Summary of night time maximum noise levels

Time and date	Maximum Noise Environment - Noise Monitoring Location											
	R1		R2		R3		R4		R5		R6	
Date	**LAmax**	**LA1**	**LAmax**	**LA1**	**LAmax**	**LA1**	**LAmax**	**LA1**	**LAmax**	**LA1**	**LAmax**	**LA1**
Wednesday 6 May	78.3	63.3	76.5	64.3	-	-	77.7	61.3	72	61	64.3	54.8
Thursday 7 May	84.3	72.5	83.3	73.0	-	-	74.4	62.6	85.4	58.9	63.5	55.5
Friday 8 May	71.3	58.6	72.7	59.0	-	-	71.0	60.8	72.0	67.1	63.2	54.8
Saturday 9 May	81.7	69.1	76.3	59.6	-	-	70.9	63.5	72.0	65.9	71.8	60.8
Sunday 10 May	87.6	64.7	84.6	63.5	-	-	70.3	59.3	72.0	58.1	66.0	53.2
Monday 11 May	-	-	83.2	63.5	-	-	71.2	60.2	68.7	54.2	72.8	56.4
Tuesday 12 May	-	-	75.8	63.5	-	-	71.1	59.7	-	-	-	-
Median	**81.7**	**64.7**	**78.2**	**63.5**	**-**	**-**	**71.2**	**61.1**	**72**	**60.0**	**65.2**	**55.2**

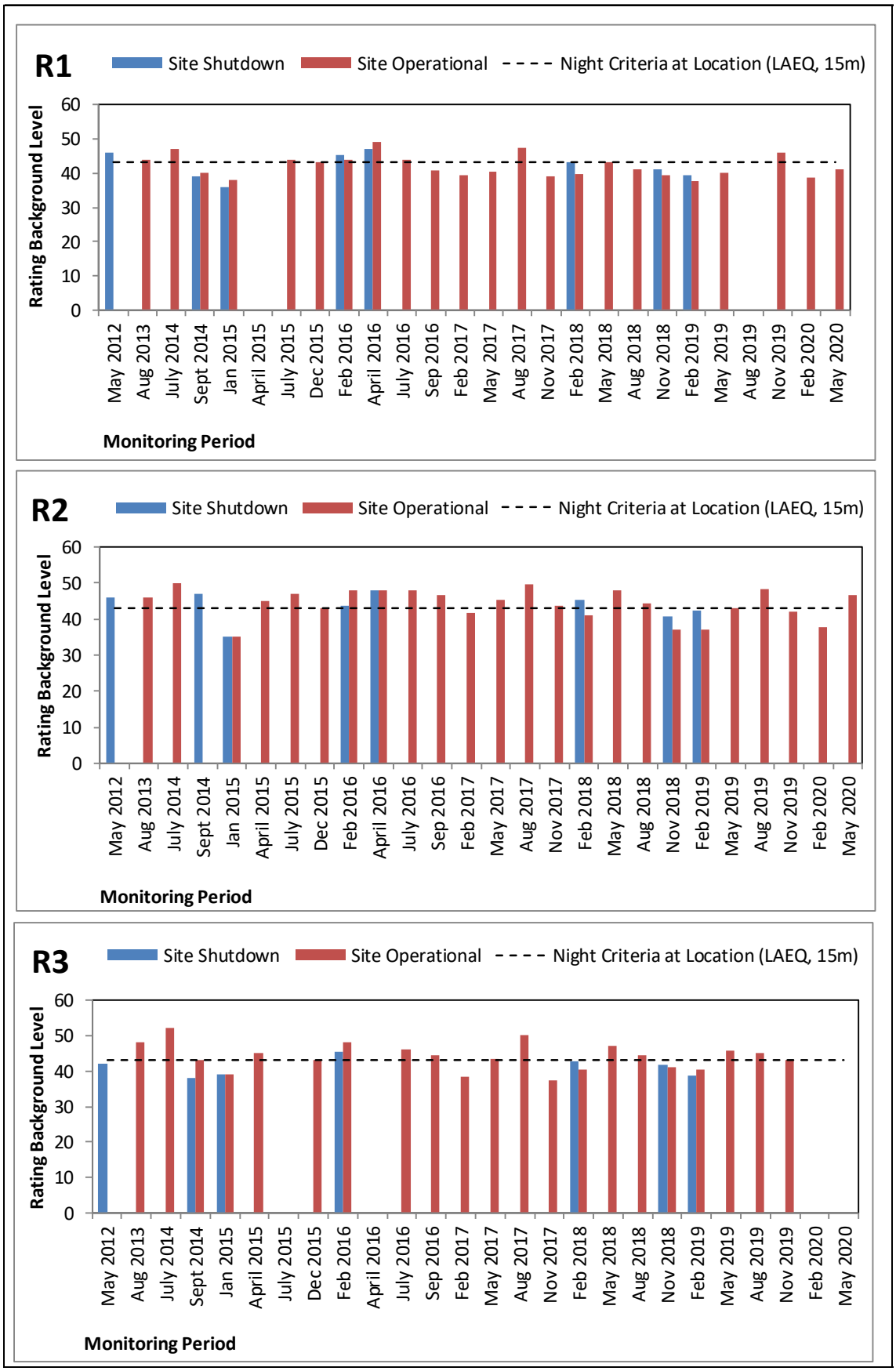


Figure 3-3: Comparison of background noise levels at R1 – R3

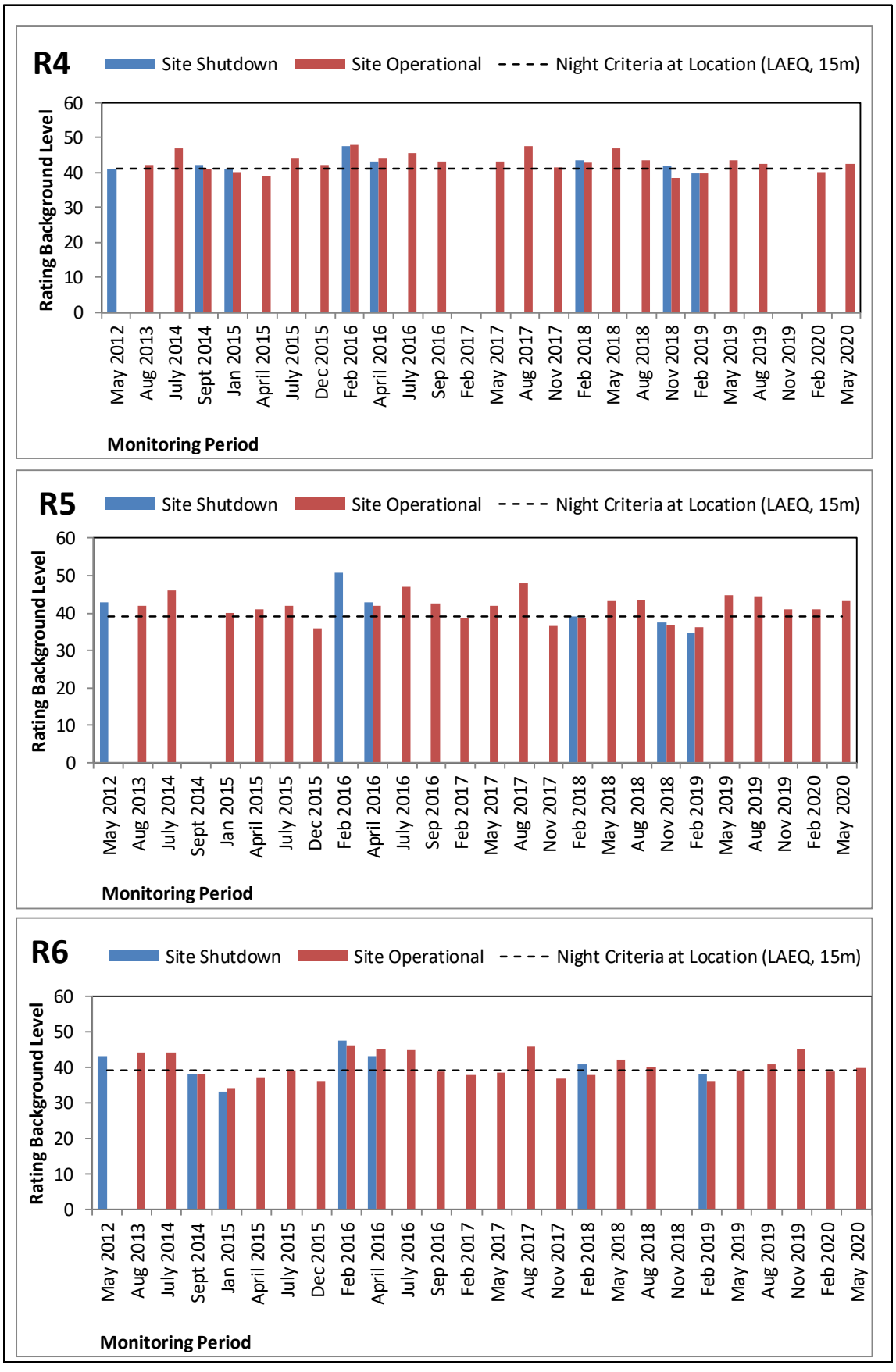


Figure 3-4: Comparison of background noise levels at R4 – R6

4. Summary

The results of the May 2020 quarterly noise survey demonstrate that the L_{Aeq} measured noise levels in the vicinity of the paper mill exceeded the EPL criteria for day, evening, and night time. The maximum recorded noise levels at each monitoring location exceeded the EPL criteria of 55 dB(A) for this assessment parameter at all receiver locations.

When compared to other seasonal results for similar times during the year, the measured L_{A90} noise levels from the latest monitoring data are on par with previous surveys.

From the May 2020 quarterly monitoring the following conclusions may be drawn:

- The most recent noise monitoring results indicate that the measured L_{Aeq} noise levels are higher than the L_{Aeq} criteria and are slightly lower than the long term series of data for corresponding seasonal measurement periods.

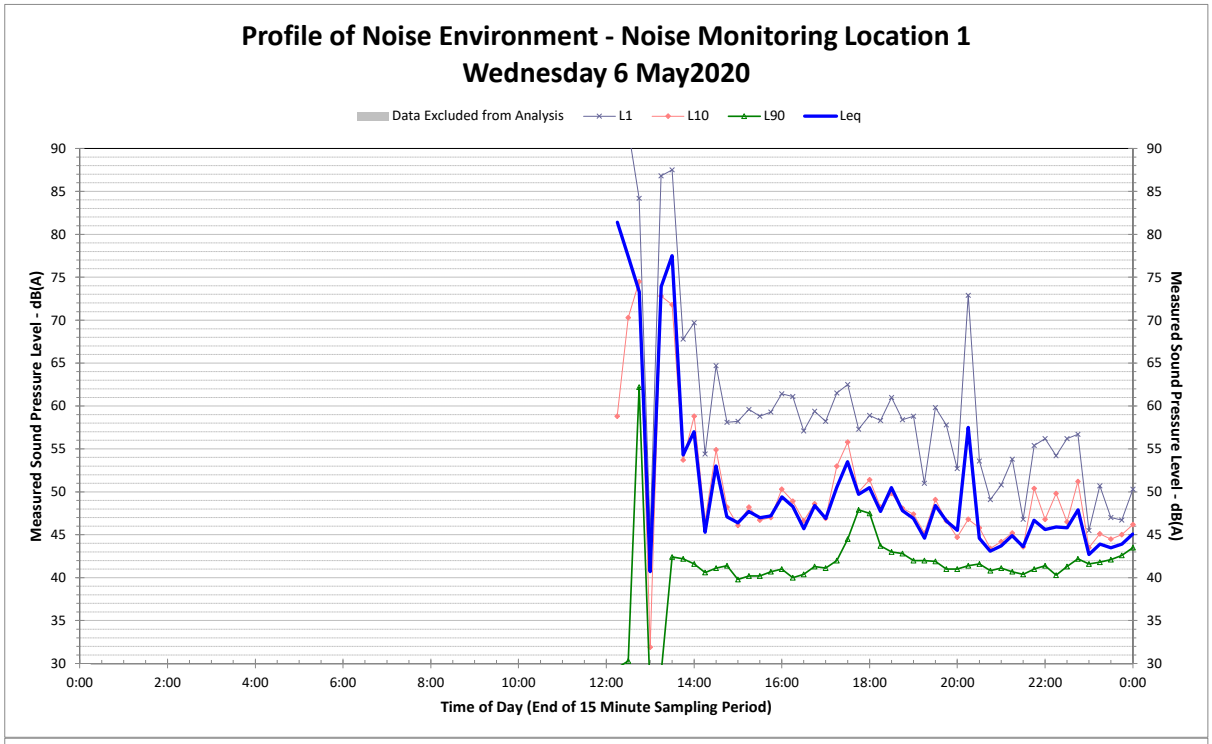
- The ambient noise environment in the local area is a product of the combined influence of all noise sources within the Port Botany area including the Opal site when operational.

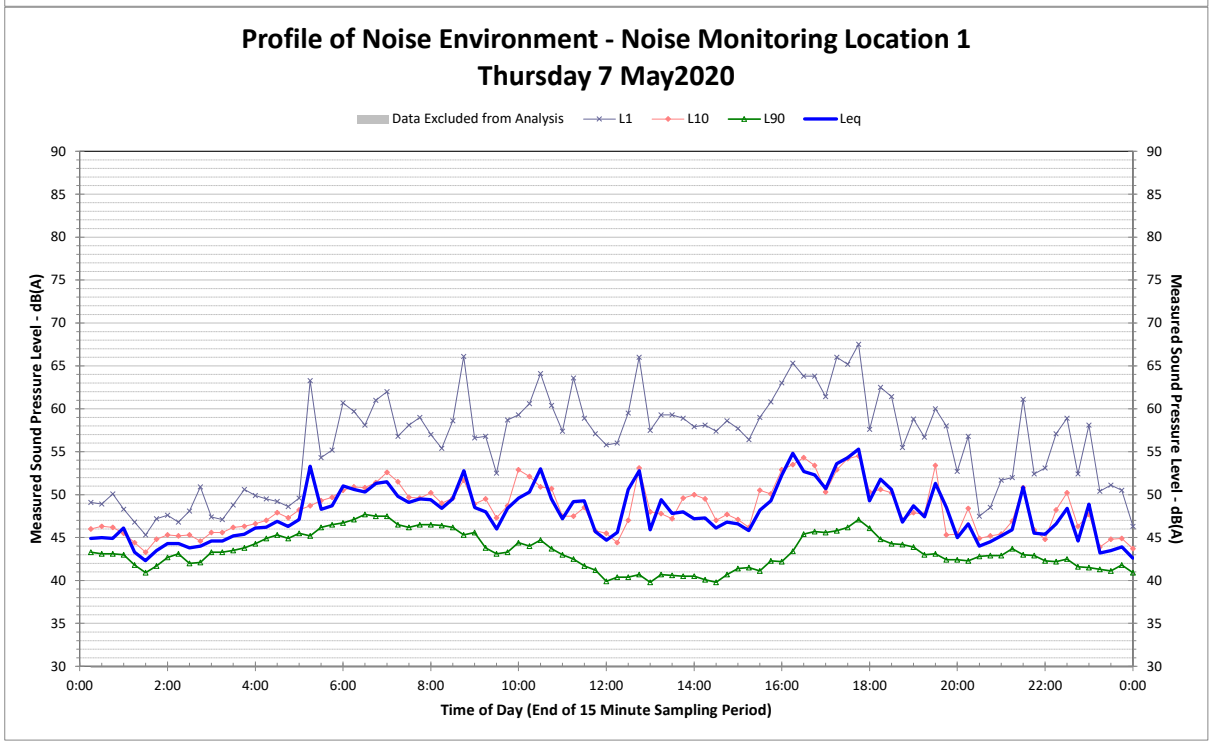
- L_{Aeq} and maximum noise levels recorded during the survey period are generally unrelated to the normal operation of the Opal site. The L_{Amax} and L_{A1} for the May noise monitoring demonstrate lower levels than previous surveys.

