REPORT



PATONS LANE RESOURCE RECOVERY CENTRE – INTEGRATED WATER AND LEACHATE PLANT MODIFICATIONS

123-179 PATONS LANE, ORCHARD HILLS, NSW

NOISE AND VIBRATION IMPACT ASSESMENT RWDI # 2205770 19 December 2022

SUBMITTED TO

Erik Larson erik@jacksonenvironment.com.au

CC TO Bingo Industries Limited

Jackson Environment and Planning Pty Ltd Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060

SUBMITTED BY

Adrian Pinto Project Engineer <u>Adrian.pinto@rwdi.com</u>

Davis Lai Project Manager Davis.Lai@rwdi.com

RWDI Australia Pty Ltd (RWDI) ABN: 86 641 303 871



© 2022 RWDI Australia Limited. ("RWDI") ALL RIGHTS RESERVED RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015 for the provision of consultancy services in acoustic engineering air quality and wind engineering; and the sale, service, support and installation of acoustic monitoring and related systems and technologies. This document is intended for the sole use of the party to whom it is addressed and may contain information that is privileged and/or confidential. If you have received this in error, please notify us immediately. Accessible document formats provided upon request. ® RWDI name and logo are registered trademarks in Canada and the United States of America.

rwdi.com

RWDI#2205770 19 December 2022



DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
А	Draft	25 November 2022	Adrian Pinto	John Wassermann
В	Draft	02 December 2022	Adrian Pinto	John Wassermann
с	Draft	12 December 2022	Adrian Pinto	John Wassermann
D	Final	16 December 2022	Adrian Pinto	-
E	Final	19 December 2022	Adrian Pinto	-

NOTE

All materials specified by RWDI Australia Pty Ltd (RWDI) have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose.

The information contained in this document produced by RWDI is solely for the use of the client identified on the front page of this report. Our client becomes the owner of this document upon full payment of our **Tax Invoice** for its provision. This document must not be used for any purposes other than those of the document's owner. RWDI undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

RWDI

RWDI is a team of highly specialised consulting engineers and scientists working to improve the built environment through three core areas of practice: building performance, climate engineering and environmental engineering. More information is available at <u>www.rwdi.com</u>.

AAAC

This firm is a member firm of the Association of Australasian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.

QUALITY ASSURANCE

RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015. This management system has been externally certified by SAI Global and Licence No. QEC 13457 has been issued for the following scope: The provision of consultancy services in acoustic engineering, air quality and wind engineering; and the sale, service, support and installation of acoustic monitoring and related systems and technologies.





RWDI#2205770 19 December 2022



EXECUTIVE SUMMARY

This noise and vibration impact assessment (NVIA) has been prepared by RWDI to accompany a Modification Report to accompany the Development Application for the proposed Integrated Water and Leachate Plant modifications (MOD 2) at Bingo's Patons Lane Resource Recovery Centre (PLRRC).

This report has been prepared to address the noise and vibration impacts associated with the proposed Integrated water and Leachate Plant modifications in accordance with the relevant NSW guidelines:

- NSW Noise Policy for Industry (NPfl, EPA NSW 2017)
- Interim Construction Noise Guideline (ICNG, DECC 2009); and
- NSW Road Noise Policy (RNP, EPA NSW 2011)

A quantitative approach was adopted to conduct the noise assessments. Four (4) operational scenarios were simulated using a validated computer noise model. The study confirms that noise emissions from worst-case operations with the Modification Proposal will comply with relevant noise criteria. The increase in noise levels due to the modification proposal would be very minor and is likely to be imperceptible at the nearest receivers.

Eleven (11) construction noise scenarios were modelled under worst-case to represent the various stages of construction for the Modification Proposal. The study indicates that construction noise emissions will comply with the relevant noise criteria.

It is expected that vibration generated from the operation and construction of the Modification Proposal will meet relevant standards.

The Modification Proposal will not result in additional road traffic and hence it will meet the relevant road traffic noise goals.

