

Preliminary Noise Assessment

Project Waste reduction facility, Matraville Paper Mill
Client Opal ANZ

30 August 2021

16002-NV-RP-10-2

Introduction

Opal ANZ operates the B9 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. An illustration of the site is provided in Figure 1.

Major processes at the mill generally involve:

- Importing of waste paper and card by road
- Sorting and loading the raw product
- Production of new product
- Treatment of wastewater and by-products
- Storage and handling
- Transport of finished product.

To improve process efficiency, Opal proposes to:

- Construct a 1,600m² extension to the northern elevation of the existing B9 building adjacent to the finished products store to provide canopy cover for vehicle loading.
- Construct a dedicated waste reduction facility to enable reclamation of fibre, currently rejected as waste material, to be processed and reused as part of the papermaking operations on site.

These developments would be within the boundary of the existing paper mill at locations indicated in Figure 1.

Hutchison Weller was engaged to complete a preliminary noise assessment to establish whether the proposed developments would increase noise levels with respect to noise limits established in its Environmental Protection Licence (EPL 1594). This report summarises the modelling process, design assumptions and findings of the assessment.



Figure 1 Proposed development location

Operational noise limits

Operational noise limits for the 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**.

Table 1 Operational noise limits

ID	Location	Day	Evening	Night	Night
		$L_{Aeq,15min}$, dB(A)	$L_{Aeq,15min}$, dB(A)	$L_{Aeq,15min}$, dB(A)	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

Existing noise environment

The local noise environment in Matraville is a product of multiple noise sources and noise generating activities of which, the Opal paper mill site is one. The Opal 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 1.

The local noise environment beyond the Opal boundary is a product of significant noise sources including Heavy vehicles on Botany Road, aircraft noise from Sydney airport, Shipping and container handling noise from Port Botany, local business activities on McCauley Road, and local traffic movements throughout the area.

Noise emissions from the paper mill do not vary significantly as the operation of the B9 plant has been demonstrated to be consistent and reliable with production improvements and efficiencies over the years providing opportunities to further reduce noise from existing processes.

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 no maximum noise level events associated with normal production activities.

The influence of weather conditions on noise levels are apparent identifying seasonal variations from temperature and wind patterns that are being identified through long term data trends from monitoring in the local area.

Variations in the local noise environment for each of the receiver locations have been well documented over years of noise monitoring surveys. A summary table of the quarterly ambient noise levels over the last three years, using the L_{A90} and L_{Aeq} parameters has been provided in Appendix A.

These regular quarterly monitoring surveys have demonstrated that direct measurement of Opal's contribution to the noise environment is not possible as noise emissions from the site are 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.

When L_{Amax} noise is considered, typical ambient night time levels range between 70 - 75 dB with an L_{A1} of around 65 dB. This means in practice; Opal is limited to L_{Amax} noise events of 10 to 20 dB lower than the current measured environment.

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.

A graph of the L_{A90} statistical parameter for the night time period has been presented for each monitoring site in Appendix B.

Proposed modifications

A new Rejects Waste Handling Facility is proposed adjacent to the southern boundary along Botany Road. The new facility, which is ancillary to the current operations of the paper mill, will recover useable paper fibre from the waste stream presently being sent to landfill.

In addition to the waste facility, an additional awning is proposed for the finished products store at the norther exit of the site.

The waste handling facility will use additional processes to further treat the waste streams from the end of the existing process into automated trailer loading facilities. The first stage of the treatment will mechanically separate fibre and water from the predominantly plastic coarse rejects stream. The removed water and fibre will be reintroduced to the process for paper production. Next, the dry rejects stream is conveyed to a compactor for loading into dedicated trailers – this material would then be sent to a registered landfill for disposal.

The building that will house the facility will be approximately 15m in height and will likely be constructed of a steel portal frame with a concrete base slab and suspended concrete floors. The lower level (up to 5m) would be built using concrete panels, and the remaining elevations would be steel cladding, consistent with existing site buildings.

Waste rejects site traffic

Currently the waste rejects area provides additional stockpiling of the unused portion of the paper feed which is then scheduled for transport off site for disposal. This operation includes the option of collection of waste during the night time and therefore has been included in the modelling of existing noise impacts. These existing impacts are considered to be the base case for comparison the proposed Modification 10 operations.

During a waste collection operation, a waste truck (typically a 14m walking floor trailer) reverses into the waste rejects area and is loaded using a front end loader (FEL) before exiting site via the front gate. During a loading cycle the FEL typically operates for a period of around 15 minutes. To ensure the worst case scenario is considered for the modelling predictions, there is no shielding of the FEL by the truck and trailer during loading cycle. In practice this benefit has been measured at between 6 - 8dB.

Truck movements around the site are typically between 5 and 10 Km/h in accordance with the site traffic management plan. Reversing trucks within the waste rejects area have been assessed at the lower speed of 5km/h. Typical swept path of truck reversing movements would be around 25-30 metres for both the existing and proposed scenarios.

The base case noise impacts considered for the waste rejects area include:

- Operation of an FEL L_{Aeq} SWL 110 dB with an L_{Amax} SWL of 115 dB
- Operation of a waste truck at 5km/h L_{Aeq} SWL 105 dB
- Operation of a reversing beeper (tonal) SWL 108 dB L_{Amax}
- Operation of a waste truck reversing at 5km/h with beeper L_{Aeq} SWL 110 dB

There is no additional traffic generated by the WRF modification however, the rerouting of waste trucks and retirement of the FEL have been modelled to indicate expected site based noise reductions.

