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Opal

**Long-Term Noise Barrier
Plan**

Botany Paper Mill

wsp

March 2023

Public

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Long-Term Noise Barrier Plan

WSP

Level 27, 680 George Street

Sydney NSW 2000

GPO Box 5394

Sydney NSW 2001

Tel: +61 2 9272 5100

Fax: +61 2 9272 5101

wsp.com

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Prepared by:	Linda Rodriguez and Rouz Loghmani	14 March 2023	
Reviewed by:	Johan Goosen	14 March 2023	

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We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Opal Long Term Noise Barrier Plan + Public

March 2023

Visual Impact Assessment - For
submission v5 - for submission

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1 Purpose of this Plan

This Long-Term Noise Barrier Plan (**Plan**) has been prepared to support ongoing attenuation of operational noise associated with the Opal ANZ Paper Mill facility located at 1891 Botany Road, Matraville (**the site**).

This Plan has been prepared to satisfy Condition 10F, Schedule 2, of 05_0120 MOD 8 dated 29 October 2018.

The purpose of this Plan is to confirm the effectiveness of the proposed long-term noise barrier solution in mitigating the impact of operational noise generated from the site to nearby sensitive receivers (residential properties to the north and east of the site). Technical studies confirming the effectiveness of the subject noise barrier wall are appended to this Plan.

This Plan has been finalised by considering and addressing the outcomes of consultation with the NSW Department of Planning and Environment (**DPE**), the NSW Environmental Protection Authority (**EPA**), and Randwick City Council (**Council**).

1.1 Background

On 25 September 2015, Opal (formerly Orora) was granted consent to modify its original project approval under a Section 75W application (05_0120 MOD 5) which outlined the conditions required to allow the demolition of the B7 building and subsequent construction of a noise wall. Following this approval, Opal submitted a Stage 2 Noise Barrier Design Plan which was subsequently approved by DPE in November 2018.

The premise of the Noise Barrier Plan was to construct noise barriers on a block of land east of the B7 Building (Otherwise known as “the Hanger Block”). However, due to conditions surrounding the sale of the Hanger Block, no agreement was reached to complete the noise barrier before construction. Opal then contacted DPE and advised that demolition of the B7 building would be halted until a suitable and feasible solution for noise mitigation could be developed.

Since the Noise Barrier Plan was submitted and subsequently approved by DPE, Opal has also obtained approval to construct and operate a Secondary Water Treatment plant (MOD 6) on site. The additional site-based activities prompted a review of the off-site noise impacts that needed to be included in any noise mitigation solution proposed for the B7 building demolition. The B7 building has since been demolished and the associated noise barrier constructed.

On the 29 October 2018, Opal obtained approval from DPE for the demolition of the B7 Reel Store (adjoining the site of the old B7 building) and the construction of a 98m extension to the existing 146.4m long noise barrier, on the north-eastern boundary of the site for the entire length of the B7 Reel Store building (05_0120 MOD 8).

As a result, the combined length of the completed noise barrier measures a total of approximately 244m. The noise barrier comprises steel shipping containers, partly filled with inert ballast to assist in dampening noise. The containers have been stacked to a continuous height of 11.6m (equal to four shipping containers placed and fixed on top of each other). The architectural drawing (refer to **Appendix B**) shows the dimensions and location of the noise barrier along the north-eastern boundary of the site.

The noise barrier has been painted in ‘Deep Ocean’ (or equivalent) paint to provide visual continuity with the façade treatment of the Opal Paper Mill buildings visible from Botany Road and McCauley Street.

The noise barrier has been proven to be a cost-effective, durable solution which, based on routine quarterly noise monitoring results, has allowed the site to continue to meet its license limits after the B7 building was removed.

Condition 10B, Schedule 2, of Modification of Minister’s Approval (05_0120 MOD 5) requires the preparation of a Long-term Noise Barrier Plan (this Plan), as follows:

10F. The Applicant shall prepare a Long-term Noise Barrier Plan for the project. The Plan shall:

- a) identify the Applicant's long-term plan for noise mitigation to nearby sensitive receivers*

- b) address the planning and implementation strategy for the long-term noise barrier solution, including timeframes for implementation*
- c) include a procedure for the removal of all or part of the noise barrier if new structures are erected on the site which would perform a suitable noise attenuation function*
- d) be prepared in consultation with the Department, EPA and Council; and*
- e) be submitted to the Department by 30 June 2021 for approval by the Secretary.*

The above condition is then replicated in MOD 8 approval.

This Plan has been prepared to satisfy the above condition imposed under both MOD 5 and MOD 8.

As part of the current version of the Environmental Protection License (**EPL**) for the site (EPL 1594) issued in Oct 2022, quarterly noise monitoring has been undertaken by Hutchison Weller. This includes measurements relating to the ongoing performance of the existing noise barrier and its impacts on sensitive receivers adjoining the north-eastern boundary of the site (refer to **Appendix C**).

The quarterly noise monitoring reports show that:

- the existing noise barrier is achieving its stated purpose;
- the operation continues to meet its noise license conditions;
- the paper mill can continue to operate; and
- nearby residents are not unreasonably impacted by operational noise.

This is further quantified by the Noise Model Validation report (refer to **Appendix D**) which indicates that the noise contribution from the site with current infrastructure is lower than the EPL limits and the current use and activities on the site comply with the applicable EPL conditions.

2 The site

Opal Paper Mill (the site) is located at 1891 Botany Road, Matraville.

It is legally described as Lot 14 in DP 1205936 and Lot 1 in DP 363611.

The site is roughly triangular, relatively flat and approximately 122,560m² (circa 12.2 Ha) in area.

The site is located within the Matraville industrial area. It is zoned IN1 – General Industrial pursuant to Part 5.2 of Chapter 5 *Three ports—Port Botany, Port Kembla and Port of Newcastle of the State Environmental Planning Policy (Transport and Infrastructure) 2021* and is within the Randwick Council Local Government Area (LGA).

The site is surrounded by a mix of port, industrial and commercial uses to the south, west, north-west and southeast. The closest residential properties to the site are approximately 30 metres from the north-eastern boundary along Partanna, Murrabin and Australia Avenues (see **Figure 1** below).

In relation to noise monitoring, the locations of the receivers are indicated on the maps contained in quarterly noise monitoring and noise model variation reports, **Appendices C and D** to this Plan.

Figure 1 Aerial identification of the site



Source: Nearmap 2022

3 Noise Barrier Plan

3.1 Long-term solution

This Long-Term Noise Barrier Plan (**Plan**) seeks DPE's approval to retain and manage the existing - "in-situ" - noise barrier as the appropriate and effective solution for the long-term noise attenuation measure along the eastern boundary of the site.

The existing noise barrier, originally constructed under MOD 5 and extended as part of MOD 8 (refer to **Section 1.1**), has proven to be an effective means of noise attenuation for surrounding properties and provides acceptable visual impact in its context (refer to **Appendix A**).

This is quantified through the quarterly noise monitoring undertaken by Hutchison Weller which has been issued to NSW EPA as part of procedural (quarterly) noise monitoring (refer to **Appendix C**). This confirms the existing noise barrier in place is effective in achieving compliance with the noise limits in Opals' Environmental Protection License (**EPL**) and overall project approval.

The design of the noise barrier was endorsed by DPE and the NSW EPA through the Stage 2 Noise Barrier Design Plan, dated 5 November 2018.

It should be noted that any changes to operations/development on the site which have the potential to increase noise impacts *may* need to consider alternative noise barrier solutions which are commensurate to that potential impact and will warrant an update to this Plan.

Having said that, the construction methodology of the existing noise barrier is beneficial in this regard by virtue of its modular construction. The existing noise barrier can be readily dismantled (incrementally or in stages) to accommodate alternative noise attenuation solutions. This will help ensure that any proposed increases in noise during dismantling and/or construction is minimised and temporary (in timeframe).

Noise Barrier Design

The existing noise barrier has been designed with a level of safety appropriate to a permanent unoccupied building or structure (i.e. Class 10 per BCA).

As a result, the following design standards apply:

- Wind load AS1170.2
- Annual probability 1/500
- Terrain category 2.5
- Seismic design AS1170.4 Site class DE
- Steel design AS4100
- Concrete Design AS3600
- Container loading capacity, as certified to CSC standards.

The existing noise barrier is constructed of vertical stacks of four shipping containers with connections between containers at the corner legs.

At the base, 'feet' are anchored to new reinforced concrete strip foundations, constructed on top of the existing pavement. Each concrete base (measuring approx. 2.5m x 4.8m) supports one end of two adjacent containers. The size and reinforcement of the bases provides sufficient overturning capacity to resist ultimate load combinations, per AS1170.0.

The top surface of each base is cast level so that the face of the wall is vertical.

The lowest two containers are filled with inert ballast, within their certified capacity, and to a weight sufficient to resist wind overturning from any direction.

Container strength

Each shipping container is designed in accordance with ISO standard 1496-1 - 1990, which allows them to be stacked, loaded, up to 8 high, on a moving ship.

In this situation they are CSC certified for a stacking load of 192,000kg above each container, i.e. 48,000kg per leg, with the rating displayed on each container (see **Figure 2**).

This is a safe working value for loading and allows for an additional x1.8 safety factor due to dynamic effects on a moving ship.

In the existing noise barrier, the ultimate corner bearing loads are less than this safe working load, so there is a considerable margin of additional safety in container strength for this use.

Figure 2 Typical certification plate of shipping container

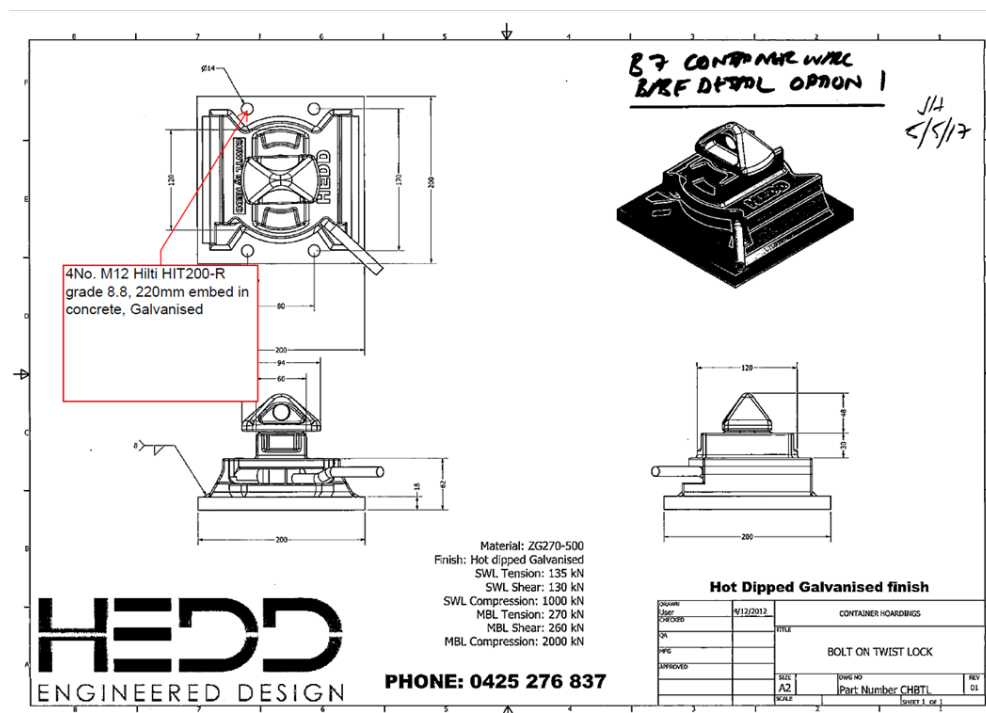


Source: Enstruct Structural Design Summary, Dated 20/04/2017

Foundations

The site is generally underlain with stiff sandy soils. Geotechnical reports from other projects on the site have advised of bearing pressures of approximately 125kPa for shallow footings. The pressure beneath the strip footings is approximately 60kPa, onto existing pavement, which helps further spread the load onto the soil. As a result, there is sufficient bearing capacity to carry the structures. Each concrete footing has been laid with bolt-on twist locks, embedded to anchor the containers (see **Figure 3**).

Figure 3 Noise barrier base details



Source: HEDD Engineered Design, dated 04/12/2012

3.2 Noise Barrier Drawings

Noise Barrier Drawings (refer to **Appendix B**) show the existing noise barrier relative to the site boundary and existing Opal buildings. Detailed elevations indicate the height of the barrier and its profile width.

3.3 Maintenance

The existing noise barrier has been engineered to deliver a life of greater than ten years. This can be extended indefinitely due to the modular nature of the structure and an active, ongoing maintenance strategy. The existing noise barrier is adequately robust and does not pose any significant amenity impacts to the neighboring industrial and residential properties located north-east of the site.

Construction of the bases, together with the loading and placement of containers has been reviewed by a Structural Engineer.

The entire noise barrier will be routinely inspected and maintained at 12-month intervals to ensure structural integrity and appearance. Rust and associated damage will be noted at that time and repaired appropriately. To record the inspection outcomes, a short pro-forma report will be prepared which sets out the conclusions of each inspection and any issues actioned as necessary. These will be kept on file on site for a minimum of five years.

3.4 Noise attenuation performance and monitoring

A summary of the major findings of the Quarterly Noise Monitoring report and the Noise Verification Model report are provided below.

The Quarterly Noise Monitoring reports for August and November 2022 monitoring periods state:

- The most recent round of compliance measurements has been added to the historical data collected during compliance noise surveys, providing about 10 years of seasonal data. This data includes measurements of the noise environment with the Opal site operational over the whole monitoring period.
- The most recent noise monitoring results indicate that the measured LAeq noise levels are amongst the lowest recorded of the long-term series of data for corresponding seasonal measurement periods. At all measured locations the LA90 noise levels are lower than the EPL criteria for each of the monitoring locations.
- The LAmax and LA1 noise levels for both August and November 2022 noise monitoring periods are consistent with other monitoring periods.
- Although the LAeq and LAmax noise levels recorded during the survey periods of August and November 2022 are higher than the EPL criteria at the monitoring locations but are **not related** to the operation of the **Opal site**.
- Several years of monitoring data consistently indicate that 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 (the total measured noise levels at monitoring locations are **only partly due to Opal operations on site**). Therefore, direct measurement of Opal's contribution to the noise environment is not possible because noise emissions from the site are **generally lower** than the ambient measured LAeq noise levels.
- The source of maximum noise level events in the area are typically from the local road network and aircraft flyovers. The nature of the processes within the 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.
- At the time of monitoring the B9 paper machine was operating at normal production capacity. Therefore, noise emissions from the paper mill did not vary significantly as the operation of the plant has been demonstrated to be consistent and reliable.

The above observations and findings of the Quarterly Noise Monitoring reports confirm the existing noise barrier has been functioning as expected and required by standards in mitigating the noise generated on site.

3.5 Noise Model Validation

The Noise Model Validation Report, dated December 2022, provides a review of noise influences with the Opal site and presents the noise modelling outcomes from updated site information against the requirements of the EPL issued by NSW EPA for the site.

These requirements, including updates to the noise model, are explained in detail within the Noise Model Validation report (refer to **Appendix D**). The Noise Model Validation report makes the following observations:

3.5.1 Operational noise limits

The NSW EPA issues EPLs that provide noise criteria for assessing operational noise from industrial premises. The Opal operations at Matraville operate under the EPL. Operational noise limits for the new Opal Paper Mill are detailed in condition L3.1 of the current EPL and Condition 10 of the Ministers Conditions of Approval (MCoA). Section L3 of this

licence details the operational conditions with respect to noise from the site. These have been replicated in **Table 1** below.

Since the inception of the monitoring program dating back to as early as 2012, the same six receiver locations have been used. However, it should be noted that the last two quarterly noise monitoring surveys for August and November 2022 periods only carried out at five locations. The residence located at R3 (Murrabin Avenue) was no longer accessible for the survey.

Table 1 – Operational Noise Limits

Location and receiver ID	Day LAeq,15min, dB(A)	Evening LAeq,15min, dB(A)	Night LAeq,15min, dB(A)	Night LAmax, dB(A)
Corner of McCauley Street and Australia Avenue (R1)	46	45	43	55
Australia Avenue (R2)	45	45	43	55
Murrabin Avenue (R3)	46	45	43	55
Partanna Avenue (R4)	42	41	41	55
Corner of Partanna Avenue and Moorina Avenue (R5)	42	42	39	55
Moorina Avenue (R6)	43	43	39	55

In addition to the original licencing requirements, the NSW EPA have issued the current version of EPL in October 2022 with further conditions relating to the noise model verification. Hutchison Weller consultants reviewed the validation and calibration of the model and the written approval by the NSW EPA. The outcomes of this review has been considered in the preparation of the current Noise Model Validation report (**Appendix D**).

Site noise contribution is discussed in sections 3.5.2 to 3.5.4 below.

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

3.5.2 Predicted noise levels

The noise model was calibrated against measured noise levels at a few validation locations within the site. In general, noise sources within the site were constant. The noise model provided a good correlation of measured and modelled noise levels with all locations predicting less than +/- 2 dB difference. Based on the close correlation of the modelled and predicted noise levels, the noise model was considered to be acceptable for modelling noise impacts at offsite locations.

After validation of the site noise measurements, the noise model was then used to predict noise levels at the EPL compliance locations. Noise levels are presented for nighttime noise criteria as these are the most stringent for the site operating conditions. Predicted operational noise levels and EPL noise goals are provided in **Table 2** below:

Table 2 – Predicted Noise Levels

ID	Location	EPL Noise Goals dB(A)		Predicted Noise Levels dB(A)	
		Night LAeq 15 Min	Night LAmax	Night LAeq 15 Min	Night LAmax
R1	Corner of McCauley Street and Australia Avenue	43	55	38	46 - 48
R2	Australia Avenue	43	55	39	47 - 49
R3	Murrabin Avenue	43	55	40	48 - 50
R4	Partanna Avenue (Most affected façade)	41	55	40	48 - 50
R5	Corner of Partanna Avenue and Moorina Avenue	39	55	37	42 - 44
R6	Moorina Avenue	39	55	35	44 - 46

Predicted noise levels are expected to be within the project noise criteria at all locations. It is worthwhile noting that the predicted noise levels are for periods of worst-case site activity under adverse meteorological conditions, the likelihood of actual impacts under these conditions is expected to be infrequent at best.

Maximum noise levels associated with other noise sources in the vicinity of the site are regularly measured to be in excess of 10 dB(A) above the LAmax criteria provided in the EPL for Opal noise impacts. In general, maximum noise level events are not a function of operations within the site.

3.5.3 Measured operational noise levels at compliance locations

Tables 3 and 4 outline a summary of the measured operational noise levels at compliance locations in the evening periods.

The parameters of LAeq and LA90 presented in **Table 3** and **Table 4** are used to provide information for comparison against the project criteria and the background noise environment.

3.5.3.1 November quarterly monitoring period

Operational noise monitoring for the November 2022 quarterly monitoring period was completed between 24 November and 1 December 2022, using automatic noise loggers deployed at five representative locations (except for R3 that was not accessible). This survey period coincided with typical continuous operations of paper mill.

Table 3 – Summary of nighttime measured operational noise levels at compliance locations – November 2022 quarterly monitoring (extracted from Appendix C)

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
Thursday 24 November 2022	-	-	79.3	60.7	-	-	75.3	61.0	73.1	60.5	74.3	62.1
Friday 25 November 2022	-	-	71.8	65.2	-	-	74.9	67.0	87.0	62.4	89.1	67.6
Saturday 26 November 2022	-	-	74.5	58.3	-	-	84.3	61.3	85.3	63.0	80.5	71.4
Sunday 27 November 2022	-	-	87.8	68.9	-	-	87.4	65.6	89.7	66.8	86.6	66.5
Monday 28 November 2022	-	-	76.8	63.8	-	-	76.8	69.2	73.8	62.2	83.0	62.9
Tuesday 29 November 2022	-	-	78.3	66.8	-	-	86.5	71.6	77.0	69.0	73.3	64.6
Wednesday 30 November 2022	-	-	-	-	-	-	91.3	66.6	76.7	71.0	76.8	65.2
Thursday 1 December 2022	-	-	-	-	-	-	75.1	62.0	66.0	51.1	77.2	67.4
Median Open	-	-	77.6	64.5	-	-	80.5	66.1	76.9	62.7	78.9	65.9

The quarterly noise survey data for the November 2022 – January 2023 period indicates that the LAeq long term measured noise levels in the vicinity of the paper mill exceeded the EPL criteria for day, evening, and night-time. The maximum (LA1) recorded noise levels at each monitoring location also exceeded the EPL criteria of 55 dB(A) at all receiver locations.

In summary, the following conclusions have been drawn from the November 2022 quarterly monitoring:

- Several years of monitoring data consistently indicate that 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.
- Measured LA90 and LAeq noise levels for the night-time period during the November 2022 monitoring survey are noticeably lower than the measured noise levels at other times of the year.
- Night-time periods were assessed to provide additional information of the paper mill noise contributions using the median LA90 noise levels as a benchmark as rating background noise levels provide a good proxy for LAeq levels from steady state noise emitters.

3.5.3.2 August quarterly monitoring period

Operational noise monitoring for the August 2022 quarterly monitoring period was completed between 16 September and 23 September 2022, using automatic noise loggers deployed at five representative locations (except for R3 that was not accessible). This survey period coincided with typical continuous operations of paper mill.

Table 4 - Summary of nighttime measured operational noise levels at compliance locations – August 2022 quarterly monitoring (extracted from Appendix C)

Time and date	Maximum Noise Environment - Noise Monitoring Location											
	R1		R2		R3		R4		R5		R6	
Date	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}
Friday 16 September 2022	-	-	71.14	62.7			84	69.7	86.2	74.9	77.2	67.1
Saturday 17 September 2022	-	-	74.63	58.5			86.9	68.9	84.6	81.6	71.9	62.7
Sunday 18 September 2022	-	-	84.22	66			83.9	67.5	85.7	81.8	78.6	65.4
Monday 19 September 2022	-	-	77.15	62.9			88.2	72.8	84.2	81	75.4	66
Tuesday 20 September 2022	-	-	86.33	66.7			86.3	71.8	86.3	78.5	72.6	61.4
Wednesday 21 September 2022	-	-	76.45	66			99.9	70.3	86.7	64.2	72.6	68.1
Thursday 22 September 2022	-	-	87.95	63.7			90.2	73.4	83.5	80.5	74.9	65.9
Friday 23 September 2022	-	-	74.9	61			89.9	69.6	87.3	80.6	74.2	65.4
Median Open	-	-	76.8	63.3	-	-	87.6	70.0	86.0	80.6	74.6	65.7

The quarterly noise survey data for the August 2022 - October 2022 period indicates that the LAeq long term measured noise levels in the vicinity of the paper mill exceeded the EPL criteria for day, evening, and night-time. The maximum (LA1) recorded noise levels at each monitoring location also exceeded the EPL criteria of 55 dB(A) at all receiver locations.

In summary, the August 2022 quarterly monitoring report the following conclusions have been drawn:

- Several years of monitoring data consistently indicate that 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.
- Winds generally from the north are like to reduce impacts from the Opal site and reduce some noise impacts from the port.
- Measured LA90 and LAeq noise levels for the night-time period during the August 2022 monitoring survey are noticeably lower than 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 LA90 noise levels as a benchmark as rating background noise levels provide a good proxy for LAeq levels from steady state noise emitters.

3.5.4 Summary of findings

- As part of the Paper Mill's environmental licencing conditions, target noise levels at nearby residential locations form part of their operational parameters. Noise influences from many sources in the Port Botany area restrict the direct measurement of noise from Opal at these residential locations and in 2014 a site wide study of noise was commissioned to assist in the assessment of noise impacts. This model has been used as a tool for assessing impacts of site equipment and process upgrades since this time.
- Changes to the site layout and additional infrastructure projects over the last few years have necessitated a revised noise model that is calibrated by internal site measurements and external noise monitoring correlation. A review of the noise model to confirm its predictive accuracy has been carried out. This was necessary to establish a new modelling base line for future site improvements and monitoring of site noise against the noise goals detailed in the EPL. The noise model review used measurement data to check the current noise model inputs and spot measurements within the site to establish validation noise levels at key locations. The noise model was used to predict noise levels at these locations and the results were compared for accuracy. In all cases the noise model was able to predict within less than 2 dB for each validation location, indicating that the noise model is acceptable for use in assessing noise impacts at residential locations adjacent to the paper mill.
- The Noise Model Validation Report findings state:
 - Predicted noise levels for the B9 Paper mill have been validated against spot measurements within the site and are expected to remain current unless there are changes to the operations or equipment.
 - Condition U1.2 of the EPL requires that the validation of the noise model remain current when assessing any future developments within the site. To accommodate this requirement, it is proposed that long term noise verification locations are established around the site for routine testing of onsite noise levels for each of the autonomous operational zones (shown on Figure 1 on page 2 of the report – **Appendix D**).
 - These long-term monitoring locations would also be used to confirm compliance monitoring in accordance with other requirements for quarterly monitoring detailed in the note at the end of Condition U of EPL. Future modelling and assessments would proceed in accordance with the Noise Policy for Industry (NPI) based on the calibration of these points at the time of modelling.
 - Modelling against condition L3.1 of the EPL indicates that the contribution of the Opal site to nearby residential receiver locations was within the noise criteria values at all locations. Noise contours showing the predicted noise levels for the broader community also meet these criteria.
 - An additional assessment of annoying characteristics of the predicted noise levels demonstrate that no further penalties are required to be added to the predicted noise levels.
 - Based on the completed noise validation the Opal site currently complies with the NSW EPA Environmental Protection Licence conditions and no recommendations for noise remediation are necessary.

As summarised above, the findings of both Quarterly Noise Monitoring reports and the Noise Model Validation report show the existing noise barrier along the north-eastern boundary of the site satisfies the expected noise attenuation requirement for the site and its operations. Therefore, the container wall as currently exists provides the necessary sound attenuation to functions carried out on site and can be used as a long-term noise barrier without any changes.

3.6 Visual treatment

The existing noise barrier is located at a significant distance from residential properties (approximately 32 meters at its closest point to the nearest dwelling) where it lies parallel to a vacant land (easement), Partanna Avenue cul-de-sac and Purcell Park to the northern most portion of the barrier. The existing canopy trees which are planted on the adjacent Ausgrid easement or Purcell Park along the eastern boundary of the site partly screen the noise barrier from the views available from the public domain and neighbouring properties (see **Figure 4**).

The existing noise barrier is painted uniformly in Colourbond Deep Ocean (blue) as shown in **Figure 4** below. This treatment is expected to last for the duration of the noise barriers' life but shall be included in the annual inspection for any required repainting. The existing noise barrier comprises shipping containers stacked four high, providing an appropriate transition between the Opal paper mill and associated buildings to the west / southwest and neighbouring (approved) industrial and residential properties to the north-east. (see **Figure 5**).

The existing noise barrier provides a single continuous structure, industrial in character and general aesthetics (size, bulk, materials and colour), that commensurate with its location and use. It is reflective of a modern industrial building built close to / on the boundary – as can be found in the immediate vicinity to the north and southeast of the site (Refer to **Appendix A**).

Other potential visual aspect / impact issues, such as graffiti and general deterioration over time were considered and addressed for the existing noise barrier in a maintenance strategy.

- Graffiti has not been an issue for the existing noise barrier. The barrier is only accessible from within the site and there is a spatial separation of more than 2m between the face of the barrier and the nearest boundary fence (for maintenance). Notwithstanding, in an unlikely event that the barrier is defaced with graffiti, the graffiti signs would be removed within 24-48 hours.
- General deterioration has also not been an issue for the existing wall. The distance between the noise barrier and the adjacent easement ensures access for routine maintenance and structural assessment as needed.

Refer also to detailed visual impact assessment in **Appendix A**.

Figure 4 View of existing wall and screening from Western end (cul-de-sac) of Partanna Avenue



Figure 5 View of noise wall (L) from Botany Road and adjacent industrial development (R)



4 Stakeholder Engagement

Copies of the draft Plan were sent to Randwick City Council and the NSW EPA for consultation on 16 November 2022. Both Council and NSW EPA provided their feedback by 29 November and 19 December 2022 to WSP. In summary, the outcomes of the stakeholder engagement/consultation are:

01. NSW EPA did not provide any specific comments in relation to the Plan. As per their response *the EPA generally does not review, approve or endorse management plans*. The NSW EPA requires the applicant to ensure that the monitoring program proposed is in line with the conditions of consent to ensure ongoing compliance. The compliance of the proposed noise barrier wall with the standards and benchmarks applicable to it has been discussed in this Plan and the noise assessment reports appended to it.
02. Council comments were mainly concerned with the following matters:
 - The need for additional community consultation,
 - Use of different construction materials for the noise barrier,
 - The development assessment and approval process carried out by the DPE,
 - Bulk and scale, visual and environmental impacts (noise) of the existing noise barrier.

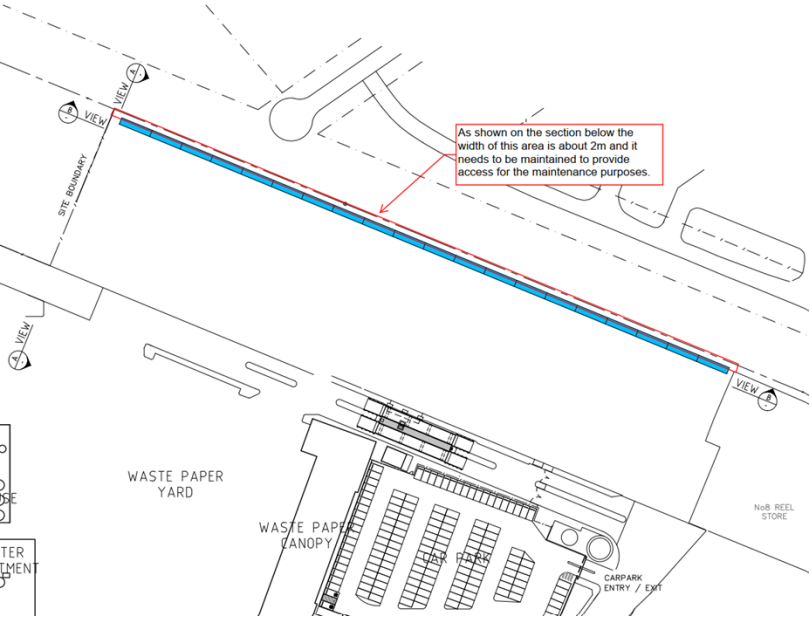
All the comments made by Council are reviewed and responded to in **Table 5** below.

Copies of the Council letter and the NSW EPA email in response to the proponent's request for their review and provision of feedback in relation to the Plan are provided at **Appendix E** to this Plan.

Based on our assessment of Council's feedback, as provided in **Table 5**, the existing noise barrier wall does not fail to satisfy any of the technical, structural, aesthetic, or statutory planning requirements and standards that apply to it. Therefore, there are no impediments in extending the life of the existing noise wall for perpetuity.

Table 5 – Randwick City Council feedback in response to the draft Plan and the proponent’s responses

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent’s comments and responses
a Modification Application (Modification 2) to the development consent (MP05_0120) was approved in 2010 for, among other things, construction of a 5m high permanent noise barrier along the northern side boundary and a 7m high noise barrier around the wastepaper storage yard to attenuate noise impacts from the paper mill operation (Condition No. 10A)	Condition 10A under MOD 2 states: <i>10A. Prior to the commencement of operations of the project, the Proponent shall prepare and implement a detailed Noise Barrier Design Plan. The Plan shall:</i> <i>a) be prepared in consultation with Council;</i> <i>b) be prepared and implemented to the satisfaction of the Director-General;</i> <i>c) demonstrate that the proposed noise barriers are designed with a material density of no less than 15kg/m², unless otherwise approved by the Director-General;</i> <i>d) Include a detailed plan of the layout indicating how the noise barriers would traverse along the north-eastern perimeter of the Amcor site and around the waste paper storage yard; and</i> <i>e) Include a detailed design of the barrier, outlining how it would be visually treated to reduce and mitigate any visual impacts, such as the provision of landscaping on its northern side.</i>	Condition 10A of MOD 2 does not make any references to the construction details of the noise barrier. Item C requires the noise barrier to be built from a material with the density of no less than 15kg/m². Council’s reference to the height of the noise barrier may be based on their review of another source such as the assessment report for MOD 2, but not conditions of consent of MOD 2, that establish the benchmark for the compliance assessment of the existing noise barrier wall. The existing noise barrier wall satisfies the requirement under item C of condition 10A under MOD 2, as per the structural summary report prepared by Enstruct and attached to the Stage 2 Noise Barrier Design Plan provided to the DPE in 2018. Provision of additional landscaping/tree planting along the eastern face of the wall is not feasible considering the 2m wide hardstand area must be maintained intact to allow for the ongoing maintenance of the wall. The below extract from the site plan shows the referenced 2m wide hardstand area between the wall and the site boundary.

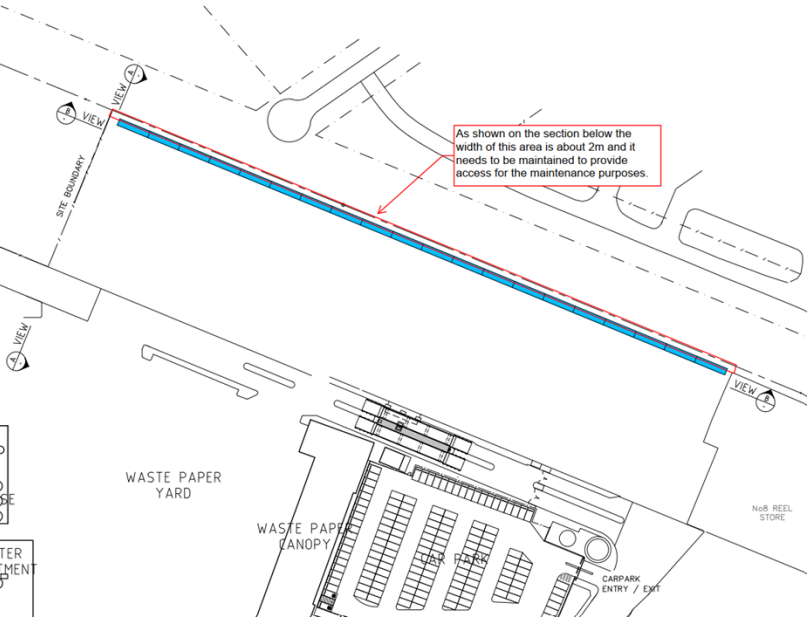
Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
		
Modification Application (Modification 5) for the demolition of former paper mill building, Building B7, was approved in September 2015 which included relevant conditions of consent (10B and 10C) requiring a noise barrier to be constructed to mitigate operational noise to sensitive receivers within 9 months of demolition being completed.		Council's comment relates to condition 10C of MOD 5. Condition 10B provides the specifications of the noise barrier plan and does not include any details in relation to the physical specifications of the noise barrier wall.
The Modification Report prepared by Jacobs Group Pty Limited on behalf of the Proponent advised that any noise wall erected "would be of similar construction to the noise wall constructed along Australia Avenue, namely piled steel supports with Hebel panels placed between the supports".		Although Jacobs report mentions the wall will be constructed with steel piles and Hebel panels and this report was referenced in the subject approval, there are no references to construction material in the relevant conditions of approval. Condition 10B of Mod 5 requires a noise barrier to satisfy the noise limits listed under conditions 10 (added under MOD 2 to the original approval) without identifying any specific building materials.

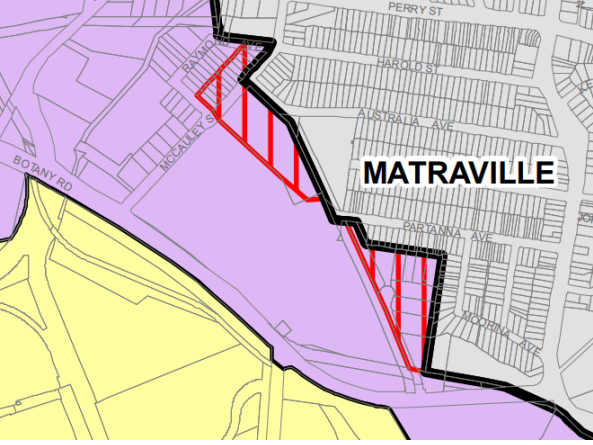
Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
With the demolition of Building B7, the proponent submitted a temporary Noise Barrier Plan to the Department of Planning and Environment (DPE) comprising a 146.4 metre-long, 12m high container noise barrier. This container noise barrier wall was approved by the DPE in November 2015 as a temporary measure with an expiry date of 14 June 2022. It is important to emphasise that the noise barrier was approved as a temporary measure to offset the loss of the noise screening afforded by Building B7.	Conditions 10D, 10E and 10F of MOD 8 state: <i>10D. The Applicant shall update the Stage 2 Noise Barrier Design Plan required by Condition 10B to include details of the proposed extension to the existing noise barrier associated with 05_0120 MOD 8. The updated Stage 2 Noise Barrier Design Plan shall:</i> <i>a) include updated plans and elevation drawings;</i> <i>b) include updated structural and civil engineering design summary;</i> <i>c) provide details of the noise barrier inspection and maintenance strategy; and</i> <i>d) be submitted to the Department at least one week prior to the commencement of works associated with 05_0120 MOD 8.</i> <i>10E. Within two weeks of completing the demolition of the B7 reel store building, unless otherwise agreed to by the Secretary, the Applicant must complete the construction of the noise barrier proposed under 05_0120 MOD 8.</i> <i>10F. The Applicant shall prepare a Long-term Noise Barrier Plan for the project. The Plan shall:</i> <i>a) identify the Applicant's long-term plan for noise mitigation to nearby sensitive receivers;</i> <i>b) address the planning and implementation strategy for the long-term noise barrier solution, including timeframes for implementation;</i> <i>c) include a procedure for the removal of all or part of the noise barrier if new structures are erected on the site which would perform a suitable noise attenuation function;</i>	None of the relevant conditions of consent of MOD 8 referenced in the opposite column, state the noise barrier wall is a 'temporary' solution. Also, the "Noise Barrier Design Plan" did not include the term 'temporary' in its title. The existing noise barrier wall, being either an interim or a temporary solution according to Council's interpretation, was approved by the DPE subject to the requirements listed under conditions 10D, 10E and 10F. Only the assessment report for the MOD 8 approval states: <i>The Department's approval notes that the shipping container noise barrier is temporary, to be removed within five years (i.e. 14 June 2022) unless the Applicant receives approval from the Planning Secretary to continue its use.</i> The above requirements have been satisfied by the actions taken by the proponent in the past few months to ensure the existing noise barrier wall satisfies the relevant conditions of consent, as discussed in this Long-Term Noise Barrier Plan (the Plan).

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
	<i>d) be prepared in consultation with the Department, EPA and Council; and</i> <i>e) be submitted to the Department by 30 June 2021 for approval by the Secretary.</i>	
Council mentioned that it disagreed with this justification for maintaining and extending the temporary noise wall barrier as the permanent noise wall approved under Modification 2 and 5 had a smaller footprint comprising a Hebel structure with a width thickness of 150mm compared with the container barrier thickness of 2400mm.		As discussed above, the previous approvals do not require the noise barrier wall to be constructed with Hebel panels and steel piles. The thickness and footprint of the noise barrier wall are not of any relevance to the functionality or visual appearance of the wall from the public domain, considering it is mainly visible from its eastern side.
Council's position has always been that the approval granted to Modification 8 was only for the extension of the existing temporary container noise barrier as an interim measure to address the demolition of the B7 Reel Store Building, not for making it a permanent solution.	As provided above, items a) and c) of condition 10F require the Applicant to prepare a Long-term Noise Barrier Plan for the project. The Plan shall: <i>a) <u>identify the Applicant's long-term plan for noise mitigation</u> to nearby sensitive receivers;</i> <i>c) include a procedure for the removal of all or part of the noise barrier <u>if new structures are erected</u> on the site which would perform a suitable noise attenuation function;</i>	The approval for MOD 8 does not state that the existing noise barrier wall cannot be used as a permanent solution. It requires the applicant to identify the solution and if new structures are erected, then the applicant should provide sufficient evidence that the new structure satisfies the noise attenuation requirements. The proponent is not applying for the erection of a new structure. The noise assessment reports prepared in support of the Plan confirm the existing noise barrier wall provides sufficient noise mitigation to the nearby sensitive receivers.
Condition 10F of Modification 8 contemplates a permanent barrier wall as required under the provisions of the consents previously granted for Modification 2 and Modification 5. The wall under these consents would comprise a permanent barrier essentially comprising piled steel supports with Hebel panels placed between the supports to a height of between 5m-7m. Council contends that these modification approvals remain in place and are not overridden by the DPE's approval for the temporary container barrier granted in November 2015 which		Requirements of Condition F of the approval for MOD 8 and the relevant conditions of approvals for MOD 2 and MOD 5 are discussed above and our assessment showed none of the referenced conditions or modification approvals reference the preferred material for the construction of the noise barrier wall. Therefore, the existing noise barrier wall can be retained and used as a permanent solution, subject to the DPE's approval. It should be noted the existing noise barrier wall is an efficient noise attenuation measure and is structurally safe as per the findings of the technical studies prepared and submitted with this Plan.

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
was subject to a time-limit that has now been exceeded.		Extending the use of the existing noise barrier wall in perpetuity does not result in the revocation of the previous approvals. The proponent has submitted a request for extending the life of the existing noise barrier wall to the DPE prior to the expiration date and their application is being assessed by the relevant stakeholders since.
The use of the existing container barrier wall as a permanent barrier solution should be subject to a modification or development application assessment process that comprehensively addresses the operational adequacy and environmental impact of the long-term use of such a wall to address noise from a significantly large-scale paper mill operation.		The existing noise barrier wall was approved by the DPE and the continuation of its use in perpetuity does not warrant the submission of a new application to Council considering no changes to the physical attributes, use or other characteristic features of the existing noise barrier wall were proposed as part of the extension application. As required by item (d) of condition 10F of MOD 8, EPA and Council were consulted in relation to the potential environmental impacts of the subject wall. Council comments are addressed in this table. The EPA has not made any comments or complaints in relation to the existing noise barrier wall as provided in the Plan. This confirms that in the EPA's expert opinion the existing noise barrier wall does not generate any environmental concerns. The operational adequacy of the noise barrier has been assessed by the noise assessment reports prepared in support of the Plan. The studies found the wall performance satisfactory in relation to noise attenuation measures.
Furthermore, the potentially significant visual and design impacts as well as the long-term suitability of the existing container wall cannot be adequately addressed via an assessment report (that is, the submitted Long Term Noise Barrier Plan) that responds to a condition of consent (that is, Condition 10F of Modification 8). Rather, it should be assessed as part of a modification or development application process together with expert assessment on visual amenity and structural integrity.		Council does not clarify what the significant visual and design impacts of the existing noise barrier wall are. Council does not provide any benchmarks for measuring the long-term suitability of the existing wall either. Council states the above referenced impacts cannot be addressed adequately by the Plan. While the Plan references all the relevant conditions of previous approvals in the assessment of the existing noise barrier wall and supports the outcomes of this assessment by referencing the findings of the noise assessment reports and the visual impact assessment that are appended to the Plan. In relation to the submission of a modification or a new development application by the proponent, Council does not provide any clear justification as to why such applications are required.

