

**MANAGING DIRECTORS**

MATTHEW PALAVIDIS  
VICTOR FATTORETTO

**DIRECTORS**

MATTHEW SHIELDS  
BEN WHITE



**Mixed Use Development at Jordan Springs Blvd  
(Southern Entry)**

**DA Environmental Noise Impact Assessment**

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SYDNEY  
A: 9 Sarah St Mascot NSW 2020  
T: (02) 8339 8000  
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA  
LONDON DUBAI SINGAPORE GREECE

[www.acousticlogic.com.au](http://www.acousticlogic.com.au)  
ABN: 11 068 954 343

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Appendix 1 Unattended Traffic Noise Monitor Data

Appendix 2 Unattended Background Noise Monitor Data

## 1 INTRODUCTION

This report presents an environmental noise assessment conducted for the proposed mixed use development at Jordan Springs Blvd (Southern Entry), Jordan Springs. The assessment is based on the following architectural drawings:

**Table 1 – Drawings for Assessment**

<b>Drawing Number</b>	<b>Revision</b>	<b>Date</b>
A0001	F	18 Dec 2013
A1000	D	14 Feb 2014
A2200	D	14 Feb 2014
A2201	D	14 Feb 2014
A2202-A2205	D	14 Feb 2014
A2210-A2215	D	14 Feb 2014
A2220-A2224	D	14 Feb 2014
A2230-A2235	D	14 Feb 2014
A2240-A2245	D	14 Feb 2014
A3100-A3103	D	14 Feb 2014
A2100-A2110		30 Oct 2013
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Potential noise impacts related to the proposal have been assessed at existing and future occupants on and surrounding the site. Recommendations have been made to fully ameliorate any identified impacts, and ensure the future occupants will be provided with an acceptable level of amenity.

## 2 PROJECT DESCRIPTION

Project site is located at the corner of Jordan Springs Blvd and Lakeside Parade, Jordan Springs. The overview of the project is:

- 71 Townhouses
- 5 multi-level residential flat buildings with approximately 250-270 residential units.
- Central Piazza with basement below.
- Retail/Commercial/Office spaces on Level 1 (Ground Floor) of Building A, B, C and D.

A detailed site map and receiver locations is provided in Figure 1.

The noise sources and potential impacts relevant to the proposed development are:

- Traffic noise intrusion into the residential dwellings from traffic movements on local roads.
- Environmental noise emissions from the proposed loading dock, car park, plant, etc.
- Noise emissions from the operation of the proposed restaurants and retail shops.

These potential impacts have been assessed in accordance with Penrith Council guidelines and recommendations made to ameliorate any impacts if required.

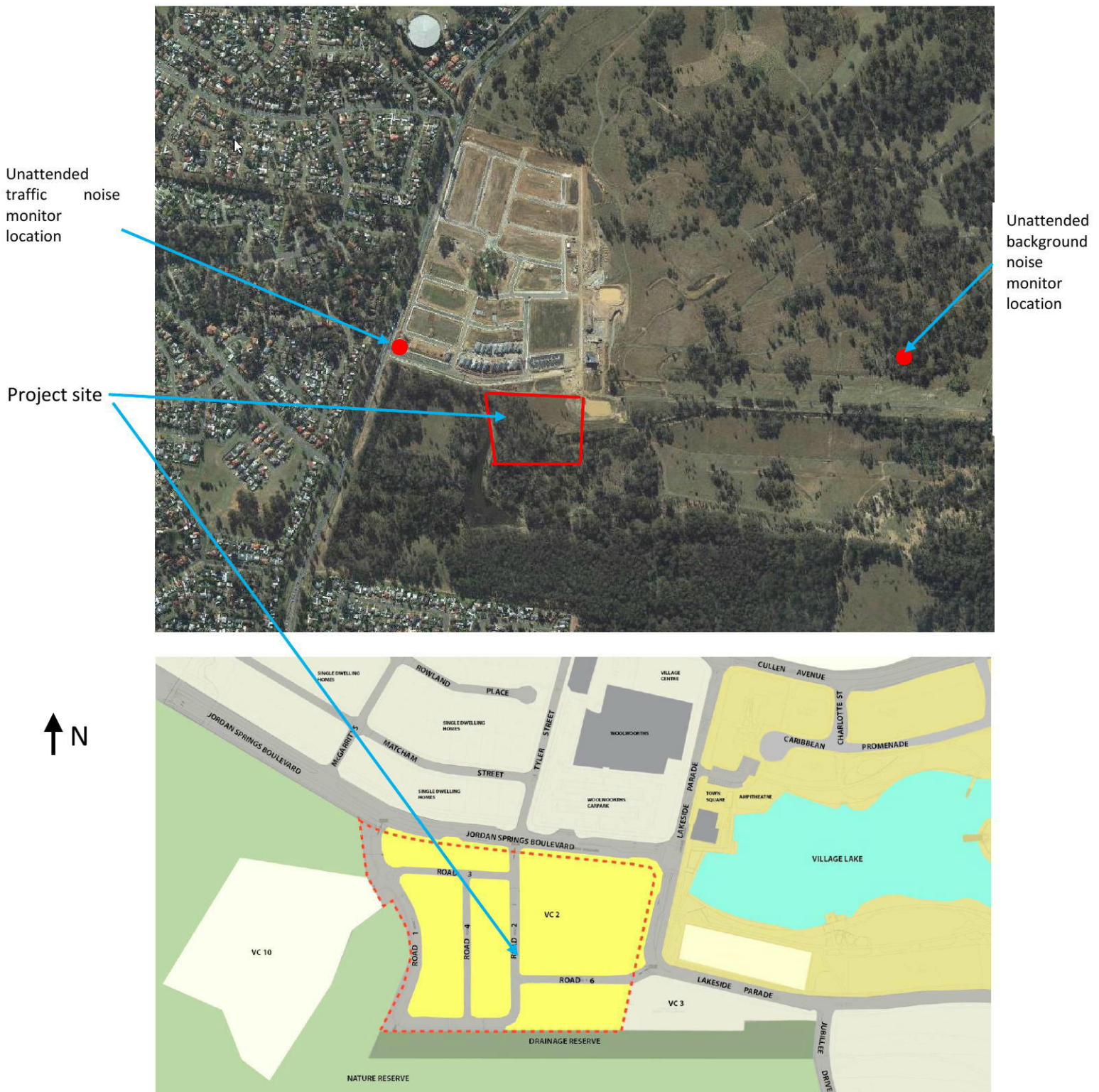


Figure 1 Site Map and Noise Monitor Locations

### 3 EXISTING BACKGROUND NOISE LEVELS

Long term background noise monitoring was undertaken to establish noise emission criteria in accordance with guidelines within the NSW EPA Industrial Noise Policy.

#### 3.1 MEASUREMENT LOCATIONS

The unattended monitor measurement locations are indicated in Figure 1. The monitor east of the site was used to assess background noise levels. This location was selected to avoid noise created by existing construction activities near the project site.

#### 3.2 EQUIPMENT USED

Background noise was recorded using an Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the unmanned monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

#### 3.3 MEASUREMENT TIME PERIOD

Unattended measurements were conducted between 13<sup>th</sup> and 19<sup>th</sup> November 2013.

#### 3.4 MEASURED RATING BACKGROUND NOISE LEVEL

The measured background noise levels (dB(A) L<sub>90</sub>) for day, evening and night time periods are shown in the table below.

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm; and
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

The rating background noise levels calculated in accordance with the guidelines contained in the EPA Industrial Noise Policy are summarised in Table 2.

**Table 2 – Rating Background Noise Levels**

Location	Time	L <sub>90</sub> dB(A)
Unattended noise monitor east of the site	Day	39
	Evening	39* (42)
	Night	39

\* The recorded level was 42 however in accordance with EPA guidelines the lower, “daytime” level has been adopted for assessment purposes.

It is noted that the measured background noise levels in the vicinity are likely to increase over time once the locality undergoes development. Therefore, use of these background noise levels provide a conservative impact assessment over the long term.



## 4 NOISE ASSESSMENT

The following noise assessments have been carried out:

- Traffic noise intrusion into the project site from vehicles on surrounding roads. The main external noise sources are The Northern Rd, and noise from future movements on Jordan Springs Boulevard and Lakeside Parade.
- Noise impacts from the proposed restaurants and retail shops to residential apartment buildings on project site and properties surrounding the project site.
- External noise emissions from the proposed plant servicing the project site.
- External noise emissions from loading dock and car park servicing the project site.

### 4.1 PENRITH CITY COUNCIL DEVELOPMENT CONTROL PLAN 2006 FOR RESIDENTIAL DEVELOPMENT

The Penrith DCP states the following:

*Where your site is likely to be affected by unacceptable levels of noise the applicant is required to provide reports from qualified consultants to demonstrate acoustic protection measures necessary to achieve an indoor environment meeting residential standards, in accordance with EPA and State Rail criteria, as well as relevant Australian Standards.*

*Section 6.10 Visual and Acoustic Privacy and Outlook*

*II. Recommended night-time internal noise levels in living and sleeping areas is 35- 40 dB(A). - WHO*

### 4.2 TRAFFIC NOISE INTRUSION ASSESSMENT

#### 4.2.1 Internal Assessment Criteria for Dwellings

In accordance with the DCP the relevant Australian standards for the assessment of traffic noise intrusion into the project are Australia Standard AS2107-2000 and AS 3671. The applicable noise level requirements from these standards are detailed below.

**Table 3 - Internal Noise Criteria**

Space	Noise Criteria $L_{eq}$
Bedroom	Night- 35 dB(A) (10pm to 7am)
Living Room	Day- 40 dB(A) (7am to 10pm)

#### 4.2.2 Noise Descriptors

Traffic noise constantly varies in level, due to fluctuations in traffic speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level. To accurately determine

the effects of traffic noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely  $L_{10}$ ,  $L_{90}$  and  $L_{eq}$ .

The  $L_{10}$  and  $L_{90}$  measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The  $L_{10}$  parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced at the source.

Conversely, the  $L_{10}$  level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The  $L_{90}$  parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the  $L_{90}$  level.

The  $L_{eq}$  parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period.  $L_{eq}$  is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of traffic noise.

### 4.2.3 Existing Roads - Traffic Noise Measurements

The main existing traffic source The Northern Road.

#### 4.2.3.1 Measurement Period, Location and Equipment

Traffic noise measurements were taken using a long term, unmanned noise monitor, and supplemented using a hand held measurement. The noise measurements were carried out at 8m from kerb with microphone full view of traffic. Refer Figure 1.

