



Proposed Industrial Development
771-797 Mamre Road
Kemps Creek

ACOUSTIC REPORT



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The GPT Group

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Contact Details

Acoustic Works
75/45 Huntley St
Alexandria NSW 2015
(02) 9666 5444
ABN: 35 607 558 707

Greg Pearce	Mark Enersen
Ph: 0450 337 375	Ph: 0409 317 416
Email: gpearce@acousticworks.com.au	Email: menersen@acousticworks.com.au

Report Register

Date	Revision	Author	Reviewer	Manager
06/12/22	R01A	Matthew Bechara	Greg Pearce	GP
14/07/23	R01B	Matthew Bechara	Greg Pearce	GP

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1 Introduction

This report is in response to a request by The GPT Group to assess environmental noise impacts associated with the proposed industrial warehouses to be located at 771-797 Mamre Road, Kemps Creek. This revised report now includes the latest architectural drawings. The environmental noise assessment was conducted in accordance with Mamre Road DCP 2021 requirements and the NSW Noise Policy for Industry. To facilitate the assessment, previous unattended noise monitoring in the vicinity of nearby sensitive receivers was utilised to establish the criteria for onsite activities. Based on the outcomes of the assessment, recommendations for acoustic treatments are specified.

2 Site Description

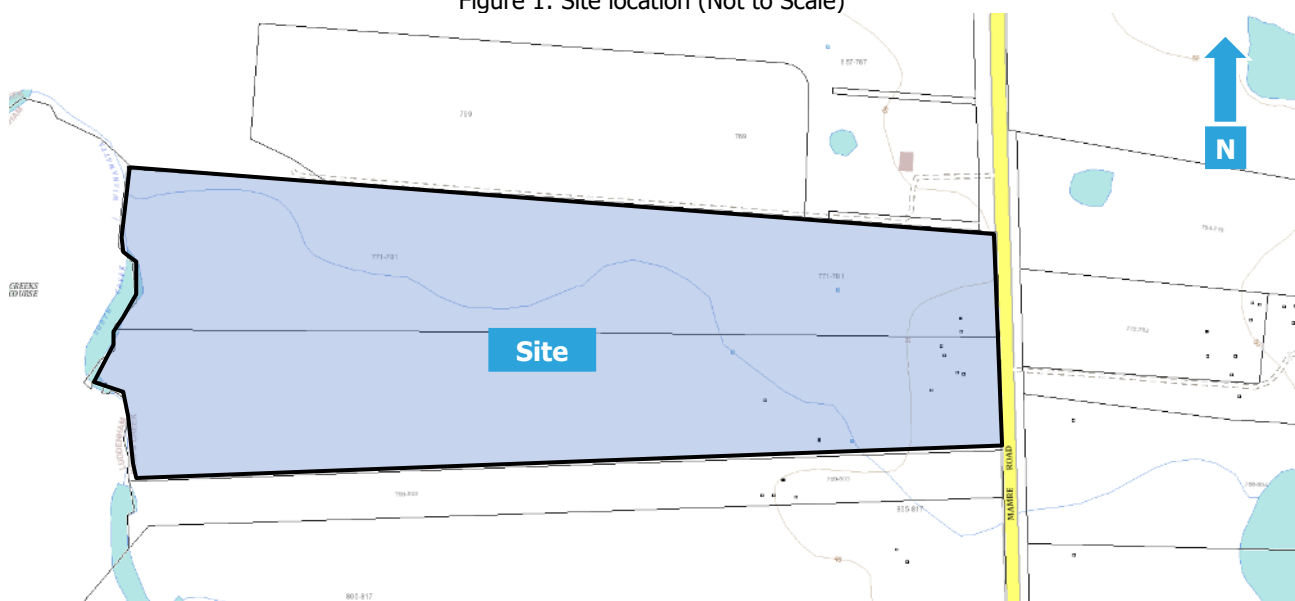
2.1 Site Location

The site is described by the following:

771-797 Mamre Road, Kemps Creek
Lots 23 and 24 on DP258414

Refer to Figure 1 for site location.

Figure 1: Site location (Not to Scale)



A comprehensive site survey was conducted on the 21st November 2022 which identified the following:

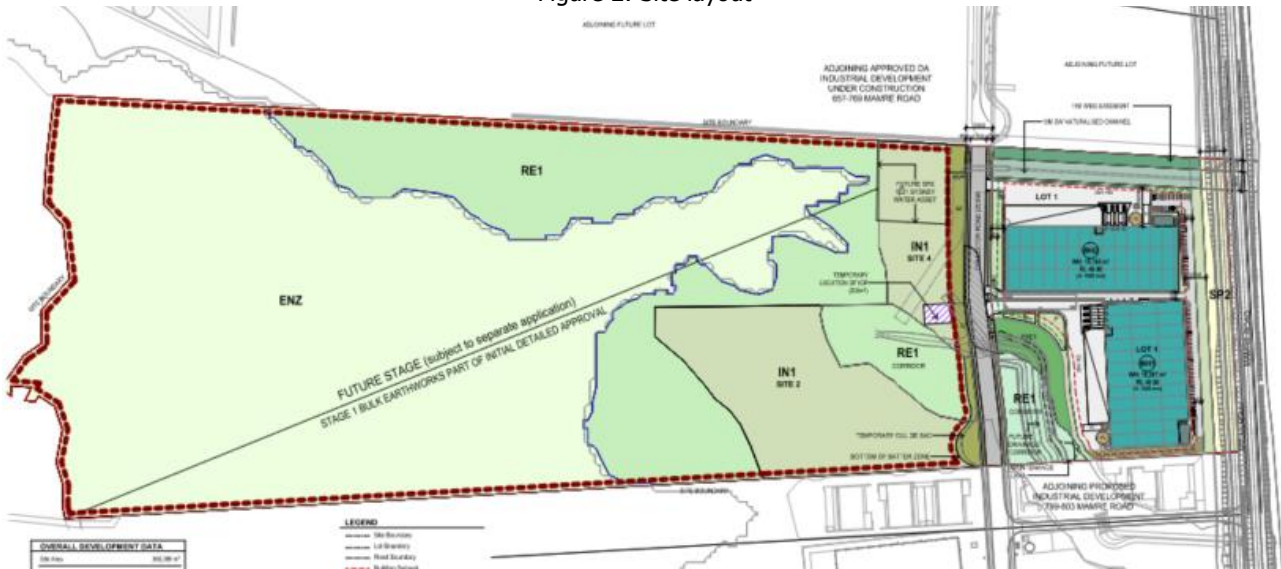
- The site is currently under development and is located in an IN1 – General Industrial and RE1 – Public Recreation zone as defined in the State Environmental Planning Policy (Industry and Employment) 2021.
- The surrounding area is comprised of existing and proposed industrial premises, residential and commercial land uses.

2.2 Proposal

The proposal seeks to construct two warehouses consisting of the following:

- Site area of 53,772m².
- Warehouse-1 with area of 10,662m² (including office areas).
- Warehouse-2 with area of 14,291m² (including office areas).
- Site access will be via proposed access roads to the west.
- Total of 103 car parking spaces

Figure 2: Site layout



2.3 Acoustic Environment

The surrounding area is primarily affected by road traffic noise from Mamre Road and noise from nearby industrial/commercial premises.

3 Equipment

The following equipment was used to record noise levels:

- Two Rion NL42 Environmental Noise Monitors (SN# 00175548 and 01259207)
- Pulsar Model 105 Ltd Sound Calibrator (SN # 57417)

The Environmental Noise Monitor holds current NATA Laboratory Certification and was field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

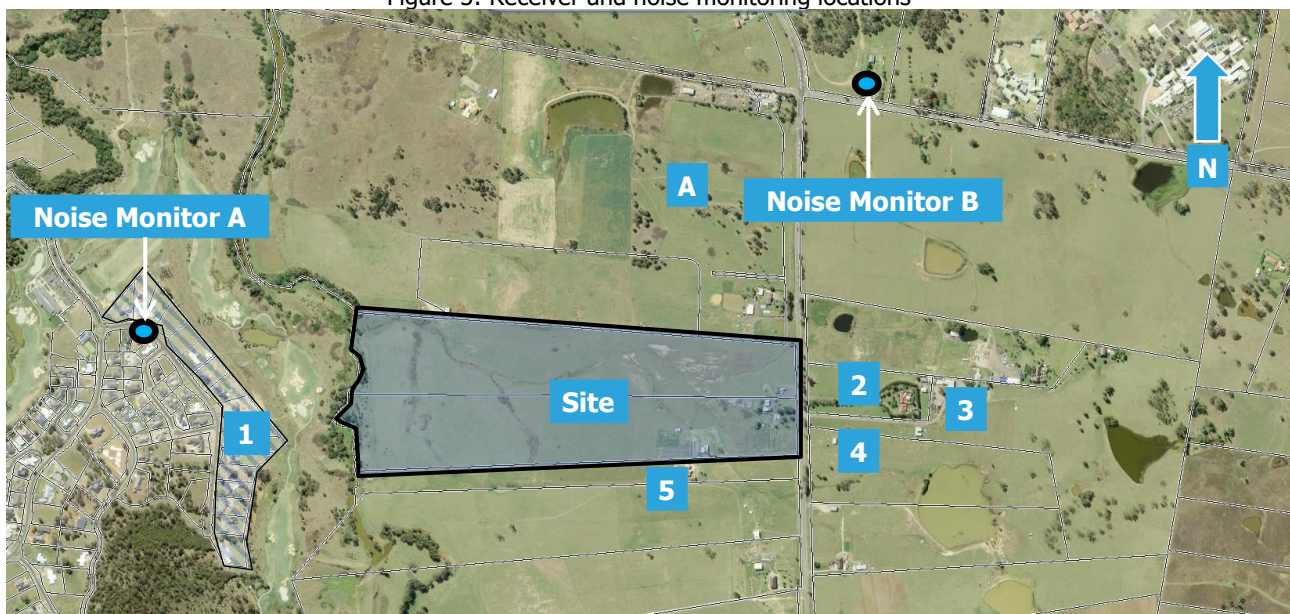
4 Receiver Locations

As nominated in the conditions for SSD-25725029, the nearest residential receivers are as follows:

1. Single storey residential dwellings are located south west of the site at Medinah Avenue, Luddenham.
2. A single storey residential dwelling is located east of the site at 772-782 Mamre Road with an industrial development proposal.
3. A single storey residential dwelling is located east of the site at 784-786 Mamre Road.
4. A single storey residential dwelling is located east of the site at 788-804 Mamre Road.
5. A single storey residential dwelling is located south of the site at 799-803 Mamre Road with an industrial development proposal in progress.
- A. Industrial/warehouses are currently being constructed north of the site at Mamre Road, Kemps Creek (SSD9522)

These locations were chosen as being representative of the nearest sensitive receivers to the proposed development. Refer to Figure 3 for these locations.

Figure 3: Receiver and noise monitoring locations



4.1 Unattended Noise Monitoring

Rion NL42 environmental noise monitors were placed at 8 Medinah Avenue, Luddenham and 676-702 Mamre Road, Kemps Creek to measure ambient noise levels. The monitors were located in free field positions with the microphones approximately 1.4 metres above ground surface level. The noise monitors were set to record noise levels between the 11th and 19th April 2018.

Both environmental noise monitors were set to record noise levels in "A" weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted in accordance with Australian Standard AS1055:1997 *Acoustics – Description and measurement of environmental noise*. For the unattended noise monitoring locations refer to Figure 3.

Weather conditions were fine for the majority of the monitoring period, with some periods of intermittent wind and rain which had no effect on the measured data.

5 Existing background noise levels

The following tables present the measured existing ambient noise levels from the unattended noise survey. Any periods of inclement weather or extraneous noise are omitted from the measured data prior to determining the overall results.

5.1 Meteorological conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (<http://www.bom.gov.au/climate/data/>), shown in Table 1 below.

Table 1: Meteorological conditions – Horsley Park

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Wednesday	11/04/2018	0	11	N	4	NNE
Thursday	12/04/2018	0	2	NW	15	NW
Friday	13/04/2018	0	11	NNW	15	N
Saturday	14/04/2018	0	19	NNW	31	NW
Sunday	15/04/2018	0.2	24	WNW	20	WNW
Monday	16/04/2018	0	4	N	11	WSW
Tuesday	17/04/2018	0	6	WSW	20	ESE
Wednesday	18/04/2018	0	2	NW	11	E
Thursday	19/04/2018	0	4	WNW	Calm	Calm

5.2 Ambient background noise level

The measured rating background noise levels (RBL) were determined in accordance with the NSW Noise Policy for Industry with levels for the different monitoring locations presented in Table 2.

