acousticdynamics

Proposed Bus Depot Noise Emission
21 Middleton Road, Cromer, NSW

Client:
ComfortDelGro Australia

Association of Australasian Acoustical Consultants

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Document	Revision	Date	Prepared	Checked	Authorised	Approved
5075R001.JC.201214	0	16 December 2020	JC	RH	RH	

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GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined in Section 2 below.

NOISE DESCRIPTORS

dB – Decibels. The fundamental unit of sound, a Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

L_{Aeq} – The A-weighted sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period. Measured in dB.

L_{Amax} – The maximum or peak A-weighted noise level that occurs over the measurement period. Measured in dB.

Indoor Design Level – The recommended maximum level in dB(A) inside a building from external noise sources.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

NOISE CHARACTER, NOISE LEVEL AND ANNOYANCE

The perception of a given sound to be deemed annoying or acceptable is greatly influenced by the character of the sound and how it contrasts with the character of the background noise. A noise source may be measured to have only a marginal difference to the background noise level, but may be perceived as annoying due to the character of the noise.

Acoustic Dynamics' analysis of noise considers both the noise level and sound character in the assessment of annoyance and impact on amenity.

1 INTRODUCTION

1.1 SUMMARY & BACKGROUND INFORMATION

Acoustic Dynamics is engaged by **ComfortDelGro Australia** to assess the impact of noise emission at nearby receiver locations resulting from operation of the subject proposed bus depot at 21 Middleton Road, Cromer NSW 2100.

Acoustic Dynamics understands that the proposed Bus Depot will operate between the following times:

- Monday to Sunday (7 days) – 5:00 am to 11:00 pm.

Accordingly, an assessment of the predicted noise emission levels against the most stringent of the applicable criteria being EPA Noise Policy for Industry and the EPA Sleep Disturbance criteria have been undertaken for the subject site. As a part of this assessment, recommendations are provided to enable compliance with the relevant noise emission criteria.

This document presents an acoustic assessment of the noise emission from the operation of the subject Bus Depot. This assessment is based on the inspections and noise measurements undertaken by Acoustic Dynamics as well as previous experience assessing bus depot operational noise.

This document provides an assessment of the measured noise emission associated with the use and operation of the subject site when assessed at nearby receivers and is prepared in accordance with acoustic requirements of the Northern Beaches Council, the NSW Environment Protection Authority (EPA), and other relevant Australian Standards.

1.2 LOCATION & DESCRIPTION OF SUBJECT SITE

The subject Bus Depot is proposed to be located at 21 Middleton Road, Cromer, NSW. The lot occupies the eastern part of the landholding currently occupied by Ausgrid. The proposed location of the bus depot would be divided, and a fence constructed to separate the two operations. Acoustic Dynamics understands that the subject site is zoned IN1 industrial and nearby residential receivers are R2 low density residential. Because of the nature of the receiver zoning and the measured RBL levels Acoustic Dynamics assumes the suburban residential category when determining project amenity levels.

The nearest receivers have been identified as:

- Commercial Receiver (Ausgrid), Corner Middleton Road & Dympna Street (IN1 zoning);
- Commercial Receiver, 55 Middleton Road (IN1 zoning);
- Commercial Receiver, 4 Thew Parade (IN1 zoning);
- Commercial Receiver, 8-10 Dympna Street (IN1 zoning); and
- Residential receivers at 118B Parkes Road (R2 zoning).

The site is shown in the location map, and aerial photo presented within **Appendix A**.

1.3 SCOPE

Acoustic Dynamics has been engaged to provide an acoustic noise emission assessment suitable for submission to the Northern Beaches Council.

The scope of the assessment is to include the following:

- Review of legislation, Council criteria and Australian Standards relevant to the internal noise emission at the development;
- Travel to site to conduct inspections and testing;
- Using previously obtained long term monitoring to establish background noise levels within the development site and at the most affected receivers;
- Measurement of noise emission associated with bus pass-by movements at the subject site; and
- Conduct analysis and calculations to assess noise emission associated with the bus depot, and determine noise intrusion and where appropriate, provide recommendations for design measures and management procedures.

2 RELEVANT ACOUSTIC CRITERIA AND STANDARDS

Responsibility for the control of noise emission at the subject site is vested in Local Council. Guidelines for the assessment of noise emission are contained within the NSW EPA's Noise Policy for Industry (NPfI). In addition to these guidelines, some Councils have specific noise criteria, against which, certain noise sources must be assessed.

Acoustic Dynamics has conducted a review of the local council, state government and federal legislation that is applicable to noise assessment for the proposed development. The relevant sections of the legislation are presented below. The most stringent criteria which have been used in the assessment of the proposed development are summarised below.

2.1 NORTHERN BEACHES COUNCIL CRITERIA

2.1.1 LOCAL ENVIRONMENT PLAN

A review of the Pittwater Council Local Environment Plan (LEP) 2014 was conducted. No relevant acoustic requirements and relevant noise criteria were presented within the LEP.

2.1.2 DEVELOPMENT CONTROL PLANS

A review of the Pittwater 21 Development Control Plan (DCP) 2014 was conducted. No relevant acoustic requirements and relevant noise criteria were presented within the DCP.

2.1.3 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT

In accordance with the noise emission requirements of Northern Beaches Council, we advise that noise emission from the proposed gym must also comply with the requirements of the relevant legislation, being the *Protection of the Environment Operations* (POEO) *Act 1997*. The

POEO Act 1997 requires that the subject plant and equipment must not generate "offensive noise". Offensive noise is defined as follows:

*"**"offensive noise"** means noise:*

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or
(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations."

Council can enforce the above planning controls under the Environmental Planning and Assessment Act of 1979.

2.2 NSW ENVIRONMENT PROTECTION AUTHORITY (EPA)

2.2.1 NOISE POLICY FOR INDUSTRY (NPFI)

Acoustic Dynamics advises that noise emission assessment at nearby and adjacent noise sensitive receivers has been conducted with reference to relevant acoustic criteria and standards and has yielded the following information.

The newly implemented NSW Noise Policy for Industry (NPfI, 2017) has replaced the NSW Industrial Noise Policy (INP, 2000), with certain specific exceptions. Acoustic Dynamics advise that the following criteria have been applied for the assessment of the operations associated with the proposed bus depot.

Project Intrusiveness Noise Level

The intrusiveness noise level is determined as follows:

$L_{Aeq,\ 15min}$ = rating background noise level + 5 dB	
where:	
$L_{Aeq,\ 15min}$	represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 15 minutes.
and	
Rating background noise level	represents the background level to be used for assessment purposes, as determined by the method outlined in Fact Sheets A and B.

Project Amenity Noise Level

The recommended amenity noise levels represent the objective for **total** industrial noise at a receiver location, whereas the **project amenity noise level** represents the objective for a noise from a **single** industrial development at a receiver location.

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)

To establish the acoustic environment at the subject site in accordance with the guidelines of the NSW EPA's NPfI, an unattended noise logger was deployed at the subject development site between Tuesday 1 December 2020 and Tuesday 8 December 2020. The logger was deployed towards the northern boundary of the subject site near the residential receivers along Parkes Road. The exact location of this logger is shown in **Appendix A**. Acoustic Dynamics advises the selected location is likely to be representative of the existing noise environment of the nearest residential receivers to the subject development site. Operator attended background noise measurements were undertaken on site to supplement unattended background noise monitoring data collected.