RWDI#2205770 19 December 2022



GLOSSARY OF ACOUSTIC TERMS

Key Terms	Definition		
The Applicant	SRC Properties Pty Ltd, a fully owned subsidiary of Bingo Industries Limited (Bingo).		
Existing Patons Lane Resource Recovery Centre (PLRRC) operations	 The PLRRC operates under a State Significant Development approval (MP09_0074) as a resource recovery centre and landfill for commercial and industrial (C&I) and construction and demolition (C&D) wastes (non-putrescible general solid waste): Landfilling activities within a total void space of 4.3 million tonnes; Acceptance of up to 450,000 tonnes per annum (tpa) of C&D and C&I waste with 350,000 tpa of resource recovery and landfilling of up to 205,000 tpa; Resource recovery activities within the Recycling and Reprocessing Area (RRA); Clay / shale extraction; and Ancillary infrastructure. 		
The Proposal	 The proposal includes the following modifications (MOD2) to the site as part of a Modification report to accompany the Development Application for Bingo's Patons Lane Resource Recovery Centre (PLRRC): Recycling Water Treatment Plant (RWTP) infrastructure to support the resource recovery centre; Landfill Leachate Treatment Plant (LTP); and Additional new raw leachate dam and new contact water dam; and A future connection to sewer and potable water. 		
The Proposal Site	Located within 123-179 Patons Lane, Orchard Hills (Lot 40, Deposited Plan DP 738126)		

RWDI#2205770 19 December 2022



Term	Definition
Bingo	Bingo Industries Pty Limited
C&D	Construction and demolition
C&I	Commercial and industrial
СЕМР	Construction Environmental Management Plan
Council	Penrith City Council
DA	Development Application
DP	Deposited Plan
DPE	Department of Planning and Environment
e.g.	for example
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
ha	Hectares
i.e.	that is
km	Kilometre
LGA	Local Government Area
m	Metres
m²	square metres
NML	Noise Management Level
RRC	Resource Recovery Centre
SEE	Modification report
SSD	State Significant Development
tpa	tonnes per annum
Mtpa	Million tonnes per annum
Maximum Noise Level (L _{Amax})	The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.
Lai	The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.
L _{A10}	The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

RWDI#2205770 19 December 2022



Term	Definition
Lago	The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.
L _{Aeq}	The equivalent continuous sound level (L _{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.
ABL	The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L _{A90}) for each period.
RBL	The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

RWDI#2205770 19 December 2022



TABLE OF CONTENTS

LIST O	F FIGURES	8
	F TABLES	8
LIST O	F APPENDICES	9
1	INTRODUCTION	10
1.1	Objectives	10
1.2	Scope of Assessments	11
1.3	Relevant guidelines	12
2	PROJECT DESCRIPTION	13
2.1	Site Description	
2.2	Background	
2.3 2.3.1 2.3.2 2.3.3	Modification proposal Recycled Water Treatment Plant (RWTP) Proposed Landfill Leachate Treatment Plant Operational Hours	16
2.4	Noise Sensitive Receivers	
3	ENVIRONMENTAL OBLIGATIONS	23
4	COMPLIANCE NOISE MONITORING	25
5	BACKGROUND NOISE LEVELS	26
6	OPERATIONAL NOISE & VIBRATION ASSESSMENT	29
6.1 6.1.1 6.1.2 6.1.3 6.1.4 6.1.5 6.1.6	Operational noise criteria Intrusive noise level Amenity noise level Summary of project noise trigger levels Maximum Noise level event assessment (MNLEA) Meteorological Effects Noise Modification Factors – Annoying Noise Characteristics	
6.2	Noise model	
6.3	Modelled scenarios for site operation	
6.4	Equipment sound power levels	



RWDI#2205770 19 December 2022

0.5	Validation Noise Model & calibration	41
6.6	Predicted continuous operational noise levels	43
6.7	Predicted Maximum level noise event assessment	45
6.8	Operational Vibration	46
7	CONSTRUCTION NOISE ASSESSMENT	47
7.1 7.1.1	Construction noise criteria Construction noise management levels for the modification proposal	47 49
7.2	Methodology and assumptions	50
7.3	Sound Power Levels	51
7.3 7.4	Sound Power Levels Predicted Construction Noise Levels	51 53
7.3 7.4 8	Sound Power Levels Predicted Construction Noise Levels OPERATIONAL ROAD TRAFFIC NOISE.	51 53 55
7.3 7.4 8 9	Sound Power Levels Predicted Construction Noise Levels OPERATIONAL ROAD TRAFFIC NOISE. CONCLUSION	51 53 55 56