- Operation of a waste truck reversing at 5km/h SWL 105 dB
- Operation of a reversing beeper (tonal) SWL 108 dB L_{Amax}
- Operation of a waste truck reversing at 5km/h with beeper L_{Aeq} SWL 110 dB

Waste rejects facility infrastructure

The mechanism of noise emissions from the WRF building is primarily through breakout noise from the process equipment contained within the building and associated ancillary equipment such as the conveyor system that feeds the product. The proposed layout of the WRF is presented in Figure 2.

Equipment proposed for the WRF is a combination of optical and magnetic/eddy current sorters and conveyor systems. These are specialist items of plant and there is currently no noise data available at

this stage of the proposal; however, operation of the equipment would comply with the requirement of 85 dB(A) at 1 metre and would be specified to meet this emission level.

Additional plant that may be considered in the future include a shredder and material pelletising equipment. While the pelletising equipment has low noise levels, the shredder is expected to have a high operational sound power level of around 115-118 dB(A) but also has the ability for mitigation using a dedicated acoustic enclosure. Where the future case for the cost/benefit of the shredder is developed and implemented, this equipment would be specified with an enclosure to meet the 85 dB(A) at 1 metre operational noise requirement.

For the assessment of noise impacts from the WRF a uniform internal noise level of 85 dB(A) has been assumed as a worst case scenario. External conveyors have been estimated with a noise level of 60 dB(A) per metre and are expected to be enclosed to meet this level of operation.

Construction of the WRF building is assumed to be similar to the B9 building having a typical construction as follows:

WRF Walls:

- outer wall 0.48 mm sheet steel,
- 10 kg/m² wavebar acoustic membrane
- minimum 55 mm cavity insulation
- inner wall of 0.7 mm LT7 profiled aluminium sheet.

WRF Roof:

- outer skin of 0.48 mm sheet steel
- 100 mm 32 kg/m³ internal insulation

To quantify the impacts from the proposed facility, a noise model has been developed to estimate the level of breakout noise from the recycling building and to provide a preliminary indication of mitigation measures necessary to meet the project noise goals outlined in Table 1.

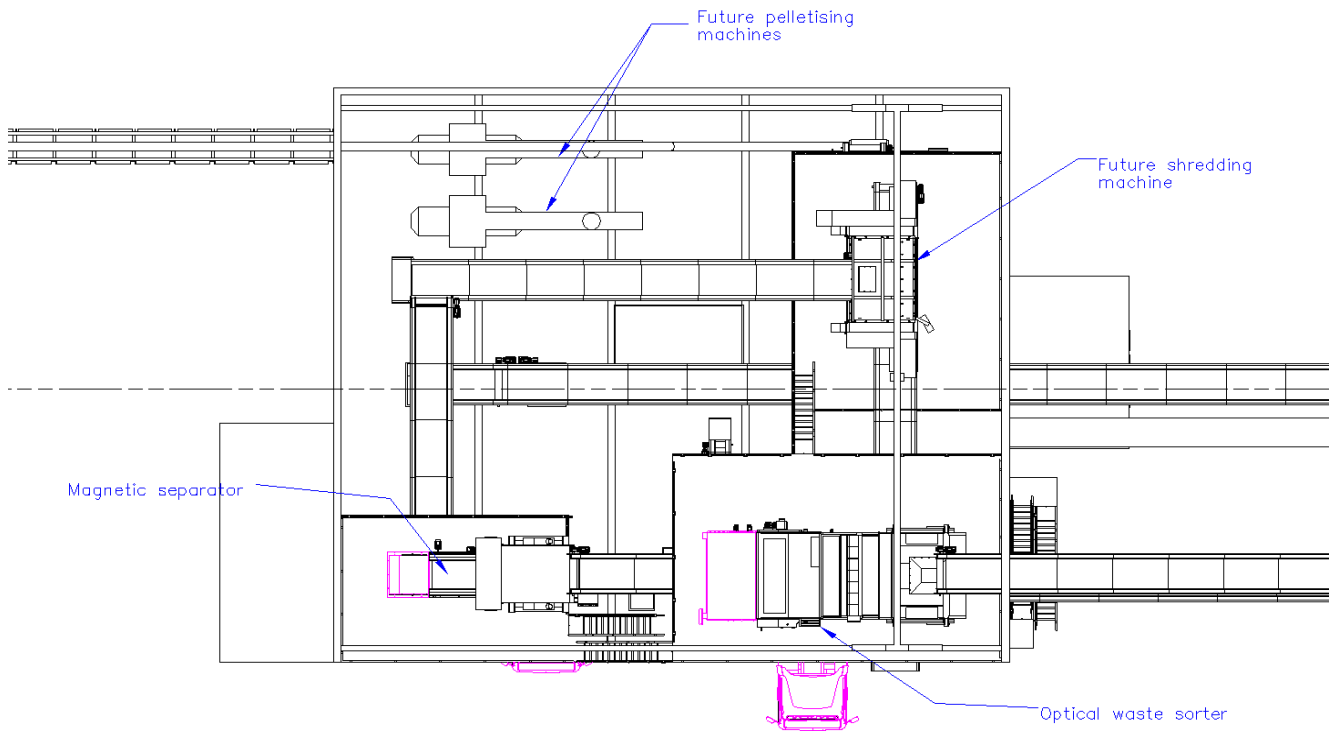


Figure 2 Waste reduction facility layout

Finished Products Store modifications

The finished product store is located on the western boundary away from many residences. Residences in this location benefit from direct shielding of vehicle noise on the Opal site thorough shielding by the adjacent storage development to the north, on MaCauley Street. This part of the Opal operations currently represents only a minor contribution to overall site noise that generally influences the western end of Australia Avenue.