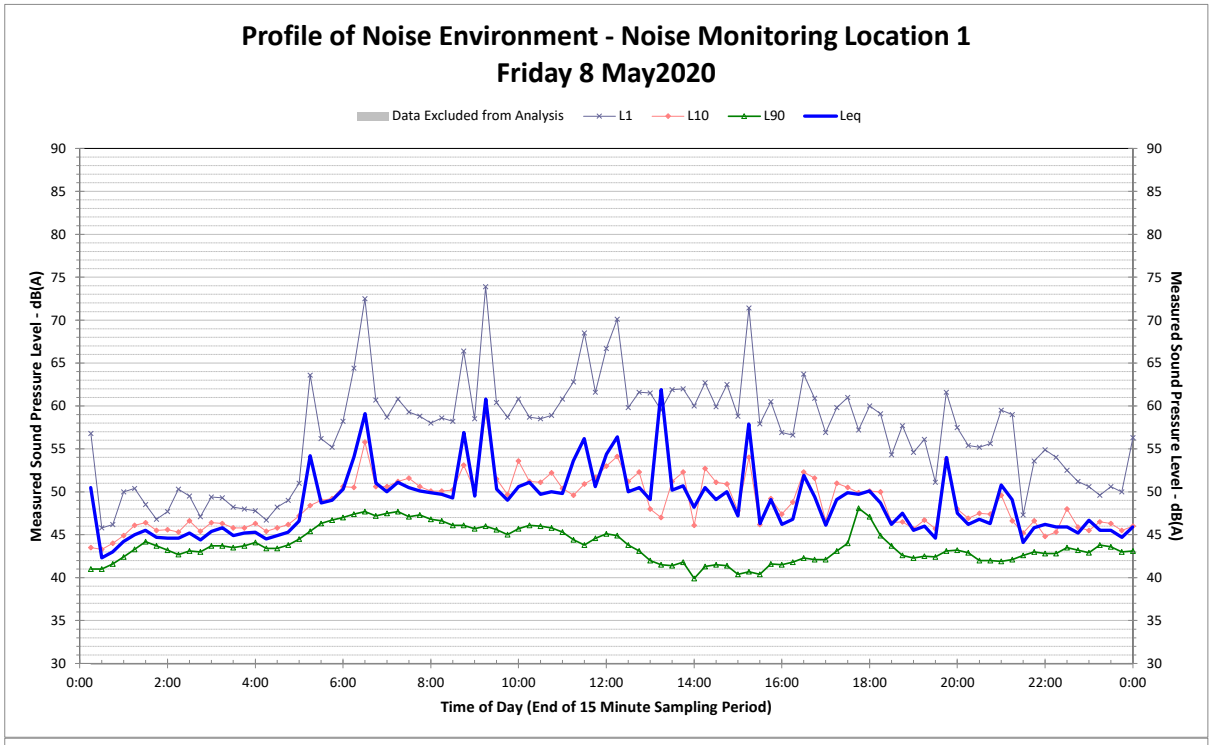
- The resultant wind vector was from the north west with dominant wind from the north-north west. These winds occured for over 30% of the time with other westerly wind directions accounting for the balance of the observations.

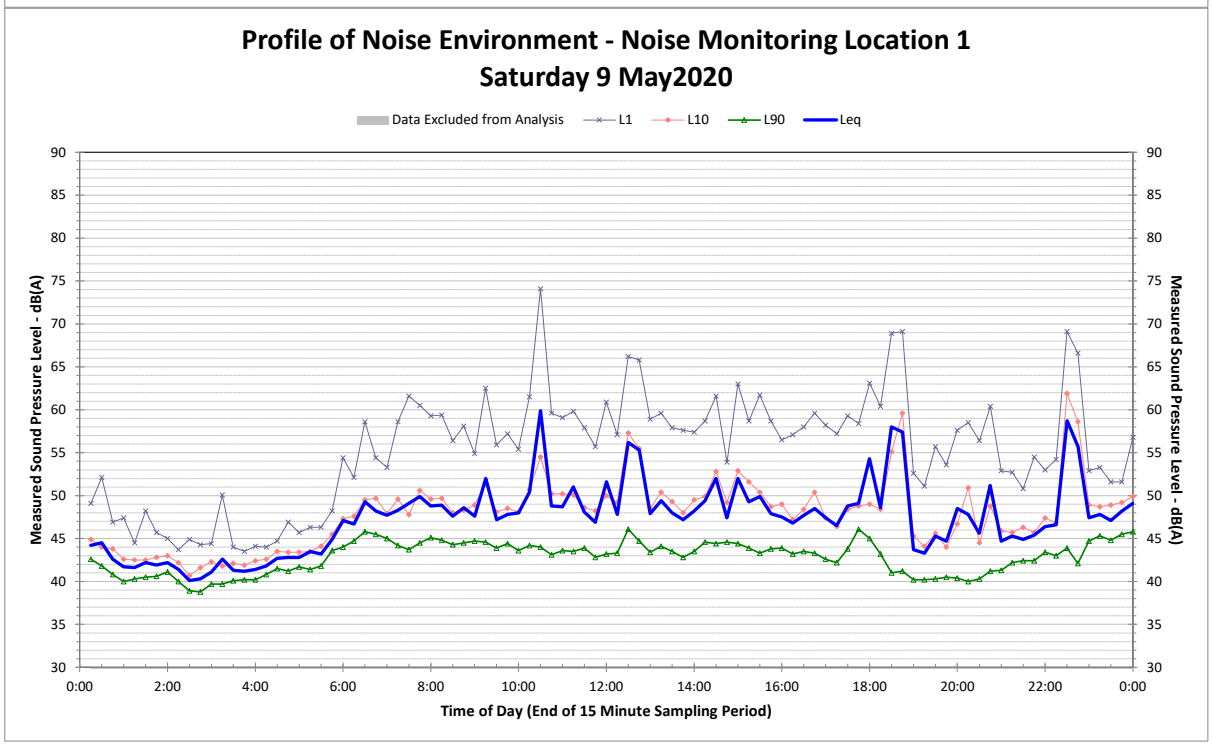
- Wind speeds exceeding 5 ms^{-1} were recorded for about 30% of the time during the monitoring period. These weather patterns tend to enhance road traffic noise from local road network to the west of the Opal site.

