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18 January 2022

City of Ballarat
PO Box 655
Ballarat VIC 3353

Attention: Mish Watt

Dear Mish

REVIEW OF ADDITIONAL INFORMATION PROVIDED BY ALC

A town planning application has been submitted to the City of Ballarat (Council) for a residential subdivision at Lot 1 Heinz Lane, Invermay Park, located in Ballarat. Acoustic Logic Consulting (ALC) have prepared an acoustic report that Marshall Day Acoustics Pty Ltd (MDA) have undertaken a peer review that is documented in letter reference: *Lt 002 20200608 Peer Review – Lot 1 Heinz Lane Invermay* (Lt 002).

Council has requested that MDA undertake a further follow up review, of ALCs response to the peer of their assessment. The ALC response is documented in their letter: *202111112BAWA_R4_Response_to_MDA_Comments (ALC Response)*. A reference extract of the ALC response letter is included in Appendix A.

Reference throughout this letter to the Noise Protocol refers to EPA Publication *1826 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues.*

MDA Summary comments

Document reviewed: 202111112BAWA_R4_Response_to_MDA_Comments

Our comments to the ALC Response are provided in Table 1.

Table 1: MDA Response comments

MDA Ref No.	MDA Comment
1	While it is acknowledged that ALC have taken further steps to review the current operation of the industrial area, as previously raised Council have confirmed that the area, at present, has no limit to the period of operation. It is recommended that AL consider the impact of the industrial area under a scenario where operations occur during the evening and night. If the industrial area operates during these periods, now or in the future, this may result in the need to stop or curtail their operations.
2	Given ALC have not included an assessment of noise from the Boral Asphalt plant, there remains a risk that noise from this site has not been properly accounted for. However, the risk appears to be low given ALC's reporting that noise from the Boral site was inaudible during operation of the plant during the day, evening and night periods.
3	Noted

MDA Ref No.	MDA Comment
4	Given the supplementary noise measurements are higher-than-neutral background conditions, what noise sources are contributing to the ambient noise level in this location? Have the supplementary measurements been reviewed to consider the weather conditions i.e. wind speed, wind direction, precipitation etc as per the Noise Protocol methodology?
5	Noted
6	It is acknowledged that the modelling of traffic noise will consider favourable wind conditions. However, as per Item 4, we request that ALC outline the weather conditions taken into account for Location 7 (i.e. the industrial noise monitoring location) and also the supplementary noise monitor location to measure noise from the Boral facility in the north-west of the site. It would be expected that this is discussed in the AL report, and the impact on the assessment detailed.
7	Noted.
8	Noted. However, how was the supplementary monitoring provided in Table 3 used in the assessment, if at all?
9	See comment No.4
10	Noted. This was missed in the review as note was on the page over, further there was confusion with the cross reference provided in Table 6 Note 1 that also refers to Table 7 On the basis of the note provided to Table 7, it is understood that freight trains passes did/do occur during the night period. Have ALC any further comments to provide regarding potential impact on dwellings and/or sleep disturbance?
11	Noted.
12	Noted. Confirm how adjustments for noise character have been considered as per the Noise Protocol
13	It is acknowledged that ALC have undertaken further assessment of activity from the industrial are to the west of the development site. We note that the assessment considers a mix of plant and equipment that was operation at the site during the site investigation, however we provide the following comments 1. Have all noise sources been documented? Particularly regarding the Hasco Foundary 2. ALC to confirm that the requirements of the Noise Protocol have been followed when assessing the effective noise level. This includes tonality adjustment, impulse adjustment and intermittency adjustment 3. Have vehicle deliveries and collections been taken into account in the assessment?
14	As per note No. 12 and 13 confirm how adjustments for noise character, and sources such as deliveries have been considered as per the Noise Protocol
15	Noted.
16	Note the response to No.2 The response lacks consideration of weather conditions during the noise monitoring, specifically the wind direction and whether downwind conditions were assessed.

MDA Ref No.	MDA Comment
17	While we acknowledge ALC's experience of vibration, they will be aware that ground and sub-ground condition can vary from site to site. If ALC and their client are comfortable that there is no need for further vibration assessment associated with freight trains, this is acknowledged. Council to provide comment on the use and validity of including as part of a Section 32 agreement.
18	While we acknowledge ALC approach and the adoption of a criteria from the Regional Rail Link project, however, using 65 L_{Amax} could be considered, as non-conservative approach for the development.
19	We have undertaken a further calculation of the areas of contribution for the assessment, which result in less than 1 dB difference in the calculations. We are therefore in general agreement with ALC.
20	ALC comments are noted, and it is therefore assumed, based on the response, that all ventilation for these nominated properties will be provided by mechanical purposes.
21	Noted
22	Noted. Reviewed in conjunction with the noise contour maps Figure 2 and Figure 3 (page 4 – *ALC Response*)
23	Confirm the metric of the traffic data i.e. is it Annual Average Weekday Traffic (AAWT) or does it represent 18-hour conditions?
24	Noted
25	If a similar noise level has been measures at Position 7 and 8 then it would be a reasonable assumption to use the same L_{Amax} level for the length of track. ALC to confirm that the model been calibrated to confirm that the L_{Amax} level is as per the level measured at Position 7 and 8.
26	Noted This was noted given that the trains will likely slow down on approach to the level crossing on Heinz Lane, and then speed up moving away from the level-crossing. If ALC observations are that train speed remains constant, and there is no variation in the track (i.e. points), then we have no further comments.
27	We accept that the investigation threshold levels referenced for this project are the same as those on other sites, though there is no specific overlay for this site outlining applicable criteria. We accept that the external rail levels are under (or at) the investigation thresholds outlined in the PRINP. We assume that the acoustic treatment outlined in Section 7.3 would allow internal short-term maximum noise levels associated with train movements at night to achieve the sleep disturbance criteria.
28	See No. 12 and 14 Council to provide comment on the use and validity of including as part of Section 32.
29	See No 2, 6 and 15

Further to the items identifies and comments provided, there still remains no reference by ALC to:

- the Environmental Reference Standard (under section 93 of the Environmental Protection Act 2017) - ERS. Should the ERS be found to be relevant to this assessment, then commentary should be provided.
- The General Environmental Duty (GED) is outlined in Part 3.2 of the Environmental Protection Act 2017 (the Act) which came into effect 1 July 2021.

It may be beneficial that we have a meeting with the Villawood, ALC and council, this may assist all parties with any misunderstanding/interpretations

If you have any comments or questions, then please do not hesitate to call.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD

Ian McNally

Associate

APPENDIX A ACOUSTIC LOGIC (ALC) LETTER: 202111112BAWA_R4_RESPONSE_TO_MDA_COMMENTS

MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

20180001.3/1211A/R4/BAW

13/10/2021

Villawood MGC Pty Ltd
PO Box 1104
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Attn: Julian Perez

330 Heinz Lane, Invermay Park - Response to MDA Comments

1 INTRODUCTION

This letter details our response with respect to the peer review by Marshall Day Acoustics dated 5 October 2021 with reference "Lt 0002 20200608 Peer Review – Lot 1 Heinz Lane Invermay.docx" (MDA Review).

To further confirm existing conditions and noise emissions, AL has undertaken additional inspection of the industrial precinct located to the west of the subject site and the Boral facility. Additional noise monitoring was also undertaken at both the subject site as well as immediately opposite the Boral facility. Appendix 2 and 3 presents the results of testing, equipment used and measurement locations to supplement monitoring conducted at the site.

2 AREA DESIGNATIONS

To ensure consistency we note that to remove confusion we confirm the following

1. Area A and Area 1 on the subject site represent the same area on the site
2. Area B and Area 2 on the subject site represent the same area on the site

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3 MDA REVIEW

3.1 ITEM 1 – SECTION 2 SITE DESCRIPTION – PAGE 4

1	High	Section 2 Site Description, Page 4	How have the industrial area premises been identified? MDA seek clarification from ALC that the operation times that have been included in the report are representative of site operations, not solely times when the premises are open to the public. Should the premises operate in the evening and night periods, the assessment should consider the impact during these times.

The industrial area premises directly adjacent to the proposed development were initially identified by a high-level assessment utilizing Google Maps. Visual inspection was subsequently undertaken during noise measurements to validate the Google Maps imagery.

AL's additional site inspections (including a site attendance before 7am on 28 October 2021) and review of measured noise levels via audio playback indicates that the industrial premises operate between 7am to 6pm Monday to Friday ie day time period.

Review of audio recorded from the noise monitor installed on Location 7 as presented in the report prepared by Acoustic Logic dated 4 August 2021 with reference 20180001.2/0408A/R7/BAW indicated **no** industrial noise was audible at that location during the evening and night-time periods.

Further additional supplementary noise monitoring conducted at approximately the same location at (Location 7) was undertaken from 22 to 28 October 2021 (Refer Appendix 2). Audio play back from the monitor also confirms that no industrial noise is audible during the evening and night periods at this location.

On that basis we consider that assessment of industrial noise associated with the industrial units to the west of the site during the evening and night periods is not required.

3.2 ITEM 2 – SECTION 2 SITE DESCRIPTION – PAGE 5

2	High	Section 2 Site Description, Page 5	Boral Asphalt Facility MDA seek clarification from ALC that the operation times for the Boral Asphalt Facility that have been included in the report are representative of site operations, not solely times when the premises are open to the public. Should the premises operate in the evening and night periods, the assessment should consider the impact during these times. MDA also seek clarification of times when deliveries/logistical operations would occur at the Boral Asphalt Facility.

AL has conducted supplementary noise monitoring from 22 to 28 October 2021 at the location indicated in the figure below.

Figure 1 – Supplementary Noise Monitoring for Boral facility

Audio playback of monitoring conducted indicate that the Boral facility is inaudible at this location throughout the monitoring period. Inspection on Old Midland Highway on 22 October 2021 (at 1pm) indicated that Boral facility was in operation, and on 28 October 2021 (at 6:30am) indicated that the Boral facility was in operation during a night-time period.

Given noise levels from Boral operation are inaudible at the subject site ***no further assessment is required*** and ***noise levels are acceptable from operation of the Boral Facility at the subject site*** noting that the facility was in operation including evening and night time periods.

3.3 ITEM 3 – SECTION 2 SITE DESCRIPTION – FIGURE 2 – EXTENT OF BERM

3	Medium	Section 2 Site Description, Figure 2 – Extent of Berm, Page 5	The extension of the berm is not explained in the report. It is assumed that this will assist to mitigate the propagation of traffic noise across the site? What degree of noise mitigation does the berm provide?

Appendix 1 presents detailed information on the proposed berm. The following comments are provided

1. The berm will be a natural berm constructed from soil and fill
2. Will be an extension of the existing natural berm located directly to the east.
3. Comparison of noise from vehicle movement on the Western Freeway with and without the berm is presented below.
4. Analysis indicates that construction of the berm will reduce noise levels by approximately 2 dB(A)

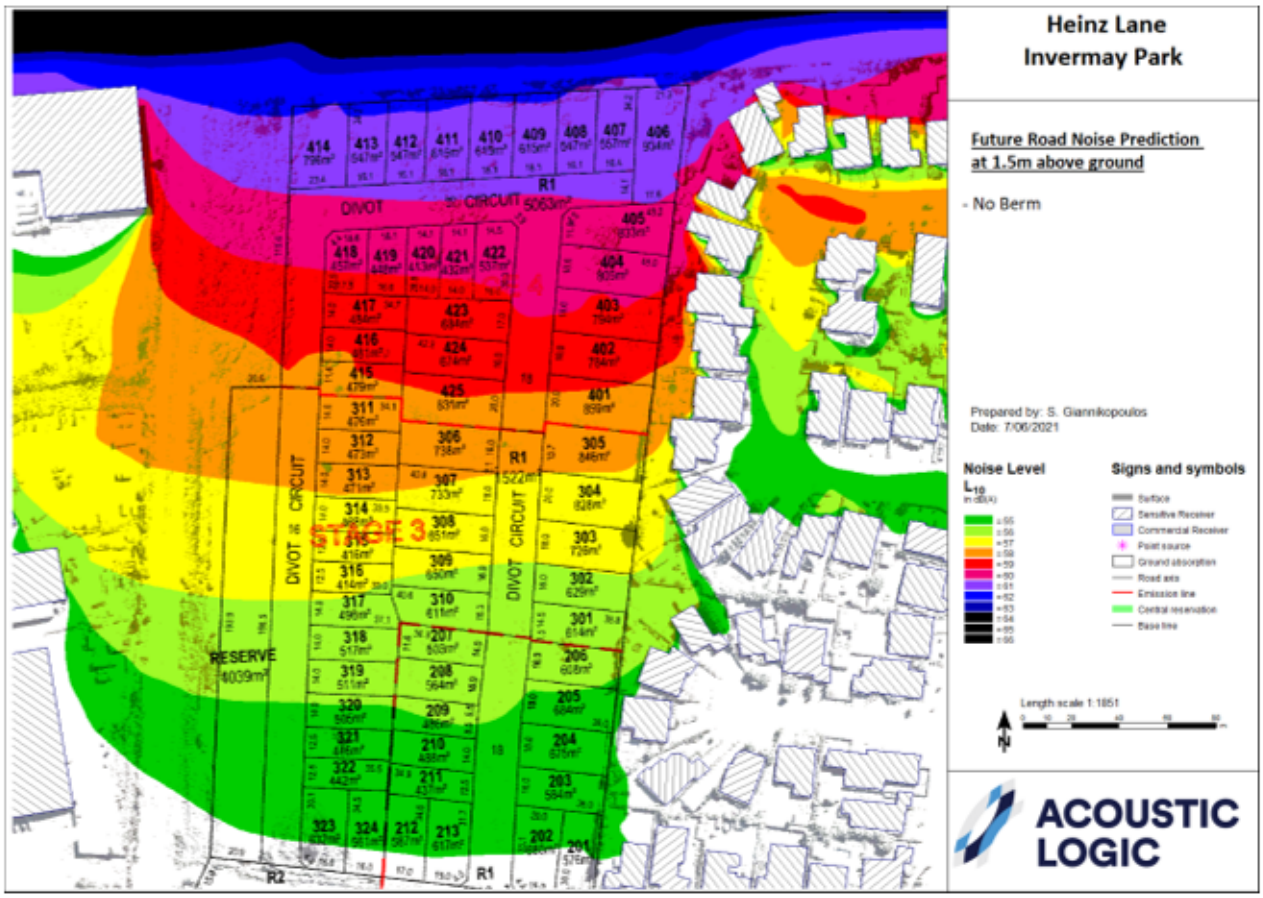


Figure 2 – Predicted traffic noise levels - No Berm

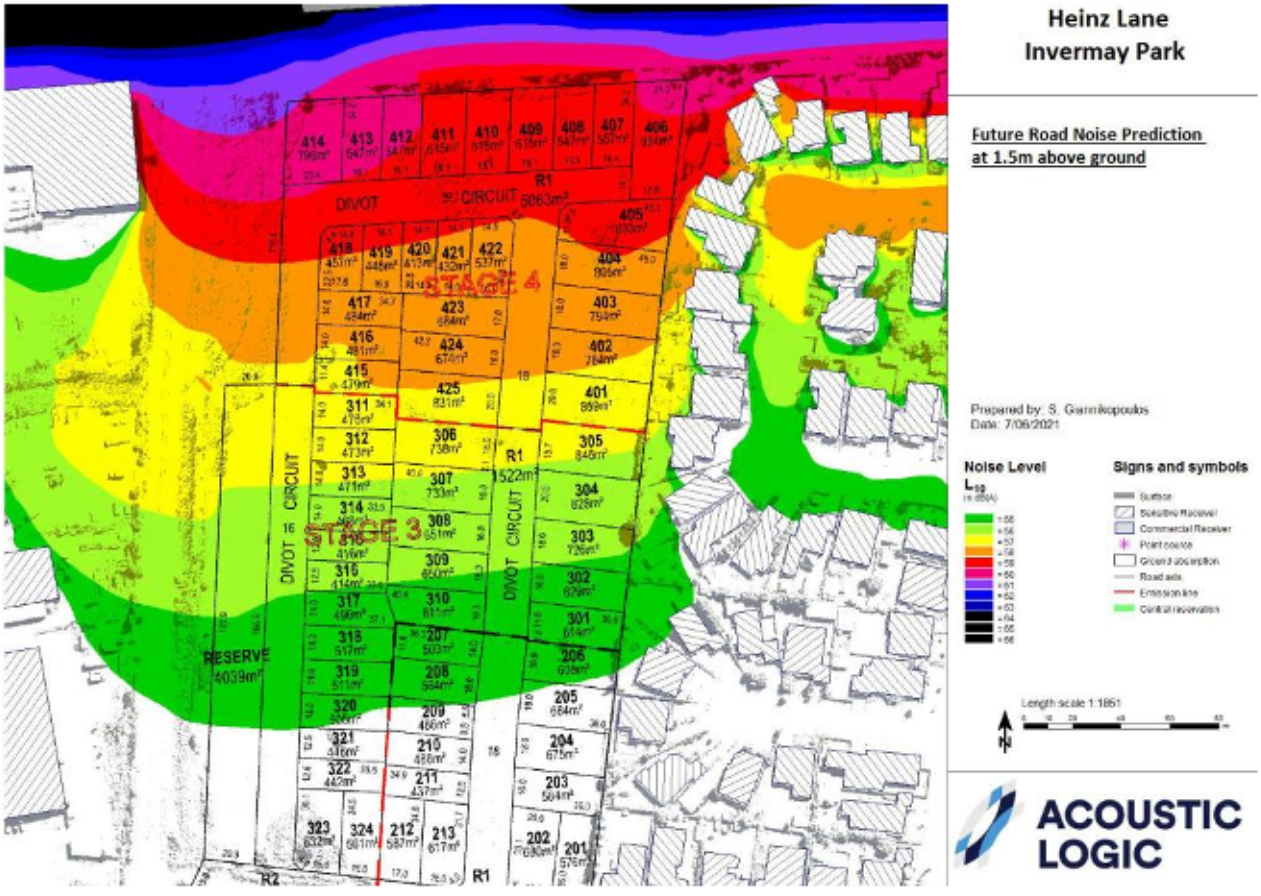


Figure 3 – Predicted traffic noise levels - Berm Installed

3.4 ITEM 4 – SECTION 4 – NOISE LEVEL MEASUREMENT AND SECTION 4.1

4	High	Section 4 Noise Level Measurement and Section 4.1 Measurement Locations, Page 7 and 8	MDA seek clarification from ALC to describe if the background noise measurements are influenced by extraneous noise from surrounding industry? If so, how has this been taken into account when deriving noise criteria?

The noise level is dominated by transportation noise and has been based on measured background noise level and appropriate for site.

In addition, AL has conducted supplementary background measurements in the location indicated in the figure above to validate the results.

Figure 4 – Background noise monitor location

The measured noise levels determined from additional supplementary monitoring are presented in the table below (Refer to Appendix 2)

Table 1 – Additional Measured Background Noise Levels (October 2021)

Period	Time	Measured Background Noise Levels dB(A)$L_{90,period}$
Day	7am-6pm (Mon-Sat)	48
Evening	6pm-10pm (Mon-Sat) 7am-10pm (Sun)	44
Night	10pm-7am	39

Comparison with criteria previously determined criteria and additional monitoring are presented below

Figure 5 – Zoning for EPA Noise Protocol Part 1 Criteria within the Subject Site

Table 2 – Noise Protocol Part 1 Criteria– Original and Supplementary monitoring

Area	Period	Criteria dB(A) Leq		Comments
		Supplementary Monitoring	AL Report	
Area A (Area 1)	Day	57	57	No change
	Evening	51	51	
	Night	46	46	
Area B (Area 2)	Day	54	51	SEPP N-1 noise level criteria increases compared to original criteria
	Evening	47	45	
	Night	42	40	

Review of the above indicates that applicable criteria for Area A (Area 1) remains consistent with that indicated previously while Noise Protocol Part 1 noise criteria is marginally less stringent in Area B (Area 2). The modification does not impact the assessment.