Table 2: Measured L90 noise levels

Day	Date	Receiver 1			Receivers 2 to 5		
		Background L90 dB(A)			Background L90 dB(A)		
		Day	Evening	Night	Day	Evening	Night
Wednesday	11/04/2018	-	36.1	35.4	-	44.2	38.4
Thursday	12/04/2018	-	32.4	30.4	44.3	47.3	46.9
Friday	13/04/2018	-	33.4	28.0	47.1	46.4	45.4
Saturday	14/04/2018	37.5	33.2	28.4	47.5	45.9	44.1
Sunday	15/04/2018	37.7	28.7	23.6	45.6	37.5	33.5
Monday	16/04/2018	35.0	31.8	24.7	39.9	40.0	33.1
Tuesday	17/04/2018	36.1	30.3	26.8	38.0	36.3	28.8
Wednesday	18/04/2018	36.3	34.8	32.0	41.8	41.6	36.0
RBL		36	33	28	44	43	37

Note Receiver 1 daytime periods on 12th and 13th April 2018 were affected by extraneous noise and were omitted from the measured data.

The night time background level for Receiver 1 is below the minimum RBL as defined in the NSW Noise Policy for Industry (2017), therefore an RBL of 30dBA is applied in accordance with the policy for the night time period.

6 Noise Criteria

The relevant noise criteria have been determined in consultation with the conditions of SSD-9522, NSW Noise Policy for Industry 2017 and the original acoustic report prepared for the industrial estate by Acoustic Works "1018022 R01AF Mamre Road Kemp's Creek ENV".

6.1 Mamre Road Precinct Development Control Plan 2021

Part 4.3 Amenity of the Mamre Road Precinct Development Control Plan (DCP) 2021 states the following in relation to noise and vibration:

Amenity 4.3.1 Noise and Vibration Objectives

- a) To ensure noise and vibration do not adversely impact human health and amenity.*
- b) To ensure building design adequately protects workers from noise and vibration.*

Controls

- 1) Any machinery or activity considered to produce noise emissions from a premise shall be adequately sound-proofed so that noise emissions are in accordance with the provisions of the Protection of the Environment Operations Act 1997.*
- 2) Noise should be assessed in accordance with Noise Policy for Industry (EPA, 2017) and NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011).*
- 3) An Acoustic Report by a qualified acoustical engineer must be submitted where proposed development, including traffic generated by that development, will create noise and/or vibration impacts, either during construction or operation, that impacts on adjoining developments or nearby rural-residential areas. The Acoustic Report should outline the proposed noise amelioration strategies and management methods.*
- 4) An Acoustic Report shall be prepared for developments within 500m of rural-residential areas and other sensitive receivers, including educational establishments.*
- 5) Acoustic Reports for individual developments must assess cumulative noise impacts, including likely future noise emissions from the development and operation of the Precinct. The consultant should liaise with the relevant consent authority to determine acceptable amenity goals for individual industrial developments and background noise levels.*
- 6) The use of mechanical plant and equipment may be restricted in areas close to sensitive receivers, such as adjoining rural-residential development and educational establishments.*
- 7) Building design is to incorporate noise amelioration features. Roof elements are to control potential breakout noise, having regard to surrounding topography.*
- 8) Boundary fences are to incorporate noise amelioration features and control breakout noise having regard to developments adjoining rural-residential areas.*
- 9) Development shall comply with the relevant Australian Standards for noise and vibration.*
- 10) A qualified acoustical consultant is to certify any acoustic design measures have been satisfactorily incorporated into the development at construction certificate stage and validate the criteria at occupation certificate stage.*

6.2 State Environmental Planning Policy Western Sydney Employment Area 2009

Clauses 23 and 33D of the State Environmental Planning Policy for Western Sydney Employment Area states the following in relation to noise:

"Clause 23

- (2) The consent authority must not grant consent to development on land to which this clause applies unless it is satisfied that –*

...

(d) noise generation from fixed sources or motor vehicles associated with the development will be effectively insulated or otherwise minimised, and
(e) the development will not otherwise cause nuisance to residents, by way of hours of operation, traffic movement, parking, headlight glare, security lighting or the like.

...

Clause 33D

(3) Before determining a development application for development to which this clause applies, the consent authority—

(a) must consider whether the development will result in an increase in the number of dwellings or people affected by aircraft noise, and

(b) must consider the location of the development in relation to the criteria set out in Table 2.1 (Building Site Acceptability Based on ANEF Zones) in AS 2021:2015, and

(c) must be satisfied that the development will meet the indoor design sound levels set out in Table 3.3 (Indoor Design Sound Levels for Determination of Aircraft Noise Reduction) in AS 2021:2015."

Further reference is made to AS 2021:2015

6.3 AS 2021:2015

With regard to requirement 3b of SEPP WSEA 2009 Clause 33D, Table 2.1 of AS 2021:2015 specifies the following requirements for building siting in relation to ANEF contours:

Table 3: Building Siting in Relation to Aircraft Noise

Building type	ANEF zone of site		
	Acceptable	Conditionally acceptable	Unacceptable
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Table 3.3 of AS 2021:2015 sets limits for noise intrusion when a new development is located in an area within the ANEF (Aircraft Noise Exposure Forecast) contour 20 and 25:

Table 4: Indoor Sound Design Levels for Aircraft Noise

Building type and activity	Indoor design sound level dB(A)
Commercial buildings, offices and shops	
Drafting, open offices	65
Industrial	
Inspection, analysis, precision work	75
Light machinery, assembly, bench work	80

The site is located outside of the 20-25 ANEF Contour for Western Sydney Airport.

6.4 Assessing Vibration: A Technical Guideline 2006

6.4.1 Types of vibration

There are three types of vibration as classified in the guide;

- Continuous - vibration continues uninterrupted for a defined period (usually throughout daytime and/or night-time). This type of vibration is assessed on the basis of weighted RMS (root mean squared) acceleration values.
- Impulsive - rapid build up to a peak followed by a damped decay that may or may not involve several cycles. The duration is short, typically less than 2 seconds. Impulsive vibration (no more than three occurrences in an assessment period) is assessed on the basis of acceleration values.
- Intermittent - interrupted periods of continuous (e.g. a drill) or repeated periods of impulsive vibration (e.g. a pile driver), or continuous vibration that varies significantly in magnitude. Assessed on the basis of vibration dose values.

6.4.2 Acceptable values for continuous and impulsive vibration (1-80Hz)

The relevant criteria for continuous and impulsive vibration are as follows;

Table 5: Preferred weighted RMS vibration acceleration values

Type	Location	Assessment period	Preferred values m/s ²		Maximum values m/s ²	
			z-axis	x- and y-axes	z-axis	x- and y-axes
Continuous vibration	Critical areas	Day or night time	0.005	0.0036	0.01	0.0072
	Residences	Day time	0.01	0.0071	0.02	0.014
		Night time	0.007	0.005	0.014	0.01
	Offices, schools, educational institutions and places of worship	Day or night time	0.02	0.014	0.04	0.028
	Workshops	Day or night time	0.04	0.029	0.08	0.058
Impulsive vibration	Critical areas	Day or night time	0.005	0.0036	0.01	0.0072
	Residences	Day time	0.3	0.21	0.6	0.42
		Night time	0.1	0.071	0.2	0.14
	Offices, schools, educational institutions and places of worship	Day or night time	0.64	0.46	1.28	0.92
	Workshops	Day or night time	0.64	0.46	1.28	0.92

6.4.3 Acceptable values for intermittent vibration

Intermittent vibration is assessed using the vibration dose value (VDV) root-mean-quad method. VDV accumulates the vibration energy received over the daytime and night-time periods. The vibration dose methodology is as per standard BS 6472–1992.

6.4.4 Acceptable values for intermittent vibration

Intermittent vibration is assessed using the vibration dose value (VDV) root-mean-quad method. VDV accumulates the vibration energy received over the daytime and night-time periods. The vibration dose methodology is as per standard BS 6472–1992.

6.5 Noise Policy for Industry

Assessment of noise in accordance with NSW EPA Noise Policy for Industry (2017) has two main components: intrusiveness and amenity criteria. These are compared to each other (after conversion of amenity noise level to LAeq,15min equivalent level) to determine the overall project noise trigger level.

6.5.1 Intrusiveness noise level

The intrusiveness noise level is based on the $L_{Aeq(15\text{ min})}$ associated with commercial activity being less than or equal to the measured L_{A90} Rating Background Level + 5dB as per section 2.3 of the policy.

6.5.2 Amenity noise level

The amenity noise level is determined in accordance with Section 2.4 of the policy based on the land use and relevant noise criteria specified in Tables 2.2 and 2.3. The Noise Policy for Industry sets out acceptable noise levels for various locations. Determination of which residential receiver category applies is described in Table 2.3 of the policy.

Table 6: Receiver Category

Receiver category	Typical planning zoning – standard instrument	Typical existing background noise levels	Description
Rural residential	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime RBL <40 dB(A) Evening RBL <35 dB(A) Night RBL <30 dB(A)	Rural – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented in column 3 due to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL <45 dB(A) Evening RBL <40 dB(A) Night RBL <35dB(A)	Suburban – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime RBL > 45 dB(A) Evening RBL > 40 dB(A) Night RBL >35 dB(A)	Urban – an area with an acoustical environment that: <ul style="list-style-type: none"> is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources

Receiver category	Typical planning zoning – standard instrument	Typical existing background noise levels	Description
			<ul style="list-style-type: none"> • has through-traffic with characteristically heavy and continuous traffic flows during peak periods • is near commercial districts or industrial districts • has any combination of the above.

To determine the appropriate receiver category, the following observations were made:

- Residential receivers 2 to 5 are zoned – IN1 Industrial and would be classed as “Isolated residences within an industrial zone” due to the industrial developments (proposed and determined) in the area.
- The Luddenham residential receivers are zoned C4 – Environmental Living
- The surrounding acoustic environment for Receivers 1 to 5 has through traffic with characteristically heavy and continuous traffic flows during peak periods and/or is near or located in an industrial district, and has evening ambient noise levels defined by the natural environment and human activity, consistent with the description of the ‘urban’ category.
- Receiver A is an industrial estate and would be assessed against the ‘industrial’ criteria.

Therefore, Receiver 1 would be assessed against the ‘urban’ residential criteria, Receivers 2 to 5 would be assessed against the ‘industrial – isolated residence’ criteria and Receiver A would be assessed against the ‘industrial’ criteria.

6.5.3 Amenity noise levels in areas of high traffic

Areas affected by a certain level of traffic noise may be high enough to make noise from an industrial source effectively inaudible. In such cases the project amenity noise level may be derived from the $L_{Aeq, period}$ minus 15 dBA on the condition all of the following apply:

- Traffic noise is identified as the dominant noise source at the site
- The existing traffic noise level is 10 dB or more above the recommended amenity noise level for the area
- It is highly unlikely traffic noise levels will decrease in the future.

Applicability is to be determined for each assessment period.

6.5.4 Amenity noise levels in areas near an existing or proposed cluster of industry

To account for the cumulative impacts from multiple industrial noise sources to sensitive receivers near an existing or proposed cluster of industry, and it can be demonstrated that existing levels of industrial noise are more than 5dB below the relevant recommended amenity noise level, the following equation can be used to determine the project amenity level for an individual project:

$$\text{Individual project amenity noise level} = 10\log((10^{(ANL-5dB/10)}) \div N)$$

Where

ANL = relevant recommended amenity noise level

N = number of proposed additional premises

Where it can be demonstrated that existing levels of industrial noise are more than 5dB below the relevant recommended amenity noise level, the formula can be modified as shown below:

$$\text{Individual project amenity noise level} = 10\log(10^{(ANL/10)} \div N)$$

No industrial noise sources are currently operating in the vicinity of the nearest receivers, therefore existing industrial noise levels are more than 5dB below the relevant recommended amenity noise level and the modified formula would apply.

To determine the cumulative criteria for the proposed development, the following must be considered:

- Each masterplan development will undertake calculation to account for the cumulative (combined) noise impacts from onsite activities associated with their development including all individual lots within the site to sensitive receivers. The assessment takes into account the cumulative effect of the development without the need to adjust the amenity criteria for the masterplan development individual lots.
- The surrounding area may be considered as a greenfield area, with individual developments in the surrounding area comprised of multiple lots for each Development Application. Each assessment when assessed by the acoustic engineer will combine all noise sources from the lots within the development site to determine the noise impacts, therefore accounting for the cumulative effect of their development regardless of the number of lots proposed within the site.
- Therefore, to determine the cumulative criteria, we need to consider the potential number of development sites, not the individual warehouses located within each development to calculate any adjustments to the criteria.
- The combined noise impacts from each development takes into account the cumulative effect regardless of how many warehouse/buildings are located within the development site, the analysis includes all noise impacts occurring simultaneously in the analysis. Therefore, to calculate the adjustment for the cumulative criteria, consideration is required based on the number of developments in proximity to the receiver, not individual buildings.
- Once the cumulative criteria has been established using the above method, if individual assessment for buildings within the development site are undertaken, then the cumulative criteria must be adjusted. You cannot use the same cumulative criteria used for the masterplan for a single building within the site, adjustment to the criteria must account for the number of building/lots within the site to ensure the individual building/lot assessment complies with the criteria. This means the cumulative criteria must be adjusted based on the number of lots within the development site to ensure the overall site still complies with the criteria used for the masterplan assessment.