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
This process would afford surrounding residents the right to be properly consulted on any issues they may have concerning the long term visual, bulk and scale impacts of the stacked container barrier wall, and the ability to properly apply conditions of consent, if necessary, to protect residential amenity including from further creep in wall height. This consultation may include discussions about the need for potential increase in tree plantings for screening along the border of the wall under a comprehensive landscaping scheme to further obscure the visual, bulk and scale impacts of the wall.		A visual impact assessment, provided as an appendix to the Plan, assesses the various aspects of any potential visual impacts that the existing noise barrier wall may have on its surrounding context. The visual impact assessment justifies why the existing wall is a qualified and suitable solution for long term use on the subject site. Council has not provided any feedback in relation to this visual impact assessment to inform the proponent or the DPE of the potential adverse visual impacts of the existing noise barrier wall in their opinion. The existing noise wall satisfies the relevant requirements for the structural integrity of noise barrier wall as per the structural summary report prepared by Enstruct and attached to the Stage 2 Noise Barrier Design Plan provided to the DPE in 2018. Not the MOD 8 approval nor the approval for the noise barrier wall require the proponent to carry out further community consultation for extending the life of the existing noise barrier wall. It should be noted that extensive community consultation was carried out as part of the application for MOD 8 that showed the community did not raise any concerns with the existing noise wall that was partly erected on site at the time. The current noise barrier wall is similar in shape, height, material and colour to the part existed at the time of previous community consultation. Bulk and scale of the existing wall is mainly defined by its height and length that are the outcomes of the noise assessment studies and the wall was required to be built with these specifications to satisfy the expected technical standards for a noise barrier. Also, as discussed in the visual impact assessment the existing noise barrier wall is not significantly higher than the surrounding structures. A significant number of trees already exist on Ausgrid easement and Purcell Park along the eastern boundary of the site to screen the noise barrier wall. The site photos provided in the visual impact assessment report clearly show the tree coverage along the eastern boundary of the site. Considering these trees are on either Purcell Park or Ausgrid easement it is not possible for Opal to plant more trees to provide more screening. Provision of new trees on the site and along the eastern boundary is not feasible either, considering the current 2m wide hardstand area east of the

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
		noise barrier wall must be maintained to allow for the ongoing maintenance of the wall. 
Under the State Environmental Planning Policy (Transport and Infrastructure) storage of containers are prohibited in certain areas of IN1 including the paper mill site. There is a section of the IN1 zoning where, under Clause 5.18 of the SEPP, the repair, refitting or storage of shipping containers is prohibited. The use of stacked containers as a wall would potentially constitute the storage of shipping containers on-site and hence may be prohibited under the SEPP. This matter has not been addressed in the current Long Term Noise Barrier Plan, and even if it were to be addressed, it should be submitted under the cover of a modification or development	The site is not affected by the requirements of clause 5.18, as it is excluded from the <i>Container Depots Prohibition Area</i> shown hatched red in the following screenshot from the control map:	It should be noted that the containers are not "stored" on the subject site, but they were used as structure parts/material to create the noise barrier wall. <i>Container Depot</i> is defined as follows under section 5.18 of the SEPP: (2) <i>In this section, a container depot means a building or place that is used for—</i> (a) <i>the unloading or unpacking (or both) of shipping containers for delivery to individual consignees, or</i> (b) <i>the consolidation of goods from different consignors into full shipping container loads for despatch, or</i> (c) <i>the repair, refitting or storage of shipping containers.</i>

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
application that comprehensively addresses this issue in a public consultation process.		The use of the containers on the site does not fall under any of the above definitions.
In the summary section, Council reiterates that the construction of the noise barrier with Hebel and steel piles will deliver a better visual outcome without providing any evidence.		
Noise validation assessment In the summary of the noise validation report prepared by Hutchison Weller (DOC no.16002-NV-RP-12-0), it states, “ Based on the completed noise validation it is expected that Opal ANZ site currently complies with the EPA Environmental Protection Licence conditions and no recommendations for noise remediation are necessary”. Can you please confirm the acoustic assessment has validated that the site currently complies and not “expected to comply” with the EPA Environmental Protection Licence conditions. Validation noise monitoring should confirm noise emissions comply with the required criteria or not. The rest of the report appears to indicate compliance with the relevant noise criteria so this maybe an error.		The noise validation report has been updated by Hutchison Weller to state: Based on the completed noise validation the Opal site currently complies with the EPA Environmental Protection Licence conditions and no recommendations for noise remediation are necessary. Any references to “expected to comply” have been removed from the report. A copy of the updated report is appended to the Plan.
Ongoing noise complaints Recently, Council has received noise concerns in relation to the Opal development from residents		EPA’s feedback in response to the draft Long Term Noise Barrier Plan is: <i>The EPA has no comment to provide on the report as the EPA generally does not review, approve or endorse management plans. The applicant</i>

Randwick City Council (RCC) feedback on the Plan	References to the relevant resources	Proponent's comments and responses
living on Harold Street, Matraville which were forwarded to the NSW EPA as the Regulatory Authority for the development. Council notes Harold street is not a designated location for the quarterly noise assessments. Whilst Council acknowledges this noise barrier plan does not include specifics for management of noise complaints, it is important to highlight that noise from the development can often be observed on many streets surrounding the development of which the barrier may not be as effective. In this regard it is recommended that should complaints be received from other surrounding street locations (i.e. street locations not specified on the NSW EPA Environmental Protection Licence), the quarterly noise monitoring should include additional monitoring locations to validate that the noise barrier is effective in noise management at these locations. Opal may also wish to discuss reviewing the required locations for quarterly assessments with the NSW EPA to reflect any concerns that have been raised by local residents from other locations.		<i>should ensure that the monitoring program proposed is in line with the conditions of consent to ensure ongoing compliance.</i> Based on the assessment provided in the Plan, the applicant satisfies the requirements of conditions of consent in relation to noise monitoring program. And the noise assessment reports confirm the noise barrier wall achieves ongoing compliance with the applicable requirements. The EPA did not mention that they have received any public complaints in relation to noise impacts generated from the Opal site. The EPA has not indicated in their review of the draft Plan that the area covered by quarterly noise monitoring should be expanded or modified. Also, the below extract from the quarterly noise monitoring reports for Aug and Nov 2022 clarifies that the noise impact felt by residents in nearby streets is not only due to industrial operation on Opal site but other ambient sources and expanding the monitoring area will not change this observation. <i>Several years of monitoring data consistently indicate that 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...the total measured noise levels at monitoring locations are only partly due to Opal operations on site..., direct measurement of Opal's contribution to the noise environment is not possible because noise emissions from the site are generally lower than the ambient measured LAeq noise levels.</i> Further to the above extracts, the general findings of the noise monitoring reports confirm the noise barrier wall has been functioning as expected and required by standards to mitigate the noise generated on site.

5 Recommendations

The Quarterly Noise Monitoring reports for August and November 2022 and the Noise Validation report prove the existing noise barrier is an effective, robust, cost-effective, and durable solution which has allowed the Opal paper mill site to continue to operate effectively and efficiently within its license limits.

In its context and its use, the existing noise barrier is considered to be appropriate in scale, character and aesthetics. It does not result in any tangible adverse amenity impacts to the neighboring properties or the public domain. In fact, it is not unreasonable to conclude that it comprises positive visual qualities on the boundary between industrial and residential lands.

This Plan recommends:

- An annual maintenance inspection of the existing noise barrier will be conducted once every 12 months.
- Based on the findings of the annual inspection, the existing noise barrier will continue to be maintained at 12-month intervals to ensure structural integrity and physical appearance.
- Rust and any physical damage to the barrier will be noted at that time and repaired appropriately.
- To record the inspection outcomes, a short pro-forma report will be prepared which sets out the conclusions of the annual inspections and any issues actioned as necessary. These will be kept on file, on site, for a minimum of five years.
- Any changes to operations/development on the site which have the potential to increase noise impacts may need to consider alternative noise barrier solutions.
- Any significant variations to the existing noise barrier will warrant an update to this Plan.

Appendix A

Visual Impact Assessment



Visual Impact Assessment

The following visual impact assessment has been prepared to support this Long-Term Noise Barrier Plan to extend the use of the existing noise barrier along the north-eastern boundary of the site for the long term.

Figure 1 below shows the location of the noise barrier in relation to other buildings on site.



Figure 1. Aerial image showing the existing noise barrier along the eastern boundary of the site. Image courtesy of Nearmap, Oct 2022

Our assessment is based on:

- the information provided in the previous planning approvals and assessment reports prepared by the DPE (primarily the assessment report for modification application 8 (05-0120 MOD 8) that was approved in October 2018); and
- a visual survey of the current site conditions and views from the surrounding area through a site visit carried out by WSP on 03 October 2022. Photos taken during this site visit are provided in this assessment.

Our assessment shows the visual impact of the existing noise barrier on the surrounding context is minimal and acceptable in its context. This conclusion is reached from the following observations:

01. The appearance of the existing noise barrier wall is very similar in colour, materials and form to the facades of the other industrial buildings on the site and surrounding industrial lands that are visible from Botany Road and McCauley Street frontages. The façades of existing industrial buildings along these streets comprise metal

cladding and are painted mainly in ocean blue (see **Figures 2 and 3** below). The exception to this is the disused B8 Paper Mill building on the southern corner of the site, which is built of brick.



Figure 2. façade of the other site buildings on the corner of McCauley St and Botany Rd. Photo taken by WSP, Oct 2022



Figure 3. façade of the other site buildings along McCauley St frontage. Photo taken by WSP, Oct 2022

02. The visual presentation of the existing noise barrier is consistent with industrial character of the site and the larger surrounding context as shown on **Figure 4** below. The existing noise barrier establishes an appropriate interface between the more noise sensitive residential uses to the north-east of the site and the less noise sensitive industrial uses and activities to the southwest.



Figure 4. Aerial image showing the site in its immediate industrial context. Photo provided by Opal.

03. The existing noise barrier appears to be approx. 10m high when viewed from Purcell Park despite its actual height of 11.6m (measured from the existing ground level below it). This difference is due to a change in level of between 1.5m to 1.8m between the site and the boundary. Therefore, the existing noise barrier appears to be generally the same height as the former B7 group of Opal paper mill buildings that used to be located along the north-eastern boundary of the site.
04. The B7 group of buildings were between 10m and 12m high and were demolished by 2017. However, it should be noted these buildings did not present as positive a visual backdrop along the north-eastern boundary, nor did they provide the same level of noise attenuation (given the fact there were (limited) operations between the buildings and the part brick / part wire fence boundary. Refer to **Figures 5, 6 and 7** below, especially the exhausts and ventilation stacks located on external walls and the damaged brick facades. The brick facades of these redundant buildings were no longer consistent with the metal cladding used on the façade of the more recent buildings on site, as discussed above.



Figure 5. View of pre-existing B7 paper mill and reel store on site, visible along the eastern boundary of the site. Photo provided by Opal.



Figure 6. View of pre-existing B7 paper mill on site, visible along the eastern boundary of the site. Photo provided by Opal.



Figure 7. View of the pre-existing B7 paper mill and reel store on site, visible from Purcell Park. Photo contained in the noise management report by Hutchison Weller dated 19 Sep 2016.

05. The existing noise barrier is mainly visible from a single cul-de-sac at the western end of Partanna Avenue, and the western boundary of Purcell Park. However, the views of the noise barrier in these locations are partly obscured by existing vegetation (see **Figure 8**).



Figure 8. View of the existing noise barrier from the southern end of Purcell Park. Image courtesy of Google Map, Oct 2022.

Figures 9 and 10 show the previous B7 Reel Store building on the site, as viewed from Purcell Park and the western end of Partanna Road. Although not taken from the exact same locations, these photographs provide a general visual comparison between the views created by existing noise barrier and what was previously visible on site from the adjoining public domain.



Figure 9. View of the pre-existing B7 reel store from the southern end of Purcell Park. Photo contained in the modification assessment report for MOD 8 application by DPE.



Figure 10. View of the pre-existing B7 reel store from the western end of Partanna Avenue. Photo contained in the SEE prepared by Elton consulting in support of MOD 8 application, June 2018

The most noticeable views of the noise barrier are experienced from a total of six residential properties at the western end of Partanna Avenue, when looking south and south-west. Previously the brick walls of the B7 building group were visible from these locations, as shown on **Figures 5, 6 and 7** above. Views of the existing noise barrier as currently seen from these properties are provided in **Figures 12, 13 and 14**.

Figure 11 contains a screenshot from google maps with the angles and view lines of **Figures 12-14** and the location of the noise barrier shown on it.

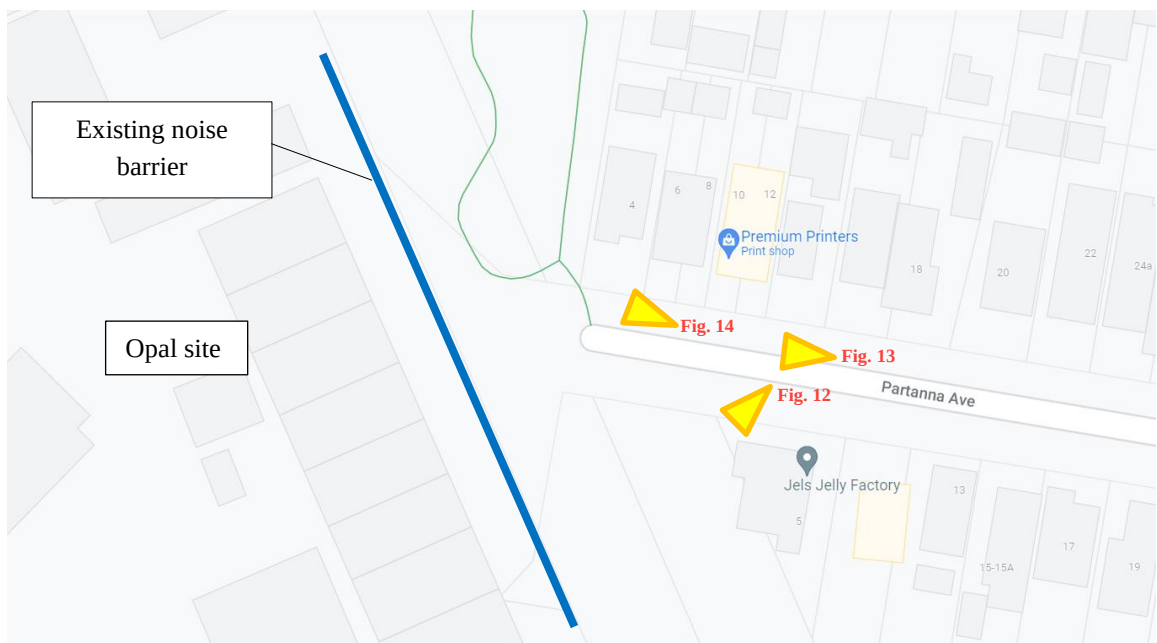


Figure 11. Map showing the location and viewing angel of Figures 11 - 13. Prepared by WSP, Oct 2022



Figure 12. View of the existing noise barrier from western end of Partanna Avenue looking south. Photo taken by WSP, Oct 2022.



Figure 13. View of the existing noise barrier from western end of Partanna Avenue looking east. Photo taken by WSP, Oct 2022.



Figure 14. View of the existing noise barrier from western end of Partanna Avenue looking north-east. Photo taken by WSP, Oct 2022.

The view of the existing noise barrier is more consistent with the other industrial buildings on the site and the rendered hebel block fence along the north-eastern boundary of the adjoining industrial site immediately north and northeast of the main Opal operations (**Figures 15 and 16** below).



Figure 15. View of the existing noise barrier and the hebel block fence along the eastern boundary of the adjoining industrial site to the north, viewed from Purcell Park. Photo taken by WSP, Oct 2022.



Figure 16. A closer view of the hebel block fence along the eastern boundary of the adjoining industrial site to the north, viewed from Purcell Park. Photo taken by WSP, Oct 2022.

There are no signs of graffiti, rust and/or damage on the wall as shown on **Figure 17** below to necessitate any maintenance or replacement of the structure. It is important to note that **Figure 17** which shows a lack of graffiti on the existing noise barrier was taken from the very end of Partanna Ave as opposed to from in front of any individual dwelling along that road. As a result, it is not a view that would [often] be seen by adjoining properties.



Figure 17. View of the existing noise barrier from the western end of Partanna Avenue. Photo taken by WSP, Oct 2022.

As it can be seen from the above images, the existing noise barrier is in a good condition, does not block any prominent views or result in any significant adverse visual impacts on the surrounding area due to its proportionate distance from the closest residential properties (at approx. 32m) that is approximately three times its visible height (10m). It should be noted that the existing noise barrier also blocks the views into the site, that might not be considered as visually pleasant by some.

Alternative noise barrier options

To be effective, a noise barrier needs to be of solid construction and of a certain size and height to block and/or mitigate the transmission of noise from its primary source. In the case of this site, the existing noise barrier is almost the same height of the recently demolished B7 group of buildings that acted as a physical barrier to much of the industrial activity generated on site and helped minimise and mitigate many of the noise between (and from beyond) the site and the more sensitive land uses to the north-east.

Alternative noise attenuation measures could be provided on site through the construction of:

- a new factory building.
- a new warehouse.
- a new walled storage yard; and/or
- a standalone structure similar to the existing container wall (e.g. a Hebel wall).

Any new building or structure that might act as a noise barrier would probably need to be constructed to the same height and length as the existing noise barrier to satisfy the relevant noise attenuation requirements.

The visual appearance of any new building / structure - when viewed from the public domain - is of relevance to the purpose of this assessment. The visual appearance of any new building / structure is mainly defined by (but not limited to) the material/s (texture), colour/s, and pattern/s created.

To provide a comparison between the existing noise barrier and an alternative building / structure, the factors that can define the aesthetic qualities of a noise barrier are reviewed below:

01. **Material/s:** considering the industrial context of the site, an alternative noise barrier would probably be constructed from concrete panels, steel structure covered with metal cladding, or other materials such as Hebel blocks. Brick is possible but considered unlikely due to faster and more efficient construction methods.

Comparing the existing noise barrier with the Hebel block fence further along the north-eastern boundary of the site, or the metal clad buildings existing on the site, there is not much difference between them in visual terms.

Erecting a new brick wall, similar to what previously existed on this boundary, does not deliver a visually better outcome to the existing barrier, as it would be inconsistent with the predominant surrounding modern industrial context. It should be noted that the existing building (B8) on the southern corner of the site is disused and may be replaced with a new building in the future.

Given the minor difference between the visual representation of likely alternative barrier options discussed above and the existing noise barrier, replacing the existing containers (that are in good shape and have projected longevity) with an alternative building or structure of a different material does not appear justifiable on the basis of materials alone nor is it a sustainable or economically feasible option.

02. **Pattern/s:** Can be created by the material/s used for the construction of the noise barrier or added through additional works for aesthetic, structural or functional purposes.

The pattern of the existing noise barrier is very similar to the metal cladding used for the façade of the main Opal paper mill building, other existing buildings on the site, as well as other industrial buildings in the vicinity of the site. This aesthetic is quite common / not unusual for buildings in an industrial area and the simplicity and strength of flat / corrugated sheet metal cladding add to the overall aesthetic of an industrial process: one where “form follows function”.

Considering the abundance of industrial buildings with a similar pattern/s to their facades, altering the existing noise barrier to something different from this would not result in a superior visual outcome, nor would it necessarily relate as well to its use and context.

03. **Colour/s:** the existing noise barrier is painted in Colourbond Ocean Blue to maintain a visual consistency with the main Opal paper mill building on the site, together with other associated buildings and structures on site.

Considering the metal cladding on the facades of the other buildings on site are also painted in Colourbond Ocean Blue and white, the other logical alternative would be to paint the existing noise barrier white. However, this would result in significant reflection and could make them far more visually prominent structures when viewed from the public domain and nearby residences. Therefore, changing the colour of the existing noise barrier from ocean blue to white would intensify their visual impact and is not considered a preferred alternative.

Additional aesthetic treatments of the façade of the noise barrier, such as murals or cladding, could have been considered if the barrier was facing a prominent public realm or a major sensitive development – such as a major public road, a school or similar land use. But given it is only visible from the end of a cul-de-sac of a local street, affecting partial views from 4 – 5 single dwellings, and one side of a small local park that is not serving large events, the value of addition of such aesthetic treatment for the whole or part of such a large area (approx. 2,500 sqm.) is not justified.

Conclusions

Based on the outcomes of the above assessment, the historical data (including planning assessment reports) available to WSP for the purpose of this assessment, site observations and the alternative option analysis, the existing noise barrier is considered to be suitable as a long-term solution considering the existing noise barrier:

- satisfies the noise attenuation standard expected from such a structure.
- is structurally safe and can be maintained as required through the inspection and maintenance strategy prepared for the noise barrier; and,
- is well maintained, and its visual presence is both acceptable and appropriate for its context.

As stated in the *State Significant Development Modification Assessment* report prepared by the DPE in response to the modification application (05_0120 MOD 8) dated October 2018, “*While the installation of the shipping container noise barrier would change the vistas from the surrounding area, the visual impact is justified given the noise attenuation associated with the installation of the barrier and the context of the area. Additionally, the Department notes that no submissions were received from nearby residents regarding visual impacts*”. The DPE report then recommends the

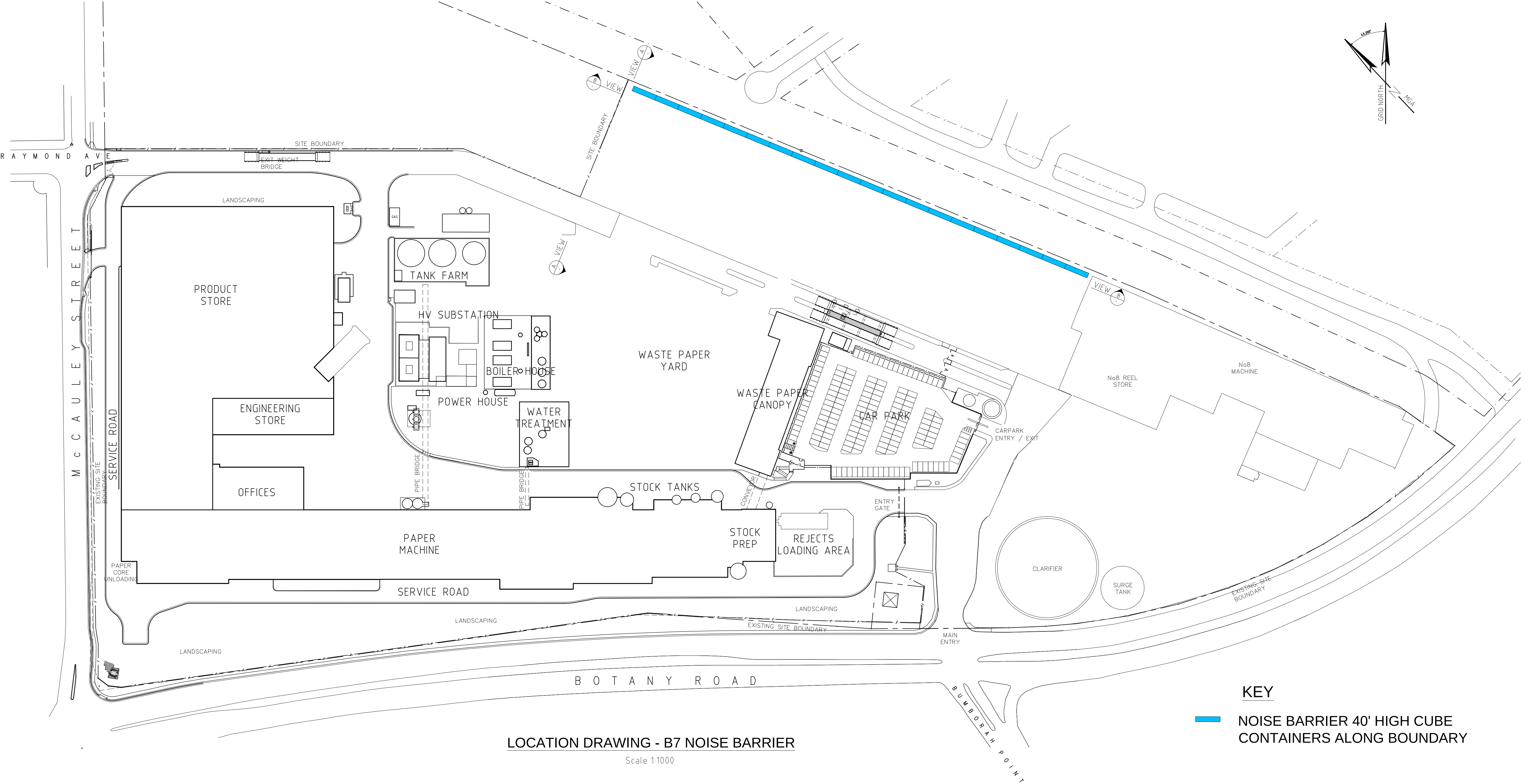
applicant to prepare a *Long-term Noise Barrier Plan* to address any visual amenity impacts associated with the noise barrier, as provided in this section of the plan.

It should be noted that demolition and reconstruction of a well-functioning and visually suitable noise barrier with an alternative structure to deliver a similar outcome but slightly different look, is a significant waste of materials and cannot be justified on any grounds.

Appendix B

Noise Barrier Wall Drawing



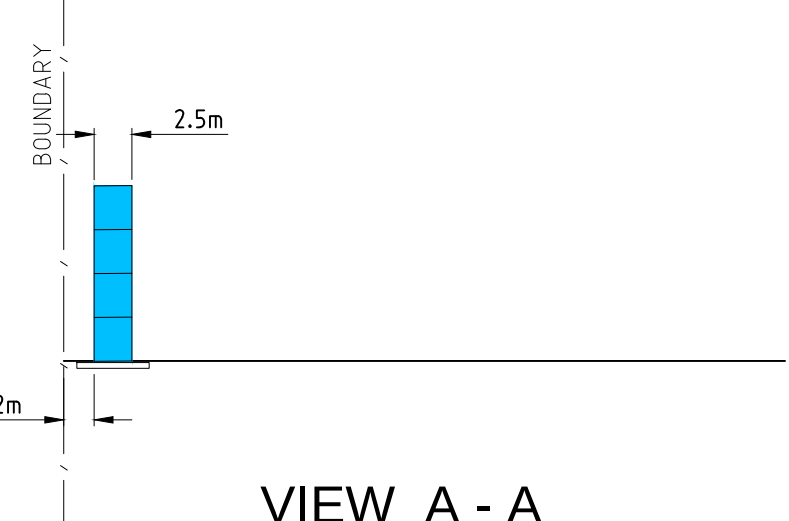


LOCATION DRAWING - B7 NOISE BARRIER

Scale 1:1000

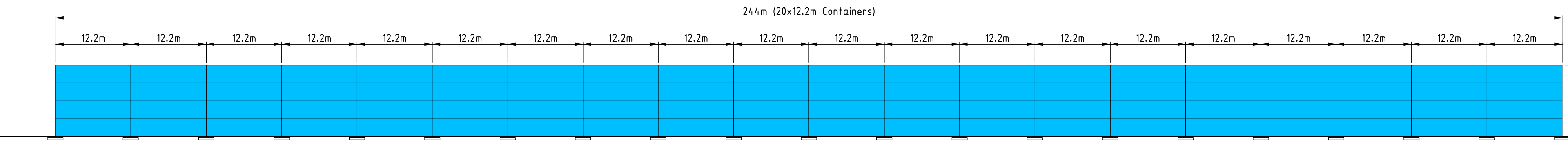
KEY

NOISE BARRIER 40' HIGH CUBE
CONTAINERS ALONG BOUNDARY



VIEW A - A

Scale 1:500

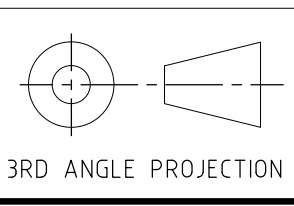


VIEW B - B

Scale 1:500

REV.	REVISION	SIGNED	DATE	REV.	REVISION	SIGNED	DATE

DIMENSION TOLERANCES EXCEPT AS NOTED	
MACHINED SURFACES	FABRICATION
FRACTIONAL : ANGULAR :	± 0.5mm/M ± 0.5°
	± 1.5mm/M ± 1°



BOTANY MILL

MILL WIDE
B7 BOUNDARY
NOISE BARRIER DEMO PROGRAM
B7 BUILDING & REEL STORE HIDDEN

SCALE 1:1000 & 1:500 @ A1	COMPUTER FILE No. H:\ORORA\A1\Drawings\523961
DRAWN SG	AREA MILL WIDE
CHECKED	DRAWING No. 523961
APPROVED	REV No. 0
DATE 29/03/18	FILE INDEX JOB No.

Appendix C

Quarterly Noise Monitoring reports



Opal Pty Ltd

Botany Paper Mill – EPL Compliance August 2022 Quarterly noise monitoring report



26 October 2022

Doc no. 16002-QM-RP-25-0

Opal Pty Ltd
Botany Paper Mill - EPL Compliance

Title	August 2022 quarterly noise monitoring report
Document no.	Doc No. 16002-QM-RP-25-0
Revision	0
Date	26 October 2022
Author	Scott Hughes
Reviewer	John Hutchison
File name	16002-QM-RP-25-0 Quarterly Monitoring Report - August 2022.docx

Hutchison Weller Pty Ltd
ABN 37 001 024 095
13/357 Military Road
Mosman NSW 2008

www.hutchisonweller.com

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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 (L_w):** 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 L_p):** 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 August 2022 – October 2022 quarter. At the time of monitoring, the B9 paper machine was operating at normal production capacity.

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 survey access.

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 noise emissions from the site 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 but a combination of influences from all local noise sources.

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 on the boundary of an industrial area around Port Botany and is bordered to the north and east of the site by residential properties 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

The local noise environment has been a feature of the area for many years and the total measured noise levels at monitoring locations are only partly due to Opal site operations. Direct monitoring of Opal noise emissions over time has demonstrated that specific contribution from Opal cannot be provided with any certainty due to the influence 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**. The receiver at R3 is not currently being monitored due to access restrictions. The receiver at R1 monitoring was not collected due to a failure of the noise logger.

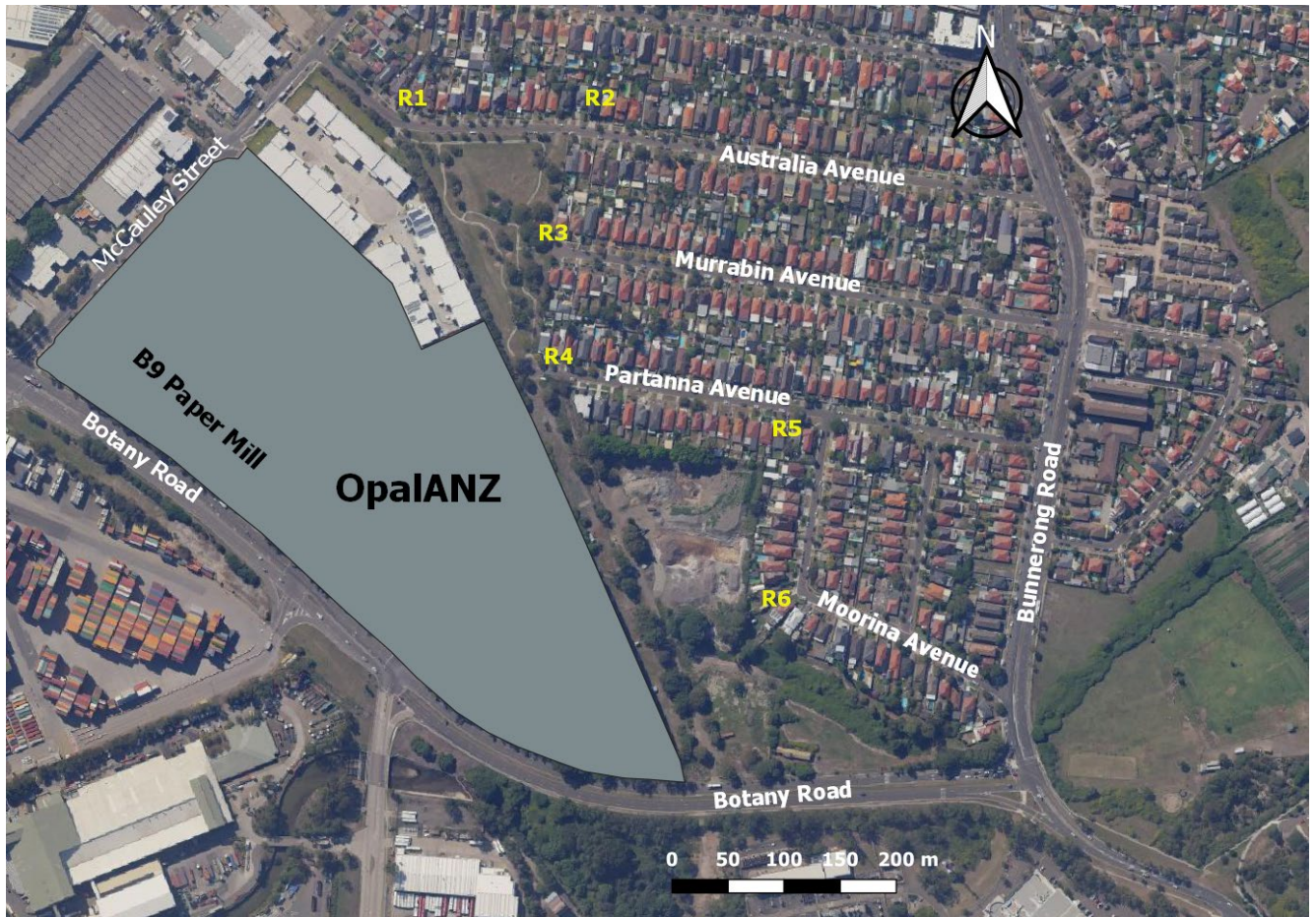


Figure 2-1 Site location and compliance monitoring locations

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 McCauley 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 park adjacent to the property during the monitoring 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 August quarterly monitoring period was completed between 16 September and 23 September 2022, using automatic noise loggers deployed at five representative locations.

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

Weather data 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.

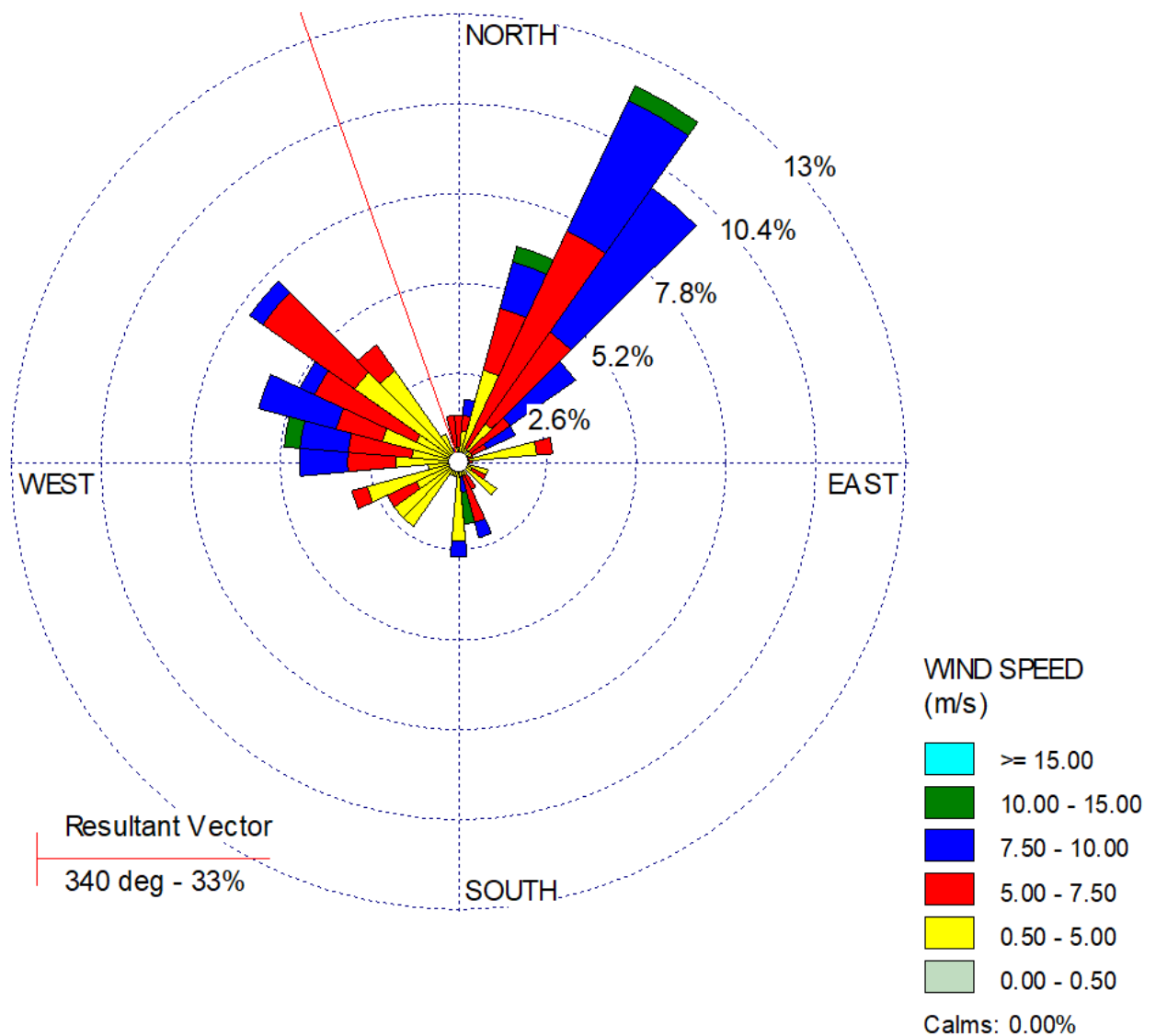


Figure 3-1 Wind speed and direction during monitoring period (16 September – 24 September 2022, source BoM 2022)

The wind rose analysis indicates that winds from the north easterly direction accounted for about 40% of the total measurements. Around 40 % of recorded wind speed during the monitoring period was in the 0.5 to 5.0m/s range. (see Figure 3-2). The resultant wind vector for the monitoring period is concentrated in the north-north west.

Winds from a northerly direction are likely to carry noise from the ports and Opal away from residences to the north and east of the Opal site however, these conditions may enhance noise carried from the road traffic in the north.

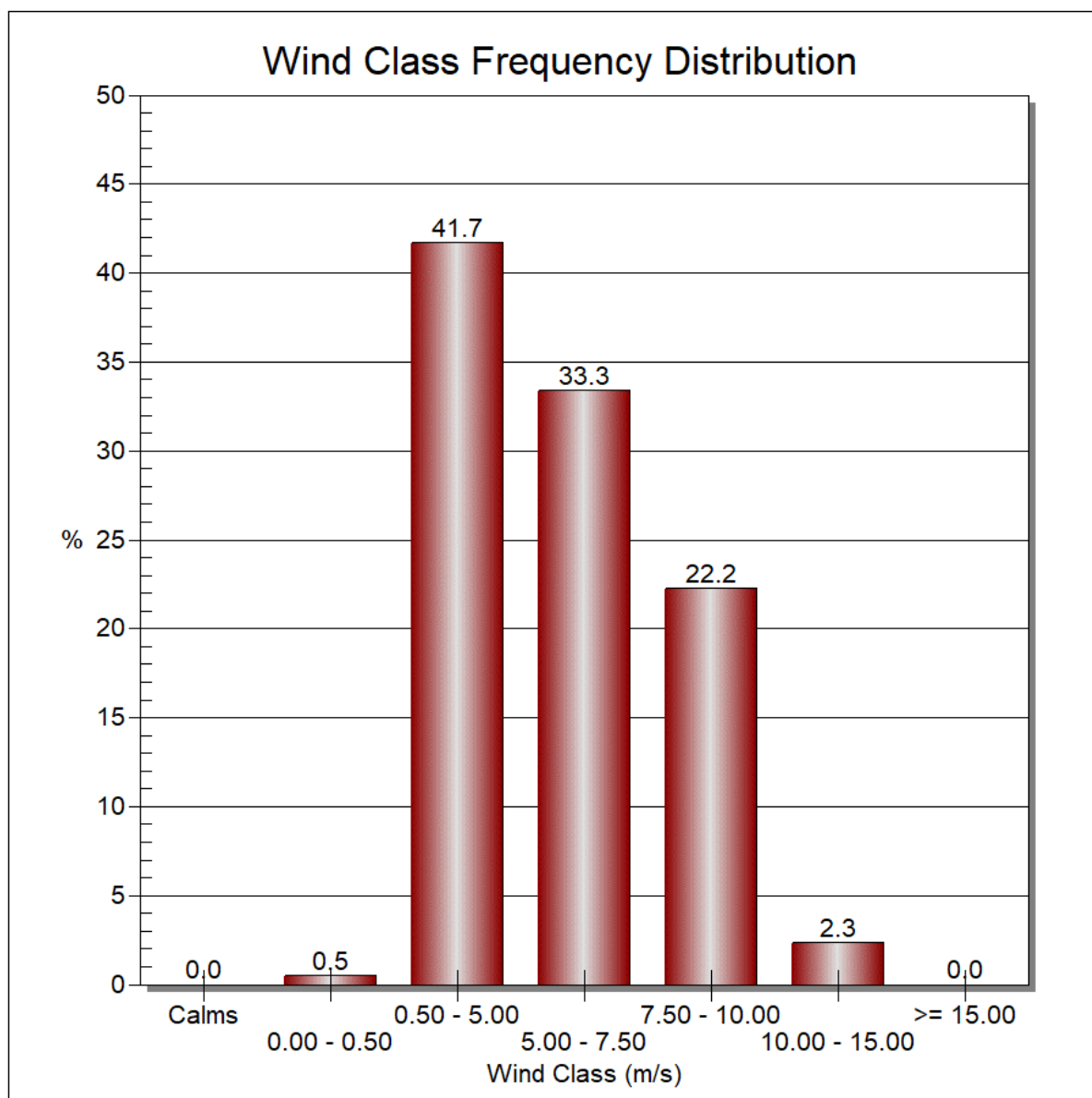


Figure 3-2 Wind speed frequency distribution over monitoring period

3.2 Monitoring results

The reported L_{Amax} , L_{A1} , L_{Aeq} , and L_{A90} noise levels are summarised from a 24 hour period of monitoring and 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.

During the August 2022 quarterly noise survey, the paper mill operated normally.

Measured L_{A90} and L_{Aeq} noise levels for the night-time period during the monitoring survey are noticeably lower than 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 measured levels during the latest round of noise monitoring indicate that the overall background environmental noise levels were within about 1 dB of the L_{Aeq} 15min noise criteria at each location and are similar levels to previous noise studies for these locations.

The most recent round of compliance measurements has been added to the historical data collected during compliance noise surveys, providing about 10 years of seasonal data. This data includes measurements of the noise environment with the Opal site operational over the whole monitoring period.

The results of monitoring survey for August 2022 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.

The L_{Amax} noise levels for the April noise monitoring period are consistent with L_{Amax} noise levels from previous surveys. Measured L_{Amax} and L_{A1} noise levels during the monitoring periods are higher than the project L_{Amax} noise goals however, these levels do not relate to the operation of the Opal site.