The addition of the canopy extension to the finished products store would not significantly change the operations around loading of product and does not employ any new equipment or processes. Furthermore, shielding provided by a 1600 m² roof covering the area would provide an overall reduction in noise from vehicle movements accessing the MaCauley Street exit.

Modelling method and assumptions

A SoundPLAN noise model previously developed and validated for the Opal site has been updated with the latest layout both within the site and externally. Recent model updates include removal of the B7 Building and Reel Store on the eastern boundary and the inclusion of a container wall. Externally a light industrial development in the MaCauley Street precinct has been added which provides shielding to the northern section of the Opal site.

Noise levels were predicted for compliance locations identified in EPL 1594 and the following were incorporated in the model:

- Topography – Based on LPI topographical data for the area.
- The receiver locations illustrated in Figure 1.
- Meteorology –worst-case meteorological conditions (gentle breeze from source to receiver and stable conditions).
- Residential and industrial building structures are included in the model, meaning screening provided by these structures has been considered.
- Calculation method – ISO9613

The modelled scenario includes the combined operations of the activities within the Opal site but does not consider external noise influences from other noise generating sources.

Predicted noise levels

Estimated noise levels for the Opal site with and without the WRF has been predicted at nearby receivers and assessed against the EPL criteria. The results of the noise modelling are based on an expected worst case scenario and are summarised in Table 2 showing the noise criteria and predicted level at each location.

Table 2 Predicted L_{Aeq} noise levels from proposed works

ID	Name	Predicted $L_{Aeq, 15 \text{ minute}}$ noise level at sensitive receiver dB(A)				Complies with EPL [§]
		EPL Criteria	B9 only*	WRF only	B9 and WRF*	
R1	Australia Avenue	43	39.9	23	39.8	YES
R2	Australia Avenue	43	41.0	26	40.8	YES
R3	Murabbin Avenue	43	43.1	29	43.0	YES
R4	Partanna Avenue	41	41.7	28	41.4	YES
R5	Corner Partanna and Moorina Avenues	39	40.2	25	39.2	YES
R6	Moorina Avenue	39	37.0	22	36.0	YES

[§] See Noise Policy for Industry (EPA 2017) Section 4.2, Table 4.1 for residual noise management

*Predicted noise levels rounded to nearest 0.1 dB(A)

The predicted noise levels in Table 2 indicate the proposed modifications are expected to provide a marginal influence on the overall site noise levels but would remain within the project noise limits outlined in EPL 1594.

The closest receivers at R3 and R4 are over 230 metres from the WRF building and associated traffic movements, with modelling indicating a potential noise level impact of 29 dB(A), around 10 dB lower than current operational noise levels. Receivers located at distances greater than 200 metres are predicted to have lower level impacts with some receivers benefitting from the reduction in operation of the FEL during the night time.

Although these levels are cumulative with the existing overall site noise emissions, they represent an imperceptible change to noise influences from the site and indicate a very marginal reduction to the overall noise levels.

While predicted noise levels are close to or marginally higher than the noise criteria at some locations, the Noise Policy for Industry recognises the minimal impact of small residual noise levels (levels above the project specific criteria).

Where residual impacts are limited to less than 2 dB above the noise goals, predicted marginal exceedances of the proposed modification would comply with noise limits detailed in Table 1.

To ensure overall compliance with the predicted noise impacts from this preliminary noise assessment, it is recommended that a review against the as built design is completed to confirm the predicted outcomes.

In addition to the assessment of operational noise, a review of maximum noise levels has been undertaken to confirm compliance with the operational noise limits in Table 1.

Table 3 Predicted L_{Amax} noise levels from proposed works

ID	Name	Predicted L_{Amax} noise level at sensitive receiver dB(A)		
		EPL L_{Amax} Criteria	B9 and WRF	Complies with EPL [§]
R1	Australia Avenue	55	30	Yes
R2	Australia Avenue	55	35	Yes
R3	Murabbin Avenue	55	36	Yes
R4	Partanna Avenue	55	37	Yes
R5	Corner Partanna and Moorina Avenues	55	38	Yes
R6	Moorina Avenue	55	35	Yes

For the proposed Mod 10 operations, the estimated L_{Amax} from a tonal reversing beeper with SWL 108 dB would be well below the project criteria. Although potentially audible at these levels, maximum noise events would have around 17 dB of headroom before exceeding the project noise limits.



In general, the predicted noise levels reflect the scale of the buildings and noise walls associated with the opal site as well as the large distances to receiver locations that provide substantial noise reduction for noise emissions from the paper mill operations.

Further to this, data in Appendix A indicates that the long term median RBL and L_{Aeq} noise levels for all receiver locations are about 42db RBL, and 50 dB L_{Aeq} 15 min. This demonstrates that the predicted L_{Aeq} operational noise levels for the paper mill are estimated to be similar to the existing measured background noise levels at all receiver locations. In turn these background noise levels are around 8 dB lower than the ambient L_{Aeq} noise level making the contribution of Opal operations to the overall noise environment minimal.