Based on the review of the area, there is the potential for up to 12 warehouse lots from SSD9522 and 1 warehouse lot from this proposal to impact the receivers nominated in Section 4. This number will increase for receivers located at greater distances, but it should also be understood that noise from the sites will be further attenuated due to screening and increased separation distances, making noise impacts from the sites imperceptible. Based on the interactive mapping tool on the NSW Major Projects website, there is potential for up to 78 nearby masterplan developments sites to impact more distant receivers considered in this assessment.

6.5.5 Modifying factors

The Noise Policy for Industry includes correction factors such as tonal noise, low-frequency noise, intermittent noise and duration. Where two or more modifying factors are present, the maximum adjustment to a noise source level is 10dBA (excluding duration correction).

6.5.6 Intrusiveness noise criteria

The intrusiveness noise levels are as follows;

Table 7: Intrusiveness noise levels

Time period	Receivers 1	Receivers 2 to 5	Receiver A
	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	41	49	N/A
Evening (6pm-10pm)	38	48	N/A
Night (10pm-7am Sun-Fri, 10pm-8am Sat)	35	42	N/A

*N/A: Intrusive noise criteria does not apply for industrial receivers.

6.5.6.1 Cumulative Amenity Criteria

The cumulative amenity criteria for the nearby receivers is as follows:

Table 8: Cumulative Impact Assessment

Location	Day $L_{Aeq(15\text{ minute})}$	Evening $L_{Aeq(15\text{ minute})}$	Night $L_{Aeq(15\text{ minute})}$
Receiver 1	49	39	34
Receivers 2-5	59	59	59
Receiver A	70	70	70

6.5.7 Project specific noise criteria

The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Therefore the project noise trigger levels are as follows:

Table 9: Project criteria

Time period	Receiver 1	Receivers 2 to 5	Receiver A
	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)
Day	41	49	70
Evening	38	48	70
Night	34	42	70

6.5.8 Sleep disturbance

Sleep disturbance is based on the maximum noise level of events from premises during the night-time period. The Noise Policy for Industry defines sleep disturbance as a noise from a premise at a residential location that exceeds:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

The project specific sleep disturbance noise levels are as follows;

Table 10: Sleep disturbance noise levels

Time period	Criteria $L_{eq(15min)}$ dB(A)		Criteria L_{AFmax} dB(A)	
	Receiver 1	Receivers 2 to 7	Receiver 1	Receivers 2 to 5
Night	40	42	52	52

6.6 NSW Road Noise Policy 2011

The NSW Road Noise Policy outlines the criteria for any increase in the total traffic noise level at the location due to a proposed project or traffic generating development. Therefore the following criteria applies:

Table 11: Road traffic noise assessment criteria for residential land uses

Road Category	Type of project/development	Total traffic noise level – dB(A)	
		Day (7am to 10pm)	Night (10pm to 7am)
Local roads	Existing Residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,15hour}$ 55 (external)	$L_{Aeq,9hour}$ 50 (external)

In addition to the assessment criteria outlined in Tables 3-5 of the NSW Road Noise Policy, any increase in the total traffic noise level at a location due to a proposed project or traffic-generating development must be considered. Residences experiencing increases in total traffic noise level above the relative increase criteria in Table 6 of the policy should also be considered for mitigation as described in Section 3.4 of the policy, with the criteria presented in Table 15.

Table 12: Relative increase criteria for residential land uses

Road Category	Type of project/development	Total traffic noise level increase – dB(A)	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway/arterial/sub-arterial roads and transitways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road	Existing traffic $L_{Aeq(15hr)} + 12dB$ (external)	Existing traffic $L_{Aeq(9hr)} + 12dB$ (external)

For other existing sensitive land uses (as outlined in Table 4 of the policy) the relative increase criteria should be applied to the respective $L_{Aeq,period}$ for that land use type, except for open space.

When the existing traffic noise levels already exceeds the L_{Aeq} 15hour and L_{Aeq} 9hr noise limits, the development should not increase the existing traffic noise levels by more than 2dB(A) as stated in Section 3.4 of the NSW Road Noise Policy 2011.

7 Environmental Assessment

7.1 Onsite activities

Noise associated with the development was assessed using 3D SoundPLAN modelling generated in accordance with ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*. The model presents the predicted worst-case 15 minute noise impacts associated with typical warehouse activities such as trucks, forklifts, reverse alarms, mechanical plant and carpark activities in accordance with the Noise Policy for Industry (2017).

Meteorological conditions, barrier screening, topographical screening, air and ground absorption were calculated in accordance with ISO 9613-2 and Fact Sheet D of the Noise Policy for Industry. Measurements of vehicles included acceleration, deceleration, idling and braking of the vehicles. The itemised noise source list is presented in Table 13. For internal activities, all openings in the building façade were assumed to be open at all times, including loading docks and fire doors.

A list of noise sources and assumptions is presented in Table 13 below.

Table 13: Itemised Noise Sources

Source	Source type	Sound Power Level L_w dBA
Car passby	Point	77
Car door closure	Point	85
Car start	Point	84
Forklift Activities	Line	102
Truck idle	Point	101
Truck Manoeuvring (incl. acceleration/deceleration/reversing)	Line	94
Truck passby (incl. acceleration)	Line	90
Truck venting air brakes	Point	110
Truck reverse alarm	Line	105
Voice conversation	Point	78
Mechanical Plant (indicative)*	Point	95
Internal warehouse activities**	Area (façade)	85

*Note mechanical plant selection are unknown at this stage, therefore the assessment was based on typical warehouse roof mounted fans.

**Note the sound power level for internal warehouse activities were based on previous measurements of similar activities.

7.2 Cumulative Noise Impact Assessment – without acoustic barriers

The following assessment of noise impacts to sensitive receivers is based on the criteria established using the cumulative criteria specified in Section 2.4.2 of the Noise Policy for Industry, which takes into account the potential impacts from multiple sources within the site and surrounding area. The noise source levels at the receiver locations are shown in Table 14. LAeq results are not shown where the calculated total is less than 0dBA. Levels have been rounded to the nearest whole number.

Table 14: Project specific noise levels – without barriers

Receiver	Project Specific Criteria L _{eq,15min} dBA			Sleep Disturbance Criteria L _{max} dBA	Predicted Noise Impacts L _{eq,15min} dBA			Predicted highest L _{max} dBA	Complies (Yes/No)			
	Day	Eve	Night	Night	Day	Eve	Night	Night	Day	Evening	Night	Sleep Disturbance
1	41	38	34	52	22	21	21	35	Yes	Yes	Yes	Yes
2	49	48	42	52	32	32	31	48	Yes	Yes	Yes	Yes
3	49	48	42	52	32	32	31	42	Yes	Yes	Yes	Yes
4	49	48	42	52	34	34	33	34	Yes	Yes	Yes	Yes
5	49	48	42	52	43	43	42	60	Yes	Yes	Yes	No
A	70	70	70	-	46	45	44	-	Yes	Yes	Yes	n/a

Compliance with the cumulative impact criteria is predicted for all onsite activities at the receiver locations during the proposed operating hours on the condition the recommendations detailed in Section 11 are implemented.

Figure 4 to Figure 6 presents a graphical representation of the predicted noise levels.