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	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}
Friday 16 September 2022	-	-	49.0	54.3	-	-	42.2	51.7	26.8	76.9	26.0	73.1
Saturday 17 September 2022	-	-	45.2	52.9	-	-	39.1	51.2	44.5	53.0	43.8	54.3
Sunday 18 September 2022	-	-	39.3	52.2	-	-	41.5	52.2	37.5	52.0	38.4	51.5
Monday 19 September 2022	-	-	39.3	51.1	-	-	41.3	53.6	40.0	50.0	43.0	51.2
Tuesday 20 September 2022	-	-	39.0	49.7	-	-	41.9	53.0	40.4	52.4	42.5	51.6
Wednesday 21 September 2022	-	-	40.8	51.3	-	-	39.1	55.0	43.9	53.4	45.2	53.2
Thursday 22 September 2022	-	-	37.8	50.0	-	-	40.2	53.9	39.5	52.0	42.1	51.7
Friday 23 September 2022	-	-	39.3	52.2	-	-	42.6	52.6	40.8	53.9	43.4	50.8
Median	-	-	39.3	51.7	-	-	41.4	52.8	40.2	52.7	42.7	51.7

Evening: 6:00:00 PM to 10:00:00 PM	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}
Friday 16 September 2022	-	-	43.6	52.1	-	-	40.9	48.6	44.6	50.8	42.0	51.2
Saturday 17 September 2022	-	-	46.2	51.0	-	-	42.9	48.1	45.1	50.2	44.1	50.7
Sunday 18 September 2022	-	-	44.2	52.5	-	-	43.2	51.5	45.2	51.1	44.8	51.5
Monday 19 September 2022	-	-	39.5	50.1	-	-	40.5	46.8	36.5	44.8	41.5	47.5
Tuesday 20 September 2022	-	-	38.3	48.2	-	-	39.2	45.5	41.8	50.3	43.0	49.9
Wednesday 21 September 2022	-	-	38.0	48.0	-	-	38.0	43.3	39.8	47.7	40.8	48.0
Thursday 22 September 2022	-	-	37.4	49.9	-	-	38.4	48.6	36.5	51.9	38.6	53.9
Friday 23 September 2022	-	-	38.3	47.2	-	-	38.6	46.7	40.3	48.8	41.0	50.9
Median	-	-	38.9	50.0	-	-	39.9	47.4	41.1	50.3	41.7	50.8

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	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}
Friday 16 September 2022	-	-	38.3	46.3	-	-	37.2	47.3	41.4	49.3	38.6	45.8
Saturday 17 September 2022	-	-	38.7	47.5	-	-	39.4	51.1	40.3	55.2	37.4	46.2
Sunday 18 September 2022	-	-	40.7	50.6	-	-	38.6	51.6	40.2	56.7	36.9	47.3
Monday 19 September 2022	-	-	46.4	51.1	-	-	41.9	50.2	41.6	54.5	40.0	46.7
Tuesday 20 September 2022	-	-	35.2	46.2	-	-	36.1	49.8	36.1	49.5	36.8	45.3
Wednesday 21 September 2022	-	-	35.1	45.1	-	-	36.2	47.4	35.9	48.5	37.0	49.5
Thursday 22 September 2022	-	-	36.7	46.6	-	-	36.5	46.7	34.6	53.8	36.5	46.7
Friday 23 September 2022	-	-	36.1	44.8	-	-	36.1	45.6	36.7	53.0	34.5	44.6
Median	-	-	35.7	46.5	-	-	36.9	48.6	38.4	53.4	37.0	46.4

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	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}
Friday 16 September 2022	-	-	71.14	62.7	-	-	84	69.7	86.2	74.9	77.2	67.1
Saturday 17 September 2022	-	-	74.63	58.5	-	-	86.9	68.9	84.6	81.6	71.9	62.7
Sunday 18 September 2022	-	-	84.22	66	-	-	83.9	67.5	85.7	81.8	78.6	65.4
Monday 19 September 2022	-	-	77.15	62.9	-	-	88.2	72.8	84.2	81	75.4	66
Tuesday 20 September 2022	-	-	86.33	66.7	-	-	86.3	71.8	86.3	78.5	72.6	61.4
Wednesday 21 September 2022	-	-	76.45	66	-	-	99.9	70.3	86.7	64.2	72.6	68.1
Thursday 22 September 2022	-	-	87.95	63.7	-	-	90.2	73.4	83.5	80.5	74.9	65.9
Friday 23 September 2022	-	-	74.9	61	-	-	89.9	69.6	87.3	80.6	74.2	65.4
Median Open	-	-	76.8	63.3	-	-	87.6	70.0	86.0	80.6	74.6	65.7

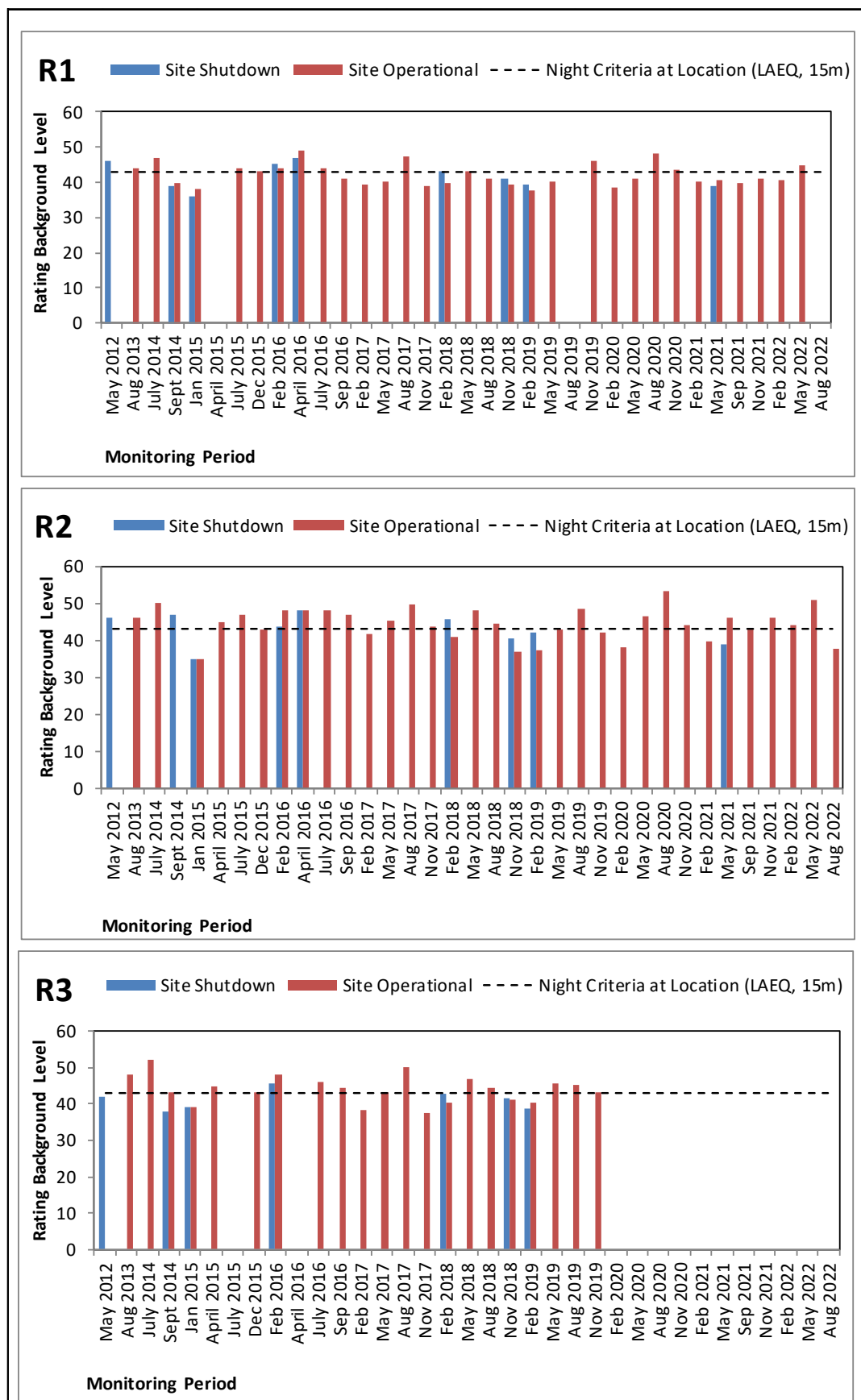


Figure 3-3: Comparison of background noise levels at R1 – R3

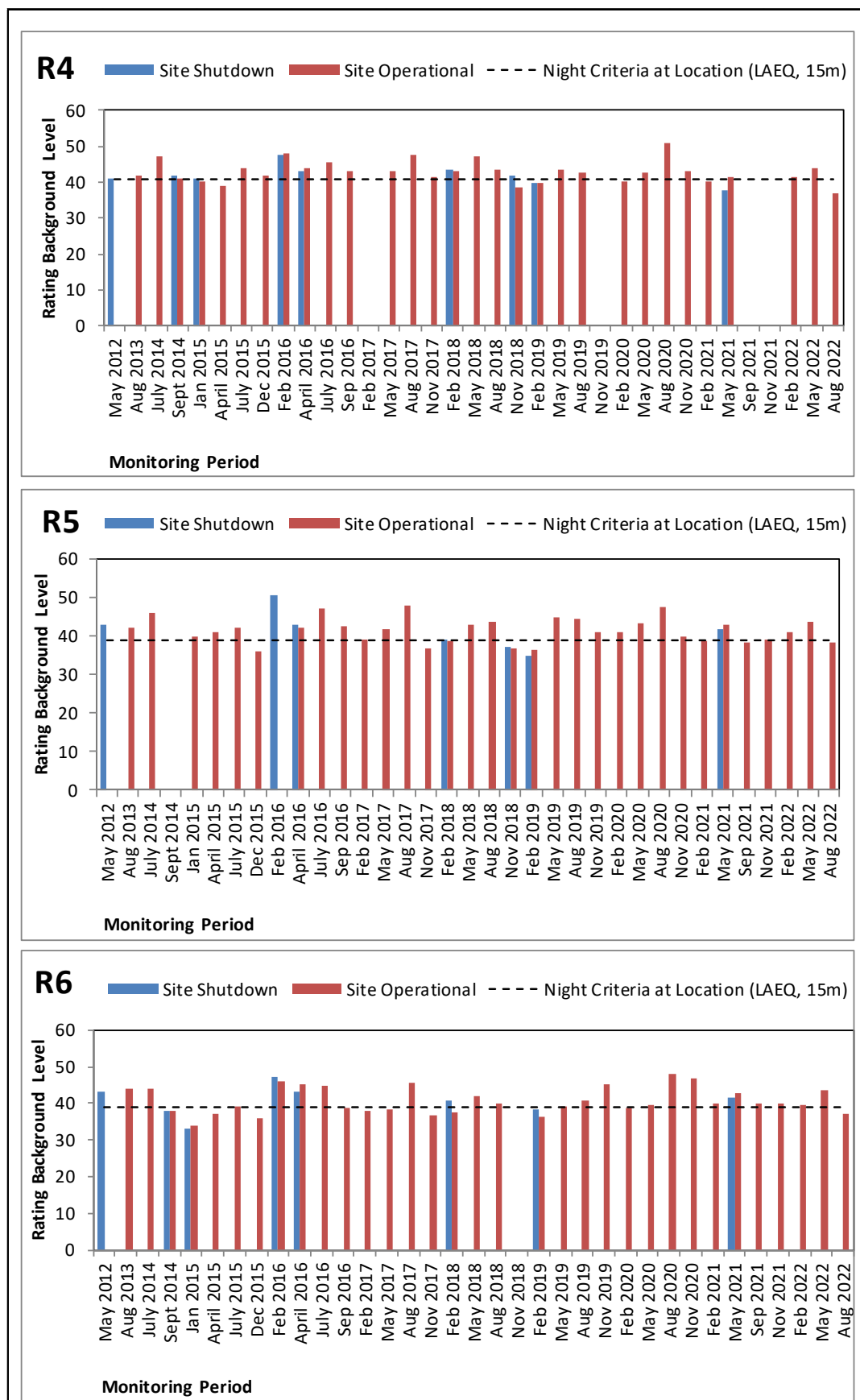


Figure 3-4: Comparison of background noise levels at R4 – R6

4. Summary

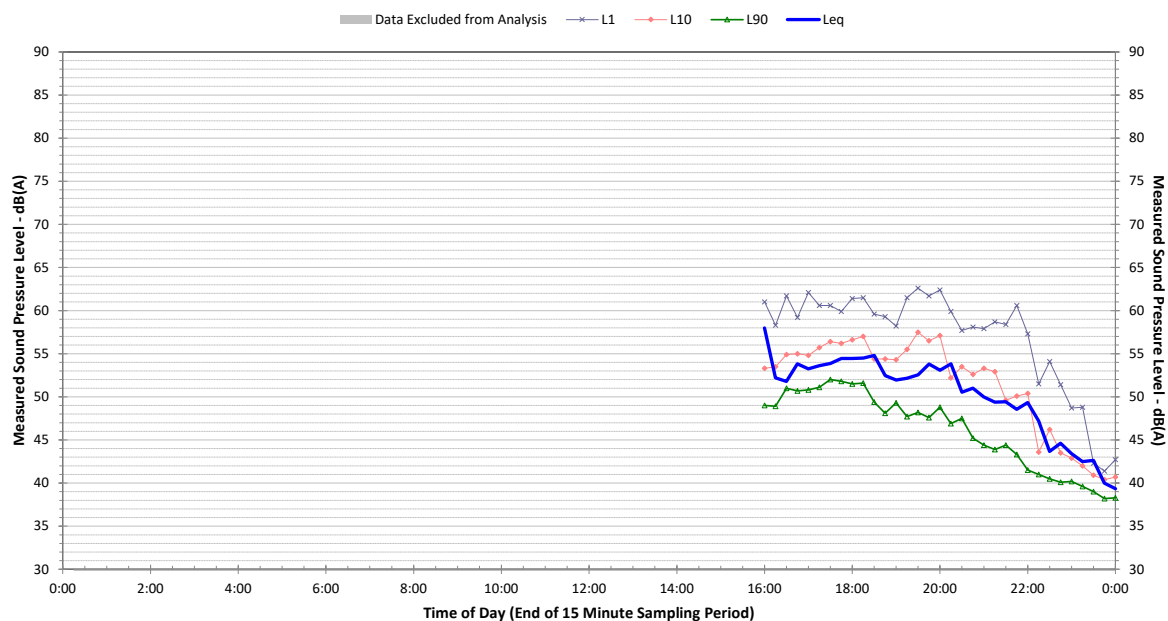
The quarterly noise survey data for the August 2022 - October 2022 period indicates that the L_{Aeq} long term measured noise levels in the vicinity of the paper mill exceeded the EPL criteria for day, evening, and night-time. The maximum (L_{A1}) recorded noise levels at each monitoring location also exceeded the EPL criteria of 55 dB(A) at all receiver locations.

In summary the August 2022 quarterly monitoring the following conclusions have been drawn:

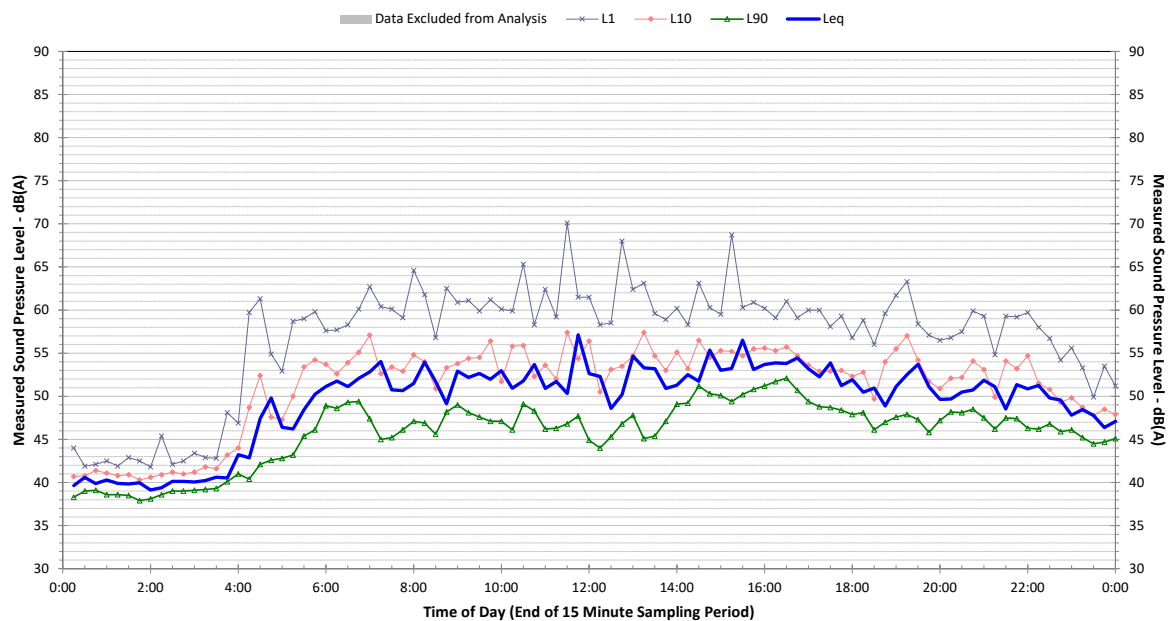
- Several years of monitoring data consistently indicate that the ambient noise environment in the local area is a product of the combined influence of all noise sources within the Port Botany area including the Opal site when operational.
- Winds generally from the north are like to reduce impacts from the Opal site and reduce some noise impacts from the port.
- The most recent noise monitoring results indicate that the measured L_{Aeq} noise levels are at the lower end of the long-term series of data for corresponding seasonal measurement periods. At all measured locations the L_{A90} noise levels are lower than the EPL criteria for each of the monitoring locations.
- The L_{Amax} noise levels for the August noise monitoring period are consistent with L_{Amax} noise levels from previous surveys. The L_{A1} noise levels are consistent with other monitoring periods.
- The L_{Aeq} and L_{Amax} noise levels recorded during the survey period are higher than the EPL criteria at the monitoring locations but are not expected to be related to the operation of the Opal site.

Appendix A. Noise logger graphs

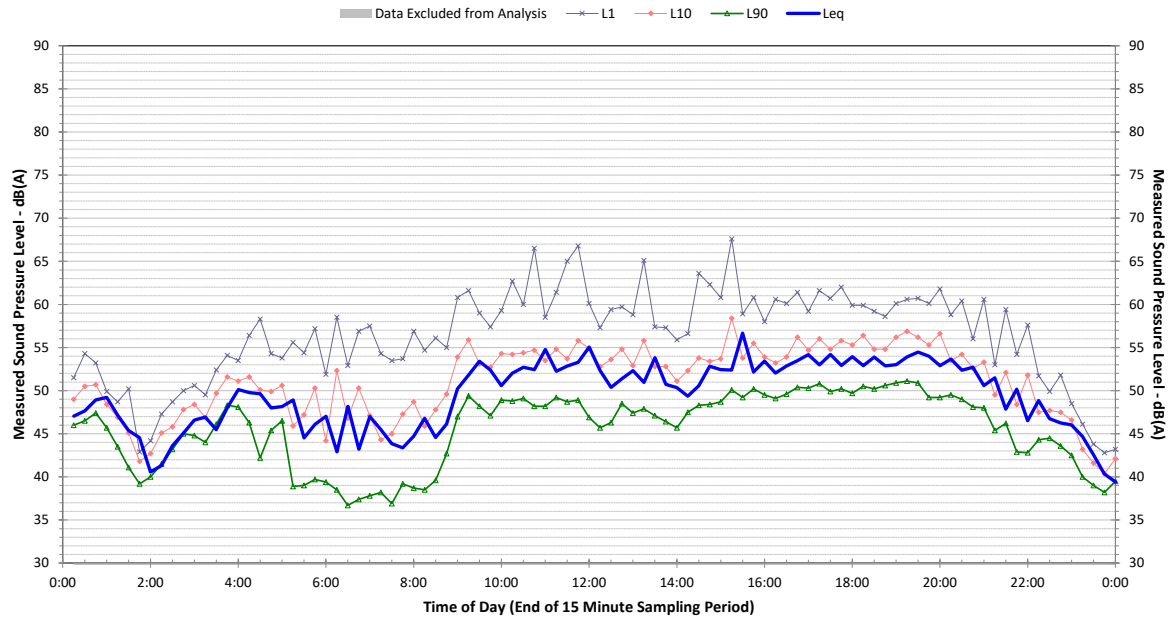
**Profile of Noise Environment - Noise Monitoring Location 2
Friday 16 September 2022**



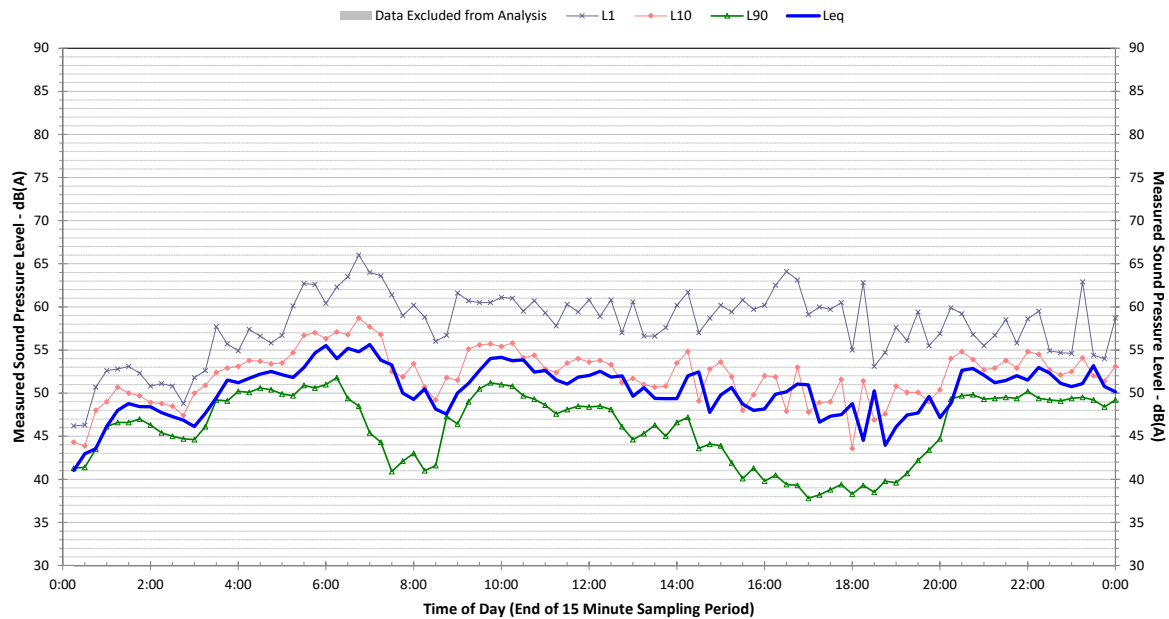
**Profile of Noise Environment - Noise Monitoring Location 2
Saturday 17 September 2022**



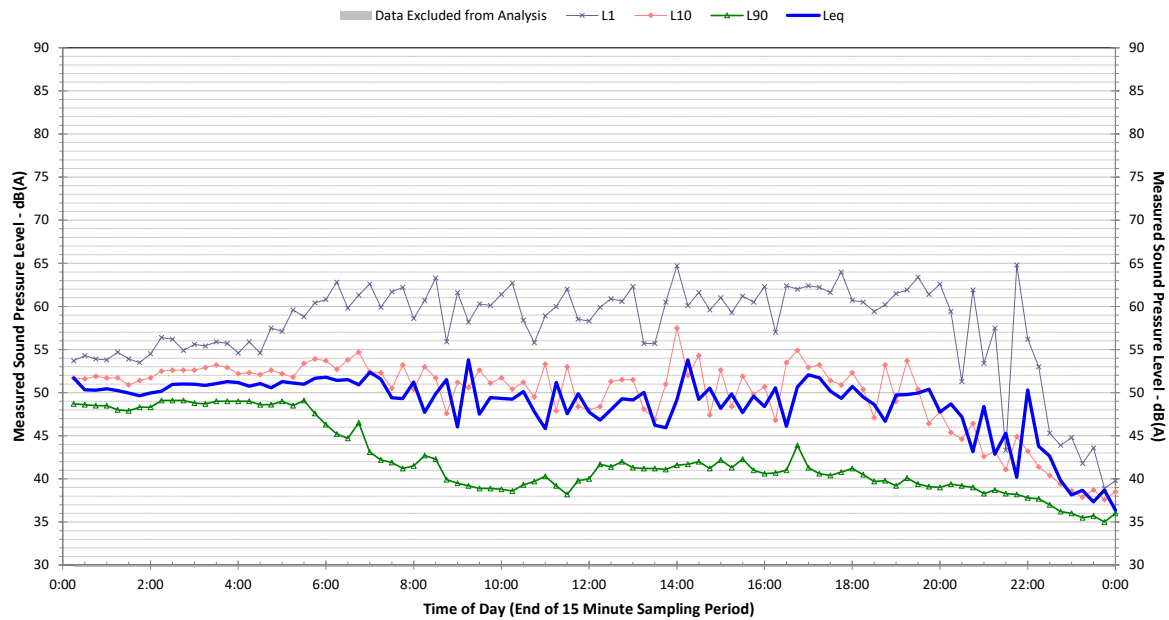
Profile of Noise Environment - Noise Monitoring Location 2 Sunday 18 September 2022



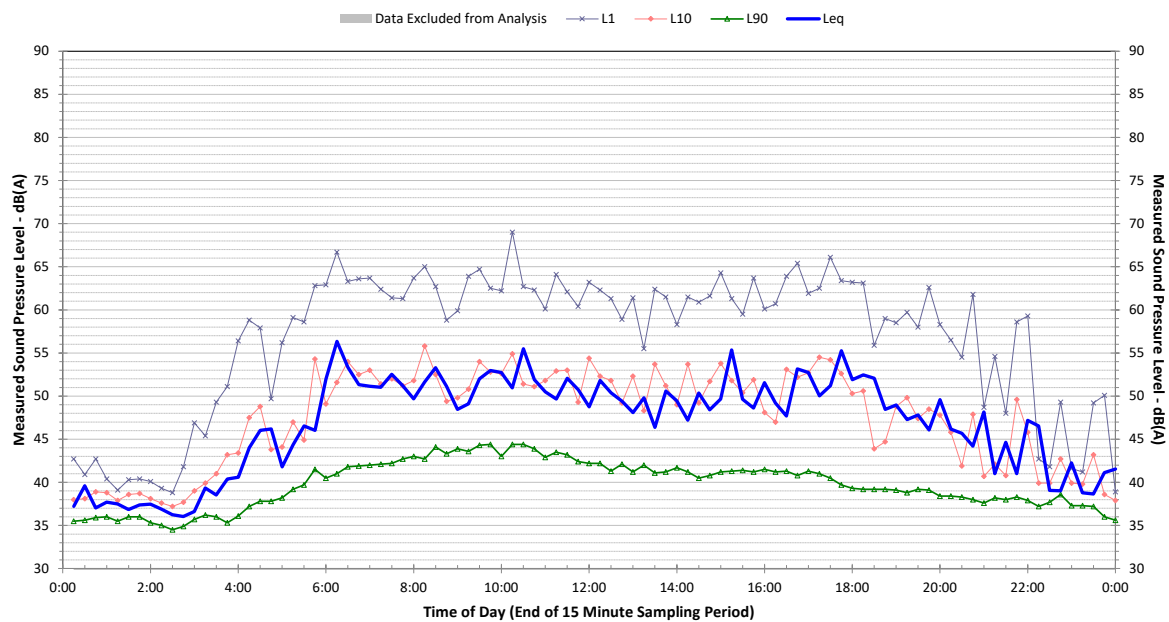
Profile of Noise Environment - Noise Monitoring Location 2 Monday 19 September 2022



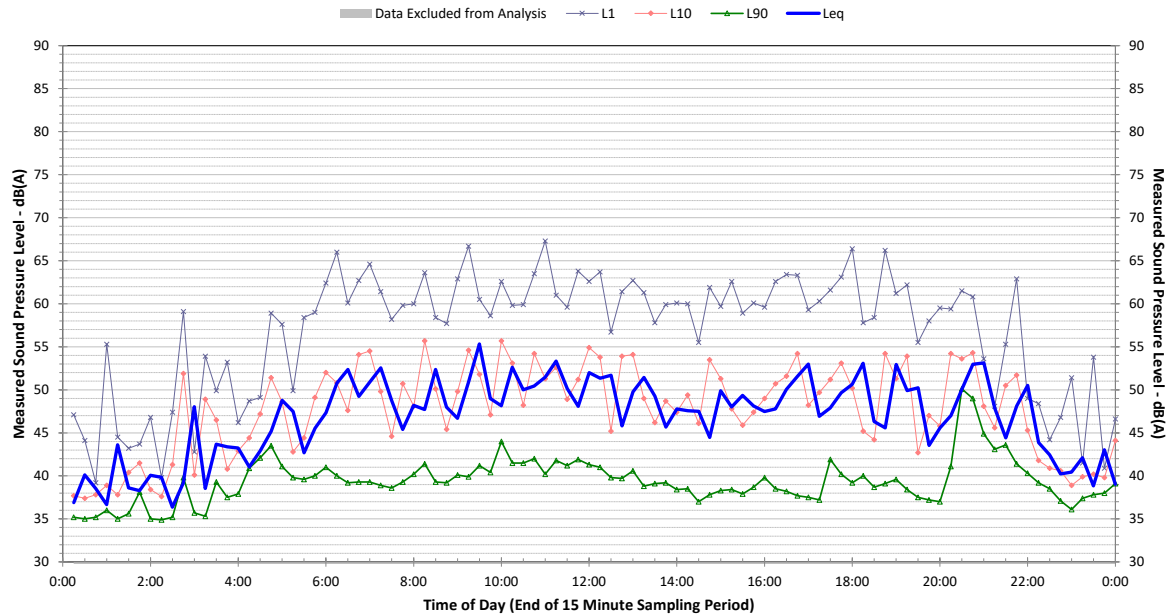
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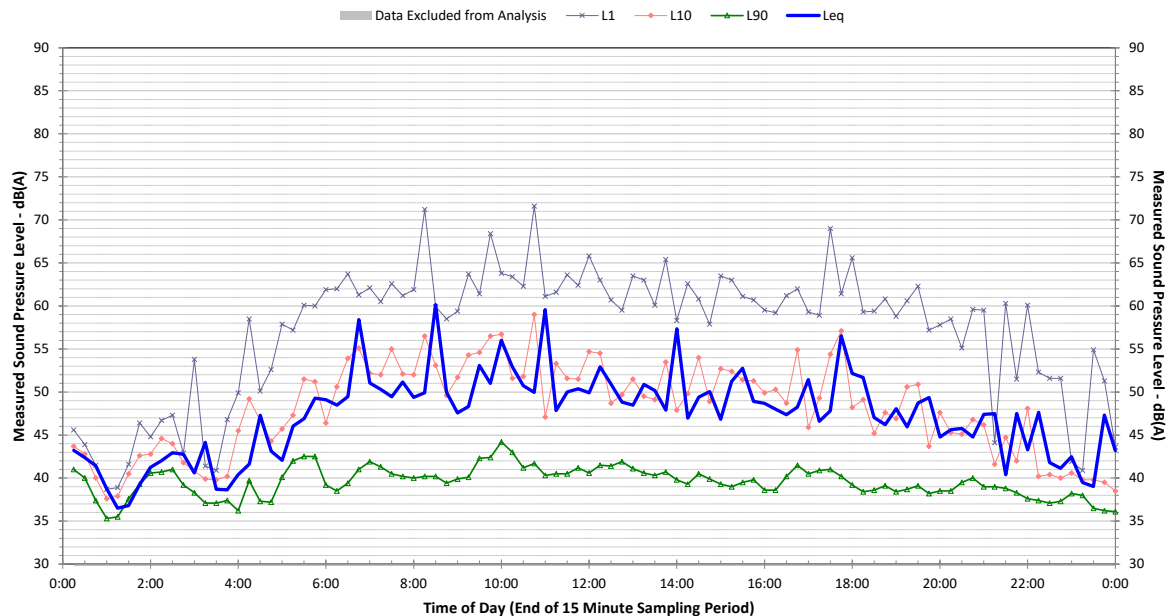
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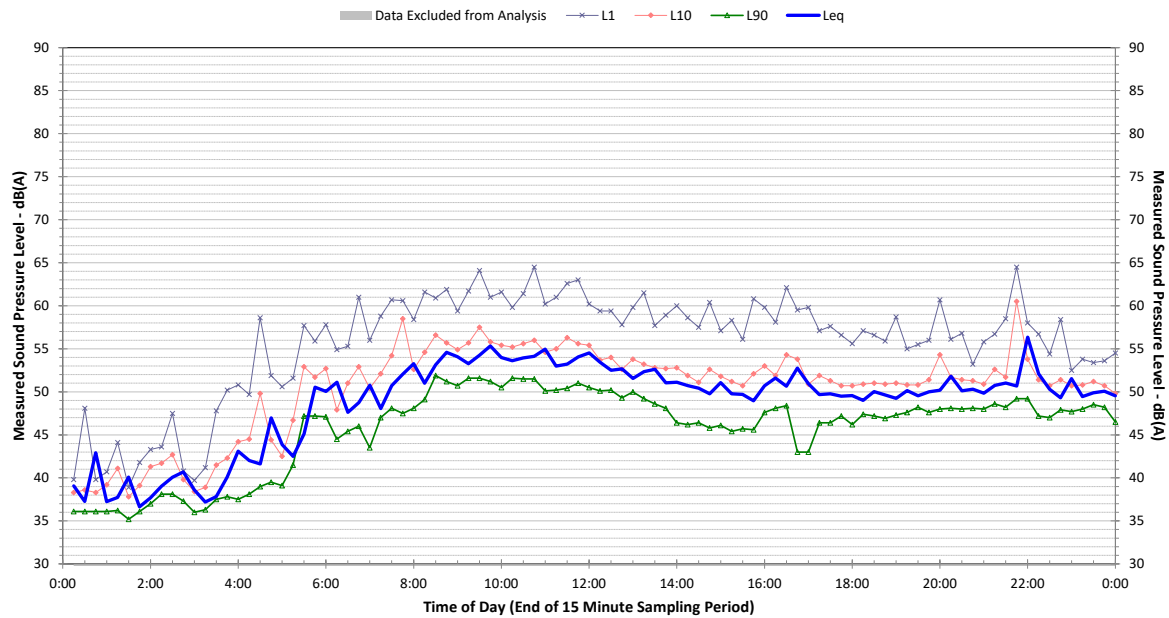
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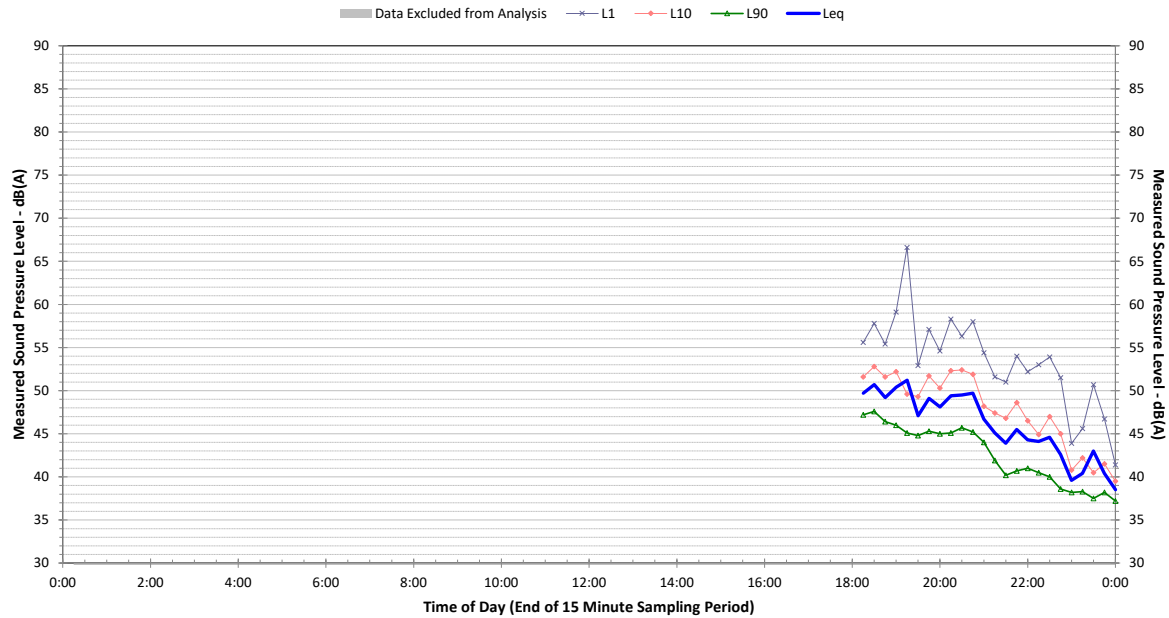
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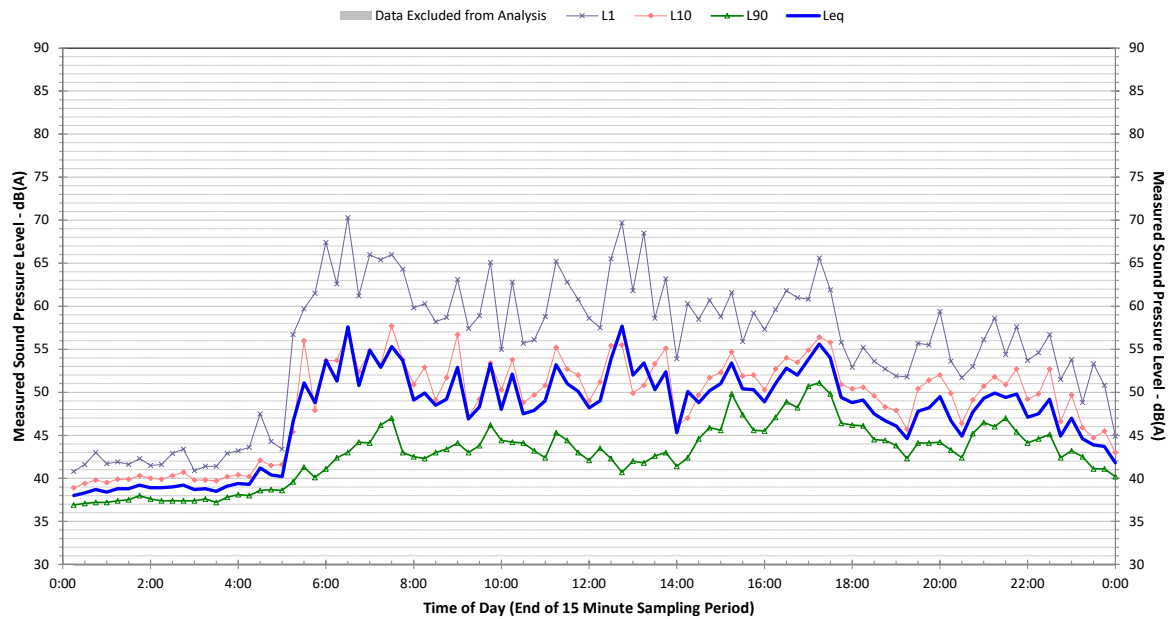
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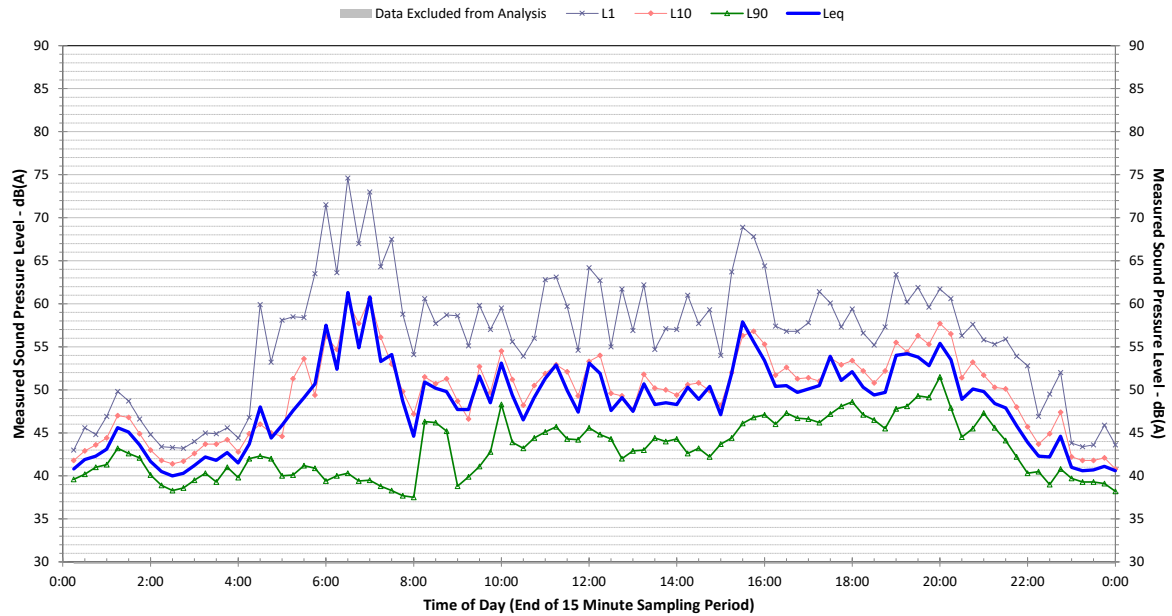
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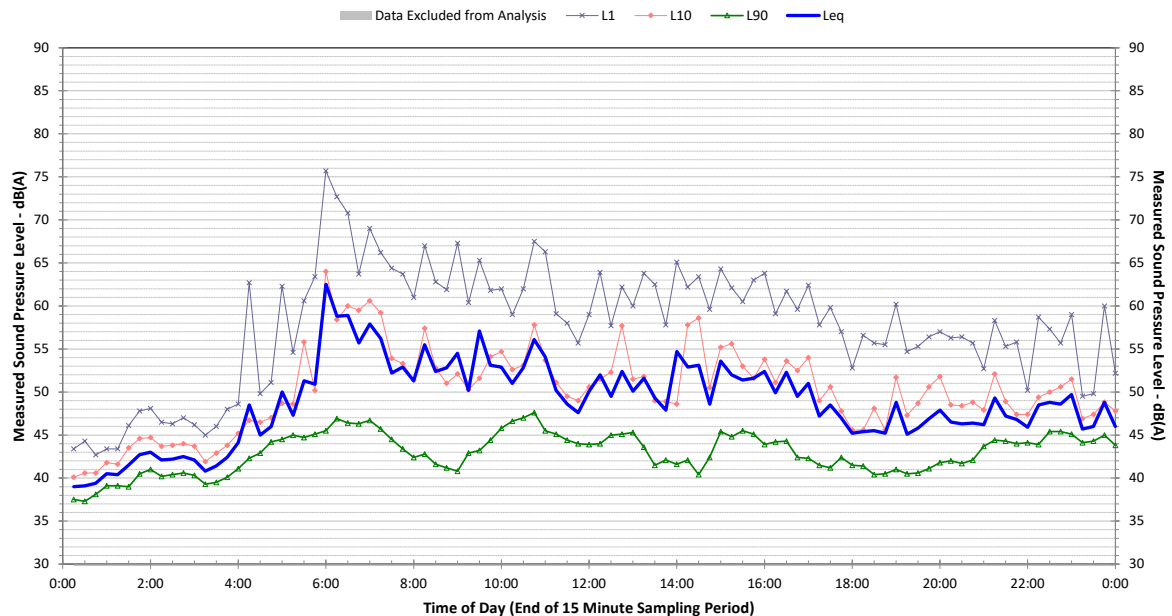
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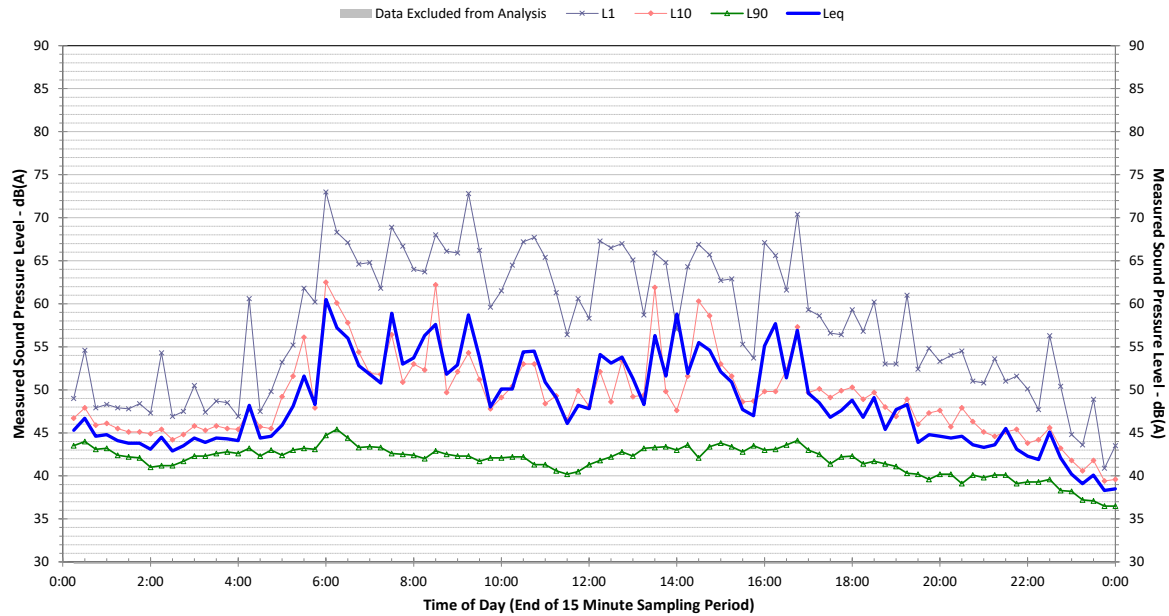
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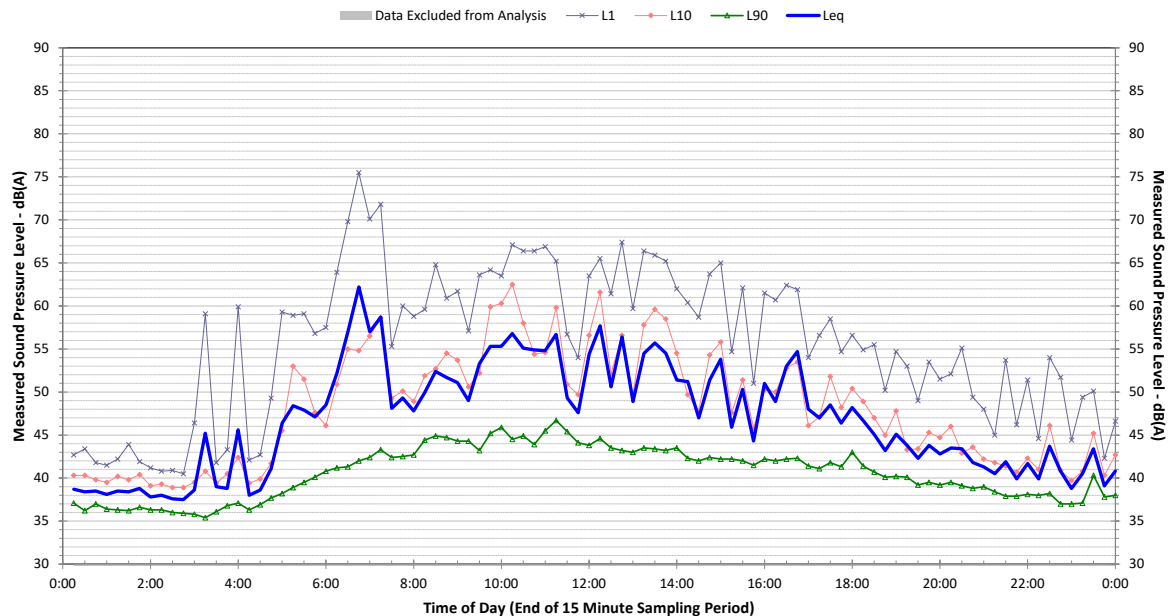
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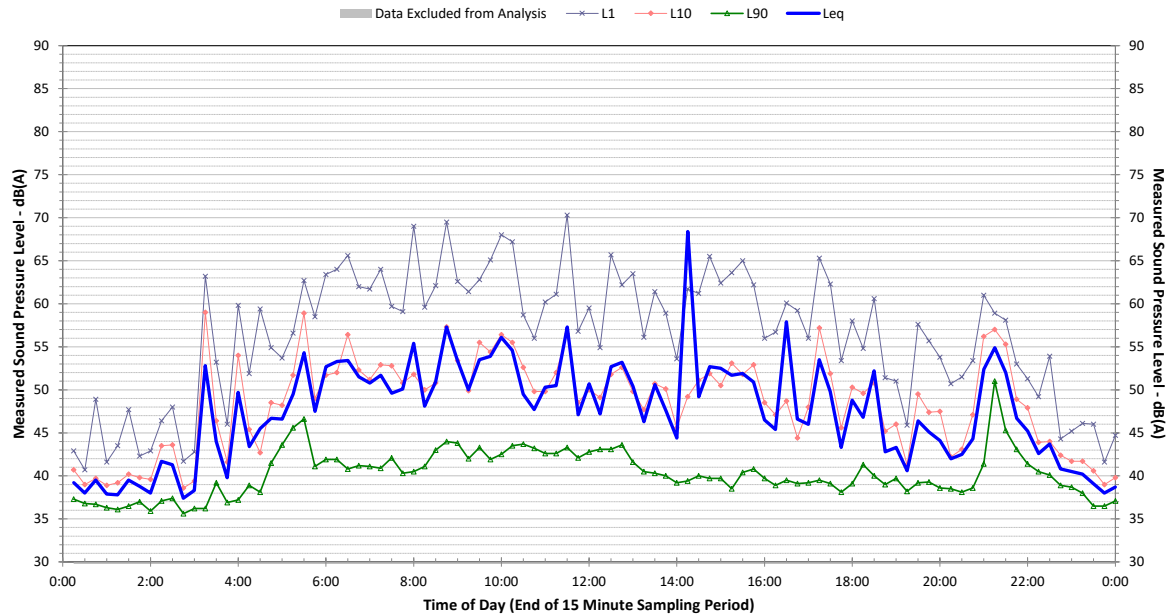
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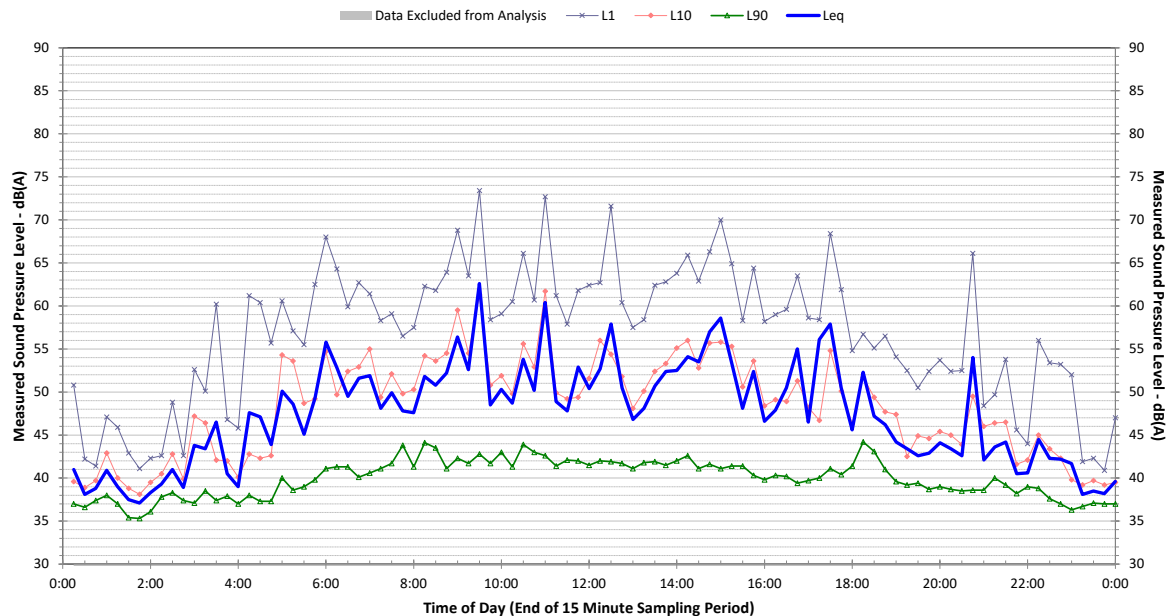
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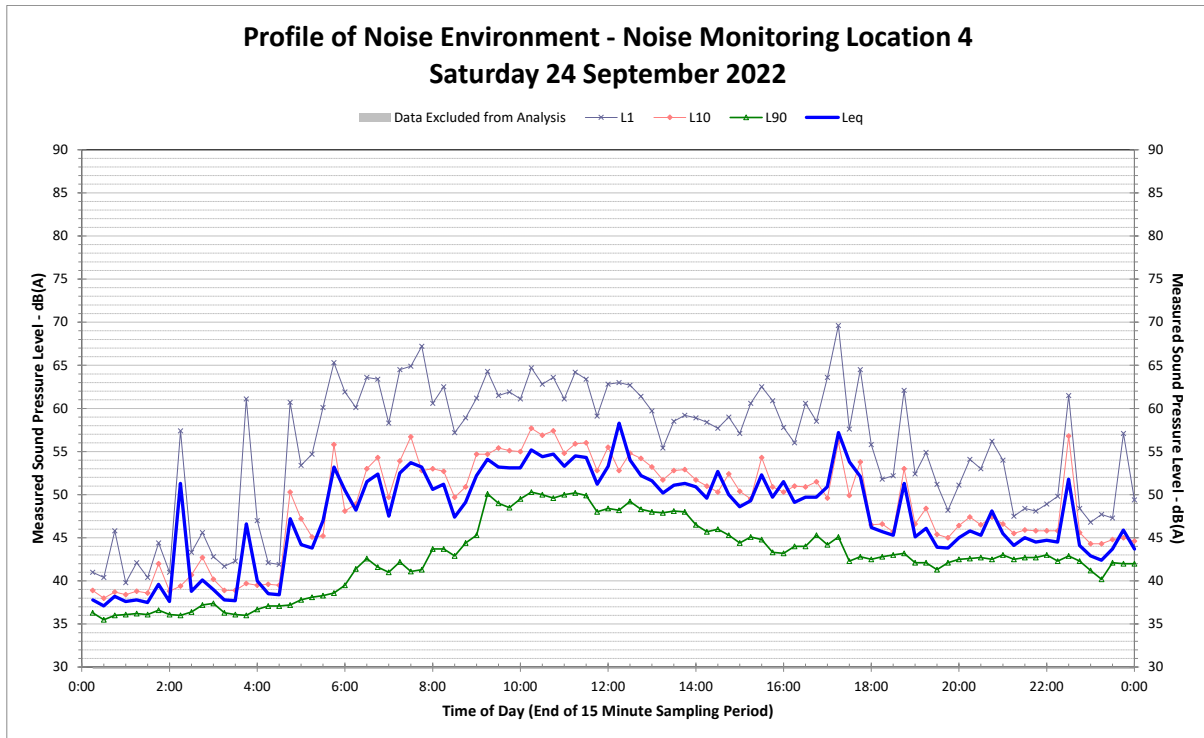