Measurements were performed generally in accordance with the Australian Standard AS1055 – Description and Measurement of Environmental Noise – General Procedures.

#### 4.2.3.2 Long Term Monitoring

Measurements of traffic noise along The Northern Rd were recorded using an Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the unmanned monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode. Unmanned measurements were conducted between 13<sup>th</sup> and 19<sup>th</sup> November 2013. Figure 1 details the measurement position.

#### 4.2.3.3 Manned Measurements

Manned measurements were taken during morning peak on 19<sup>th</sup> November 2013. Noise measurements were obtained using a Norsonic type SA140 Sound Analyser. The analyser was set

to fast response and calibrated before and after the measurements using a Norsonics Sound Calibrator type 1251. No significant drift was noted.

#### 4.2.3.4 Measured Noise Levels

Representative traffic noise levels were determined from the logging data and manned measurements, and are presented below. Long term monitoring data are attached at the end of this report.

**Table 4 - Measured Noise Levels**

Location	Existing Traffic Noise Level dB(A) <sub>Leq</sub>	
	Daytime (7am-10pm)	Night time (10pm-7am)*
@ 8m distance from Kerb of The Northern Rd	61dB(A) <sub>Leq</sub>	58dB(A) <sub>Leq</sub>

When assessing noise impacts at the proposed development the measured level is adjusted for distance, barrier attenuation and orientation. A 3 dB(A) increase in existing noise levels has also been used to allow for traffic growth for a 10 year period, assuming 7% pa compounding traffic growth.

#### 4.2.4 Future Roads' Noise Emissions

##### 4.2.4.1 Estimated Traffic Volumes

Traffic noise emitted from future roads has been predicted based on expected traffic movements. Traffic volumes used in the assessment are based on information provided by GTA Consultants. The data are summarised in the following table.

**Table 5 – Traffic Volumes on Future Roads**

Road	Vehicles per Hour	
	AM Peak	PM Peak
Jordan Springs Boulevard – west of Lakeside Parade	675-775	830-930
Lakeside Parade – south of Jordan Springs Boulevard	370-470	430-530

#### 4.2.4.2 Predicted Future Traffic Noise Levels

Traffic noise prediction has been carried out by CORTN programme and predicted traffic volume above. The predicted traffic noise levels during peak traffic hours are been presented below:

**Table 6 –Predicted Traffic Noise Levels**

<b>Location</b>	<b>Predicted Mean Traffic Noise Level During Peak Hour (day time period)</b>
Jordan Springs Blvd northern to the project site– 5m distance from kerb	66 dB(A) $L_{eq}$
Lakeside Parade eastern of the project site-5m distance from kerb	64 dB(A) $L_{eq}$

The assessment criteria use noise level descriptors based on the 7am and 10 pm (day) and 10pm and 7am (night) periods, not the peak hour noise levels. The day and night noise level descriptors have been estimated from the peak data based on a minus 2 dB(A) correction for daytime (meaning the average traffic volume is 2/3 of the peak) and 7 dB(A) for night time (meaning the average traffic volume is 1/5 of the peak).

#### 4.2.5 Evaluation of Noise Intrusion

Internal noise levels will primarily be as a result of noise transfer through the windows, doors and roofs, as these are relatively light building elements that offer less resistance to the transmission of sound. Similarly, sound transmission through light-weight wall constructions on facades facing roads should also be assessed. External walls that are proposed to be masonry elements will not require assessment as they will adequately prevent sound transmission.

Noise transmission through windows, doors and roofs has been predicted based on the predicted external levels incident on the façade, the spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

The glazing required to comply with the recommended criteria are summarised in Section 5.

### 4.3 ENVIRONMENTAL NOISE INTRUSION FROM THE PROPOSED RESTAURANTS AND OTHER COMMERCIAL USES

The proposed Piazza is intended to act as a hub for the community within the development and for nearby residents, providing necessary facilities for the local residents. The associated noise impacts can be adequately addressed through building design and management of the commercial operations. These measures have been determined by assessing typical noise emissions from the proposed restaurant uses:

- To future residential dwellings forming part of the proposal.
- To surrounding properties external to the subject application.

#### 4.3.1 Restaurant Noise Emission Criteria - Dwellings within the Subject Development

The noise intrusion criteria have been determined based on the requirements of Australian Standard AS2107-2000 for quasi steady noise sources in accordance with the DCP.

**Table 7 –Internal Noise Criteria within Residential Apartments on the Development Site**

Space	Criteria, dB(A) L <sub>eq</sub> (15min)
Bedroom	35
Living Room	40

For sleeping areas an additional criterion is needed to prevent adverse sleep arousal from short duration events. The recommended criterion (based on WHO guidelines) is that L<sub>1</sub> (15 min) noise level should not exceed 45 dB(A) after 10pm.

#### 4.3.2 Restaurant Noise Emission Criteria - Dwellings outside the Subject Development

External noise criteria applying to dwellings outside the subject development have been based on Industrial Noise Policy guidelines. Refer Section 4.5.1 for the derivation of the project specific criteria.

**Table 8 –External Noise Criteria - Residential Dwellings Outside the Subject Development**

Time	Criteria, dB(A) L <sub>eq</sub> (15min)
Day	44
Evening	44
Night	44

For sleeping areas an additional criterion is needed to prevent adverse sleep arousal from short duration events. The recommended criterion (based on EPA guidelines) is that the external L<sub>1</sub> (1 min) noise level should not exceed the background noise level by more than 15 dB(A) after 10pm. Thus, the noise level outside residential bedrooms should not generally exceed 54 dB(A) L<sub>1</sub> (1 min).

### 4.3.3 Noise Sources

The proposed maximum operating periods for the proposed restaurants are:

- Monday to Wednesday 8am to 10pm.
- Thursday to Sunday 8am to 11pm.

This office has been advised that only background music will be permitted to be played within the proposed restaurant/café.

Where specific restaurants propose to undertake louder activities then this would be assessed as part of the individual application for the use and, if necessary, additional treatment incorporated into the tenancy to ameliorate any adverse impacts in accordance with the recommended noise criteria.

Licensed premises may be subject to additional conditions imposed by their OLGR licence.

#### 4.3.3.1 Background Music

The assessment has been based on noise levels that occur during the worst-case situation. This event would correspond to maximum use periods e.g. Friday, Saturday nights.

**Table 9 – Music Maximum Internal Noise Level, dB  $L_{eq}$**

	OCTAVE BAND CENTRE FREQUENCY (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	A-wt
Ambient Music	71	75	77	71	66	63	62	58	57	<b>70</b>

#### 4.3.3.2 Patron Noise

The main noise source in the outdoor seating areas would be patron speech, with a sound power level of 74 dB(A)  $L_{eq}$  per patron.

The sound power level spectrum used in the calculations to predict the impact of patrons utilising the outdoor terraces is presented below. This has been based on measurements taken of similar outdoor dining spaces.

**Table 10 –Sound Power Level Spectrum of Single Patron**

Noise Level dB – Frequency (Hz)									
31.5	63	125	250	500	1k	2k	4k	8k	A-wt
59	59	64	67	71	72	67	58	45	74

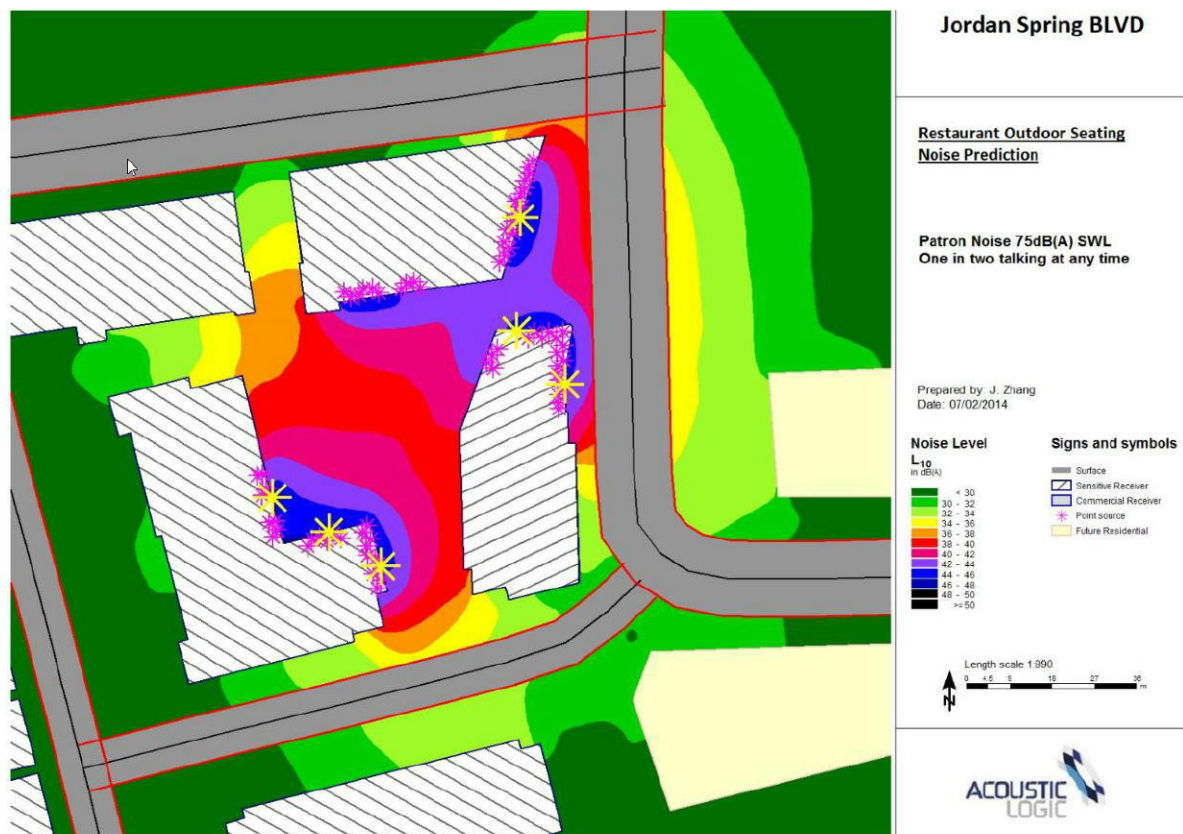
Noise from patrons using the outdoor seating has been predicted at the nearest residences. The noise level predicted at each receiver is based on indicated number of seats in outdoor spaces with 1 in 2 people talking at any one time.