Following the general procedures outlined in the EPA's NPfI, a summary of the established noise environment, and relevant environmental noise criteria is presented in **Table 2.1**. Acoustic Dynamics advises that some periods of the logging were affected by high winds and rain. These affected periods were excluded when calculating the environmental noise criteria.

Acoustic Dynamics advises that the assessment has been based on the **lowest** background noise levels in the area during typical **maximum** operations of the proposed bus depot. Acoustic Dynamics advises that such an assessment is conservative and will ensure no loss of amenity to the nearby residential receivers.

Table 2.1 Summary of External Noise Level & Most Stringent Criteria

Location	Time of Day	L_{A90} Rating Background Noise Level (RBL) [dB]	Measured L_{Aeq} [dB]	Project Intrusive Noise Level [dB]	Project Amenity Noise Level[2] L_{Aeq} [dB]	Project Noise Trigger Level L_{Aeq} [dB]
Nearest residential receiver(s)	Morning Shoulder (5am-7am)	36	63	41	38	38
	Daytime (7am[1] to 6pm)	42	67	47	53	47
	Evening (6pm to 10pm)	37	58	42	43	42
	Evening Shoulder (10pm to 11pm)	36	65	41	38	38

Note: 1) 8am on Sundays and public holidays.

2) Amenity adjustment based on "Suburban" receiver type (Table 2.3 of the NPfI). The noise emission objective has been modified in accordance with the recommendations detailed within the NPfI Section 2.2, for time period standardising of the intrusiveness and amenity noise levels ($L_{Aeq,15min}$) will be taken to be equal to the $L_{Aeq,\,(period)}$ + 3 decibels (dB).

For premises to which it applies, the NPfi noise criteria for the assessment of noise emission from industrial noise sources at the boundaries of nearby commercial premises are reproduced from Table 2.1 of the NPfi and presented as **Table 2.2**.

Table 2.2 – Recommended L_{Aeq} Noise Levels – Commercial

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Project Noise Trigger Level L_{Aeq} [dB]
Commercial premises	All	When in use	65

The EPA's NPfI specifies additional noise emission level corrections that should be applied when a noise source is determined to include "modifying factors" that can vary the perceived intrusiveness of a noise source. Such modifying factors include tonal, low frequency, impulsive, or intermittent noise.

Although the NPfI does not apply for the assessment of noise emission from the subject development, Acoustic Dynamics advises that achieving compliance with the NPfI intrusive noise emission objectives applicable at the boundaries of the nearest non-residential premises will adequately protect the acoustic amenity of these receivers.

2.2.2 THE EPA'S SLEEP DISTURBANCE CRITERION

Acoustic Dynamics advises that sleep disturbance is a complex issue and the potential for sleep disturbance to occur depends on both the level of noise at a residential receiver and the number of events that occur.

The EPA has in the past investigated overseas and Australian research on sleep disturbance. The method of assessing noise for sleep disturbance relies on the application of a screening that indicates the potential for this to occur. The EPA's Noise Guide for Local Government, provides the following guidance for such a screening test:

> *"Currently, there is no definitive guideline to indicate a noise level that causes sleep disturbance and more research is needed to better define this relationship. Where likely disturbance to sleep is being assessed, a screening test can be applied that indicates the potential for this to occur. For example, this could be where the subject noise exceeds the background noise level by more than 15 dB(A). The most appropriate descriptors for a source relating to sleep disturbance would be $L_{A1(1\ minute)}$ (the level exceeded for 1% of the specified time period of 1 minute) or L_{Amax} (the maximum level during the specified time period) with measurement outside the bedroom window."*

Additionally, the guidelines of the NSW EPA's NPfI provide the following additional information:

> *"Where the subject development/premises night-time noise levels at a residential location exceed:*
>
> - $L_{Aeq,15min}$ *40dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
> - L_{AFmax} *52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater*

Further to the above information, the following summarizes the sleep disturbance criterion:

L_{Amax} or $L_{A1(1\ minute)} < L_{A90}$ + 15 dB or 52 dB(A), whichever is greater

In addition to the above, the EPA has published the following additional information relating to findings of significant research carried out for sleep disturbance:

> *"Maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions… One or more noise events per night, with maximum internal noise levels of 65-70 dBA, are not likely to affect health and wellbeing significantly."*

The following sleep disturbance screening criterion was determined for the residential receivers with windows open:

Sleep Disturbance Criterion = **52 dB(A)**

2.3 THE EPA'S ROAD NOISE POLICY

The NSW Environmental Protection Authority (EPA) presents guidelines for assessment of road traffic noise in its Road Noise Policy (RNP). The document provides road traffic noise criteria for 21 Middleton Road as well as other developments with the potential to have an impact in relation to traffic noise generation. **Table 2.2** presents the relevant RNP noise criteria for the subject development site.

Table 2.3 Road Traffic Noise Assessment Criteria for Residential Land Uses

Road category	Type of project / land use	Assessment Criteria [dB]	
		Day (7am – 10pm)	Night (10pm – 7am)
Local Roads	6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments	$L_{Aeq(1\ hour)}$ 55 (external)	$L_{Aeq(1\ hour)}$ 50 (external)

3 NOISE MEASUREMENT EQUIPMENT & STANDARDS

All measurements were conducted in general accordance with Australian Standard 1055.1-1997, *"Acoustics - Description and Measurement of Environmental Noise Part 1: General Procedures"*. Acoustic Dynamics' sound measurements were carried out using precision sound level meters conforming to the requirements of IEC 61672-2002 *"Electroacoustics: Sound Level Meters – Part 1: Specifications"*. The survey instrumentation used during the survey is set out in **Table 3.1**.

Table 3.1 Noise Survey Instrumentation

Type	Serial Number	Instrument Description
2250	2679541	Brüel & Kjaer Modular Precision Sound Level Meter
4189	2650956	Brüel & Kjaer 12.5 mm Prepolarised Condenser Microphone
4230	1234136	Brüel & Kjaer Acoustic Calibrator
XL2	A2A-05048-E0	NTi Audio XL2 Environmental Noise logger

The reference sound pressure level was checked prior to and after the measurements using the acoustic calibrator and with negligible drift.

4 NOISE EMISSION LEVELS & ASSESSMENT

The following subsections provide an assessment of the subject site against the various noise emission criteria and objectives outlined in **Section 2** above.

4.1 NOISE EMISSION ASSESSMENT

Acoustic Dynamics advises that the L_{Aeq} noise emission levels from the proposed Bus Depot at 21 Middleton Road have been determined based upon attended measurements, unattended logger measurements and Acoustic Dynamics' experience with bus depot noise emission assessments.

Attended measurements of bus movements have previously been conducted for similar development proposals. Bus pass-by measurements were conducted on both the driver's side and opposite driver's side accelerating at different speeds. The bus provided to conduct this testing was an *EBS DV 4x2 – 13RM-11.7212*. Acoustic Dynamics has been advised this bus would be representative of the buses proposed to be stored at the subject site.

Acoustic Dynamics understands that this model bus will be typical of the busses operated from this proposed bus depot. As time progresses the fleet will be replaced with newer and potentially quieter buses, in accordance with the 12-year average fleet age requirement in NSW.

Table 4.1 below indicates predicted traffic levels for the proposed bus depot.