Figure 4: $L_{Aeq,15min}$ noise contours (Day) – without barriers

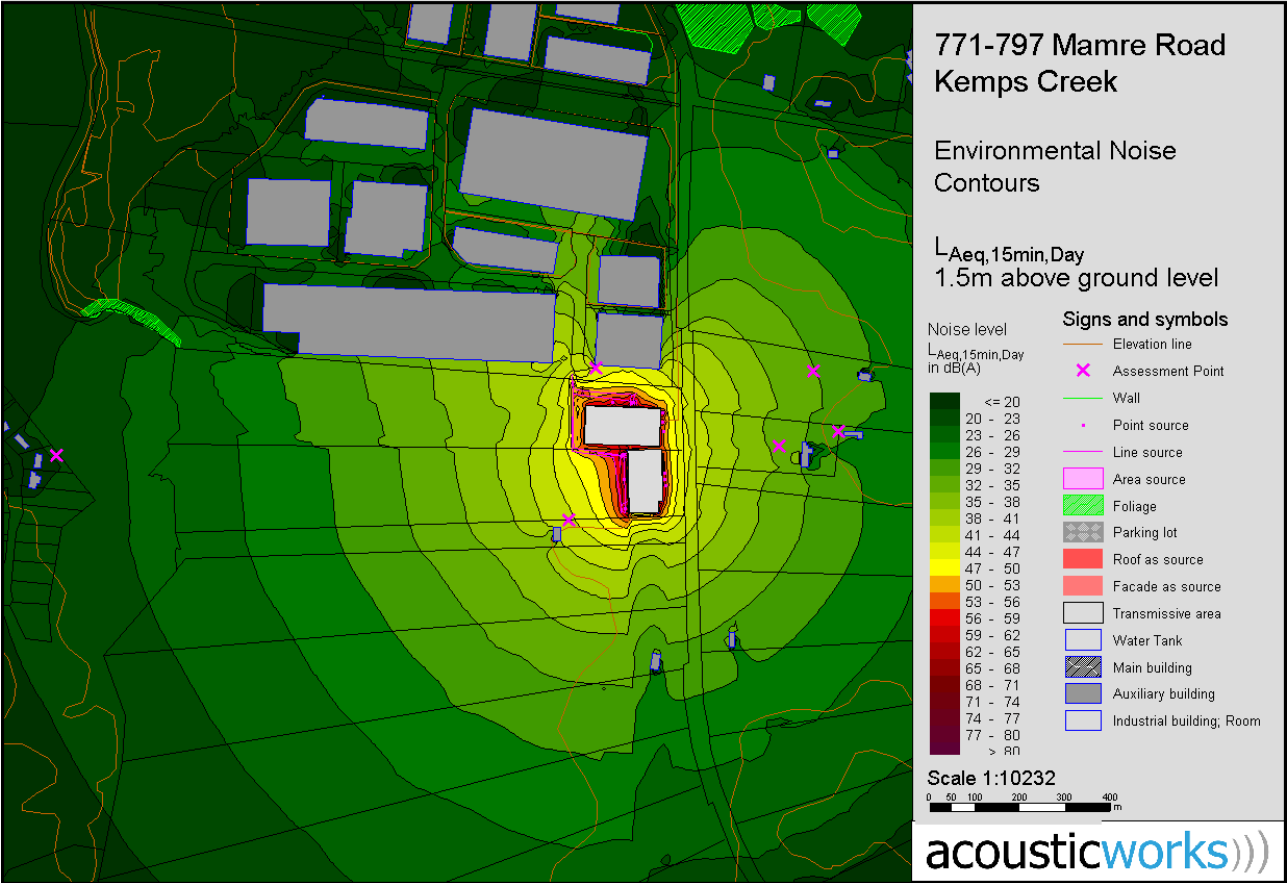


Figure 5: $L_{Aeq,15min}$ noise contours (Evening) – without barriers

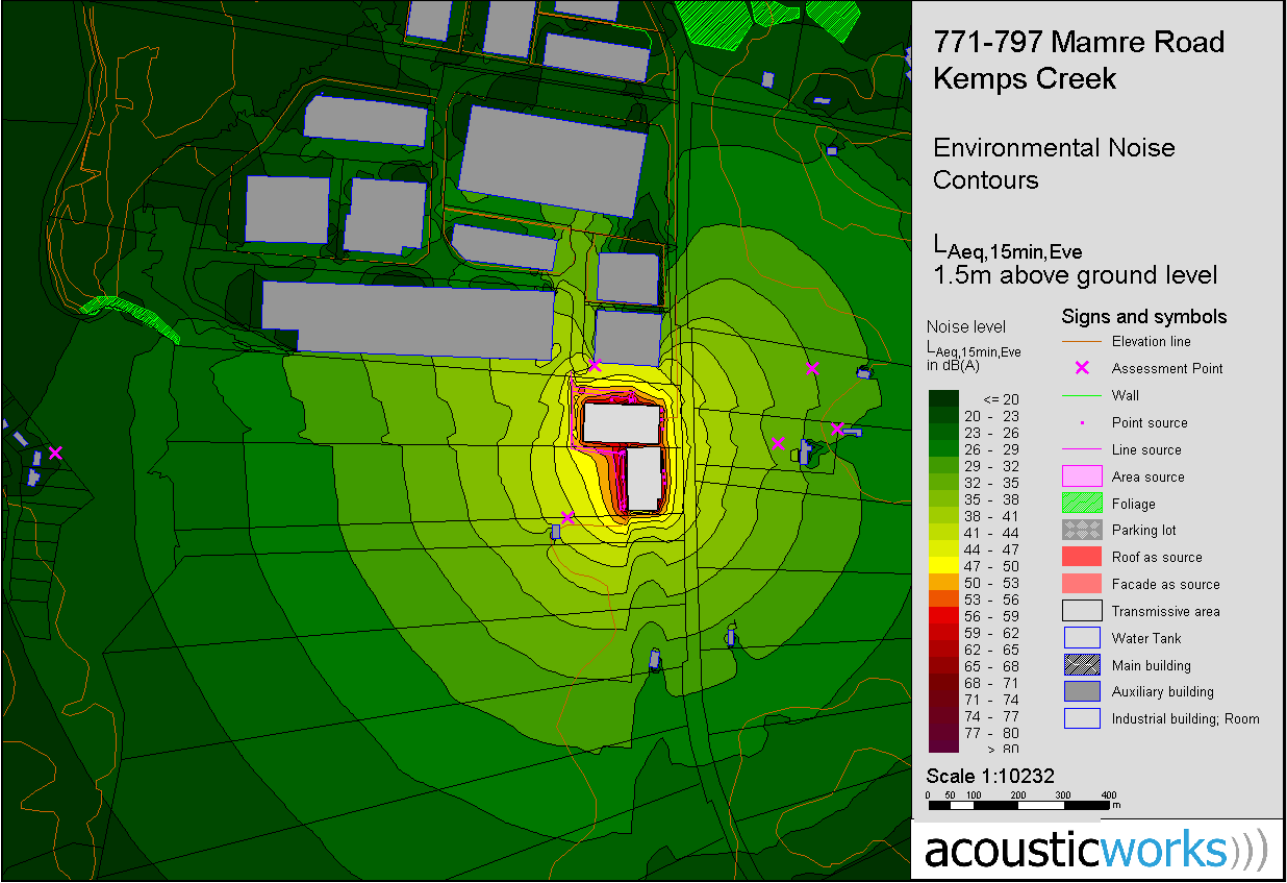
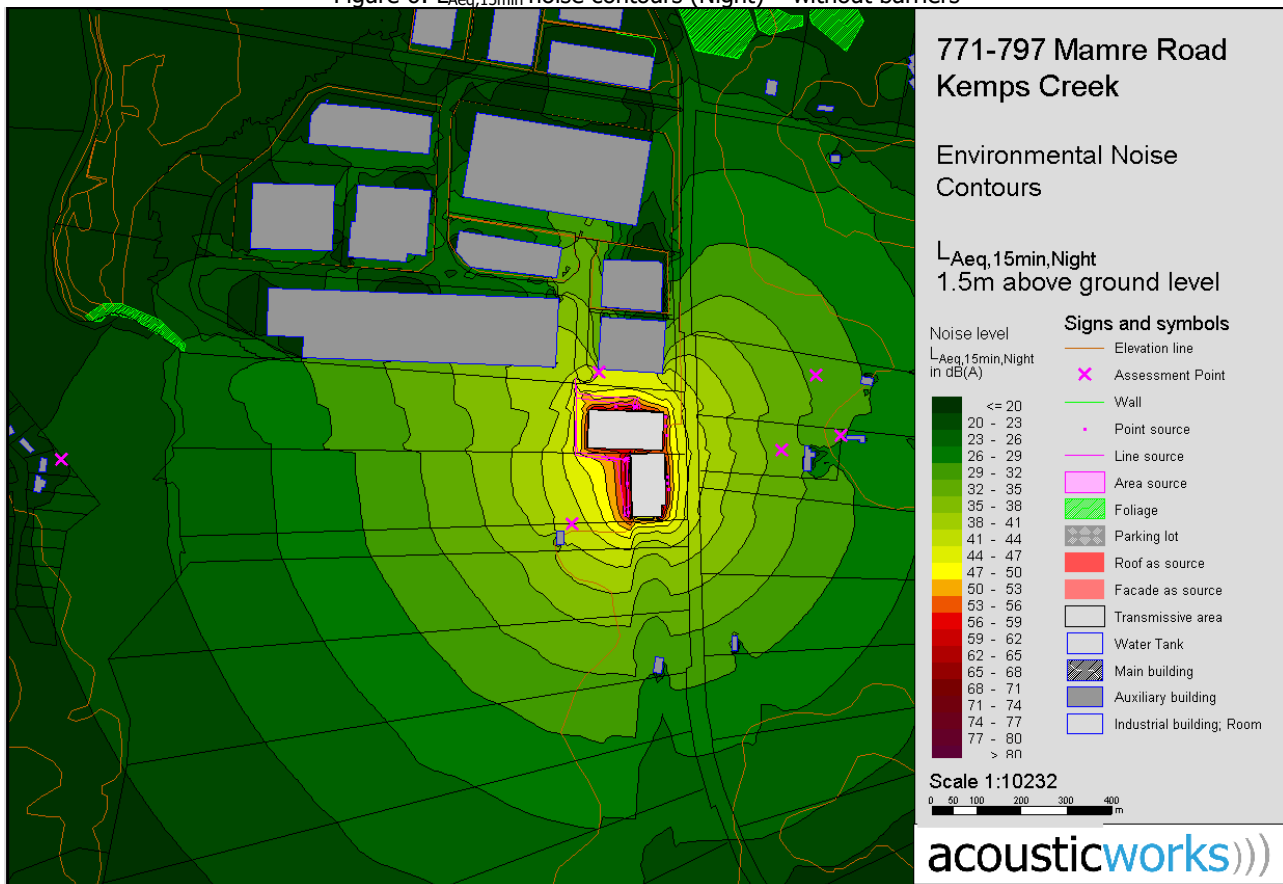


Figure 6: $L_{Aeq,15min}$ noise contours (Night) – without barriers

7.3 Cumulative Noise Impact Assessment – with acoustic barriers

The following assessment of noise impacts to sensitive receivers is based on the criteria established using the cumulative criteria specified in Section 2.4.2 of the Noise Policy for Industry, which takes into account the potential impacts from multiple sources within the site and surrounding area. The noise source levels at the receiver locations with acoustic barriers are shown in Table 15. Levels have been rounded to the nearest whole number.

Table 15: Project specific noise levels – including acoustic barriers

Receiver	Project Specific Criteria $L_{eq,15min}$ dBA			Sleep Disturbance Criteria L_{max} dBA	Predicted Noise Impacts $L_{eq,15min}$ dBA			Predicted highest L_{max} dBA	Complies (Yes/No)			
	Day	Eve	Night	Night	Day	Eve	Night	Night	Day	Evening	Night	Sleep Disturbance
1	41	38	34	52	21	21	20	35	Yes	Yes	Yes	Yes
2	49	48	42	52	32	32	31	48	Yes	Yes	Yes	Yes
3	49	48	42	52	32	32	31	42	Yes	Yes	Yes	Yes
4	49	48	42	52	34	34	33	34	Yes	Yes	Yes	Yes
5	49	48	42	52	43	42	42	52	Yes	Yes	Yes	Yes
A	70	70	70	-	46	45	44	-	Yes	Yes	Yes	n/a

Compliance with the cumulative impact criteria is predicted for all onsite activities at the receiver locations during the proposed operating hours on the condition the recommendations detailed in Section 11 are implemented.

Figure 7 to Figure 9 presents a graphical representation of the predicted noise levels.