LIST OF FIGURES

Figure 2-1	Site location	15
Figure 2-2	Modification Proposal	17
Figure 2-3	Noise sensitive receivers	21
Figure 2-4	Sydney Metro- Western Sydney Airport line in relation to Patons Lane	22
Figure 4-1	Compliance noise monitoring locations	25
Figure 5-1	Noise monitoring locations	28
Figure 6-1	Typical Noise Impact Assessment Process (adapted from NSW NPfI)	30
Figure 6-2	Validation points	41

LIST OF TABLES

Table 2-1	Noise sensitive receiver locations	. 19
Table 5-1	Noise logger details	. 26
Table 5-2	Noise monitoring summary	. 27
Table 6-1	Noise trigger levels applicable for the project	. 31
Table 6-2	Project maximum noise level event level screening criteria	. 32
Table 6-3	Standard and Noise-Enhancing Meteorological Conditions	. 32

RWDI#2205770 19 December 2022



Table 6-4	Variables used for operational noise modelling	34
Table 6-5	Modelling assumptions for site related operational noise sources	36
Table 6-6	Adopted sound power levels for operational noise sources	39
Table 6-7	Summary of calibration measurements and post-calibration results	42
Table 6-8	Predicted noise levels for continuous operation	44
Table 6-9	Maximum noise level event assessment	45
Table 7-1	Construction Noise Management Levels (CNMLs)	48
Table 7-2	Project Construction Noise Management Levels (CNMLs)	49
Table 7-3	Variables used for construction noise modelling	50
Table 7-4	Construction noise scenarios	51
Table 7-5	Predicted Construction Noise Levels	54

LIST OF APPENDICES

- Appendix A: Proposed development architectural plans
- Appendix B: Noise monitoring data
- Appendix C: Noise source Layout
- Appendix D: Noise contours

RWDI#2205770 19 December 2022



1 INTRODUCTION

RWDI has been engaged by Jackson Environment and Planning Pty Ltd (JEP) on behalf of SRC Properties Pty Ltd (a wholly owned subsidiary of Bingo Industries Limited) to conduct a noise and vibration impact study for the proposed Integrated water and Leachate Plant modifications for Patons Lane Resource Recovery facility.

The PLRRC operates under a State Significant Development approval (MP09_0074) as a resource recovery centre and landfill for commercial and industrial (C&I) and construction and demolition (C&D) wastes (non-putrescible general solid waste). Since the existing approval was granted for the Facility by the NSW Land and Environment Court, there has been changes to market conditions, Bingo's broader network operations and the NSW waste management regulatory framework. These changes have highlighted the need for Bingo to adjust site operations at the Facility.

The following modifications (MOD2) to the site are currently being considered as part of a Modification report to accompany a Development Application for Bingo's Patons Lane Resource Recovery Centre (PLRRC) under s4.55(1a) of the Environmental Planning and Assessment Act 1979:

- Recycling Water Treatment Plant (RWTP) infrastructure to support the resource recovery centre;
- Landfill Leachate Treatment Plant (LTP); and
- Additional new raw leachate dam and new contact water dam; and
- A future connection to sewer and potable water

Given that the impacts of the proposed integrated water and leachate plant modifications are likely to be minor (and in most cases positive), development consent under s4.55(1a) of the Environmental Planning and Assessment Act 1979 is considered appropriate. This has been confirmed in consultation with the Department of Planning and Environment.

1.1 Objectives

The purpose of this assessment is to document the process, objectives, and outcomes of the noise & vibration impact assessment to support the development application for Bingo's PLRRC modifications.

The noise & vibration assessment has the following main components:

- Existing environment;
- Land zoning of the site and neighbouring area;
- Conducting a baseline noise survey through unattended noise monitors placed over a period of four (4) years at three (3) receptor locations;
 - Identifying the sensitive receivers for the noise & vibration assessment;
- Establishing the target criteria at sensitive receivers for:
 - Operational noise in accordance with the NSW Noise Policy for Industry (NPfl, EPA NSW2017);
 - Noise and vibration associated with construction works in accordance with the Interim Construction Noise Guideline (ICNG, DECC 2009); and
 - Road traffic noise in accordance with the NSW Road Noise Policy (RNP, EPA NSW 2011).
- Preparation of a computer noise model representative of the proposed operations and construction stages;

RWDI#2205770 19 December 2022



- Determination of the potential impacts of noise and vibration emissions associated with construction noise/vibration sources for the site upon nearby receivers;
- Determination of the potential impacts of noise and vibration emissions associated with site operational noise and vibration sources such as mechanical plant and on-site movements of vehicles upon nearby receivers;
- Based on projected traffic generation, prediction and assessment of additional road traffic noise levels generated as a result of the development; and
- Providing recommendations to ensure operations and construction activities do not result in any adverse noise impacts upon the surrounding community.