Appendices C and D present the predicted noise contours for the current and proposed operational scenarios respectively.

Summary and recommendations

Noise emissions from the Opal site are predicted to be in the range of existing rating background noise levels and about 8 dB below the long term median L_{Aeq} noise levels in the vicinity of the Opal site.

Noise monitoring for the site, undertaken on a quarterly basis, continually demonstrates that ambient noise from other sources such as the airport, heavy vehicle road traffic on Botany Road and Bunnerong Road, operations at the port including idling of ships diesel engines and container handling activities are co-contributors if not significant influences on the overall noise environment around the paper mill.

To ensure the noise environment is not significantly impacted a preliminary assessment of impacts using conservative estimates for noise emissions from the Opal WRF has been undertaken.

Based on the noise impact assessment the change in contribution from the proposed modification to operations is expected to be very low.

Recommendations for consideration of noise impacts for the ongoing design of the proposed modification of the site include:

- The operation of the finished product store would not substantially change from current levels of vehicle activity.
- Noise emissions within the WRF would be minimised using quiet equipment or enclosures where necessary and noise data obtained from manufacturers to conform compliance with the modelled impacts.
- External equipment such as conveyors would be enclosed to minimise noise emissions.
- The construction of the WRF building would be of the same level of acoustic performance as the existing B9 building.

Further assessment of impacts is also recommended during the detailed design/commissioning phase to confirm the outcomes of this assessment. Assessment of the as built WRF is to include:

- An update to the equipment schedule with manufacturer/ measured SWL.
- Recommendations for specific mitigation measures as required.
- A noise monitoring survey including:
 - Waste rejects operational scenarios.
 - Measurement of waste vehicles including L_{Amax} impacts.
 - Compliance noise surveys prior to and after the completion of the WRF.



Technical note

Appendix A

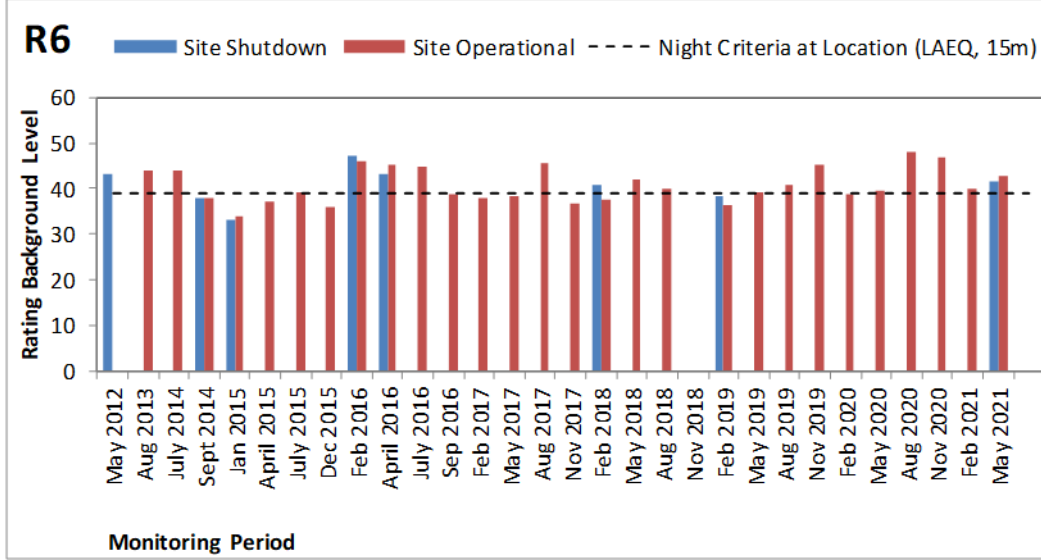
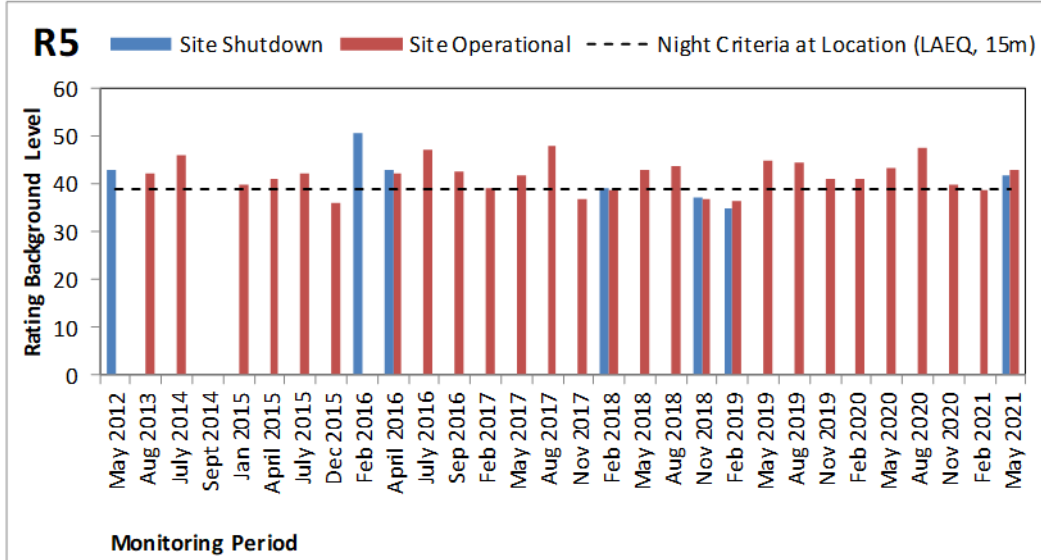
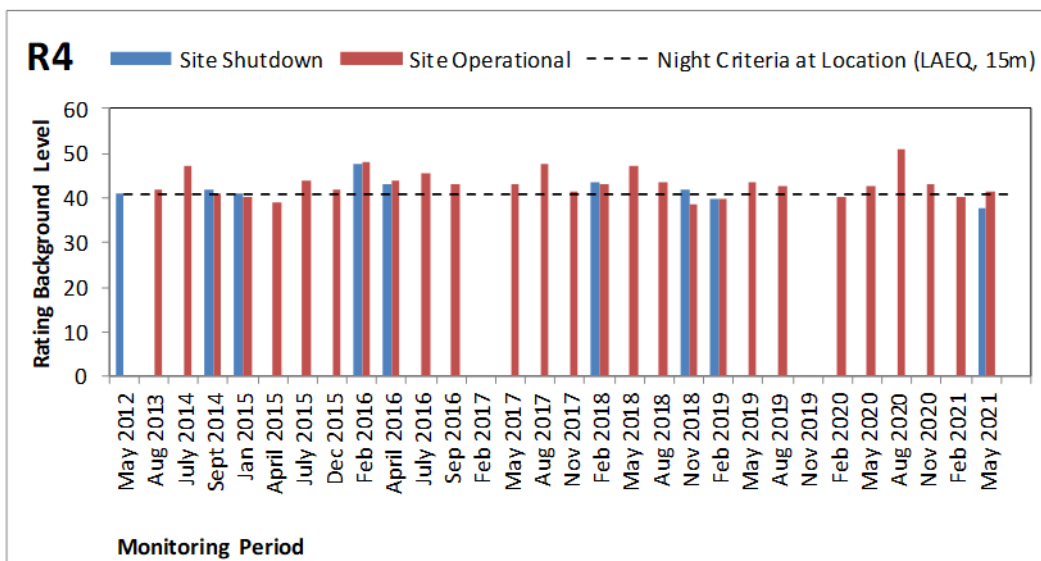