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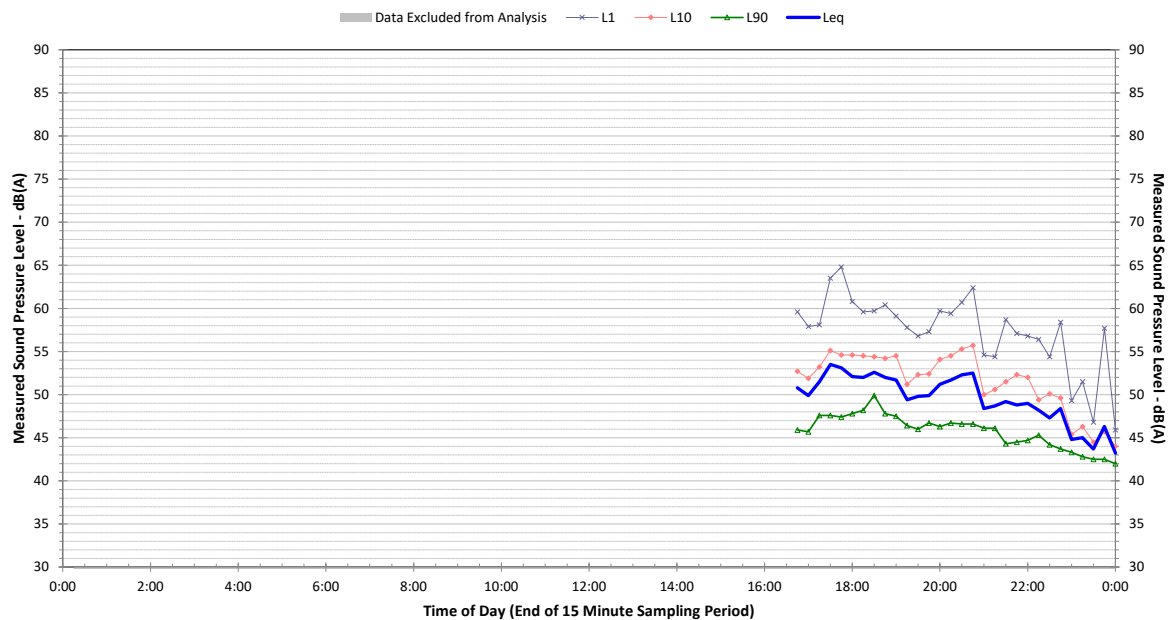


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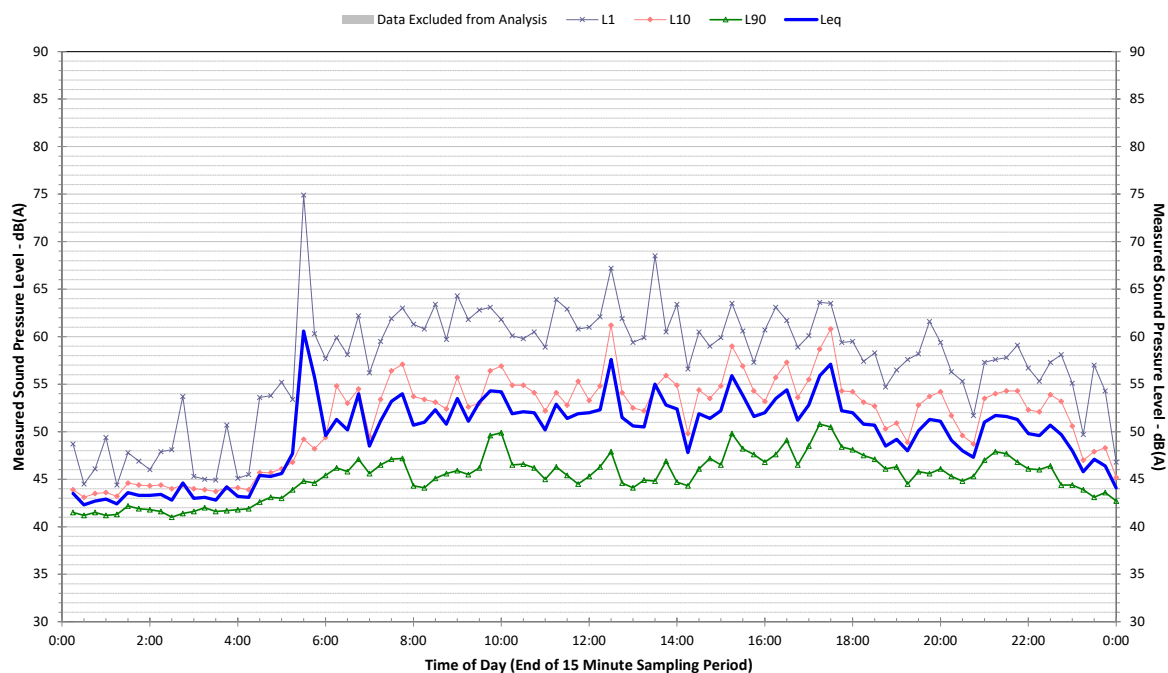




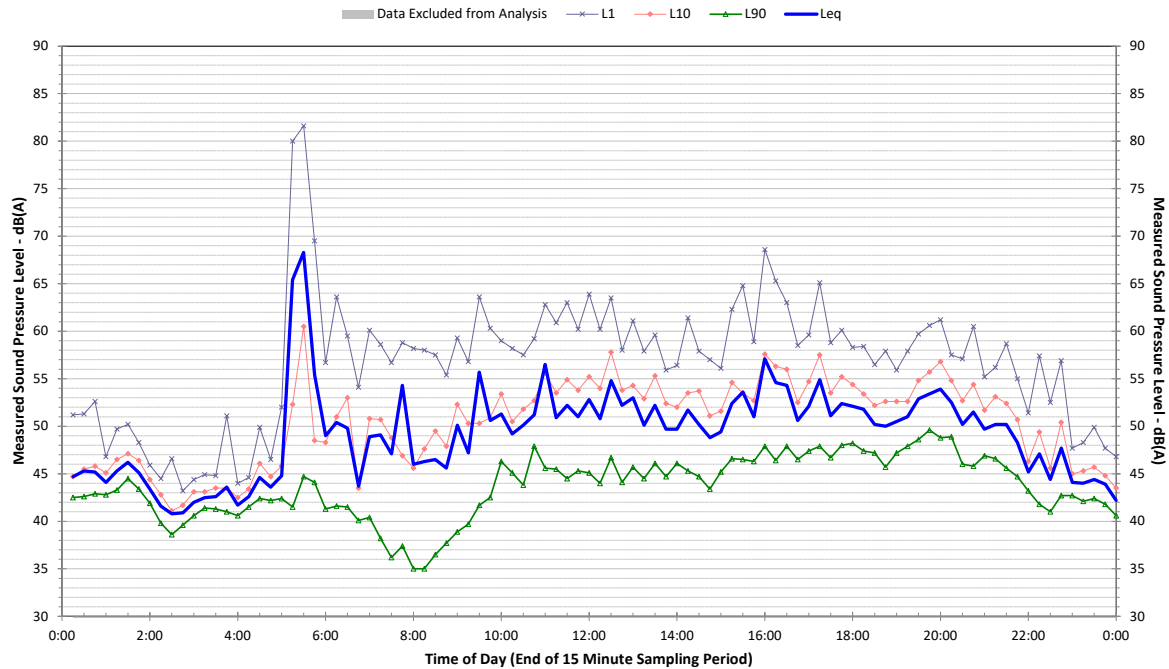
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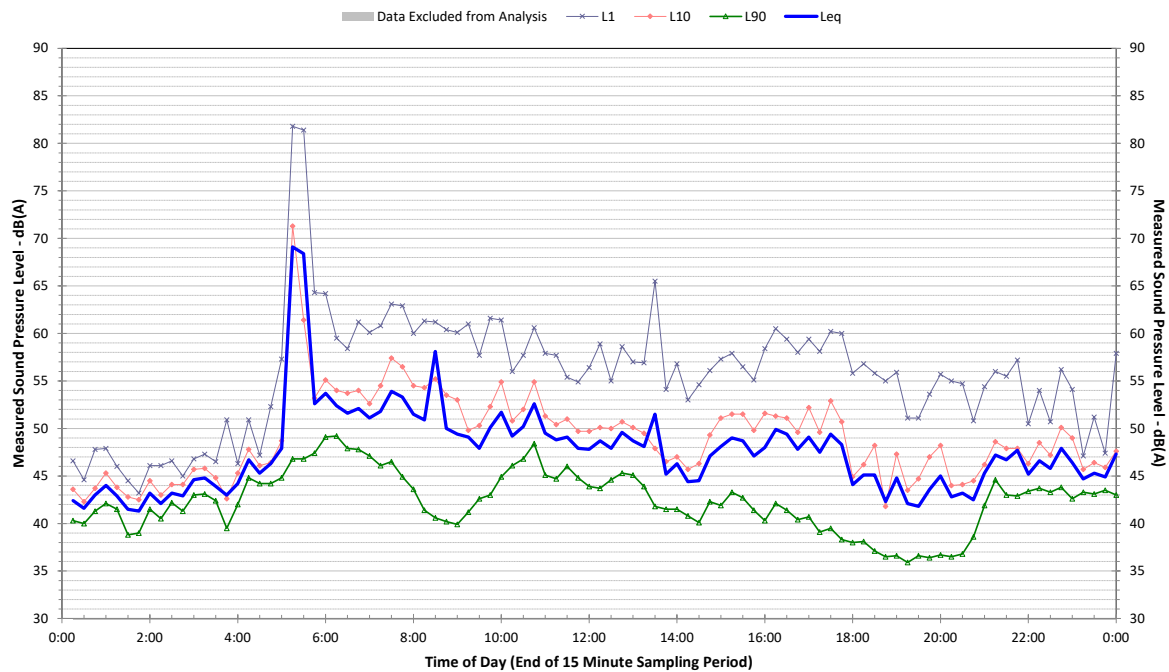
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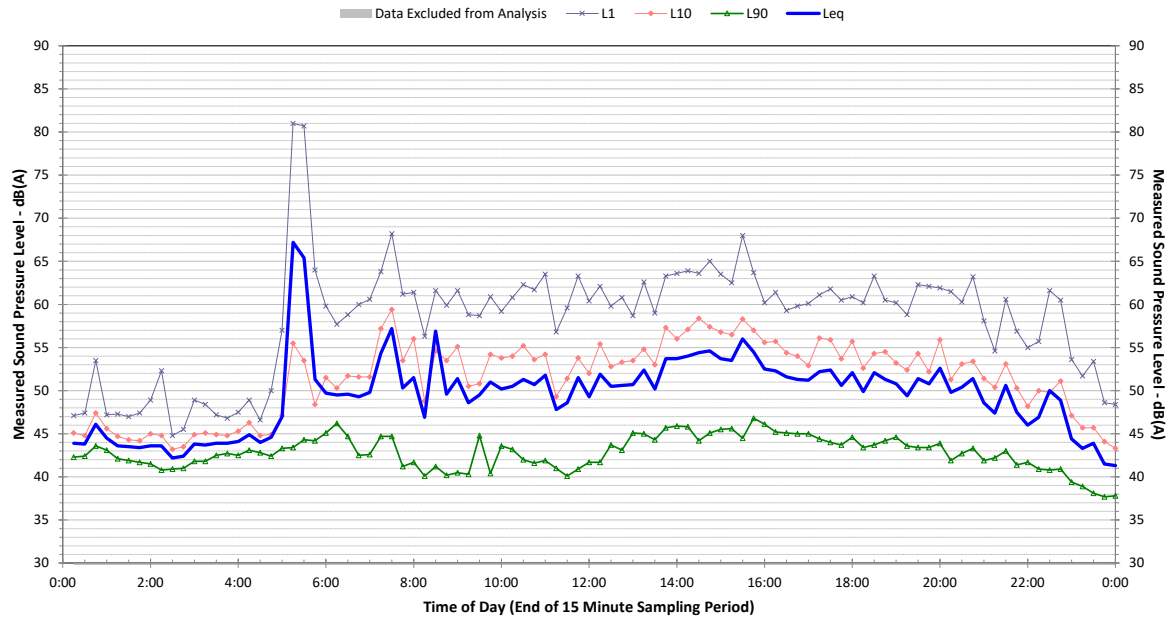
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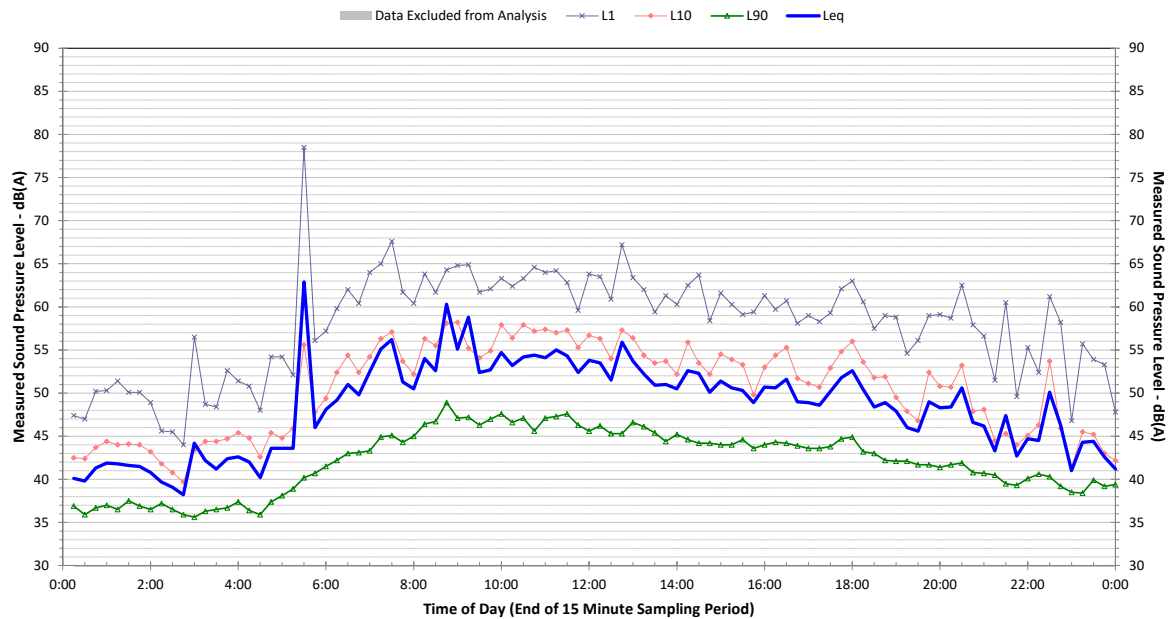
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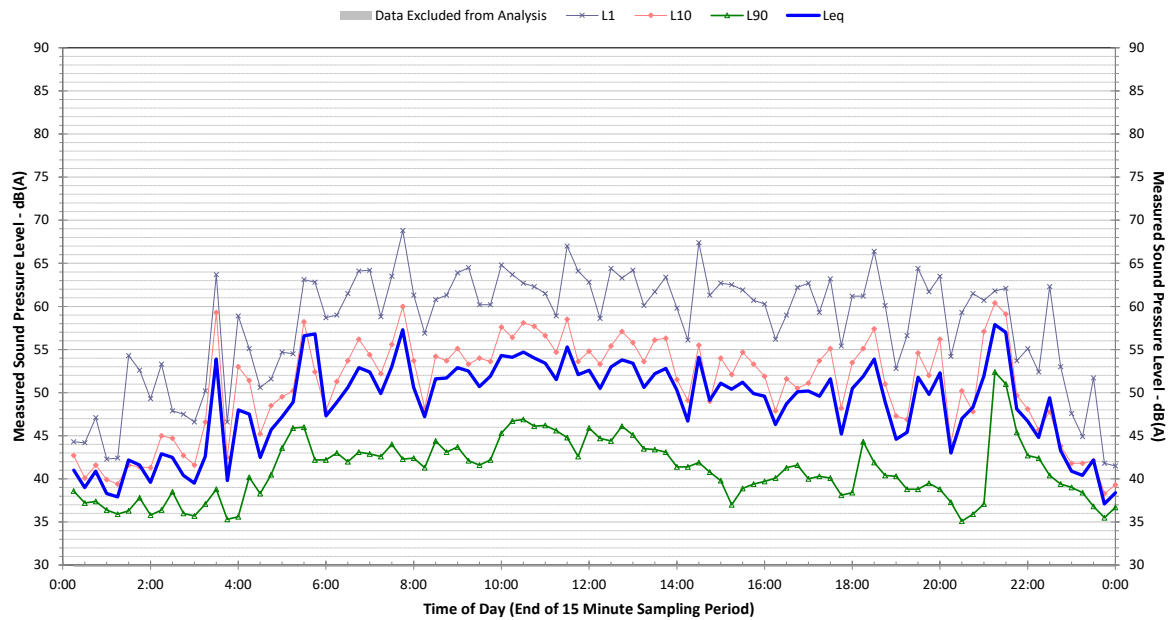
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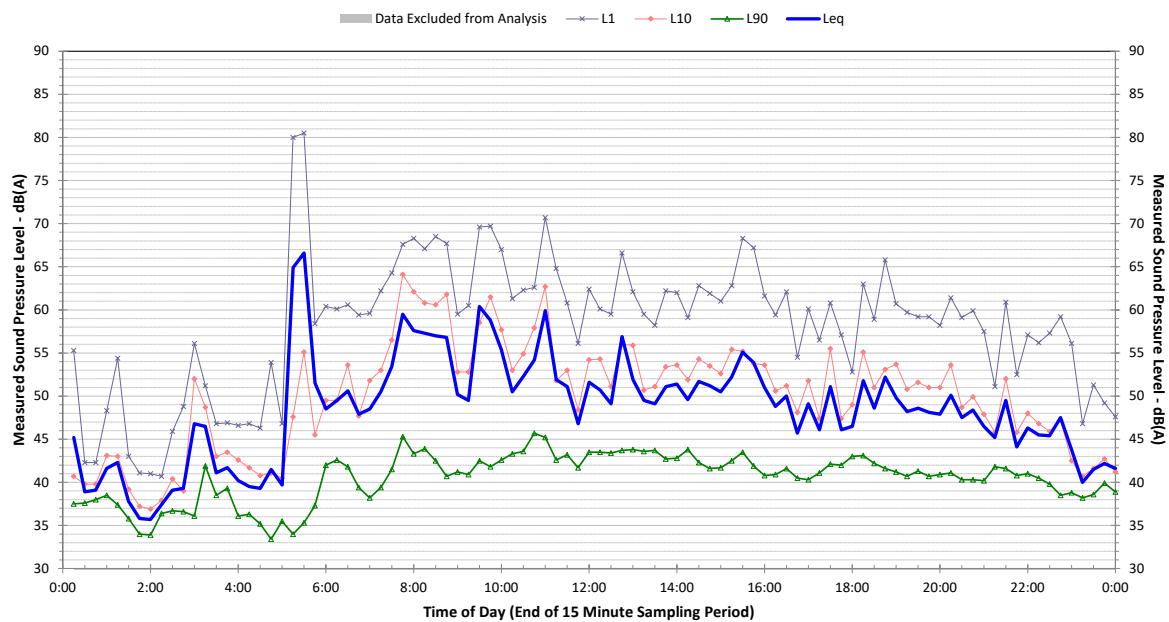
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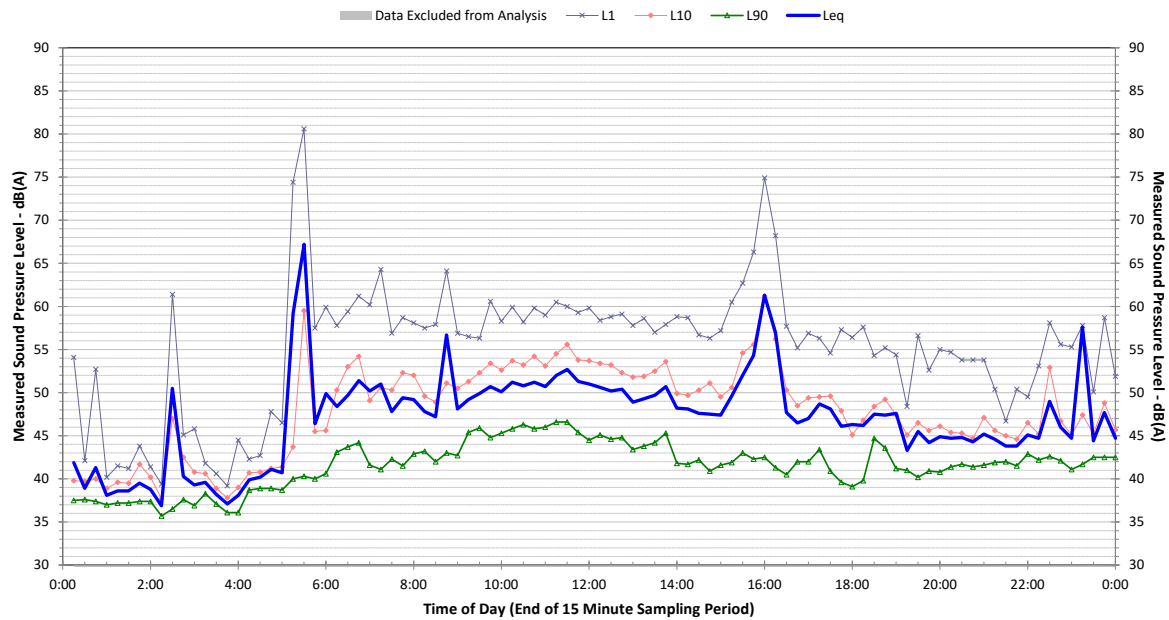
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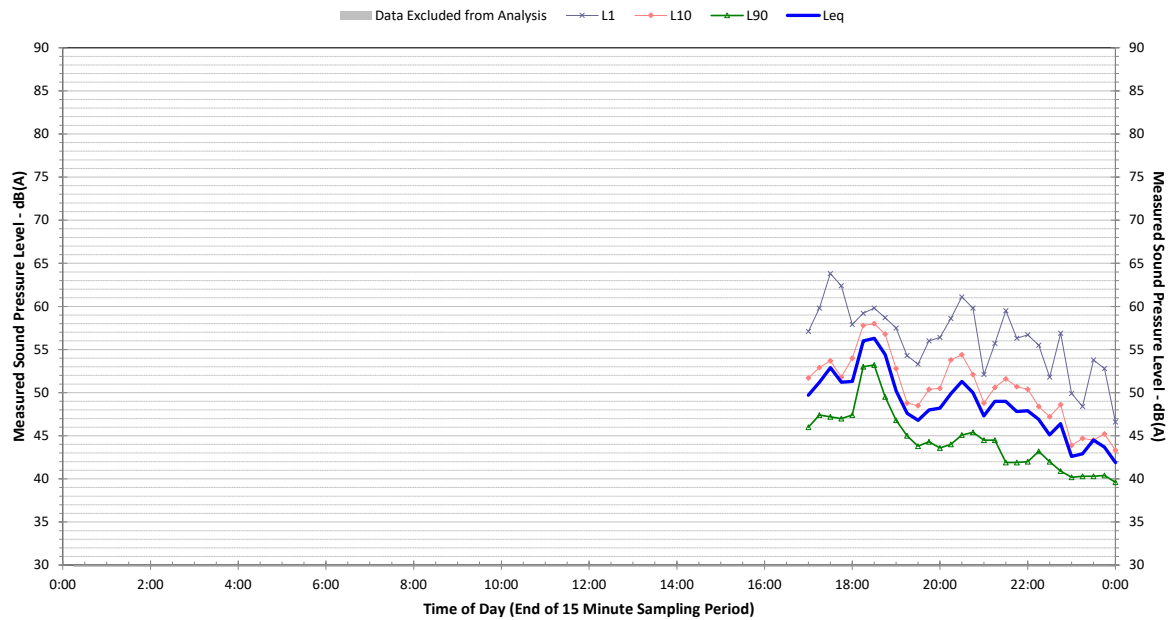
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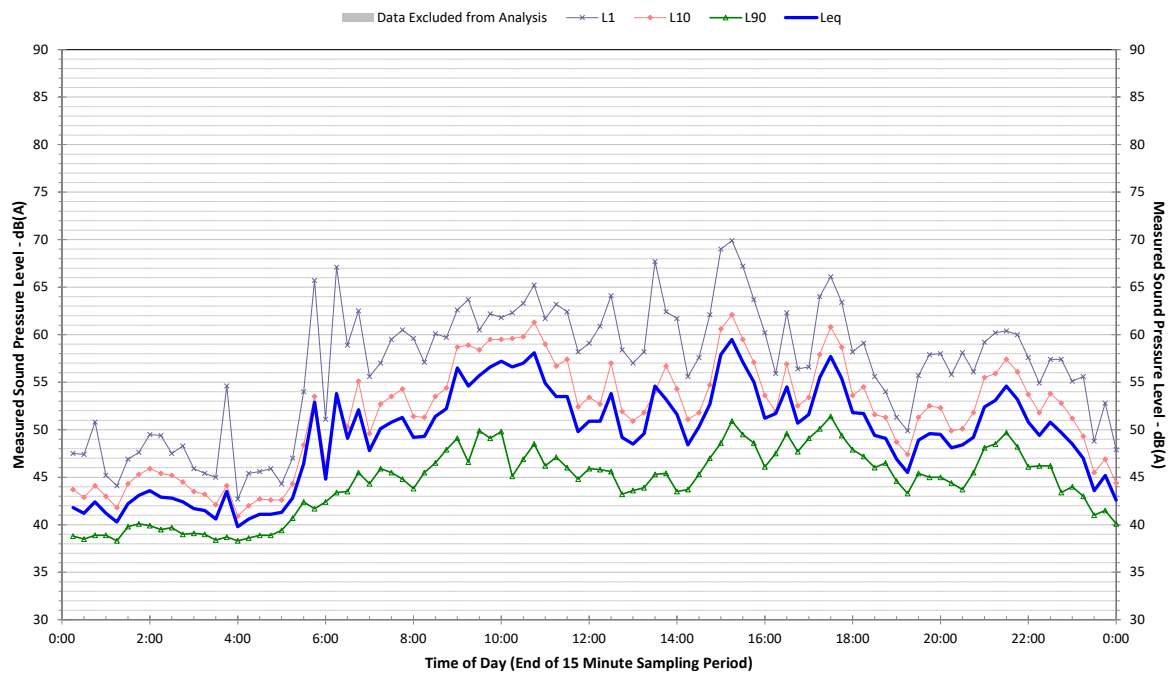
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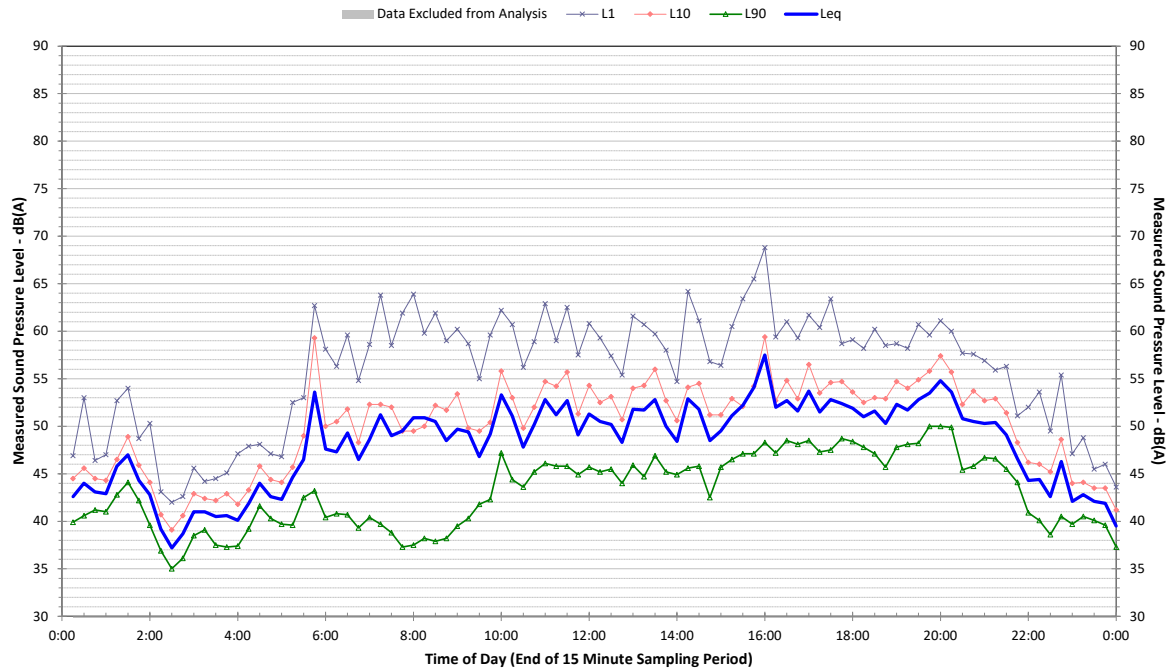
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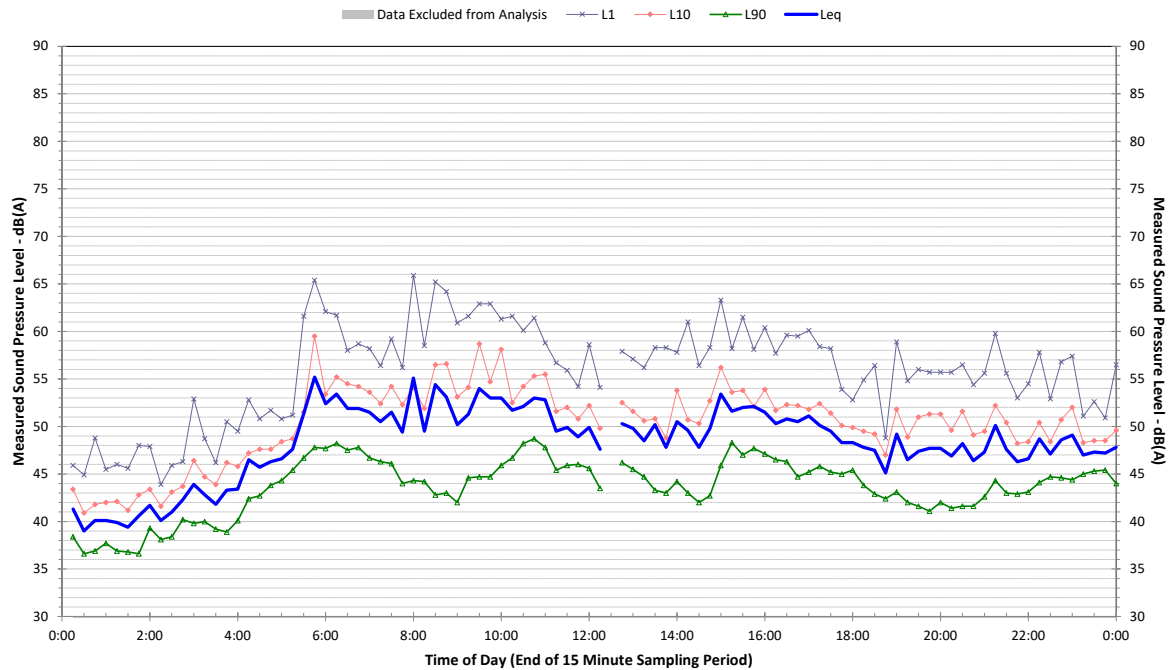
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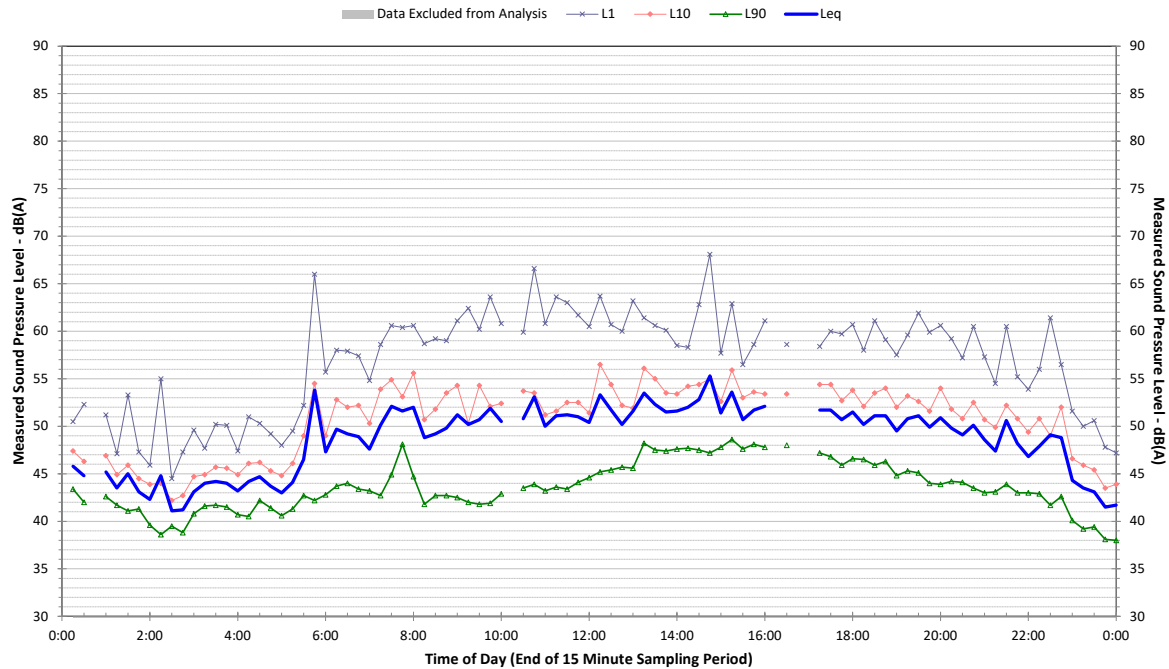
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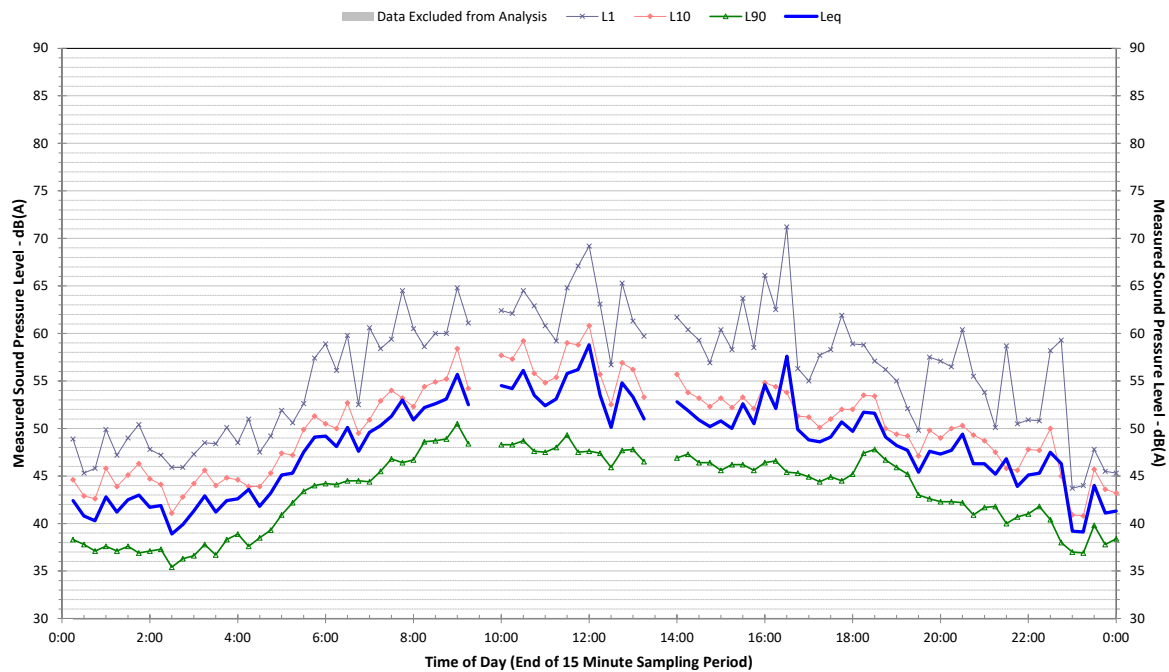
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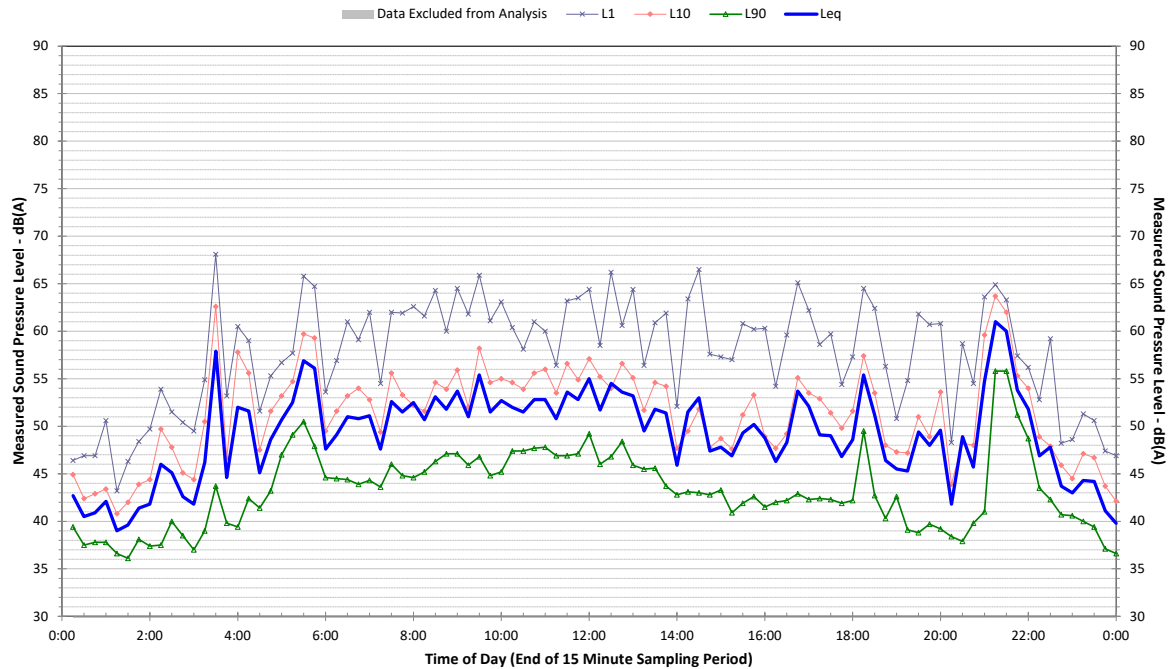
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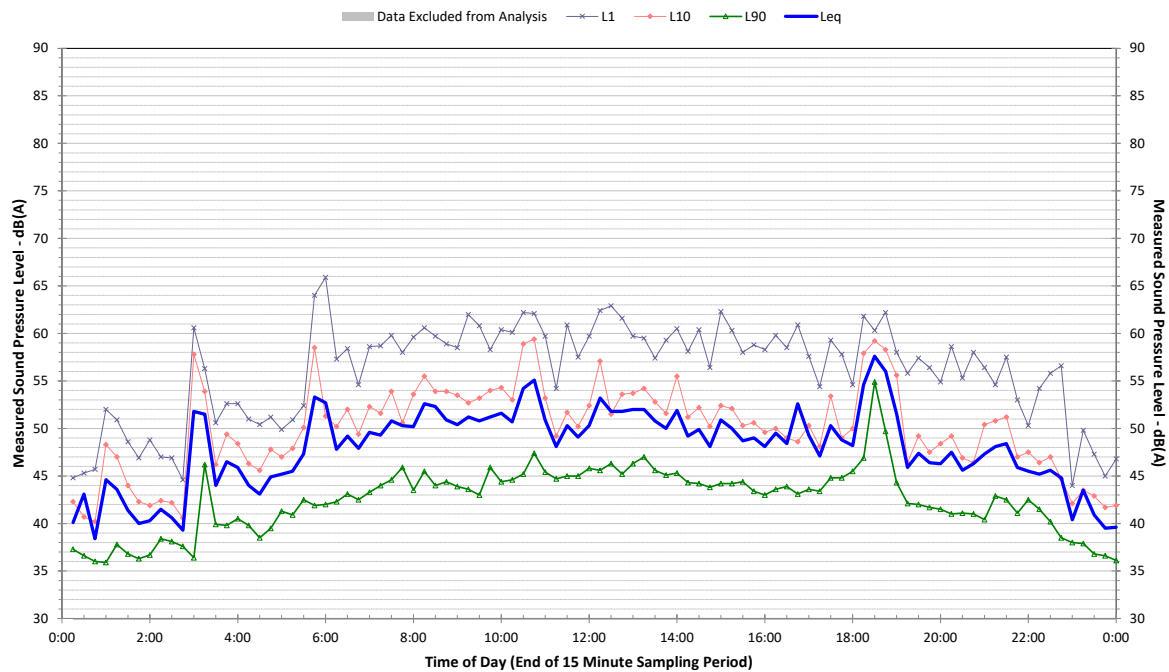
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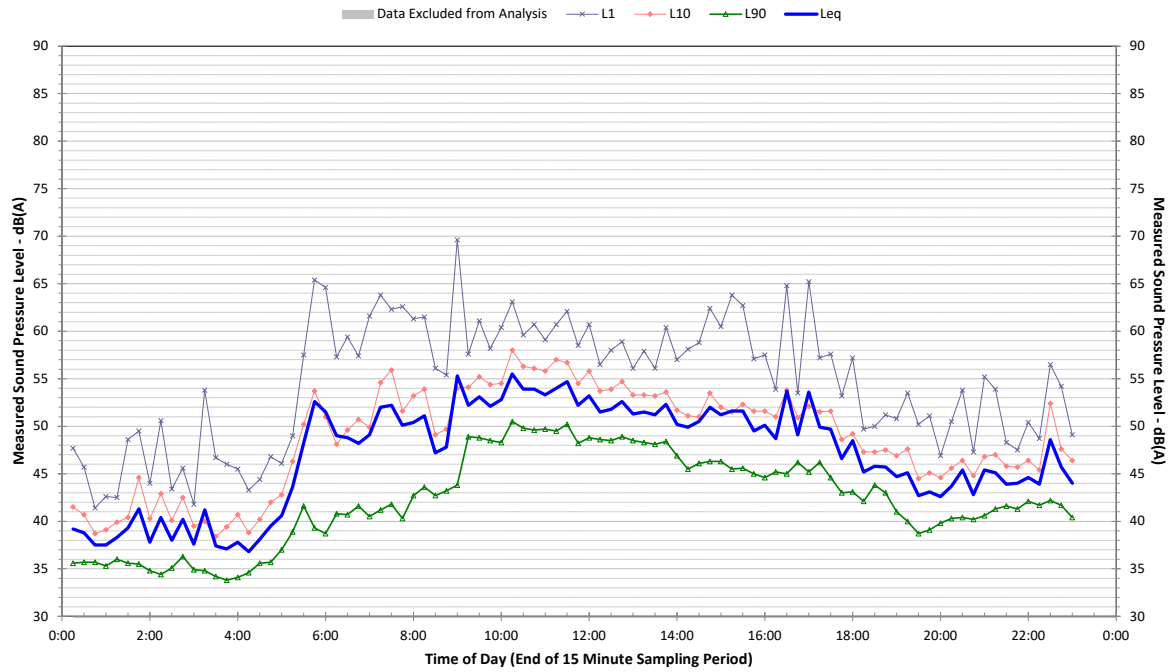
Profile of Noise Environment - Noise Monitoring Location 6 Thursday 22 September 2022