Table 4.1 Predicted Traffic Generated by the Development

Time period	Light Vehicles Inbound	Light Vehicles Outbound	Buses Inbound	Buses Outbound
6:00 – 6:30 AM	10	0		10
6:30 – 7:00 AM	18			18
7:00 – 7:30 AM	20			20
7:30 – 8:00 AM	7	0		7
4:30 – 5:30 PM		10	10	
5:30 – 6:30 PM		15	15	
6:30 – 7:30 PM		12	12	
7:30 – 8:30 PM		9	9	
8:30 – 9:30 PM		6	6	
After 9:30 PM		3	3	

Given the predictions provided in **Table 4.1**, Acoustic Dynamics has conservatively undertaken modelling and calculations to predict the likely **maximum** external noise levels at the adjacent residential receivers resulting from the following scenarios in **any relevant 15-minute period** during the period under assessment, as required by the EPA's NPfI:

Morning Shoulder (5am to 7am)

- Ingress and egress of 10 staff on foot if arriving on-foot;
- 15 cars arriving and parking in the provided on-site car spaces;
- 9 buses starting, and leaving site along Middleton Road.

Daytime – Scenario A (Early morning from 7am)

- Ingress and egress of 10 staff on foot if arriving on-foot;
- 15 cars arriving and parking in the provided on-site car spaces;
- Mechanical air conditioner noise (SWL = 70 dB(A)); and
- 10 buses starting, and leaving site along Middleton Road.

Daytime – Scenario B (Late afternoon until 6pm)

- Ingress and egress of 10 staff on foot if arriving on-foot;
- 12 leaving site along Middleton Road;
- Mechanical air conditioner noise (SWL = 70 dB(A)); and
- 4 buses travelling along Middleton Road, and turning into the site;
- These 4 buses manoeuvring on-site (including idling, reversing and releasing hydraulic suspension); and
- Operation of fuel pump generator at refuelling station (SWL = 85 dB(A)).

Evening (6pm to 10pm)

- Egress of staff;
- 15 cars leaving site along Middleton Road;
- 15 buses travelling along Middleton Road, and turning into the site;
- These 3 buses manoeuvring on-site (including idling, reversing and releasing hydraulic suspension); and
- Operation of fuel pump generator at refuelling station (SWL = 85 dB(A)).

Night-time shoulder (10pm to 11pm)

- Egress of staff;
- 2 cars leaving via the eastern driveway;
- 1 bus travelling along Middleton Road, and turning into the site; and
- This bus manoeuvring on-site (including idling, reversing and releasing hydraulic suspension).

The maximum noise emission levels determined at the nearest effected residential and commercial receivers neighbouring the subject site, resulting from the operation of the subject site are presented against the most stringent noise criteria in **Table 4.2** below.

4.1.1 EXTERNAL NOISE LEVEL ASSESSMENT

Based upon the information provided above, Acoustic Dynamics' measurements and analysis of the scenarios detailed above following the implementation of recommendations detailed in **Section 5** are presented in **Table 4.1** below.

Table 4.2 Determined Emission Noise Levels and Project Noise Objectives – External Receiver

Receiver Location	Assessment Period	Calculated Maximum $L_{Aeq(15min)}$ Noise Level [dB]	Relevant $L_{Aeq(15min)}$ Objective [dB]	Achieves Objective / Complies?
Residential Receivers 118B Parkes Rd (external)	Morning Shoulder (5am-7am)	37	38	**Yes**
	Day-time – Scenario A (from 7am)	37	47	**Yes**
	Day-time – Scenario B (until 6pm)	44	47	**Yes**
	Evening (6pm – 10pm)	42	42	**Yes**
	Evening Shoulder (10pm – 11pm)	37	38	**Yes**
Commercial Receiver Ausgrid 21 Middleton Rd (external)	Daytime (Worst-case, Whenever in operation)	59	65	**Yes**
Commercial Receiver 55 Middleton Rd (external)	Daytime (Worst-case, Whenever in operation)	53	65	**Yes**
Commercial Receiver 8-10 Dympna St (external)	Daytime (Worst-case, Whenever in operation)	45	65	**Yes**
Commercial Receiver 4 Thew Pde (external)	Daytime (Worst-case, Whenever in operation)	48	65	**Yes**

Note: 1) 8am on Sundays and public holidays.

4.2 SLEEP DISTURBANCE (WINDOWS OPEN)

Acoustic Dynamics has also determined the potential maximum $L_{A1(60\ Sec)}$ noise emission from the reverse alarm of a bus at the rear of the subject site following the implementation of the

recommendations detailed in **Section 5** below, at the nearest potential residential receivers, during night-time hours.

Table 4.3 Determined Emission Noise Levels and Project Noise Objectives – Residential Receiver

Location	Assessment Period	Determined Emission Level at Receiver $L_{A1(1minute)}$ [dB]	Sleep Disturbance Criteria Level $L_{A1(1minute)}$ [dB]	Complies?
Residential Receiver 118B Parkes Road	Night-time (10pm – 7am)	46	54	**Yes**

Acoustic Dynamics advises that compliance at the nearest residential receivers will ensure compliance is achieved at residential receivers further away.

4.3 NSW EPA'S ROAD NOISE POLICY

Acoustic Dynamics has determined the potential maximum $L_{Aeq(1\ hour)}$ noise emission from off-site bus movements, at the nearest potential residential receivers, during night-time hours.

Table 4.4 Maximum L_{Aeq} Road Traffic Noise Emission Levels & Criteria for Residential Receivers

All Residential Receivers	Noise Source	Period of Operation	Calculated Maximum $L_{Aeq(1\ hour)}$ Noise Level [dB]	Relevant Criterion $L_{Aeq(1\ hour)}$ [dB]	Complies With Criteria?
Residential receivers on nearby roads	Off-site car and bus movements	Daytime (7am to 10pm)	47	50	**Yes**
		Night-time (10pm to 7am)	49	55	**Yes**

5 ASSESSMENT FINDINGS AND RECOMENDATIONS

5.1.1 ASSESSMENT FINDINGS

The measured and calculated noise levels presented in **Table 4.2, 4.3 and 4.4** above indicate:

- Acoustic Dynamics has determined the proposed bus depot will **achieve compliance** with Northern Beaches Council and EPA NPfI criteria.

- Acoustic Dynamics advise that the proposed bus depot will **achieve compliance** with the EPA Sleep Disturbance Criterion.

- Acoustic Dynamics advise that off-site car and bus movements associated with the proposed bus depot will **achieve compliance** with the EPA Road Noise policy.

- Acoustic Dynamics has determined that the noise emission from the proposed bus depot will **achieve compliance** with Offensive noise component of the NSW POEO act.

5.1.2 RECOMMENDATIONS

Acoustic Dynamics advises the following recommendations to ensure:

- The diesel fuel pump generator be enclosed to shield noise away from the residences to the north, and direct noise towards Middleton Road;

- The diesel fuel pump must not be operated between 10pm and 7am (10pm and 8am on Sundays and public holidays);

- Any air conditioning condenser units servicing the staff rooms must only be operated between 8am and 6pm;

- All buses entering and leaving the site should do so in the quietest manner possible. Minimise idling time, excessive acceleration and the use of horns;

- Buses returning after 10pm should park in the bays on the western side of the existing building, and not proceed to the very rear of the site; and

- Buses should be well maintained to prevent increase in noise emission while operating.

6 CONCLUSION AND ACOUSTIC OPINION

Acoustic Dynamics has conducted an acoustic assessment of the noise emission resulting from the use and operation of the subject site at 21 Middleton Road, Cromer, NSW, in accordance with the requirements of Northern Beaches Council and the NSW EPA.