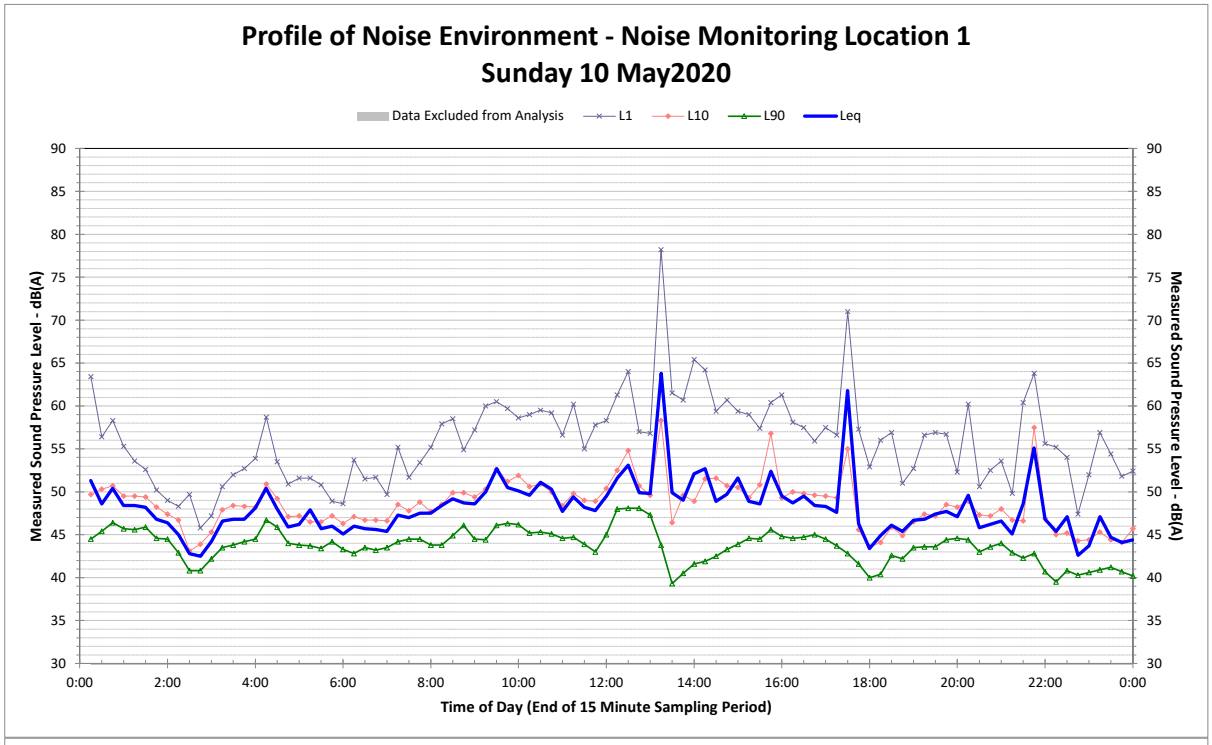
Appendix A. Noise logger graphs






Profile of Noise Environment - Noise Monitoring Location 1
Friday 8 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 1
Saturday 9 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 1
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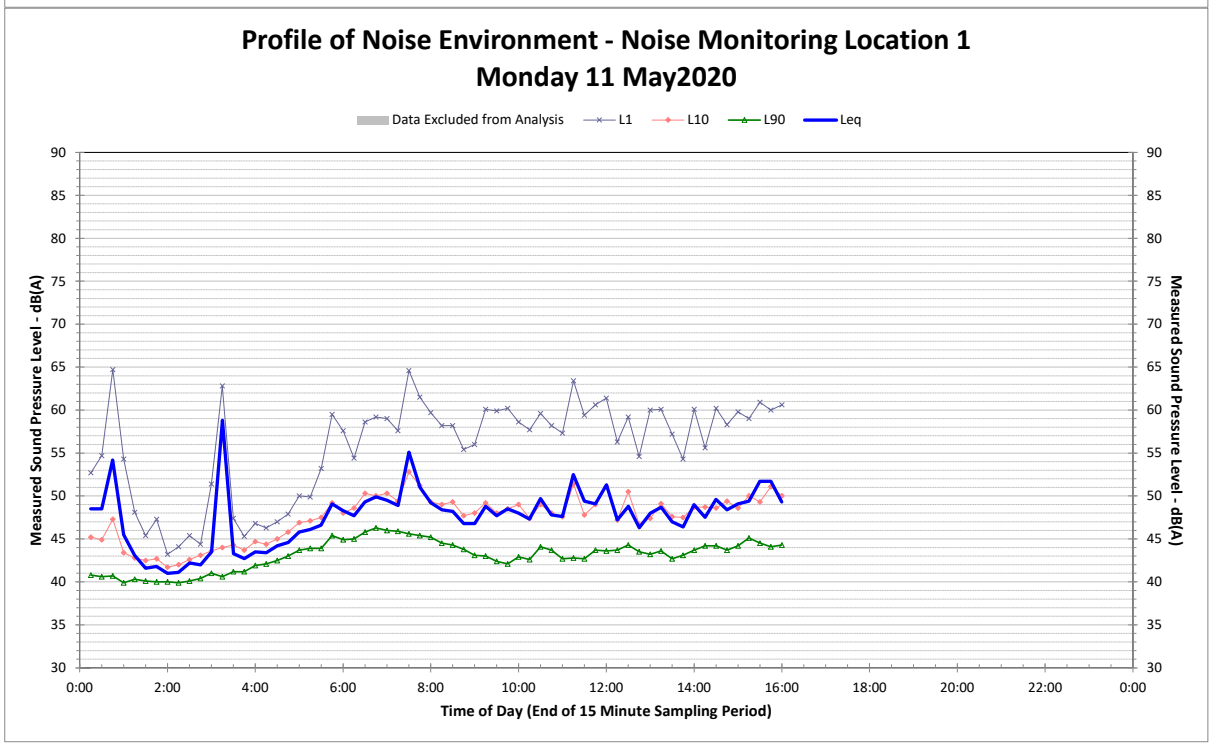
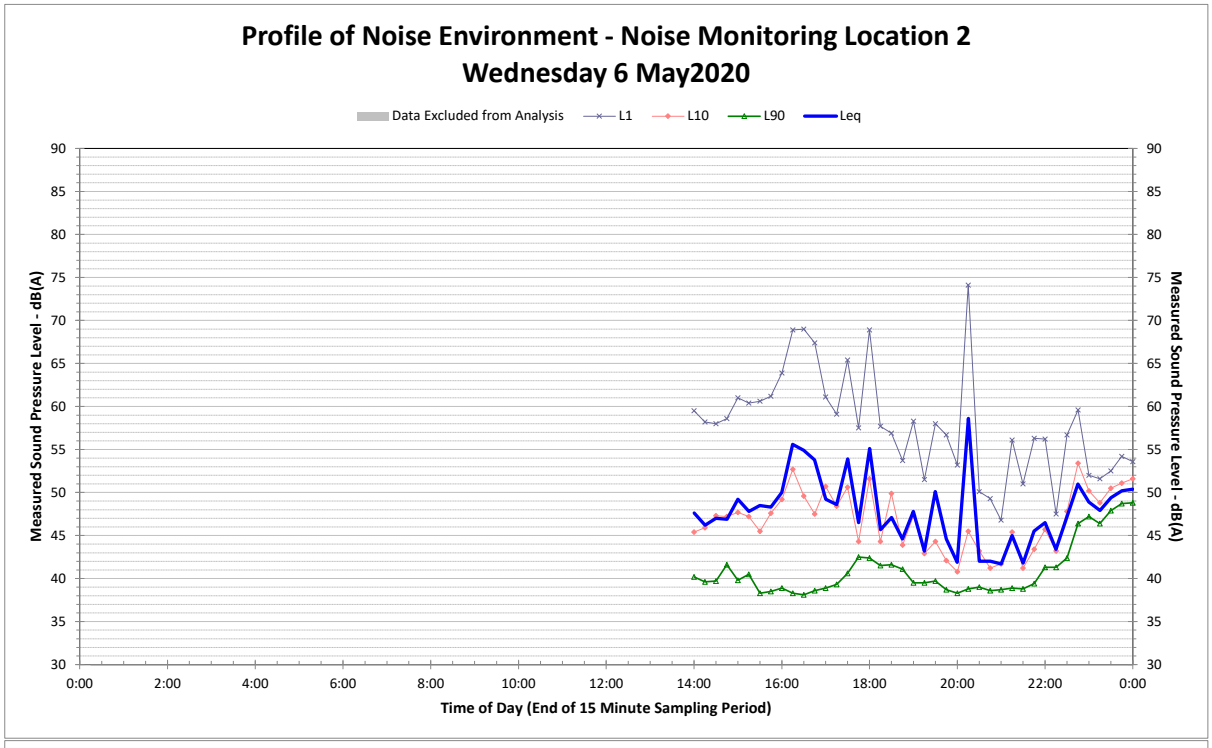
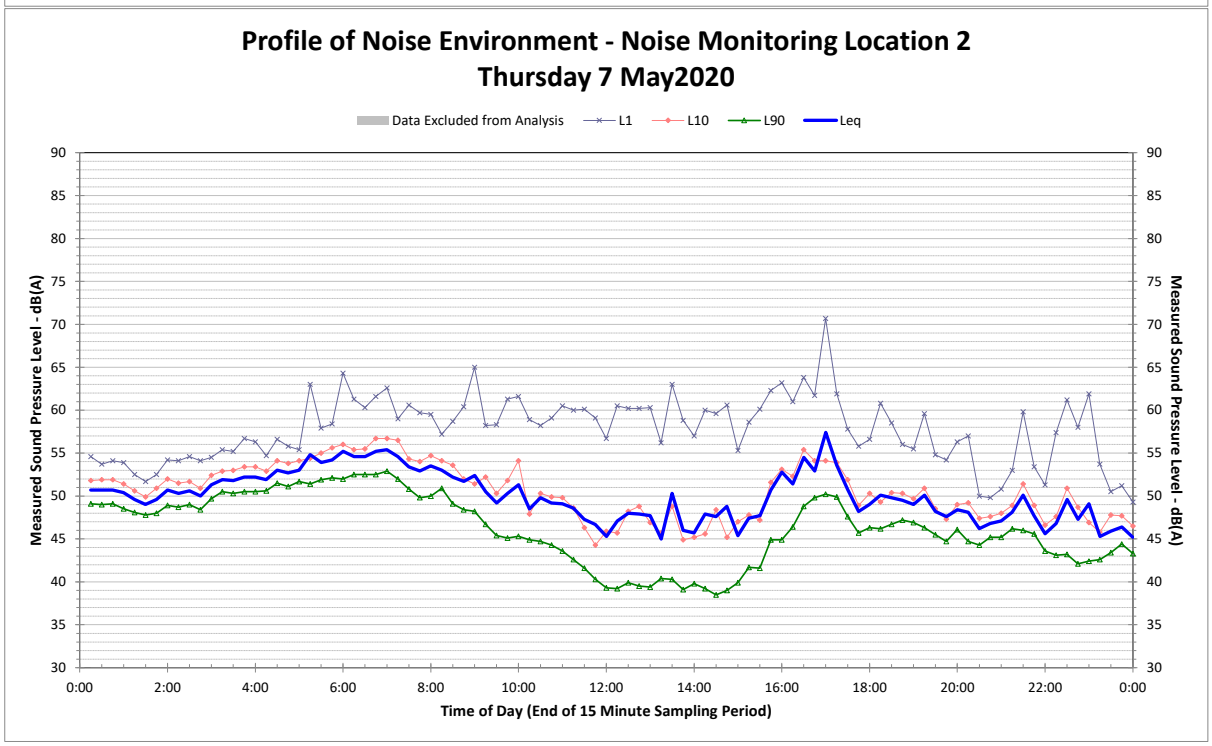
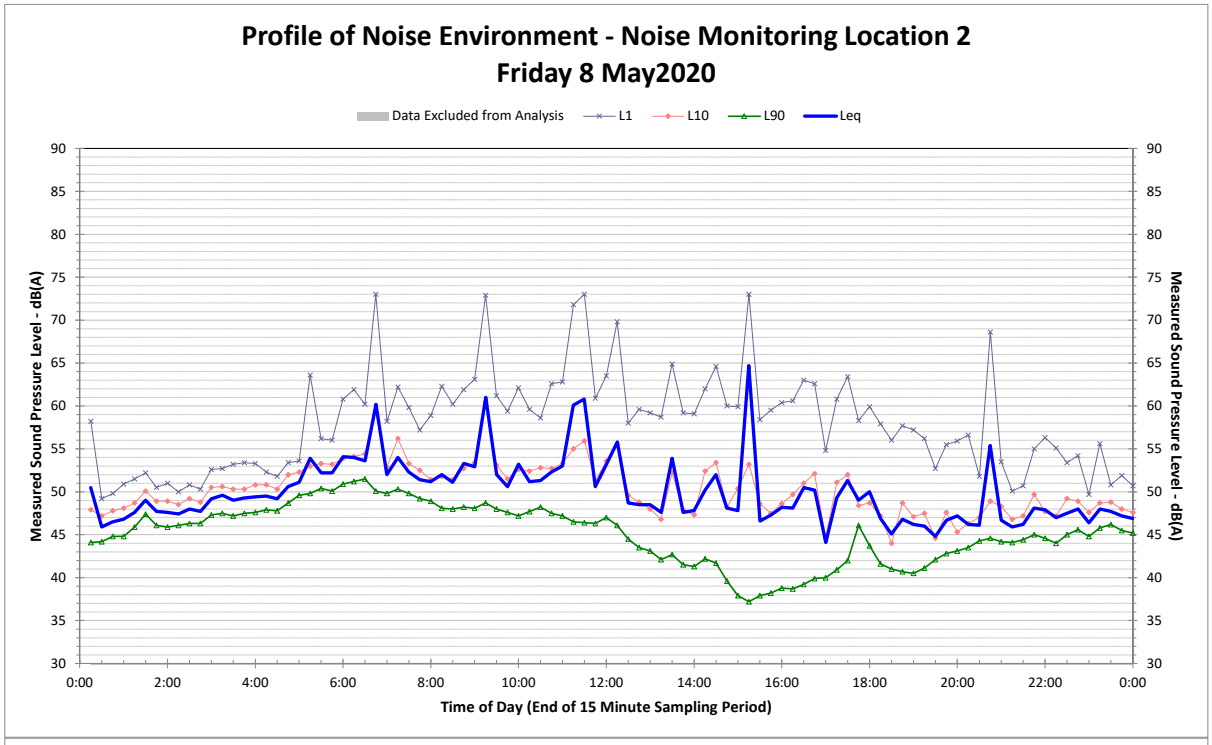
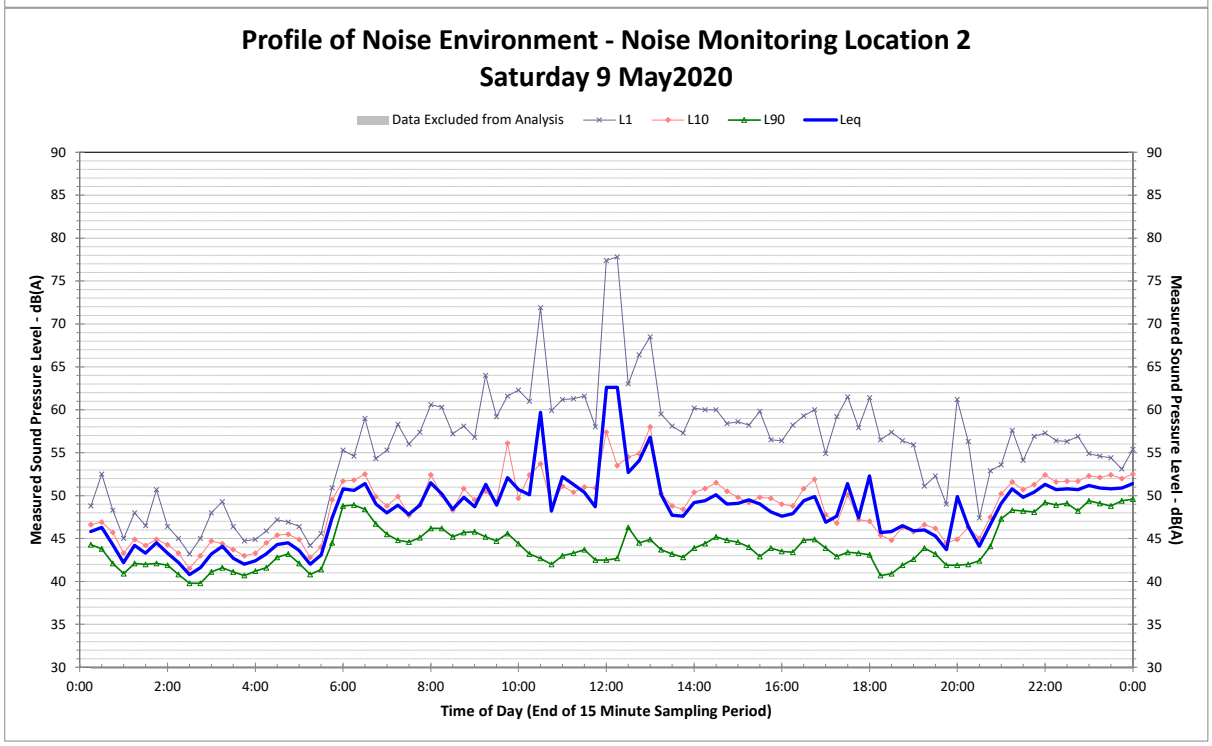
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

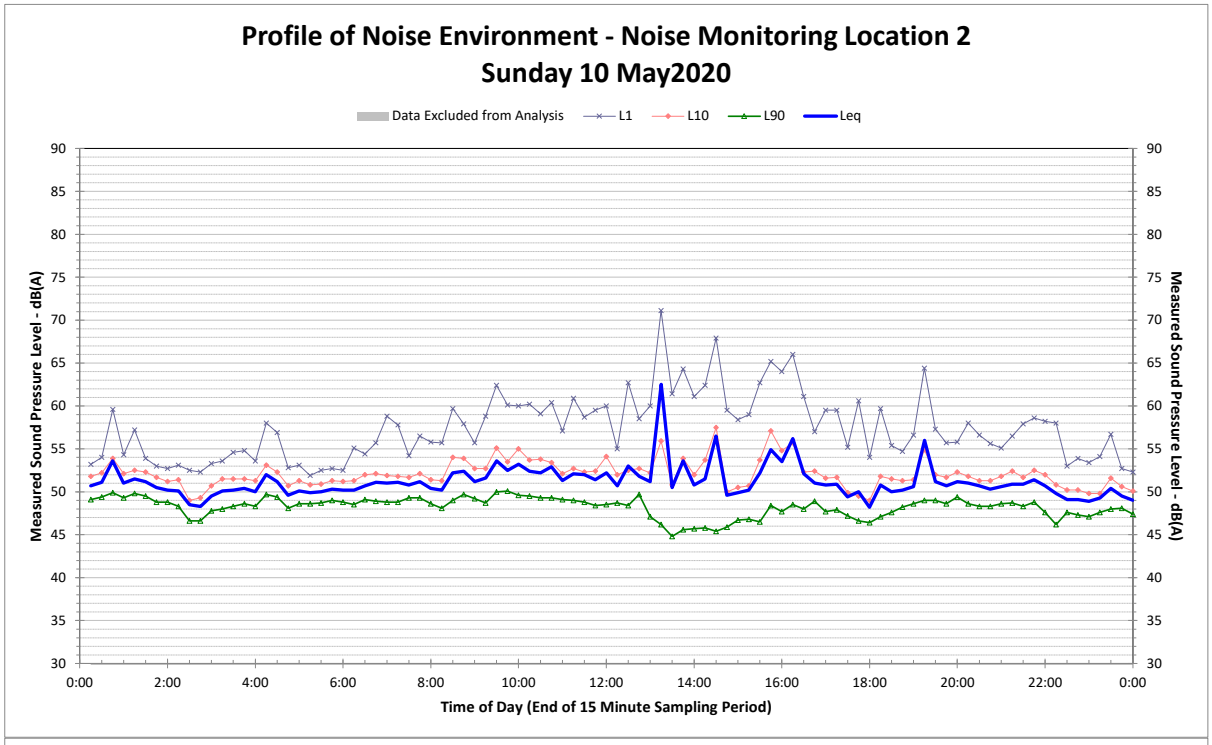

Profile of Noise Environment - Noise Monitoring Location 1
Monday 11 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

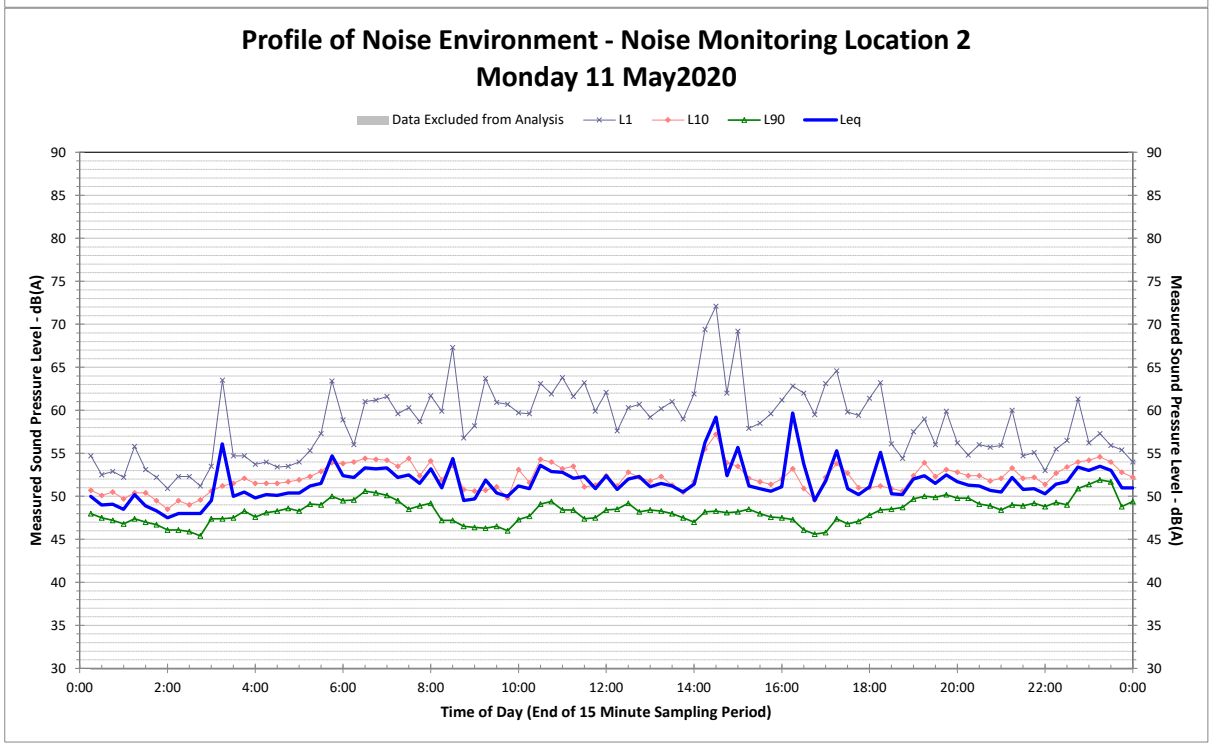

Profile of Noise Environment - Noise Monitoring Location 2
Wednesday 6 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