Profile of Noise Environment - Noise Monitoring Location 6 Friday 23 September 2022



Profile of Noise Environment - Noise Monitoring Location 6
Saturday 24 September 2022



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Hutchison Weller Pty Ltd
ABN 34 603 174 518
Level 1, 357 Military Road, Mosman NSW 2088
www.hutchisonweller.com

Opal Pty Ltd

Botany Paper Mill – EPL Compliance November 2022 Quarterly noise monitoring report



22 December 2022

Doc no. 16002-QM-RP-26-0

Opal Pty Ltd
Botany Paper Mill - EPL Compliance

Title	November 2022 quarterly noise monitoring report
Document no.	Doc No. 16002-QM-RP-26-0
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Hutchison Weller Pty Ltd
ABN 37 001 024 095
13/357 Military Road
Mosman NSW 2008

www.hutchisonweller.com

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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 (L_w):** 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 L_p):** 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, a quarterly monitoring survey undertaken at receivers surrounding the site is to be prepared to demonstrate compliance with set noise limits. In addition to the monitoring survey results, condition U1 of the EPL requires a summary of predicted noise levels from the validation noise model to be included in the quarterly monitoring report.

This report covers the November 2022 – January 2023 quarter. At the time of monitoring, the B9 paper machine was operating at normal production capacity and validation modelling has been confirmed in the Noise Model Validation Report (HW October 2022).

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 survey access.

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 noise emissions from the site 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 but a combination of influences from all local noise sources.

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 on the boundary of an industrial area around Port Botany and is bordered to the north and east of the site by residential properties 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

The local noise environment has been a feature of the area for many years and the total measured noise levels at monitoring locations are only partly due to Opal site operations. Direct monitoring of Opal noise emissions over time has demonstrated that specific contribution from Opal cannot be provided with any certainty due to the influence 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**. The receiver at R3 is not currently being monitored due to access restrictions. The receiver at R1 monitoring was not collected due to a failure of the noise logger.



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 McCauley 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 park adjacent to the property during the monitoring 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

3.1 Noise monitoring

Operational noise monitoring for the May quarterly monitoring period was completed between 24 November and 1 December 2022, using automatic noise loggers deployed at five representative locations.

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

Weather data 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.

3.2 Noise modelling

A noise model for the Opal site was developed in 2014 to predict noise emissions at receiver locations adjacent to the paper mill. This noise model has been updated in 2022 as the result of changes to the site layout and additional infrastructure projects over the intervening few years.

The noise model was calibrated by internal site measurements and external noise monitoring correlation and is to be used as an aid to the quarterly monitoring surveys, specifically to verify the conclusions of the monitoring survey compared to the EPL criteria in Table 1.

The noise model will be updated with changes to the site to reflect difference in the noise emission profile of the Opal operations as necessary.

Table 3 Predicted noise levels at monitoring locations

ID	Location	EPL Noise Goals dB(A)		Predicted Noise Levels dB(A)	
		Night		Night	
		LAeq 15 Min	LAmx	LAeq 15 Min	LAmx
R1	Corner of McCauley Street and Australia Avenue	43	55	38	46 - 48
R2	Australia Avenue	43	55	39	47 - 49
R3	Murrabin Avenue	43	55	40	48 -50
R4	Partanna Avenue (Most affected façade)	41	55	40	48 -50
R5	Corner of Partanna Avenue and Moorina Avenue	39	55	37	42 -44
R6	Moorina Avenue	39	55	35	44 - 46

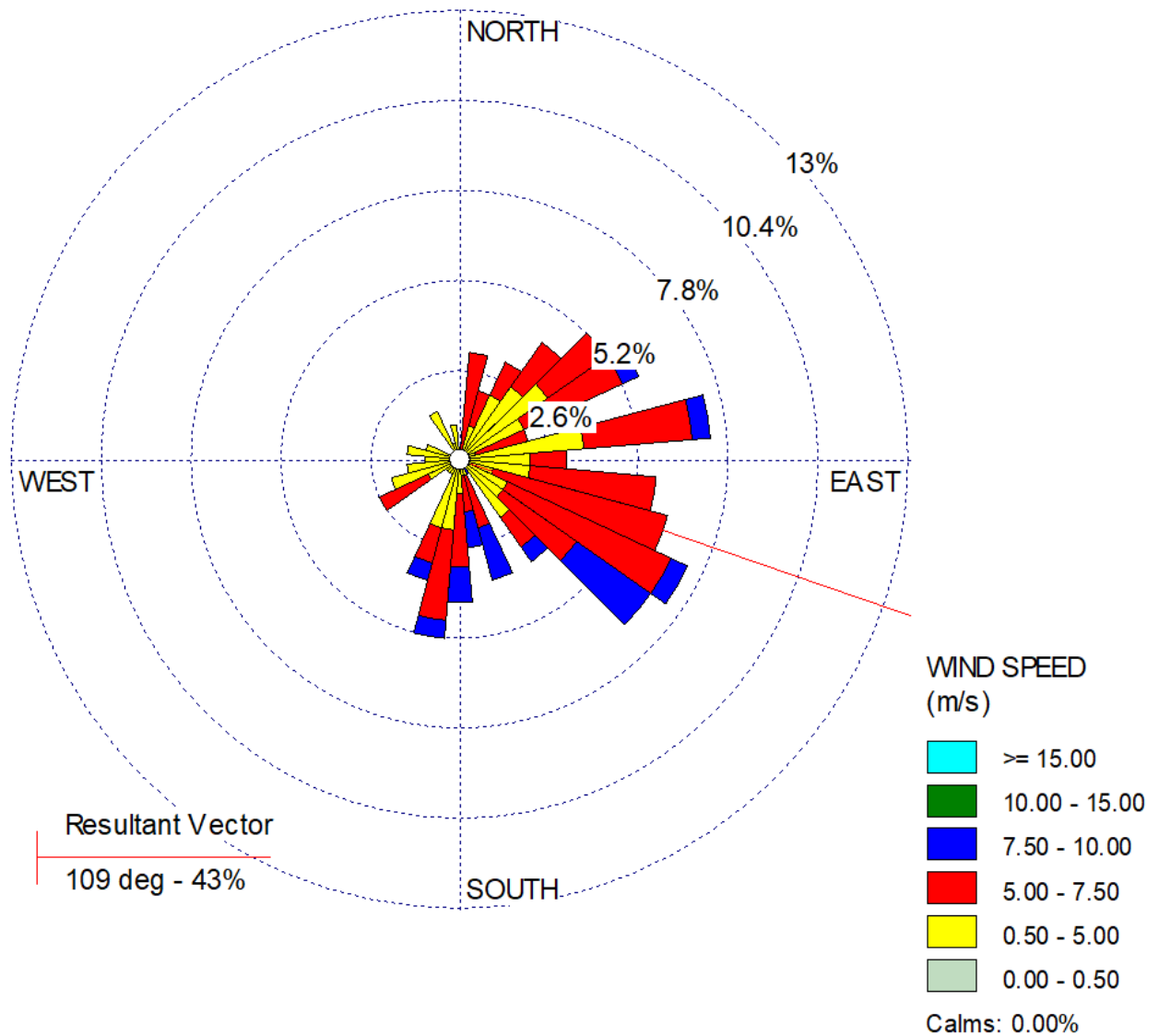


Figure 3-1 Wind speed and direction during monitoring period (24 November – 1 December 2022, source BoM 2022)

The wind rose analysis indicates that winds from the north westerly direction accounted for the majority of the observations with a west-north-west resultant vector. Around 45% of recorded wind speed during this time was in the 0.5 to 5.0m/s range. (see Figure 3-2). Winds from a westerly direction are likely to carry noise from the Opal site and the Port Botany area away from residences to the north of the site.

Residences east of the site would still experience noise from Opal operations however, these conditions lead to lower levels from the Port Botany container terminal, an outcome that is consistent with reduced noise levels observed during this survey.

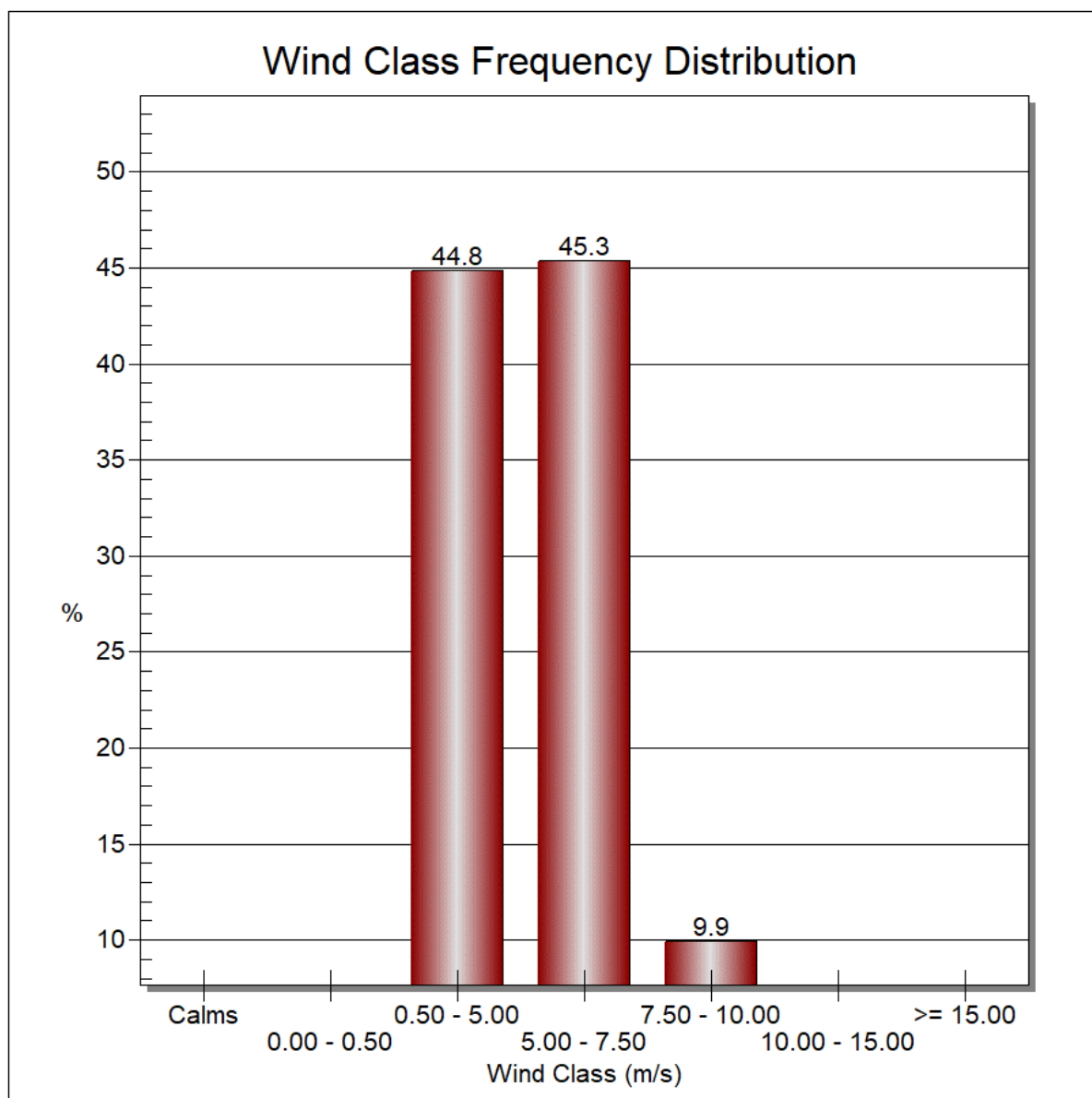


Figure 3-2 Wind speed frequency distribution over monitoring period

3.3 Monitoring results

The reported L_{Amax} , L_{A1} , L_{Aeq} , and L_{A90} noise levels are summarised from a 24 hour period of monitoring and 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.

During the November 2022 quarterly noise survey, the paper mill operated normally.

Measured L_{A90} and L_{Aeq} noise levels for the night-time period during the November 2022 monitoring survey are noticeably lower than the measured noise levels at other times of the year.

Measured L_{A90} noise levels, used as an indicator of continuous industrial noise sources, ranged from about 32-36 dB(A), which is lower than predicted noise levels for corresponding receiver locations in Table 3. This indicates compliance with the EPL noise goals, which is expected to be assisted by a reduced influence of Port noise at the monitoring locations.

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 measured levels during the latest round of noise monitoring indicate that the overall background environmental noise levels were within about 1 dB of the L_{Aeq} 15min noise criteria at each location and are similar levels to previous noise studies for these locations.

The most recent round of compliance measurements has been added to the historical data collected during compliance noise surveys, providing about 10 years of seasonal data. This data includes measurements of the noise environment with the Opal site operational over the whole monitoring period.

The results of monitoring survey for November 2022 have been graphed and are shown in Appendix A. The parameters of L_{Aeq} and L_{A90} presented in Table 4 are used to provide information for comparison against the project criteria and the background noise environment.

The L_{Amax} noise levels for the April noise monitoring period are generally lower than L_{Amax} noise levels from previous surveys. Measured L_{Amax} and L_{A1} noise levels during the monitoring periods are higher than the project L_{Amax} noise goals however, these levels do not relate to the operation of the Opal site.

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 4 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	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}
Thursday 24 November 2022	-	-	32.3	70.2	-	-	42.7	52.1	41.1	52.5	45.3	52.6
Friday 25 November 2022	-	-	38.4	69.4	-	-	40.2	56.7	38.5	53.9	41.9	51.2
Saturday 26 November 2022	-	-	37.8	50.7	-	-	40.0	53.0	40.1	49.5	44.0	49.9
Sunday 27 November 2022	-	-	38.1	51.6	-	-	38.6	51.6	38.9	55.8	41.0	52.2
Monday 28 November 2022	-	-	38.5	50.9	-	-	40.9	59.8	39.6	50.3	44.2	51.2
Tuesday 29 November 2022	-	-	44.9	52.4	-	-	45.5	60.0	42.2	51.2	46.6	53.4
Wednesday 30 November 2022	-	-	38.1	50.0	-	-	40.5	58.0	37.0	52.7	42.6	50.5
Thursday 1 December 2022	-	-	-	-	-	-	42.0	55.9	38.3	49.6	44.4	55.9
Median	-	-	38.1	51.6	-	-	40.7	56.3	39.3	51.8	44.2	52.2

Evening: 6:00:00 PM to 10:00:00 PM	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}
Thursday 24 November 2022	-	-	35.0	48.4	-	-	36.5	46.1	35.4	46.7	40.0	50.8
Friday 25 November 2022	-	-	37.8	50.1	-	-	38.1	46.3	34.5	47.0	38.8	55.1
Saturday 26 November 2022	-	-	36.8	56.1	-	-	37.4	44.0	39.4	49.3	41.6	49.3
Sunday 27 November 2022	-	-	40.0	54.8	-	-	41.9	54.8	42.0	54.6	42.7	55.5
Monday 28 November 2022	-	-	36.8	46.2	-	-	37.0	60.3	34.3	46.5	38.4	52.2
Tuesday 29 November 2022	-	-	40.2	51.1	-	-	39.6	48.1	37.9	47.0	41.8	51.3
Wednesday 30 November 2022	-	-	36.0	47.2	-	-	36.5	46.5	37.8	48.1	40.7	51.4
Thursday 1 December 2022	-	-	-	-	-	-	40.7	47.5	38.0	50.3	43.1	50.9
Median	-	-	36.8	50.1	-	-	37.8	47.0	37.8	47.6	41.1	51.3

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	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}	L ₉₀ (10th Percentile)	L _{Aeq}
Thursday 24 November 2022	-	-	33.5	42.1	-	-	34.4	44.4	29.5	42.8	33.1	44.6
Friday 25 November 2022	-	-	38.2	48.1	-	-	37.1	47.9	32.1	43.4	35.4	49.4
Saturday 26 November 2022	-	-	35.3	41.0	-	-	35.5	45.1	36.2	44.5	35.3	47.6
Sunday 27 November 2022	-	-	47.4	52.7	-	-	43.7	50.7	40.5	49.5	43.0	51.6
Monday 28 November 2022	-	-	36.4	49.5	-	-	37.2	48.5	33.9	45.3	34.8	47.2
Tuesday 29 November 2022	-	-	34.2	44.9	-	-	34.3	47.9	30.1	43.2	33.4	46.5
Wednesday 30 November 2022	-	-	-	-	-	-	34.2	47.4	29.0	45.3	32.6	46.5
Thursday 1 December 2022	-	-	-	-	-	-	39.1	46.8	33.7	39.8	37.0	48.4
Median	-	-	35.8	46.5	-	-	36.3	47.6	32.9	44.0	35.1	47.4

Table 5 Summary of night time maximum noise levels

Time and date	Maximum Noise Environment - Noise Monitoring Location											
	R1		R2		R3		R4		R5		R6	
Date	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}	L _{Amax}	L _{A1}
Thursday 24 November 2022	-	-	79.3	60.7	-	-	75.3	61.0	73.1	60.5	74.3	62.1
Friday 25 November 2022	-	-	71.8	65.2	-	-	74.9	67.0	87.0	62.4	89.1	67.6
Saturday 26 November 2022	-	-	74.5	58.3	-	-	84.3	61.3	85.3	63.0	80.5	71.4
Sunday 27 November 2022	-	-	87.8	68.9	-	-	87.4	65.6	89.7	66.8	86.6	66.5
Monday 28 November 2022	-	-	76.8	63.8	-	-	76.8	69.2	73.8	62.2	83.0	62.9
Tuesday 29 November 2022	-	-	78.3	66.8	-	-	86.5	71.6	77.0	69.0	73.3	64.6
Wednesday 30 November 2022	-	-	-	-	-	-	91.3	66.6	76.7	71.0	76.8	65.2
Thursday 1 December 2022	-	-	-	-	-	-	75.1	62.0	66.0	51.1	77.2	67.4
Median Open	-	-	77.6	64.5	-	-	80.5	66.1	76.9	62.7	78.9	65.9

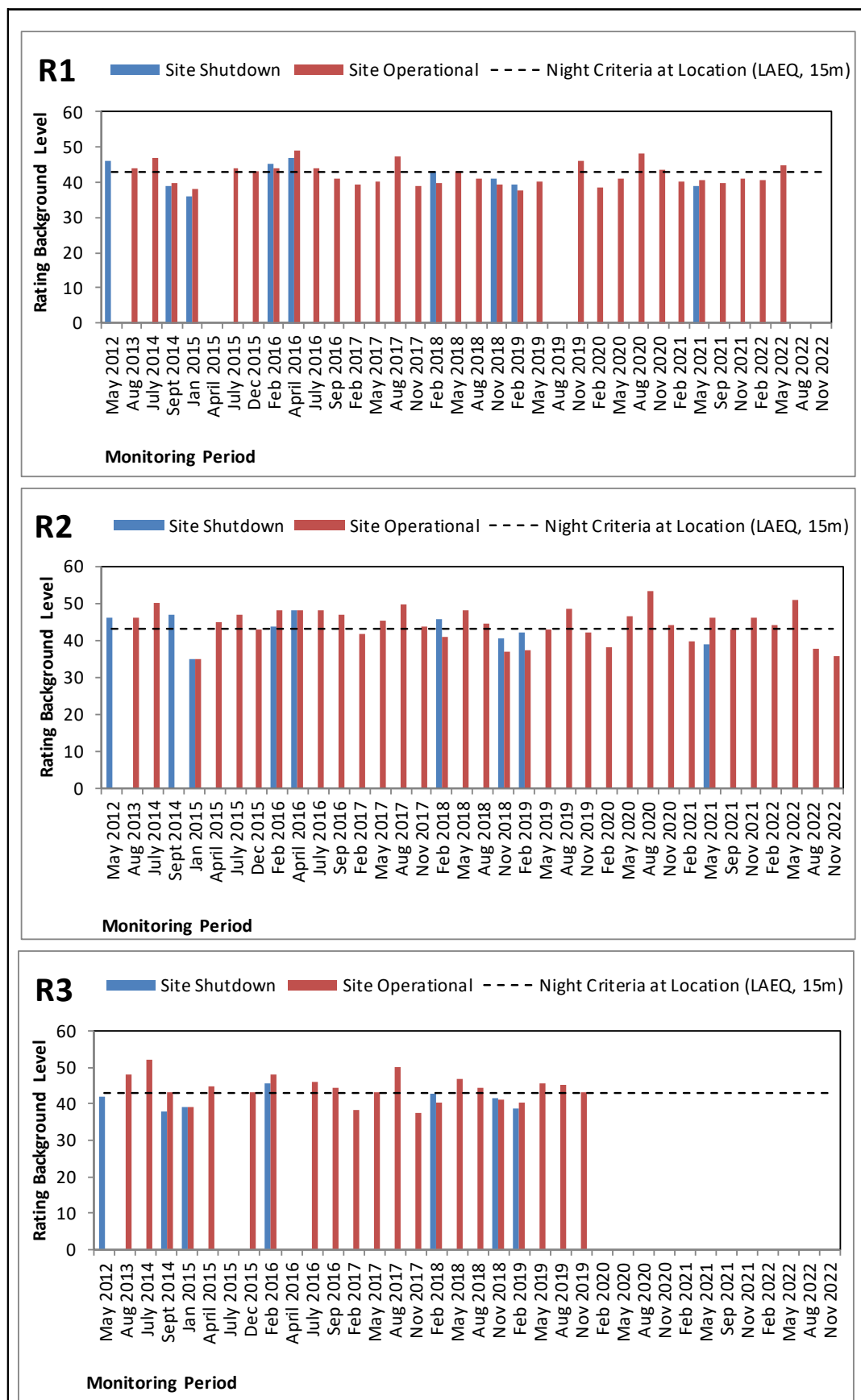


Figure 3-3: Comparison of background noise levels at R1 – R3

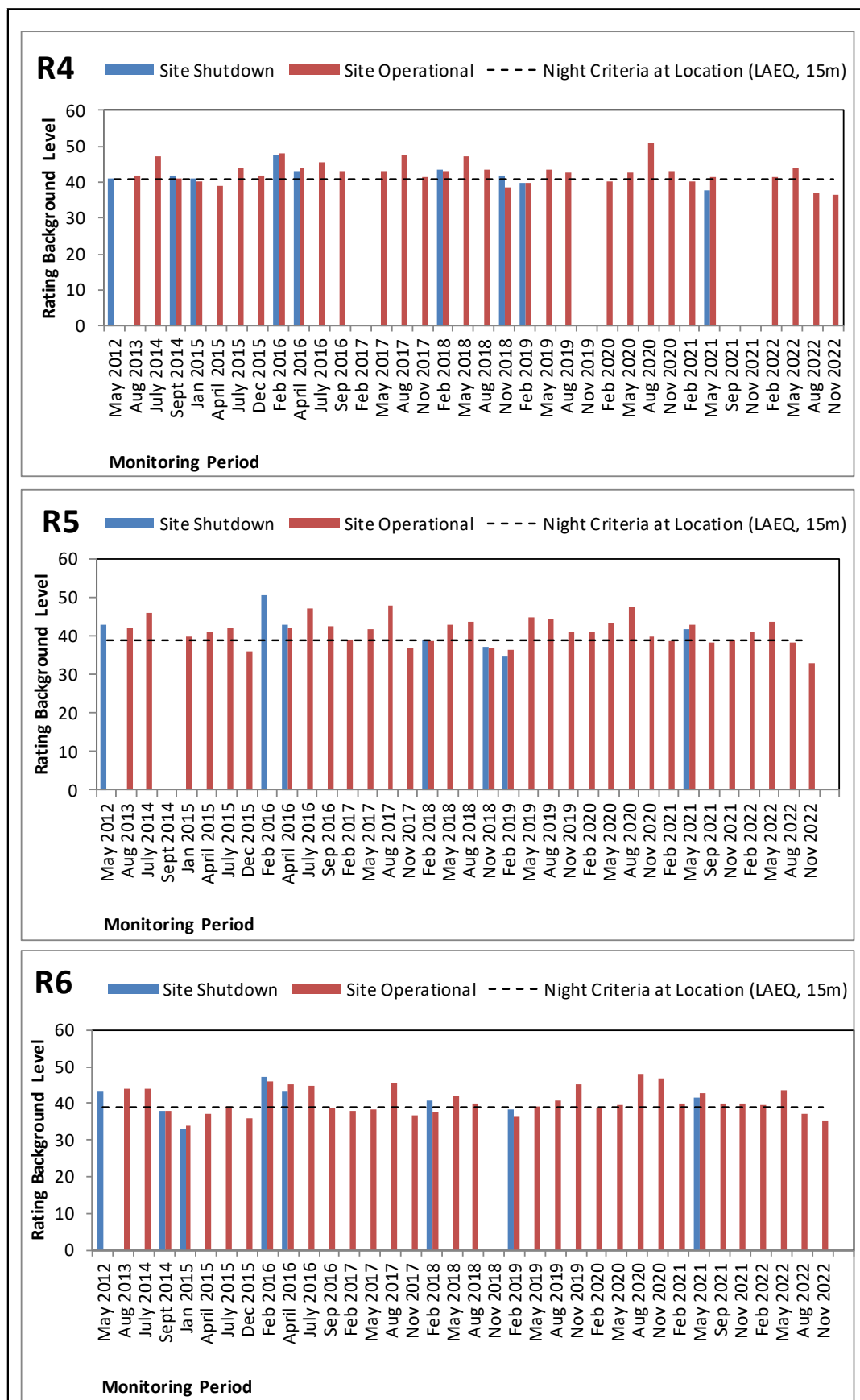


Figure 3-4: Comparison of background noise levels at R4 – R6

4. Summary

The quarterly noise survey data for the November 2022 - January 2023 period indicates that the L_{Aeq} long term measured noise levels in the vicinity of the paper mill exceeded the EPL criteria for day, evening, and night-time. The maximum (L_{A1}) recorded noise levels at each monitoring location also exceeded the EPL criteria of 55 dB(A) at all receiver locations.

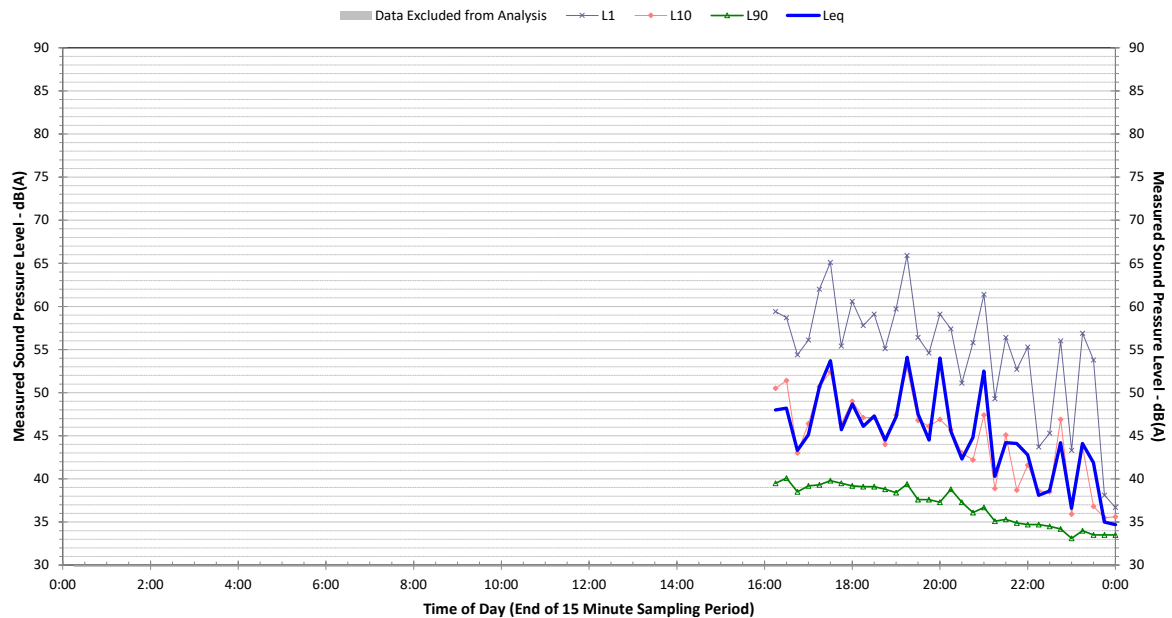
In summary the following conclusions have been drawn from the November 2022 quarterly monitoring:

- Several years of monitoring data consistently indicate that 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.
- North westerly winds are like to reduce impacts from industrial sources on residences to the north of the container terminal.
- The most recent noise monitoring results indicate that the measured L_{Aeq} noise levels are amongst the lowest recorded of the long-term series of data for corresponding seasonal measurement periods. At all measured locations the L_{A90} noise levels are lower than the EPL criteria for each of the monitoring locations.
- The L_{Amax} noise levels for the November noise monitoring period are consistent with L_{Amax} noise levels from previous surveys. The L_{A1} noise levels are also consistent with other monitoring periods.
- The L_{Aeq} and L_{Amax} noise levels recorded during the survey period are higher than the EPL criteria at the monitoring locations but are not related to the operation of the Opal site.
- Measured L_{A90} noise levels during the night time period were lower than the predicted noise levels from the noise model.

Appendix A. Noise logger graphs

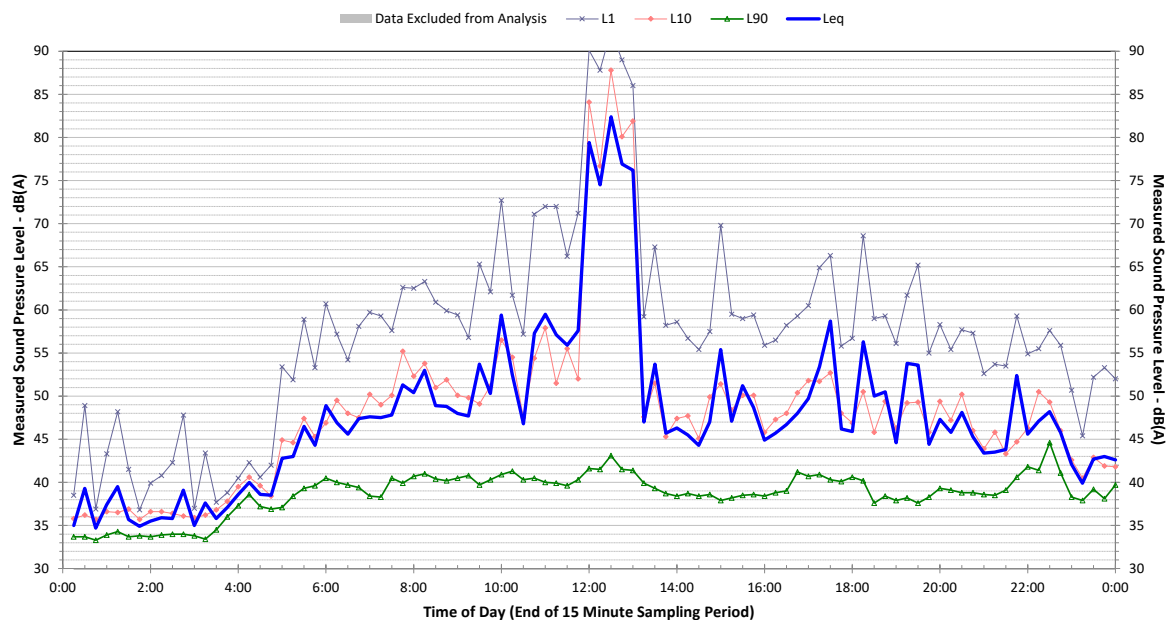
Profile of Noise Environment - Noise Monitoring Location 2

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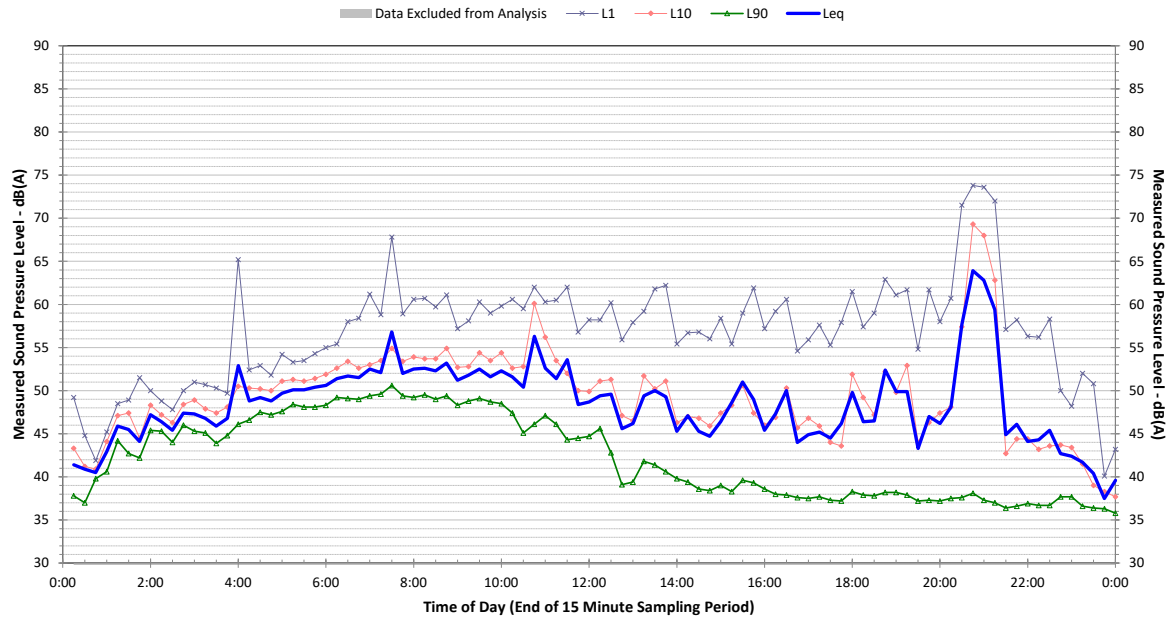