Figure 7: $L_{Aeq,15min}$ noise contours (Day) – with barriers

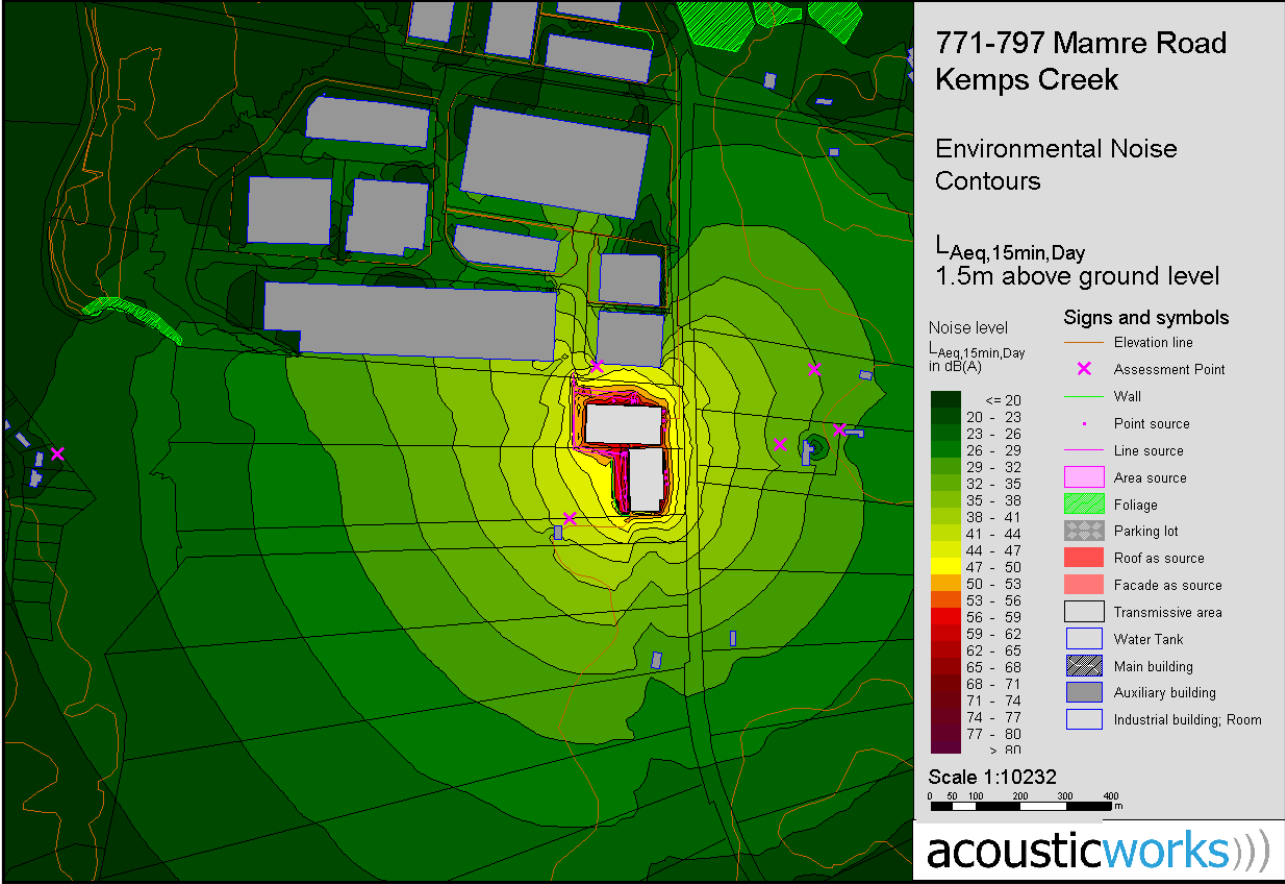


Figure 8: $L_{Aeq,15min}$ noise contours (Evening) – with barriers

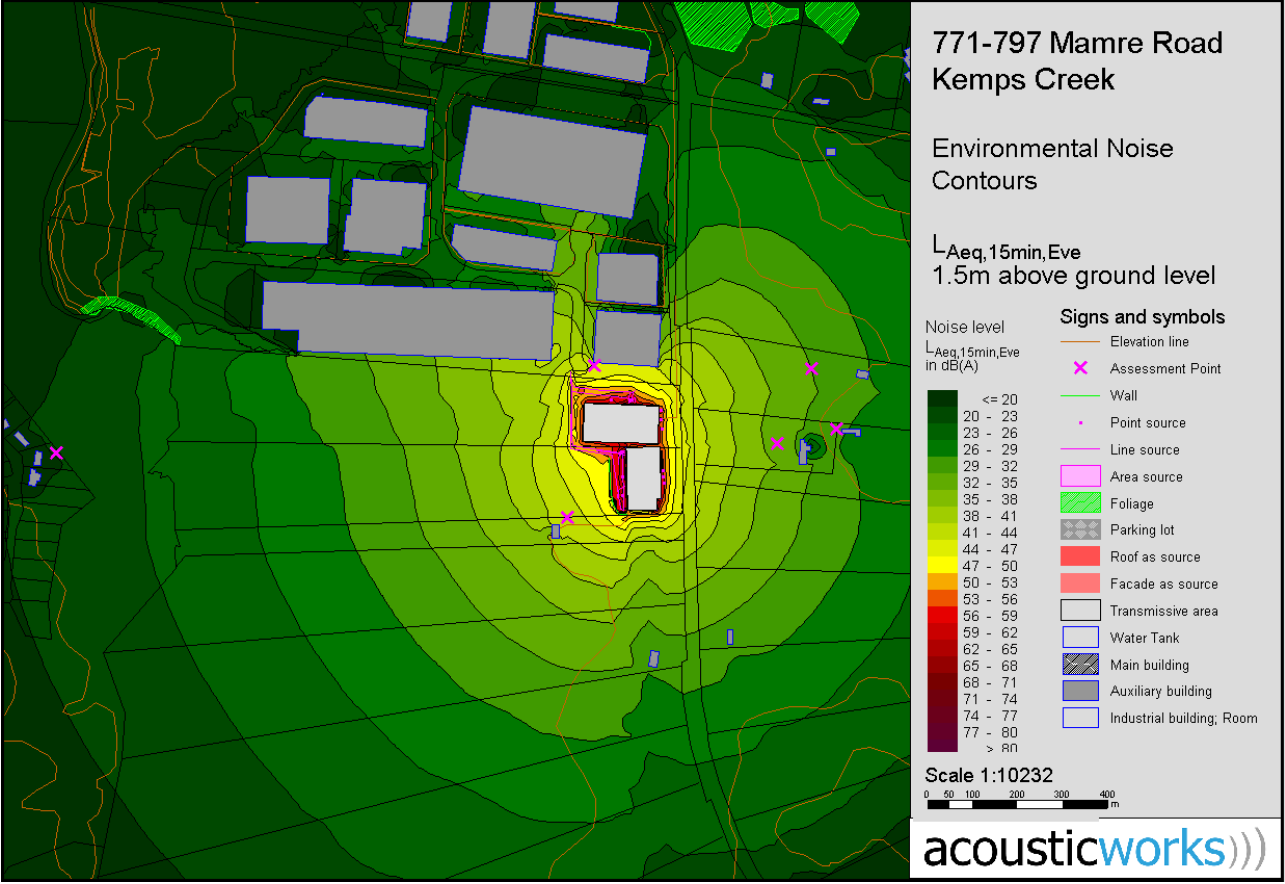
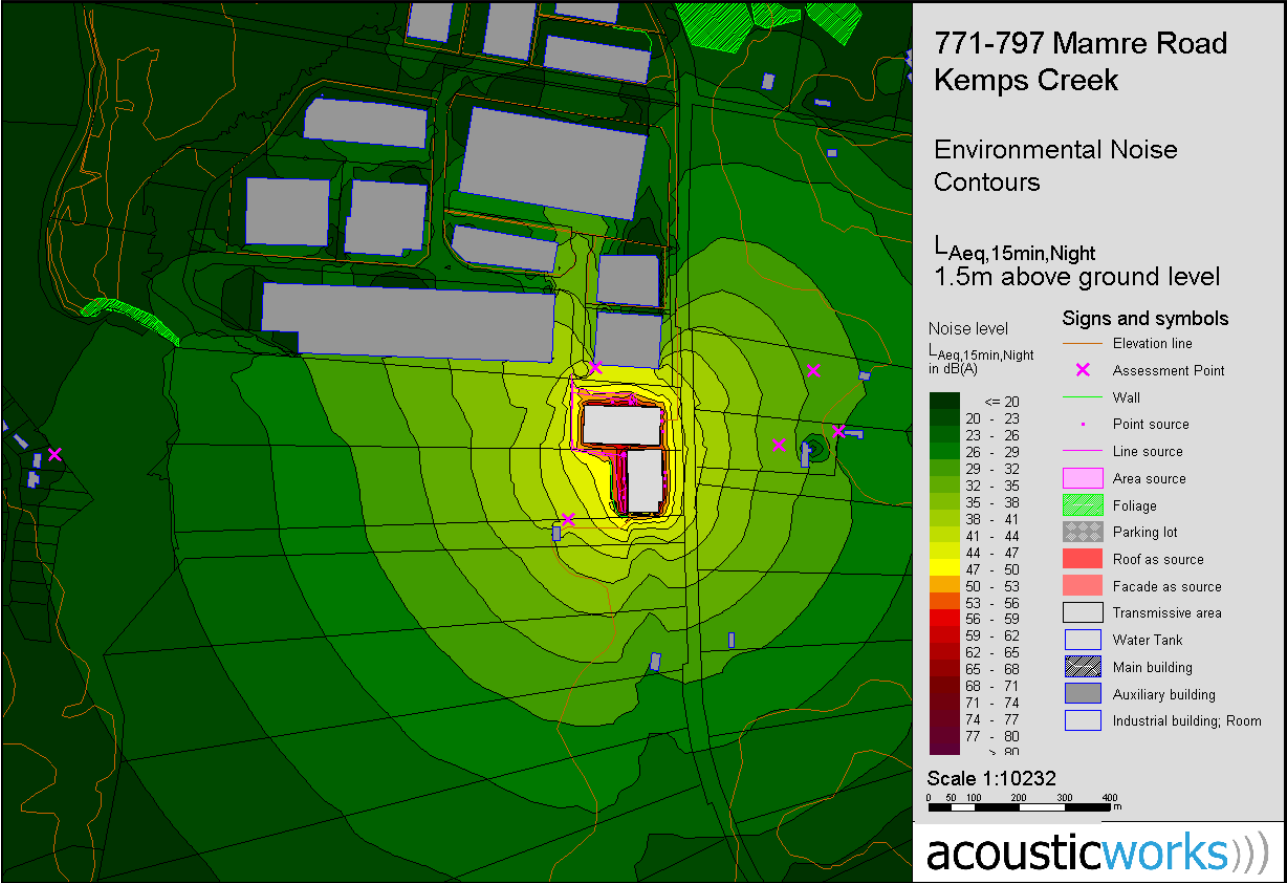


Figure 9: L_{Aeq,15min} noise contours (Night) – with barriers



8 Vibration Predictions

Potential vibration and acceleration impacts were assessed to determine typical levels within a set distance of the activity to the receiver with a maximum combined Peak Particle Velocity of level less than 1mm/s predicted based on the equipment in operation. The level of impact may change depending on the ground composition, example stone/rock or concrete will allow higher levels of ground vibration than soft soil.

After review of the proposal in relation to vibration impacts, we provide the following recommendations:

- The surrounding residential receivers located in proximity to the site are separated from the roads and site by soil, with reasonable separation distances from onsite activities and local roads. The human exposures and Peak Particle levels are predicted to be below the criteria nominated in Section 6.4 with no further treatments required.
- The surrounding lots within the development are predicted to comply with the criteria based on the proposed warehousing activities. Note if vibrating plant is proposed within the development then individual assessment is recommended of the equipment to determine minimum treatment requirements.

9 Road Traffic Noise

The existing annual average daily traffic volume for Mamre Road is approximately 20,000 vehicles per day. Based on information provided by Ason Group, the development is expected to produce up to 726 trips per day. the increased traffic to Mamre Road from the proposed development is predicted to comply with the NSW Road Noise Policy criteria as detailed in Table 12 (Section 6.6) of this report and will only result in less than a 1 dB increase. Mamre Road already exceeds the LAeq 15hr and LAeq 9hr noise limits (refer to Table 11), the 1 dB increase is less than the 2dB(A) allowed maximum increase as stated in Section 3.4 of the NSW Road Noise Policy 2011 and therefore complies with all assessment requirements.

Refer to Figure 10 to Figure 13 for a visual representation of the predicted road traffic noise levels.