3.5 ITEM 5 – SECTION 4.1 – MEASUREMENT LOCATIONS 7 AND 8

5	Medium	Section 4.1 Measurement Locations 7 and 8, Page 8	In reference to the noise measurements undertaken for Location 7 and 8, were the measurements undertaken at the simultaneously? How do these results compare when considering the train horns?

The measurements undertaken at Location 7 and Location 8 were not conducted simultaneously.

1. The noise monitor at Location 8 was installed between 7 and 13 December 2017. The noise monitor at location Location 7 was installed from 6 to 13 May 2021.
2. Measured L_{max} levels at Location 8 were 92 dB(A) L_{max} which are commensurate with those measured at Location 7.
3. The measured L_{max} is governed by both train pass-bys and horn sounding.
4. The levels presented are the highest 95th percentile recorded. Based on visual inspection, the train horn typically is sounded on approach to Heinz Lane level crossing.

3.6 ITEM 6 – SECTION 4.2 – MEASUREMENT EQUIPMENT

6	Medium	Section 4.2 Measurement Equipment, Page 8	MDA requests ALC confirm if a weather station was installed during the site measurements. If not, how was the weather monitored? Which weather BOM weather station was used and how was the weather considered (i.e. wind direction, precipitation etc) in the assessment of the measured noise data?

No weather station was installed during the site measurements. The weather was monitored via the weather station at Ballarat Airport which is summarised below.

Table 3 – Monitored Wind Speed

Date	Typical Wind Speed / Direction
7 December 2017	8-12km/h (south / east)
8 December 2017	9-16km/h (east) - Rain
9 December 2017	10-19km/h (east / north-east)
10 December 2017	6-11km/h (east / north-east)
11 December 2017	4-12km/h (north / north-west)
12 December 2017	5-14km/h (north-west)
13 December 2017	9-27km/h (south)

Notwithstanding the above, noise modelling from traffic noise was based on CoRTN and traffic volumes as indicated in Section 6.1.1. Modelling predicted 59 dB(A) $L_{10,18hr}$ at noise monitor Location 1 (northern boundary of subject site). Modelling was then corrected to the highest measured noise level which is 61 dB(A) $L_{10,18hr}$ based on measured noise levels at Location 1 which provides a more conservative assessment.

3.7 ITEM 7 – SECTION 4.3 – MEASUREMENT DATE

7	High	Section 4.3 Measurement Date, Page 8	As noted in Lt 001. During the noise measurement undertaken between 6 and 12 May 2020, at the time of COVID restrictions, were industrial/commercial premises operating as normal. No discussion is provided as to whether the noise measurements were representative (for example, from industry/commercial activity), other that noting that traffic volumes were likely reduced during the COVID restriction period.

As indicated above additional supplementary monitoring and inspection was done to verify existing operations with respect to the western industrial area. The levels monitored previously and currently indicate that the assessment remains valid with respect to noise emissions and hours of operation of the industrial estate.

3.8 ITEM 8 – SECTION 4.4.1 – TABLE 3

8	Medium	Section 4.4.1, Table 3 Attended Noise Level Measurements (Traffic North Western Freeway), Page 9	As noted in Lt 001. All noise measurements are in the middle of the day. MDA requests that ALC demonstrate how the assessment takes into account potentially higher noise levels during peak hour traffic movements.

AL's assessment was based using CoRTN and the long-term noise monitoring conducted in Location 1 (7 and 12 December 2017) and indicated Appendix 5 of the acoustic report. The monitor continuously measured noise from traffic movements throughout all time periods. Attended noise level measurements detailed in Table 3 are supplementary measurements only.

3.9 ITEM 9 – SECTION 4.4.2 – TABLE 4

9	High	Section 4.4.2 Background Noise Levels, Table 4 – Un-attended Noise Monitor Measurements (Ambient Noise) – Location 7, Page 9	As noted in Lt 001 Also see MDA Ref No.4 ALC to confirm how the background noise data was processed to remove the influence of the existing industrial/commercial premises and rail noise. It is important that that the environmental noise limits are properly determined in accordance with the Noise Protocol, as these are used to assess the potential impact of the industrial zone on the development

Refer to comments per Item 4 above. We confirm the IF levels are correct and criteria are therefore applicable to the site. Supplementary monitoring indicates that the levels originally reported are also correct and those for Area B (Area 2) based on the additional monitoring and presented in the AL report are conservative compared to that confirmed set out in the Comparison table above.

3.10 ITEM 10 – SECTION 4.4.3 – TRAIN NOISE LEVELS

10	High	Section 4.4.3 Train Noise Levels, Page 10	Section 2 makes reference to both passenger and freight use of the rail line. No distinction between train types has been provided in the assessment. Based on our experience, freight trains are typically a higher noise level compared with passenger trains. ALC to confirm whether the assessment takes into account freight train movement.

The assessment includes Freight movements. Note 1 in Table 7 on page 11 of the report identifies what have been assumed to be freight train pass-bys based on audio playback from the noise monitor.

3.11 ITEM 11 – SECTION 4.4.3 – TRAIN NOISE LEVELS

11	Low	Section 4.4.3 Train Noise Levels, Table 6 – Measured Train Noise Levels, Page 10	What was the L_{Amax} dB noise level associated with the train horns at Location 8? How do these compare with Location 7?

Refer discussion in Item 5 above. Note that the monitoring data has been used from both locations to undertake assessment.

3.12 ITEM 12 – SECTION 4.4.4 – INDUSTRIAL NOISE LEVELS

12	Low	Section 4.4.4 Industrial Noise Levels, Page 11	The report does not provide information about how various noise sources have been identified for the unattended measurements at Location 7 and 8. MDA seek clarification from ALC to describe how different noise sources were identified.

Refer to Appendix 3 which identifies the various noise sources for the industrial noise to the west of subject site.

3.13 ITEM 13 – SECTION 4.4.4 – INDUSTRIAL NOISE LEVELS

13	High	Section 4.4.4 Industrial Noise Levels, Page 11	The noise measurements used in the assessment are noted to have been undertaken in 2017. MDA seek clarification from ALC that the measurements remain representative of the activities in the industrial precinct.

Refer Appendix 3 for our comments with respect to the western industrial area. Supplementary measurements indicate that current operation of the Industrial area has not changed and as such are representative.

3.14 ITEM 14 – TABLE 8 – MEASURED INDUSTRIAL NOISE LEVELS

14	High	Table 8 – Measured Industrial Noise Levels, Page 11	The following comments apply to all data provided in Table 8: • Not clear what the $L_{eq,\ 30\ mins}$, dB includes, in the data provided i.e. activities, sources of noise and influence, • Is this the highest $L_{eq,\ 30mins}$, dB, across the monitoring period? • Has allowance been made for types and duration of noise generated at each industrial site? Have adjustments been made for noise character i.e. tonality, impulse, intermittency?

Refer our discussion in Appendix 3. We note that the industrial noise levels comply with EPA Noise Protocol Part 1 day time criteria.

3.15 ITEM 15 – TABLE 8 – MEASURED INDUSTRIAL NOISE LEVELS

15	High	Table 8 – Measured Industrial Noise Levels, Note 1, Page 11	See comment MDA Ref No 1 and 2

Boral asphalt is not audible at the subject site nor does it impact proposed residential lots at the sub-division. Noise from operation of the Industrial Area comply with criteria for the day-time period as indicated in Appendix 3. Industrial noise was not audible during the evening and night time period based on monitoring audio playback.

3.16 ITEM 16 – TABLE 8 – MEASURED INDUSTRIAL NOISE LEVELS

16	High	Table 8 – Measured Industrial Noise Levels, Note 2, Page 11	Given the size of the Boral Plant and the nature of their operation, further detail should be provided as part of the ALC assessment to demonstrate that the noise from the operations will not impact on the development site and the presence of noise-sensitive uses in the development site will not curtail Boral's operations. This includes assessment of evening and night operations, if relevant. Also see comments MDA Ref No 2.

Boral asphalt is not audible at the site nor impacts proposed residential lots at the sub-division. Refer our discussion in Item 2 above.

3.17 ITEM 17 – SECTION 5.2

17	Medium	Section 5.2 Train Noise Level Criteria from the Ballarat-Maryborough Railway, Page 12	It is acknowledged that vibration may not be a significant issue for the site from passenger trains. As stated in Section 2, freight train types use the line. These train types can generate significant vibration. It is recommended that ALC provide further information for their justification for not undertaking assessment of vibration.

Vibration measurements were not undertaken based on the location of the two nearest dwellings Lot 222 and Lot 414 being 36 metres and 45 metres from the rail tracks.

Based on past projects we note that tactile vibration at these distances will not impact human comfort and as such residential dwellings will not require vibration isolation.

AL has assessed residential and noise sensitive developments adjacent to rail corridors since 1994 including sub- division projects similar to the subject site. Examples of projects include Bradmills, the regional rail link and others clearly indicate that vibration isolation to the rail corridor with setbacks significantly closer to the rail corridor do not require isolation nor assessment of ground borne vibration.

Further, Lot 1 (Stage 1) which is currently under construction has been issued a Planning Permit without condition and does not require isolation. For Lot 2 (stages 2-4) all proposed Lot's within the subdivision (with the exception of lot 222) are located further from the rail corridor than those in Lot 1 (Stage 1).

Based on the above, we confirm that no assessment for vibration associated with the rail corridor is required.

In addition, it has been confirmed by Villawood that the Purchasers have been advised of the proximity of the development to the rail corridor as indicated in Section 32.

3.18 ITEM 18 – TABLE 11

18	Medium	Table 11 – Internal Railway Noise Level Criteria for Dwellings within Zone of Influence, Page 13	The L_{Amax}, dB criteria level is high if there are multiple events occurring at that level. If as noted there is only ONE event then the L_{Amax} 65 dB could be considered acceptable. It is recommended that the Sleep Disturbance criteria set out ion NSW Road Noise Policy 2011 is considered, that concludes: • *Maximum internal noise levels below 50-55dB L_{Amax} are unlikely to awaken people from sleep* • *One or two events per night, the maximum internal noise levels of 65-70dB L_{Amax}, are not likely to affect health and wellbeing significantly*

As indicated in Table 7 there is typically one train pass-by event during the night-time period, whilst two events were noted on 9 May 2021. Based on this, in our opinion the proposed criteria are adequate to address rail noise.

Notwithstanding the criteria have been adopted on other sub-division developments along the Rail Regional link corridor and adopted by other consultants on similar projects. Further the DDO for the Regional Rail Link specifically nominates the criteria nominated by Acoustic Logic as the assessment criteria applicable to development adjacent to the rail corridor. In our opinion the criteria are appropriate and suitable.

3.19 ITEM 19 – SECTION 5.3.1

19	Medium	5.3.1 Zoning Level, Page 14	MDA are in general agreement with the approach to include sets of Zoning Levels given the large size of the site. This provides a view on the likely change in noise criteria across the site. However, reviewing the Zone Levels on the western site of the site MDA calculate that the levels should be 1dB lower for the Day, Evening and Night periods. MDA seek clarification from ALC to confirm the noise limits for the western site of the site.

Our analysis indicates that the zoning level noted in the report are correct.

3.20 ITEM 20 – TABLE 14

20	Medium	Table 14 – Internal Noise Level Criteria, Note 1, Page 15	The internal noise criteria are considered appropriate. MDA request clarification from ALC to determine if alternative methods of background and purge ventilation are to be provided where windows and doors are required to be kept closed to meet the internal noise level criteria?

AL have provided indicative requirements for dwelling construction depending on the applicable zoning requirements which in principle shall incorporate acoustic treatment such as internally lined cushion head boxes, acoustic flexible ductwork or similar treatment.

In addition, AL have specified that the dwellings within the Zone of Influence (noted in Section 7.3 of the report) shall be assessed by a qualified acoustic consultant to meet the nominated performance requirements. This project is not dissimilar to other projects. Where criteria are exceeded, it will necessitate windows to be closed to address external noise intrusion.

It has been confirmed by Villawood that the requirements of Section 7.3 of the acoustic report are noted in the Section 32 and Special Conditions requirements provided to each Purchaser.

3.21 ITEM 21 – TRAFFIC NOISE LEVELS

21	Medium	Section 6.1.1 Traffic Noise Levels, Table 15 – Traffic Noise Levels at 'Measurement Location 1', Page 16	ALC to confirm that Location 1 is representative of the predicted noise levels and is NOT subject to shielding

AL confirm that the predicted noise levels in Table 15 does not take into account the future shielding from the proposed natural berm extension.

3.22 ITEM 22 – SECTION 6.1.1. TRAFFIC NOISE LEVELS

22	Medium	Section 6.1.1 Traffic Noise Levels, Page 16 And 6.1.3 SoundPlan Modelling, Item 1, Page 17	It is not clear from the information in the report or from the noise contour maps provided in Appendix 1, as to how the traffic noise levels have been adjusted to represent measurements at Location 1. It is not possible to validate the approach based on the description provided or through the review of the noise contours provided in Appendix 1. Has the model been adjusted to reflect the measured noise levels? ALC to confirm how the extension of the roadside berm referenced in Figure 2, has been considered to allow for the accurate comparison of the measured noise levels with the modelled noise levels

The traffic modelling was conducted using the following methodology:

- The initial modelling was conducted based on CoRTN analysis which indicate 59 dB(A) $L_{10,18hours}$ at noise monitor Location 1.
- Predicted traffic noise levels were adjusted to obtain 61 dB(A) $L_{10,18hours}$ at noise monitor Location 1 based on the highest measured noise levels as a conservative assessment.
- The traffic flow is further adjusted include increase in traffic movement over the 10 year period.
- The natural berm (detailed in Appendix 1) was added to the north of subject site as indicated in the report.

3.23 ITEM 23 – TABLE 16

23	Low	Table 16 – Predicted Future Traffic Count, Page 6	ALC to confirm the metric of traffic data provided in Table 16.

Table 4 – Traffic Data

Year	Predicted Future Traffic Count	Year	Predicted Future Traffic Count
2020	17,000[1]	2027	18,997
2021	17,272	2028	19,301
2022	17,548	2029	19,610
2023	17,829	2030	19,924
2024	18,114	2031	20,243
2025	18,404	2032	20,567
2026	18,698		

Note 1 – Based on the traffic data provided by VicRoads Open Data Hub.

3.24 ITEM 24 – TABLE 6.1.3

24	Medium	6.1.3 SoundPlan Modelling, Page 17	It is expected that calculation modelling assumptions are included in the report, including propagation conditions, traffic speed and road surface type. MDA requests that ALC outline these model inputs in the report.

Refer the following:

- Propagation condition: 0.5 was used for ground effect.
- Traffic speed: 110km/hr
- The road surface: Bituminous surface

3.25 ITEM 25 – 6.2 TRAIN NOISE LEVEL ANALYSIS

25	Medium	6.2 Train Noise Level Analysis, Page 18	It is not clear why the train horns have been modelled as a moving line source. It would be expected that the measured noise levels could be used as the basis for a point source calculation. It is not possible to validate the noise predictions in the model as the predicted noise levels shown on the contour map do not show levels higher than 90 L_{Amax}, dB (Appendix 2)

To clarify, train horns have been modelled as moving point source. The purpose of the SoundPlan modelling is to indicate the future lots that are within the zone of influence. An updated contour map can be provided to show levels higher than 90 dB(A) $L_{max.}$

3.26 ITEM 26 – 6.2 TRAIN NOISE LEVEL ANALYSIS

26	Low	6.2 Train Noise Level Analysis, Paragraph 4, Page 18	This statement assumes there is no variation in the track, train speed is constant. These are unlikely to be valid assumptions.

We do not agree with the statement, and we believe assumptions are correct for train speed. Observations on site of train movement confirm the trains are constant as they enter the site and progress past the site. (ie no stopping and starting). This has been based on observations of multiple passenger train pass bys from Maryborough heading south past the site were appeared constant. In any case assessment has been based on measured noise levels.

3.27 ITEM 27 – TABLE 17

27	Medium	Table 17 Assessment of External Measured Train Noise Levels, Page 18	The Passenger Rail Infrastructure Noise Policy provides thresholds for investigation and is not a compliance assessment policy. It would be expected that ALC consider Sleep Disturbance, external amenity specified in the Environmental Reference Standard (under section 93 of the Environmental Protection Act 2017) and internal amenity due to rail noise.

We do not concur with MDA. The approach for sub-divisions is consistent with that adopted on other developments adjacent to rail corridors similar to this. Further DDO overlays on other projects have adopted the same design criteria of 65 dB(A) L_{max} and 40 dB(A) L_{eq} 8 hour. Criteria are based on that successfully adopted as part of many estates sub-divisions along the Regional Rail Link.

Notwithstanding, the residential dwellings currently under construction at Lot 1 (directly south of subject site) has the same proximity to the train line and was accepted with no specific acoustic requirements by Council.

3.28 ITEM 28 – SECTION 6.3 INDUSTRIAL NOISE

28	High	6.3 Industrial Noise Level Analysis, Page 18 and 19	The approach adopted by ALC to assess noise from the industrial area needs to be expanded to consider specific noise sources from the various activities that may impact on the received noise levels at the proposed development. Numerous items have been raised in this review that need to be addressed to provide an accurate assessment of industrial noise impacts. Further items that ALC need to consider include: • Further assessment to confirm that operations from the precinct are compliant with the Noise Protocol. For example, a search on Google maps indicated that there is a foundry opposite Lot 221/222. Further, other industry sites along the industrial precinct eastern boundary have storage yards facing onto the proposed development. It is unclear whether these sites have been taken into account in the assessment. • Is there a requirement to preserve the industrial precinct, based on the current assessment it is likely that complaints may be generated from the residents from proposed development

The noise from the industrial precinct to the west consists of activities including angle grinding, pipe cutting, forklift movements which occur sporadically. We confirm that based on measurements / inspection, that noise levels over 30-minute period are governed by the traffic noise from the Western Freeway. In addition, Appendix 3 provides comments with respect to the supplementary measurement / assessment of the western industrial area.

Villawood have confirmed that all Purchasers are made aware of the industrial area to the west via Section 32 and Special Conditions. We also note that the residential dwellings currently under construction at Lot 1 (directly south of subject site) have the same proximity to the western industrial area and was accepted with no specific acoustic requirements by Council.