Profile of Noise Environment - Noise Monitoring Location 2

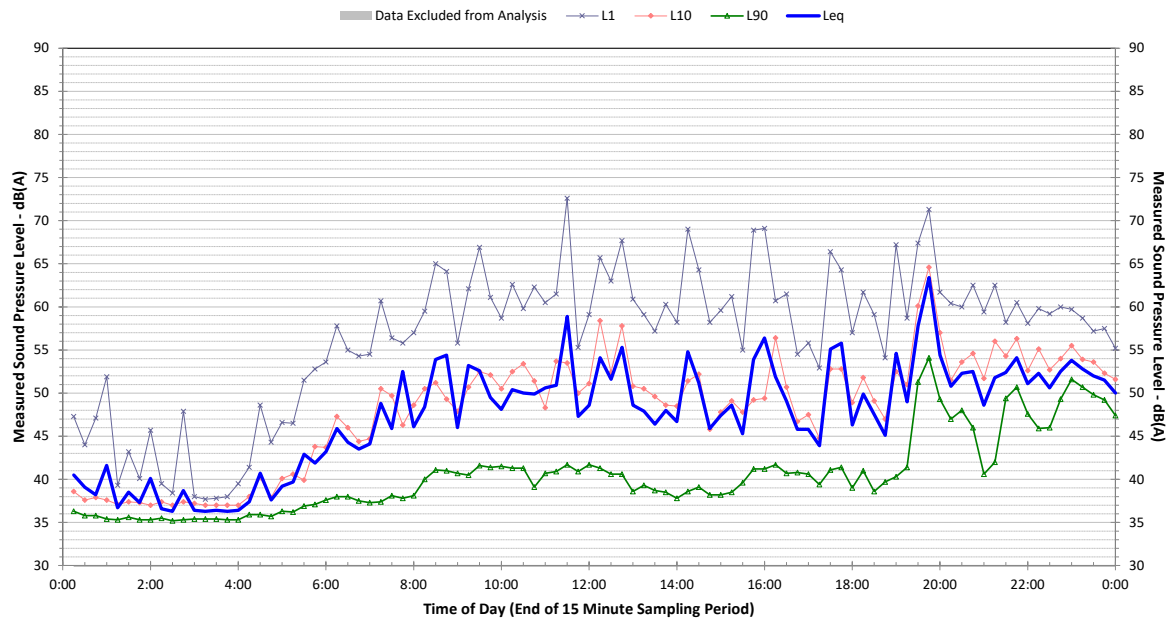
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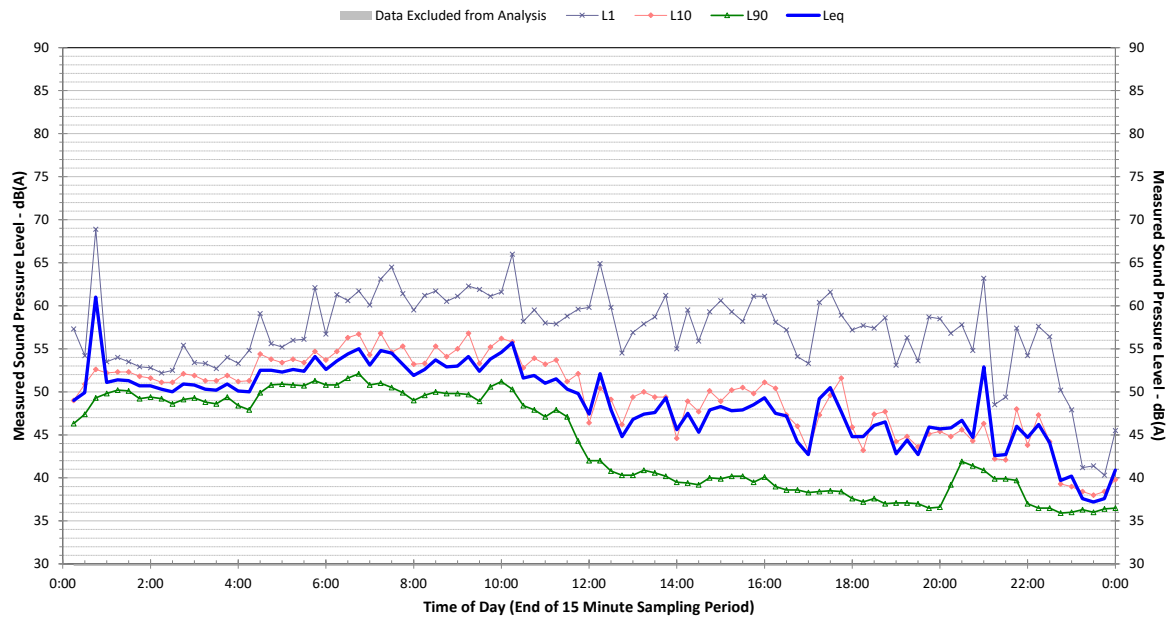
Profile of Noise Environment - Noise Monitoring Location 2 Saturday 26 November 2022



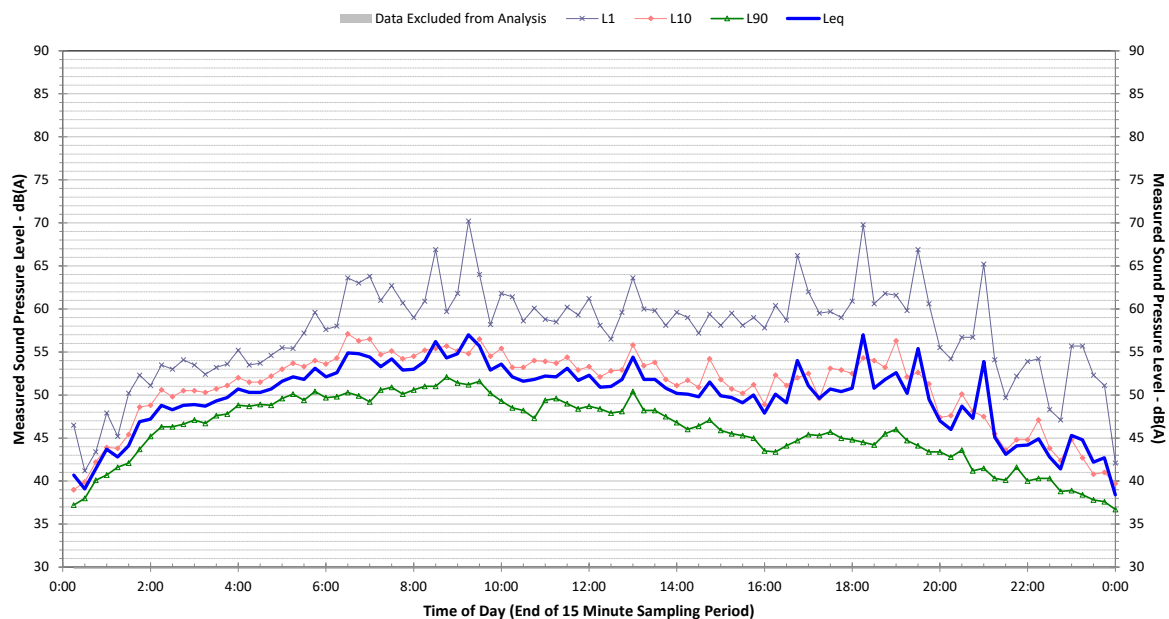
Profile of Noise Environment - Noise Monitoring Location 2 Sunday 27 November 2022



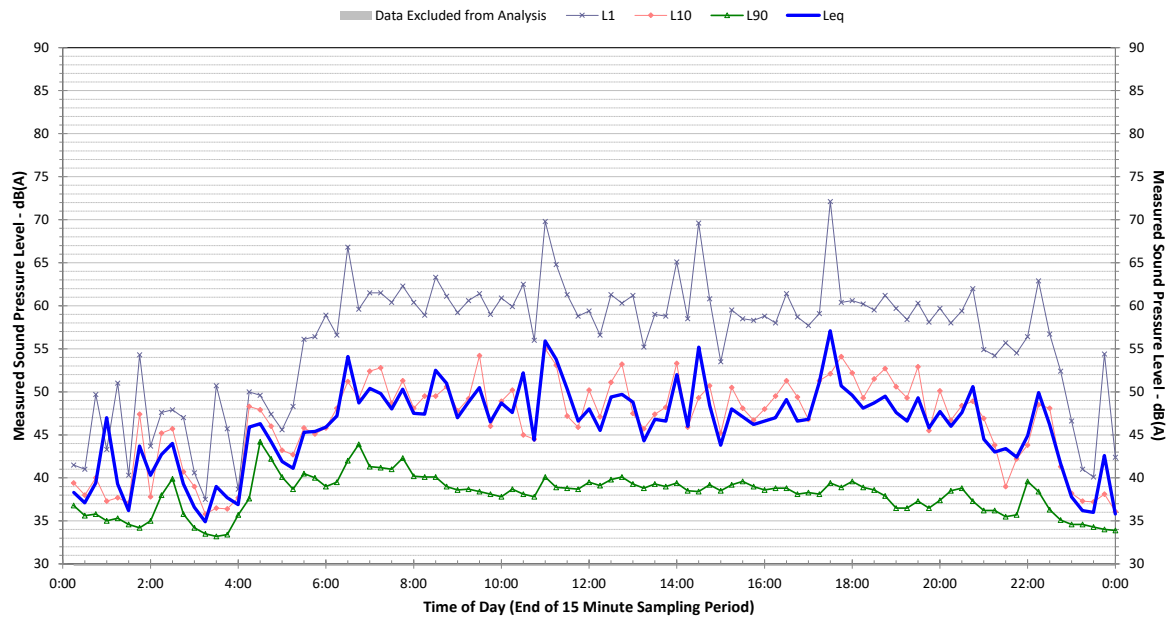
Profile of Noise Environment - Noise Monitoring Location 2 Monday 28 November 2022



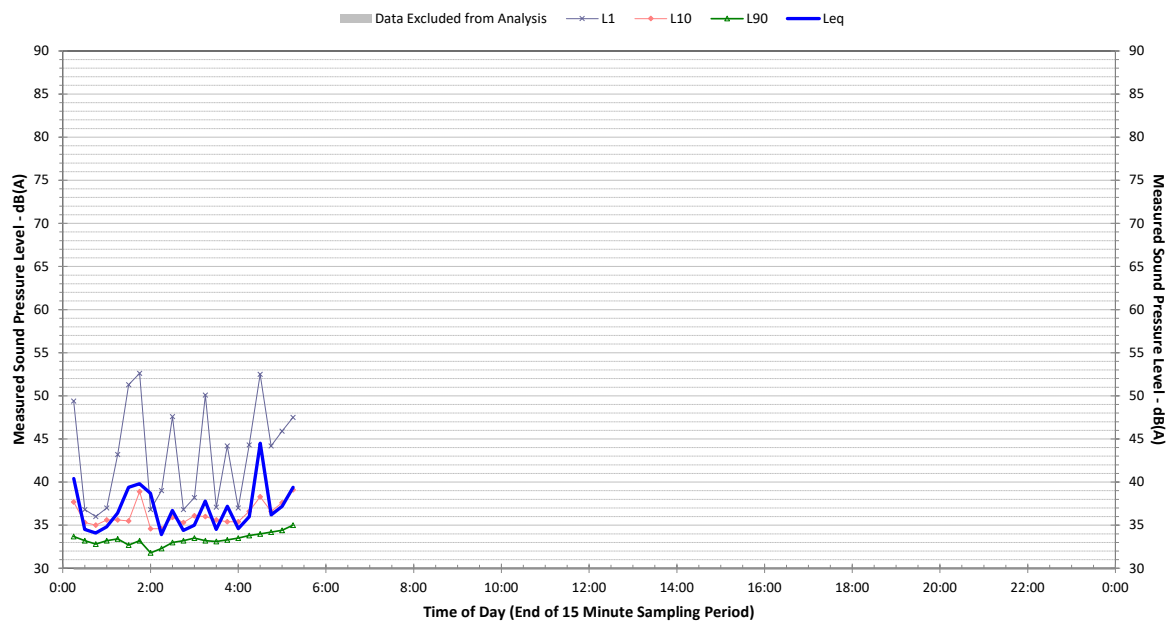
Profile of Noise Environment - Noise Monitoring Location 2 Tuesday 29 November 2022



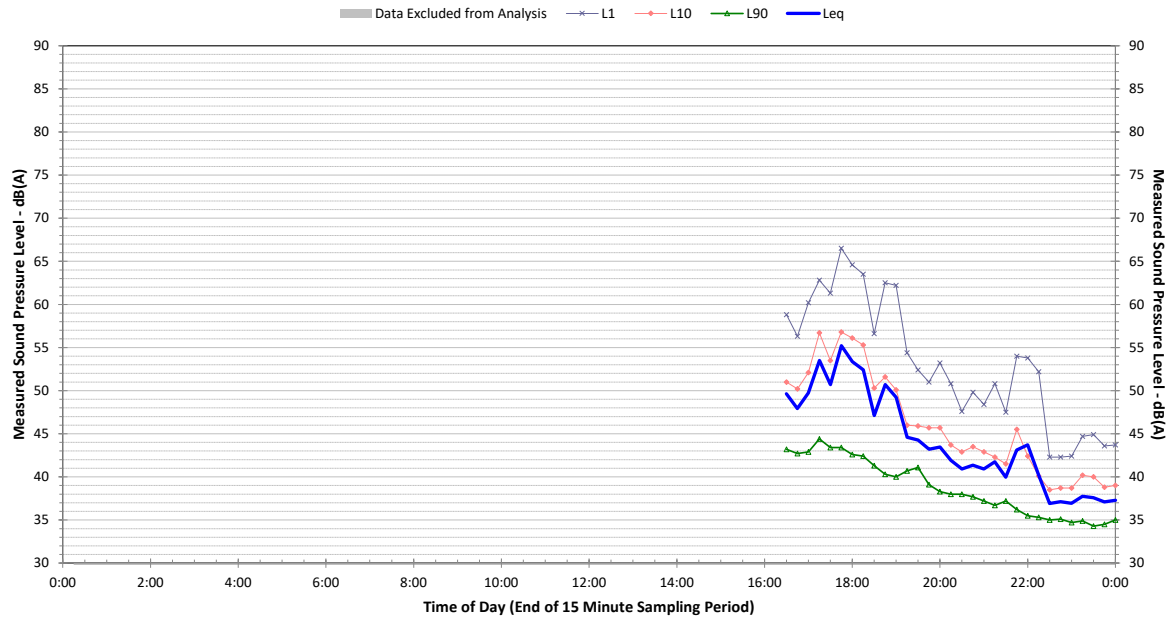
Profile of Noise Environment - Noise Monitoring Location 2 Wednesday 30 November 2022



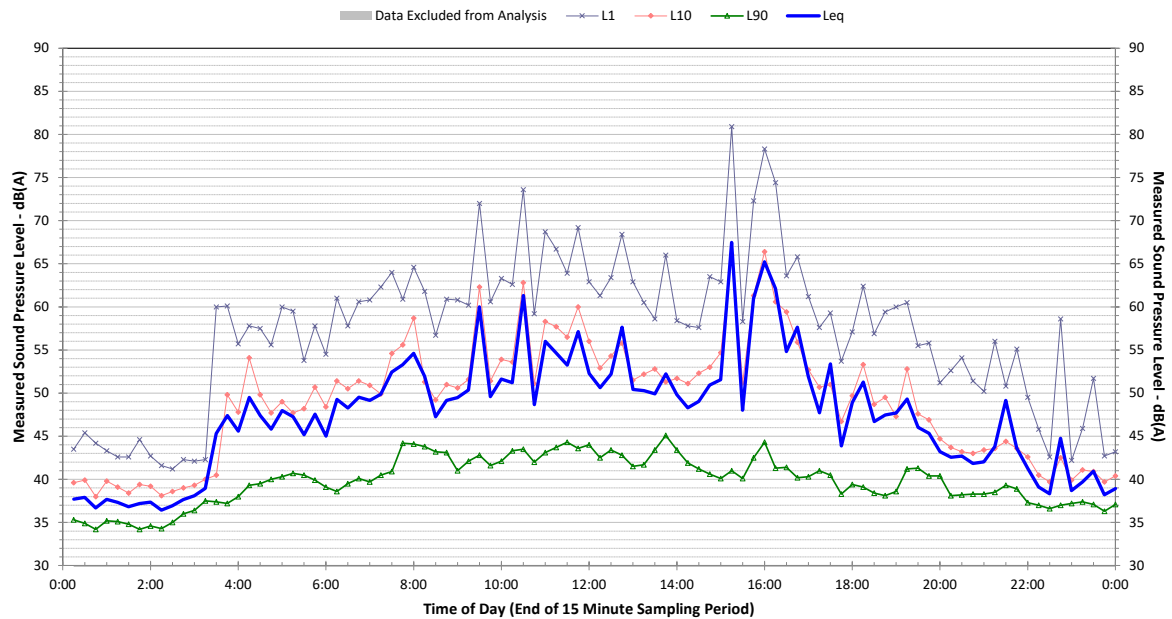
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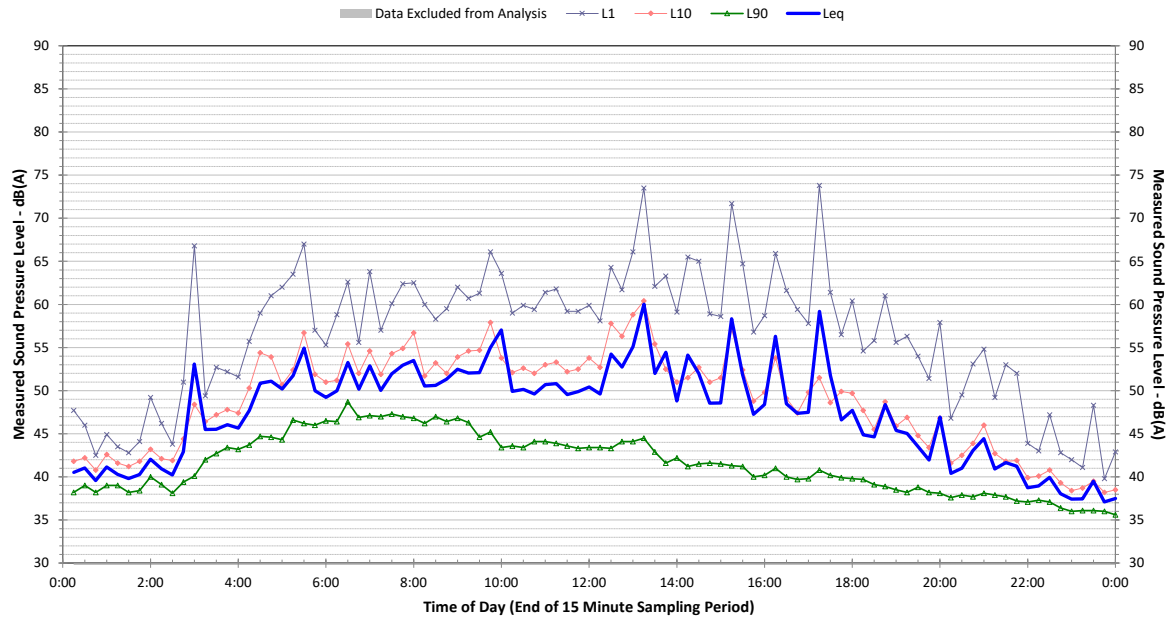
Profile of Noise Environment - Noise Monitoring Location 4 Thursday 24 November 2022



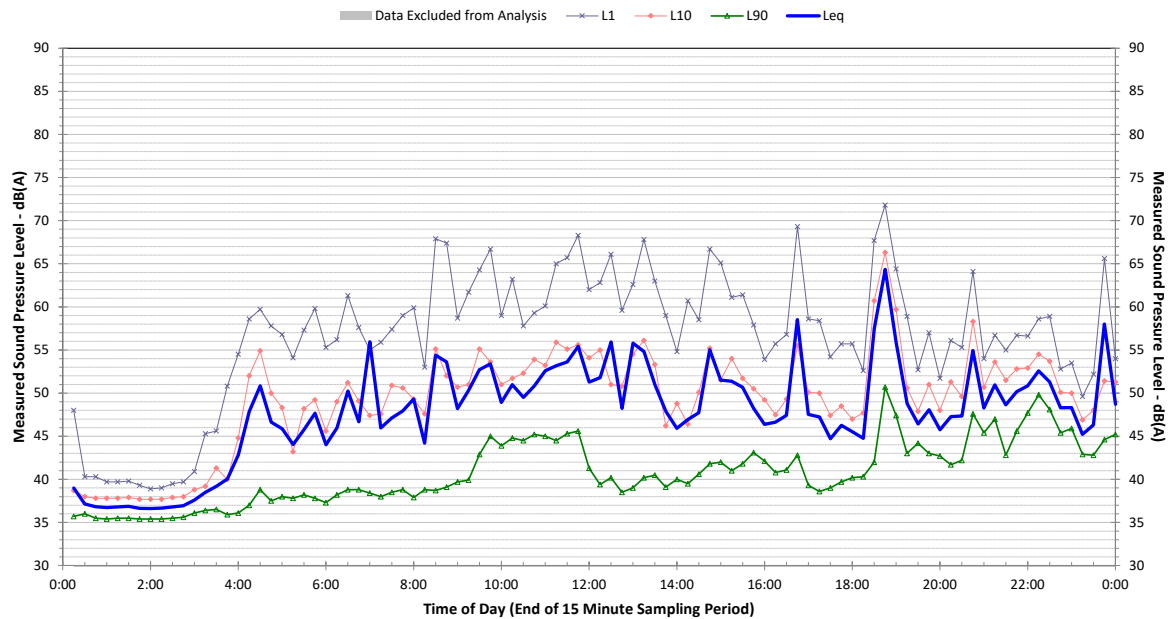
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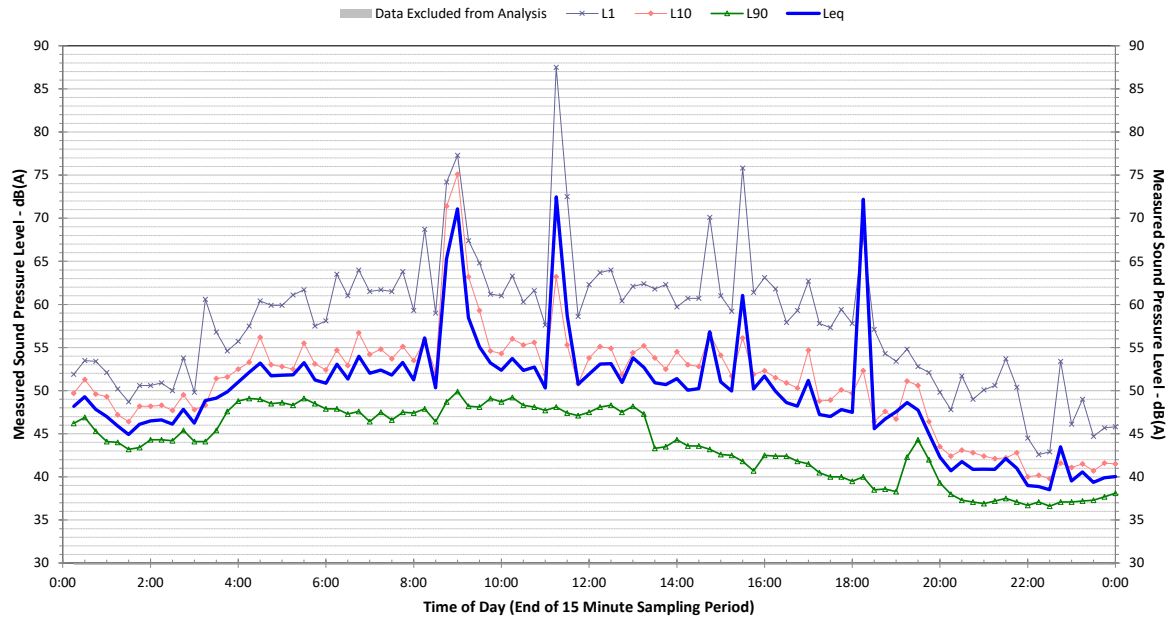
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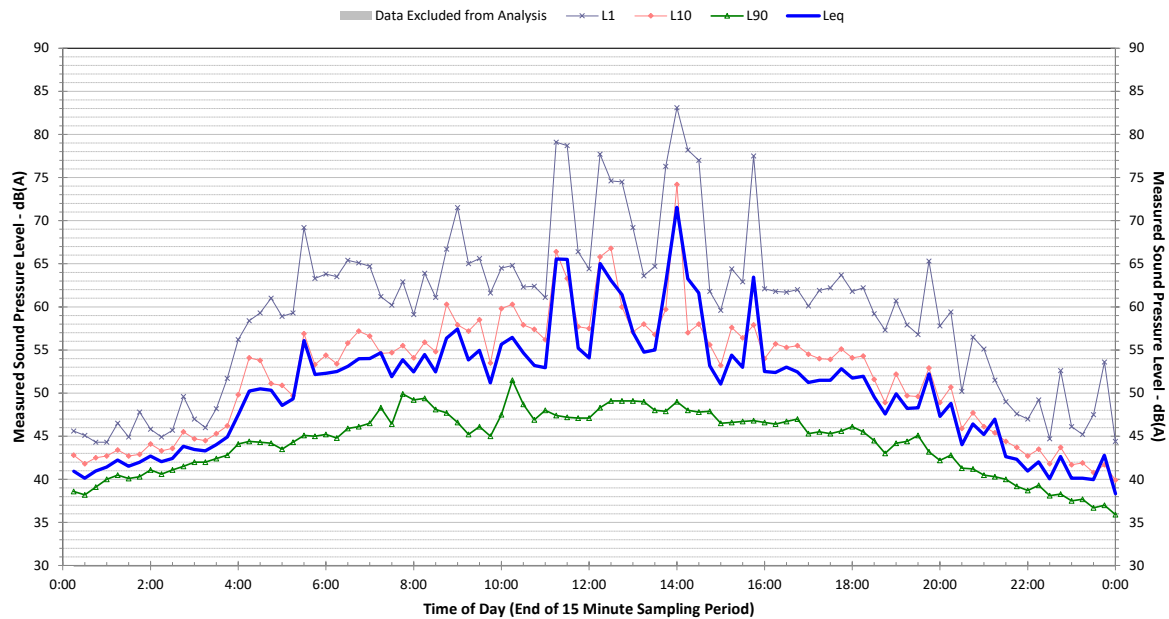
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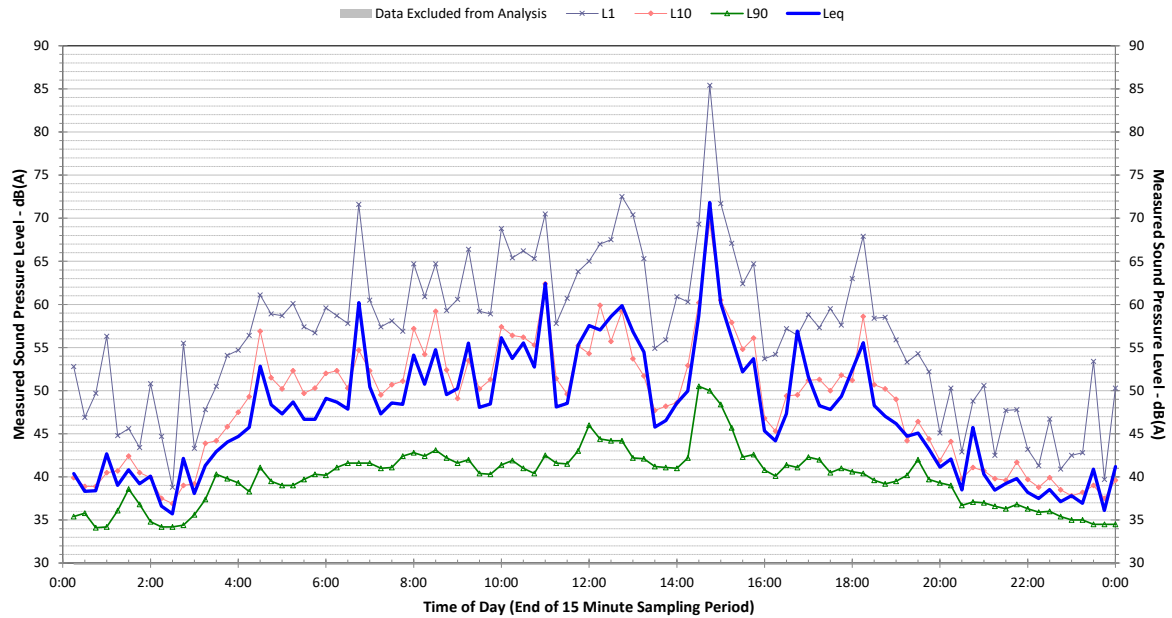
Profile of Noise Environment - Noise Monitoring Location 4 Monday 28 November 2022



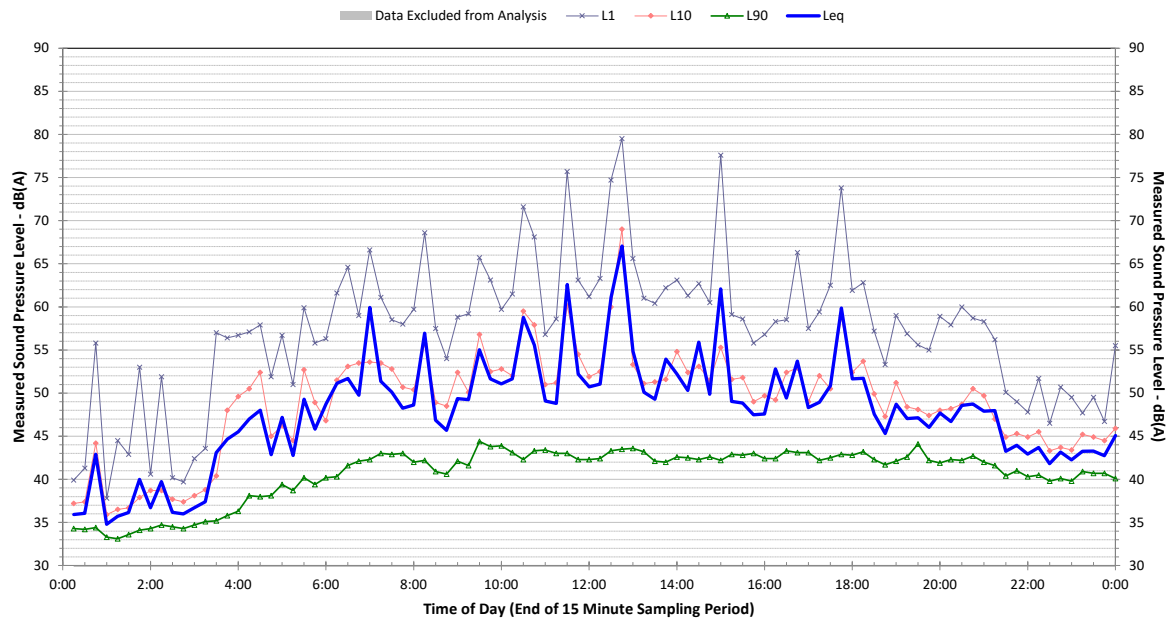
Profile of Noise Environment - Noise Monitoring Location 4 Tuesday 29 November 2022



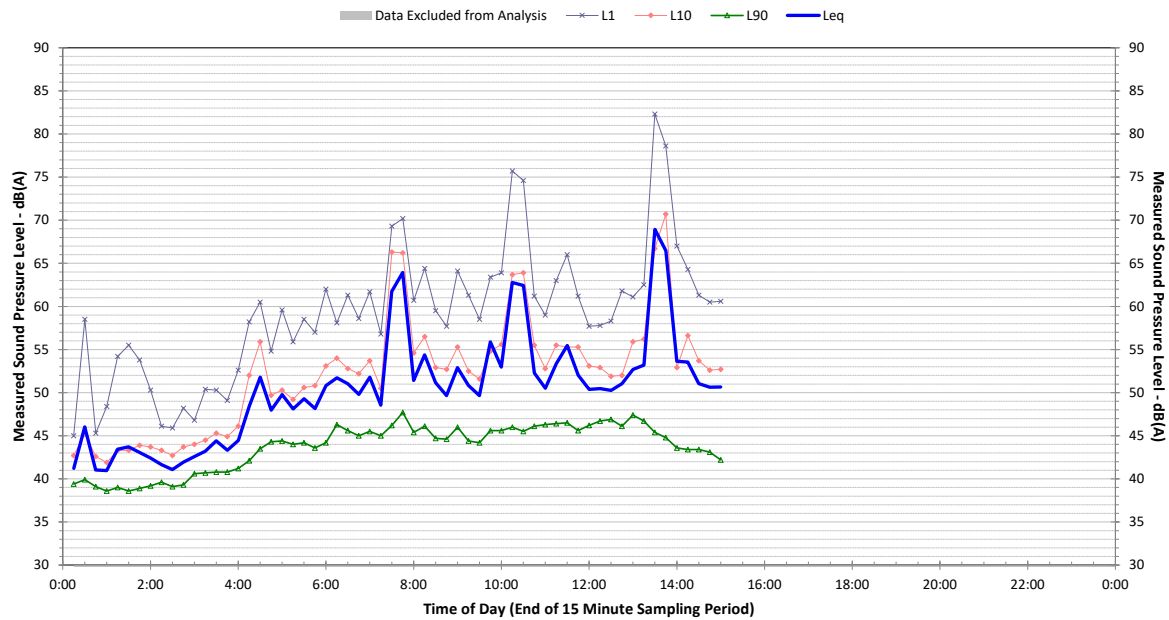
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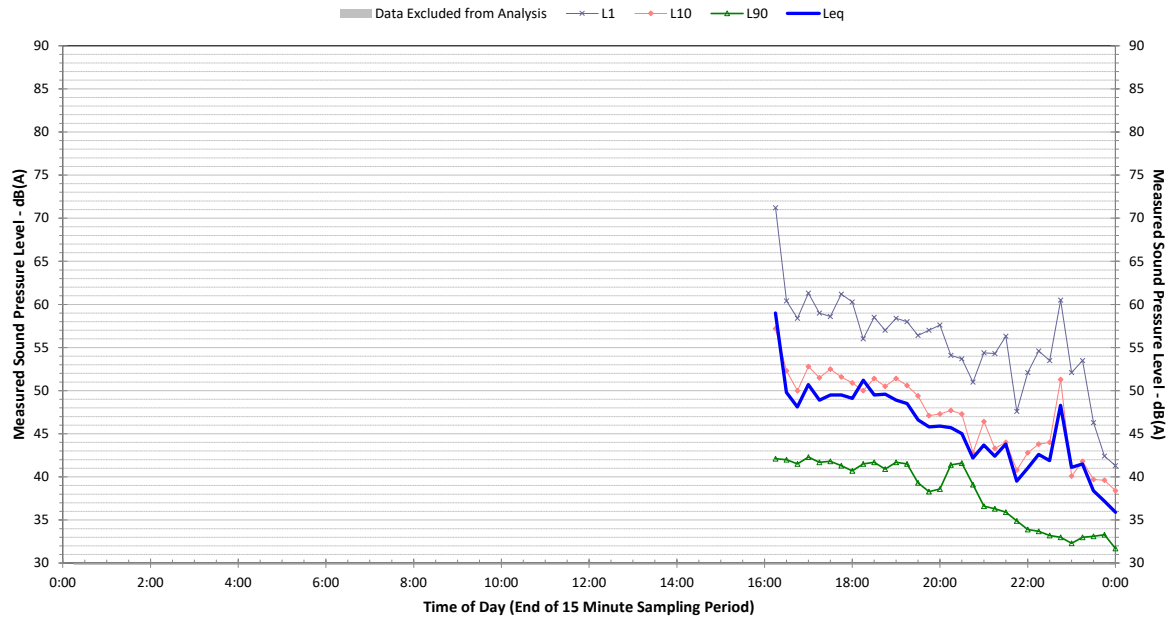
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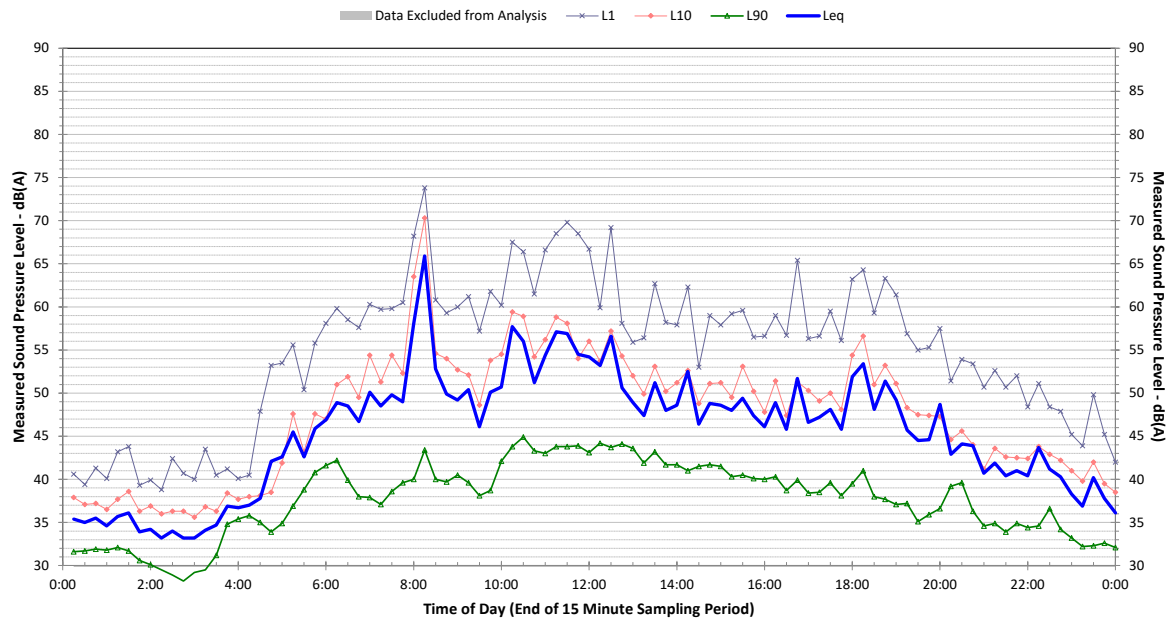
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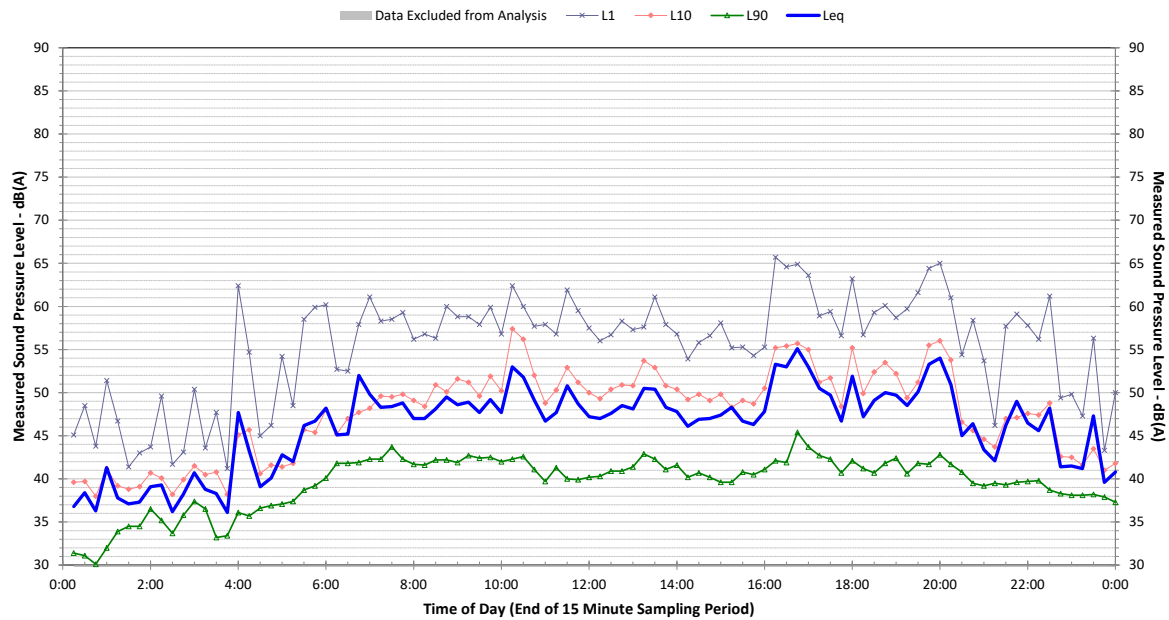
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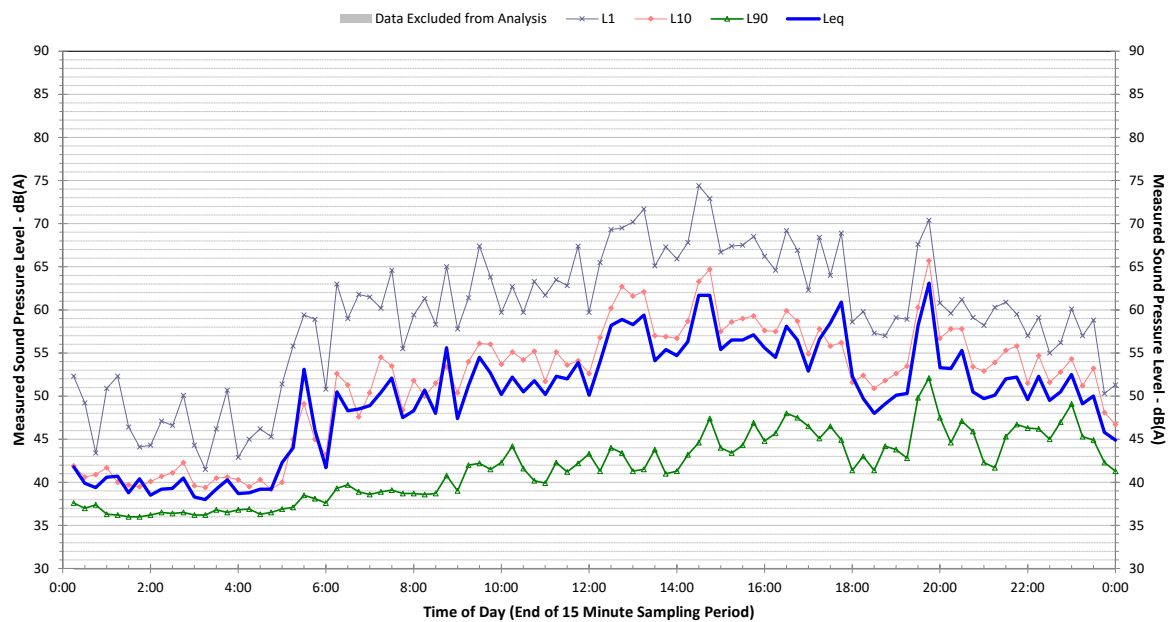
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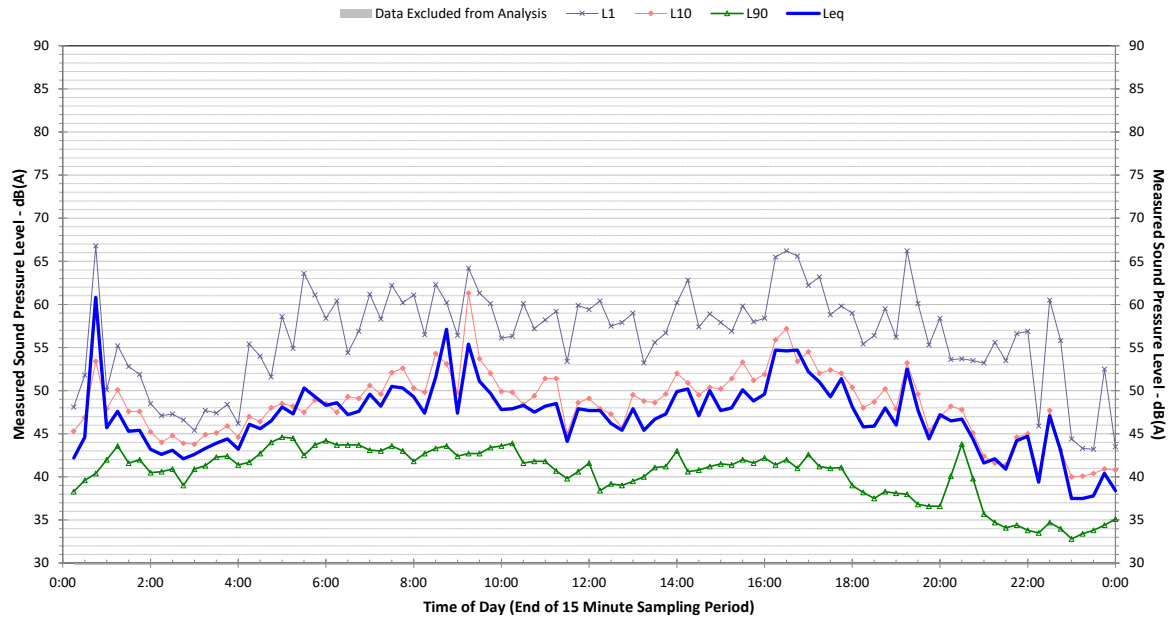
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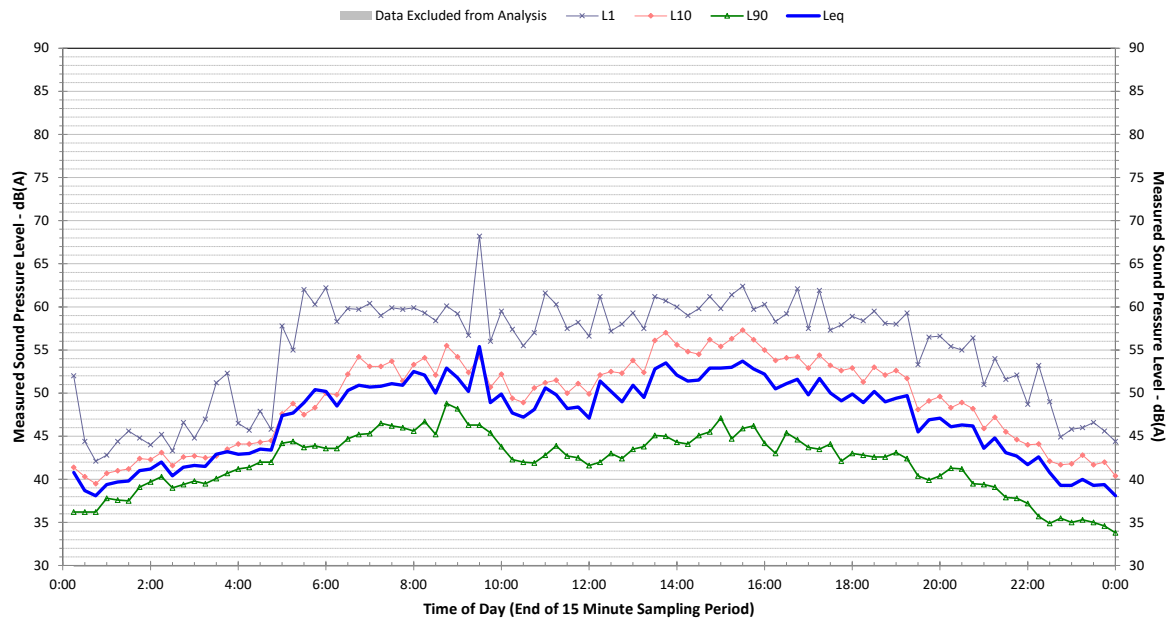
Profile of Noise Environment - Noise Monitoring Location 5 Sunday 27 November 2022