#### 4.3.3.3 Outdoor Seating Noise Modelling

Outdoor seating noise levels have been predicted at the receiver locations using SoundPlan™ modelling software implementing the ISO 9613-2:1996 “Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation” noise propagation standard. The modelling is based on the building layouts and outdoor seating shown on the drawings provided to this office.

#### 4.4 PREDICTED NOISE LEVELS AND PREDICTED IMPACTS

Figure 2 shows the results of the external noise modelling. The model has been used to assess worst case impacts at the lowest residential level.



**Figure 2 Sound Plan Modelling of Outdoor Seating Noise Emissions**

Noise levels in Figure 2 close to facades include façade reflection, which locally elevates noise levels by approximately 2.5 dB(A). Comparison with the noise criteria is made on a noise level with no façade reflection.

The conclusions arising from the assessment are:

- Noise emissions to all future residential dwellings outside the subject site (being <31 dB(A) excluding façade reflection) would comply with the applicable noise criteria.

- A concrete slab would be sufficient to prevent internal noise transmission generated by the restaurants and other commercial uses from adversely impacting the future residences.
- For the residential dwellings within the proposed development the façade treatments and other measures recommended in Section 5 would be sufficient to comply with the recommended internal criteria at all times.
- Notwithstanding, additional management controls are recommended in Section 5 to be imposed on the restaurant and commercial uses to minimise noise emissions.

## 4.5 PLANT NOISE EMISSIONS

A detailed mechanical design is unavailable at this stage. Therefore, noise emission limits for plant serving the project site will be established. These will be the basis for future assessments of plant noise during detailed design of the buildings and associated plant treatments. The criteria apply to the cumulative effect of all noise sources on the subject site.

### 4.5.1 Plant Noise Emission Criteria

Environmental noise emissions from the plant serving the project site should comply with the requirements of NSW EPA Industrial Noise Policy which has been detailed below.

The EPA Industrial Noise Policy provides guidelines for assessing noise impacts from industrial developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The EPA Industrial Noise Policy has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion. In addition, the EPA in its Environmental Noise Control Manual states that noise controls should be applied with the general intent to protect residences from sleep arousal.

#### 4.5.1.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the  $L_{eq}$  descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

#### 4.5.1.2 Amenity Criterion

The guideline is intended to limit the absolute noise level from all industrial noise sources to a level that is consistent with the general environment.

The EPA's Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table below provides the recommended ambient noise levels for the urban residential receivers for the day, evening and night periods.



For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm; and
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

**Table 11 – EPA Recommended Amenity Industrial Noise Levels - External**

Type of Receiver	Time of Day	Recommended Acceptable Noise Level dB(A) $L_{eq}$
Residential	Day	60
	Evening	50
	Night	45

#### 4.5.1.3 Sleep Arousal

To minimise the potential for sleep arousal the  $L_1$  (1 minute) noise level of any specific noise source does not exceed the background noise level ( $L_{90}$ ) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. The  $L_1$  noise level is the level exceeded for 1 per cent of the time and approximates the typical maximum noise level from a particular source. Where the typical repeatable existing  $L_1$  levels exceed the above requirement then the existing  $L_1$  levels form the basis for sleep disturbance criteria.

#### 4.5.1.4 Summary of Assessment Criteria

EPA Industry Policy requirements will be used as acoustic assessment criteria for this project. The intrusiveness, amenity and sleep arousal criteria for this project have been determined using these guidelines and the noise monitoring results. These are summarised below. We note that the formulation of the assessment criteria has been based on the lowest background noise levels determined from all monitoring data.

The table below provides a summary of the criteria applicable to the proposed development based on the information documented above.

**Table 12 – Noise Objectives for Residential Receivers Near Proposed Development**

Daytime Noise Objective dB(A) $L_{eq}$	Evening Noise Objective dB(A) $L_{eq}$	Night Noise Objective dB(A) $L_{eq}$	Night Noise Objective dB(A) $L_1(1min)$
44	44	44	54

#### 4.6 NOISE GENERATED BY LOADING DOCK AND CARPARK

The car parks are fully enclosed therefore the noise emissions would not impact receivers around the project site.

The potential noise sources associated with the loading dock are listed in table below along with the noise emission levels. The emission levels have been obtained from noise monitoring carried out at similar retail loading dock facilities. Noise measurements were obtained using a Norsonics SA 110 with (serial number 24692) or CEL-593 Type 1 sound level analysers (serial number C1. T 116962), set to fast response. The sound level analysers were calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was recorded.

This office has been advised that loading dock operation hours is between 7am and 5pm Monday to Friday. The assessment has been based on rigid trucks up to 8.8m in length.

**Table 13 - Noise Source Emission Levels**

<b>Noise Source</b>	<b>Sound Power Level dB(A)</b>	<b>Type of Noise Source</b>
Truck Idle	99	Quasi-Steady
Trucks Manoeuvring	103	Intermittent
Truck reversing alarm	108 including 5 dB(A) tonality correction	Intermittent
Truck Air Brakes	114	Intermittent
Loading Dock Door Operation	85	Intermittent
Waste Truck compacting load	103	Quasi-Steady

## 5 RECOMMENDATIONS

The following acoustic treatments are recommended for the proposed development to comply with the recommended noise criteria and prevent adverse noise impacts to occupants on the subject site and on surrounding sites.

### 5.1 GLAZING

The worst case glazing thickness of the facades of the proposed development (applying to the lower levels) have been recommended to ensure that traffic and patron noise levels comply with all internal noise criteria.

**Table 14 – Worst-Case Glazing Recommendations**

Building	Façade	Glazing Thickness	Minimum STC/Rw Rating
TH-01 to TH12	North	6.38mm Lam	31
	Remaining	Standard Glazing	22
Remaining TH	All	Standard Glazing	22
A	North	6.38mm Lam	31
	West/East	6.38mm Lam	31
	South	6.38 mm Lam	31
B	All	6.38mm Lam	31
C	North/West	6.38mm Lam	31
	Remaining	Standard Glazing	22
D	East	6.38mm Lam	31
	Remaining	Standard Glazing	22
E	All	Standard Glazing	22

The opening sashes should be fitted with acoustic seals for the recommended glazing system above.

## 5.2 ROOF /CEILING STRUCTURE

The top floor town house ceilings with light weight roofing materials such as tiles and or metal deck roofing to living areas and bedrooms are to be built according to Figure 3.

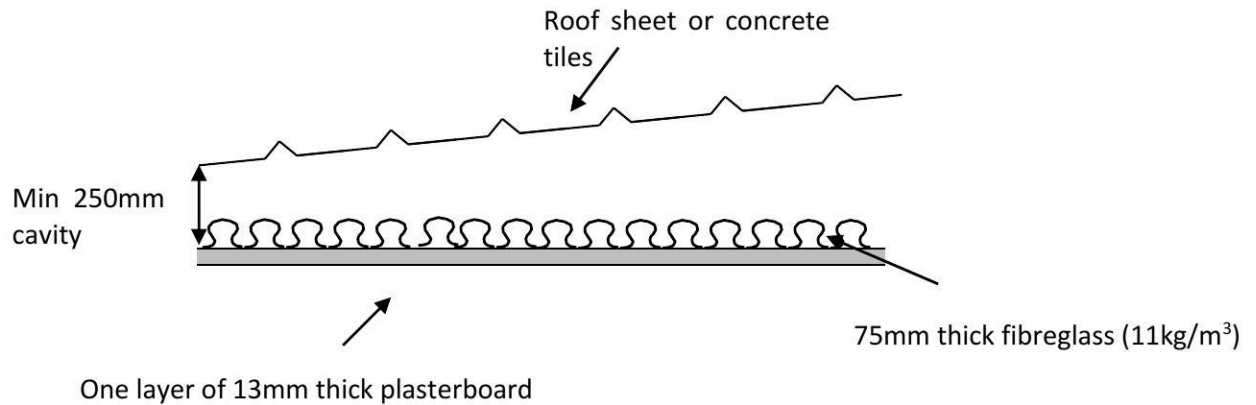


Figure 3 – Roof/Ceiling Construction

## 5.3 LIGHTWEIGHT WALLS (FC SHEETING) FOR TOWN HOUSE

Lightweight walls for upstairs bedrooms require the following construction:

- a. Upstairs Bedrooms facades facing Jordan Springs Blvd: 1 layer of minimum 7mm fibre cement sheet external cladding / 92mm stud with 75mm thick 11kg/m<sup>3</sup> glass wool insulation to cavity / 1 layer of 16mm plasterboard internal sheet.
- b. Upstairs Bedrooms of remaining TH: 1 layer of minimum 7mm fibre cement sheet external cladding / 64-92mm stud with 75mm thick 11kg/m<sup>3</sup> glass wool insulation to cavity / 1 layer of 13mm plasterboard internal sheet.

## 5.4 DWELLING VENTILATION

Where traffic noise levels transmitted through the façade under a naturally ventilated (windows open) condition exceed the internal criteria by more than 10 dB(A) in habitable spaces then an alternative ventilation system or air conditioning should be provided to those rooms.

Where restaurant/commercial activity noise levels transmitted through the façade under a naturally ventilated (windows open) condition exceed the internal criteria in habitable spaces then an alternative ventilation system or air conditioning should be provided to those rooms.

Indicatively, the following facades would require alternative ventilation or air conditioning to habitable rooms:

- The southern facades of Blocks A and B
- The northern and western façade of Block C, and the northern half of the eastern facade.
- The eastern façade of Block D.

The exact extent should be assessed at construction certificate based on final configuration of layouts and façade designs.

### **5.5 LOADING DOCK**

- Loading dock truck movements limited to day time and evening only: 7am to 10pm Monday to Saturday; 8am to 10pm Sunday and public holidays.

### **5.6 PLANT**

- Plant noise emission criteria are provided in this report. A detailed mechanical noise assessment should be carried out at CC stage to assess the treatment to be applied to the plant to comply with the criteria.

### **5.7 RESTAURANT AND COMMERCIAL USES**

- Maximum acceptable internal background music noise level is 70 dB(A)  $L_{eq}$ .
- Slab thickness between restaurant/café and residential apartment above shall be minimum 150mm thick with all penetrations /junctions acoustically sealed.
- Waste should be retained internally until the next morning.
- Patron activity should be managed by the restaurant staff to control excessive noise from patrons particularly at night.
- Any applications for proposed uses not meeting these requirements should include a detailed noise assessment conducted by a specialist acoustic consultant highlighting the expected noise sources, impact assessment and any additional ameliorative treatment required.