Figure 10: Existing $L_{Aeq,15h}$ noise levels

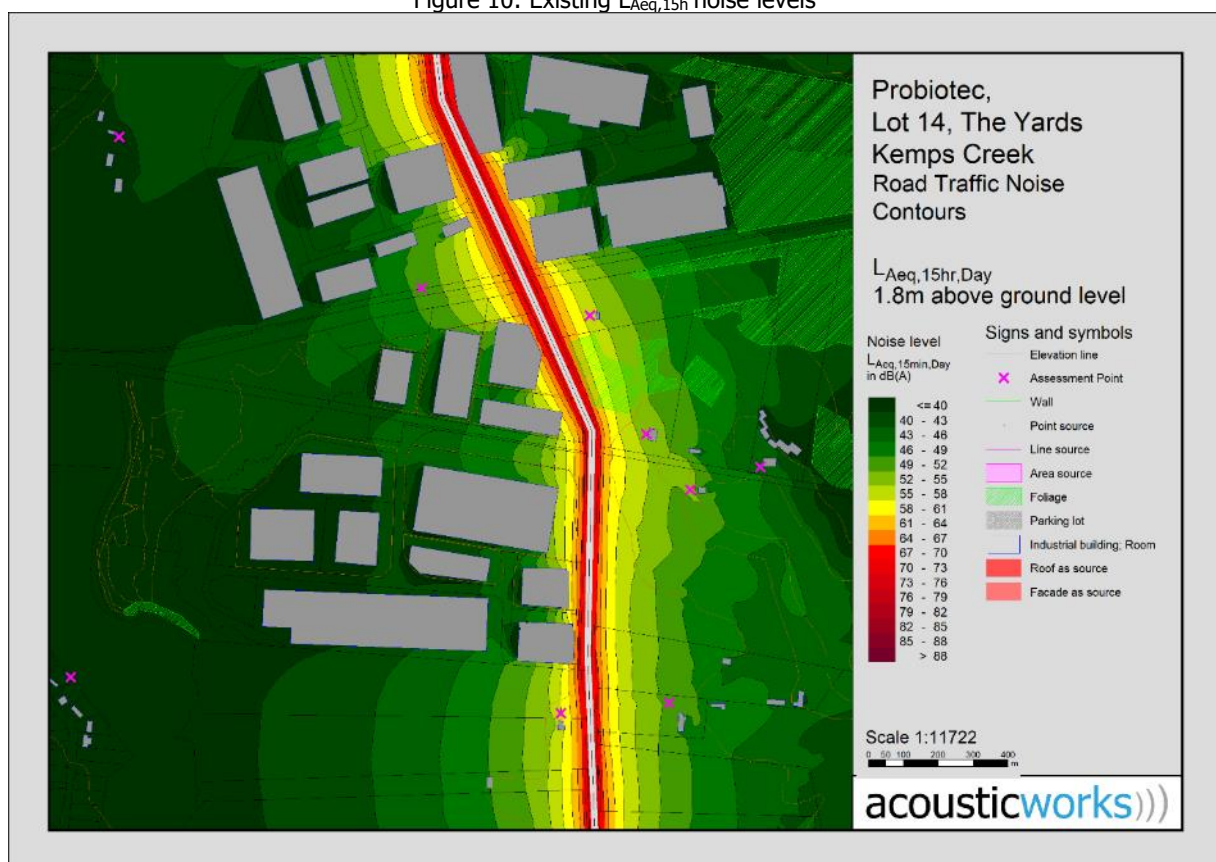


Figure 11: Existing $L_{Aeq,9h}$ noise levels

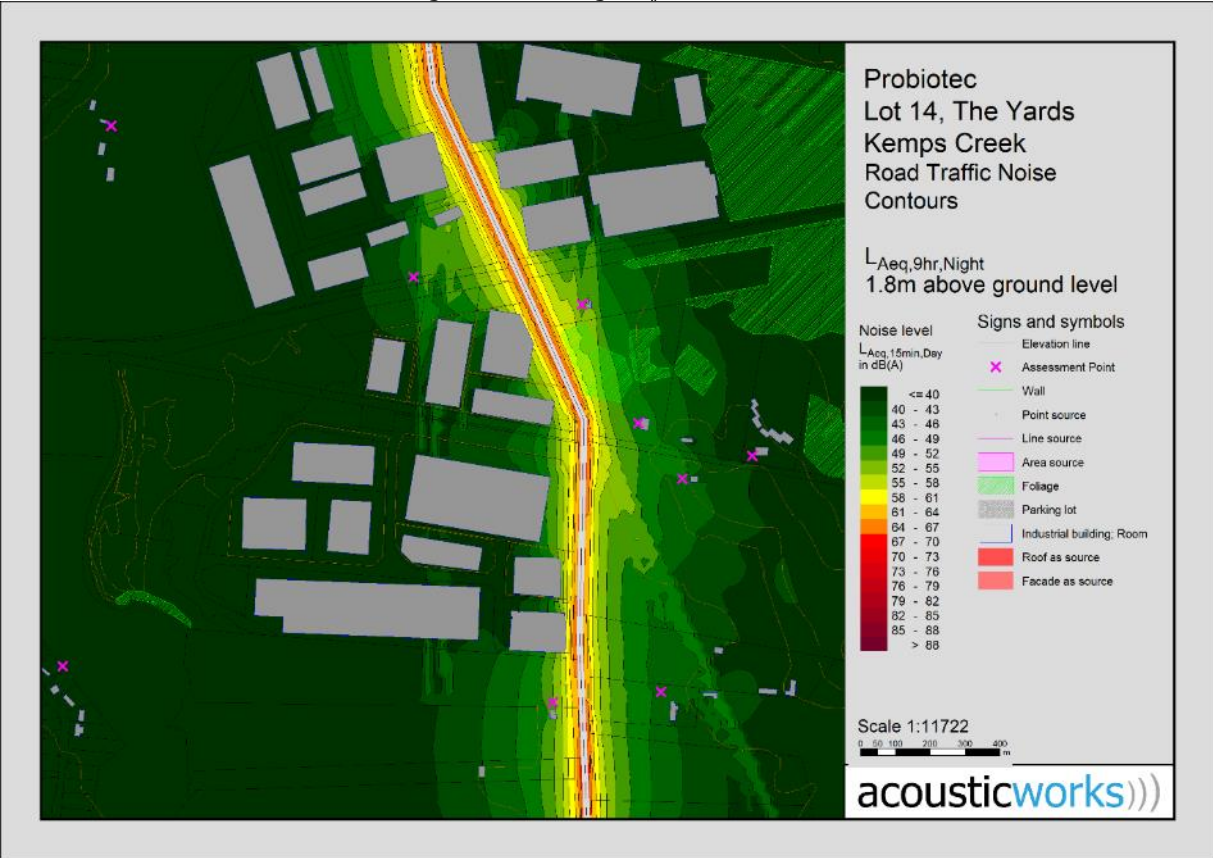


Figure 12: Predicted $L_{Aeq,15h}$ noise levels

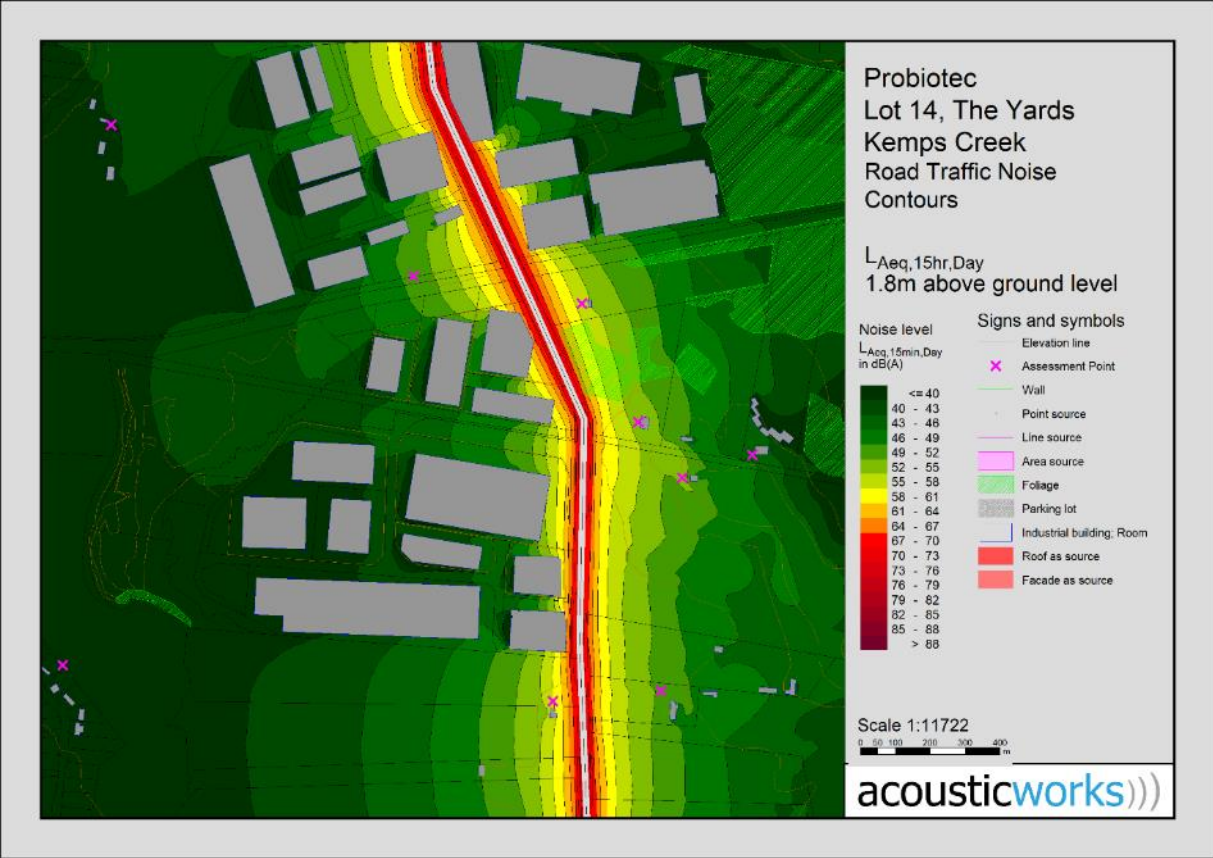
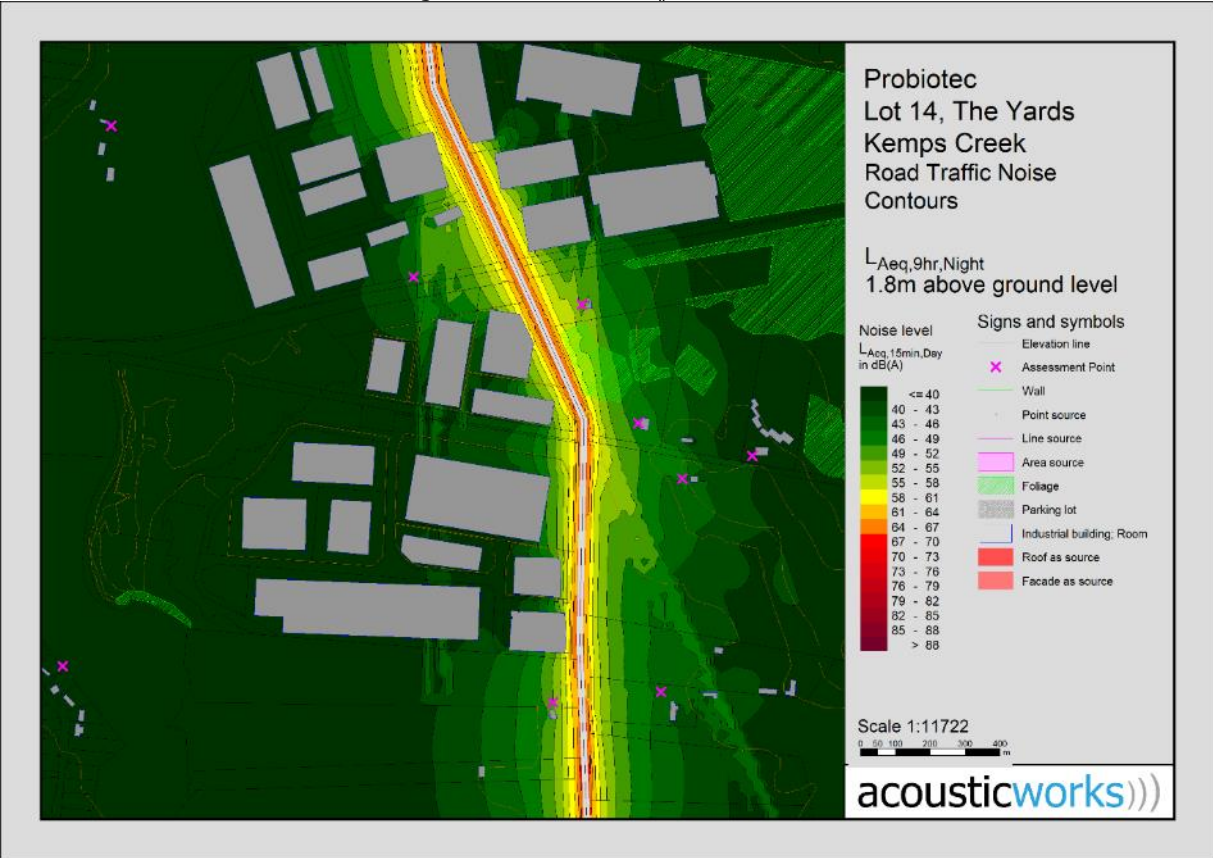


Figure 13: Predicted $L_{Aeq,9h}$ noise levels



Traffic generated by the development is predicted to comply with the NSW Road Noise Policy criteria at all nearby residences except for those where the criteria are exceeded by existing traffic noise levels. Compliance is predicted with the relative increase criteria for residential land uses.

10 Aircraft Noise Assessment

10.1 Site Location

The site is located outside of the Western Sydney Airport ANEF 2030 contours.

10.2 Site Coordinates

The following dimensions have been determined in accordance with AS2021:2015;

Table 16: Site Coordinates Runway

Description	Dimension (m)
DS, sideline distance	1,121
DL, landing distance	6,294
DT, takeoff distance	9,994
HS, elevation of site	40
HA, elevation of airport	80

10.3 Aircraft Noise Levels – AS2021:2015

Using the site coordinates, the noise levels for the various types of aircraft are calculated in Table 13.

Table 17: Aircraft noise levels – AS2021:2015 Runway 05/23

Model	Representative aircraft	Noise level dBA L _{max} (slow)	
		Departure	Arrival
A319-115	Airbus A319-131	62	55
A320-231	Airbus A320-232	61	56
A321-231	Airbus A321-232	63	56
A330-202	Airbus A330-301	69	60
A330-303	Airbus A330-301	69	60
A340-642	Airbus A340-642	66	61
A380-842 (Short haul)	Airbus A380-841 (Short haul)	67	60
A380-842 (Long haul)	Airbus A380-841 (Long haul)	68	60
737-3YO	Boeing 737-300	68	57
737-476	Boeing 737-400	68	58
737-8FE	Boeing 737-800	68	60
DHC-6 SERIES 300	Bombardier Dash 6	62	60
EMB-110P1	Bombardier Dash 6	62	60
SA226-TC	Bombardier Dash 6	62	60
SA227-DC	Bombardier Dash 6	62	60
DHC-8-102	Bombardier Dash 8-100	48	48
DHC-8-202	Bombardier Dash 8-300	50	48
DHC-8-315	Bombardier Dash 8-300	50	48
DHC-8-402	Bombardier Dash 8-300	50	48
340B	Saab 340	57	55
Maximum noise level		69	61
		69	

Based on the highest predicted impact of L_{max} 69dBA, no further treatment to the building façade would be required to comply with AS2021:2015 internal assessment requirements.

11 Recommendations

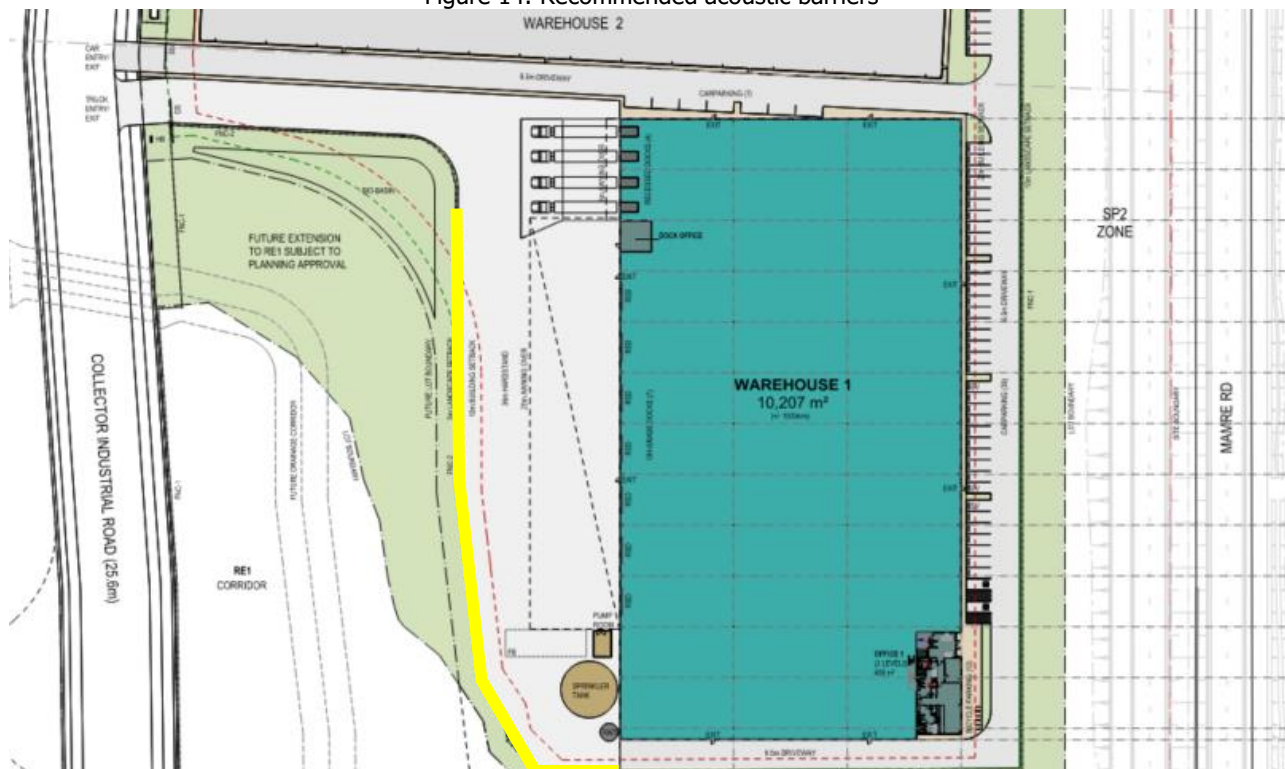
11.1 Operational Noise & Vibration

The noise assessment indicates that 24 hour operation of the site is predicted to comply with the assessment criteria on the condition that the following recommendations are implemented.