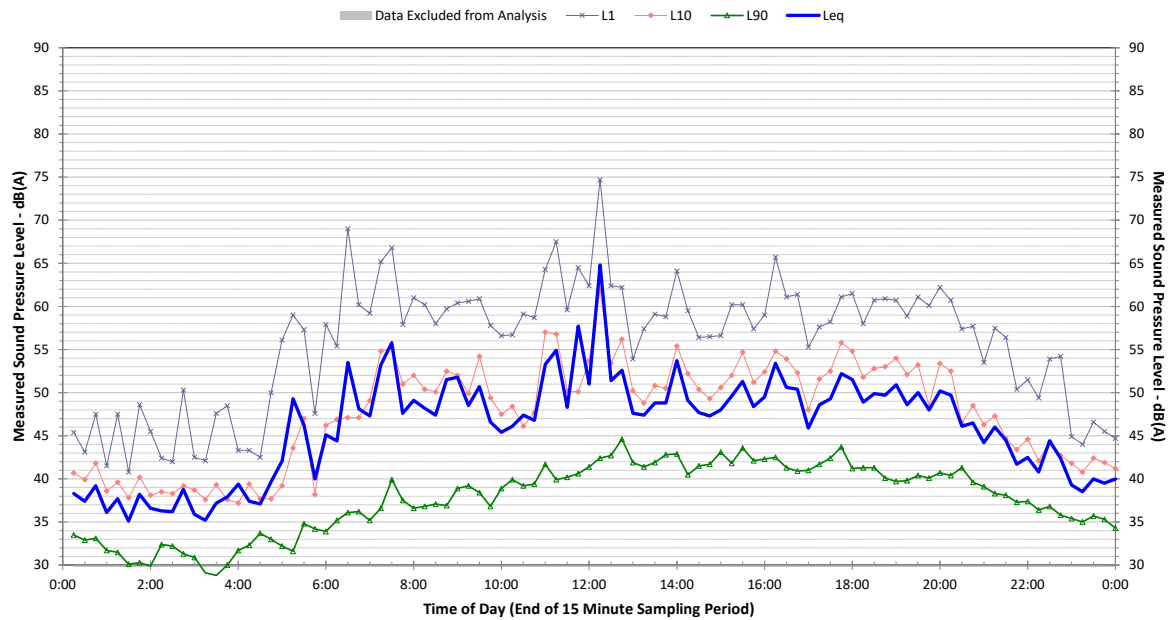
Profile of Noise Environment - Noise Monitoring Location 5 Monday 28 November 2022



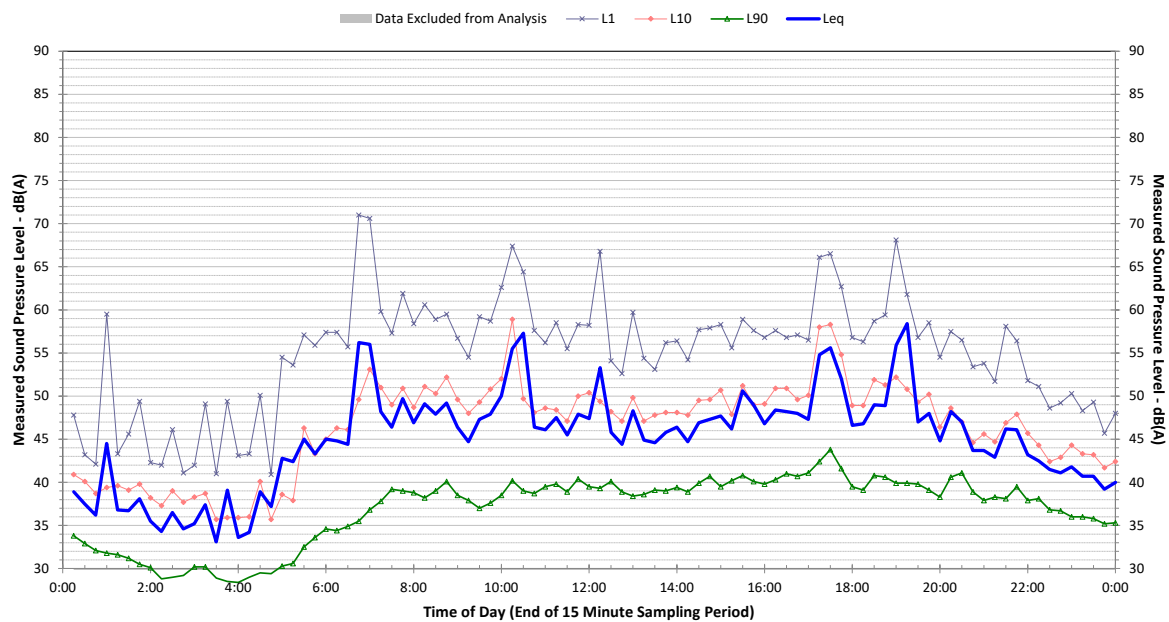
Profile of Noise Environment - Noise Monitoring Location 5 Tuesday 29 November 2022



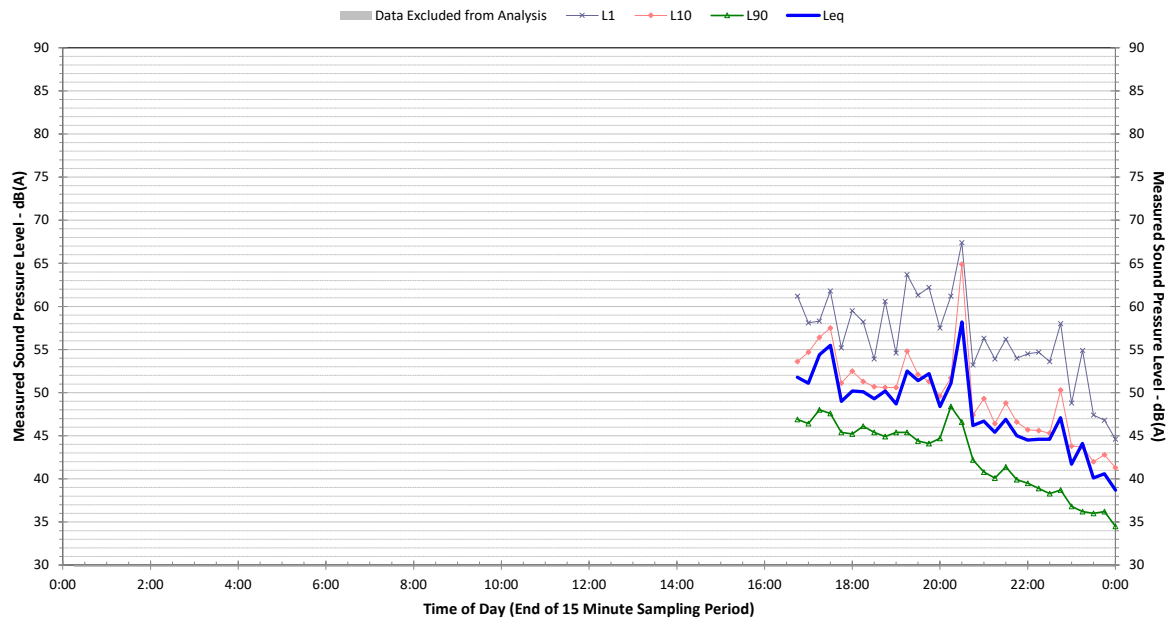
Profile of Noise Environment - Noise Monitoring Location 5 Wednesday 30 November 2022



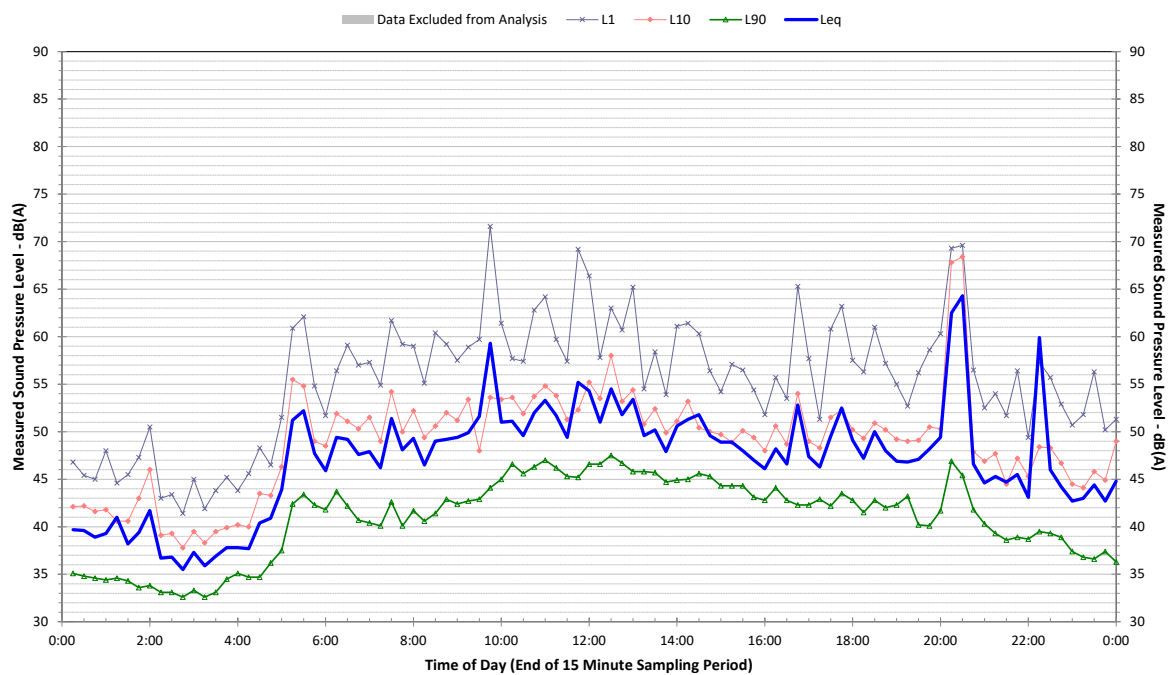
Profile of Noise Environment - Noise Monitoring Location 5 Thursday 1 December 2022



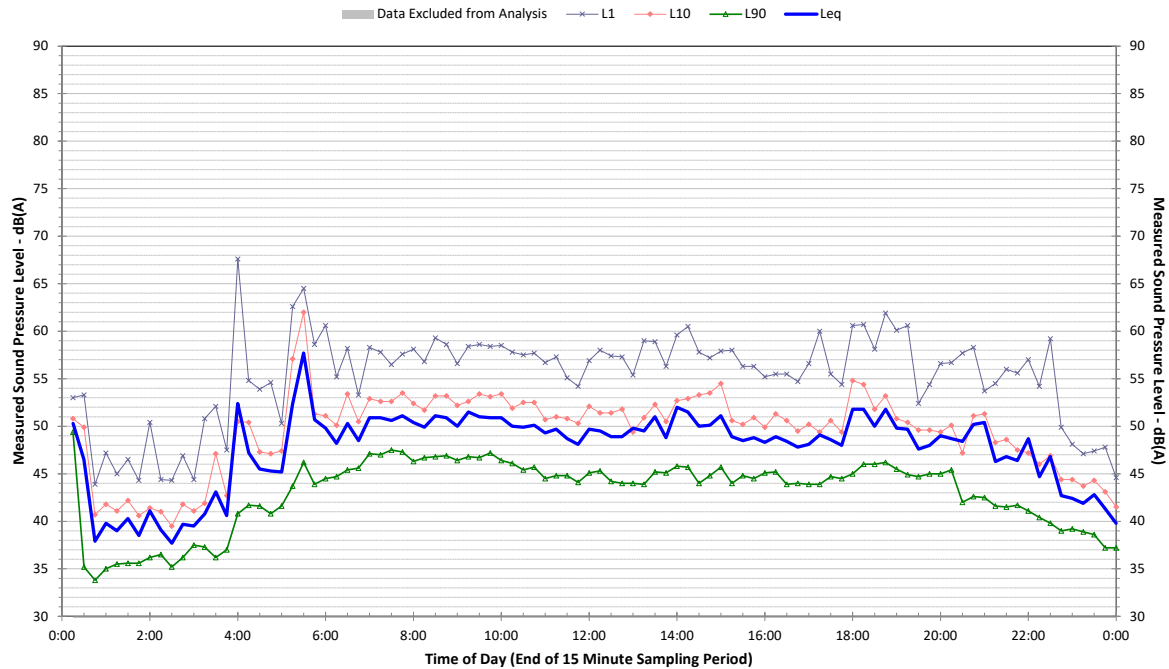
Profile of Noise Environment - Noise Monitoring Location 6 Thursday 24 November 2022



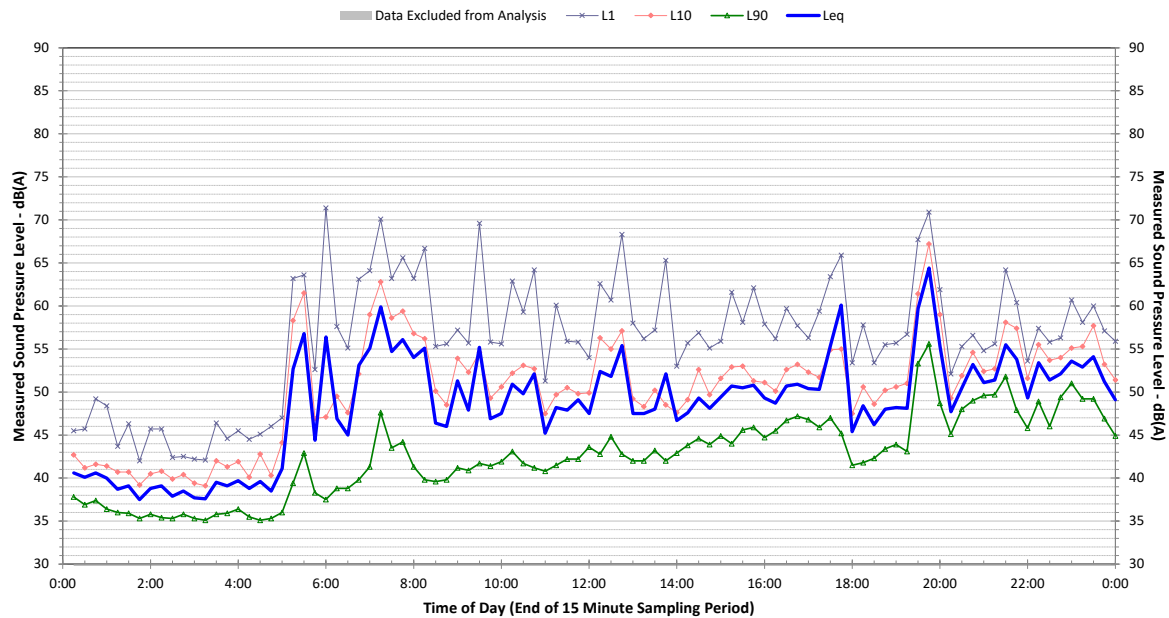
Profile of Noise Environment - Noise Monitoring Location 6 Friday 25 November 2022



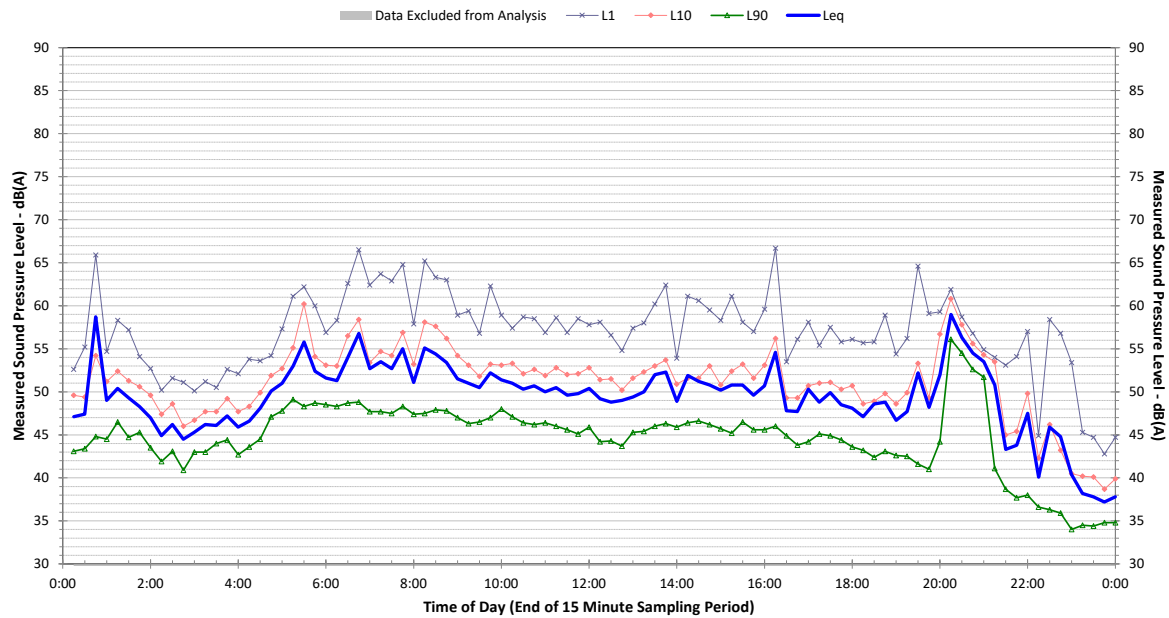
**Profile of Noise Environment - Noise Monitoring Location 6
Saturday 26 November 2022**



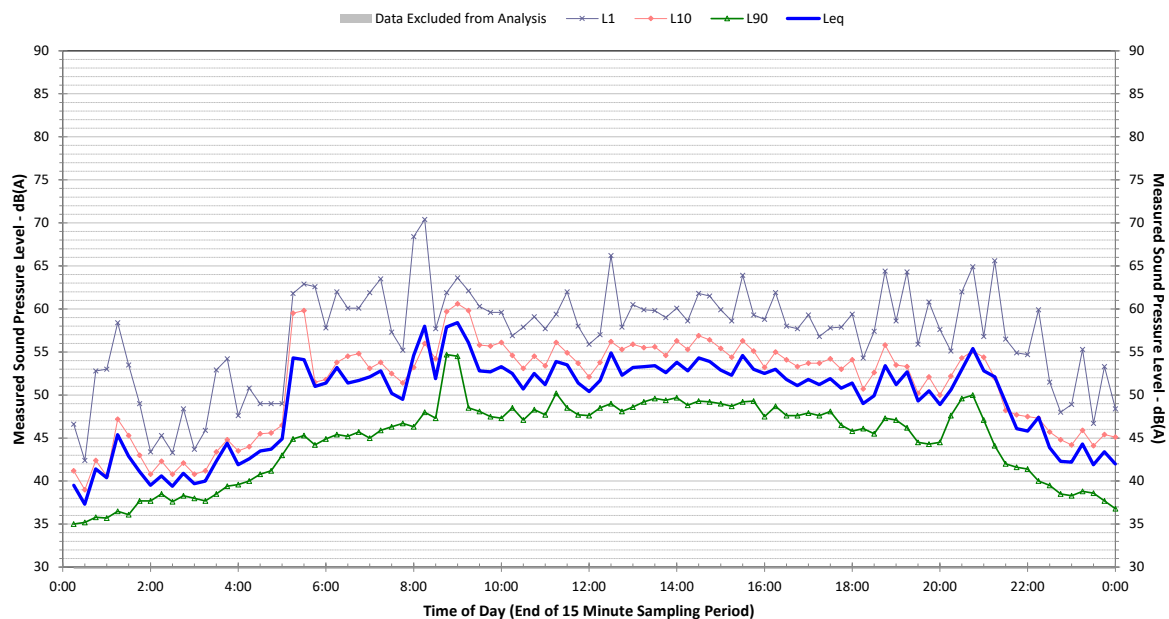
**Profile of Noise Environment - Noise Monitoring Location 6
Sunday 27 November 2022**



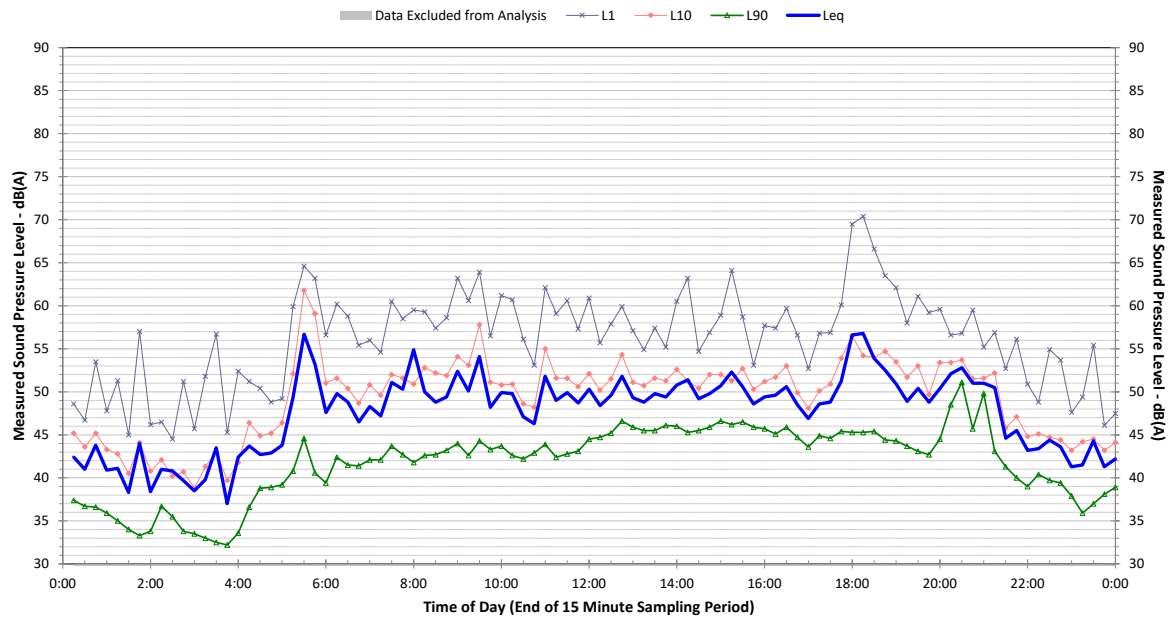
Profile of Noise Environment - Noise Monitoring Location 6 Monday 28 November 2022



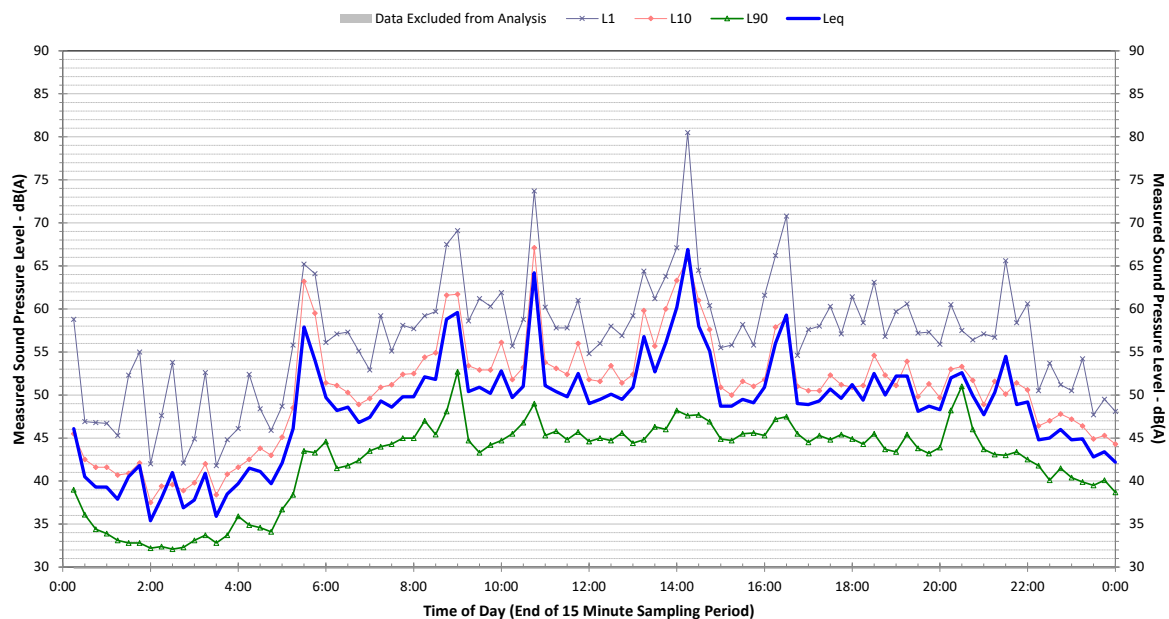
Profile of Noise Environment - Noise Monitoring Location 6 Tuesday 29 November 2022

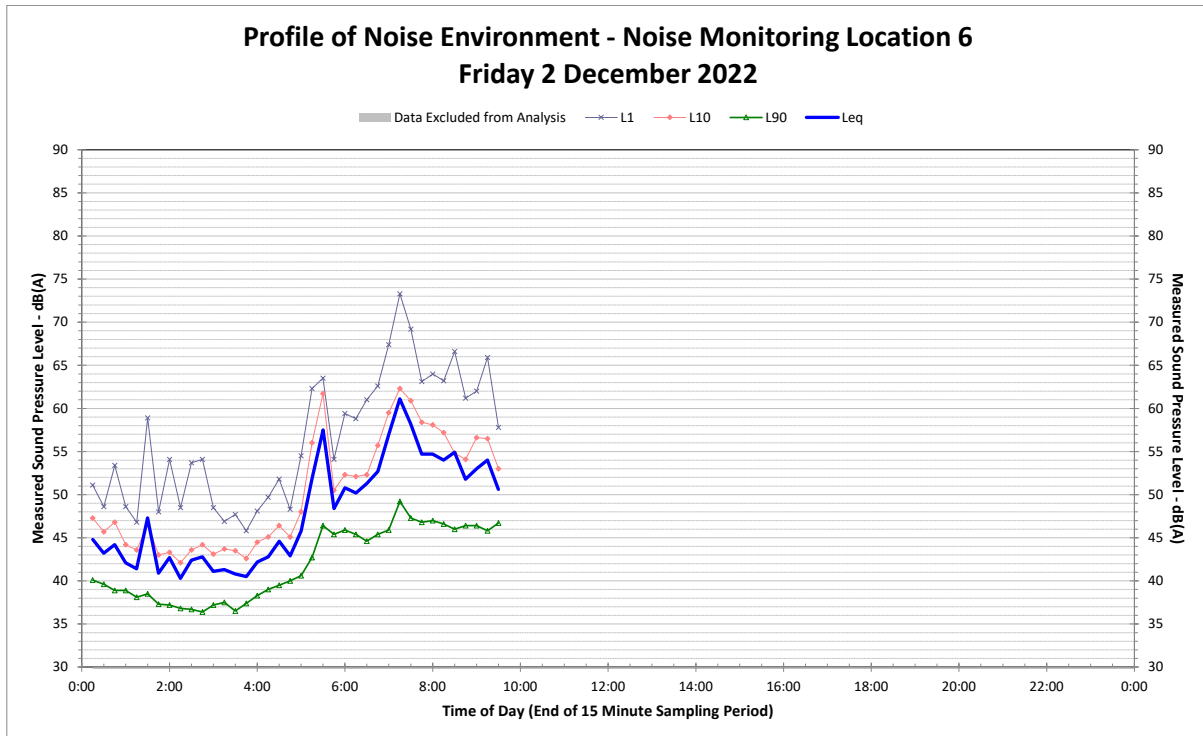


Profile of Noise Environment - Noise Monitoring Location 6 Wednesday 30 November 2022



Profile of Noise Environment - Noise Monitoring Location 6 Thursday 1 December 2022





hutchison weller

Hutchison Weller Pty Ltd
ABN 34 603 174 518
Level 1, 357 Military Road, Mosman NSW 2088
www.hutchisonweller.com

Appendix D

Noise Model Validation report

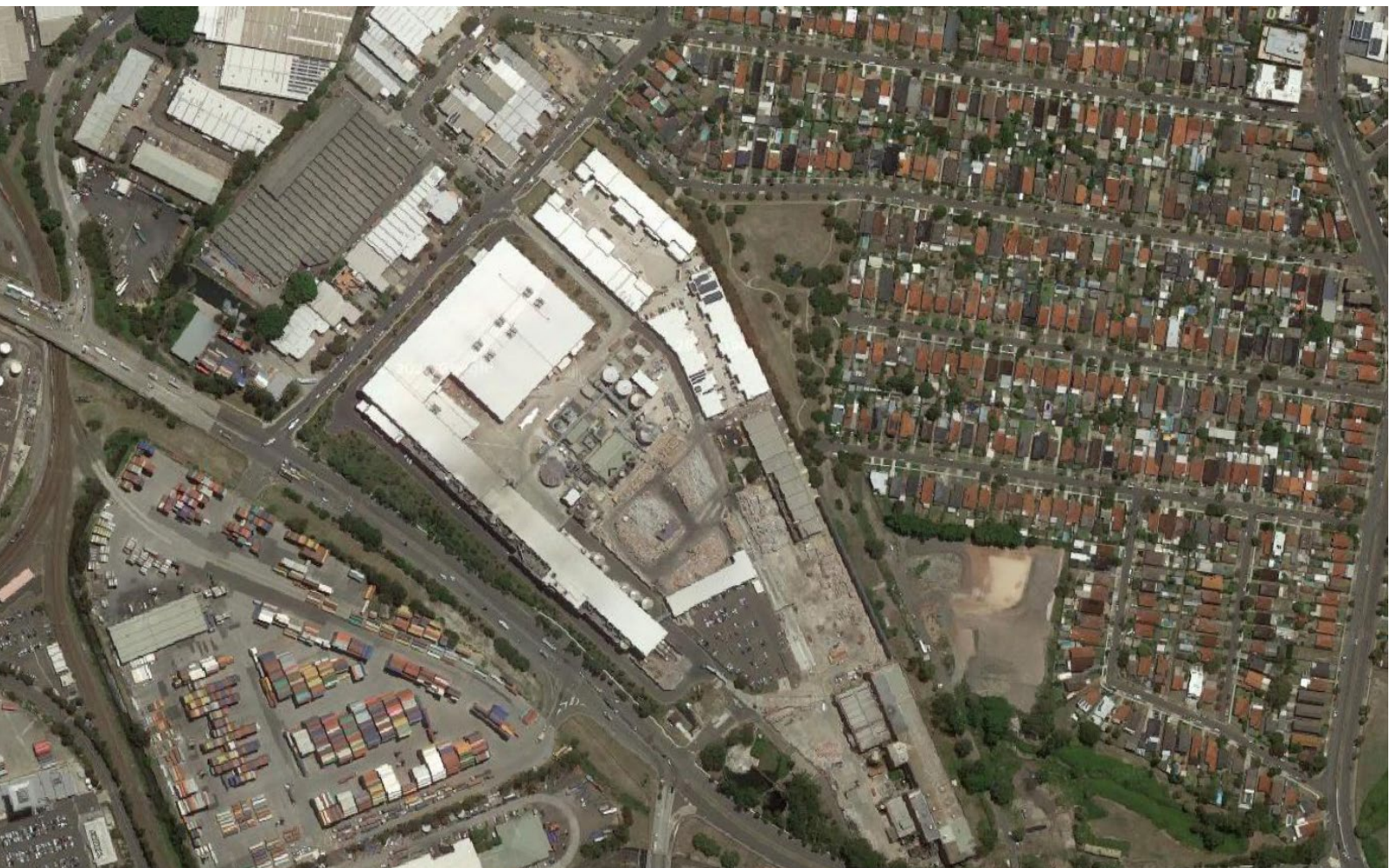


**Opal ANZ Matraville
B9 Paper Mill**

Noise Model Validation Report

19 December 2022

Doc no. 16002-NV-RP-12-2





Opal ANZ –Noise model validation

Client	Opal ANZ
Project	B9 Paper Mill
Document no.	16002-NV-RP-12-2
Revision	Rev 2
Date	19 December 2022
Author	Scott Hughes
Reviewer	John Hutchison
File path	16002-NV-TN-12-2 Noise Model Validation Report.docx

Hutchison Weller Pty Ltd
ABN 37 001 024 095
Lvl 1, 357 Military Road Mosman NSW 2008

www.hutchisonweller.com

Revision history

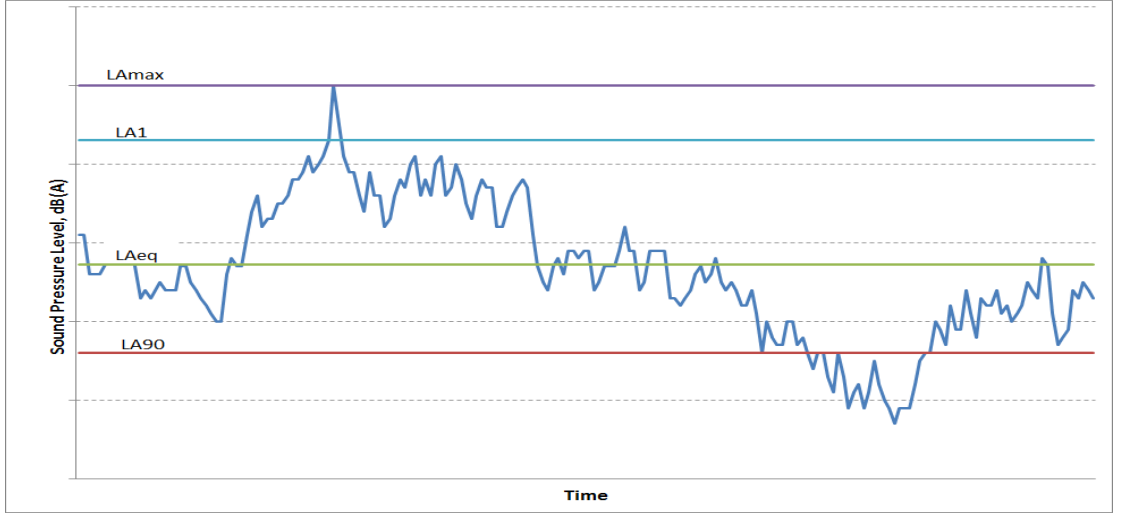
0	30 June 2022	Issued for approval
1	14 October 2022	Updated details – Section 3.2, Updated difference values Table 1
2	19 December 2022	Amended report summary

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Appendix A. Noise prediction contours

Definition of acoustic terms

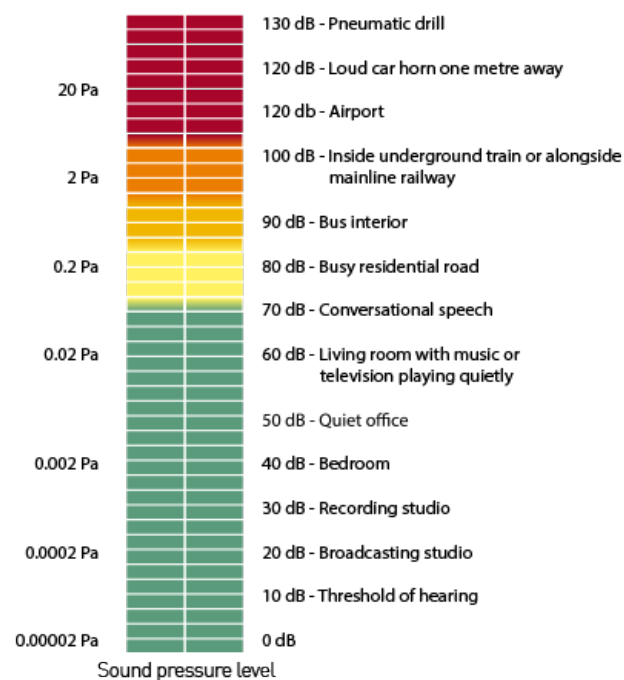
Assessment period	The period in a day over which assessments are made.
Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation.
Decibel (dB)	A measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm (to base 10) of the ratio of a given sound power to a reference power.
dB(A)	Unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear.
dB(C)	Unit used to measure 'C-weighted' sound pressure levels, an adjustment made to sound level to approximate low frequency noise between 10 Hz and 200 Hz.
Extraneous noise	Noise resulting from activities that are not typical of the area such as construction, and traffic generated by holiday periods or special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Noise assessment criteria	A standard rule or test by which the acceptability of the nature and characteristics of noise may be judged or evaluated. Criteria are generally based on guidelines or standards developed by Government agencies (eg EPA) to protect the majority of people for the majority of the time from adverse impacts.
Noise level statistics	L_{A90} - The A-weighted sound pressure level exceeded 90% of the monitoring period. This is considered to represent the background noise. L_{Aeq} - The equivalent continuous A-weighted noise level—the level of noise equivalent to the energy average of noise levels occurring over a measurement period. L_{A1} - The A-weighted sound pressure level exceeded 1% of the monitoring period. L_{Amax} - The maximum A-weighted noise level associated with the measurement period. 
Sound Power Level (SWL)	The A-weighted sound power level is a logarithmic ratio of the acoustic power output of a source relative to 10^{-12} watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.

Sound Pressure Level (SPL)

This is the level of noise, usually expressed in dB(A), as measured by a standard sound level meter with a pressure microphone. The sound pressure level in dB(A) gives a close indication of the subjective loudness of noise.

A technical definition for the sound pressure level, in decibels, is 20 times the logarithm (base 10) of the ratio of any two quantities related to a given sound pressure to a reference pressure (typically 20 μ Pa equivalent to 0 dB). Examples of typical sound pressure levels are shown below.

Threshold of pain



Source: https://www.osha.gov/dts/osta/otm/noise/health_effects/soundpropagation.html

Tonal noise

Noise with perceptible and definite pitch or tone

1. Introduction

Opal ANZ operates the B9 Paper Mill (the Paper Mill) at its site in Matraville in Sydney, producing around 400,000 tonnes of recycled containerboard every year. The Matraville site was established in around 1902 and in 2013 was upgraded to its present form where the site's ninth paper mill, the B9, was commissioned.

As part of the Paper Mill's environmental licencing conditions, target noise levels at nearby residential locations form part of their operational parameters. Noise influences from many sources in the Port Botany area restrict the direct measurement of noise from Opal at these residential locations and in 2014 a site wide study of noise was commissioned to assist in the assessment of noise impacts. This model has been used as a tool for assessing impacts of site equipment and process upgrades since this time.

Changes to the site layout and additional infrastructure projects over the last few years have necessitated a revised noise model that is calibrated by internal site measurements and external noise monitoring correlation.

Hutchison Weller has been engaged to undertake a review of the noise model and confirm its predictive accuracy which will be used to establish a new modelling base line for future site improvements and monitoring of site noise against the noise goals detailed in the Environmental Protection Licence (EPL 1594). This report provides a review of noise influences with the Opal Matraville site and presents the noise modelling outcomes from updated site information.

An illustration of the site is provided in Figure 1 against the latest available aerial imagery, which shows the current layout of the site in most respects. Of note is the existence of the B7 reel store located mid boundary on the north eastern side of the site. This building has been demolished and is currently used as a paper storage area.

Receiver locations identified in the EPL are shown in relation to the site.



Figure 1 Opal ANZ Matraville site and key receiver locations

2. Noise and vibration assessment criteria

2.1 Overview

The NSW EPA issues EPLs that provide noise criteria for assessing operational noise from industrial premises. The Opal ANZ operations at Matraville operate under EPL 1594. Section L3 of this licence details the following operational conditions with respect to noise from the site:

L3 Noise limits

L3.1 Noise emissions from the premises must not exceed the noise limits prescribed in the table below:

Location and receiver ID	Day LAeq,15min, dB(A)	Evening LAeq,15min, dB(A)	Night LAeq,15min, dB(A)	Night LAmax, dB(A)
Corner of McCauley Street and Australia Avenue (R1)	46	45	43	55
Australia Avenue (R2)	45	45	43	55
Murrabin Avenue (R3)	46	45	43	55
Partanna Avenue (R4)	42	41	41	55
Corner of Partanna Avenue and Moorina Avenue (R5)	42	42	39	55
Moorina Avenue (R6)	43	43	39	55

L3.2 For the purposes of Condition L3.1:

- Day' is defined as the period between 7:00 am and 6:00 pm Monday to Saturday and between 8:00 am and 6:00 pm Sundays and Public Holidays.
- Evening' is defined as the period between 6:00 pm and 10:00 pm.
- Night' is defined as the period between 10:00 pm Sunday to Friday and 7:00 am the following day, between 10:00 pm Saturdays and 8:00 am Sundays, and between 10:00 pm the day preceeding a Public Holiday and 8:00 am on the Public Holiday.

L3.3 Noise from the premises must be measured at any point within 1 metre of any residential boundary to determine compliance with $L_{Aeq(15\ min)}$ licence noise limits.

L3.4 Noise from the premises must be measured at any point within 1 metre of any residential building facade to determine compliance with L_{Amax} licence noise limits.

L3.5 The noise limits specified in Condition L3.1 apply under the following meteorological conditions:

- Wind speeds up to 3 metres/ sec at 10 metres above ground level; and
- Temperature inversion conditions of up to 3°C.

In addition to the original licencing requirements, the EPA have issued a draft EPL in December 2021 with further conditions relating to the noise model verification as follows:

U1.1 The licensee must commission an independent and suitably qualified person with expertise in noise monitoring and noise modelling to:

- 1 Verify the existing noise model via on-site measurement to obtain information that is sufficient to ensure its accuracy. This must include but not be limited to:
 - Appropriate source level measurements that are sufficient to carry out the requirements of the Noise Policy for Industry (NPfI).
 - Measurements on-site which are able to be extrapolated back to receiver locations as they appear on the EPL.
- 2 Include within the noise model the worst-case 15-minute noise level on site including the maximum number of front-end loaders and heavy vehicles that may be operational at any one time.
- 3 Include within the results an assessment of potential annoying characteristics as contained within Fact Sheet C of the NPfI.

U1.2 The licensee must provide a report (Noise Model Verification Report) to the EPA by 30 June 2022. This report must contain as a minimum:

- 1 Details of the existing noise model for the premises.
- 2 A summary of the work completed, and the noise measurement data gathered, as per the requirements of condition U1.1.
- 3 Details of any necessary calibration to the existing noise model, if required.
- 4 An evaluation of the overall noise emission performance of the premises up against condition L3.1 of this licence, including an estimate of the premises noise contribution at off-site receiver locations.
- 5 Recommendations for any noise mitigation options, if required.
- 6 A procedure detailing how new plant and equipment at the premises, such as those proposed in future planning applications, will be assessed against the verified and calibrated noise model to ensure the overall noise emission from the premises will continue to meet condition L3.1 of this licence.

Note: Following a review of the validation and calibration of the model and written approval by the EPA, all future quarterly monitoring reports are to include an estimate of the contribution from the premises at the receiver locations contained on the licence. A summary of the ambient noise levels will not be considered appropriate.

3. Opal Matraville site

Details of the site noise model are characterised for six main areas of activity and noise impact shown in Figure 2 and described as follows:

- Paper machine building
- Process and waste water
- Waste paper yard
- Rejects yard
- Reel Store
- Paper delivery and product truck movements

These areas were reviewed for monitoring of noisy equipment or plant during the validation survey



- Figure 2 Noise model zones with Opal Matraville

3.1 Equipment modelled in each zone

The paper machine building includes noise from the paper machine located at the operational level and associated equipment including pumps located on the ground floor and fans located at the rear of the building on a mezzanine roof top.