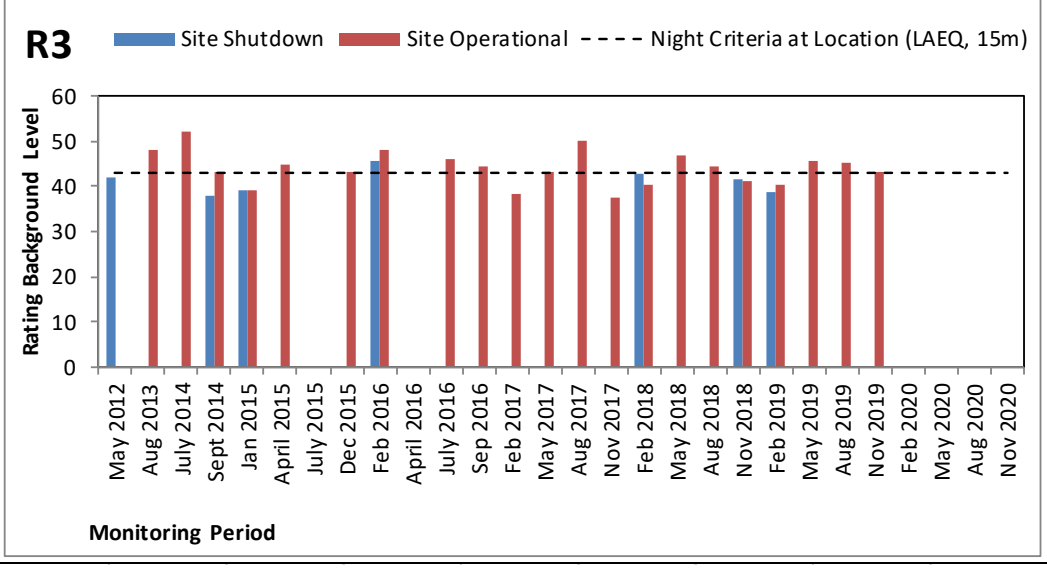
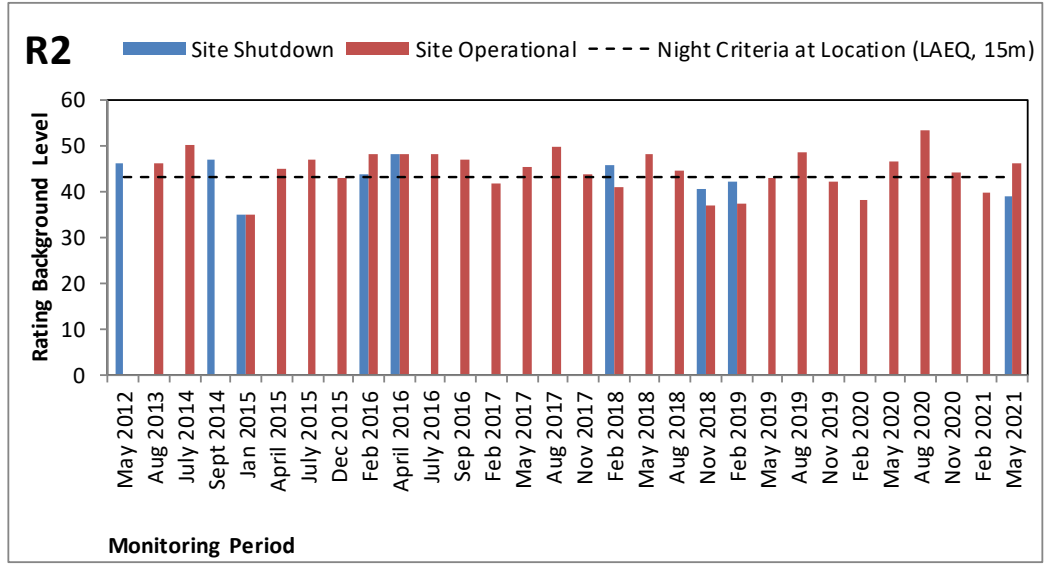
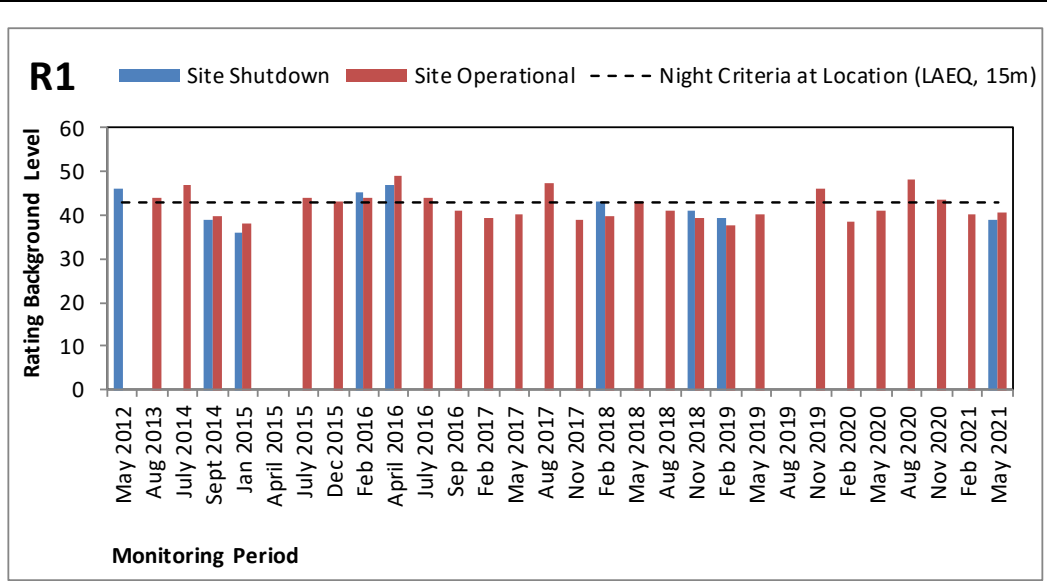
Technical note