3.29 ITEM 29 – SECTION 6.3 INDUSTRIAL NOISE

29	High	6.3 Industrial Noise Level Analysis, Page 19	See MDA Ref No. 2 MDA seeks clarification on the following items in relation to noise from the Boral Asphalt Plant: • What analysis has been undertaken to demonstrate that noise from the Boral Asphalt site does not contribute to the subject site, other than attended measurements? (i.e. have calculations been performed?) • Was any noise from the Boral site apparent during lulls in traffic? • Were the measurements undertaken during down-wind conditions? • Is noise from the Boral site apparent during the evening and night period when traffic noise reduces? • Confirm that Boral plant was operational during the noise measurement period

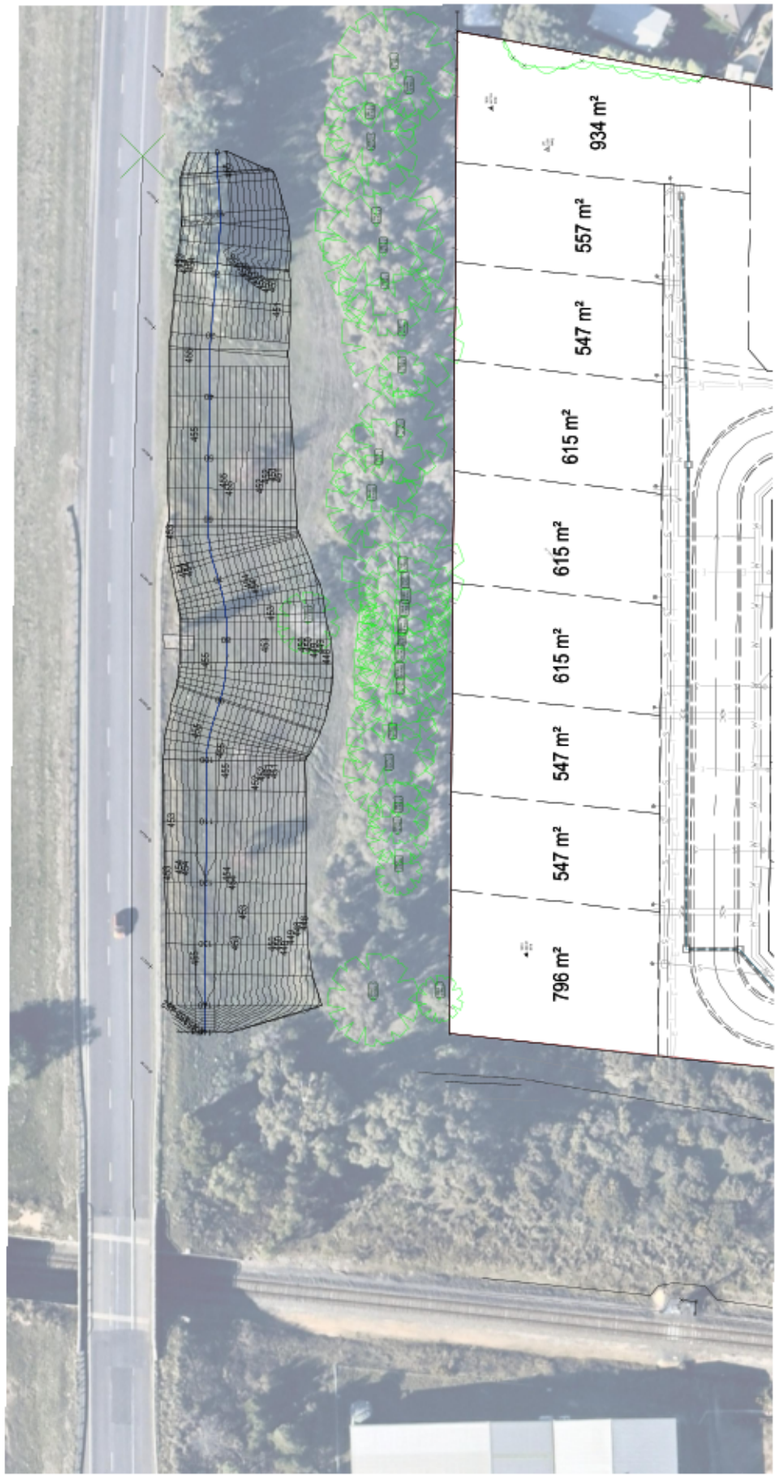
Refer our response in Item 2 above. Supplementary measurements indicate that noise from operation of the Boral facility was not audible at any stage at the supplementary monitoring locations.

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

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Barli Wibisono

APPENDIX 1 – BERM DESIGN



SOUND MOUND BARRIER LAYOUT PLAN

SCALE 1:500

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CLIENT: villawood properties
Communities Designed for Living

PROJECT: Drew's PADDOCK

STAGE 2

CIVIL DRAWING

NORTH

DRAWING TITLE:
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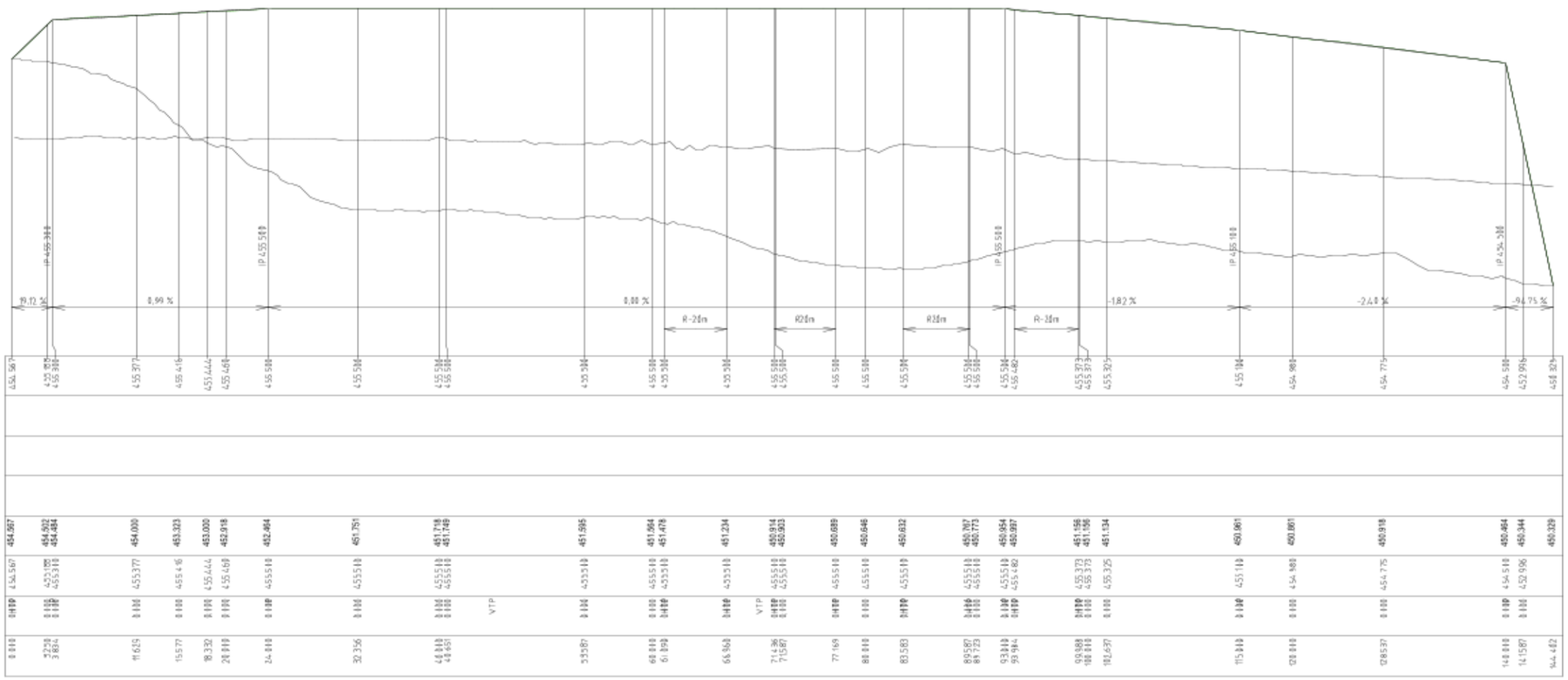

VERTICAL GEOMETRY

HORIZONTAL GEOMETRY
DATUM RL 449.0

DESIGN SURFACE
AT ℄ENTRELINE

LEFT LIP
OF MEDIAN

RIGHT LIP
OF KERB

LEFT LIP
OF KERB

tin ex st4 sound mound

design SURFACE
AT ℄ENTRELINE

DEPTH OF CUT(-)
/ FILL(+)

CHAINAGE

top LONGITUDINAL SECTION

SOUND MOUND BARRIER LONGITUDINAL SECTION
SCALE 1:500

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CLIENT: villawood properties
Communities Designed for Living

PROJECT: Drew's PADDOCK INVERMAY PARK

STAGE 2

CIVIL DRAWING

DRAWING TITLE:
EARTH SOUND BARRIER LAYOUT PLAN

REF. No. 17547-202 | SHEET C25 OF 6 | REV 01

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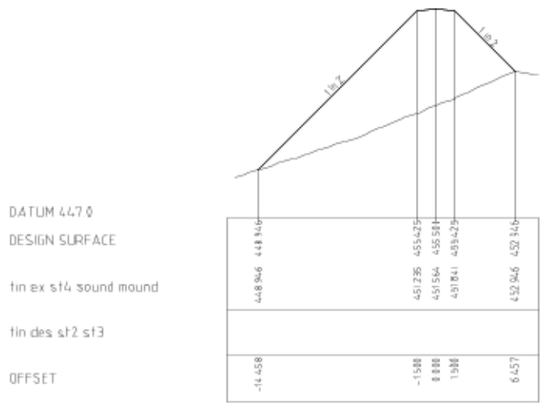

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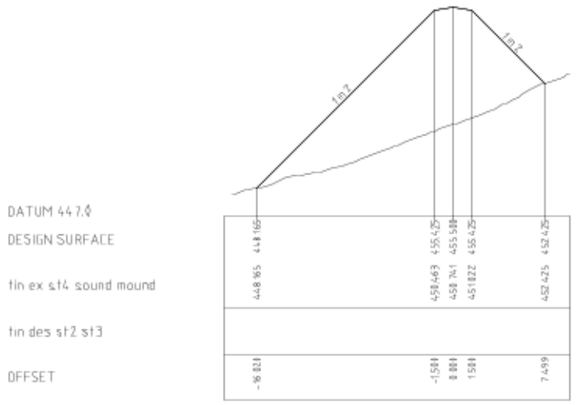

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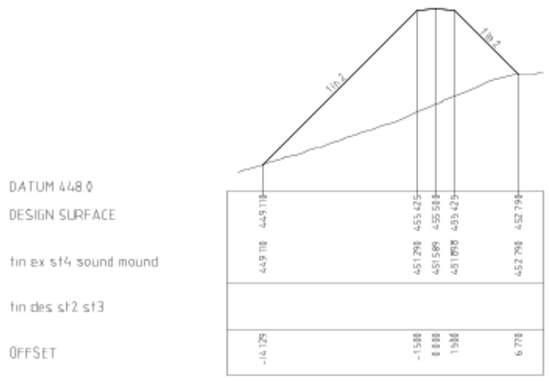

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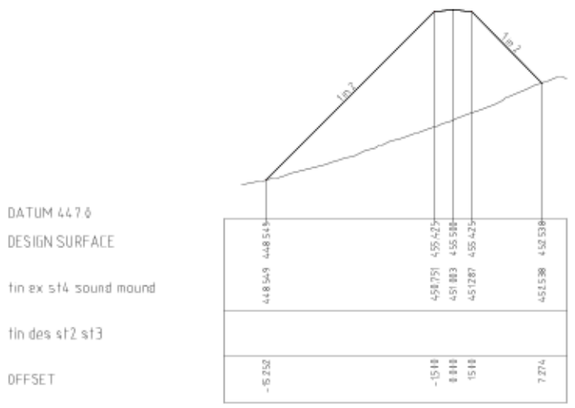

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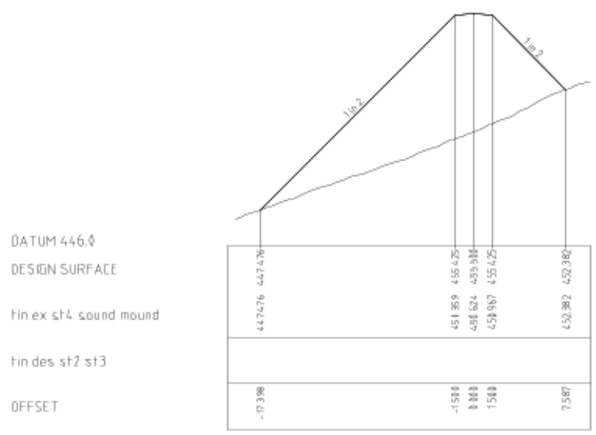

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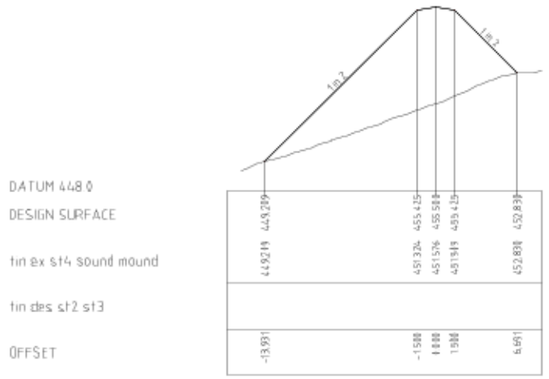

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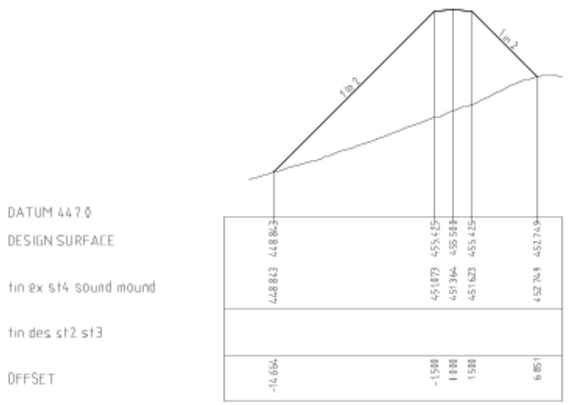

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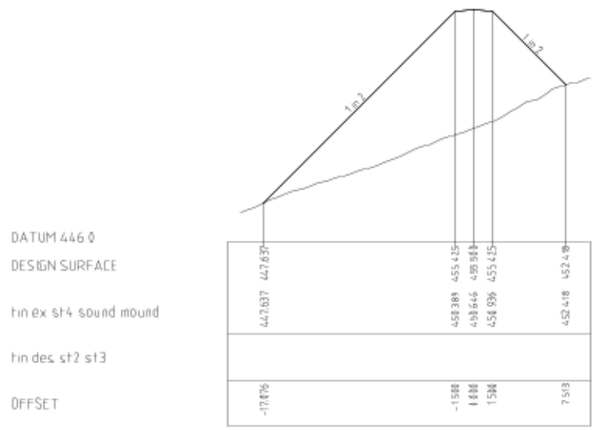

CH. 80.000

SOUND MOUND BARRIER CROSS SECTIONS

SCALE 1:500

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Communities Designed for Living

PROJECT: Drew's PADDOCK
STAGE 2

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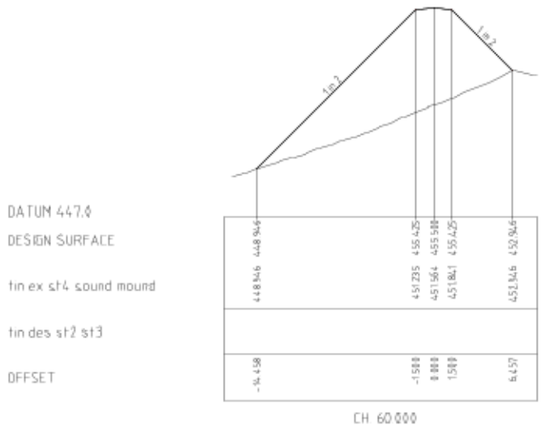

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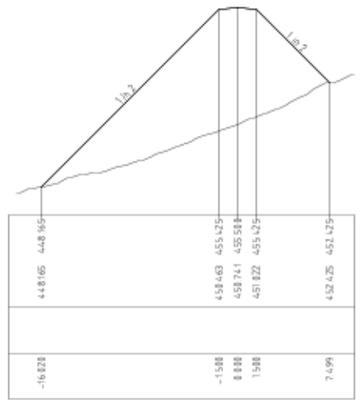

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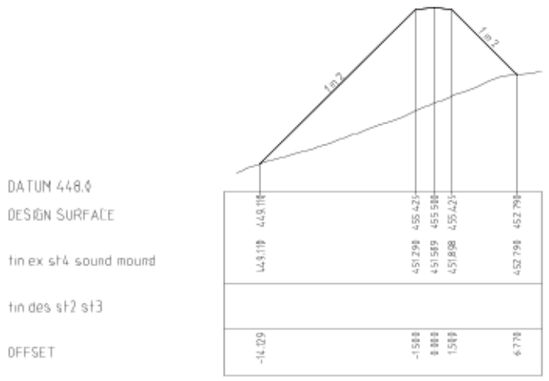

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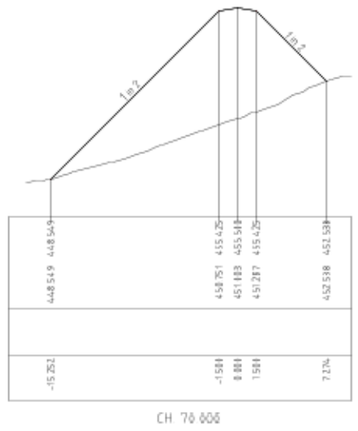

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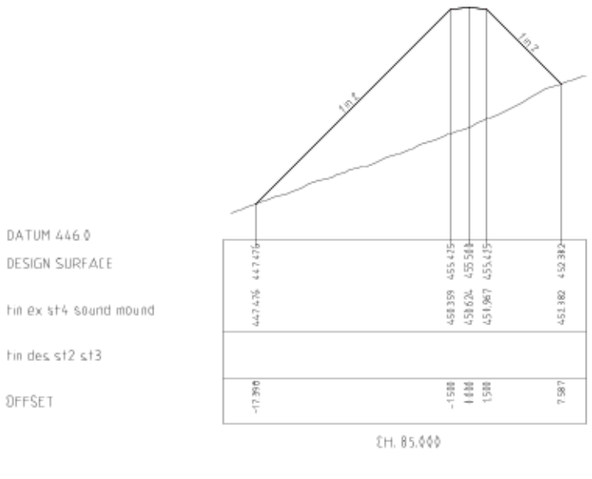

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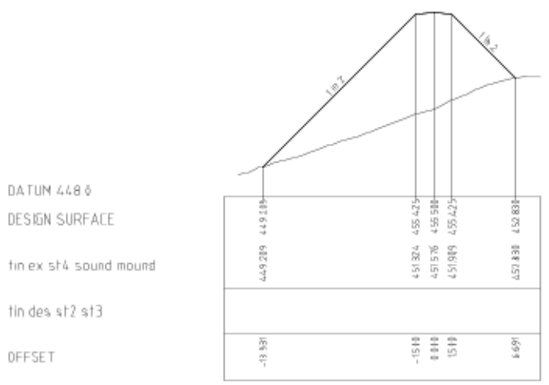

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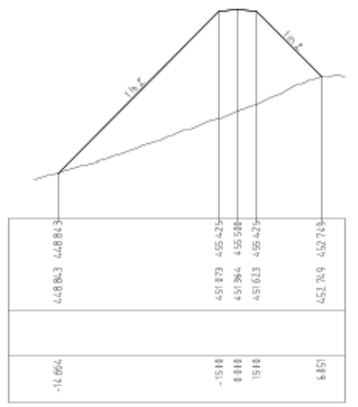

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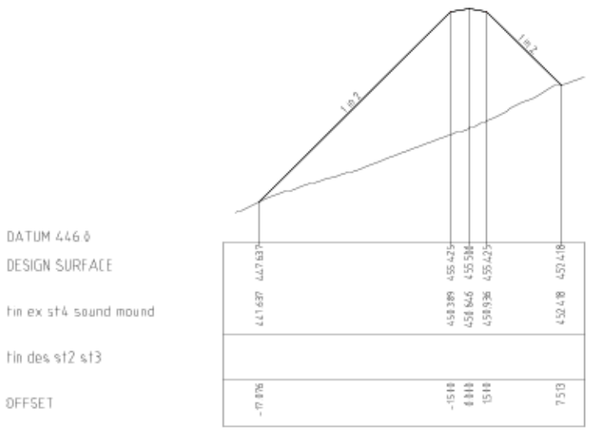

CH 80.000

SOUND MOUND BARRIER CROSS SECTIONS
SCALE 1:500

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PROJECT: Drew's PADDOCK — STAGE 2