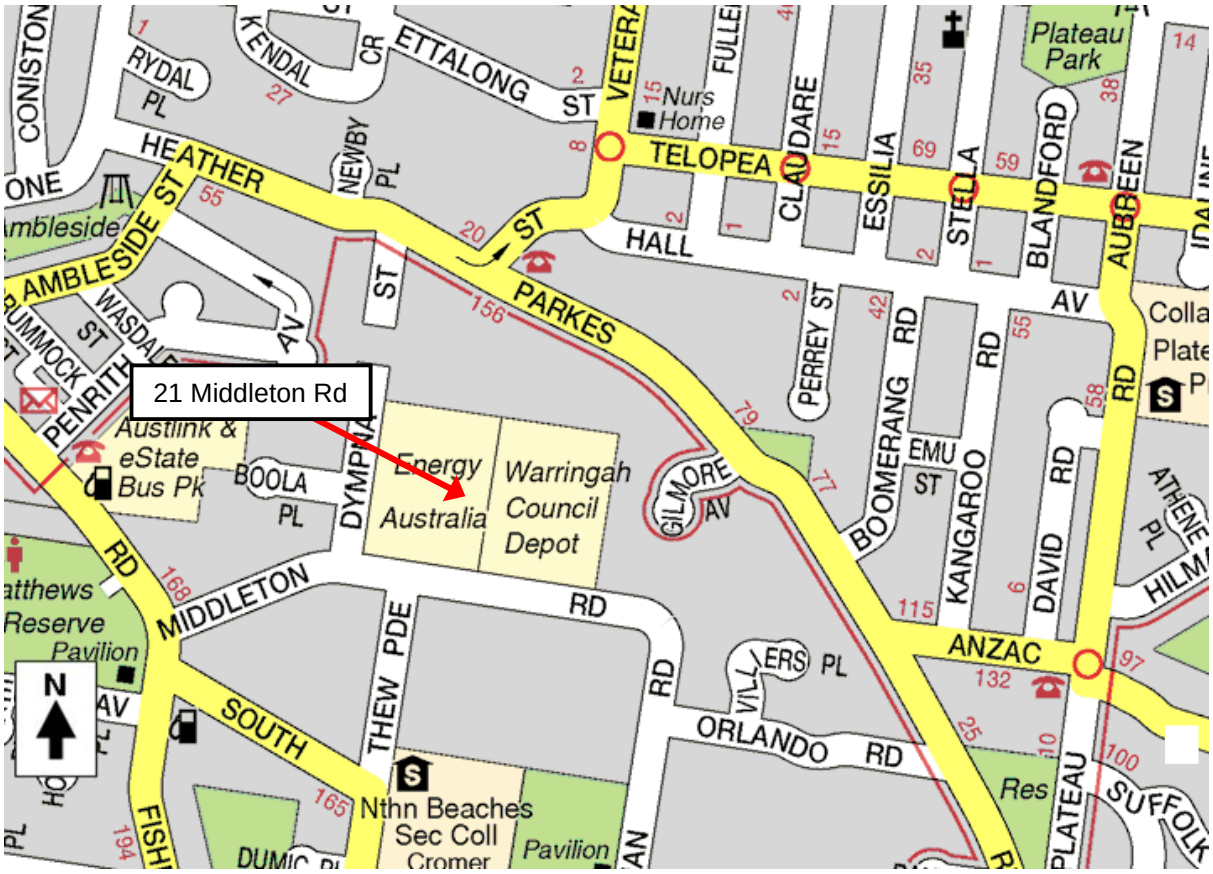
Acoustic Opinion

Further to the noise monitoring and measurements conducted, our review of the relevant acoustic criteria and requirements, our modelling, calculations and assessment, Acoustic Dynamics advises that the proposed bus depot will comply with relevant noise emission criteria of the Northern Beaches Council, the POEO Act 1997 and the NSW EPA.

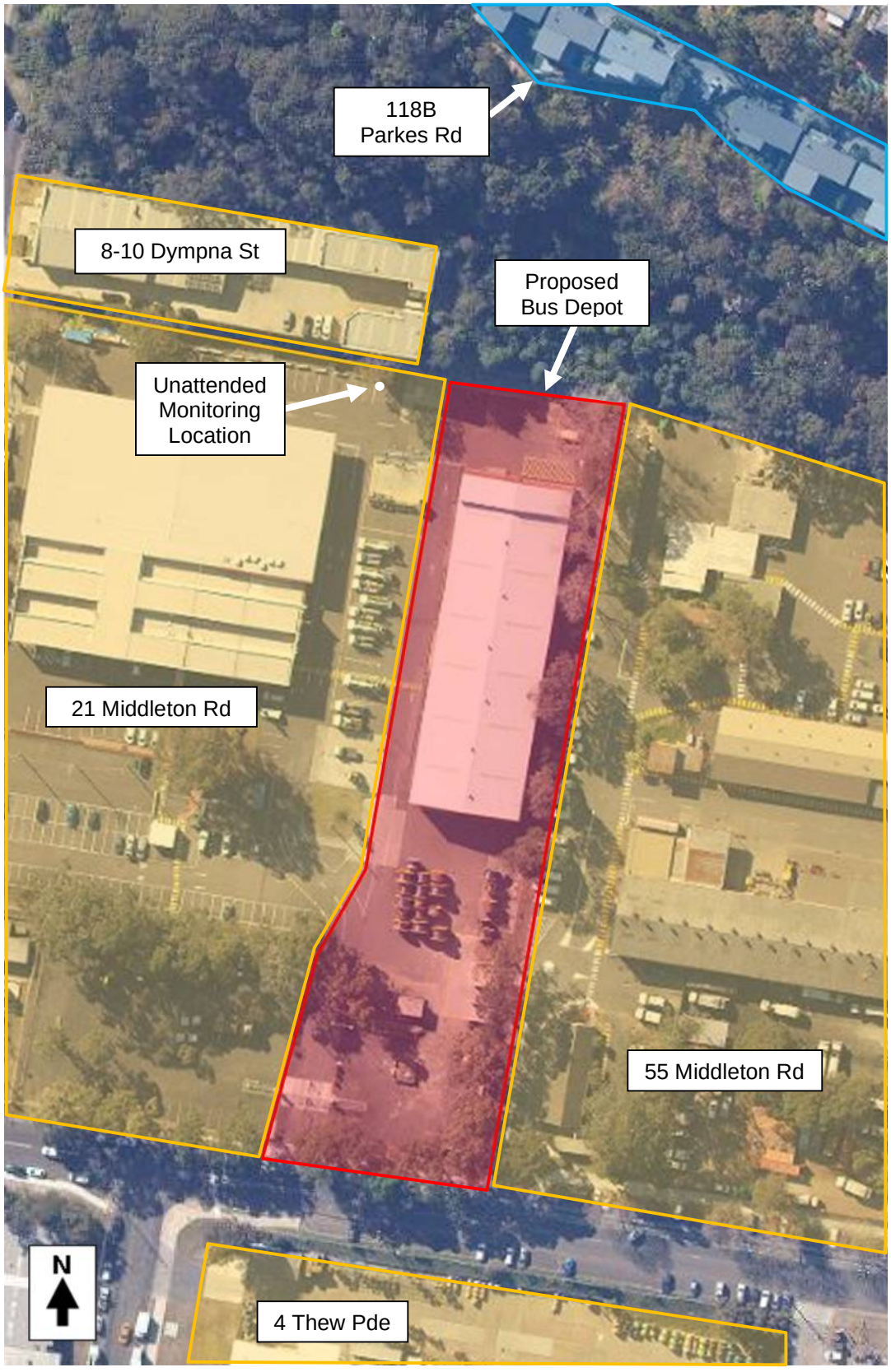
We trust that the above information meets with your requirements and expectations. Please do not hesitate to contact us on 02 9908 1270 should you require more information.