1.2 Scope of Assessments

In performing the noise and vibration impact assessments (the "**Assessments**") listed above, RWDI confirms that such assessments were performed by RWDI in accordance with generally accepted professional standards at the time when the Assessments were performed and in the location of the Project. No other representations, warranties, or guarantees are made with respect to the accuracy or completeness of the information, findings, recommendations, or conclusions contained in this Report. This report is not a legal opinion regarding compliance with applicable laws.

The findings and recommendations set out in this report are based on the following information ("**Project Data**") disclosed to RWDI:

- 1. Patons Lane Operational Analysis spreadsheet prepared by JEP, dated 19 August 2022;
- 2. Site layout (revision 15) prepared by JEP dated 13 December 2022 (file name *SRC Operations Pty Ltd Mod 2 Full Plan Set 151222*);
- 3. Weighbridge data for the Site between July 2020 and March 2022 provided by Bingo Industries; and
- 4. Operational and construction noise scenarios as confirmed by JEP and Bingo Industries.

The recommendations and conclusions are based on the following assumptions:

- 1. The Project Data is accurate and complete; and
- 2. Traffic volumes provided by Bingo Industries are accurate and representative of the potential future tenants for the site (collectively "**Project Specific Conditions**").

RWDI assumes no responsibility for any inaccuracy or deficiency in information it has received from others.

The opinions in this report can only be relied up on to the extent that the Project Data and Project Specific Conditions have not changed. Any change in the Project Data or Project Specific Conditions not reflected in this report can impact and/or alter the recommendations and conclusions in this report. Therefore, it is incumbent upon the Client and/or any other third party reviewing the recommendations and conclusions in this report to contact RWDI in the event of any change in the Project Data and Project Specific Conditions in order to determine whether any such change(s) may impact the assumptions upon which the recommendations and conclusions were made.

The recommendations and conclusions in this report are partially based on historical data and can be affected by a number of external factors, including but not limited to Project design, quality of materials and construction, site conditions, meteorological events, and climate change. As such, the conclusions and recommendations contained in this report do not list every possible outcome. RWDI#2205770 19 December 2022



1.3 Relevant guidelines

The noise impact assessment has been conducted in accordance with the following NSW guidelines:

- NSW Noise Policy for Industry (NPfl, EPA NSW 2017)
- Interim Construction Noise Guideline (ICNG, DECC 2009); and
- NSW Road Noise Policy (RNP, EPA NSW 2011)

RWDI#2205770 19 December 2022



2 PROJECT DESCRIPTION

2.1 Site Description

The Patons Lane Resource Recovery Centre (PLRRC) is a resource management facility located at 123-179 Patons Lane, Orchard Hills (Lot 40, Deposited Plan DP 738126) within the former Erskine Park Quarry owned by SRC Properties Pty Ltd (a wholly owned subsidiary of Bingo Industries). It is situated north of Patons Lane approximately 3km south of the M4 Motorway in western Sydney. The Project Site is approximately 3km to the west of St Clair and Erskine Park and approximately 6km north of Badgerys Creek. Access to the site is via Patons Lane which extends to the west off Luddenham Road. See **Figure 2-1** for an aerial view of the Site.

2.2 Background

The Facility was originally approved under Part 3A (now repealed) of the Environmental Planning and Assessment Act 1979 (EP&A Act). The PLRRC operates under a State Significant Development approval (MP09_0074) granted in August 2012 by the Land and Environment Court, as a resource recovery centre (RRC) and landfill for commercial and industrial (C&I) and construction and demolition (C&D) wastes (non-putrescible general solid waste):

- Landfilling activities within a total void space of 4.3 million tonnes;
- Acceptance of up to 450,000 tonnes per annum (tpa) of C&D and C&I waste with
- 350,000 tpa of resource recovery and landfilling of up to 205,000 tpa;
- Resource recovery activities within the Recycling and Reprocessing Area (RRA);
- Clay / shale extraction; and
- Ancillary infrastructure.