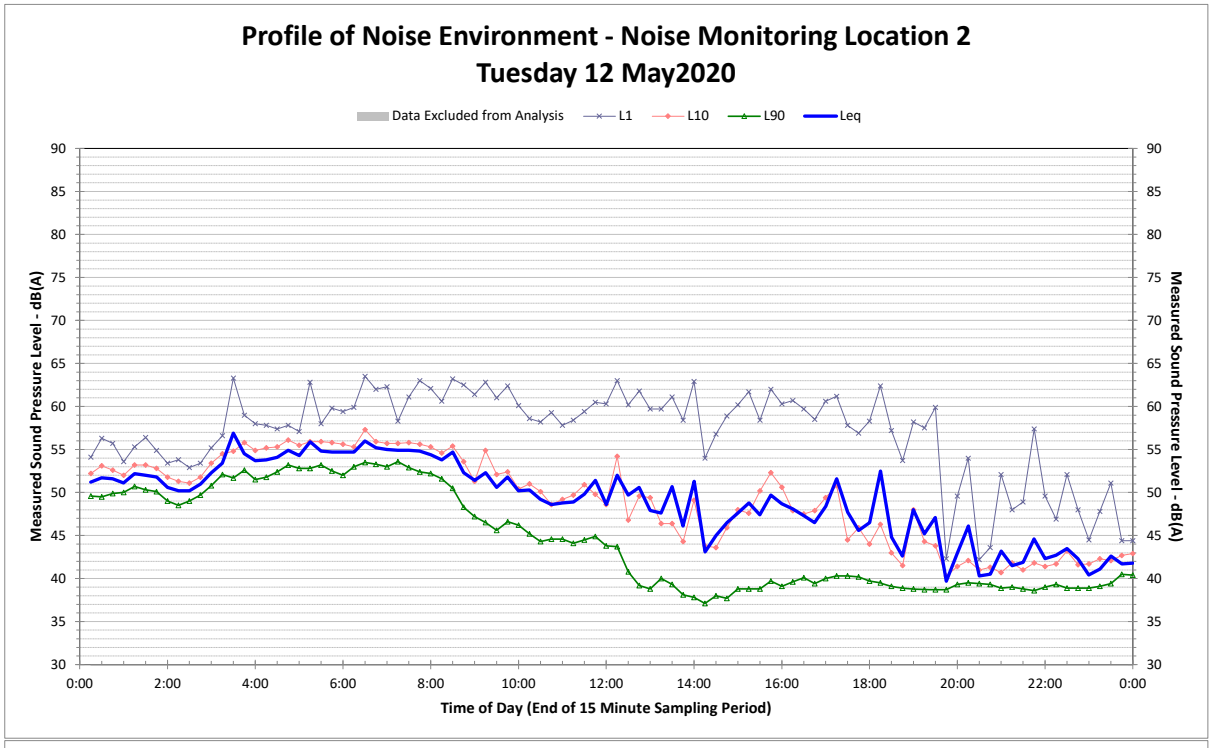

Profile of Noise Environment - Noise Monitoring Location 2
Thursday 7 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

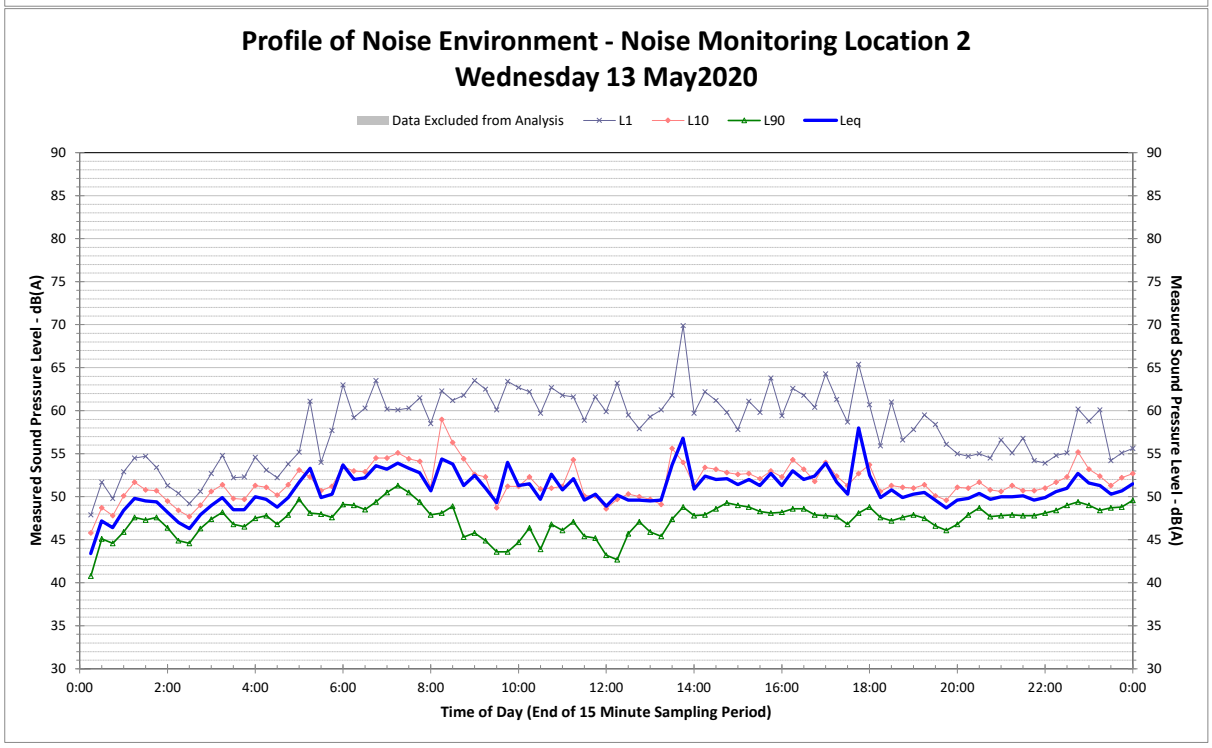

Profile of Noise Environment - Noise Monitoring Location 2
Friday 8 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

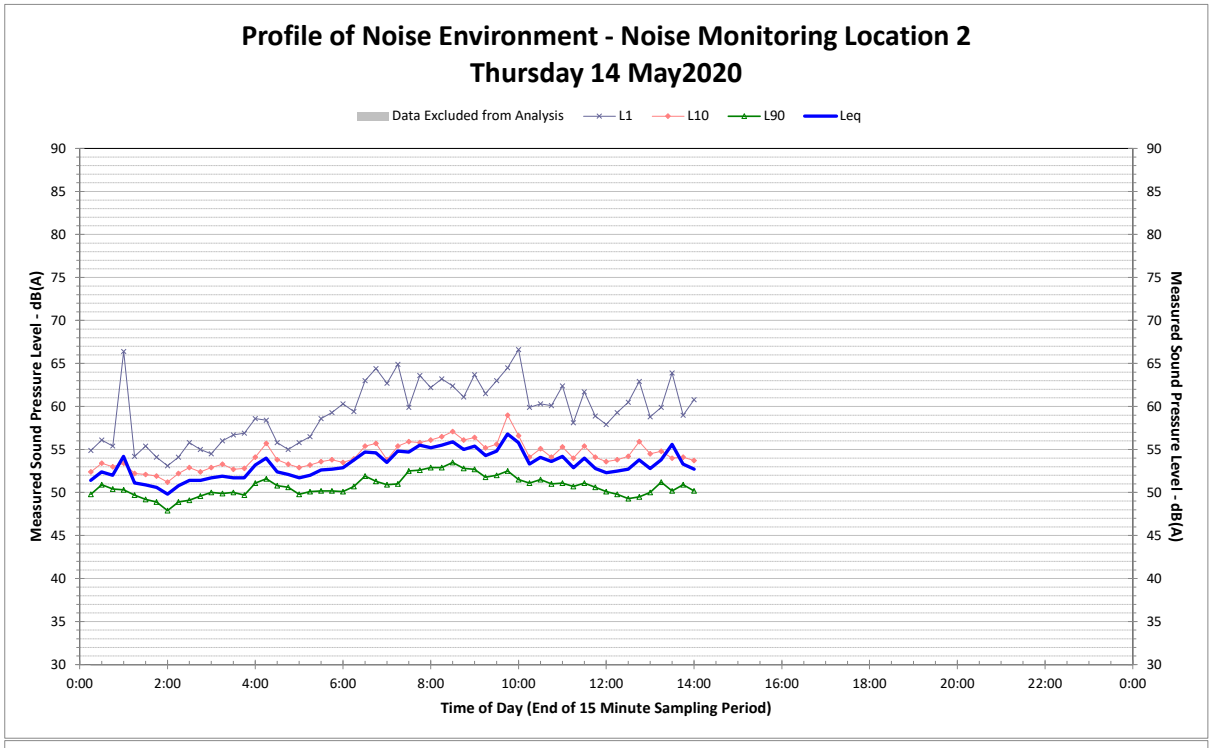

Profile of Noise Environment - Noise Monitoring Location 2
Saturday 9 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

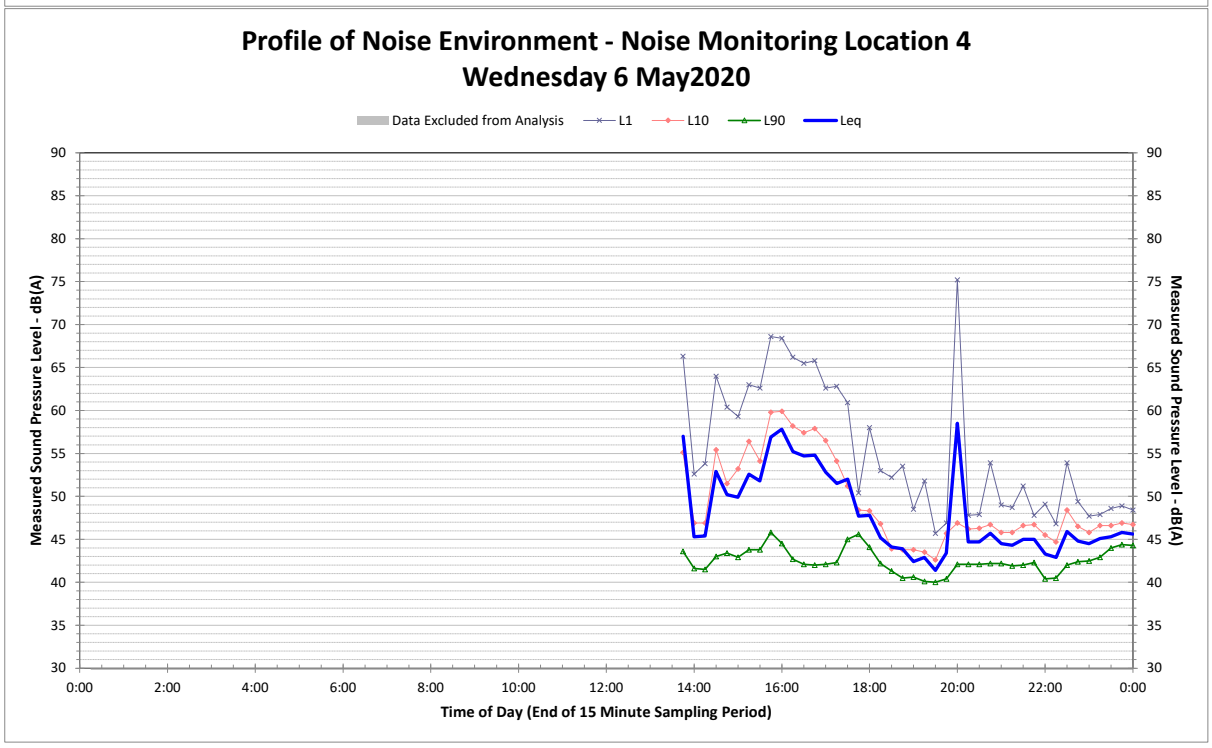

Profile of Noise Environment - Noise Monitoring Location 2
Sunday 10 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

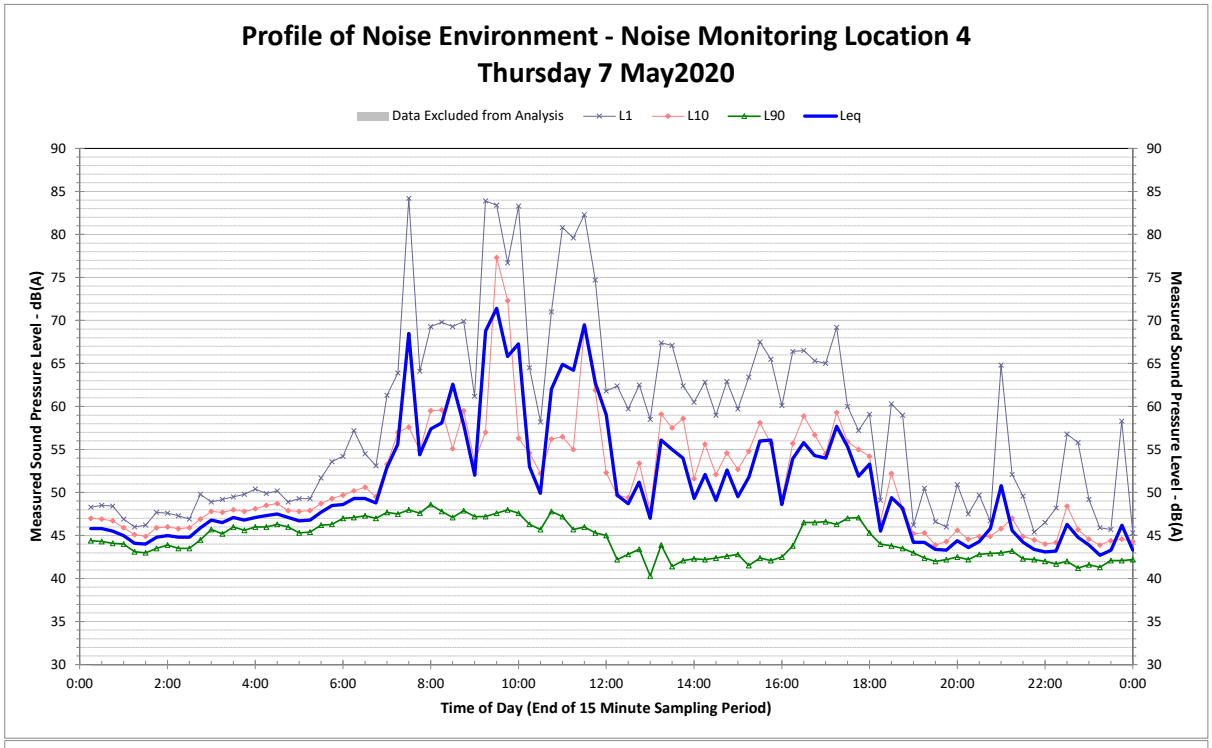

Profile of Noise Environment - Noise Monitoring Location 2
Monday 11 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