11.1.1 Acoustic barriers

An acoustic barrier would be required for predicted compliance of the sleep disturbance criteria at Receiver 5. An industrial development is proposed to be constructed at this location with the dwelling to be demolished. If the application is successful and the dwelling is demolished, the acoustic barrier will no longer be required. Temporary acoustic barriers may be used provided that they are constructed to the height and extent shown in Figure 14 and achieve a minimum surface density of 9kg/m². The barrier must be free of gaps and holes. Suitable materials may include construction hoarding that consists of minimum 18mm plywood or other materials that achieve the minimum required surface density.

Figure 14: Recommended acoustic barriers



3m high acoustic barrier above Warehouse 1 pad level RL

11.2 Mechanical Plant

No information regarding mechanical services was available at the time of the assessment, but a preliminary assessment based on measurements of similar developments predicted that similar plant would comply on the condition without the need for further acoustic treatment. Any new mechanical plant shall be designed to comply with the criteria nominated in Section 6 of this report.

Acoustic Works recommends that once mechanical plant selection is finalised, an assessment by a qualified acoustic consultant be conducted prior to installation to determine any requirements for acoustic treatments.

11.3 NSW Road Noise Policy – Traffic Generation

Traffic generated by the development is predicted to comply with the NSW Road Noise Policy criteria at all nearby residences except for those where the criteria are exceeded by existing traffic. Compliance is predicted with the Relative increase criteria for all residential land uses. Noise from road traffic generated by the site is predicted to be below the relative increase criteria of 2dB.

11.4 Vibration

Vibration associated with truck activity and onsite activities is predicted to comply with the relevant NSW guidelines at the nearest sensitive receivers. We recommend that any vibrating equipment used onsite is adequately isolated to prevent vibration issues to nearby receivers and is reviewed by a qualified acoustic consultant.

11.5 Aircraft Noise

Based on the predicted noise impacts presented in Section 10, no further treatments would be required.

12 Conclusion

An environmental noise assessment was conducted for the proposed warehouses to be located at 771-797 Mamre Road, Kemps Creek. On the condition the recommendations detailed in Section 11 are implemented, the development is predicted to comply with the Mamre Road Precinct DCP 2021, the NSW Noise Policy for Industry and Penrith City Council's assessment requirements.

If you should have any queries, please do not hesitate to contact us.

Report Prepared By



Matthew Bechara M.ArchSci MAAS
Senior Acoustic Consultant

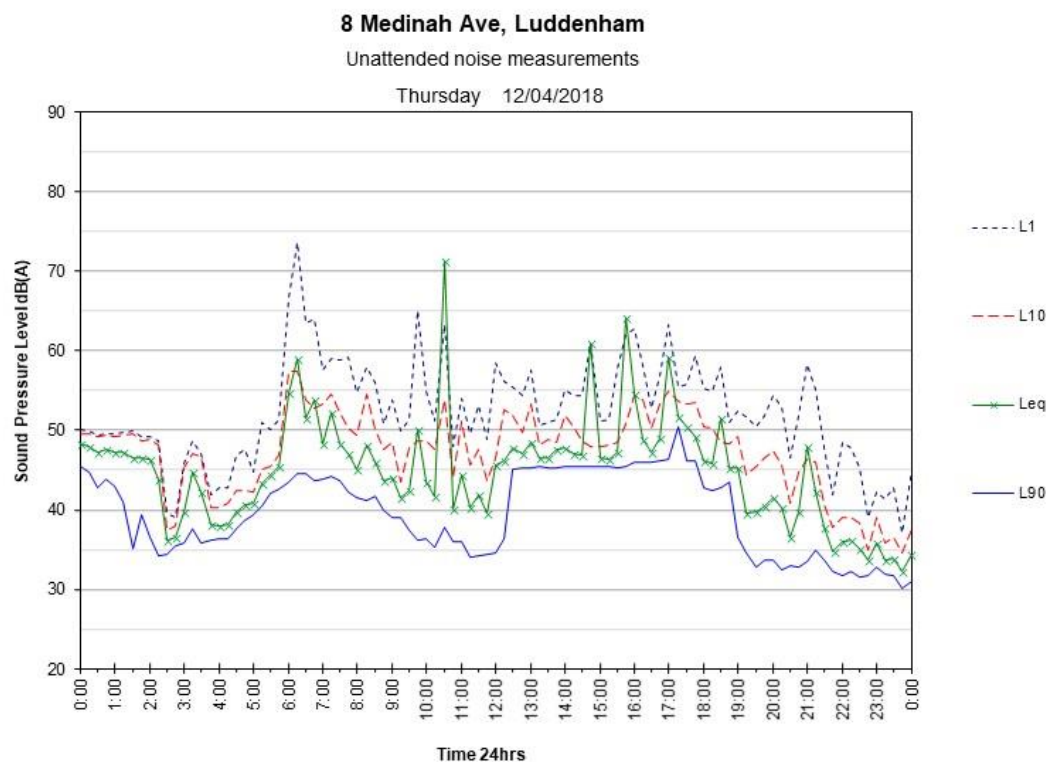
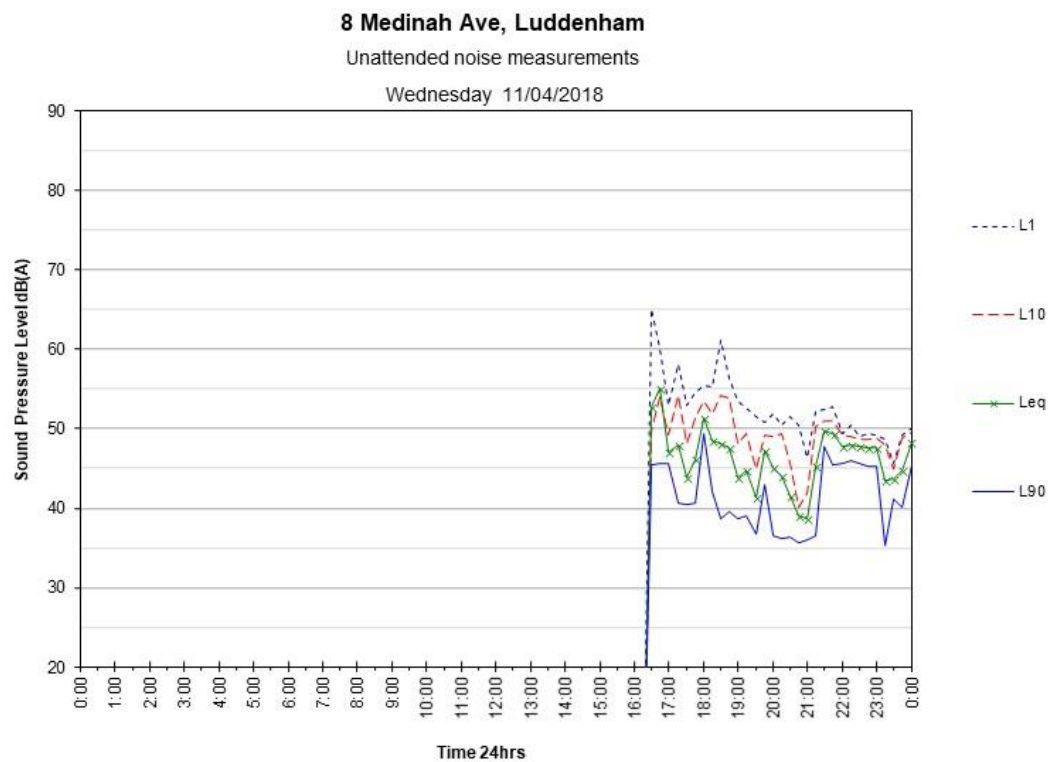
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13 Appendices

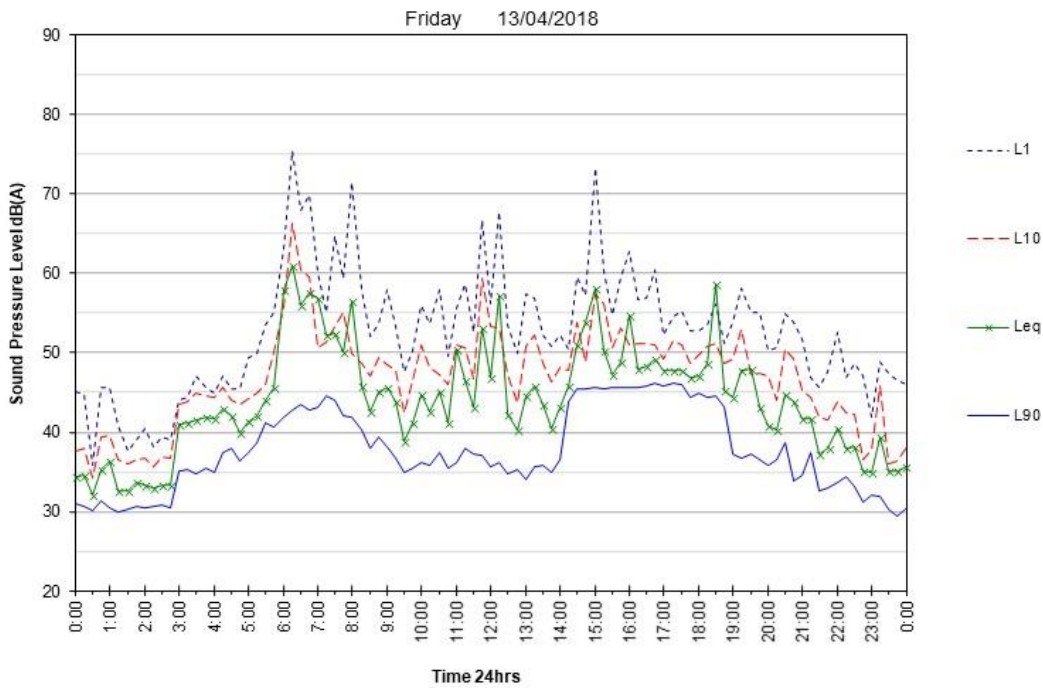
13.1 Development Plans



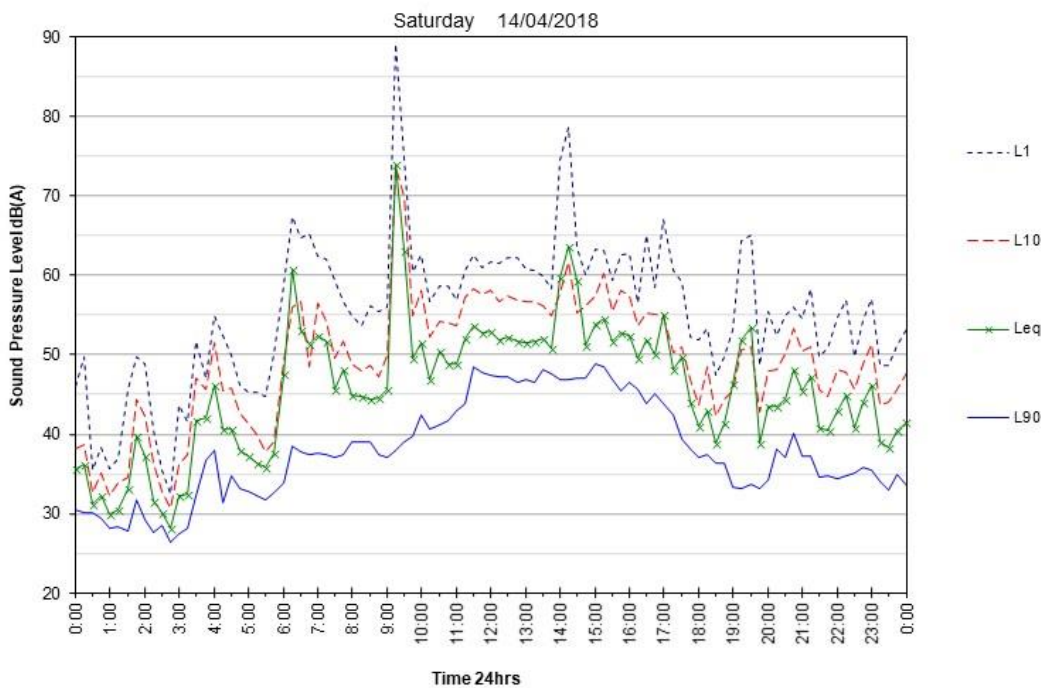
13.2 Noise Monitoring Charts
13.2.1 8 Medinah Avenue, Luddenham