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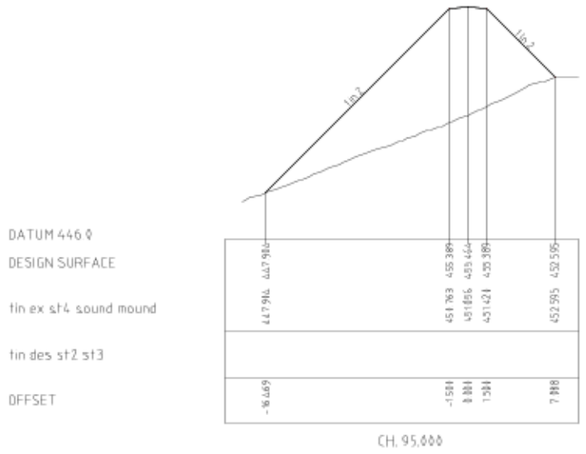

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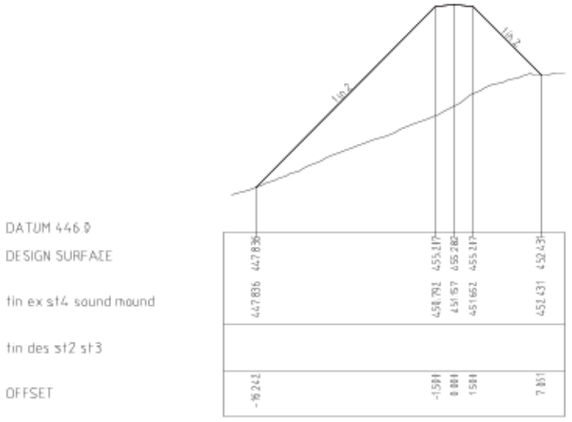

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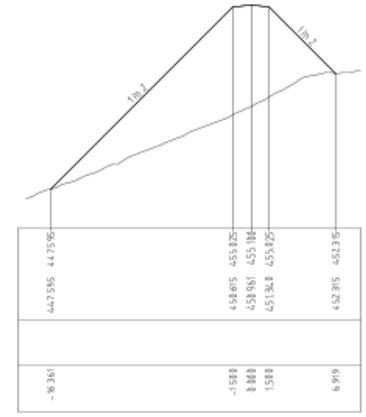

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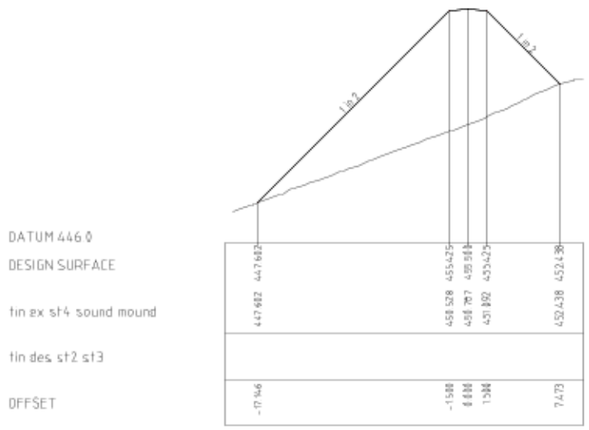

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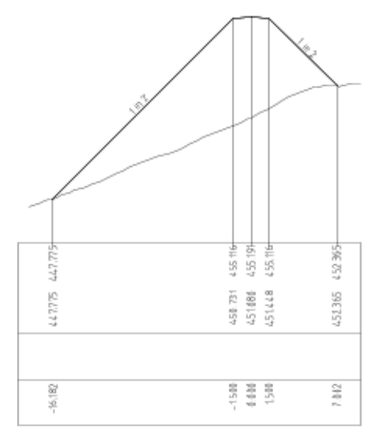

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SOUND MOUND BARRIER CROSS SECTIONS

SCALE 1:500

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STAGE 2

CIVIL DRAWING

DRAWING TITLE: **EARTH SOUND BARRIER CROSS SECTIONS**

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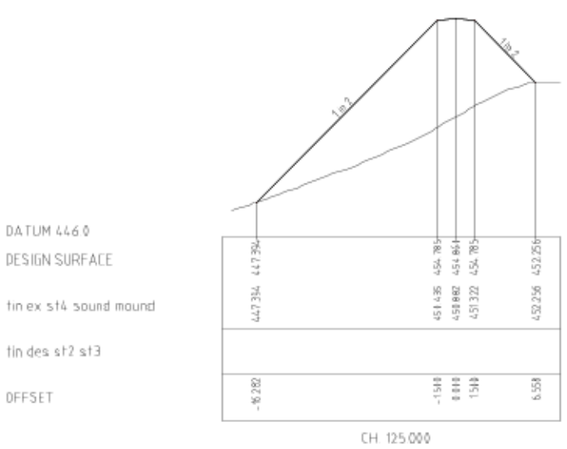

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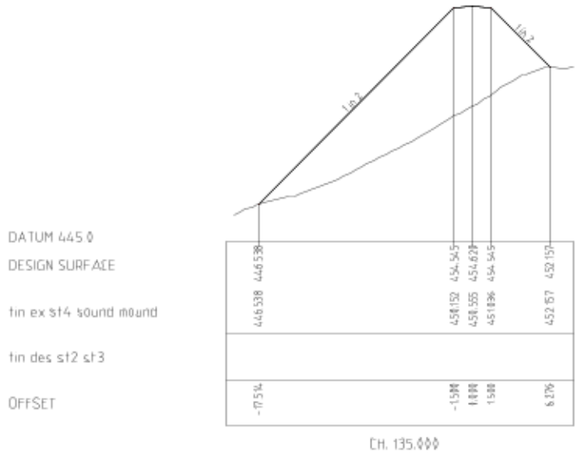

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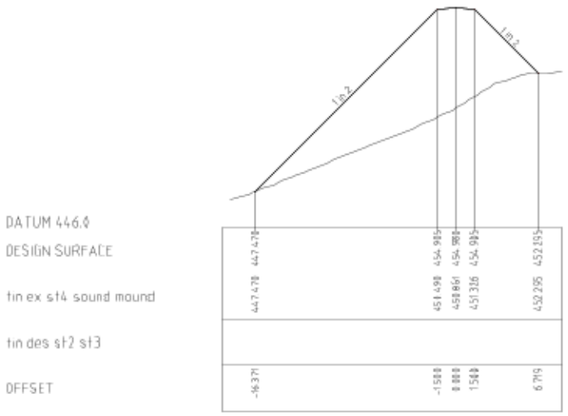

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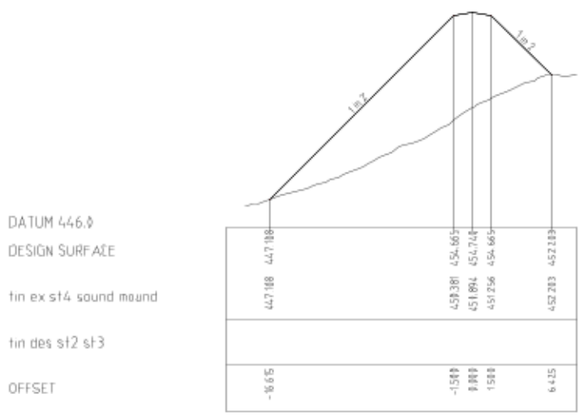

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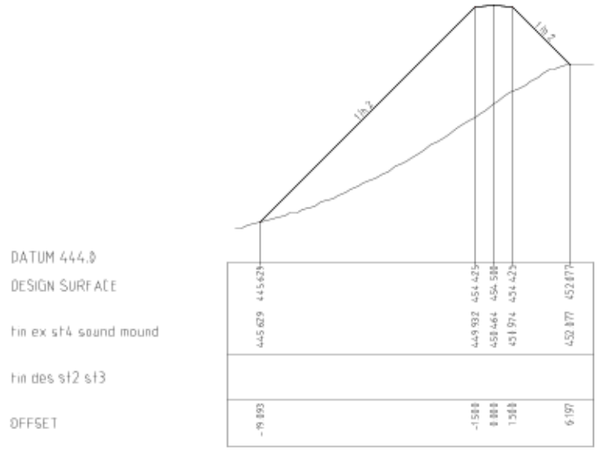


CH 140.000

SOUND MOUND BARRIER CROSS SECTIONS
SCALE 1:500

PRELIMINARY DRAWING
NOT TO BE USED FOR CONSTRUCTION

ISSUE	ISSUED FOR	DATE	DRAWN	APPROVED	ISSUE	ISSUED FOR	DATE	DRAWN	APPROVED
01	PRELIMINARY		DK						

DESIGNED: RD | DATE: JULY 2021
DRAWN: DK | SCALE: A1: 1:500, A3: 1:1000
SURVEY: CardnoTGM | SHEET SIZE: A1 / A3
CHECKED: | APPROVED:
DATE: | DATE:

Cardno TGM
ABN 11 125 568 461
1315 Sturt Street, Ballarat, VIC Australia (PO Box 563W, Ballarat West) 3350
Phone +61 3 5336 6680 Fax +61 3 5333 3815
Email: victoria@cardno.com.au Web: www.cardno.com

CLIENT: villawood properties — Communities Designed for Living

PROJECT: Drew's PADDOCK — INVERWAY PARK

STAGE 2

CIVIL DRAWING

DRAWING TITLE: **EARTH SOUND BARRIER CROSS SECTIONS**

REF. No. 17547-202 | SHEET C29 OF 6 | REV 01

APPENDIX 2 – MONITORING DATA

Measurement Location

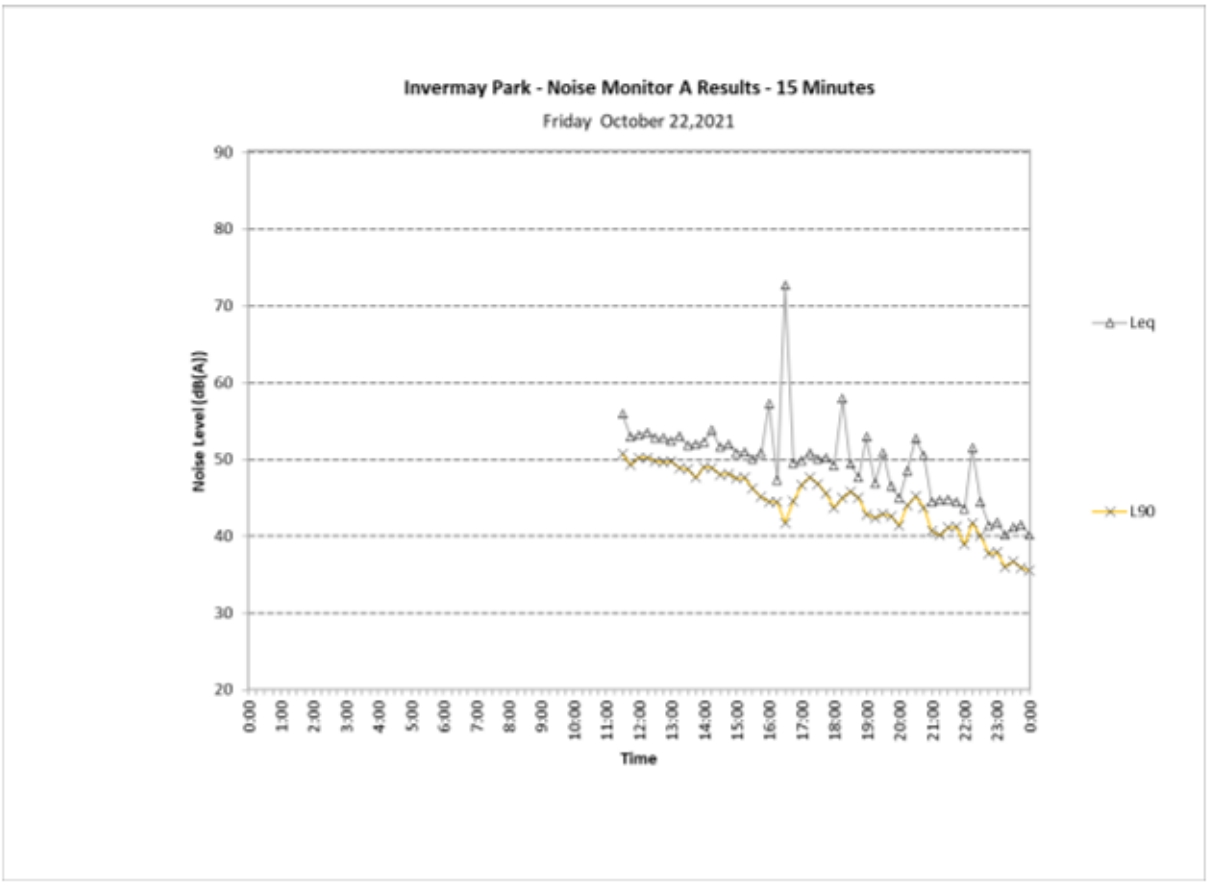
The following measurement equipment was used for the supplementary noise monitoring:

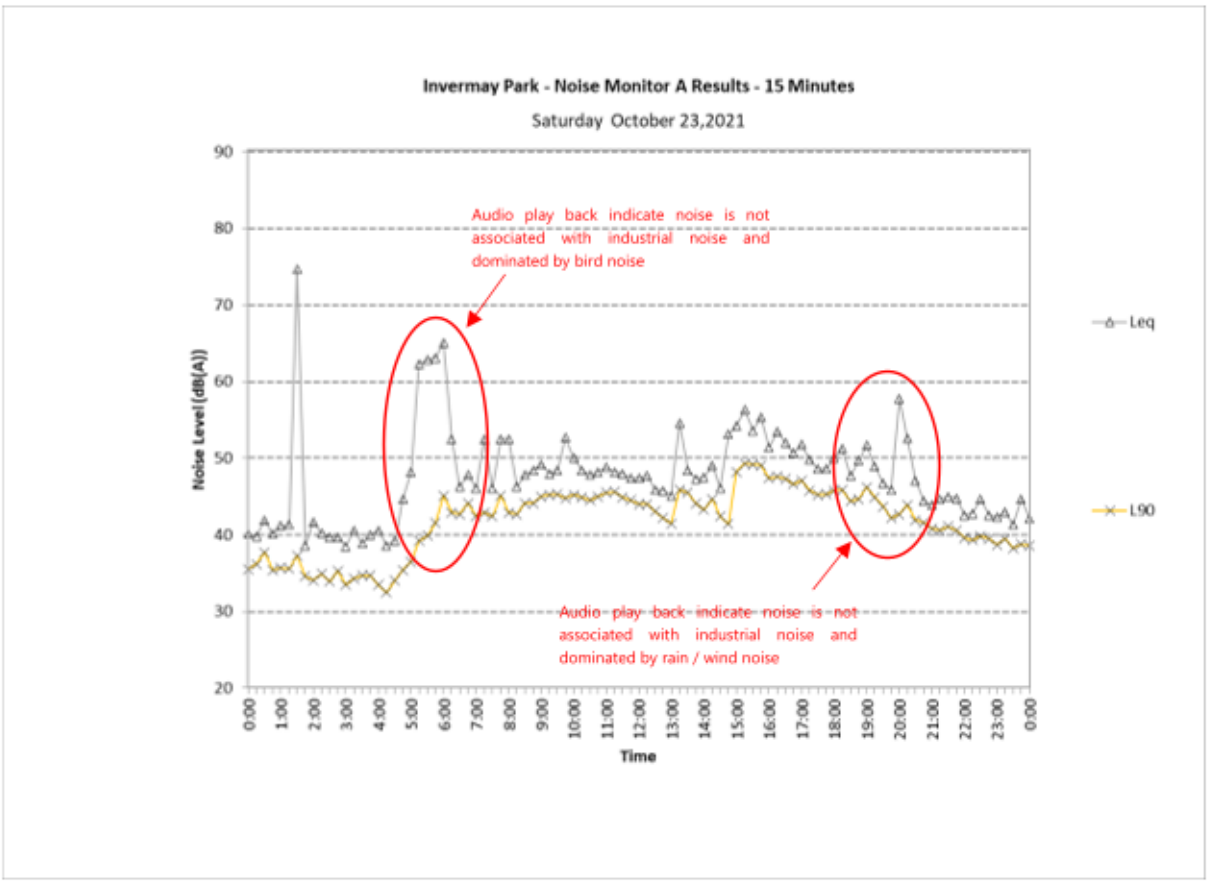
Figure 6 – Supplementary noise monitoring locations