## 6 CONCLUSION

An environmental noise assessment for the proposed mixed use development at Jordan Springs Boulevard, Jordan Springs has been carried out. The following noise sources have been assessed:

- Traffic noise impacts on the dwellings within the proposed development.
- Noise emissions from restaurant and other commercial activities on the dwellings within the proposed development and on surrounding properties.
- Noise emissions from plant on the dwellings within the proposed development and on surrounding properties.

Recommendations are made in Section 5 of the report based on the assessment outcomes. The implementation of these recommendations will ensure there would be no adverse noise impacts.

Yours faithfully,

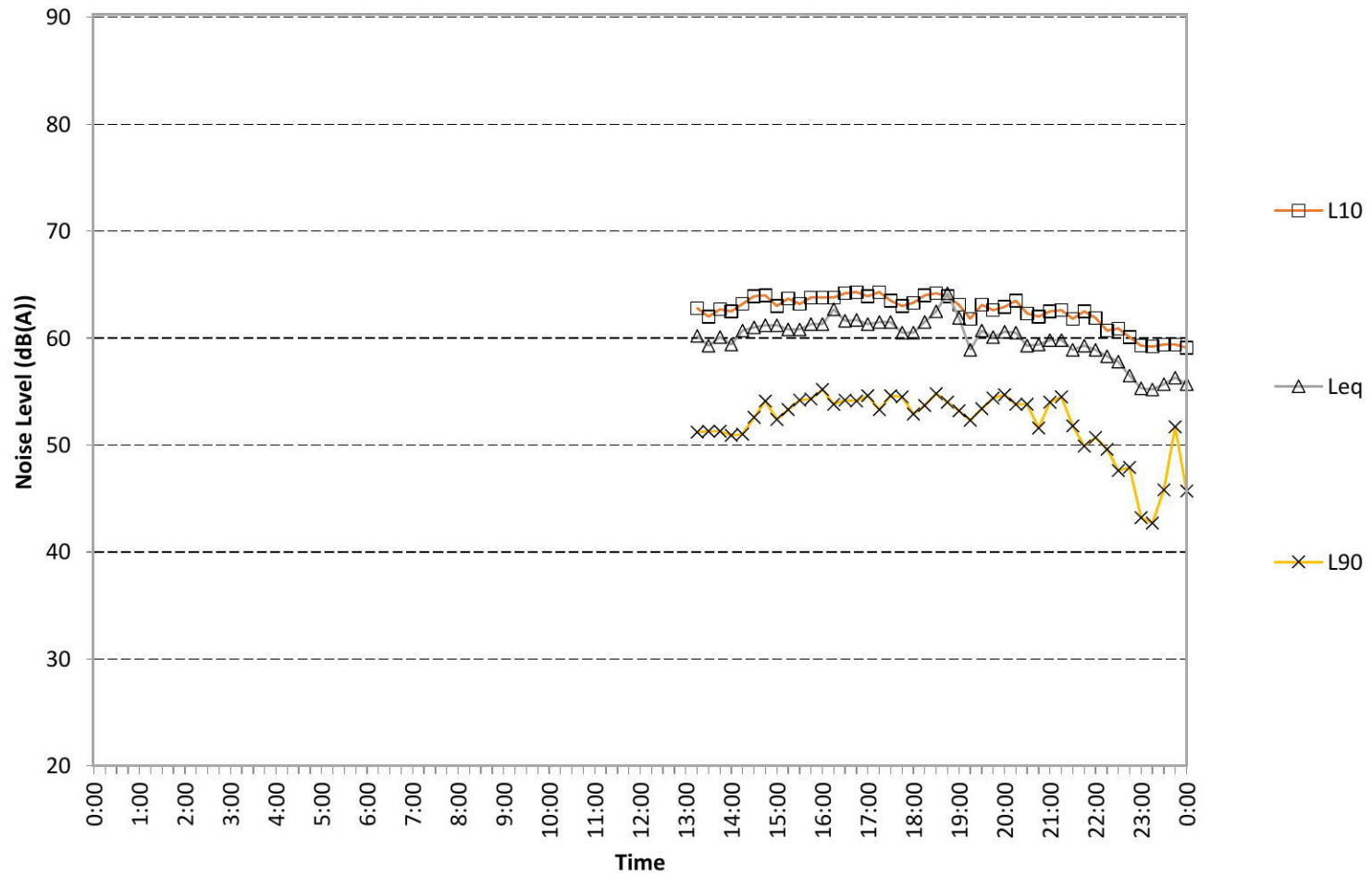


Acoustic Logic Consultancy Pty Ltd  
Victor Fattoretto

**Appendix 1**  
**Unattended Traffic Noise Monitor Data**

### Traffic Noise Monitor- Jordan Spring

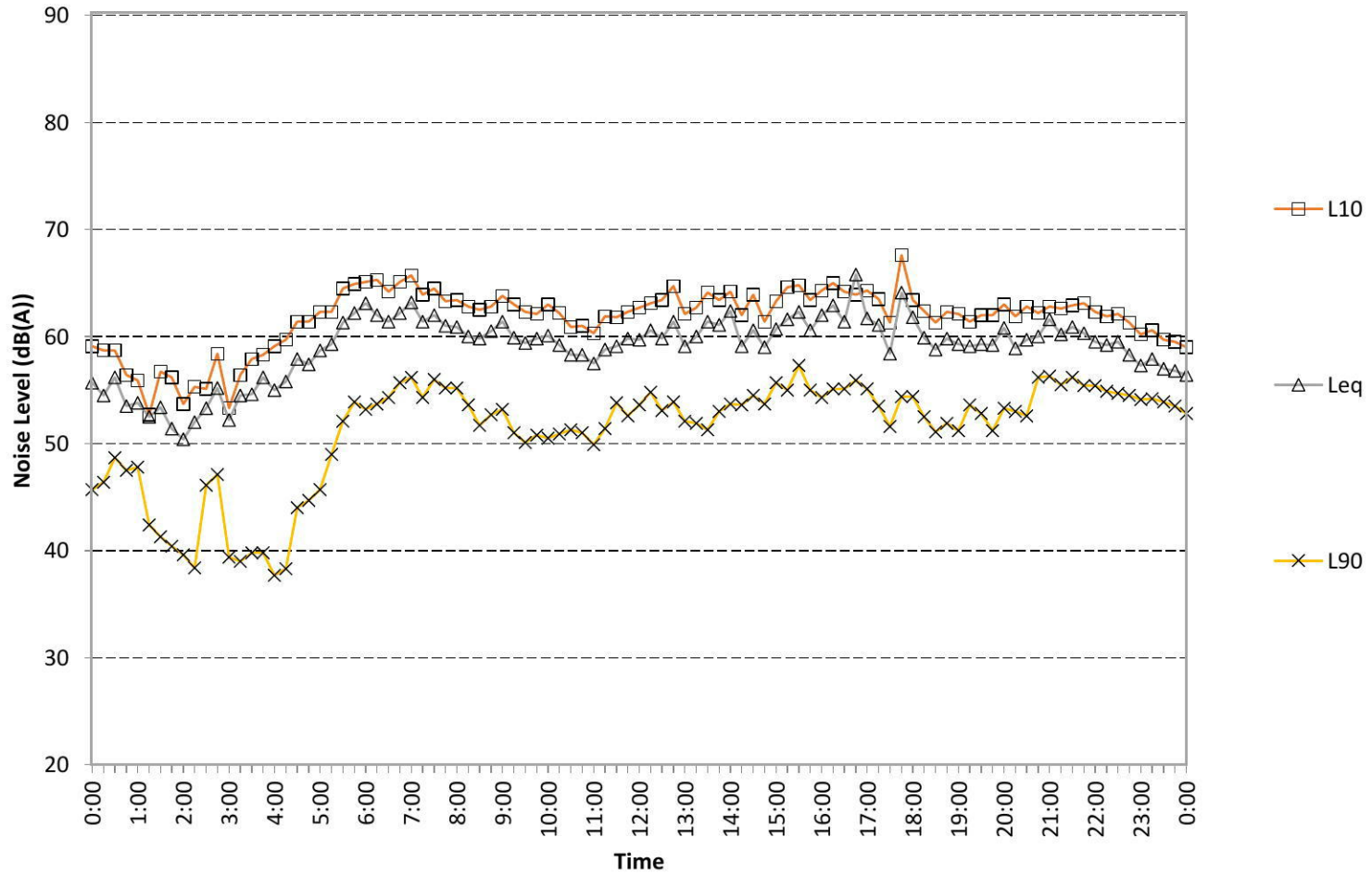
Wednesday November 13,2013





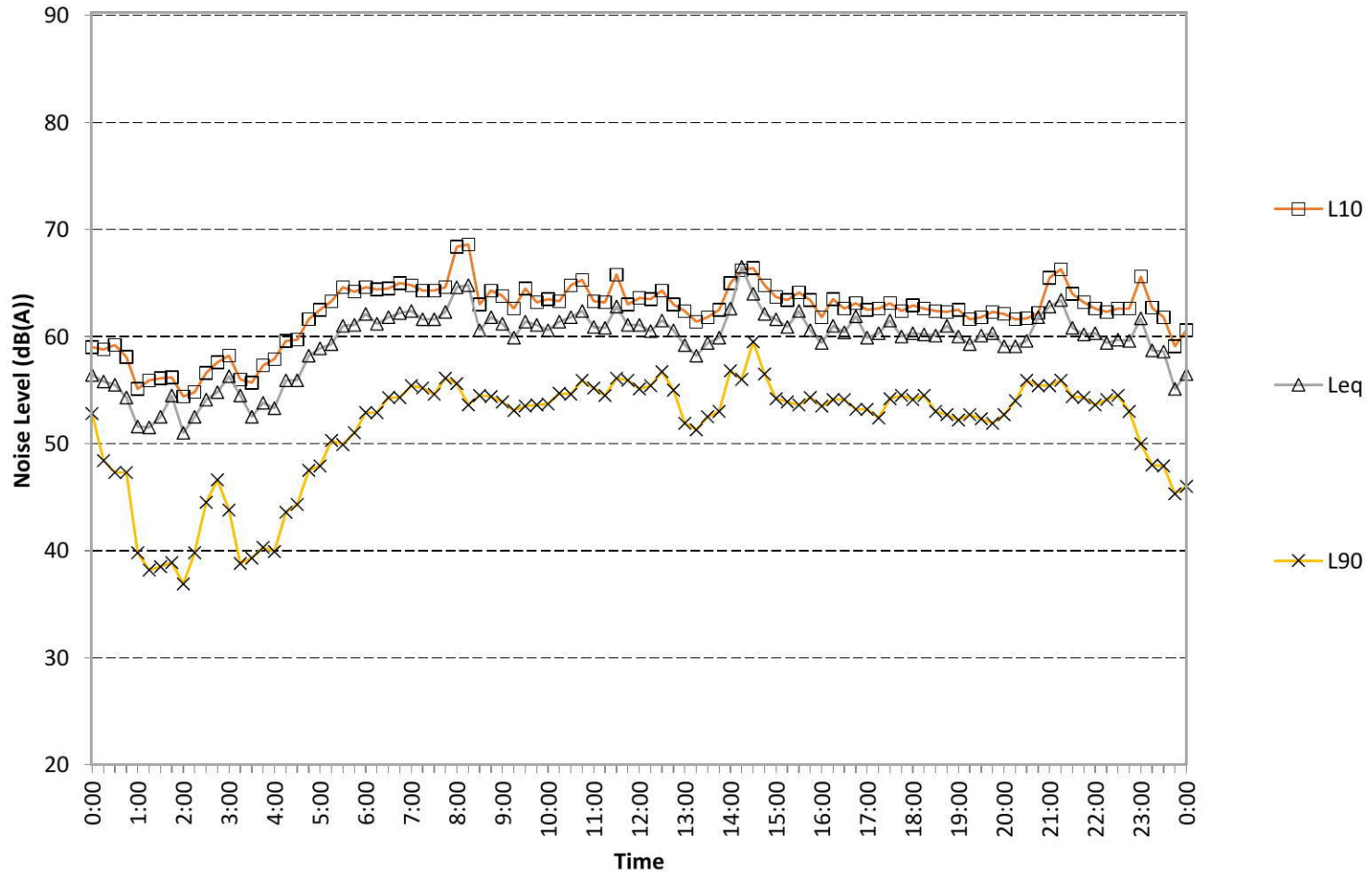
### Traffic Noise Monitor- Jordan Spring

Thursday November 14, 2013



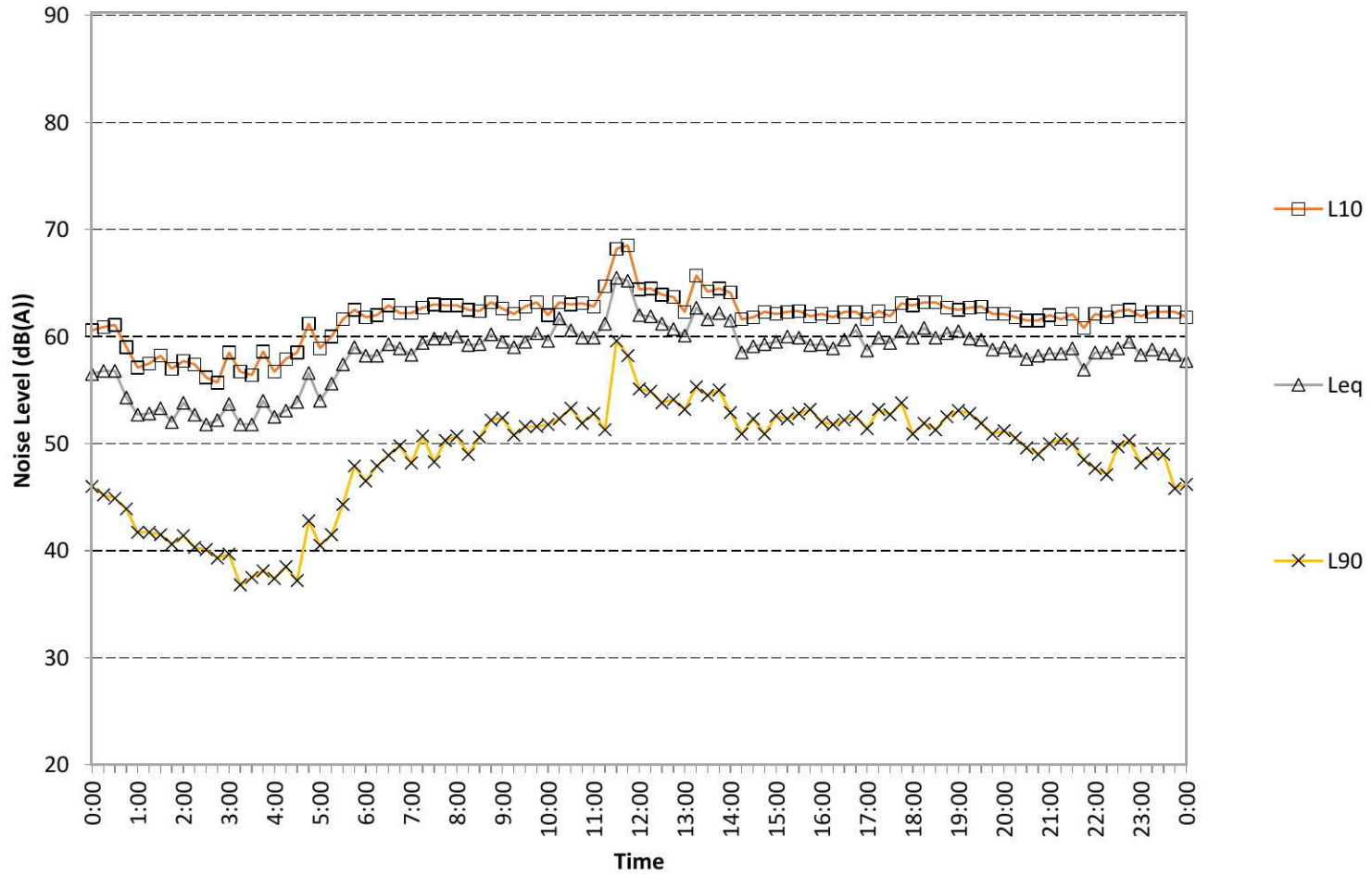
### Traffic Noise Monitor- Jordan Spring

Friday November 15,2013



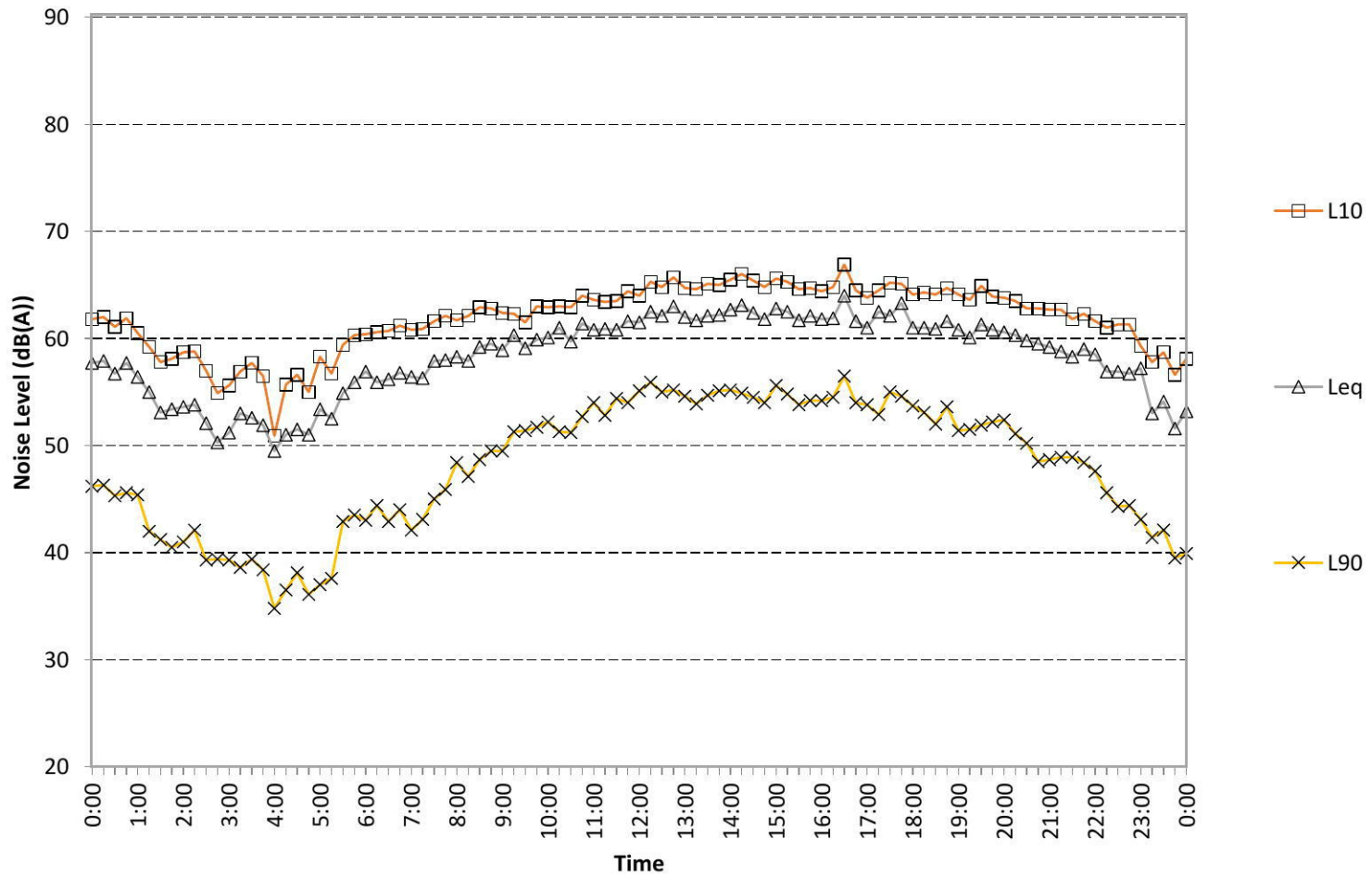
### Traffic Noise Monitor- Jordan Spring