APPENDIX A – SITE LOCATION MAP, AERIAL IMAGE & SITE PLAN

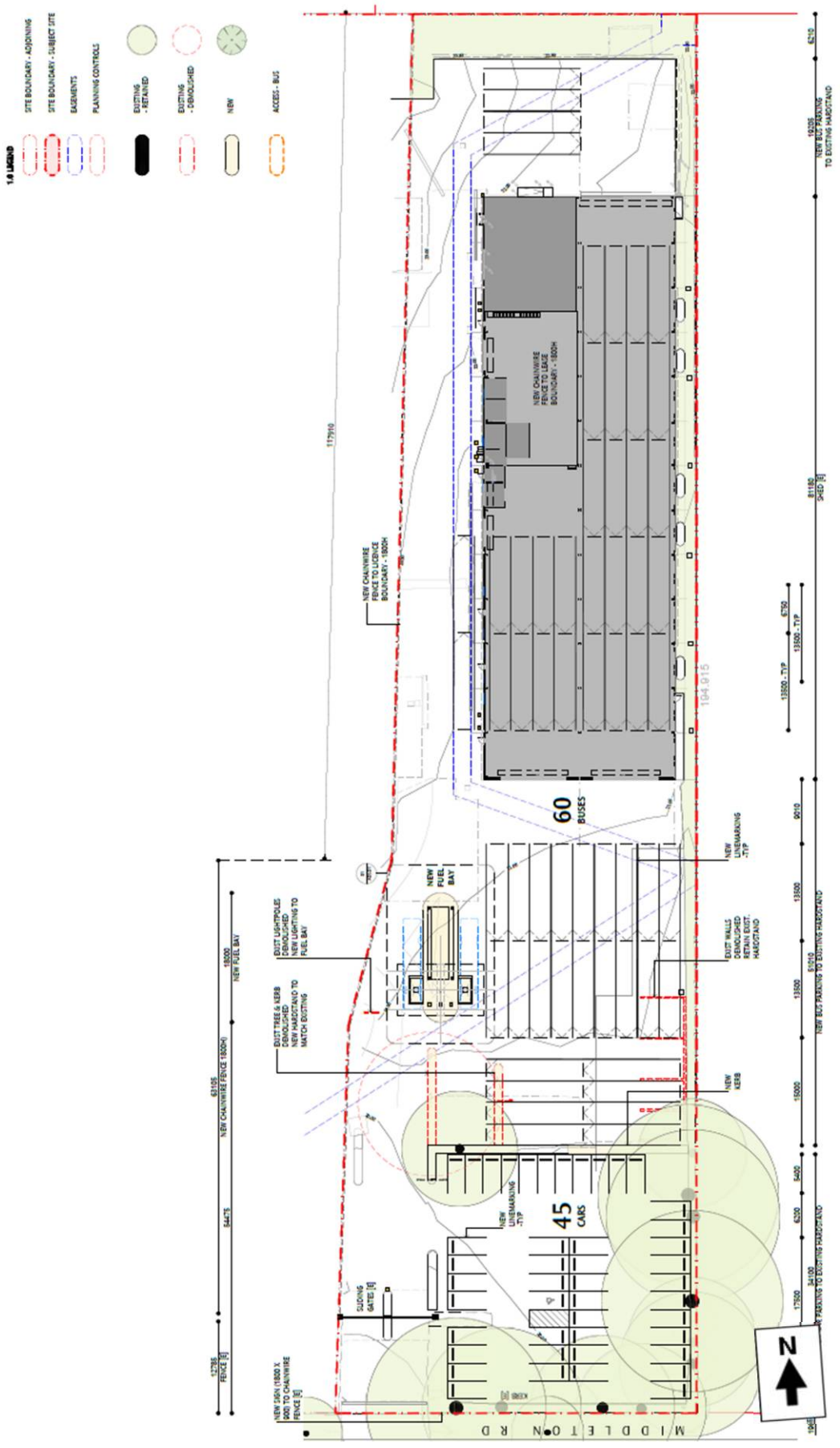
A.1 SITE LOCATION MAP



A.2 AERIAL IMAGE

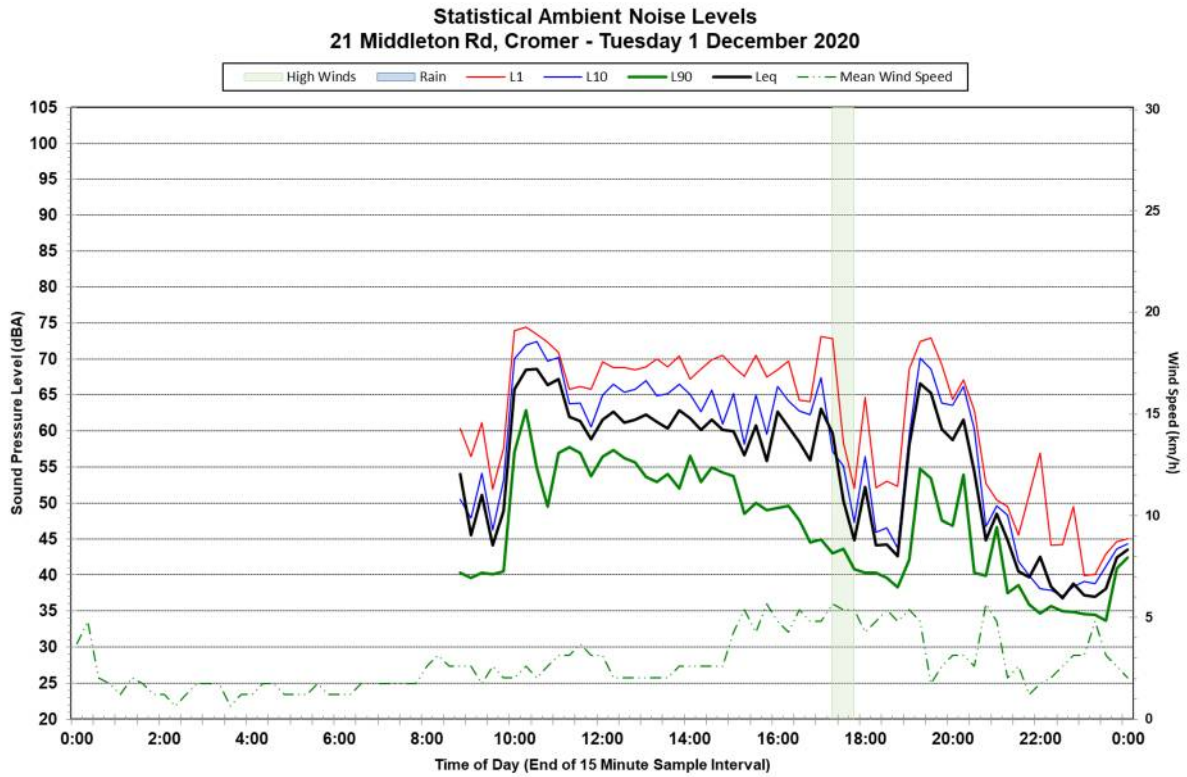


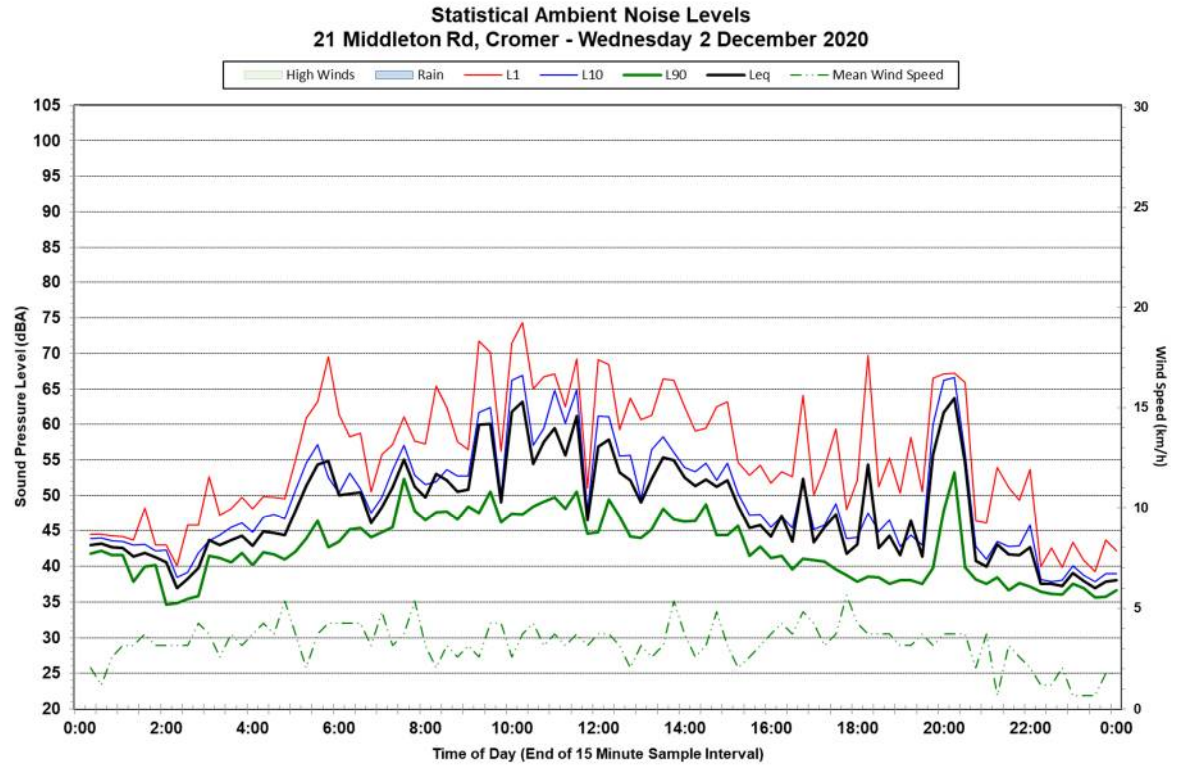
A.3 SITE PLAN

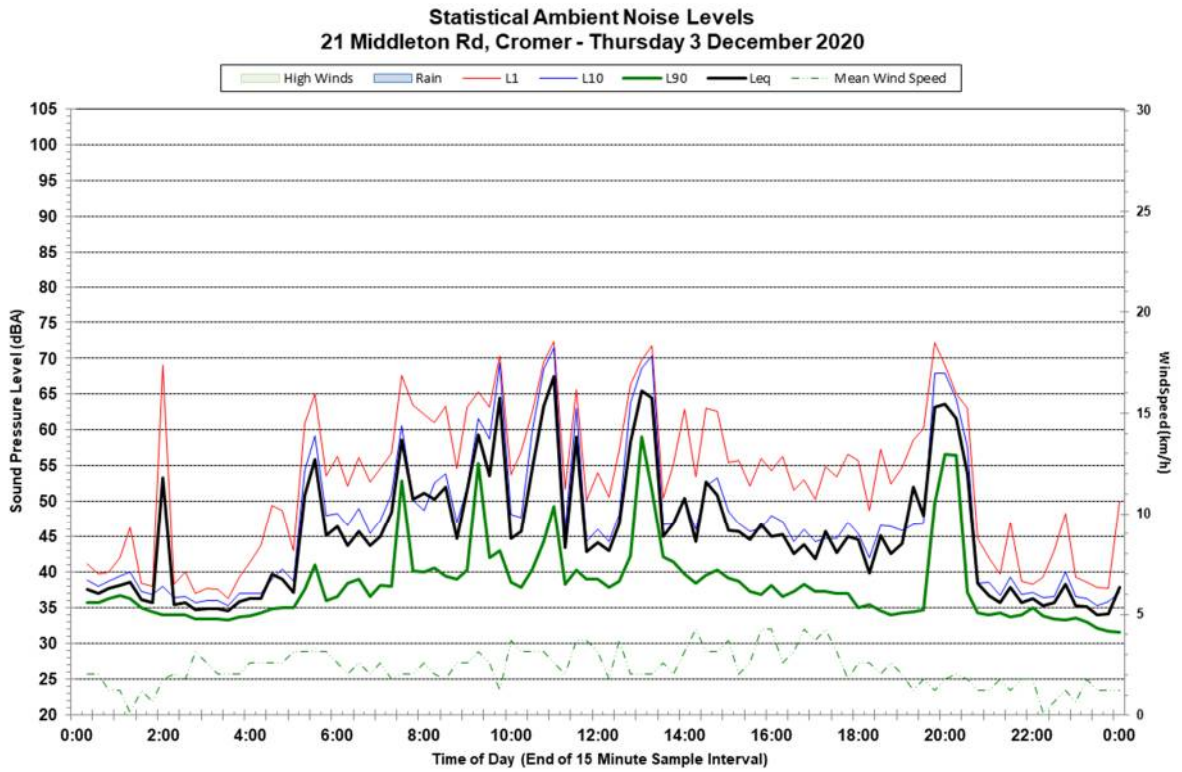

SITE BOUNDARY - ADJOINING
SITE BOUNDARY - SUBJECT SITE
EASEMENTS
PLANNING CONTROLS
EXISTING - RETAINED
EXISTING - DEMOLISHED
NEW
ACCESS - BUS
1.0 LEGEND
60 BUSES
45 CARS
NEW FUEL BAY
NEW LINEMARKING -TYP
NEW KERB
SLIDING GATES
NEW CHAINWIRE FENCE TO LEASE BOUNDARY - 1800H
NEW CHAINWIRE FENCE TO LICENCE BOUNDARY - 1800H
EXIST LIGHTPOLES DEMOLISHED NEW RELOCATED TO FUEL BAY
EXIST TREE & KERB DEMOLISHED NEW KERB AND TO MATCH EXISTING
EXIST WALLS DEMOLISHED RETAIN EXIST. HARDSTAND
NEW BUS PARKING TO EXISTING HARDSTAND
MIDDLETON RD
N