Monitoring Quater	Profile of Noise Environment - Noise Monitoring Location											
	R1		R2		R3		R4		R5		R6	
	LA90 (RBL)	Leq period	LA90 (RBL)	Leq period	LA90 (RBL)	Leq period	LA90 (RBL)	Leq period	LA90 (RBL)	Leq period	LA90 (RBL)	Leq period
Feb 2019	40.9	54.2	38.7	53.9	43.7	53.7	41.2	53.3	41.3	54.0	44.4	60.9
	41.9	52.3	40.6	51.5	45.1	52.3	45.4	53.6	43.1	52.5	45.0	54.3
	38.0	47.8	37.2	46.0	39.8	46.2	39.7	51.3	36.3	44.9	37.2	45.8
May 2019	39.0	50.0	39.0	48.0	40.9	50.8	42.1	53.2	39.5	53.0	40.5	49.5
	41.6	48.1	0.0	0.0	42.8	47.2	41.2	46.6	41.1	50.3	41.0	46.6
	40.2	45.6	-	-	45.8	49.4	43.4	47.2	44.8	49.1	39.0	44.7
Aug 2019	46.2	52.4	40.4	53.2	40.9	51.4	40.8	56.7	38.9	53.6	40.4	50.4
	-	-	41.4	51.2	44.2	49.3	43.1	49.2	42.7	48.9	42.9	48.0
	-	-	48.4	53.2	45.2	50.4	42.6	48.7	44.4	49.5	40.7	46.2
Nov 2019	46.3	52.5	41.6	53.1	43.3	52.5	-	-	42.1	53.7	42.0	51.0
	45.7	50.8	42.5	50.7	45.4	51.9	-	-	45.3	52.4	46.0	49.0
	46.3	48.8	41.0	49.9	42.9	48.8	-	-	40.7	48.3	45.0	49.0
Feb 2020	42.5	52.7	40.1	49.9	-	-	42.4	56.7	44.6	55.3	44.6	54.3
	42.8	51.9	38.5	47.1	-	-	43.8	51.3	44.9	54.3	44.5	55.8
	38.7	47.5	37.9	47.4	-	-	40.1	50.0	38.2	47.3	38.9	46.3
May 2020	41.5	50.7	42.7	52.9	-	-	42.4	60.5	40.0	53.8	42.0	49.7
	41.5	48.2	43.0	48.7	-	-	41.9	46.9	42.4	48.4	40.7	47.9
	41.2	48.1	46.5	50.9	-	-	42.5	46.3	43.3	48.5	39.7	43.9
Aug 2020	43.9	53.8	46.0	54.8	-	-	43.9	54.5	40.9	53.1	44.0	54.8
	43.4	49.1	50.8	54.3	-	-	44.1	50.6	44.6	49.5	45.0	48.8
	41.5	48.0	48.1	53.1	-	-	43.5	50.8	41.4	47.5	41.3	48.1
Nov 2020	43.6	53.3	44.2	53.5	-	-	43.2	56.3	39.9	52.4	46.9	61.9
	42.2	50.8	41.0	49.5	-	-	40.9	48.8	43.1	52.4	45.2	52.2
	41.0	48.9	40.1	49.5	-	-	39.5	49.5	41.4	47.2	41.2	49.9
Feb 2021	42.4	51.3	42.5	53.9	-	-	43.0	52.7	40.5	51.1	43.3	51.2
	42.8	49.4	40.5	49.6	-	-	43.0	49.6	41.4	52.2	44.0	52.2
	40.3	46.1	39.6	45.4	-	-	40.0	46.3	38.8	49.7	39.9	49.3
May 2021	37.9	49.5	44.8	52.1	-	-	42.0	53.8	40.0	52.9	42.8	55.8
	43.0	47.9	47.6	52.3	-	-	42.8	47.9	44.1	48.7	44.5	48.9
	40.8	45.8	46.1	50.6	-	-	41.0	46.1	43.0	47.9	42.5	47.4
Long term median	41.8	49.5	41.4	50.9	43.5	50.6	42.4	50.6	41.4	50.7	42.7	49.4