Saturday November 16,2013



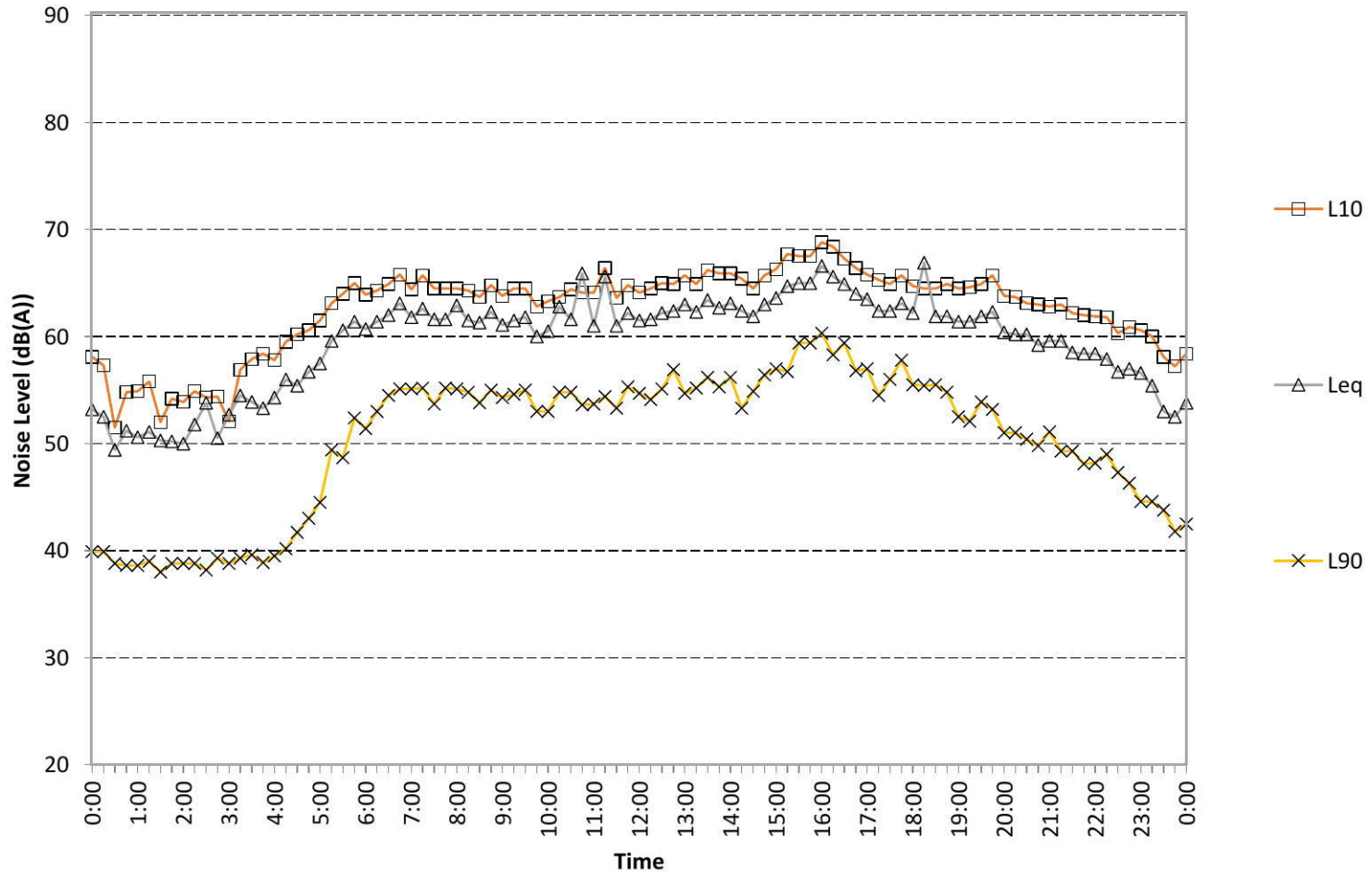
### Traffic Noise Monitor- Jordan Spring

Sunday November 17,2013



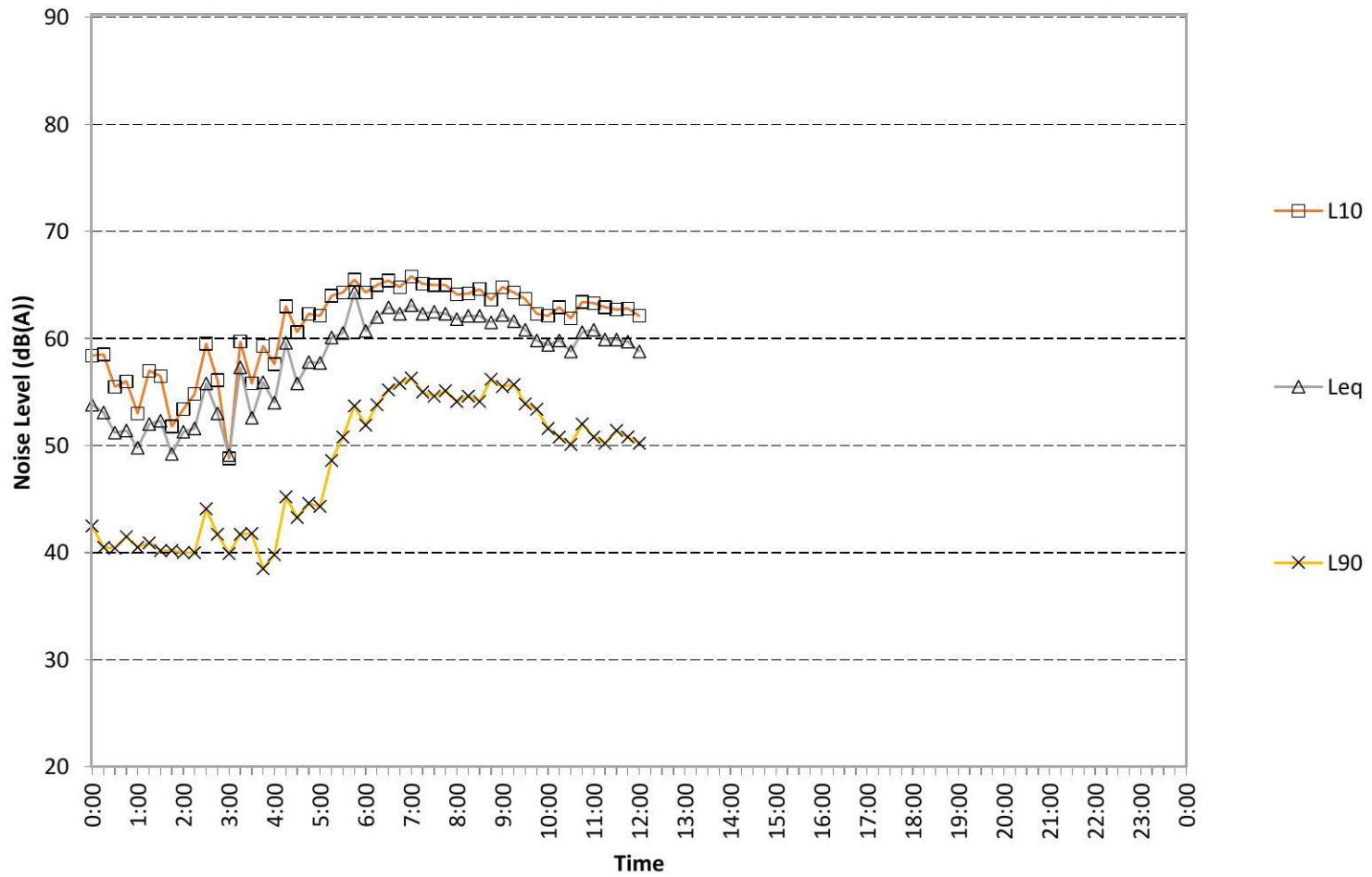
### Traffic Noise Monitor- Jordan Spring