The Approval was subsequently modified (MOD 1) in March 2016 to allow for changes to site establishment activities. MOD 1 was essentially an administrative modification to provide appropriate contingencies for site establishment program.

Site establishment works commenced on 19 April 2018 with the majority of works completed in April 2019. Operation of the site commenced in August 2019. Environmental Protection Licences for landfill and resource recovery centre were issued by the Environment Protection Authority in June and July 2019, respectively. Since commencing operations in August 2019, the site has only received waste intermittently at both the landfill and RRC. The landfill is not currently operational and is forecast to recommence by July 2023. The RRC to date has been operating with a focus on processing recovered aggregates (<60mm) sourced from Bingo's network of transfer stations and recycling facilities. There are no outstanding EPL compliance issues for the RRC (EPL 21259) or the landfill (EPL 20814).

Previous acoustic assessments conducted in relation to the PLRRC are referenced in the following documents:

- Orchard Hills Waste and Resource Management Facility, which is described in the *Modified Preferred Project Report (MPPR)* prepared by R.W. Corkery & Co, dated January 2011 which includes Appendix 2, "Noise Assessment", to the Modified Preferred Project Report;
- 2. Orchard Hills Waste and Resource Management Facility Penrith and Anor ats Dellara -Land and Environment Court Proceedings 10928 of 2011, Response for additional information in relation to the

RWDI#2205770 19 December 2022



Further Modified Preferred Project Report (FMPPR)Supplementary Noise Assessment (Wilkinson Murray Pty Limited Ref NG 240911BCmk5.doc) dated 24 September, 2011

- 3. Orchard Hills Waste and Resource Management Facility Supplementary Noise Assessment (Wilkinson Murray Pty Ltd Ref NG 2909IL BC LTRT.doc) dated 29 September, 2011
- 4. The Acoustic Joint Conference Report prepared by Dr Rob Bullen and Mr Steven Cooper dated 27 July 2011 which addressed acoustic issues for the Modified Preferred Report;
- 5. The Acoustic Joint Conference Report prepared by Mr Brian Clarke and Mr Steven Cooper dated 22 December 2011 which addressed acoustic issues for the Further Modified Preferred Report;
- 6. Report for Modifications to the Modified Preferred Project Overview Report by GHD Pty Ltd Dated September 2011.
- NSW Office of Environment and Heritage (OEH) letter "Review of Orchard Hills Waste Project (Project Application MP_090074) Exhibition of Further Modified Preferred Project Report September 2011 dated 16 November 2011 (reference DOCI1/52564).
- Orchard Hills Waste and Resource Management Facility Penrith and Anor ats Dellara -Land and Environment Court Proceedings 10928 of 2011, Response for additional information in relation to the Further Modified Preferred Project Report (FMPPR) Supplementary Statement of Evidence (Wilkinson Murray Pty Limited Ref: Sup Report 09154-FM) dated February, 2012.
- Orchard Hills Waste and Resource Management Facility Consolidated Acoustic Report Minister for Planning and Penrith City Council ATS Dellara Pty Ltd. Land and Environment Court Proceedings 10928 of 2011 (Report No. 09154-FM-CAR) dated 14 February 2012.

RWDI#2205770 19 December 2022





Figure 2-1 Site location

RWDI#2205770 19 December 2022



2.3 Modification proposal

Since the existing approval was granted for the Facility by the NSW Land and Environment Court, there has been changes to market conditions, Bingo's broader network operations and the NSW waste management regulatory framework. These changes have highlighted the need for Bingo to adjust site operations at the Facility.

This Modification Proposal aims to improve the quality of recovered soils from processing of building waste, to protect human health and the environment. This plant and investment will help Bingo improve the quality of recovered soils and aggregates, increase diversion rates and better deliver on the objectives of the NSW Government's *Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027*. NSW currently has an undersupply of processing capacity for general solid waste resource recovery, therefore the modified development will provide additional processing capacity to ensure more wastes are recovered and re-used and less are sent to landfill.

The proposed elements of the integrated water treatment management system upgrades would include an additional new raw leachate dam, new contact water dam, Leachate Treatment Plant (LTP), Recycling Water Treatment Plant (RWTP) infrastructure to support the resource recovery centre, and a future connection to sewer and potable water.