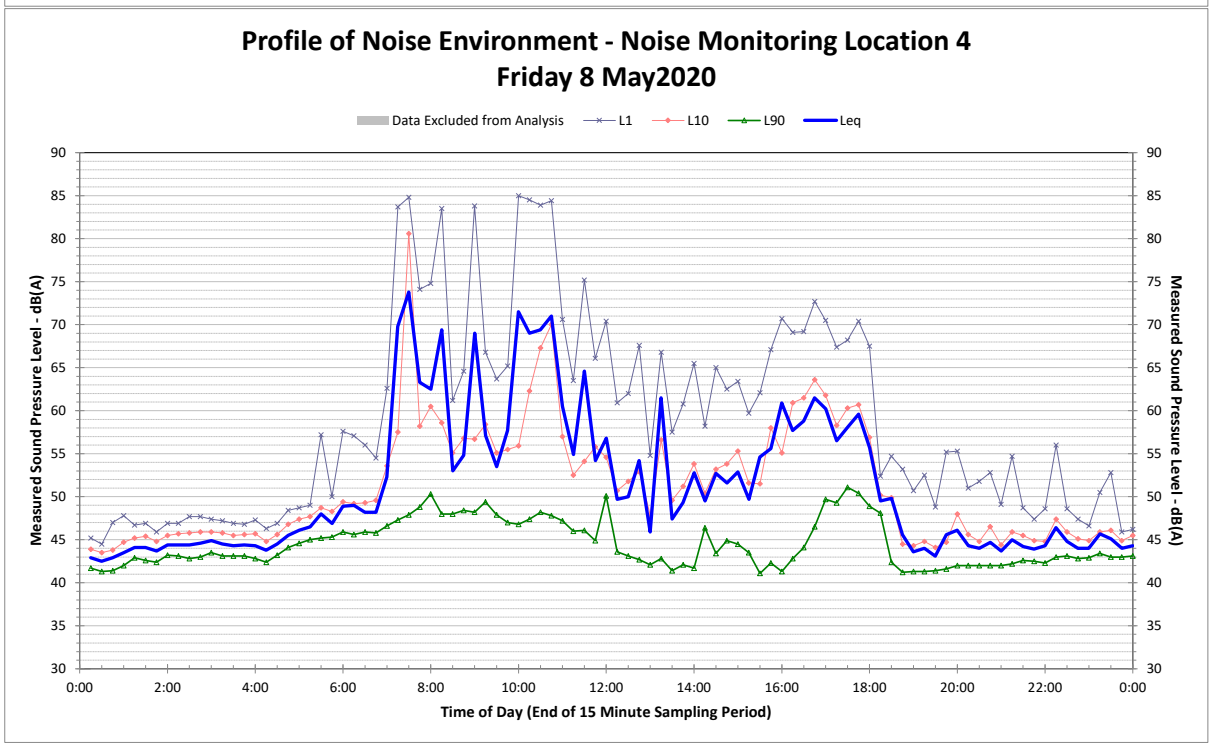

Profile of Noise Environment - Noise Monitoring Location 2
Tuesday 12 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

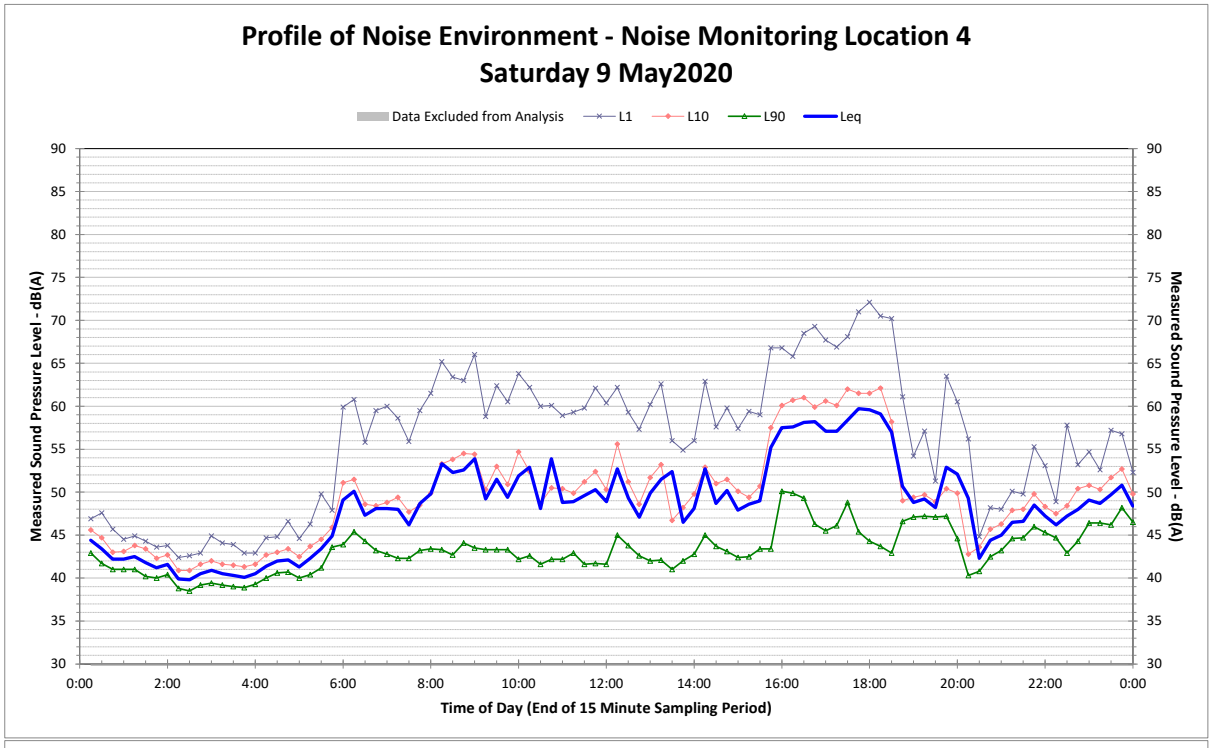

Profile of Noise Environment - Noise Monitoring Location 2
Wednesday 13 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

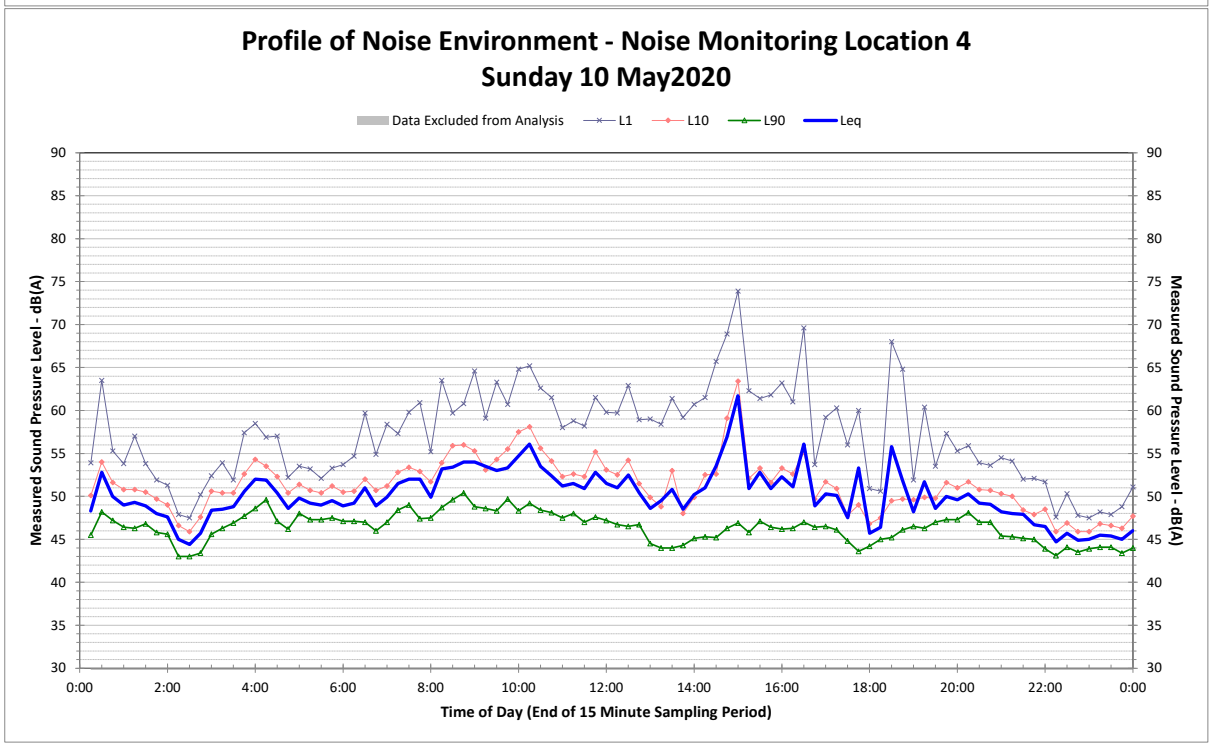

Profile of Noise Environment - Noise Monitoring Location 2
Thursday 14 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

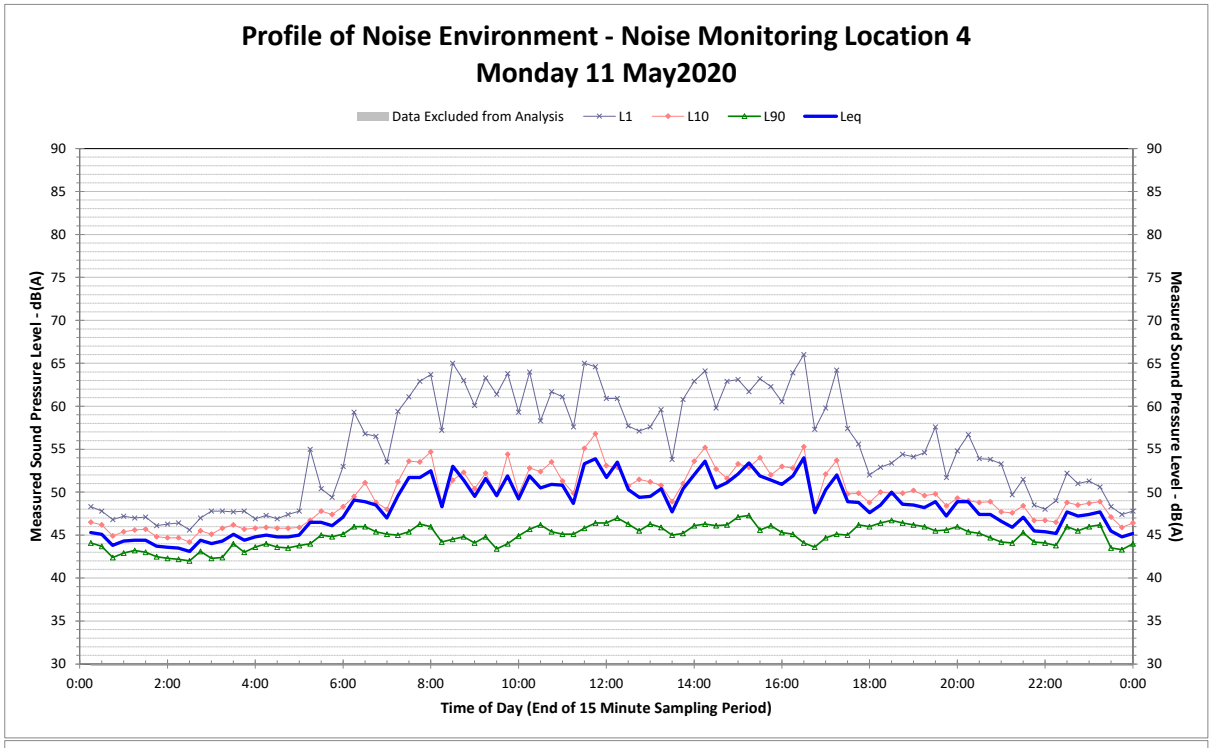

Profile of Noise Environment - Noise Monitoring Location 4
Wednesday 6 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

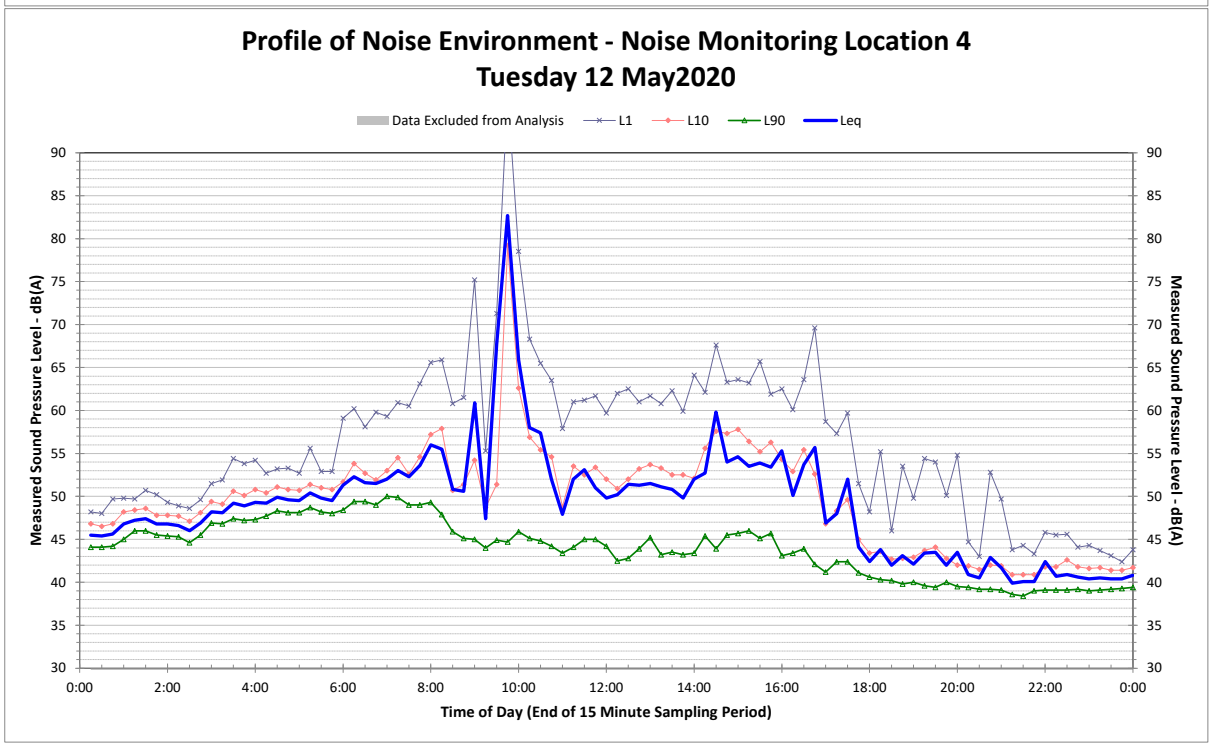

Profile of Noise Environment - Noise Monitoring Location 4
Thursday 7 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

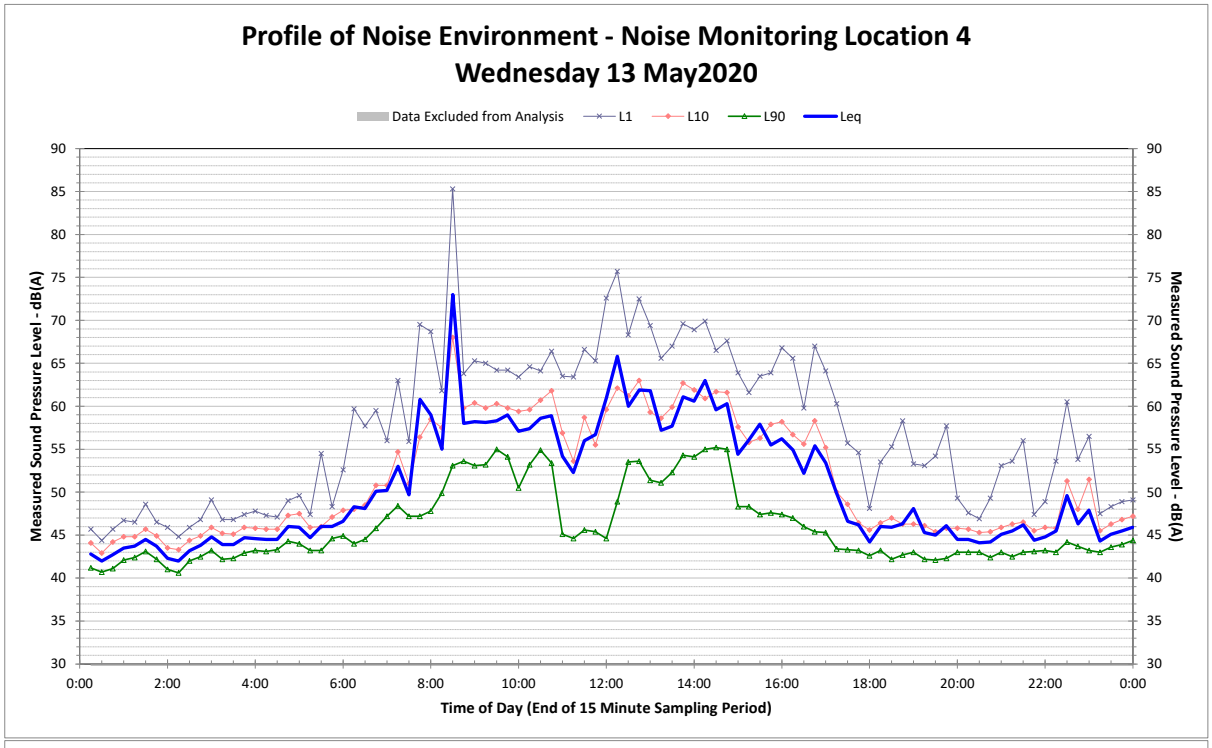

Profile of Noise Environment - Noise Monitoring Location 4
Friday 8 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