Appendix B







Appendix C

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Customer:
Opal Pty Ltd

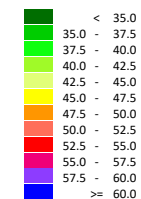
Project:
Opal WRF August 2021
Project-No.16002

Opal B9 Operations Current Layout Night time Period

Map
1

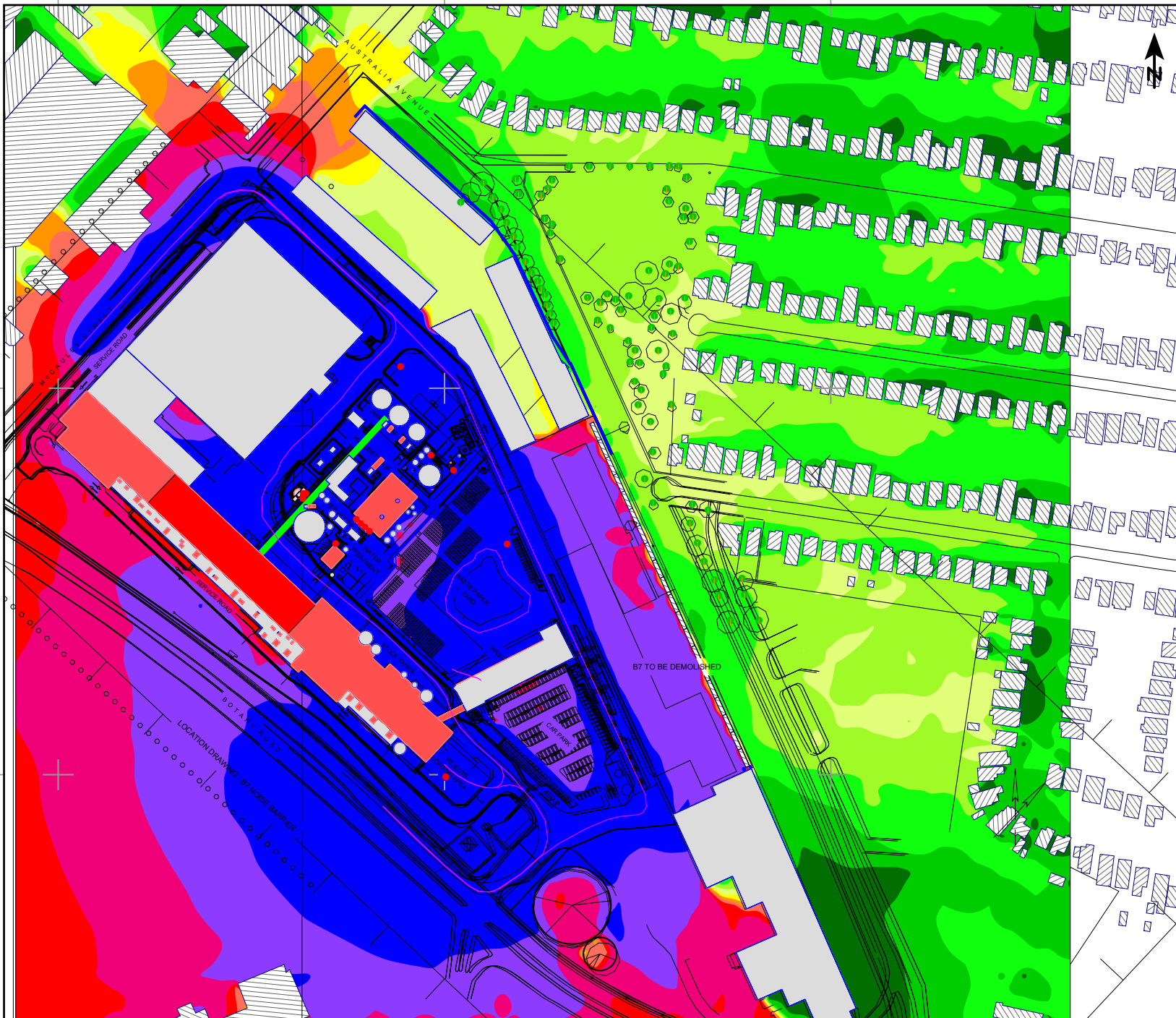
Project engineer:
Created: 30/08/2021

Change in noise levels in



Map details:
Map showing noise contours for Opal
with Rejects FEL and Waste Truck
Night time period

Length scale 1:3535



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Appendix D