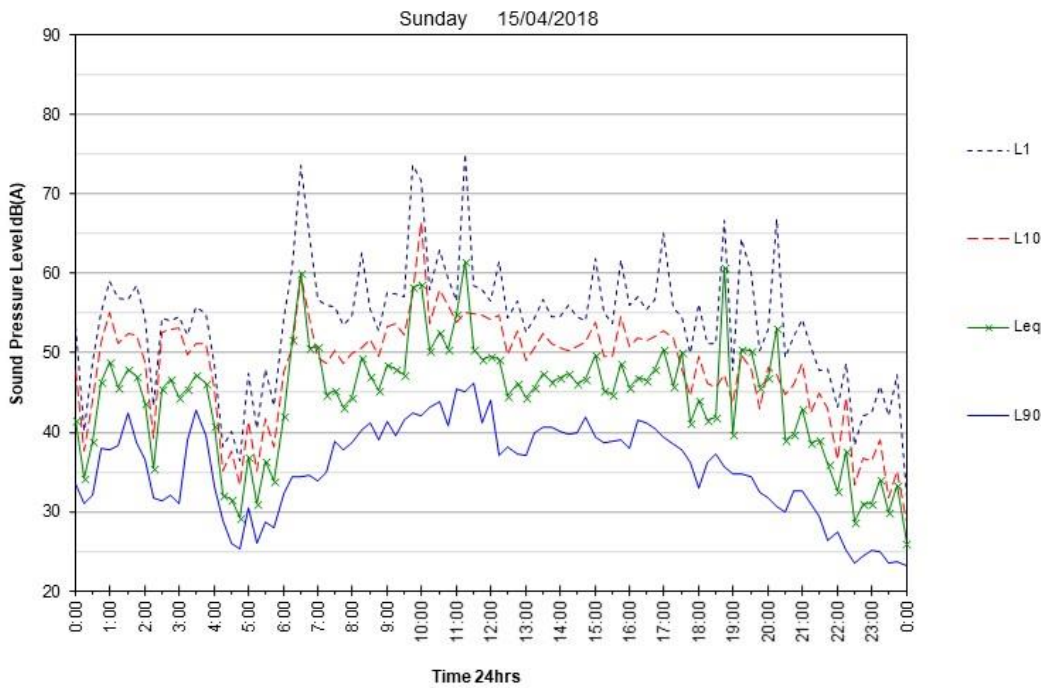
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Unattended noise measurements



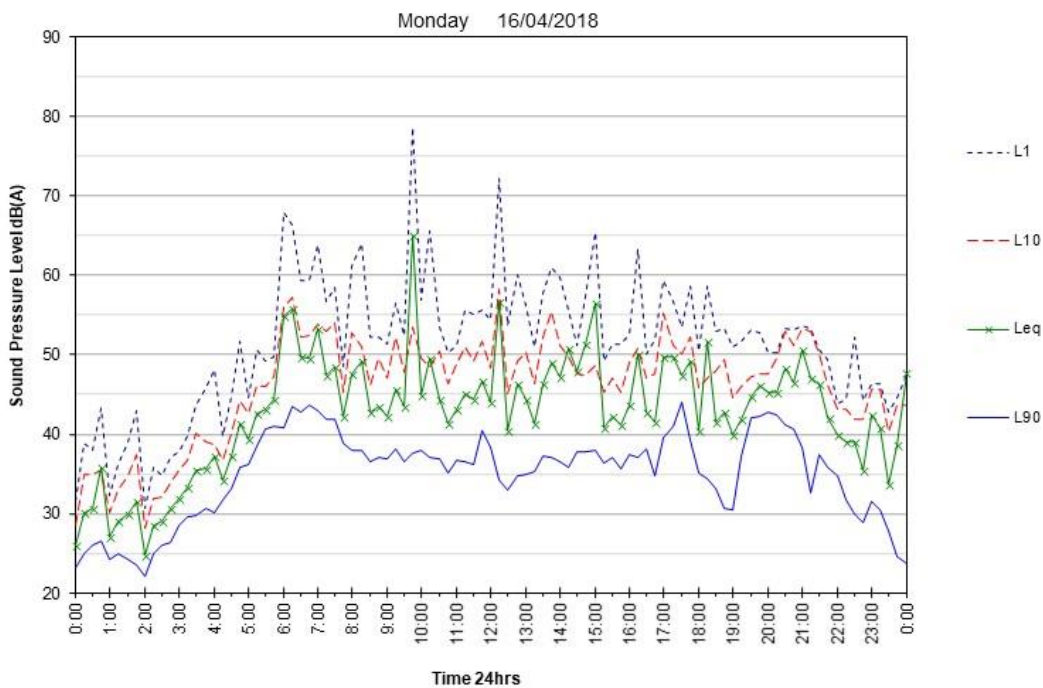
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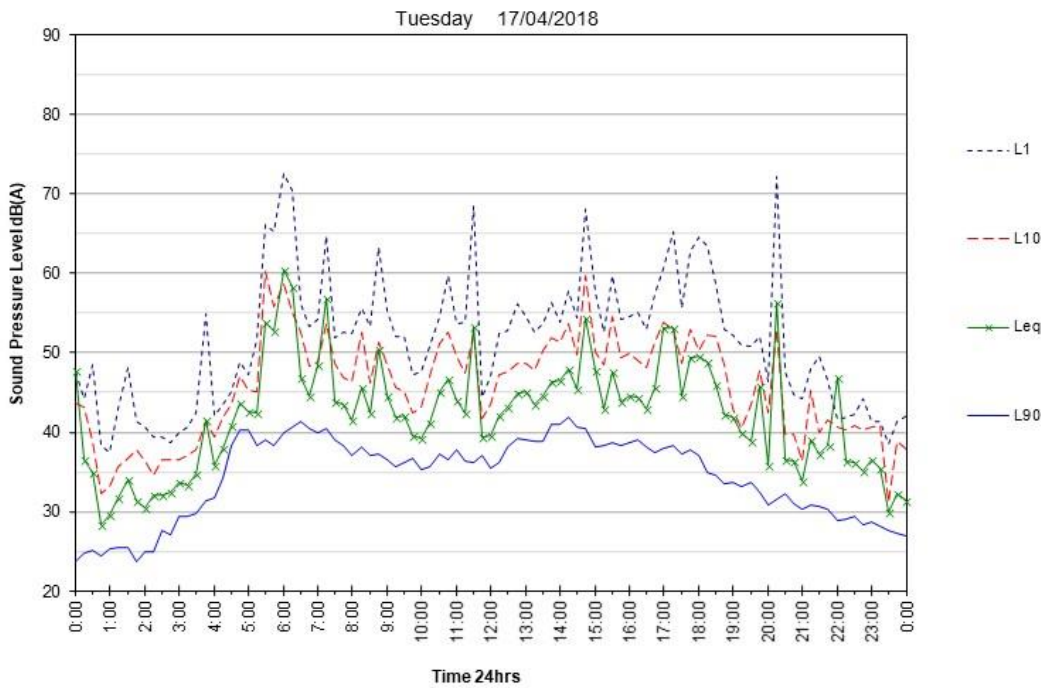
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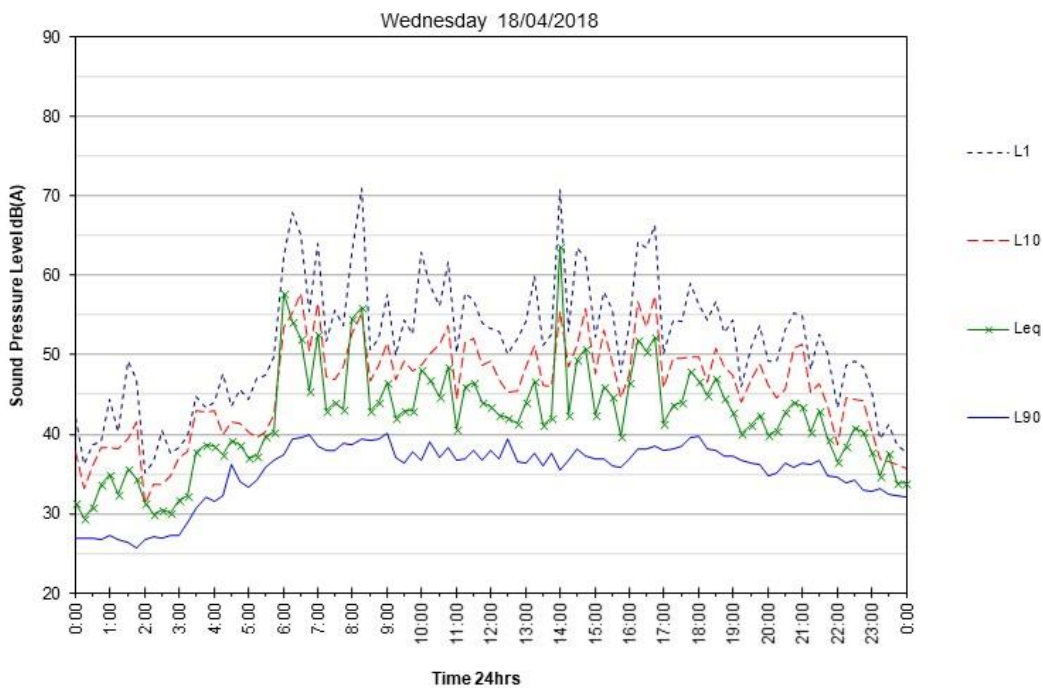
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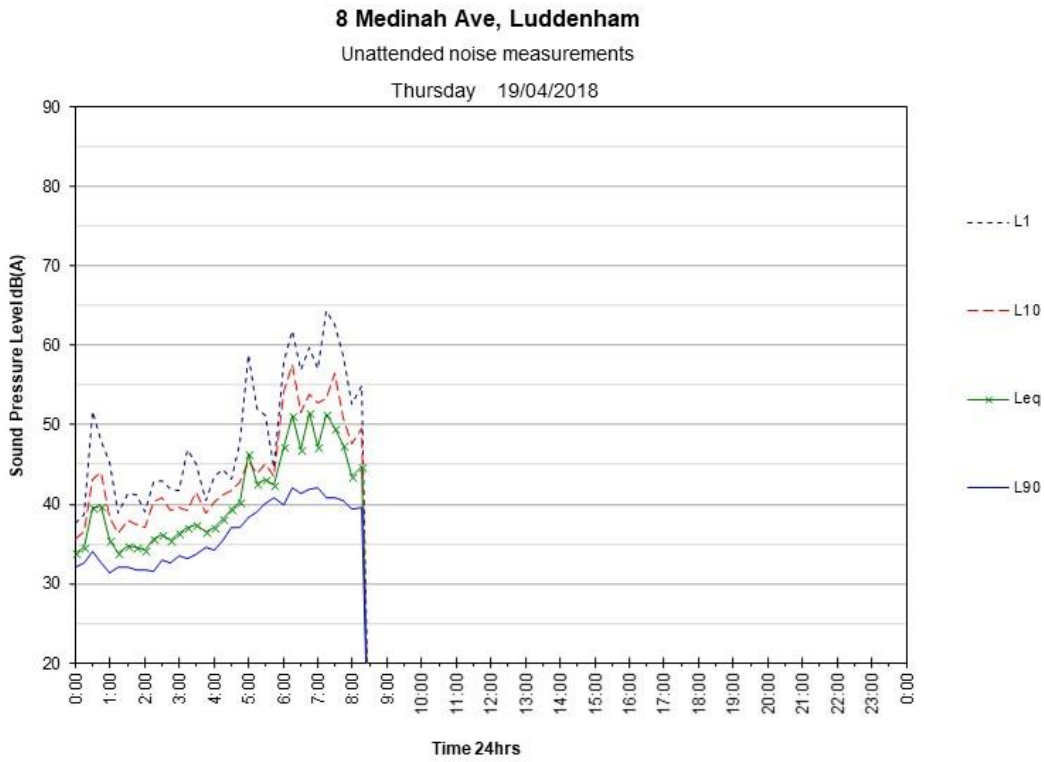


8 Medinah Ave, Luddenham
Unattended noise measurements



8 Medinah Ave, Luddenham
Unattended noise measurements





13.2.2 676-702 Mamre Road, Kemps Creek