Monday November 18, 2013



### Traffic Noise Monitor- Jordan Spring

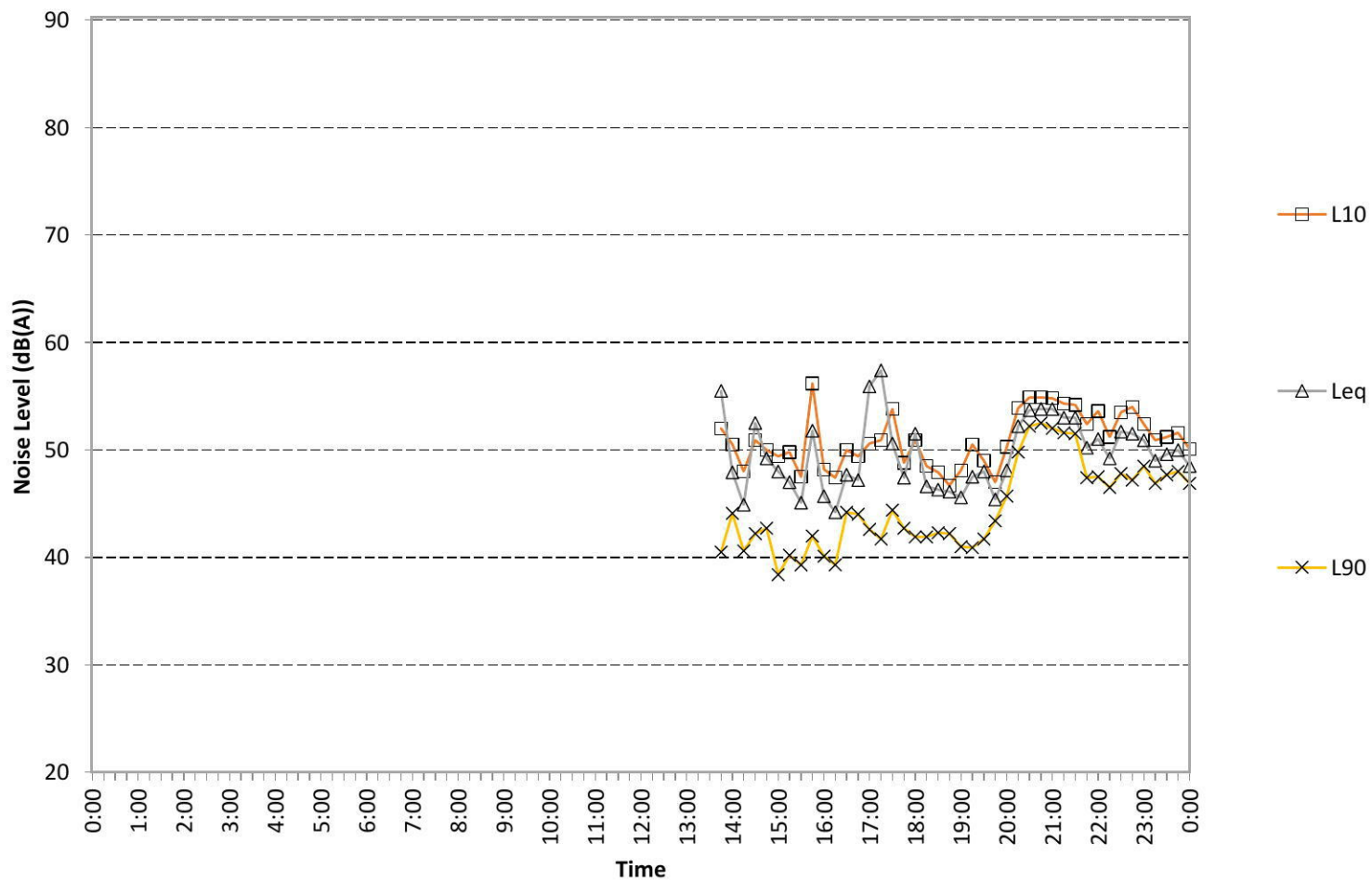
Tuesday November 19,2013



**Appendix 2**  
**Unattended Background Noise Monitor Data**

# Background Noise Monitor Jordan Springs

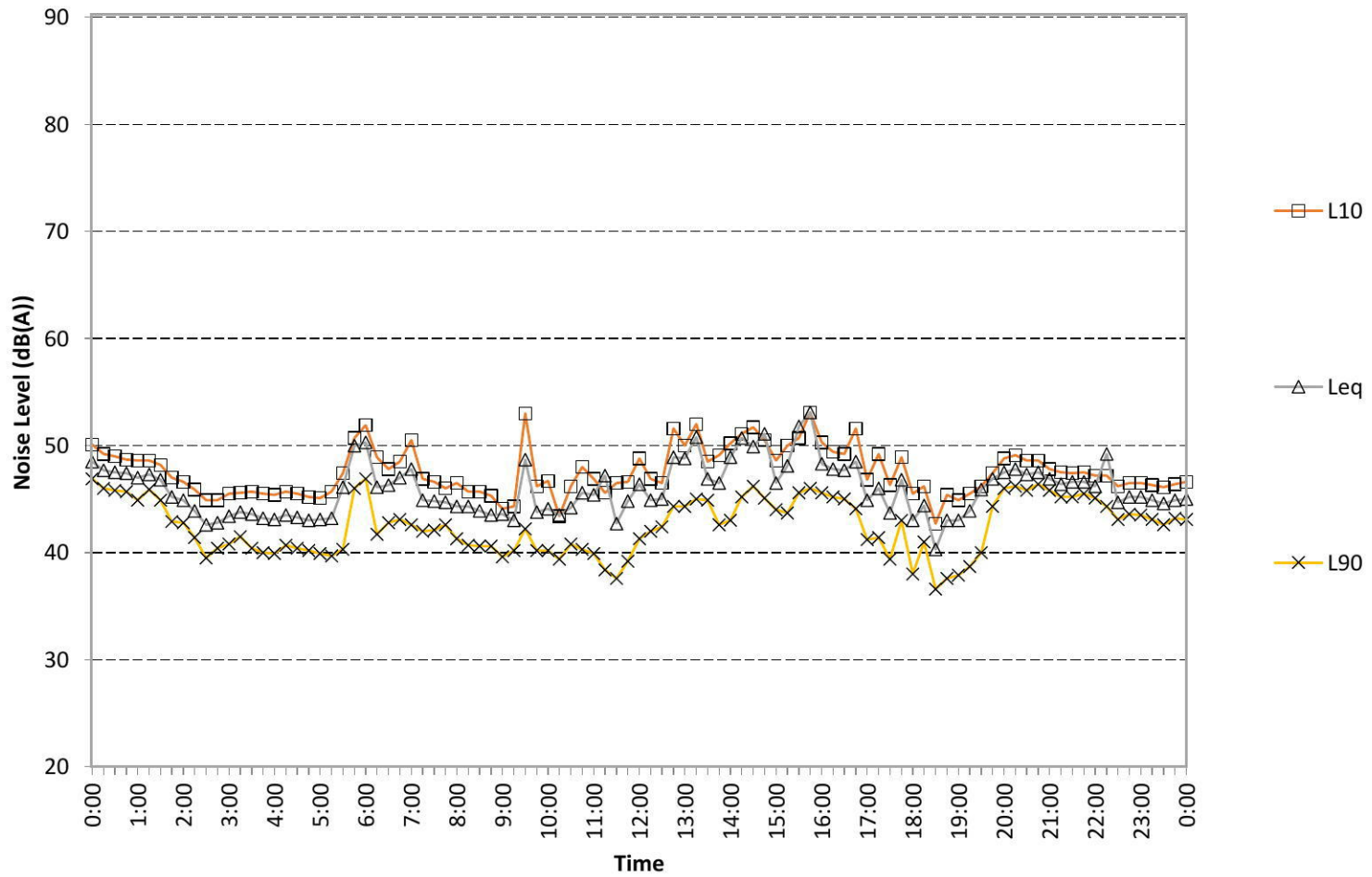
Wednesday November 13, 2013





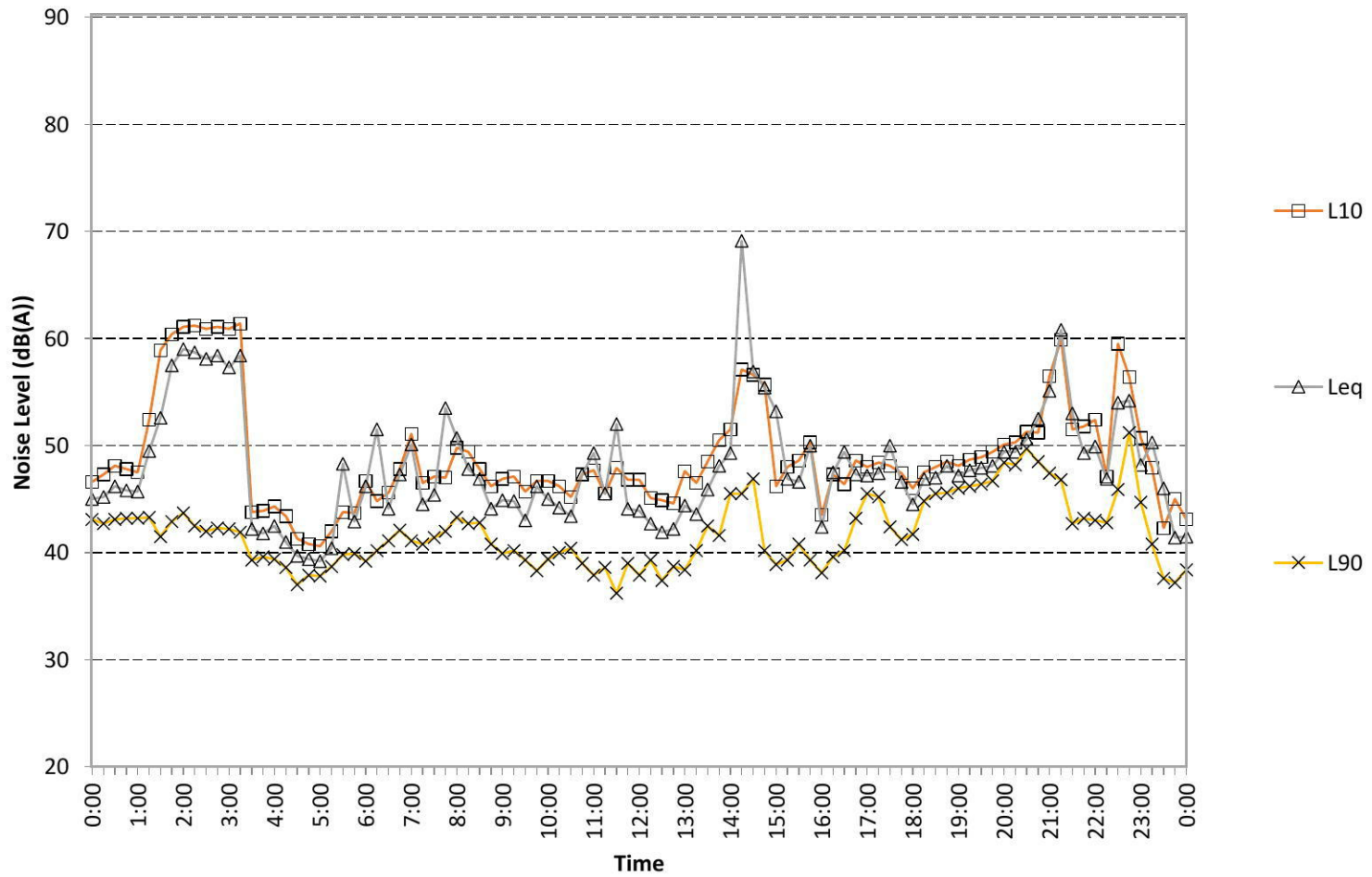
### Background Noise Monitor Jordan Springs