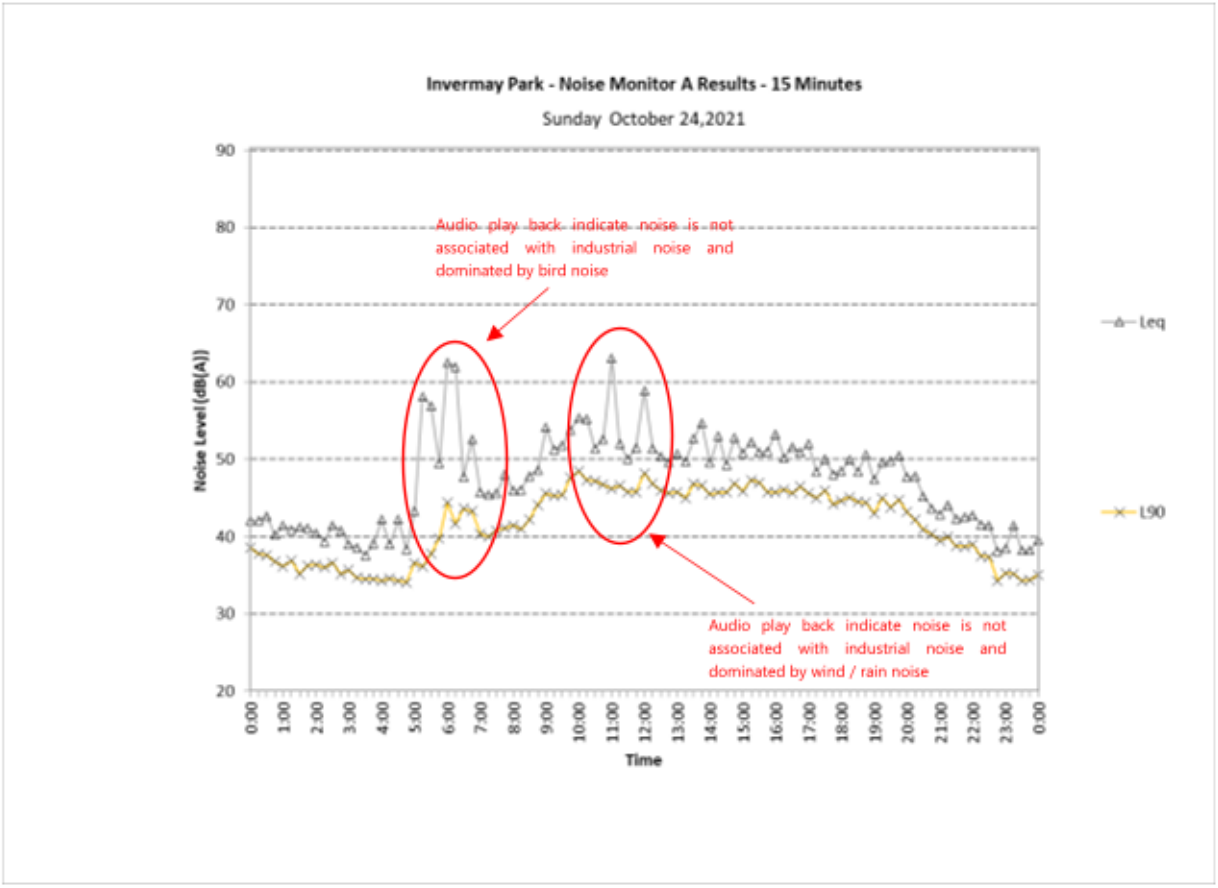
Measurement Equipment

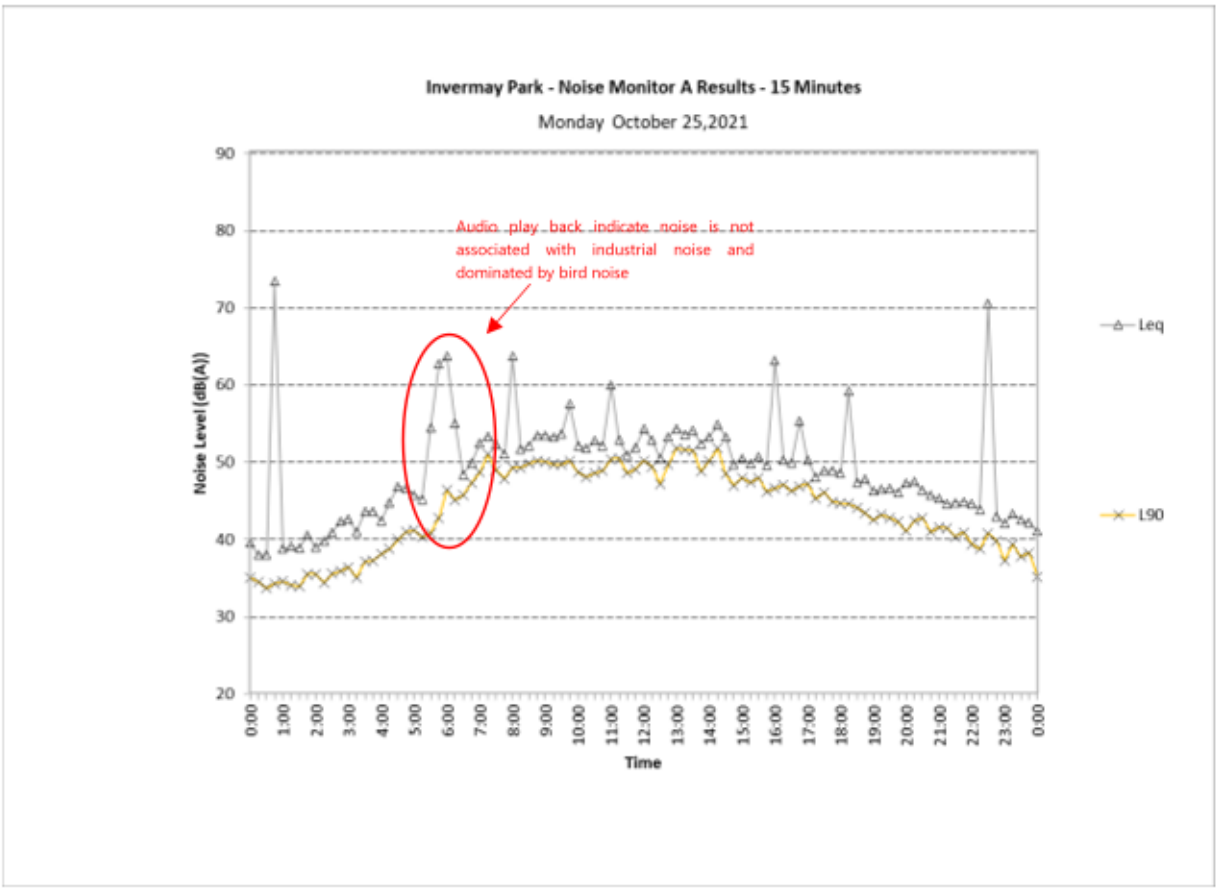
The un-attended noise monitoring was conducted using Ngara noise monitors for locations A, B, C and D and an ARL-315 for location E. All Ngara's were setup to record audio content for playback purposes. The equipment was calibrated at the beginning and the end of the measurements using a Rion NC-74 Sound Calibrator. No significant drift was detected. All measurements were taken on fast response mode.

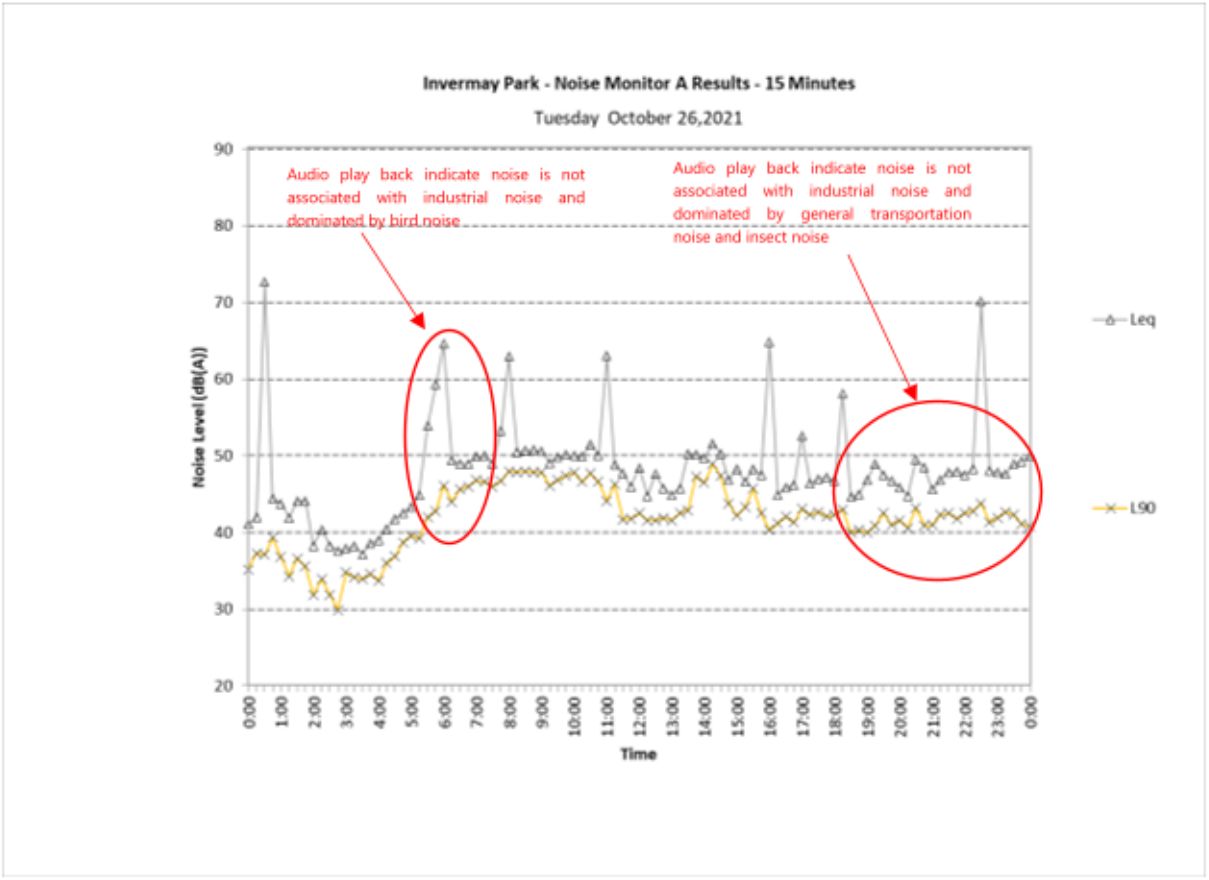
Measurement Results

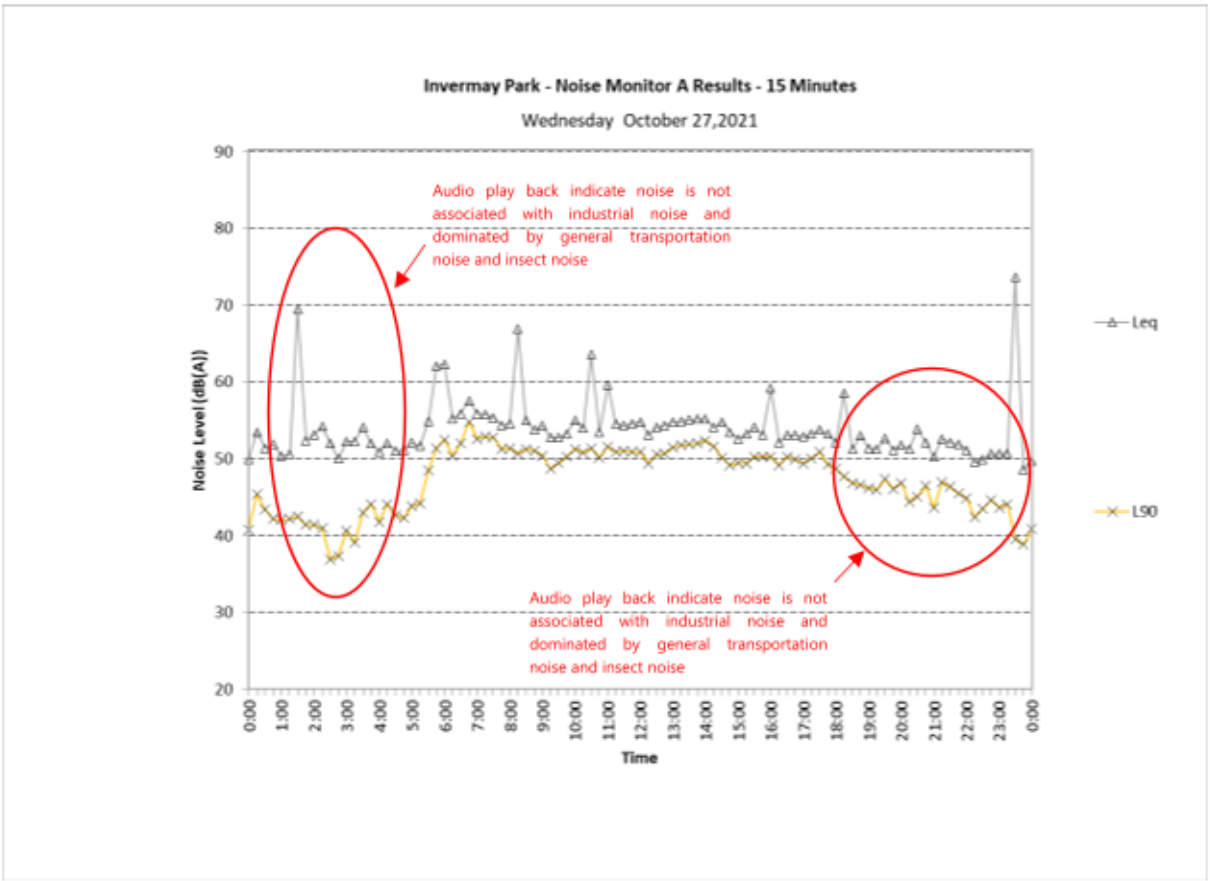


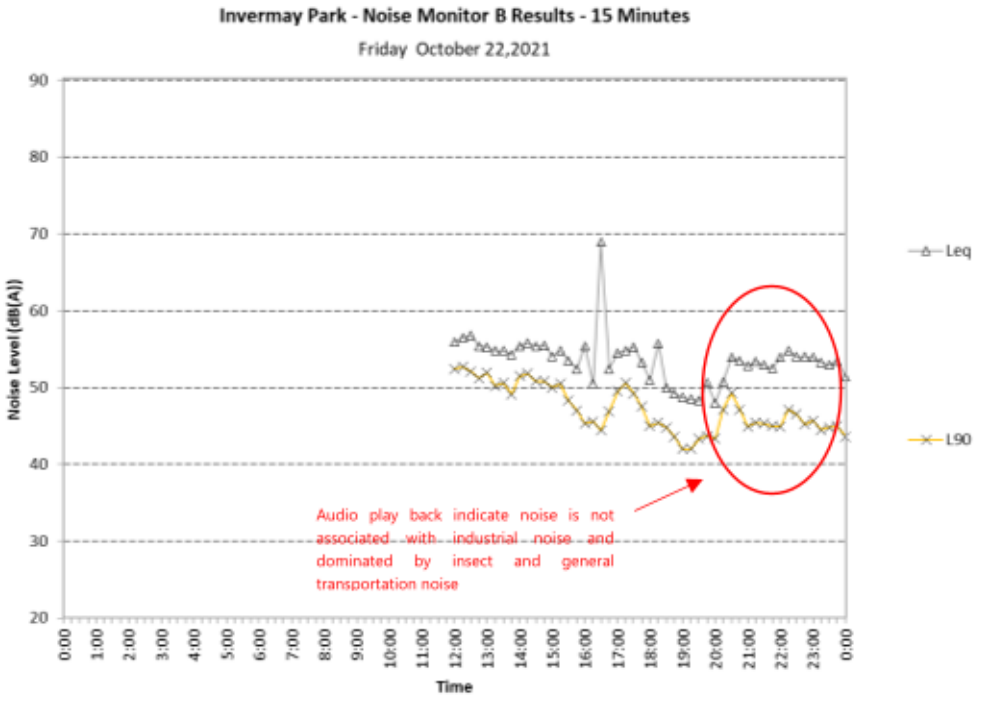


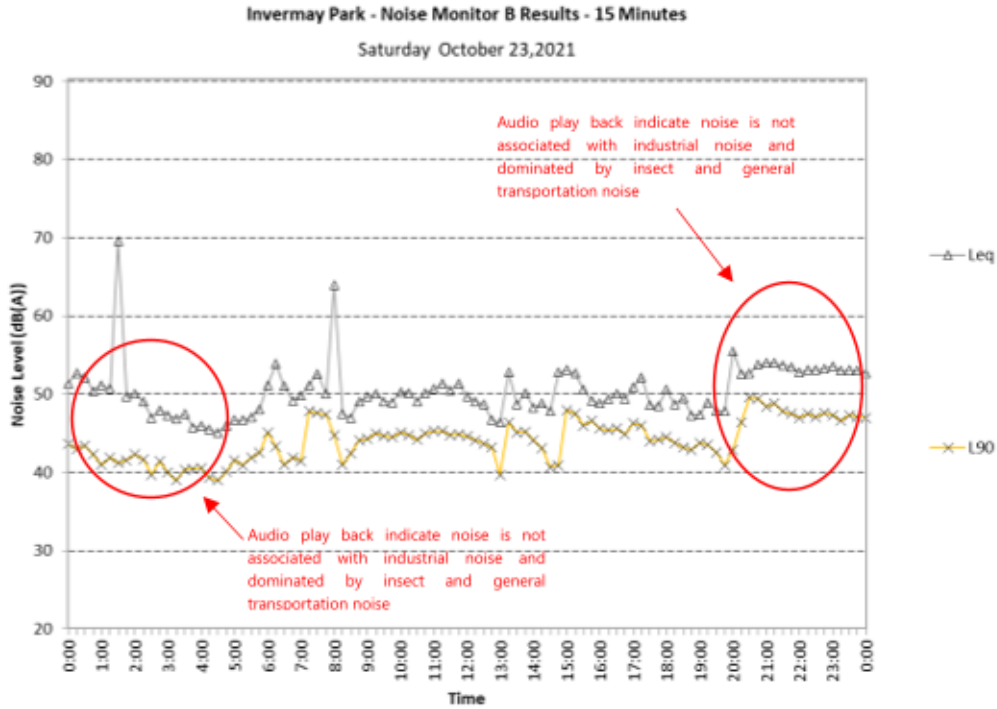

Invermay Park - Noise Monitor A Results - 15 Minutes
Sunday October 24,2021
Audio play back indicate noise is not associated with industrial noise and dominated by bird noise
Audio play back indicate noise is not associated with industrial noise and dominated by wind / rain noise
Noise Level (dB(A))
Time
Leq
L90

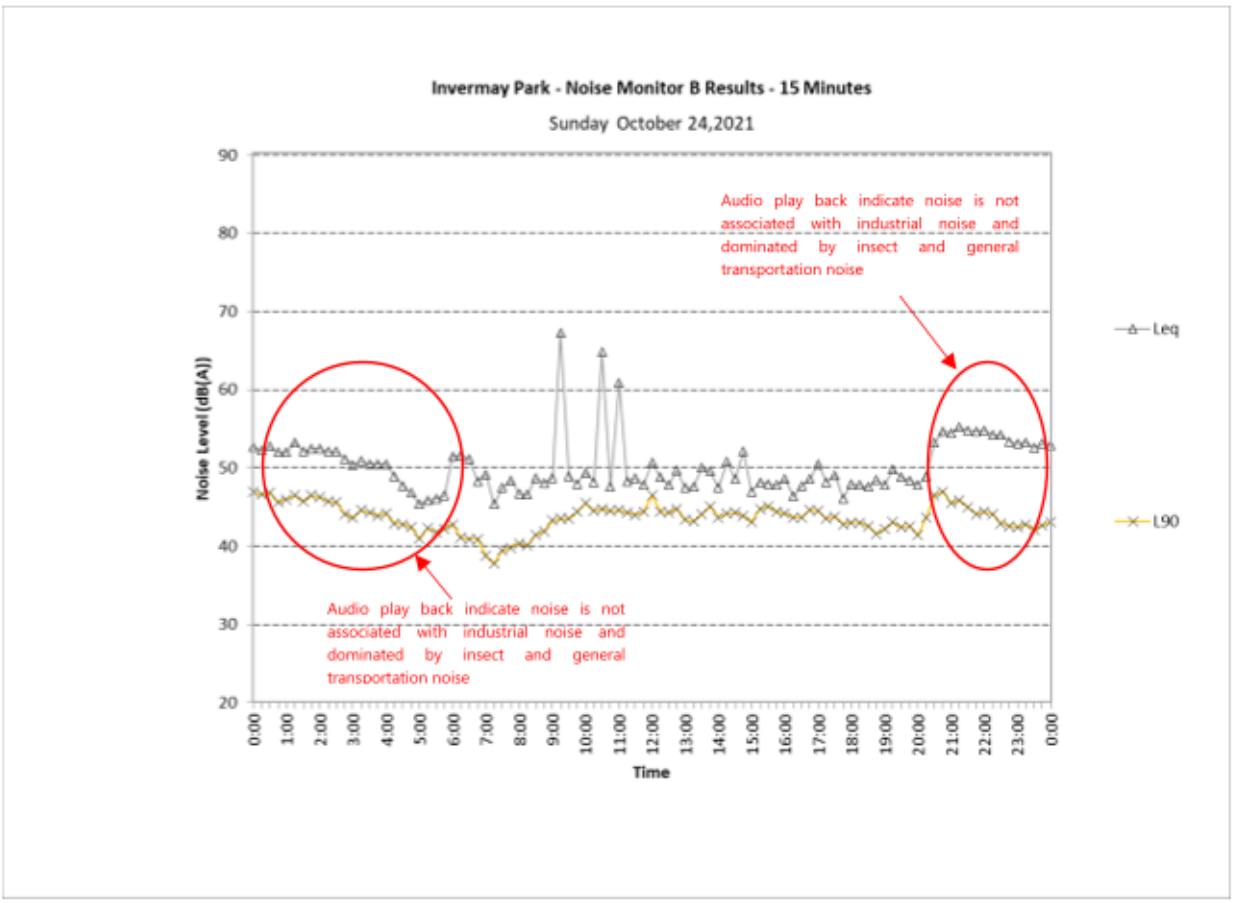

Invermay Park - Noise Monitor A Results - 15 Minutes
Monday October 25,2021
Audio play back indicate noise is not associated with industrial noise and dominated by bird noise
Noise Level (dB(A))
Time
Leq
L90