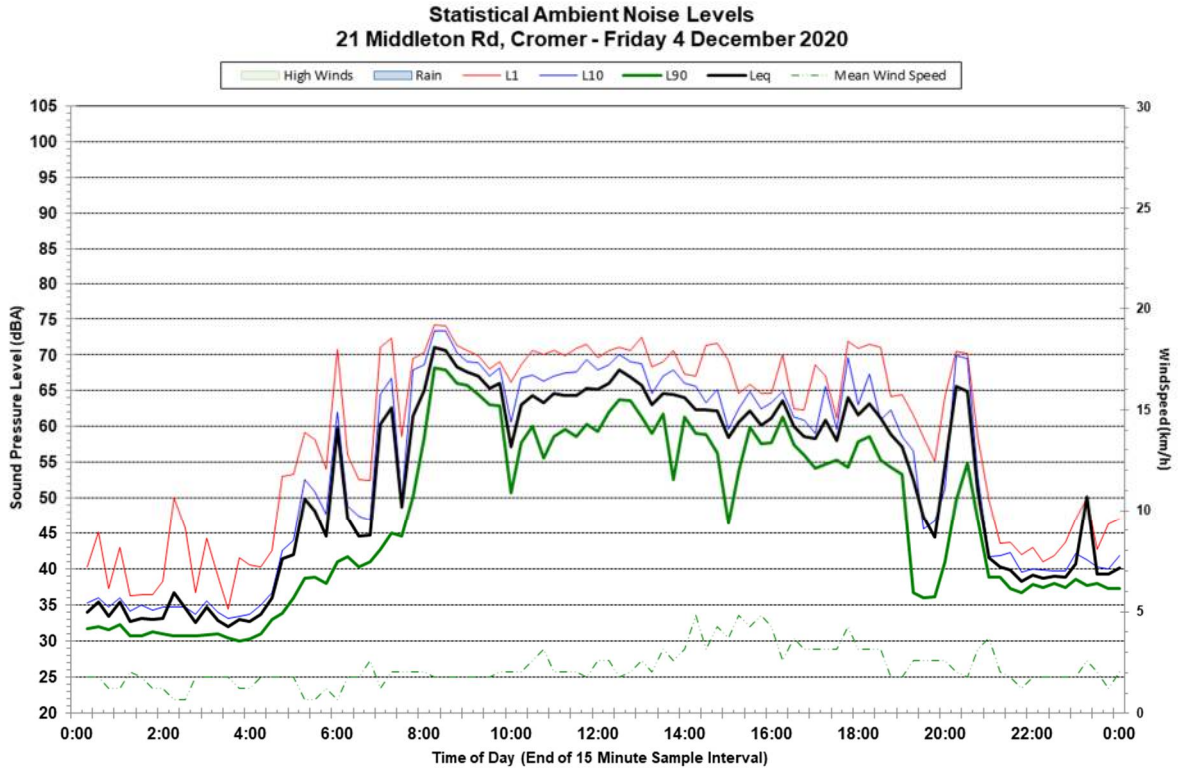
APPENDIX B – NOISE LOGGER DATA

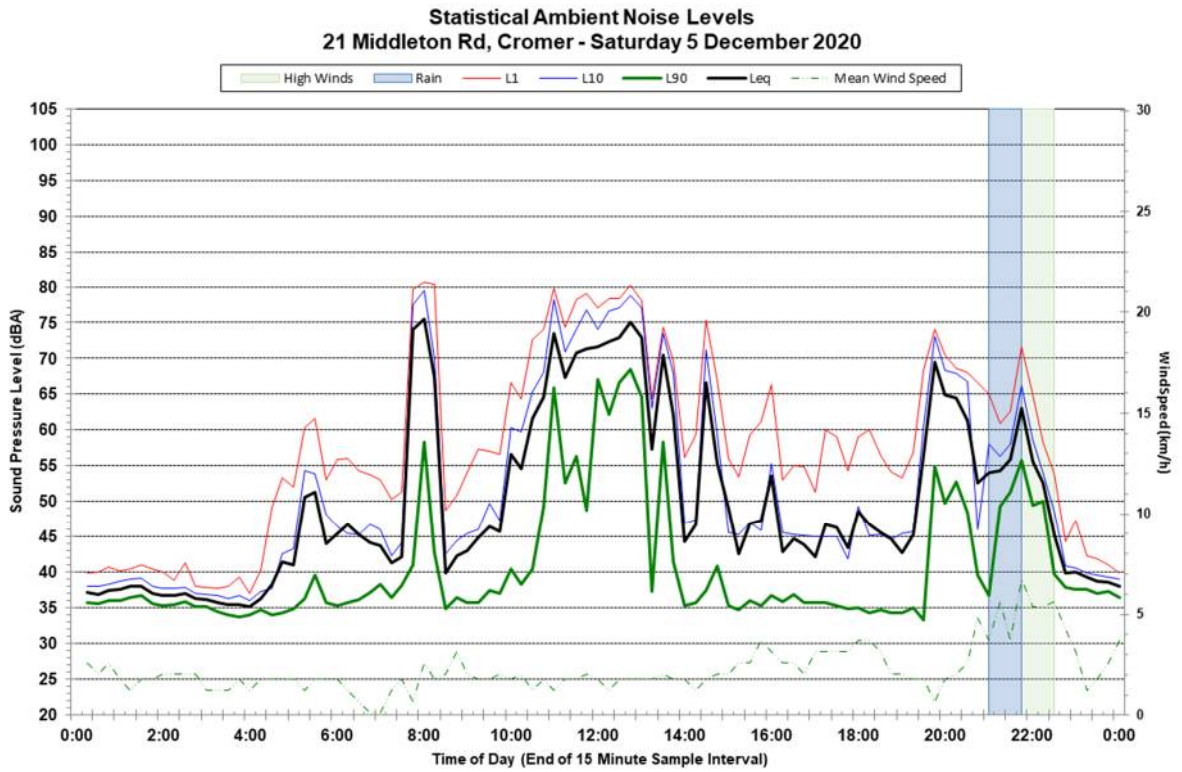
B.1 LOGGER DATA

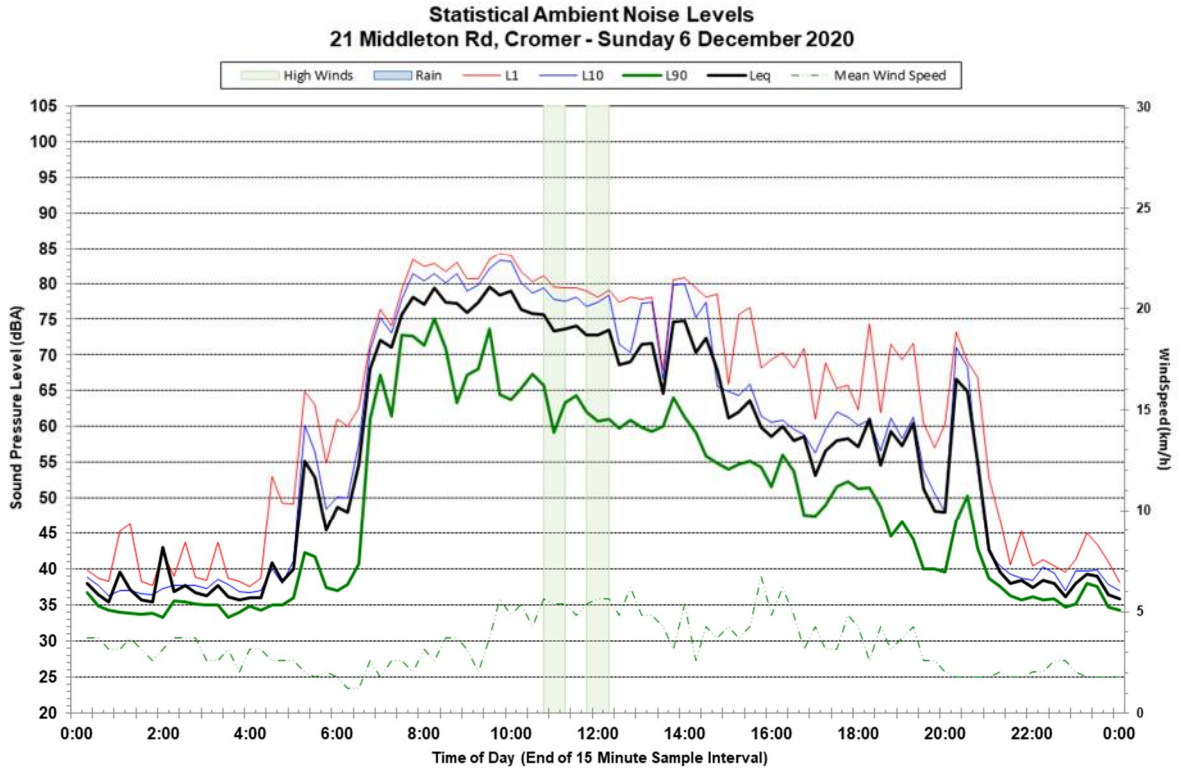


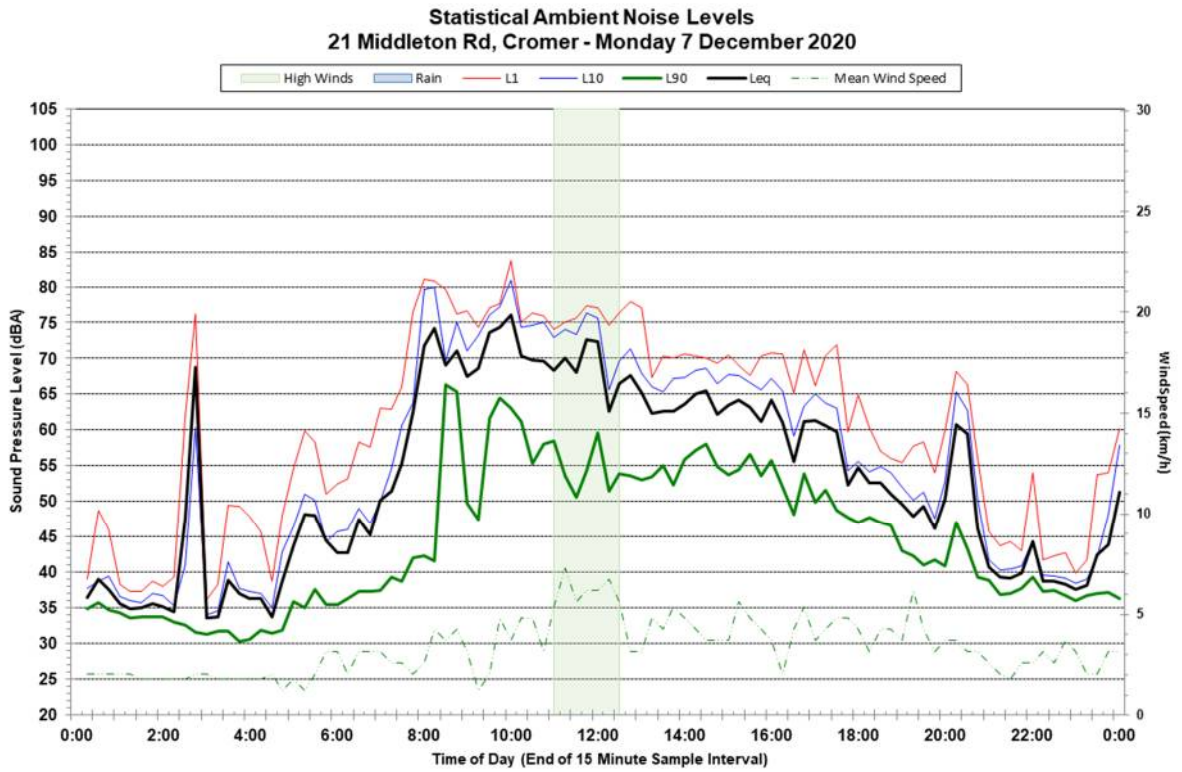


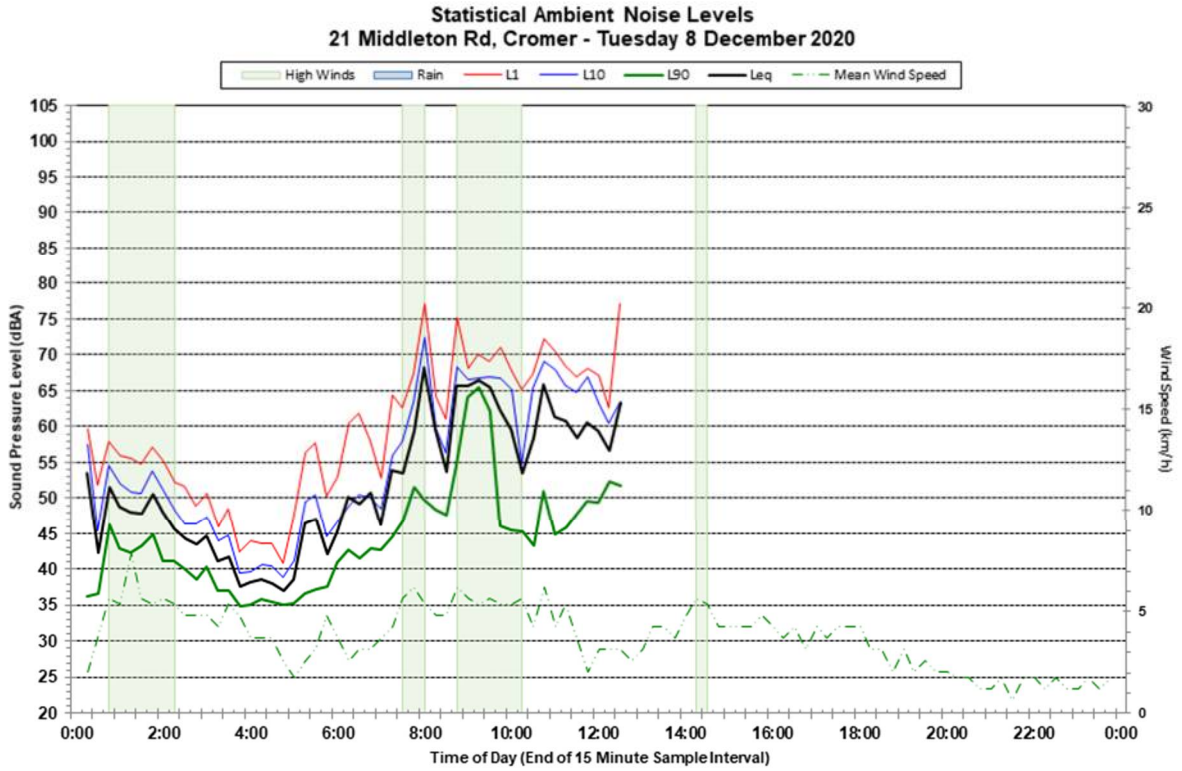

Statistical Ambient Noise Levels
21 Middleton Rd, Cromer - Thursday 3 December 2020
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
WindSpeed(km/h)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
21 Middleton Rd, Cromer - Friday 4 December 2020
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
WindSpeed(km/h)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
21 Middleton Rd, Cromer - Saturday 5 December 2020
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
WindSpeed(km/h)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
21 Middleton Rd, Cromer - Sunday 6 December 2020
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
WindSpeed(km/h)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
21 Middleton Rd, Cromer - Monday 7 December 2020
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Windspeed (km/h)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
21 Middleton Rd, Cromer - Tuesday 8 December 2020
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (km/h)
Time of Day (End of 15 Minute Sample Interval)