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Customer:
Opal Pty Ltd

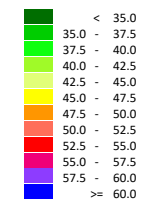
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Opal WRF August 2021
Project-No.16002

Waste Rejects Facility Modification 10 Operational Layout

Map
1

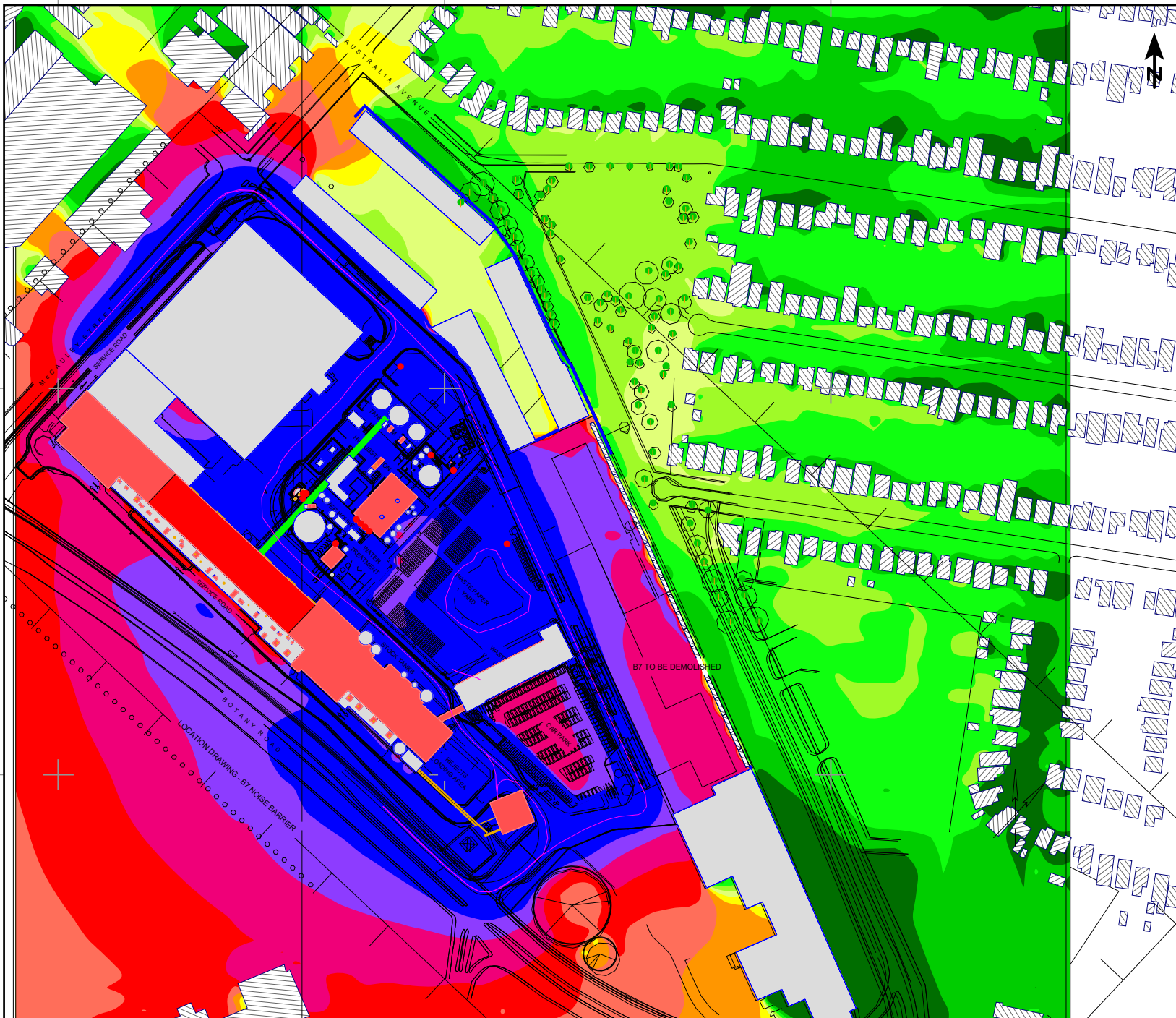
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Created: 30/08/2021

Change in noise levels in



Map details:
Map showing noise contours for Opal
with Waste Rejects Facility building and
Waste Truck
Night time period

Length scale 1:3535



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