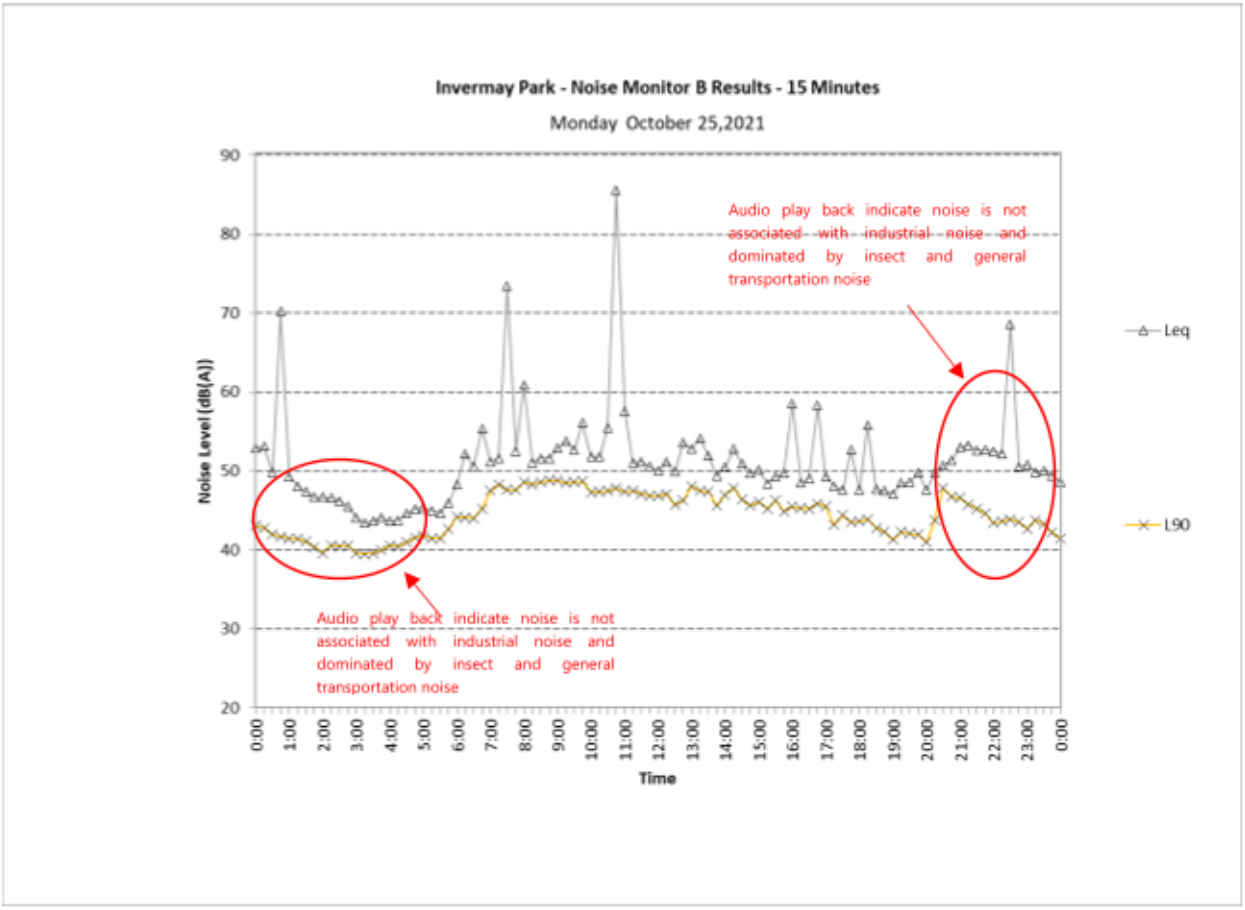

Invermay Park - Noise Monitor A Results - 15 Minutes
Tuesday October 26,2021
Audio play back indicate noise is not associated with industrial noise and dominated by bird noise
Audio play back indicate noise is not associated with industrial noise and dominated by general transportation noise and insect noise
Noise Level (dB(A))
Time
Leq
L90

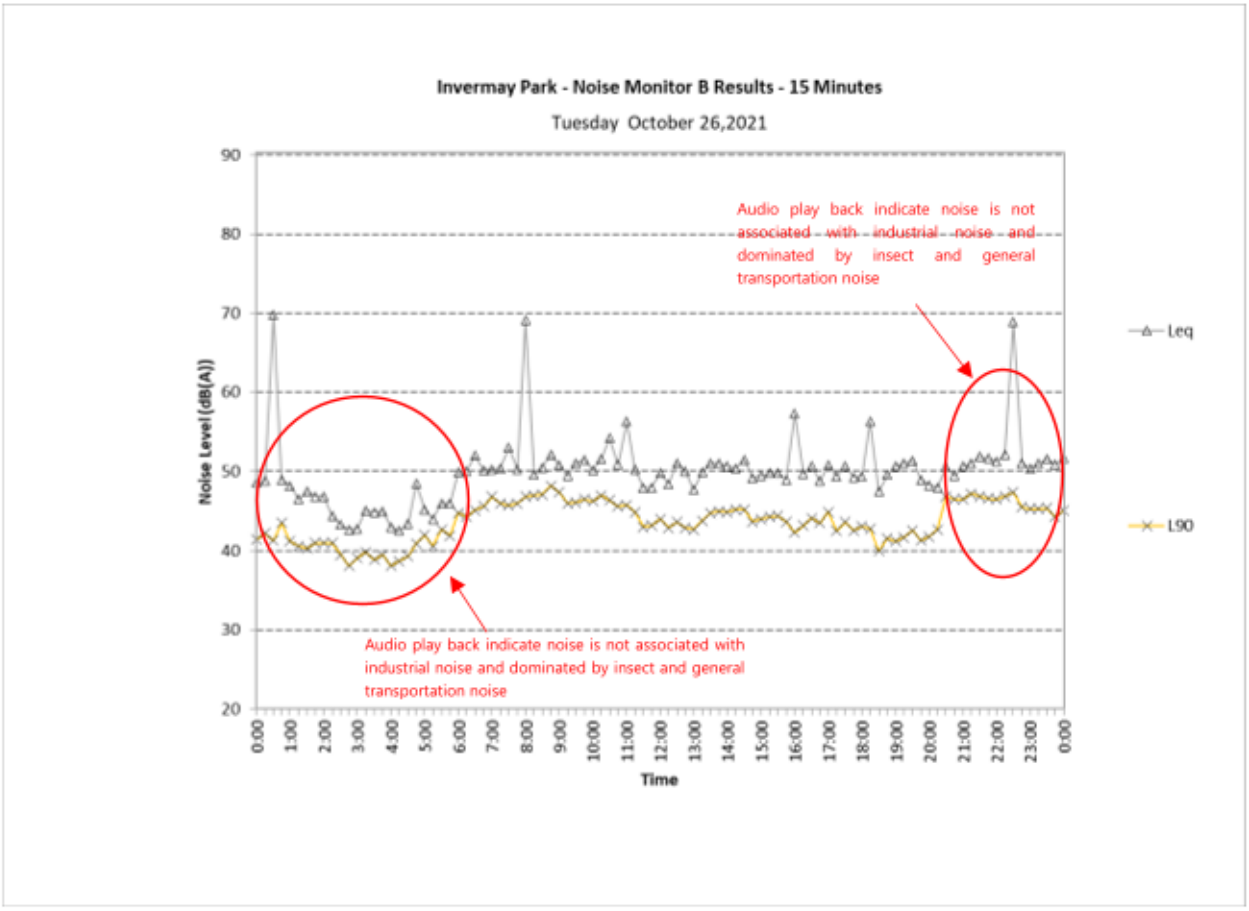

Invermay Park - Noise Monitor A Results - 15 Minutes
Wednesday October 27,2021
Audio play back indicate noise is not associated with industrial noise and dominated by general transportation noise and insect noise
Audio play back indicate noise is not associated with industrial noise and dominated by general transportation noise and insect noise
Noise Level (dB(A))
Time
Leq
L90

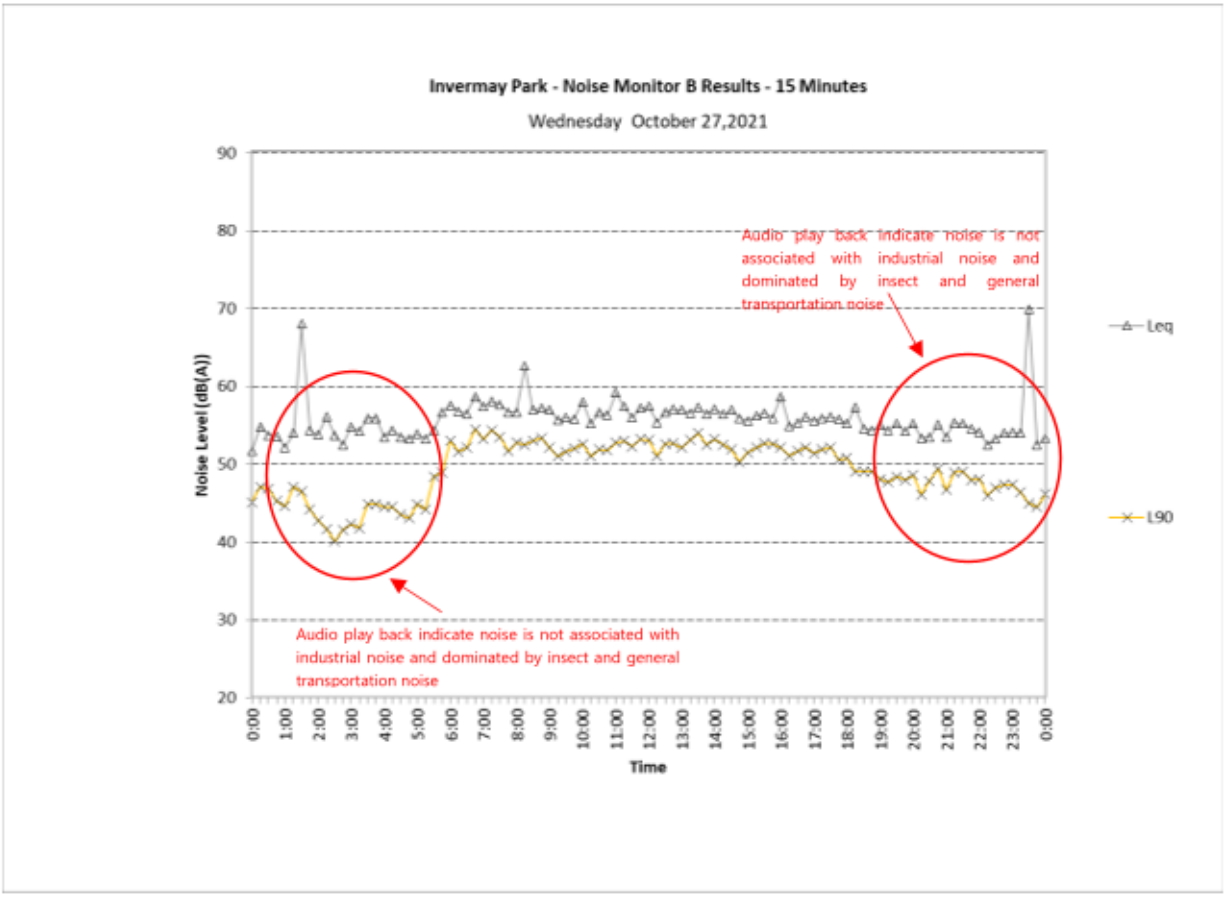

Invermay Park - Noise Monitor B Results - 15 Minutes
Friday October 22,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise

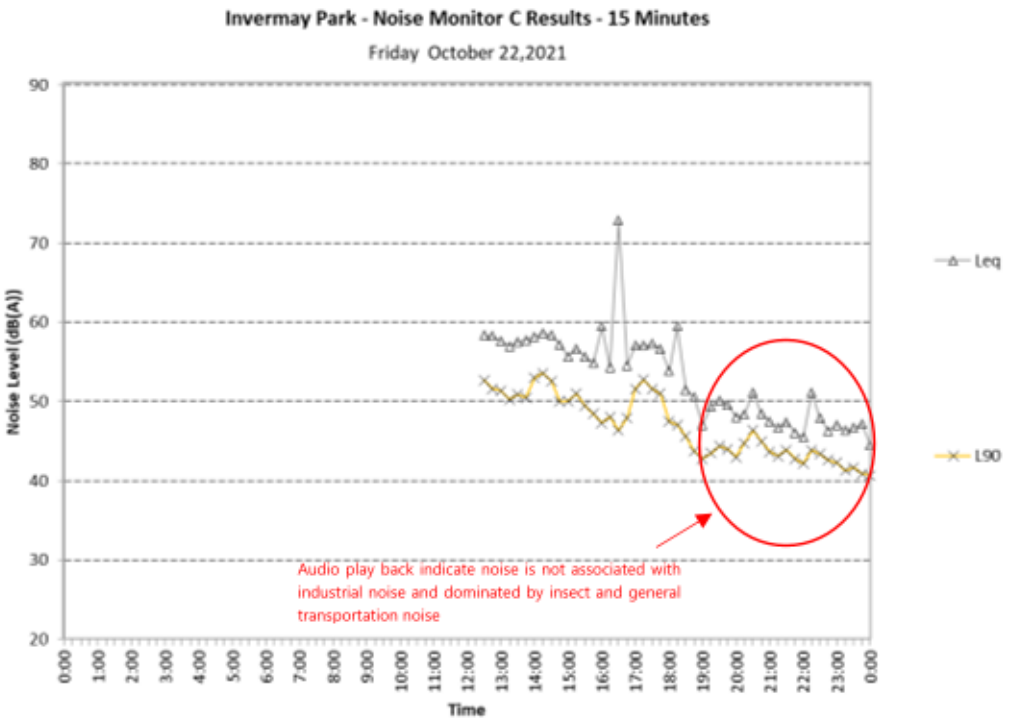

Invermay Park - Noise Monitor B Results - 15 Minutes
Saturday October 23,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise

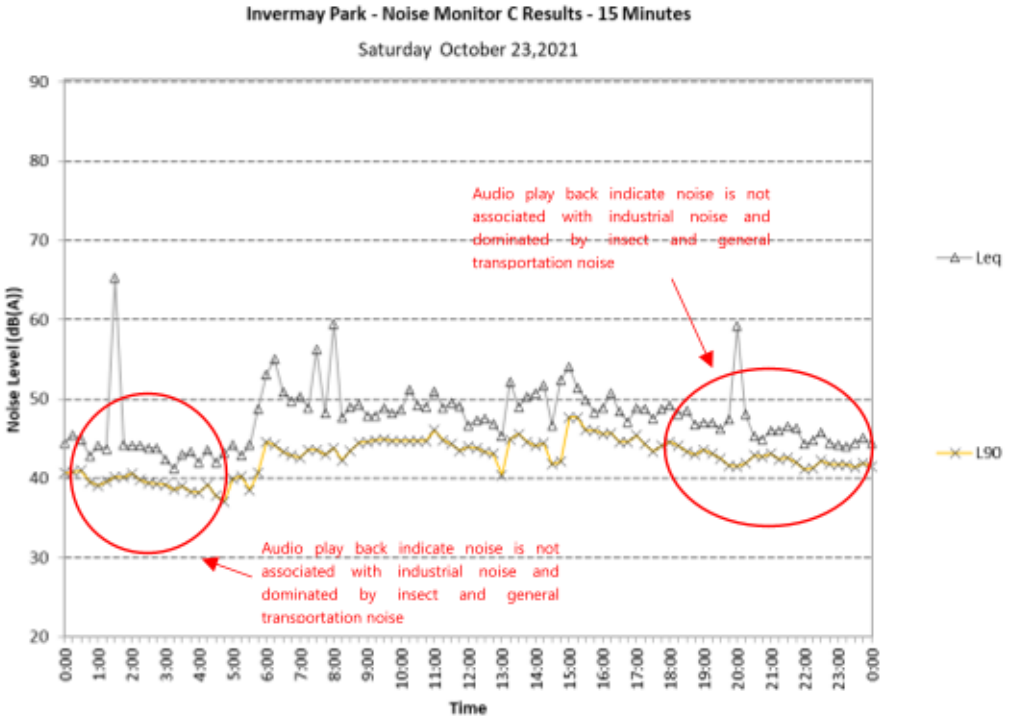

Invermay Park - Noise Monitor B Results - 15 Minutes
Sunday October 24,2021
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Noise Level (dB(A))
Time
Leq
L90

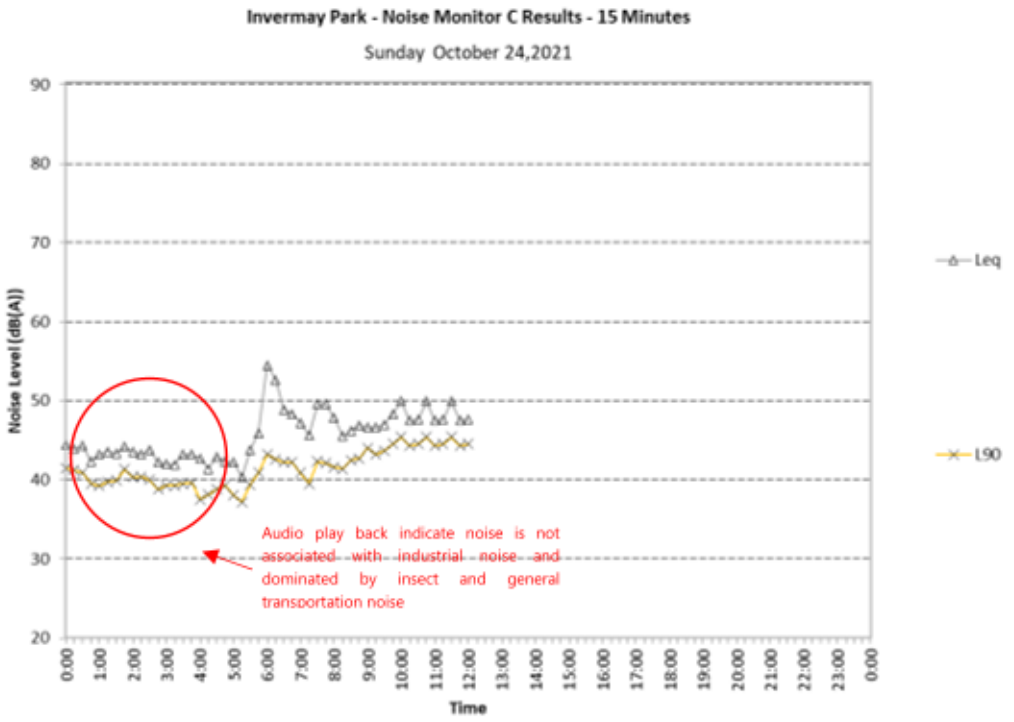

Invermay Park - Noise Monitor B Results - 15 Minutes
Monday October 25,2021
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Noise Level (dB(A))
Time
Leq
L90

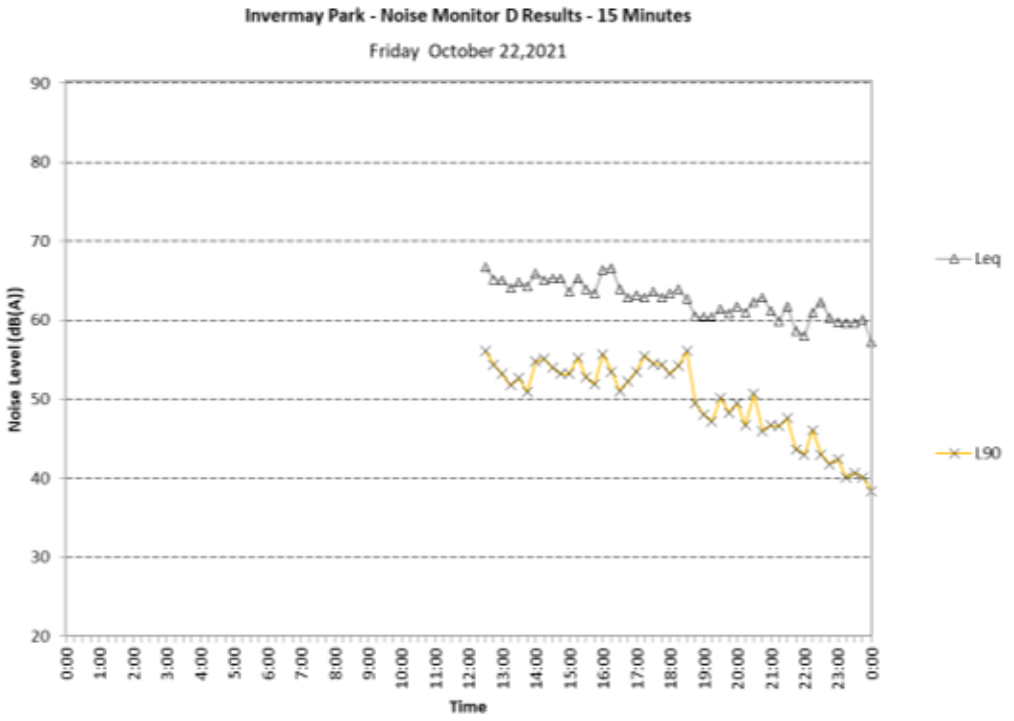

Invermay Park - Noise Monitor B Results - 15 Minutes
Tuesday October 26,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise