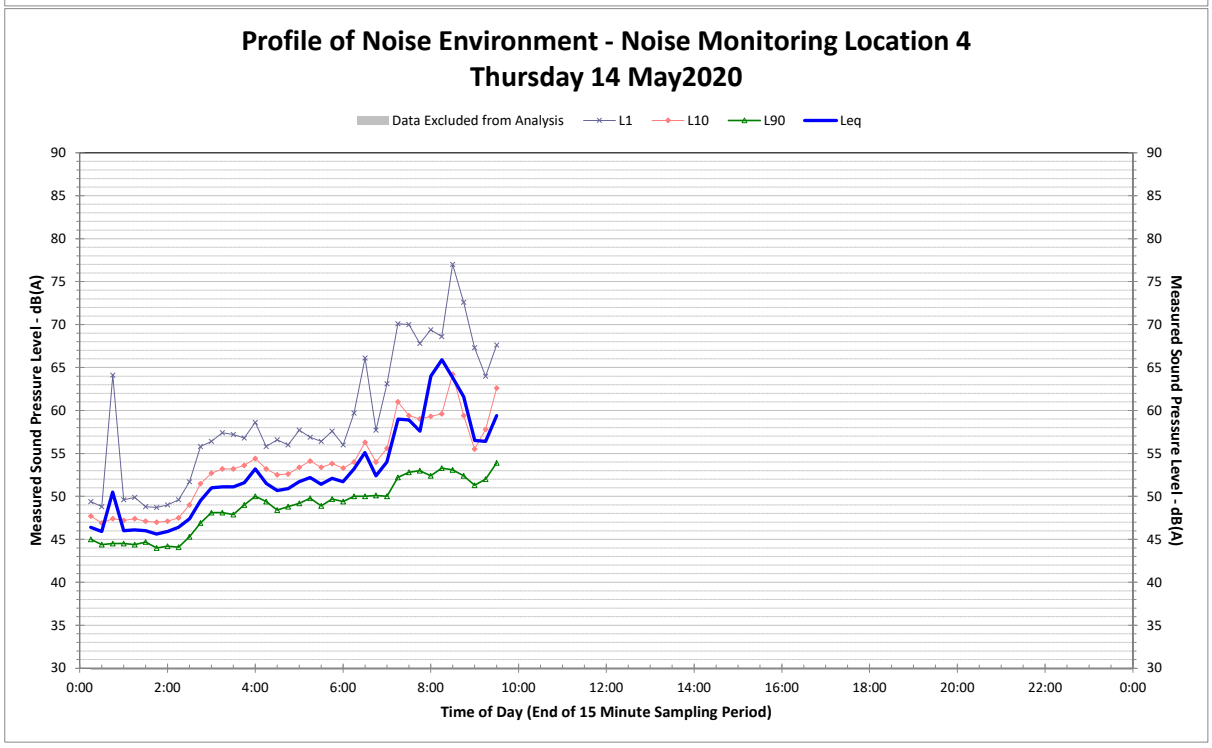

Profile of Noise Environment - Noise Monitoring Location 4
Saturday 9 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

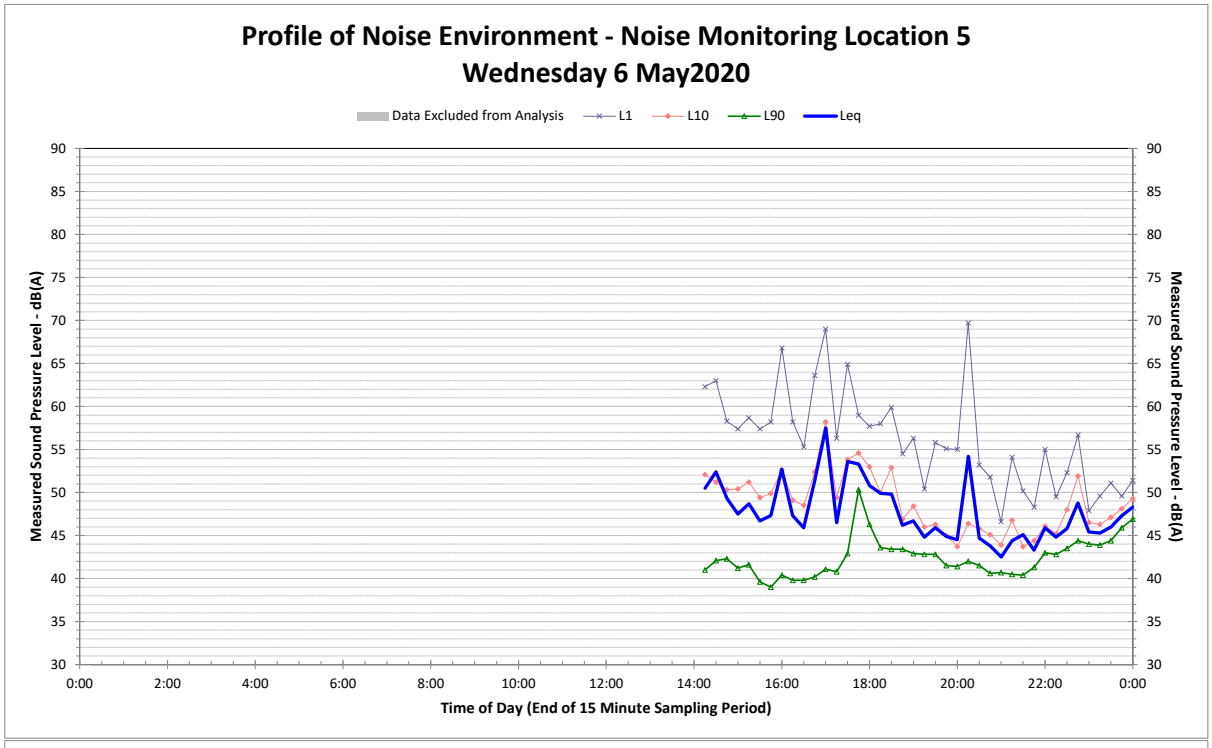

Profile of Noise Environment - Noise Monitoring Location 4
Sunday 10 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

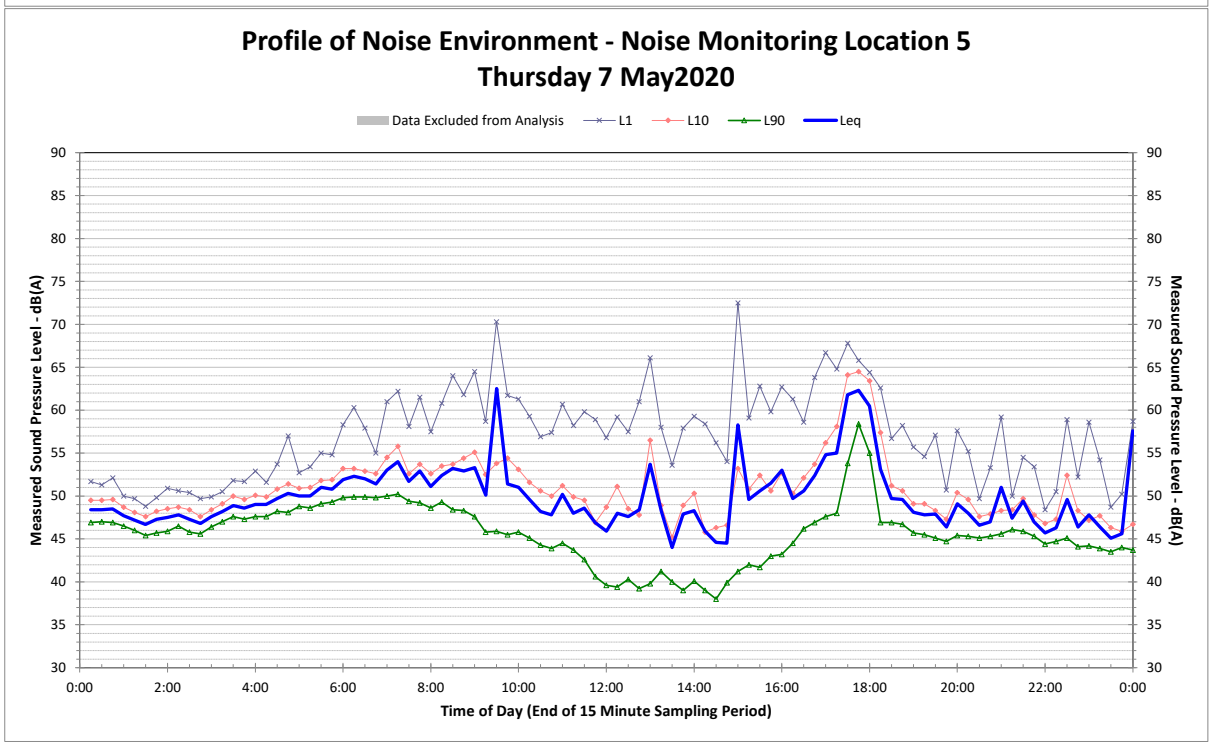

Profile of Noise Environment - Noise Monitoring Location 4
Monday 11 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

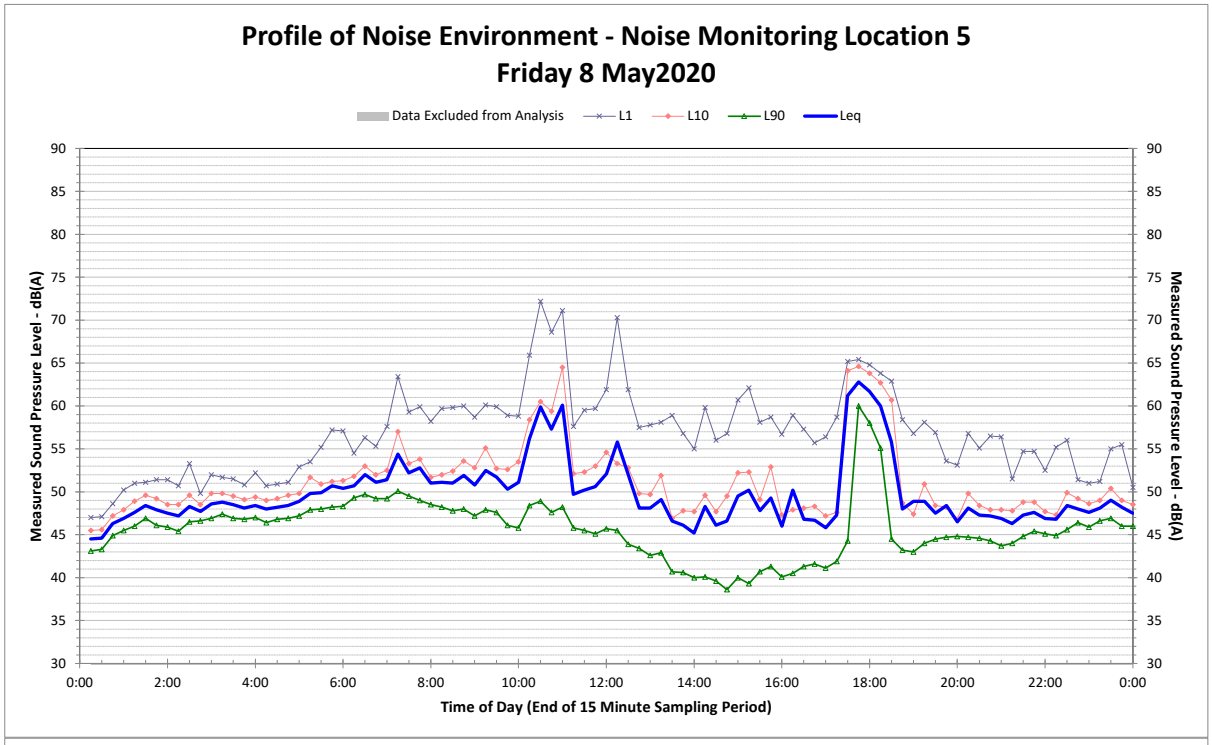

Profile of Noise Environment - Noise Monitoring Location 4
Tuesday 12 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

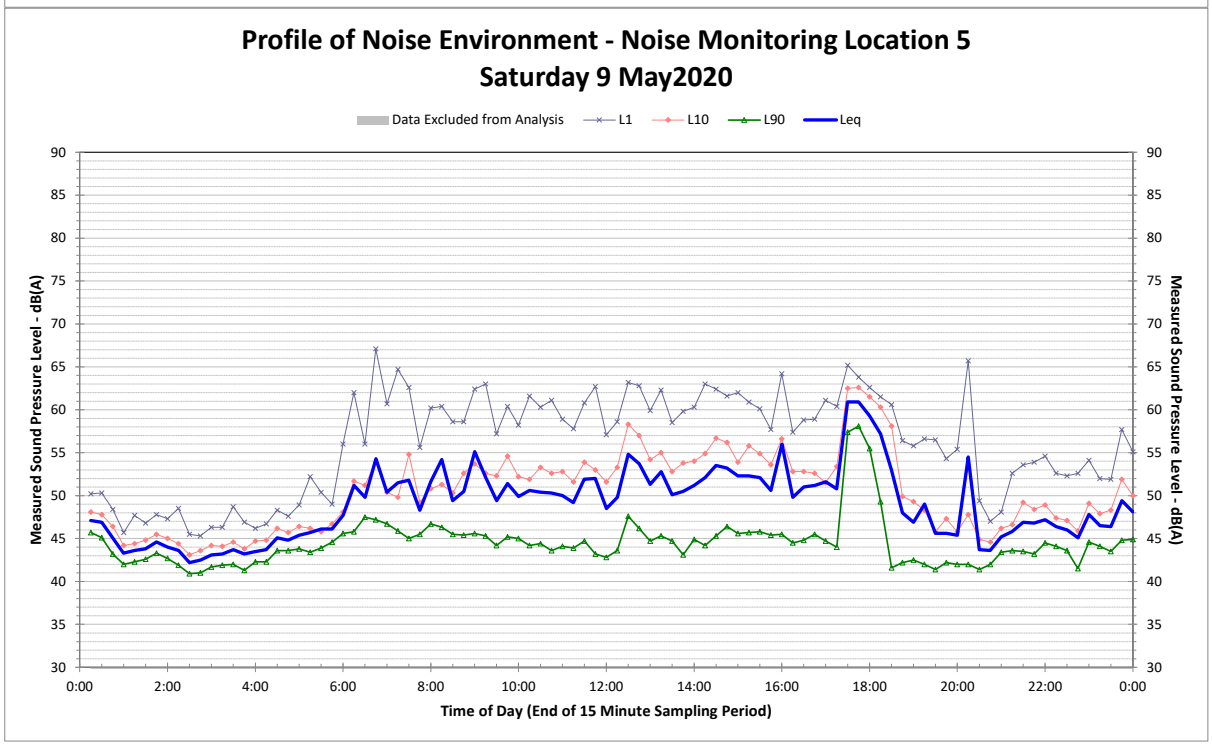

Profile of Noise Environment - Noise Monitoring Location 4
Wednesday 13 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