The process and waste water area contains equipment and infrastructure that handles waste water from the paper machine. This equipment includes the waste water treatment plant, cooling towers, transformers, tank farm, gas flare, boiler house, deaerator and boiler feed pumps.

The waste paper yard receives waste paper deliveries and loads the paper machine product conveyor at the start of the manufacturing process. Vehicles associated with the yard include a front end loader, forklift and idling trucks during delivery of the waste paper.

The rejects yard removes waste product from the raw material stream and operates with a front end loader and a semi trailer. The rejects yard has been modelled as it currently operates with a front end loader however, a recent approved modification for the waste recycling facility in this area would eliminate the front end loader as a noise source.

The reel store houses the finished paper products and loads product trucks inside the reel store building, which has minimal noise emissions with only forklifts operational when loading trucks.

Site traffic includes vehicle movements throughout the site from product delivery to finished product movements.

3.2 Summary of validation monitoring

Noise monitoring was undertaken in June 2022 to verify existing modelled noise sources and confirm noise levels at calibration points within the Opal site.

Monitoring of equipment during the survey included:

- B9 paper machine ground floor and first floor and mezzanine levels to confirm existing noise measurements.
- Boiler house
- Boiler feed pumps and de-aerator
- Gas flare
- Gas farm
- Waste paper yard including truck movements and idling trucks
- Aeration Blowers
- Cooling towers
- Tank farm

Typical daily activities are characterised by the operation of fixed plant and equipment which have constant noise emissions. These items of plant include the paper machine, motor and pump combinations, cooling towers, boilers, deaerators and filtration equipment.

Items of plant and equipment that are not constant in terms of location or usage include front end loaders used for handling raw and waste-paper products, delivery and transport trucks. Some areas such as the rejects facility and the waste paper yard are not accessible during normal operations and therefore characterising these zones for the noise model was undertaken using proxy site measurements and observations of quantities and locations of equipment.

At the paper machine rejects location, modelling includes a waste truck with reversing beeper, SWL 105 dB(A) @ 5 km/h, entering and exiting the waste rejects area, which also includes a front end loader (FEL), SWL 108 dB(A)

as a point Source. The SWL of the FEL has been updated from previous modelling based on recent attended measurements at the boundary.

Product and delivery truck movements around the site are modelled at 5 km/h in accordance with the site traffic management plan. One waste paper delivery truck every 15 minutes is included in the night time modelling scenario. Delivery trucks were measured with an SEL of 96 dB(A) at 2.8 metres and modelled as a moving point source with SWL 101.5 dB(A) calibrated in the model. Product trucks are assumed be 102 dB(A) SWL, with a worst case scenario of four vehicle movements in any given 15 minute period during the night time.

The waste paper yard zone includes a rubber tyred FEL and a forklift moving around the yard. The FEL and the fork lift are modelled on 100% use in any 15 minute period. Both items of plant are modelled at a base SWL of 108 dB(A), and both as moving point sources. In addition to Opal equipment, two idling delivery trucks with SWL of 100 dB(A) are included in this zone.

3.3 Modelling methodology

Each noise generating element of the paper mill has been considered and included in an acoustic model developed using SoundPlan noise modelling software (version 8.1). The acoustic model predicted noise levels at the key receiver locations detailed in the EPL using the ISO9613 prediction method.

The following elements were included in the model.

- Topography – digital terrain file developed using LIDAR data
- Buildings – all buildings within 600 metres of the works have been included to consider noise barrier effects and reflection from facades.
- Ground absorption as appropriate, 0 for hard surfaces around the site and 0.5 for residential areas
- Meteorology – ISO9613 assumes worst-case meteorological conditions (gentle breeze from source to receiver and stable conditions).

3.4 Noise model updates

As a final process, the noise model was reviewed for changes to the site layout which included several new buildings and structures. Additional structures included the use of waste paper storage areas bounded by shipping containers stacked 2 high, in the area previously occupied by the B7 reel store.

All large items and structures have been included in the noise model to represent shielding from within the plant however, there are many small structures and localised shielding of sources that cannot be represented in the model.

These items include pipework, cable trays and plinths that may add some attenuation. It is expected that these reductions would balance any reflective surfaces that may also increase local noise levels and not sufficiently accounted for in the noise model.

Other updates to the physical model components were the addition of LIDAR terrain data for the site and surrounding areas.

Additional building work on the old hanger land is being undertaken by a third party however, the buildings are not yet complete. Information on the location and scale of these buildings is currently being sourced and will be added to the noise model when work is complete. The absence of any buildings in this location for the current modelling validation will provide a conservative noise prediction for receiver locations at R4 and R5.

4. Model Validation

The noise model was calibrated against measured noise levels at each of the validation locations shown in Figure 3. In general noise sources within the Opal site are constant and these locations should provide consistent results when used as spot checks for on site noise levels.

The licence conditions U1 and U2 include a note that requires onsite validation of noise levels to be included with additional quarterly monitoring to confirm consistency with predicted noise levels at the compliance locations.

The calibration points in Figure 3 used for the model validation would not be appropriate for long term monitoring during the quarterly assessments and therefore recommendations have been included for the development of permanent or semi-permanent monitoring locations within the site which would be calibrated with the model and used as reference locations for future monitoring and modelling assessments.

The measured and predicted noise levels for the on site model validation are presented in Table 1.

Table 1 Existing background noise levels

Noise Monitoring Location	Description	Comments	Noise levels, L_{Aeq} , dB(A)		
			Measured	Modelled	Difference measured v modelled
C1	Middle of walkway – No vehicle movements	WTP and Cooling towers dominant	68.0	67.6	-0.4
C2	Corner of Garden Bed- No truck movements	Gas farm dominant noise source	63.1	61.9	1.2
C3	Adjacent to waste paper yard	No vehicles plant noise only	54.0	53.5	0.5
C3	Adjacent to waste paper yard	Idling Truck	64.0	64.2	-0.2
C3	Adjacent to waste paper yard	Truck pass 15 min	66.8	67.2	-0.4
C4	End of WTP driveway	General plant noise	68.9	69.1	-0.2
C5	Carpark boundary	Levels affected by road noise	-	49.2	0
C6	Fan roof	Near doorway	83.4	84.5	-1.1

The noise model provides a good correlation of measured and modelled noise levels with all locations predicting less than +/- 2 dB difference.

Based on the close correlation of the modelled and predicted noise levels, the noise model is considered to be acceptable for modelling noise impacts at off site locations.

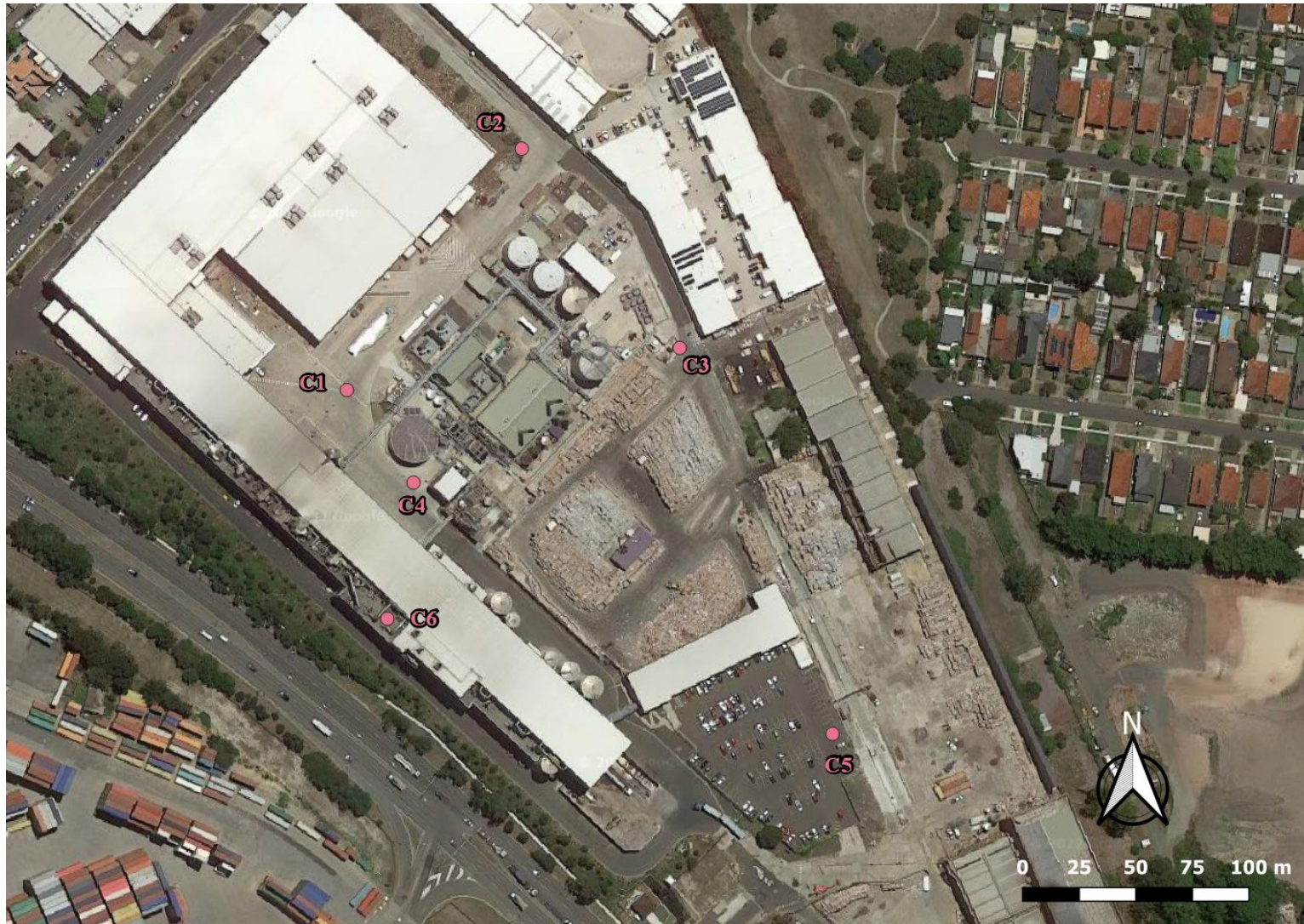


Figure 3 Model calibration locations

4.1 Predicted noise levels

After validation of the site noise measurements, the noise model was then used to predict noise levels at the EPL compliance locations. Noise level are presented for night time noise criteria as these are the most stringent for the site operating conditions.

ID	Location	EPL Noise Goals dB(A)		Predicted Noise Levels dB(A)	
		Night L _{Aeq} 15 Min	Night L _{Amax}	Night L _{Aeq} 15 Min	Night L _{Amax}
R1	Corner of McCauley Street and Australia Avenue	43	55	38	46 - 48
R2	Australia Avenue	43	55	39	47 - 49
R3	Murrabin Avenue	43	55	40	48 - 50
R4	Partanna Avenue (Most affected façade)	41	55	40	48 - 50
R5	Corner of Partanna Avenue and Moorina Avenue	39	55	37	42 - 44
R6	Moorina Avenue	39	55	35	44 - 46

Predicted noise levels are expected to be within the project noise criteria at all locations. It is worthwhile noting that the predicted noise levels are for periods of worst case site activity under adverse meteorological conditions, the likelihood of actual impacts under these conditions is expected to be infrequent at best.

The modelled outcomes are also shown to be consistent with monitored noise level at these receiver locations over several years, covering periods when Opal is operational and times when the site is shut down for periods of extended maintenance.

Maximum noise levels associated with other noise sources in the vicinity of the Opal site are regularly measured to be in excess of 10 dB(A) above the L_{Amax} criteria detailed the EPL for Opal noise impacts. In general maximum noise level events are not a function of operations within the Opal site.

While general site operations do register a maximum noise level more than a few dB above the L_{Aeq} noise levels, it is possible that maximum noise events could occur within the waste paper yard and the rejects handling area associated with the operation of heavy machinery although these events are random in both location and timing.

For the purposes of assessment of these impacts Maximum noise have been estimated to be between 8 and 10 dB above the operational noise levels at each receiver location, which is consistent with industrial sites and heavy machinery. Longer term on site monitoring will be used to verify this assumption for each of the operational areas.

Appendix A presents the noise contours for the validated noise model.

5. Assessment of annoyance

Assessment for annoyance (NPfI Fact Sheet C)

Fact sheet C of the Noise Policy for Industry (NPfI) details methods for assessing annoying characteristics of noise emissions. Where present, modifying factors are used to add corrections to predicted noise levels. These annoying characteristics are generally related to low frequency noise and or tonal noise emissions.

Where a difference of 15 dB or more between C-weighted and A-weighted noise emissions is noted, a low frequency impact may be present. For tonality, adjacent third octave bands are assessed to determine any inconsistencies.

Areas of notable low frequency within the Opal site included the boiler house and the waste water flare. Measured spectrum for each of these locations is presented in Table 2 and Table 3 respectively.

Assessment of the low frequency and tonal components of project noise at receiver locations was completed using the predicted acoustic spectrum for the worst case noise level at R4, 6 Partanna Avenue.

To determine the impact of low frequency noise on the project, a two-part test was applied to the predicted noise spectrum. A screening assessment for source noise levels, calculating the difference between the C-weighted and A-weighted one-third octave measurements in the range 10–160Hz and then a test of predicted noise levels at the receiver location;

Source noise measurements for each of these locations were screened for potential low frequency noise impacts. Table 2 presents details the differences in the acoustic spectra for the boiler house and the same calculations for the flare in Table 3, in accordance with the NPI assessment method.

Table 2 Difference in the C weighting and A weighting acoustic spectra 16-160 Hz -Boiler house(internal)

Weight	SUM	Acoustic Frequency (Hz)											
		12.5	16	20	25	31	40	50	63	80	100	125	160
dB(A)	68.5	17.3	26.6	31.8	36.6	48.2	54.6	56.6	56.0	60.5	62.2	61.9	62.0
dB(C)	83.2	55.6	56.8	60.0	61.9	65.3	65.7	69.0	68.6	69.9	78.0	79.5	73.2
dB(C)-dB(A)	14.7	38.3	30.2	28.2	25.3	17.2	11.2	12.4	12.6	9.4	15.8	17.5	11.2

Table 3 Difference in the C weighting and A weighting acoustic spectra 16-160 Hz -Flare

Weight	SUM	Acoustic Frequency (Hz)											
		12.5	16	20	25	31	40	50	63	80	100	125	160
dB(A)	66.9	13.5	17.8	23.8	28.4	34.4	37.3	43.2	45.4	49.4	60.2	64.2	60.3
dB(C)	83.2	55.6	56.8	60.0	61.9	65.3	65.7	69.0	68.6	69.9	78.0	79.5	73.2
dB(C)-dB(A)	16.3	42.1	39.0	36.2	33.5	30.9	28.4	25.8	23.2	20.5	17.8	15.3	12.9

For the boiler house, the screening test falls marginally short of the criteria however, the screening test established a difference of 16 dB between the two weightings for the flare.

While the boiler house does not register as a low frequency source, assessment of the predicted noise levels at the residential location will determine the potential for all sources from the Opal site to have an overall low frequency content. Table 4 presents the assessment of predicted noise impacts against the NPI threshold values for noise levels at the residential receiver location of R4.

Table 4 Low frequency threshold assessment

Hz/dB(Z)	One-third octave LZeq,15min threshold level								
Frequency (Hz)	25	31.5	40	50	63	80	100	125	160
NPI Threshold Levels dB(Z)	69	61	54	50	50	48	48	46	44
Predicted Levels dB(Z)	6	32	15	22	30	27	26	27	25
Difference* Threshold dB(Z) - Predicted dB(Z)	-64	-29	-39	-28	-20	-21	-22	-19	-19

The predicted noise levels demonstrate a clear compliance with the threshold values for all frequencies being significantly below the threshold levels. Values from Table 4 indicate that there are no exceedances of the NPI values and therefore the Opal site noise characteristics are not considered to have a low frequency noise impact.

In addition to the assessment of low frequency noise impacts, tonal characteristics of the Z weighted modelled noise predictions were reviewed in accordance with the NPI requirements in Table C2.

For each of the frequency ranges 25 Hz to 125 Hz, 160 Hz to 400 Hz and 500 Hz to 10,000 Hz, the adjacent third octave bands were calculated and compared to the criteria for tonality. Where the calculated difference of any one-third octave band exceeds the criterion level of the adjacent bands on both sides, a tonal influence may be apparent.

In practice, it is unlikely that large and complex sites with multiple noise sources would exhibit tonal characteristics unless a single item of plant dominated the noise emissions. No tonal noise influences are observed within the Opal B9 Paper mill site.

Table 5 to Table 7 present the calculations for the assessment of tonality at R4.

Table 5 Tonality assessment 25Hz -125 Hz

	Acoustic Frequency							
	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz
dB(Z)	--	31.8	15.4	21.6	30.1	27.2	25.6	26.8
Calculated difference from previous	-	31.8	16.4	6.2	8.5	2.9	1.6	1.2
Criterion	15 dB or more between adjacent bands on both sides							

Table 6 Tonality assessment 160Hz - 400 Hz

	Acoustic Frequency				
	160Hz	200Hz	250Hz	315Hz	400Hz
dB(Z)	24.9	23.6	25.9	22.4	22.5
Calculated difference from previous	1.9	1.3	2.3	3.5	0.1
Criterion	8 dB or more between adjacent bands on both sides				

Table 7 Tonality assessment 500hz - 8kHz

	Acoustic Frequency												
	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz
dB(Z)	27.5	23.7	24.2	28.2	23.6	23.7	26.7	21.4	20.7	21.4	15.7	13.8	14.2
Calculated difference from previous	5.0	3.8	0.5	4.0	4.6	0.1	3.0	5.3	0.7	0.7	5.7	1.9	0.4
Criterion	5 dB or more between adjacent bands on both sides												

A tonality assessment on accordance with the NIP requirements confirms that the predicted noise level at the most affected receiver location does not exhibit tonal noise characteristics. This outcome is consistent with observations at residential locations during monitoring surveys.

6. Compliance monitoring and modelling

Predicted noise levels for the B9 Paper mill have been validated against spot measurements within the Opal site and are expected to remain current unless there are changes to the operations or equipment.

Condition U2.6 of the EPL requires that the validation of the noise model remain current when assessing any future developments within the site. To accommodate this requirement, it is proposed that long term noise verification locations are established around the site for routine testing of onsite noise levels for each of the autonomous operational zones as detailed in Figure 2.

These long-term monitoring locations would also be used to confirm compliance monitoring in accordance with other requirements for quarterly monitoring detailed in the note at the end of Condition U of the EPL. Future modelling and assessments would proceed in accordance with the NPfl based on the calibration of these points at the time of modelling.

7. Summary and recommendations

A noise model validation has been completed for the Opal B9 Paper Mill in Matraville in accordance with the Opal Environmental Protection Licence 1594.

The noise model review used measurement data to check the current noise model inputs and spot measurements within the site to establish validation noise levels at key locations. The noise model was used to predict noise levels at these location and the results were compared for accuracy.

In all cases the noise model was able to predict to within less than 2 dB for each validation location, indicating that the noise model is acceptable for use in assessing noise impacts at residential locations adjacent to the paper mill.

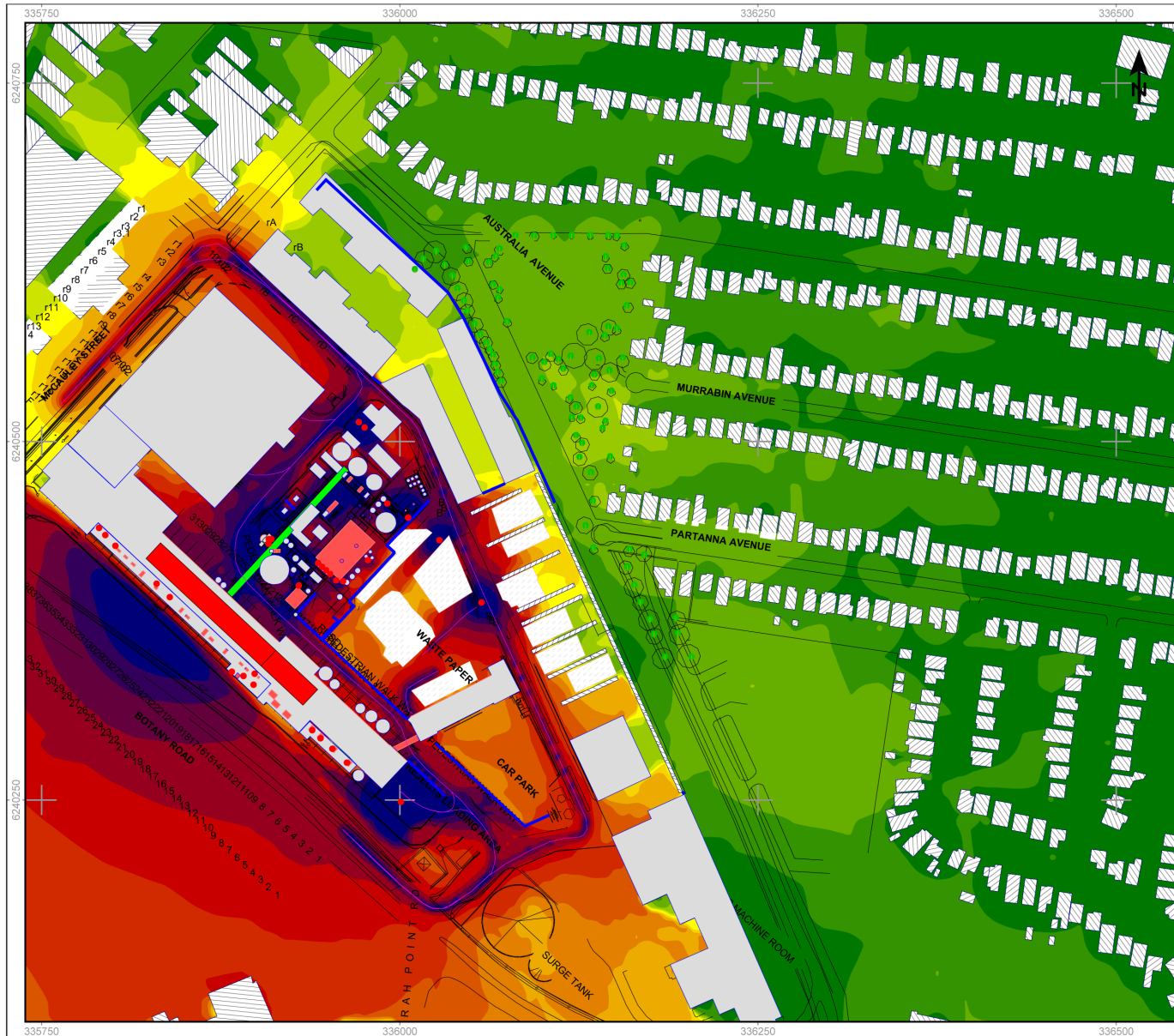
Modelling against condition L3.1 of the EPL indicates that the contribution of the Opal site to nearby residential receiver locations was within the noise criteria values at all location. Noise contours showing the predicted noise levels for the broader community also meet these criteria.

An additional assessment of annoying characteristics of the predicted noise levels demonstrate that no further penalties are required to be added to the predicted noise levels.

Based on the completed noise validation the Opal ANZ site currently complies with the EPA Environmental Protection Licence conditions and no recommendations for noise remediation are necessary.



Appendix A. Noise prediction contours



Customer:
Opal ANZ Pty Ltd

Project:
Opal B9 Paper Mill
Project-No.16002

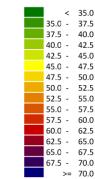
Opal B9 Operations
Noise Model
Validation

Map

1

Project engineer:
Created: 28-06-22
Processed with SoundPLAN 8.1, Update 27-04-20

Modelled
noise levels Night
dB(A)



Map details:
Map showing noise contours for Opal
B9 Paper Machine and associated operations
All operations worst case scenario
and adverse met conditions

Length scale 1:2610



Appendix E

Council and EPA responses to the
consultation



Loghmani, Rouz

From: Janice Dennany <Janice.Dennany@randwick.nsw.gov.au>
Sent: Wednesday, 30 November 2022 3:02 PM
To: Loghmani, Rouz
Cc: David Ongkili; Oscar Guillen
Subject: Opal Matraville - Draft Noise Barrier Plan

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Rouz,

Reference is made to the long-term noise barrier plan prepared for Opal Paper Mill, 1891 Botany Road, Matraville, that was submitted to Council as part of the final consultation process.

Council has reviewed the plan and noise validation reports and provides the comments below for your consideration.

Community consultation

The plan does not discuss community consultation for the long-term noise barrier. Council raises concerns as to whether there has been any community consultation with regards to the final plan. In particular, residents located on the surrounding streets and the local precinct. If consultation has not been undertaken it is recommended that OPAL consult with residents from the surrounding streets and the Matraville precinct as they may wish to provide some feedback on the long term plan and any impacts they may be concerned about.

Noise validation assessment

In the summary of the noise validation report prepared by Hutchison Weller (DOC no.16002-NV-RP-12-0), it states, " Based on the completed noise validation **it is expected** that Opal ANZ site currently complies with the EPA Environmental Protection Licence conditions and no recommendations for noise remediation are necessary". Can you please confirm the acoustic assessment has validated that the site currently complies and not "expected to comply" with the EPA Environmental Protection Licence conditions. Validation noise monitoring should confirm noise emissions comply with the required criteria or not. The rest of the report appears to indicate compliance with the relevant noise criteria so this maybe an error.

Ongoing noise complaints

Recently, Council has received noise concerns in relation to the Opal development from residents living on Harold Street, Matraville which were forwarded to the NSW EPA as the Regulatory Authority for the development. Council notes Harold street is not a designated location for the quarterly noise assessments. Whilst Council acknowledges this noise barrier plan does not include specifics for management of noise complaints, it is important to highlight that noise from the development can often be observed on many streets surrounding the development of which the barrier may not be as effective. In this regard it is recommended that should complaints be received from other surrounding street locations (i.e. street locations not specified on the NSW EPA Environmental Protection Licence), the quarterly noise monitoring should include additional monitoring locations to validate that the noise barrier is effective in noise management at these locations. Opal may also wish to discuss reviewing the required locations for quarterly assessments with the NSW EPA to reflect any concerns that have been raised by local residents from other locations.

I hope this information is of assistance and should you wish to discuss the above comments further, please don't hesitate to contact me.

Kind regards
Janice

Janice Dennany
Senior Environmental Health Officer
Health, Building & Regulatory Services
Randwick City Council
02 9093 6825
janice.dennany@randwick.nsw.gov.au



From: Loghmani, Rouz <Rouz.Loghmani@wsp.com>
Sent: Wednesday, 30 November 2022 8:41 AM
To: Janice Dennany <Janice.Dennany@randwick.nsw.gov.au>
Subject: Opal Matraville - Draft Noise Barrier Plan

Good morning Janice

Hope this email finds you well.

David Ongkili shared your contact details with me. He mentioned that you are assessing the Long Term Noise Barrier Plan for Opal Paper factory in Matraville (1891 Botany Rd, Matraville NSW 2036).

Could you please let me know how you have been going with your review. Do you have any questions or need anything that we can help you with?

Regards



Rouz Loghmani
Senior Associate Planner

T: +61 2 9272 5638

Rouz.Loghmani@wsp.com

WSP Australia Pty Limited
Level 27, 680 George Street
Sydney, 2000
Australia

wsp.com/au

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Our ref: F2006/00713

16 December 2022

Mr Rouz Loghmani
WSP Australia
Level 27,
680 George Street
SYDNEY NSW 2000

Dear Mr Loghmani,

Re: Response to Draft Long Term Noise Barrier Plan

Thank you for the opportunity to comment on Opal's draft Long Term Noise Barrier Plan to support the ongoing industrial operations at the Matraville Paper Mill Site (1891 Botany Rd, Matraville NSW 2036). Council notes that the draft Long Term Noise Barrier Plan has been lodged to address Condition No. 10F of the consent for Modification 8 to the development consent (MP05_0120). Council also notes that the subject of the draft Long Term Noise Barrier Plan is an existing noise barrier wall that comprises a temporary container noise barrier that has been in place along the eastern boundary of the paper mill site since 2015. The draft Long Term Noise Barrier Plan seeks to make the temporary container barrier wall a permanent solution for addressing operational noise from the Opal paper mill.

Council has reviewed the draft Long Term Noise Barrier Plan and provided Council's acoustic assessment on 5 December 2012. This letter provides Council's comments on the planning and urban design impact of the container noise barrier wall contained in the draft Noise Barrier Plan.

By way of background, a Modification Application (Modification 2) to the development consent (MP05_0120) was approved in 2010 for, among other things, construction of a 5m high permanent noise barrier along the northern side boundary and a 7m high noise barrier around the wastepaper storage yard to attenuate noise impacts from the paper mill operation (Condition No. 10A).

Subsequently, Modification Application (Modification 5) for the demolition of former paper mill building, Building B7, was approved in September 2015 which included relevant conditions of consent (10B and 10C) requiring a noise barrier to be constructed to mitigate operational noise to sensitive receivers within 9 months of demolition being completed. The Modification Report prepared by Jacobs Group Pty Limited on behalf of the Proponent advised that any noise wall erected "*would be of similar construction to the noise wall constructed along Australia Avenue, namely piled steel supports with Hebel panels placed between the supports*". This was required as operational noise at the time was effectively buffered by the then existing Building B7.

With the demolition of Building B7, the proponent submitted a temporary Noise Barrier Plan to the Department of Planning and Environment (DPE) comprising a 146.4 metre-long, 12m high container noise barrier. This container noise barrier wall was approved by the DPE in November 2015 as a temporary measure with an expiry date of 14 June 2022. It is important to emphasize that the noise barrier was approved as a temporary measure to offset the loss of the noise screening afforded by Building B7.

In June 2018, the proponent submitted another Modification Application, (Modification 8) for demolition of the B7 Reel Store Building and extension of the temporary noise wall structure to meet its noise limit criteria post demolition of the B7 Reel Store Building. The proponent argued that an extension to the temporary noise wall (following the demolition of the B7 Reel Store building) was necessary as the subject site had “space constraints” that did not allow for any other noise barrier wall. In Randwick Council’s response to Modification 8, Council mentioned that it disagreed with this justification for maintaining and extending the temporary noise wall barrier as the permanent noise wall approved under Modification 2 and 5 had a smaller footprint comprising a Hebel structure with a width thickness of 150mm compared with the container barrier thickness of 2400mm. Additionally, Council maintained that a permanent noise barrier should have been in place prior to demolition of both the B7 Building and the B7 Reel Store Building to mitigate impacts arising from the demolition process and to avoid the lag time and gap of constructing the acoustic barrier afterwards. Council has consistently argued that constructing the permanent noise barrier first would have a ready-made approved solution to address noise impacts once demolition/removal of the existing temporary noise wall was commenced. Notwithstanding Council’s objection, DPE granted consent to the Modification Application 8 on 30 October 2018. The Modification Consent, included among other things, Condition No 10F which requires the submission of a Long-term Noise Barrier Plan by 30 June 2021.

Council’s position has always been that the approval granted to Modification 8 was only for the extension of the existing temporary container noise barrier as an interim measure to address the demolition of the B7 Reel Store Building, not for making it a permanent solution. Council contends that the requirement for a Long-term Noise Barrier Plan under Condition 10F of the Modification Approval No. 8 cannot be satisfied if it involves making the existing temporary container noise wall a permanent solution unless the following issues are fully addressed:

- Condition 10F of Modification 8 contemplates a permanent barrier wall as required under the provisions of the consents previously granted for Modification 2 and Modification 5. The wall under these consents would comprise a permanent barrier essentially comprising piled steel supports with Hebel panels placed between the supports to a height of between 5m-7m. Council contends that these modification approvals remain in place and are not overridden by the DPE’s approval for the temporary container barrier granted in November 2015 which was subject to a time-limit that has now been exceeded.
- The use of the existing container barrier wall as a permanent barrier solution should be subject to a modification or development application assessment process that comprehensively addresses the operational adequacy and environmental impact of the long-term use of such a wall to address noise from a significantly large-scale paper mill operation. Furthermore, the potentially significant visual and design impacts as well as the long-term suitability of the existing container wall cannot be adequately addressed via an assessment report (that is, the submitted Long Term Noise Barrier Plan) that responds to a condition of consent (that is, Condition 10F of Modification 8). Rather, it should be assessed as part of a modification or development application process together with expert assessment on visual amenity

and structural integrity. This process would afford surrounding residents the right to be properly consulted on any issues they may have concerning the long term visual, bulk and scale impacts of the stacked container barrier wall, and the ability to properly apply conditions of consent, if necessary, to protect residential amenity including from further creep in wall height. This consultation may include discussions about the need for potential increase in tree plantings for screening along the border of the wall under a comprehensive landscaping scheme to further obscure the visual, bulk and scale impacts of the wall.

- Under the State Environmental Planning Policy (Transport and Infrastructure) storage of containers are prohibited in certain areas of IN1 including the paper mill site. There is a section of the IN1 zoning where, under Clause 5.18 of the SEPP, the repair, refitting or storage of shipping containers is prohibited. The use of stacked containers as a wall would potentially constitute the storage of shipping containers on-site and hence may be prohibited under the SEPP. This matter has not been addressed in the current Long Term Noise Barrier Plan, and even if it were to be addressed, it should be submitted under the cover of a modification or development application that comprehensively addresses this issue in a public consultation process.

In summary, the container noise wall arrangement was always intended to be a temporary solution to address the operational noise from the Opal Mill site arising from the demolition of the B7 Building and the B7 Reel Store Building. It was not intended as a permanent long-term solution to address noise along the full boundary of a paper mill site with the scale and intensity of operations as the Opal Paper Mill plant. The installation of a proper permanent noise wall by Opal as approved under previous modification consents would demonstrate to adjacent residents Opal's commitment to proactively consult and address not only noise from its operations but also the visual amenity of residents.

If you have any questions regarding Randwick City Council's submission, please contact David Ongkili, Coordinator Strategic Planning on 9093 6793.

Yours sincerely,



Stella Agagiotis
Manager Strategic Planning

English If you need help to understand this letter, please come to Council's Customer Service Centre and ask for assistance in your language or you can contact the Telephone Interpreter Service (TIS) on 131 450 and ask them to contact Council on 1300 722 542.	Greek Αν χρειάζεστε βοήθεια για να καταλάβετε αυτή την επιστολή, παρακαλείστε να έρθετε στο Κέντρο Εξυπηρέτησης Πελατών της Δημαρχίας (Council Customer Service Centre) και να ζητήσετε βοήθεια στη γλώσσα σας ή τηλεφωνήστε στην Τηλεφωνική Υπηρεσία Διερμηνέων (Telephone Interpreter Service — TIS) τηλ. 131 450 και να ζητήσετε να επικοινωνήσουν με τη Δημαρχία τηλ. 1300 722 542.	Italian Se avete bisogno di aiuto per capire il contenuto di questa lettera, recatevi presso il Customer Service Centre del Municipio dove potrete chiedere di essere assistiti nella vostra lingua; oppure mettetevi in contatto con il Servizio Telefonico Interpreti (TIS) al 131 450 e chiedete loro di mettersi in contatto col Municipio al 1300 722 542.
Croatian Ako vam je potrebna pomoć da biste razumjeli ovo pismo, molimo dođite u Općinski služni centar za klijente (Council's Customer Service Centre) i zatražite pomoć na svom jeziku, ili možete nazvati Telefonsku službu tumača (TIS) na 131 450 i zamoliti njih da nazovu Općinu na 1300 722 542.	Spanish A la persona que necesite ayuda para entender esta carta se le ruega venir al Centro de Servicios para Clientes [Customer Service Centre] de la Municipalidad y pedir asistencia en su propio idioma, o bien ponerse en contacto con el Servicio Telefónico de Intérpretes ["TIS"], número 131 450, para pedir que le comuniquen con la Municipalidad, cuyo teléfono es 1300 722 542.	Vietnamese Nếu quý vị không hiểu lá thư này và cần sự giúp đỡ, mời quý vị đến Trung Tâm Dịch Vụ Hướng Dẫn Khách Hàng của Hội Đồng Thành Phố (Council's Customer Service Centre) để có người nói ngôn ngữ của quý vị giúp hay quý vị có thể liên lạc Dịch Vụ Thông Dịch qua Điện Thoại (TIS) ở số 131 450 và yêu cầu họ liên lạc với Hội Đồng Thành Phố (Council) ở số 1300 722 542.
Polish Jeśli potrzebujesz pomocy w zrozumieniu treści tego pisma, przyjdź do punktu obsługi klientów (Customer Service Centre) przy Radzie Miejskiej i poproś o pomoc w języku polskim, albo zadzwoń do Telefonicznego Biura Tłumaczy (Telephone Interpreter Service — TIS) pod numer 131 450 i poproś o skontaktowanie się z Radą Miejską (Council) pod numerem 1300 722 542.	Indonesian Jika Anda memerlukan bantuan untuk memahami surat ini, silakan datang ke Pusat Pelayanan Pelanggan (Customer Service Centre) Pemerintah Kotamadya (Council) dan mintalah untuk bantuan dalam bahasa Anda, atau Anda dapat menghubungi Jasa Juru Bahasa Telepon (Telephone Interpreter Service - TIS) pada nomor 131 450 dan meminta supaya mereka menghubungi Pemerintah Kotamadya pada nomor 1300 722 542.	Turkish Bu mektubu anlamak için yardıma ihtiyaciniz varsa, lütfen Belediye'nin Müşteri Hizmetleri Merkezi'ne gelip kendi dilinizde yardım isteyiniz veya 131 450'den Telefonla Tercüme Servisi'ni (TIS) arayarak onlardan 1300 722 542 numaradan Belediye ile ilişkiye geçmelerini isteyiniz.
Hungarian Amennyiben a levél tartalmát nem érti és segítségre van szüksége, kérjük látogassa meg a Tanácsház Ügyfél Szolgálatát (Customer Service Centre), ahol magyar nyelven kaphat felvilágosítást, vagy hívja a Telefon Tölmács Szolgálatot (TIS) a 131 450 telefonszámon és kérje, hogy kapcsolják a Tanácsházat a 1300 722 542 telefonszámon.	Czech Jestliže potřebujete pomoc při porozumění tohoto dopisu, navštivte prosím naše Středisko služeb pro veřejnost (Council's Customer Service Centre) a požádejte o poskytnutí pomoci ve vaší řeči anebo zavolejte Telefonní tlumočnickou službu (TIS) na tel. číslo 131 450 a požádejte je, aby oni zavolali Městský úřad Randwick na tel. číslo 1300 722 542.	Arabic إذا أردت مُساعدة لفهم هذه الرسالة، نرجوك الحضور إلى مركز خدمة عملاء المجلس والمُلب المُساعدة في لغتك، أو يُمكنك الاتصال بخدمة الترجمة الهاتفية (TIS) على هاتف رقم 131 450 والمُلب منهم الاتصال بالمجلس على رقم 1300 722 542.
Chinese 如果你需要人幫助你了解這封信的內容，請來市政會顧客服務中心要求翻譯服務，或者與電話傳譯服務 (TIS) 聯係，號碼是 131 450。請他們幫助你打電話給市政會，號碼是 1300 722 542。	Russian Если Вам требуется помощь, чтобы разобраться в этом письме, то, пожалуйста, обратитесь в Муниципальный Центр Обслуживания Клиентов и попросите оказать Вам помощь на Вашем языке или же Вы можете позвонить в Телефонную Службу Переводчиков (TIS) по номеру 131 450 и попросить их связаться с Муниципалитетом по номеру 1300 722 542.	Serbian Ako vam treba pomoć da razumete ovo pismo, molimo vas da dođete do Centra za usluge mušterijama pri Opštini (Customer Service Centre) i zamolite ih da vam pomognu na vašem jeziku, ili možete nazvati Telefonsku prevodilačku službu (TIS) na 131 450 i zamolite ih da vas povežu sa Opštinom na 1300 722 542.

Loghmani, Rouz

From: Joanne Bell1 <Joanne.Bell1@epa.nsw.gov.au>
Sent: Tuesday, 29 November 2022 3:22 PM
To: Loghmani, Rouz
Cc: Larissa Borysko
Subject: RE: Opal Matraville - Draft Noise Barrier Plan

Follow Up Flag: Follow up
Flag Status: Completed

Dear Rouz

Thank you for the invite to comment on the Long Term Noise Barrier Plan (Plan), prepared to satisfy Condition 10F, Schedule 2, of 05_0120 MOD 8, dated 29 October 2018.

The EPA has no comment to provide on the report as the EPA generally does not review, approve or endorse management plans.

The applicant should ensure that the monitoring program proposed is in line with the conditions of consent to ensure ongoing compliance.

If you have any questions please get in touch.

Thank you.

Kind regards
Jo

Joanne Bell
Operations Officer
Regulatory Operations – Metropolitan West
NSW Environment Protection Authority
D 02 9274 6285 | M 0447 180 178



www.epa.nsw.gov.au @NSW_EPA

The EPA acknowledges the traditional custodians of the land and waters where we work. As part of the world's oldest surviving culture, we pay our respect to Aboriginal elders past, present and emerging.

Report pollution and environmental incidents 131 555 or +61 2 9995 5555

From: Loghmani, Rouz <Rouz.Loghmani@wsp.com>
Sent: Thursday, 24 November 2022 3:19 PM
To: Joanne Bell (EPA) <Joanne.Bell1@epa.nsw.gov.au>
Subject: RE: Opal Matraville - Draft Noise Barrier Plan

Thank you very much Joanne

We are looking forward to receiving your feedback when it is ready.

Regards



Rouz Loghmani
Senior Associate Planner

T: +61 2 9272 5638

Rouz.Loghmani@wsp.com

WSP Australia Pty Limited
Level 27, 680 George Street
Sydney, 2000
Australia

wsp.com/au

WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

From: Joanne Bell (EPA) <Joanne.Bell1@epa.nsw.gov.au>

Sent: Thursday, 24 November 2022 3:15 PM

To: Loghmani, Rouz <Rouz.Loghmani@wsp.com>

Cc: Larissa Borysko <Larissa.Borysko@epa.nsw.gov.au>

Subject: RE: Opal Matraville - Draft Noise Barrier Plan

Good afternoon Rouz

Apologies I've been delayed in responding to you.

The EPA is currently reviewing the report you provided but I'm unable to provide a timeframe for when this will be completed.

I'll provide an update as soon as I can.

Kind regards

Jo

Joanne Bell
Operations Officer
Regulatory Operations – Metropolitan West
NSW Environment Protection Authority
D 02 9274 6285



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Report pollution and environmental incidents 131 555 or +61 2 9995 5555

From: Loghmani, Rouz <Rouz.Loghmani@wsp.com>
Sent: Wednesday, 23 November 2022 8:31 AM
To: Joanne Bell (EPA) <Joanne.Bell1@epa.nsw.gov.au>
Subject: FW: Opal Matraville - Draft Noise Barrier Plan

Good morning Joanne

Hope you are well.

Could you please let me know if you have had a chance to review the attached report and if you have any questions for us?

Also, do you have a rough estimate for when you will be able to get back to us with your feedback?

Kind regards



Rouz Loghmani
Senior Associate Planner

T: +61 2 9272 5638

Rouz.Loghmani@wsp.com

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Australia

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From: Loghmani, Rouz <Rouz.Loghmani@wsp.com>
Sent: Wednesday, 16 November 2022 12:18 PM
To: Joanne.Bell1@epa.nsw.gov.au
Cc: larissa.borysko@epa.nosw.gov.au
Subject: Opal Matraville - Draft Noise Barrier Plan

Dear Joanne

I am the lead planner from WSP, assisting Opal with the preparation of a Long Term Noise Barrier Plan (Plan) to support the ongoing industrial operations at the Matraville Paper Mill Site (1891 Botany Rd, Matraville NSW 2036).

Please find attached a copy of the draft Plan which provides a summary of the noise assessment reports and a visual impact assessment of the current Noise Barrier in place on Site.

We are inviting the NSW EPA to review and provide feedback on the attached draft Plan, prior to issue to the Department of Planning and Environment (DPE) for endorsement.

The attached draft Plan has been prepared to satisfy the requirements of Condition 10F of Modification Application MP05_0120.

Your written feedback is welcome. However, should you request a meeting or wish to discuss further via Teams or in person, we are available to arrange your requirements accordingly

Regards



Rouz Loghmani
Senior Associate Planner

T: +61 2 9272 5638

Rouz.Loghmani@wsp.com

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Sydney, 2000
Australia

wsp.com/au

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