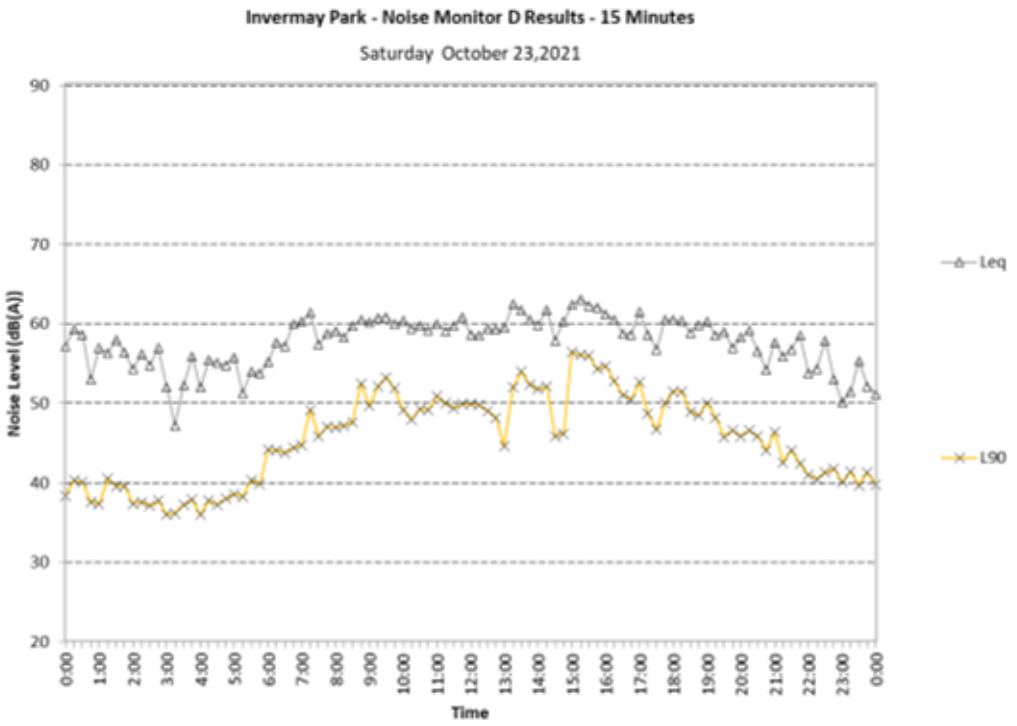

Invermay Park - Noise Monitor B Results - 15 Minutes
Wednesday October 27,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise


Invermay Park - Noise Monitor C Results - 15 Minutes
Friday October 22,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise


Invermay Park - Noise Monitor C Results - 15 Minutes
Saturday October 23,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise


Invermay Park - Noise Monitor C Results - 15 Minutes
Sunday October 24,2021
Noise Level (dB(A))
Time
Leq
L90
Audio play back indicate noise is not associated with industrial noise and dominated by insect and general transportation noise


Invermay Park - Noise Monitor D Results - 15 Minutes
Friday October 22,2021
Noise Level (dB(A))
Time
Leq
L90


Invermay Park - Noise Monitor D Results - 15 Minutes
Saturday October 23,2021
Noise Level (dB(A))
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
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Time
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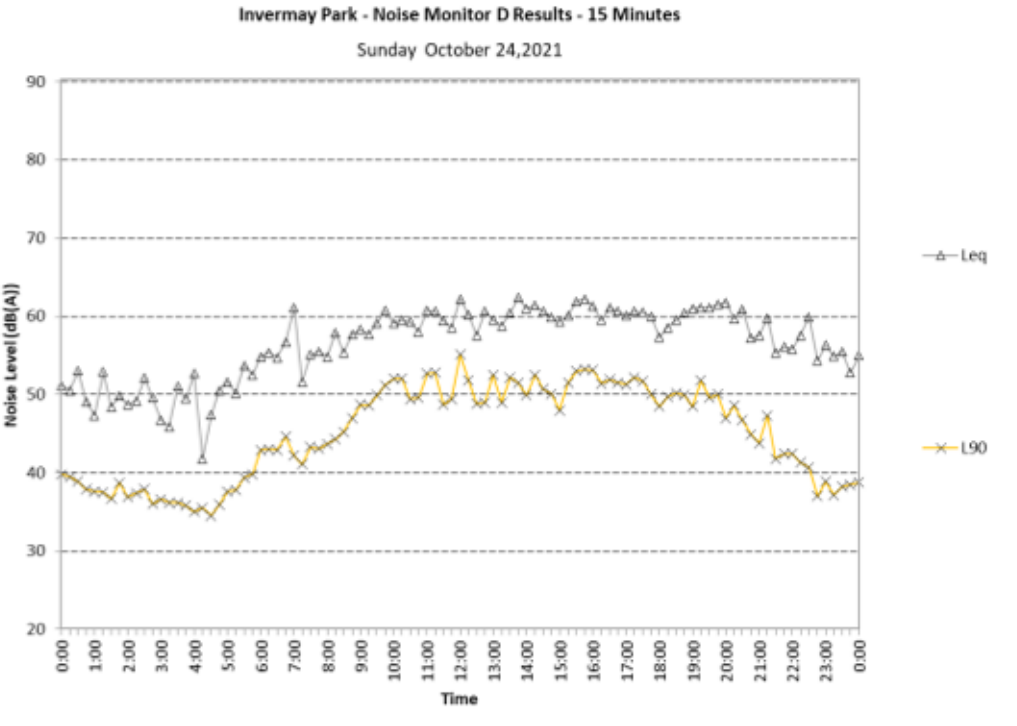
L90