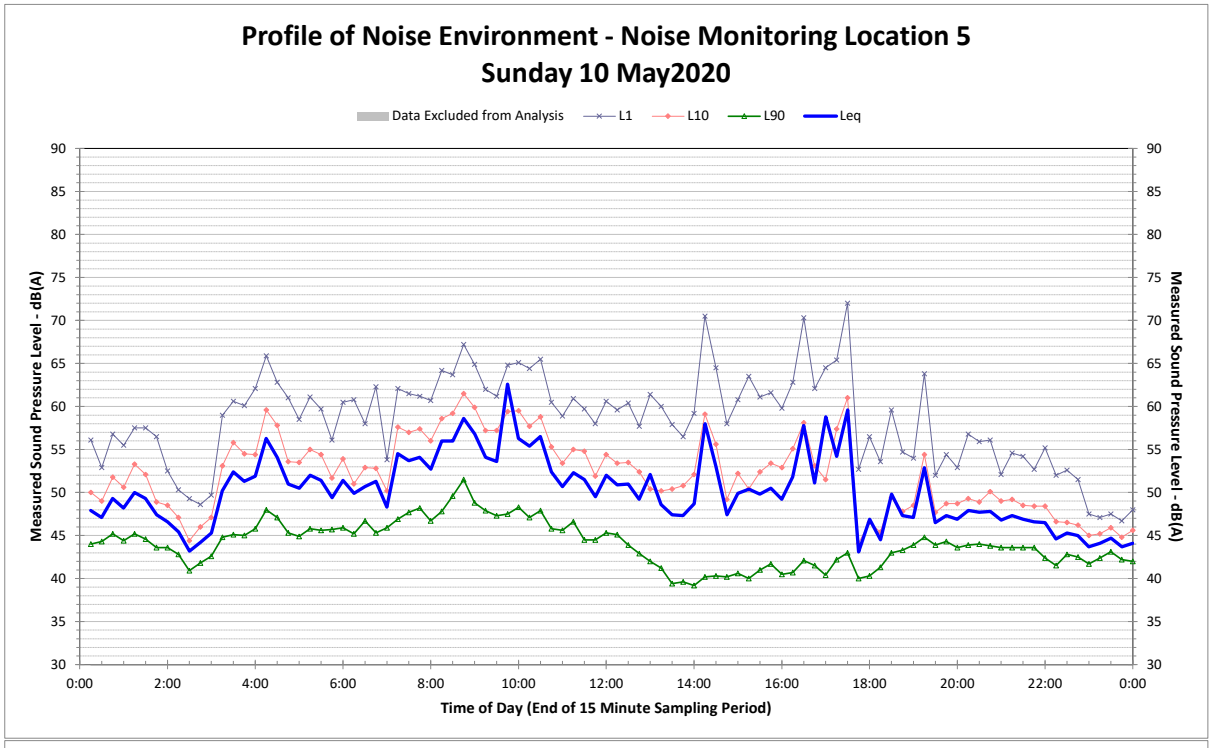

Profile of Noise Environment - Noise Monitoring Location 4
Thursday 14 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

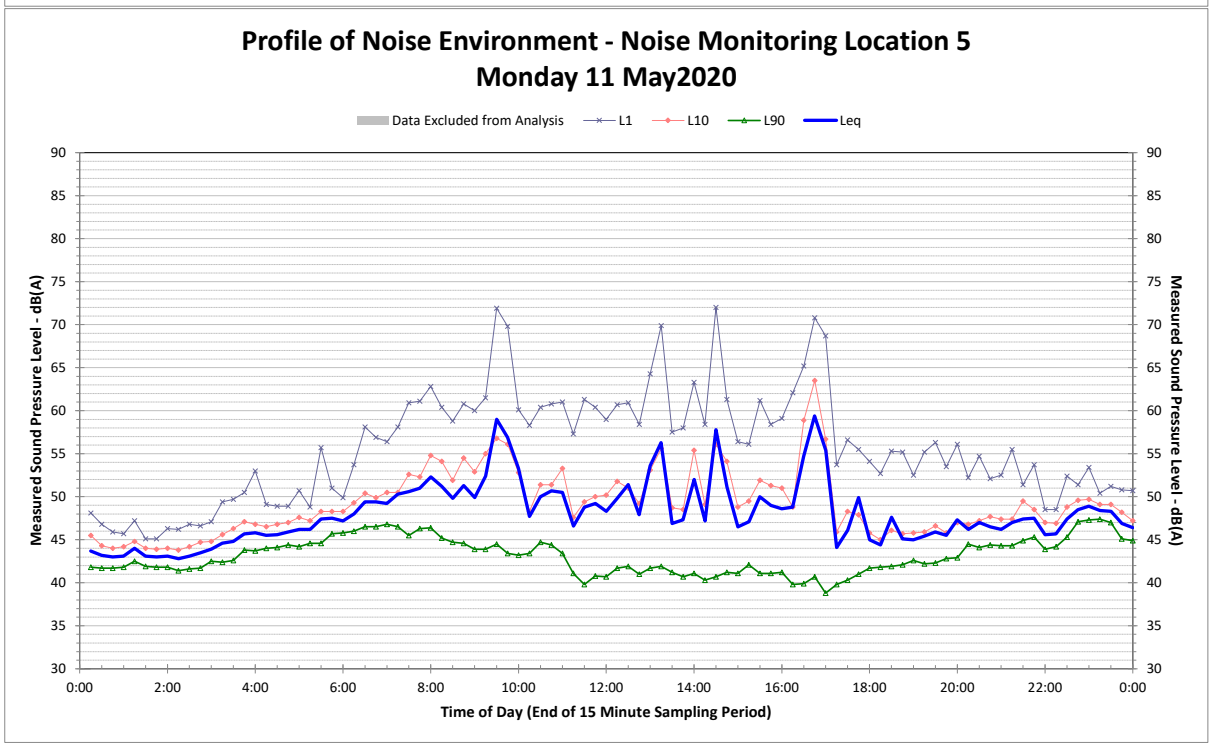

Profile of Noise Environment - Noise Monitoring Location 5
Wednesday 6 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

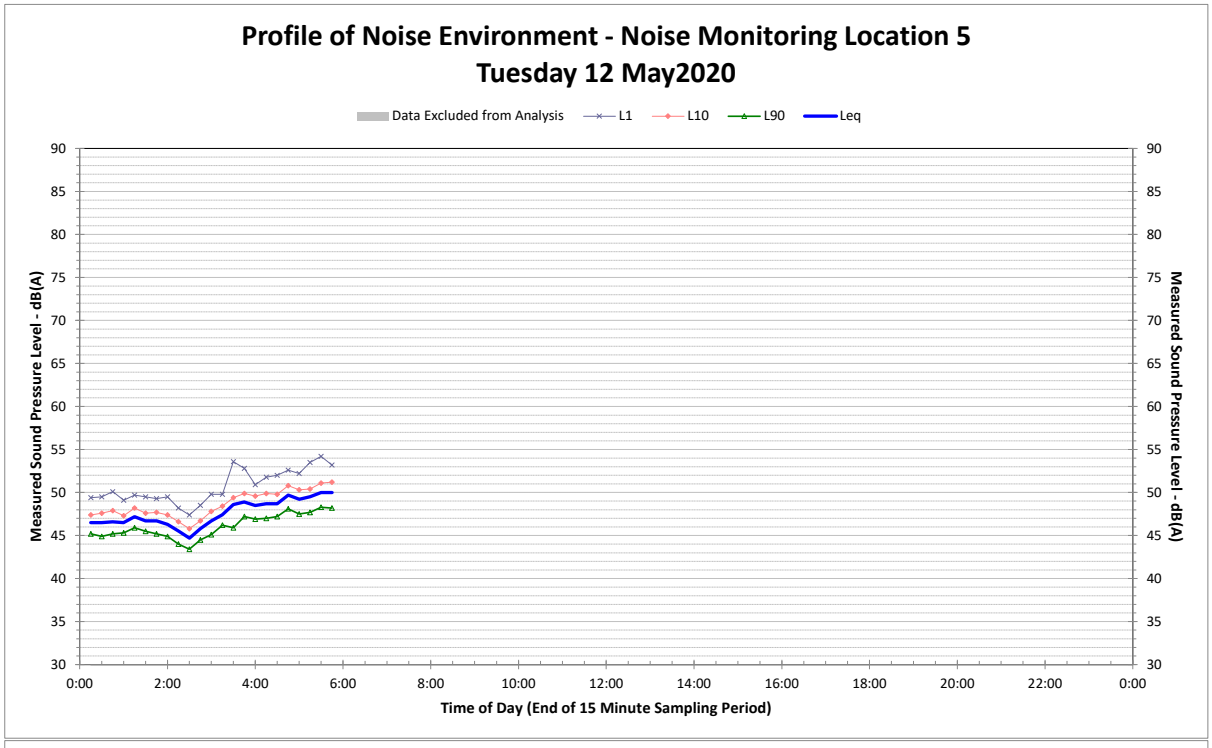

Profile of Noise Environment - Noise Monitoring Location 5
Thursday 7 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

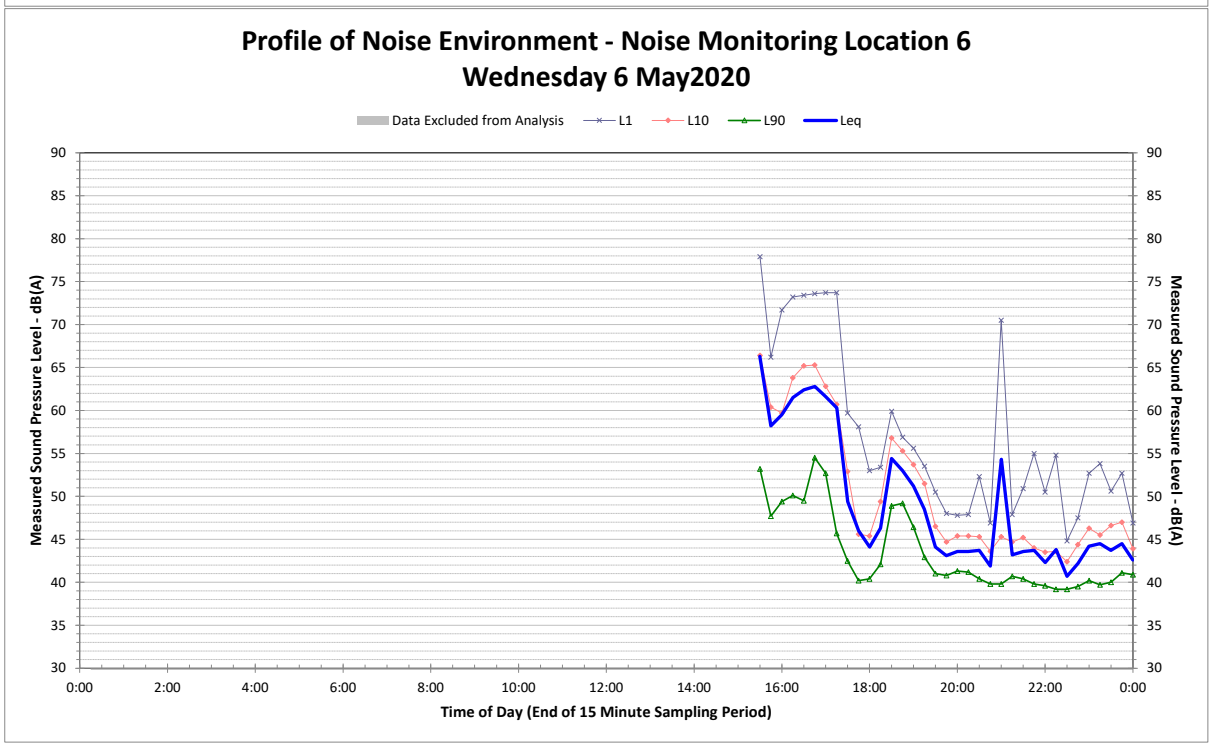

Profile of Noise Environment - Noise Monitoring Location 5
Friday 8 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

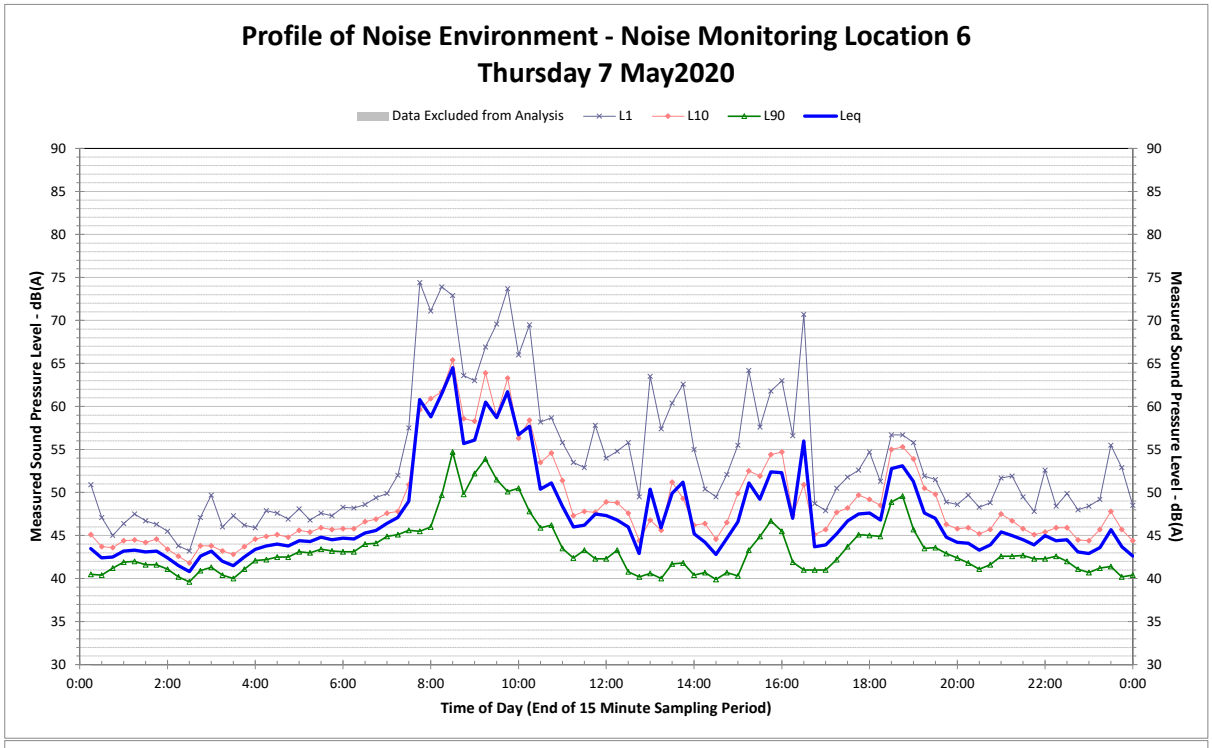

Profile of Noise Environment - Noise Monitoring Location 5
Saturday 9 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