Thursday November 14, 2013



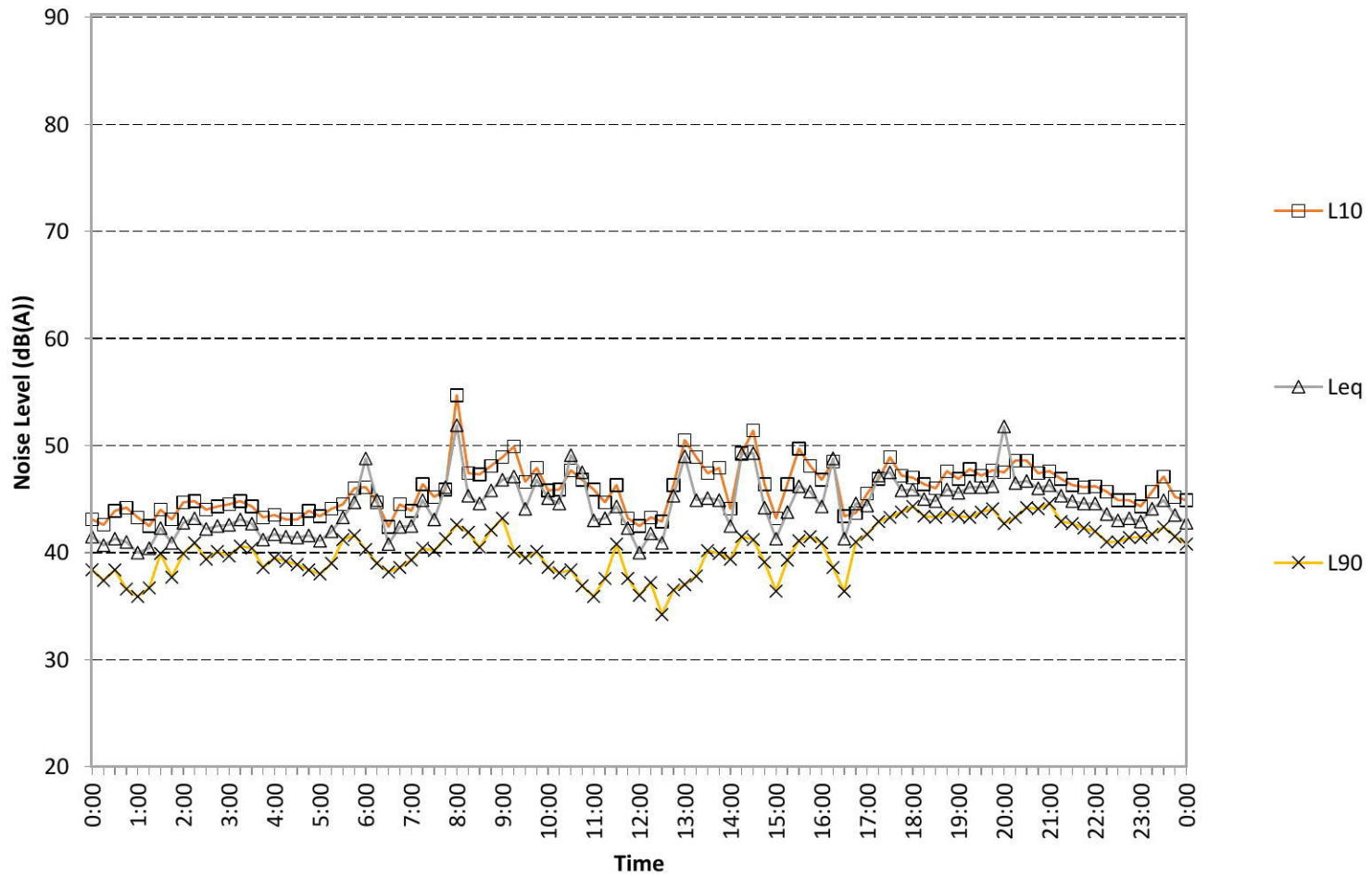
### Background Noise Monitor Jordan Springs

Friday November 15, 2013



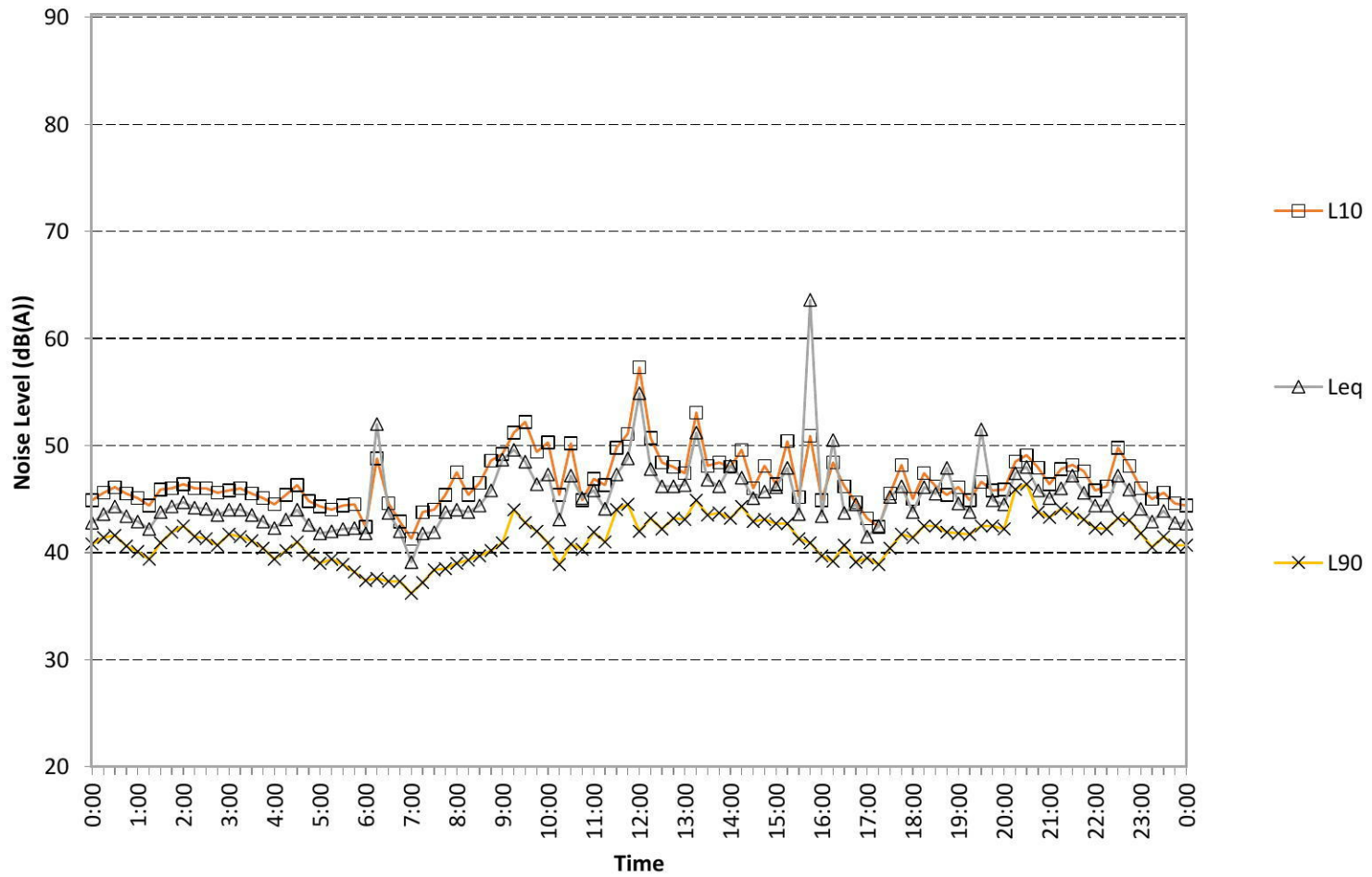
### Background Noise Monitor Jordan Springs

Saturday November 16,2013



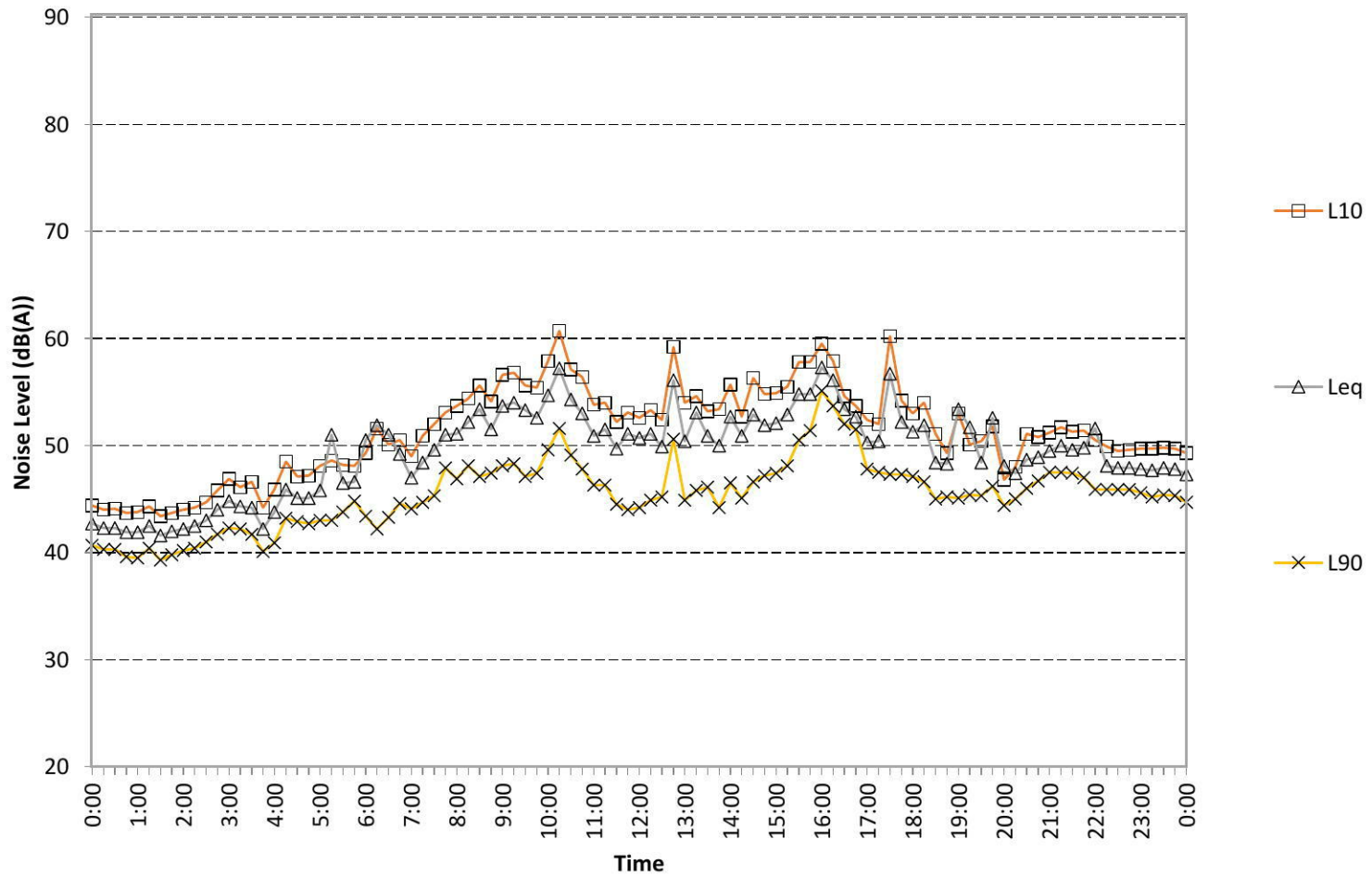
### Background Noise Monitor Jordan Springs

Sunday November 17, 2013



### Background Noise Monitor Jordan Springs

Monday November 18, 2013



### Background Noise Monitor Jordan Springs

Tuesday November 19, 2013