Invermay Park - Noise Monitor D Results - 15 Minutes
Sunday October 24,2021
Noise Level (dB(A))
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80
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60
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20
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2:00
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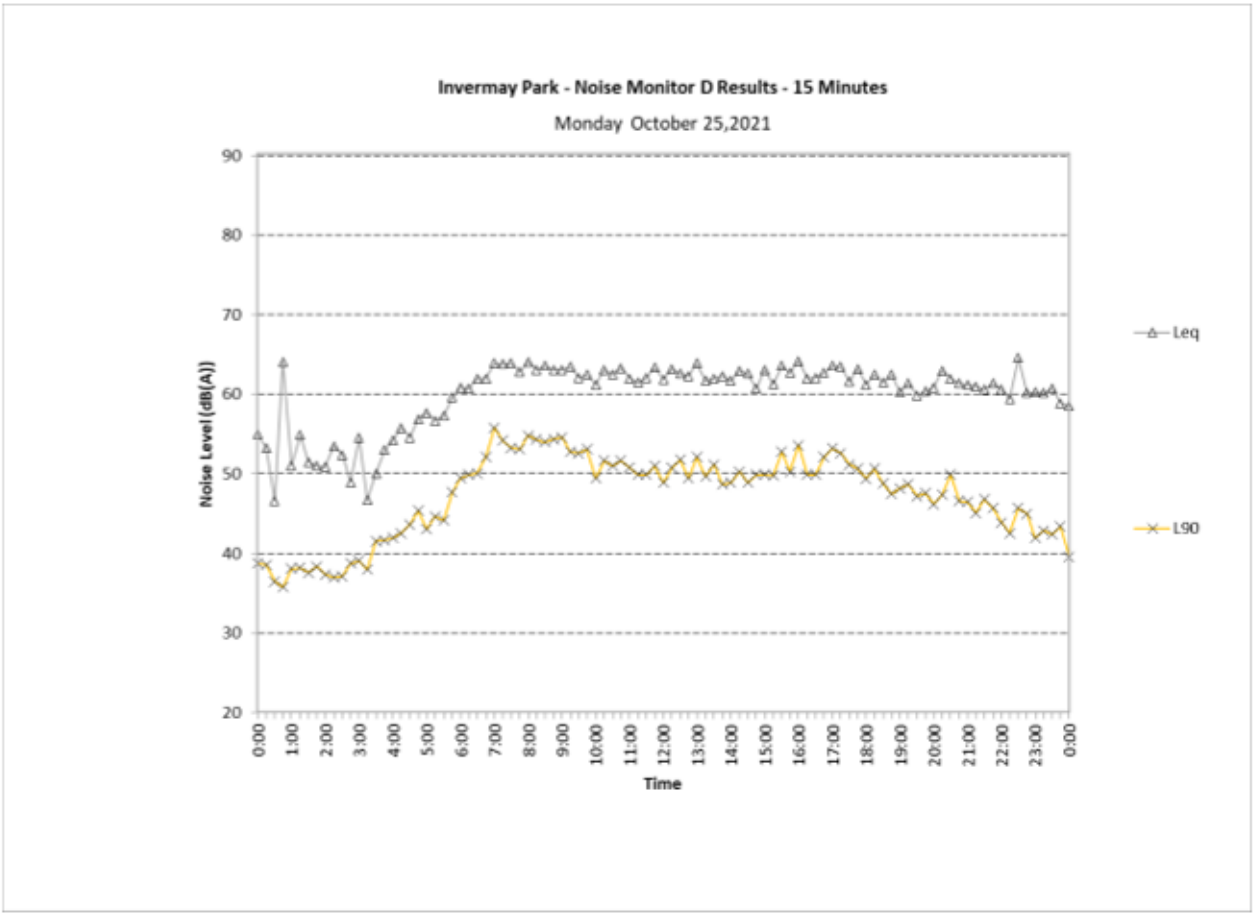
Invermay Park - Noise Monitor D Results - 15 Minutes
Monday October 25,2021
Noise Level (dB(A))
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80
70
60
50
40
30
20
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1:00
2:00
3:00
4:00
5:00
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18:00
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Time
Leq
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Invermay Park - Noise Monitor D Results - 15 Minutes
Tuesday October 26,2021
Noise Level (dB(A))
90
80
70
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40
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0:00
1:00
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6:00
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Time
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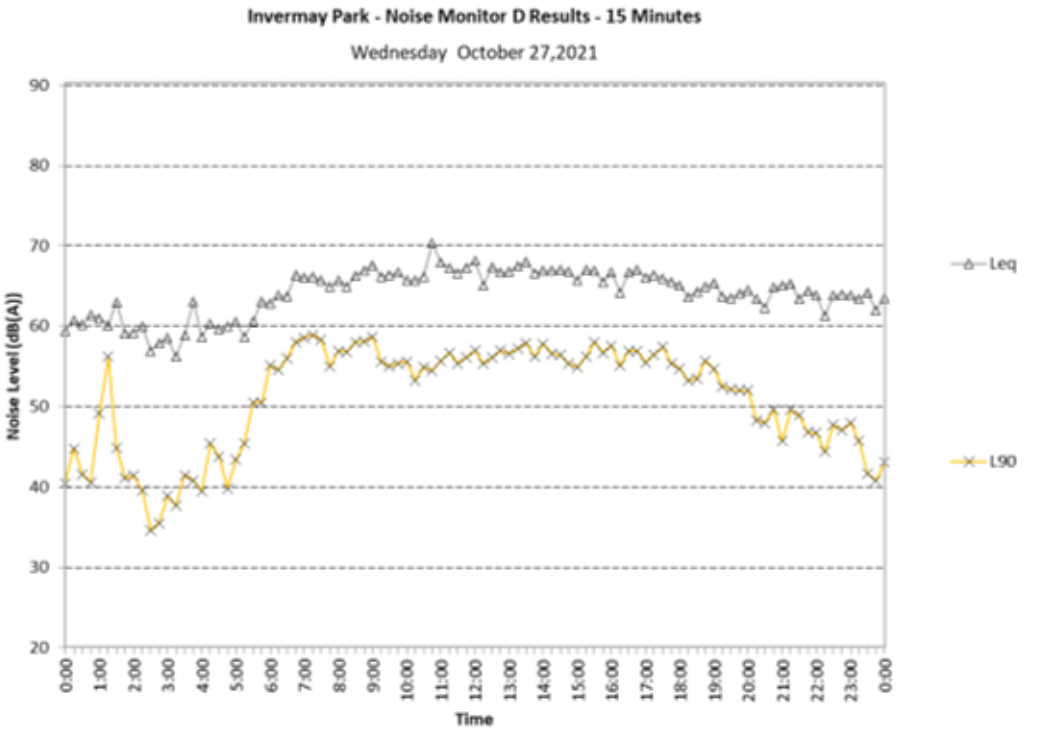
Invermay Park - Noise Monitor D Results - 15 Minutes
Wednesday October 27,2021
Noise Level (dB(A))
90
80
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0:00
1:00
2:00
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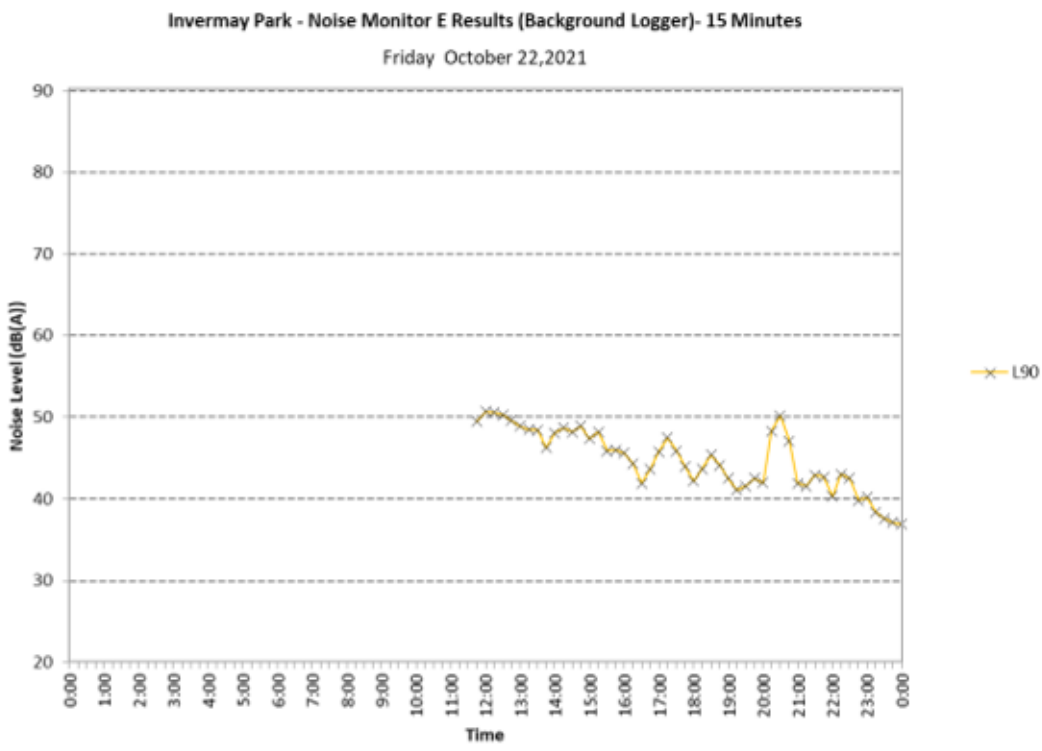
Invermay Park - Noise Monitor E Results (Background Logger)- 15 Minutes
Friday October 22,2021
Noise Level (dB(A))
90
80
70
60
50
40
30
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0:00
1:00
2:00
3:00
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Time
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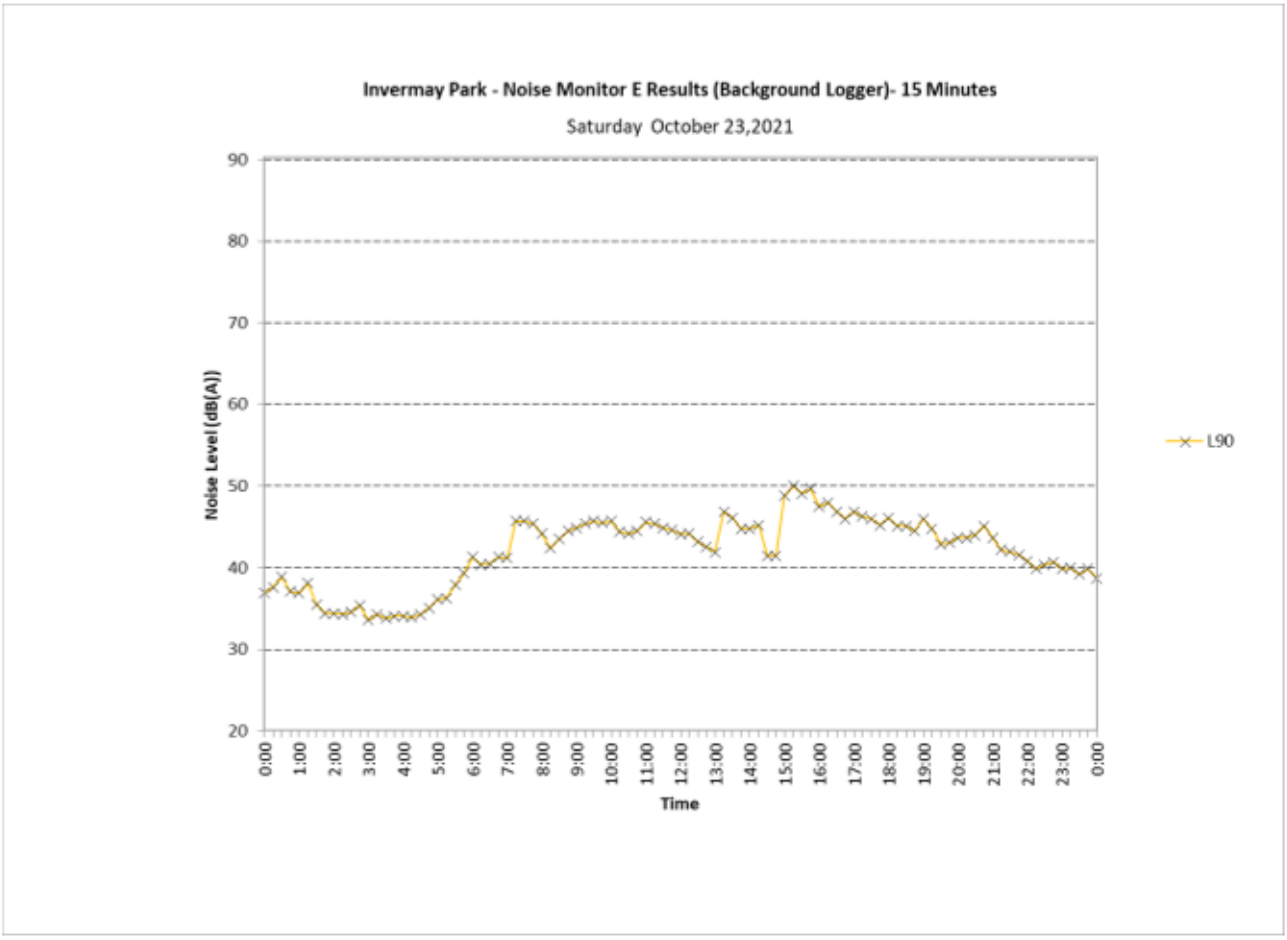
Invermay Park - Noise Monitor E Results (Background Logger)- 15 Minutes
Saturday October 23,2021
Noise Level (dB(A))
90
80
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60
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0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
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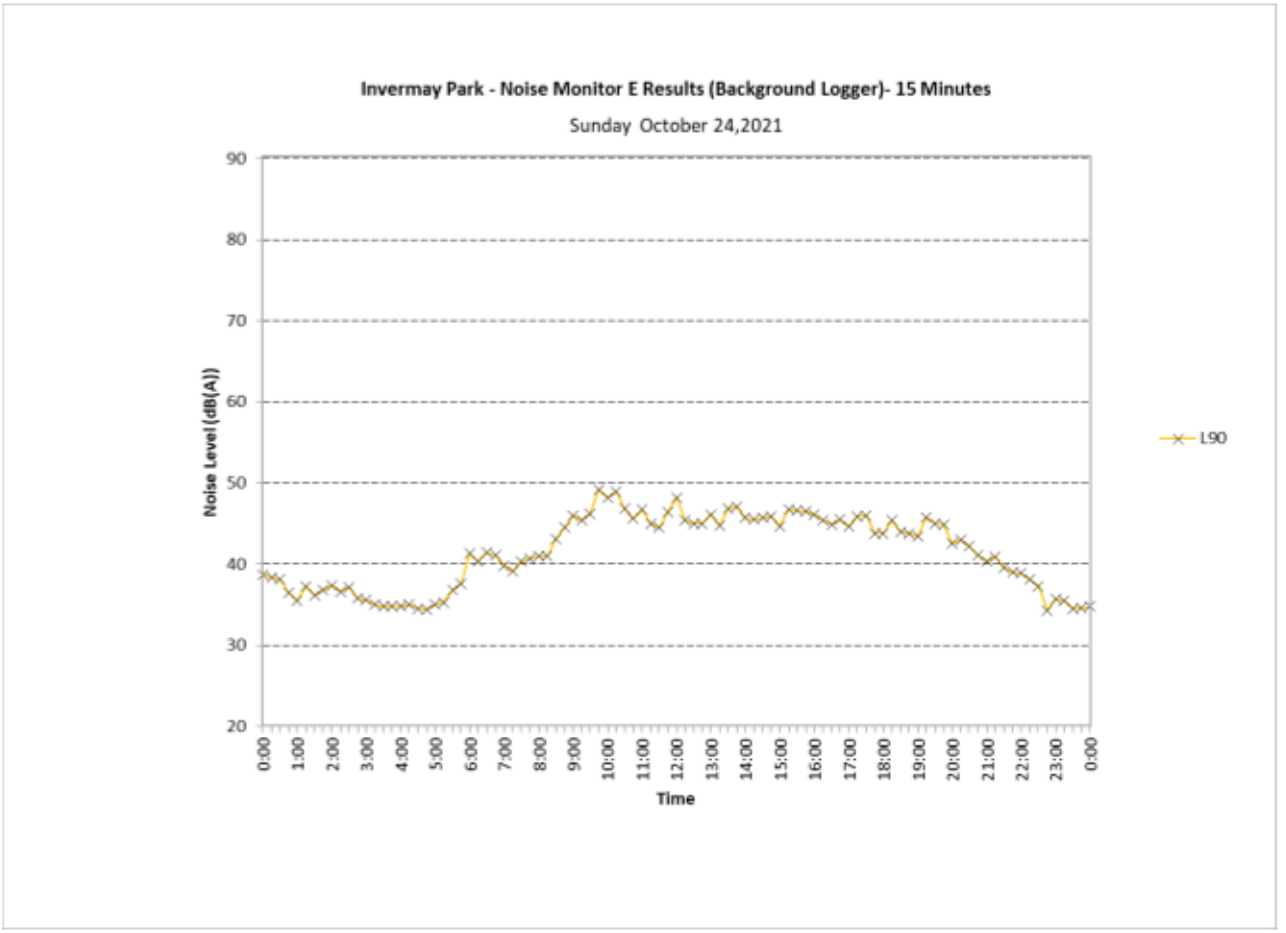
Invermay Park - Noise Monitor E Results (Background Logger)- 15 Minutes
Sunday October 24,2021
Noise Level (dB(A))
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80
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30
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1:00
2:00
3:00
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Time
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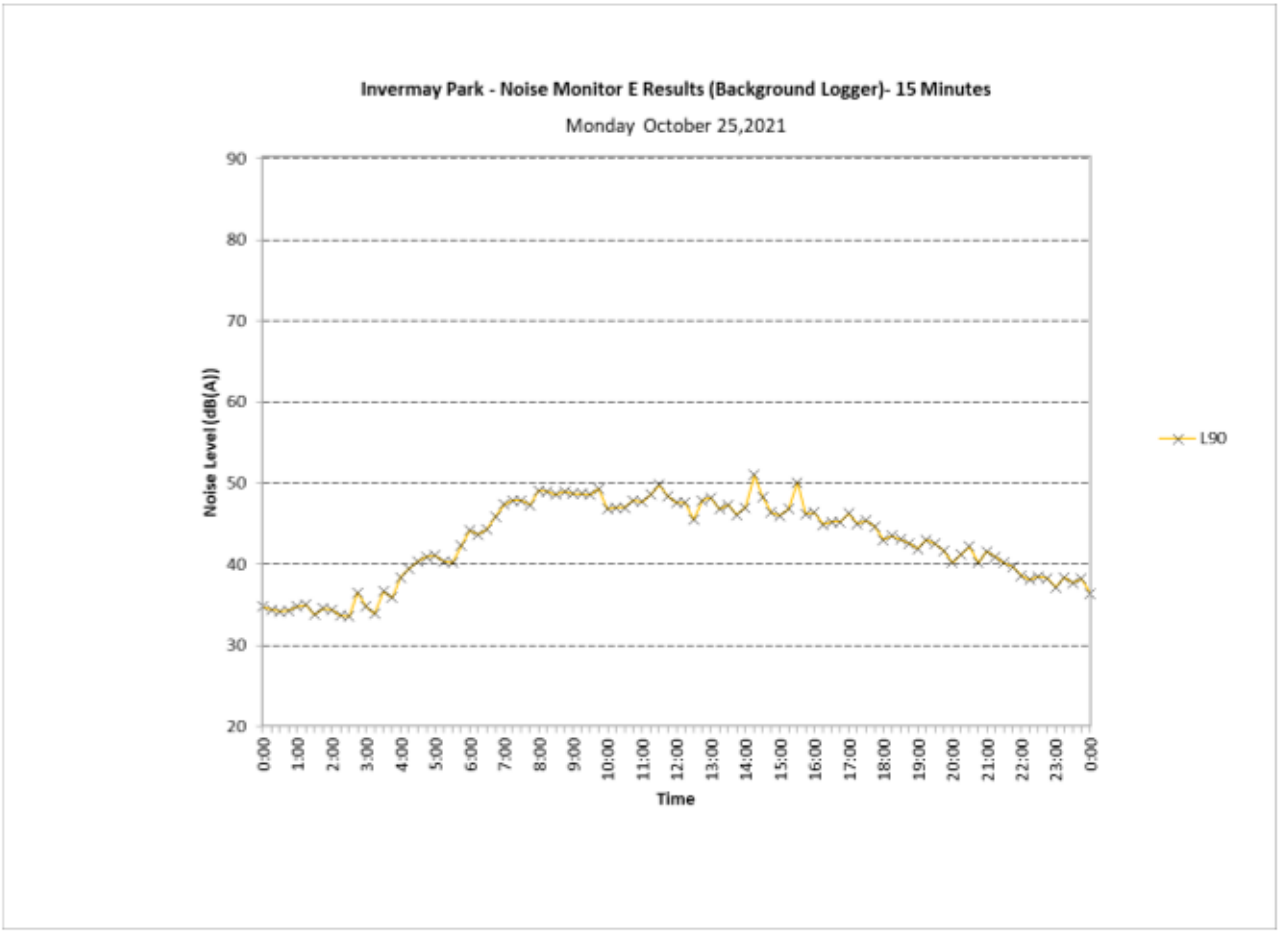
Invermay Park - Noise Monitor E Results (Background Logger)- 15 Minutes
Monday October 25,2021
Noise Level (dB(A))
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Time
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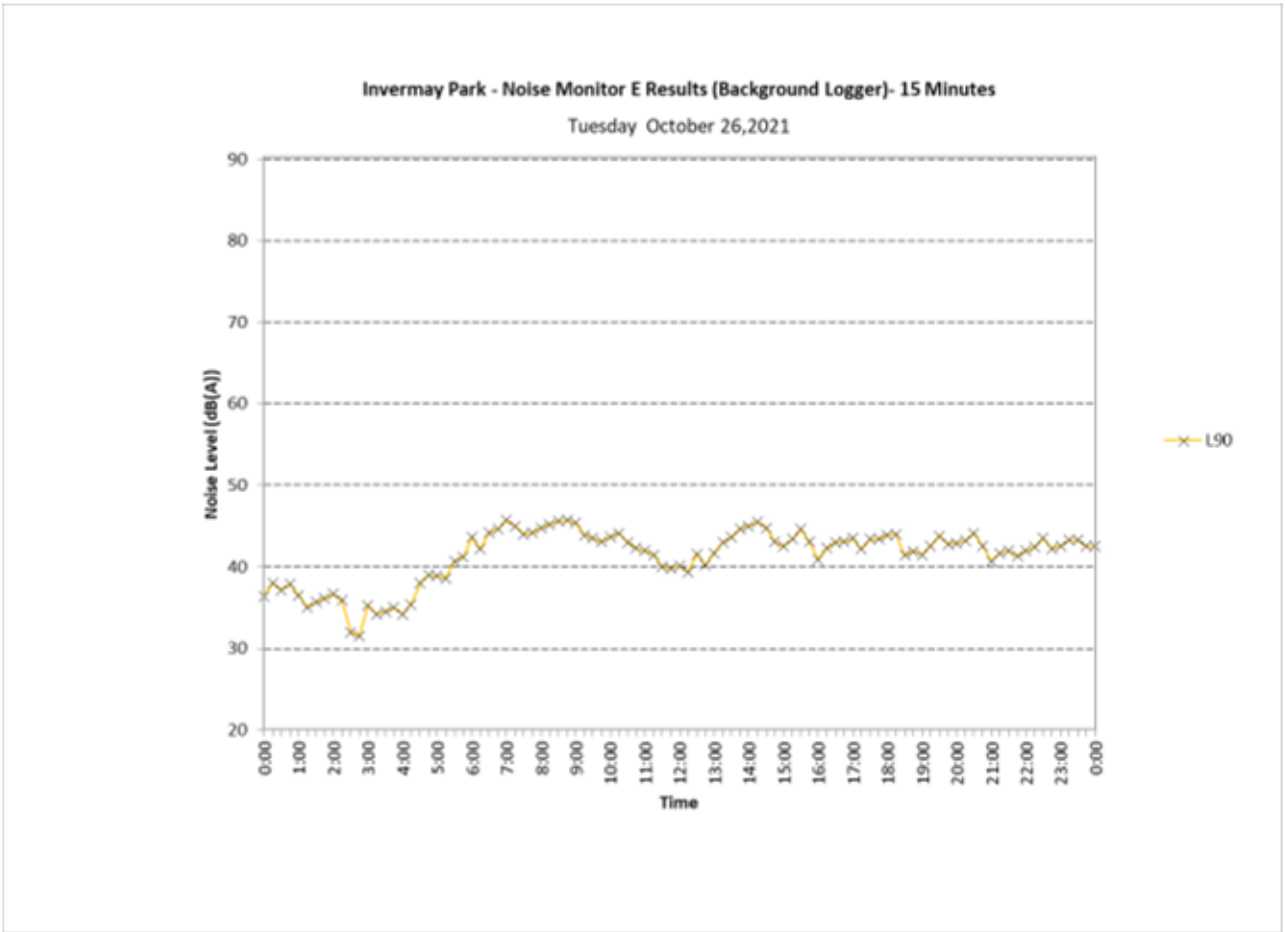
Invermay Park - Noise Monitor E Results (Background Logger)- 15 Minutes
Tuesday October 26,2021
Noise Level (dB(A))
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60
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40
30
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0:00
1:00
2:00
3:00
4:00
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6:00
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Time
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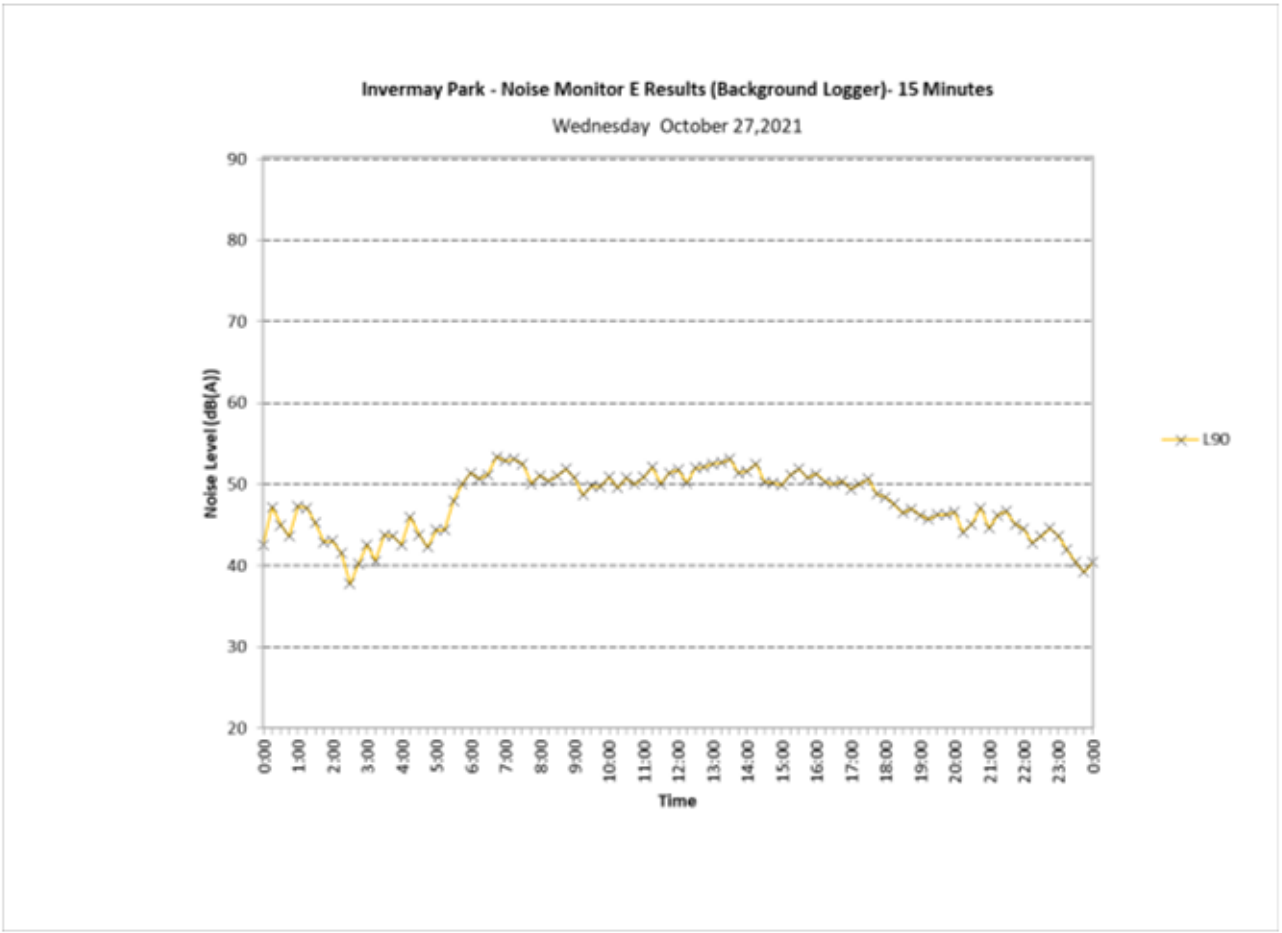
Invermay Park - Noise Monitor E Results (Background Logger)- 15 Minutes
Wednesday October 27,2021
Noise Level (dB(A))
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1:00
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3:00
4:00
5:00
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Time
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APPENDIX 3 – SUPPLEMENTARY INDUSTRIAL NOISE

To address MDA's comments with respect to the western industrial premises, AL conducted supplementary noise level measurements at the location indicated below. Three noise monitors were installed and supplemented by attended noise level measurements. The un-attended noise monitors were installed between 22 and 28 October 2021 and the attended noise level measurements were conducted on 22 October 2021 between 12pm and 3pm and on 28 October 2021 between 6:30am and 8am. Based on the early morning inspection on 28 October 2021, we confirm that there were no industrial activities between 6:30am and 7am on 28 October 2021.

The measurement equipment is detailed in Appendix 2 above.

Figure 7 – Noise monitor locations to measure western industrial premises

Table 5 – Measured Noise Levels

Location	Typical Highest Measured Noise Levels for Day Period dB(A) $L_{eq,30mins}$[1]	Attended Noise Level Measurements for Industrial Activities dB(A) L_{eq}[1]
Monitor Location A	55 dB(A) $L_{eq,30mins}$ - Measured noise levels are governed by traffic noise from Western Freeway	Griding noise: 52 dB(A) – occurs sporadically Forklift: inaudible Compressed air: 49 dB(A) - occurs sporadically Screwing: 44 dB(A) - occurs sporadically
Monitor Location B	55 dB(A) $L_{eq,30mins}$ - Measured noise levels are governed by traffic noise from Western Freeway	Low level hum: 48 dB(A) Forklift: inaudible Dust extraction unit: 61 dB(A) – operates for 5 seconds every 10-15 minutes
Monitor Location C	57 dB(A) $L_{eq,30mins}$ – Measured noise levels are governed by traffic noise from Western Freeway	Compressed air: 51 dB(A) – occurs sporadically Metal griding (inside the shed): 51 dB(A) - occurs sporadically Pipe cutting: 57 dB(A) - occurs sporadically Truck driving inside warehouse: 50 dB(A)

Note 1: Based on long-term noise monitoring data. We note that the L_{eq} presented is governed by continuous traffic noise from the Western Freeway. Noise from industrial noise during the 30-minute period in isolation is significantly lower than the presented L_{eq} levels.
Note 2: Measured noise levels are short term and affected by traffic noise levels in the background.

We confirm based on inspection on site and noise monitor audio playback that no industrial noise was audible during the evening and night period.

In addition, based on the attended noise level measurements noted in Table 5 above, refer the following noise prediction.

Table 6 – Industrial Noise Level Prediction

Measurement Location	Nearest Affected Lot	Dominant Industrial Noise at Measurement Location	Predicted Noise Levels Nearest Affected Lot $L_{eq,30mins}$	Day Period Criteria dB(A) $L_{eq,30mins}$	Complies
Location A	Lot 221	Griding noise: 52 dB(A) L_{eq} – occurs sporadically	50[1]	57	Yes
	Lot 222	Griding noise: 52 dB(A) L_{eq} – occurs sporadically	45[1]	57	Yes
Location B	Lot 323	Dust extraction unit: 61 dB(A) – operates for 5 seconds every 10-15 minutes	42	57	Yes
Location C	Lot 415	Compressed air: 51 dB(A) – occurs sporadically	45[1]	57	Yes
		Metal griding (inside the shed): 51 dB(A) - occurs sporadically	46[1]	57	Yes
		Pipe cutting: 57 dB(A) - occurs sporadically	51[1]	57	Yes

Note 1: Assuming the activity is operating continuously which is considered as a conservative assessment.

Based on the above we confirm that the operation from the western industrial noise precinct complies with the established EPA Noise Protocol Part 1 Criteria for the day-time period.