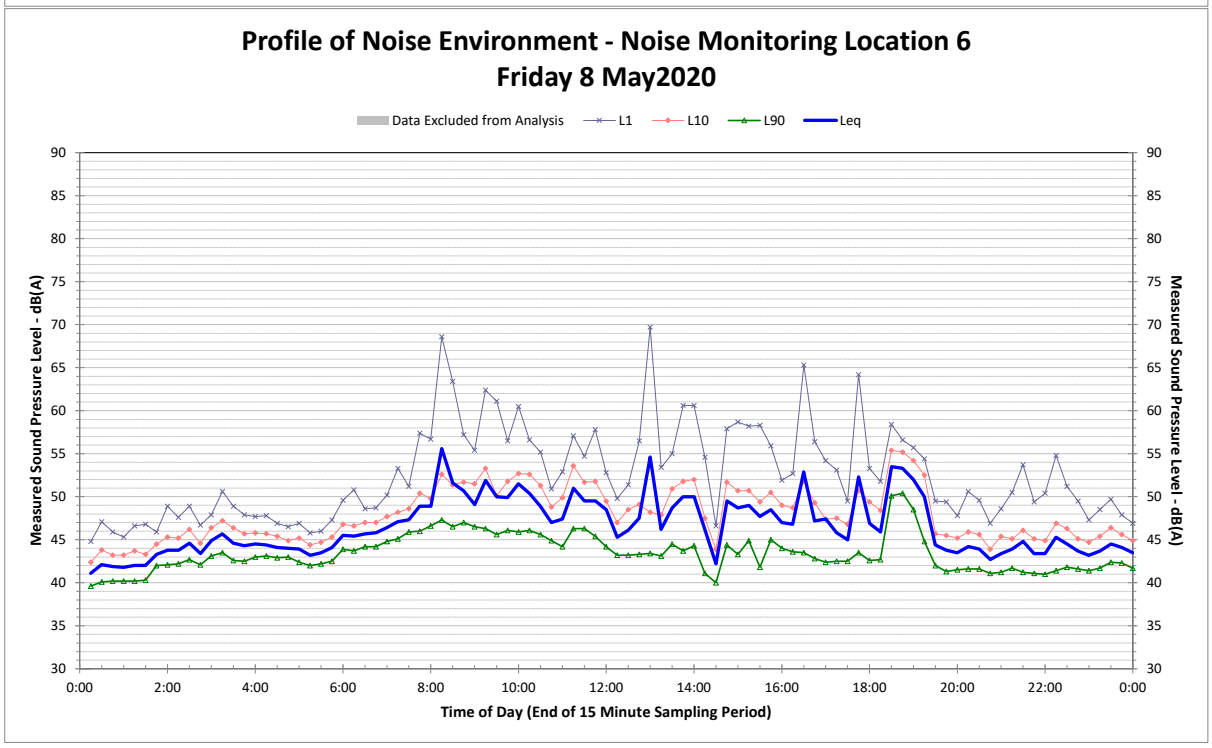

Profile of Noise Environment - Noise Monitoring Location 5
Sunday 10 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

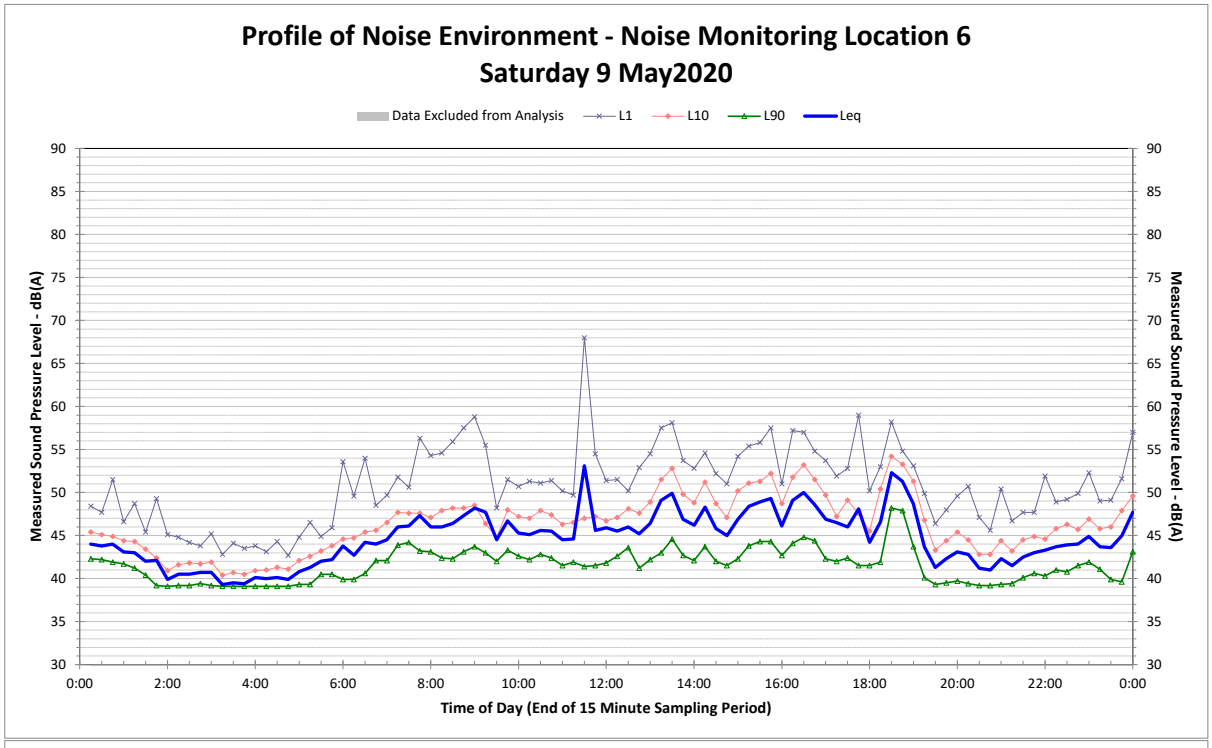

Profile of Noise Environment - Noise Monitoring Location 5
Monday 11 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

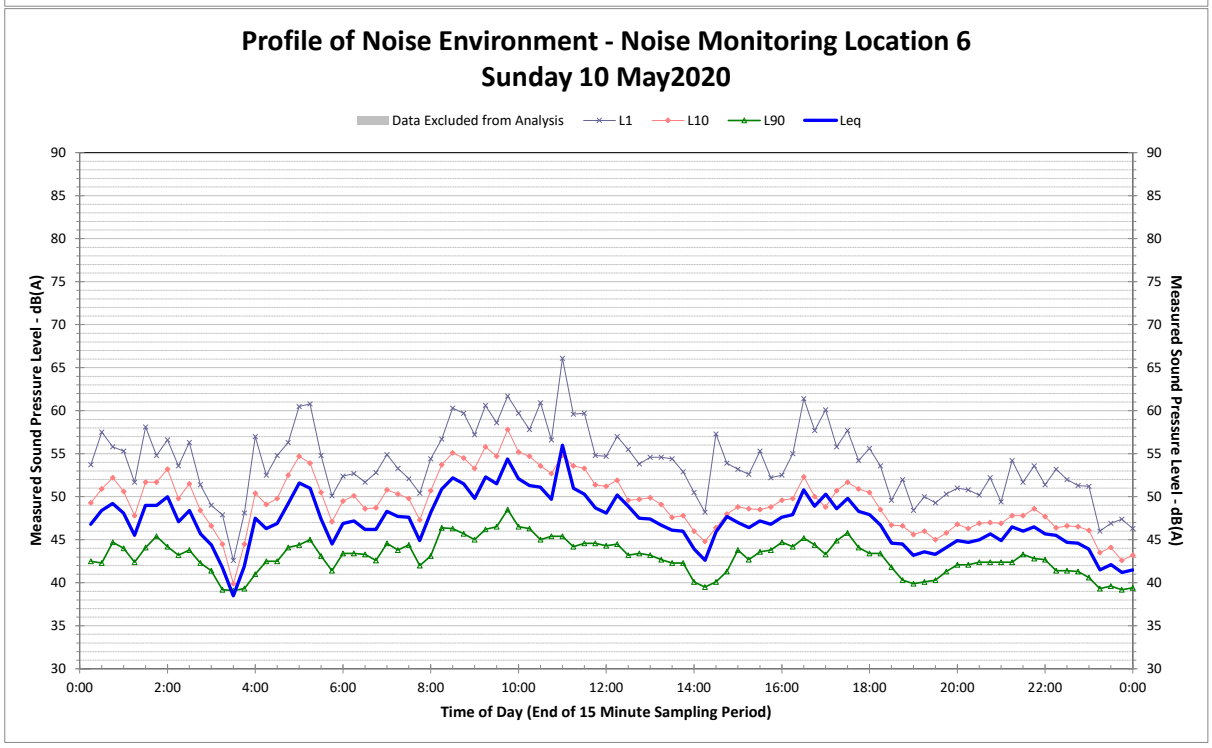

Profile of Noise Environment - Noise Monitoring Location 5
Tuesday 12 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

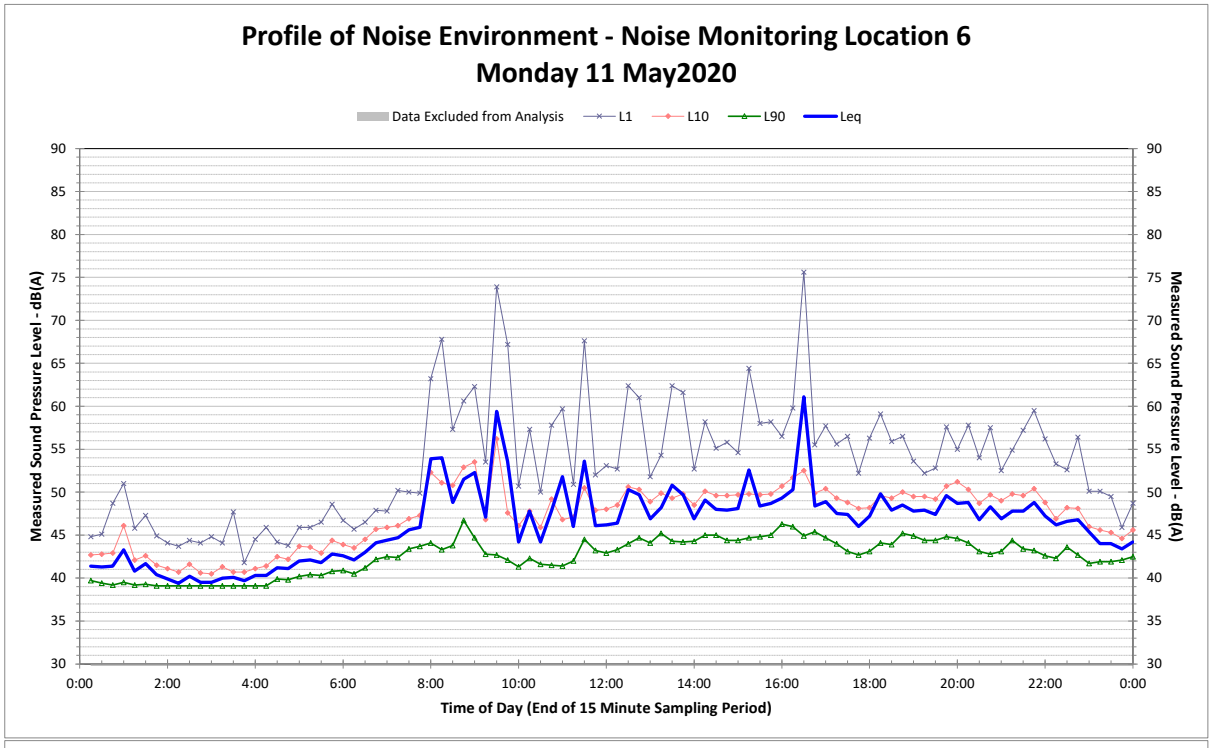

Profile of Noise Environment - Noise Monitoring Location 6
Wednesday 6 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

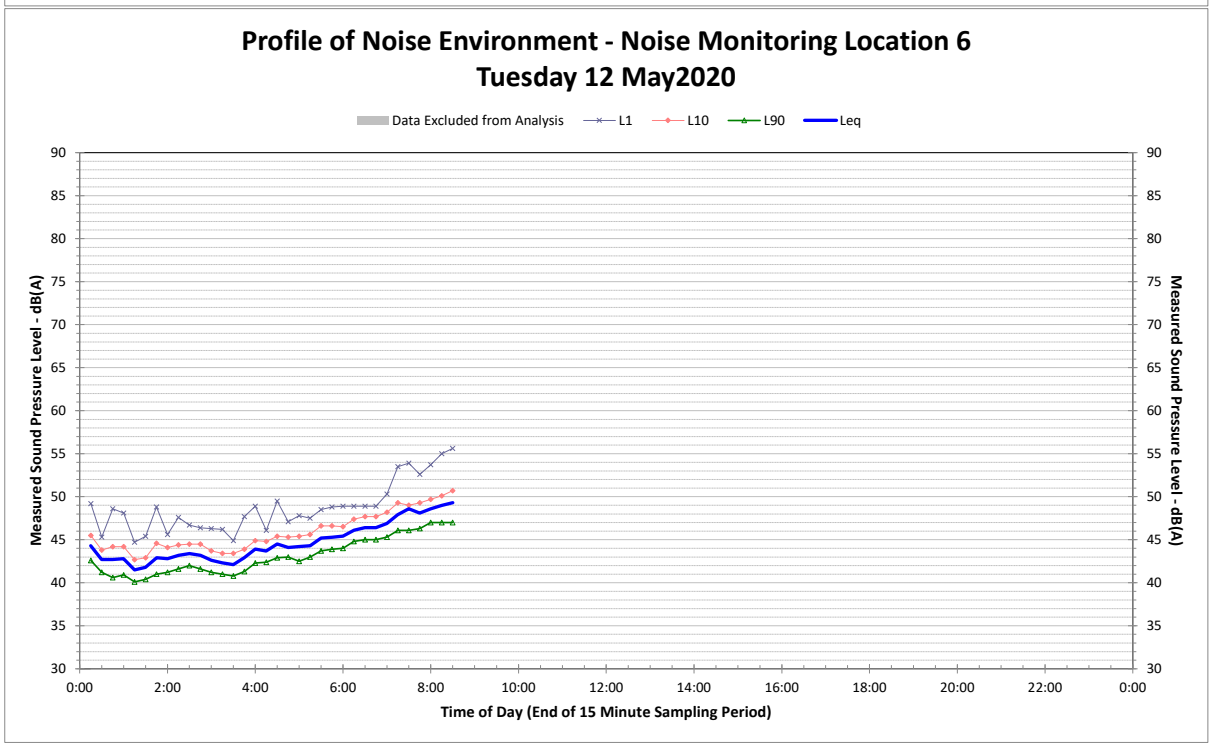

Profile of Noise Environment - Noise Monitoring Location 6
Thursday 7 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 6
Friday 8 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 6
Saturday 9 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 6
Sunday 10 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 6
Monday 11 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)


Profile of Noise Environment - Noise Monitoring Location 6
Tuesday 12 May2020
Data Excluded from Analysis
L1
L10
L90
Leq
Measured Sound Pressure Level - dB(A)
Time of Day (End of 15 Minute Sampling Period)

hutchison weller

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www.hutchisonweller.com