The RWTP would assist in removing silt loads within process water from the resource recovery centre enabling reuse of this water in the system. This upgrade to the RWTP is required to ensure adequate treatment of wash water for reuse in an NSW EPA approved resource recovery trial. The trial will identify if the Facility's processes are suitable to accept and treat materials classified as general solid waste (GSW). The upgrades to the RWTP and water reuse would allow additional resource recovery of aggregates, sands, ferrous and non-ferrous metals that would otherwise be lost to landfill. The proposed plant and equipment investment by SRC would improve the quality and quantity of recovered soils, increase landfill diversion rates and assist in delivering the objectives of the NSW Government's *Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027*.

The Modification Proposal also seeks to upgrade the landfill leachate treatment system to achieve improved water quality outcomes related to the landfill. Provision of a leachate treatment plant would improve the reliability and efficacy of the leachate management system, bringing the site in line with modern best practice and improving environmental outcomes.

The upgrade of water management infrastructure to support the PLRRC and ongoing landfilling operations would not result in changes to the approved types or volumes of waste accepted at the Facility under the existing Project Approval.

Detailed site and process flow diagrams are provided in Appendix A.

RWDI#2205770 19 December 2022





Figure 2-2 Modification Proposal

2.3.1 Recycled Water Treatment Plant (RWTP)

The RWTP is proposed to be located north-east of the existing PLRRC buildings and within the confines of the earthen bunds of the PLRRC. Existing dual sand conveyors are considered part of the RWTP and will be regularised as part of this Modification Proposal. The compound and infrastructure layout are indicative and subject to final contractor requirements and detailed design.

2.3.2 Proposed Landfill Leachate Treatment Plant

A leachate treatment plant is proposed to manage landfill leachate (from landfill operations only) and the current operational constraints associated with the existing leachate management system. The leachate treatment system is expected to comprise a new raw leachate dam to complement the existing raw leachate dam, a new contact water dam, a leachate treatment plant (with associated filters and chemical dosing systems) and a treated leachate holding tank. The leachate treatment plant will be designed and constructed to treat the influent leachate to a level that meets the standard trade waste acceptance standards set by Sydney Water. The proposed LTP is proposed to be located to the north-east of the proposed raw leachate dam and a potential future sewer connection point near the existing site entrance.

The proposed leachate treatment plant would improve the effectiveness of the Facility's leachate management system and prepare the Site for connection and discharge of surplus treated leachate to sewer subject to a trade waste agreement with Sydney Water.

Currently leachate water is tankered off site. The Modification proposal includes the treatment and tanker of treated leachate water until a sewer connection is provided.

Provision of the LTP would improve the reliability and efficacy of the leachate management system, bringing the site in line with modern best practice and improving environmental outcomes.

2.3.3 Operational Hours

19 December 2022

Currently, the RRC operates between 7am – 5pm Monday to Friday, and 8am - 2pm Saturday.

Based on the water balance and the abundance of contact water, the LTP would need to run 24/7 due to the high generation volumes and low sewer discharge rate. Hence it is proposed to extend these hours 24/7 for the operation of the LTP.

RWDI#2205770 19 December 2022



2.4 Noise Sensitive Receivers

Figure 2-3 presents the land zoning map for the site and its surrounding areas under the Penrith Local Environmental Plan 2010. The land zoning map indicates that the site is located within a RU 2 – rural landscape zone.

The land use immediately surrounding the site is largely rural/rural-residential in character comprising a mix of open grazing land, vegetated areas, and residential development. Immediately to the north and east of the site are rural properties (including "Roughwood Park" and "Glenholme Farm") containing residences and buildings with similar land holdings further to the north-east and south-east of the site. Approximately 500m further to the north of the site is a residential subdivision known as the "The Vines" containing large, detached residences within a RU 4 – primary production small lots zone. "The Vines" was approved by Penrith Council on 4 July 1988. Further to the south-east are rural-residential properties having frontage to Luddenham Road. Residences to the east and south-east are within RU 2 – rural landscape zone. Adjoining to the west and south of the site is heavily vegetated land owned by the Commonwealth which is used by the Australian Defence Force.

Since the approval and the original noise and vibration investigations done by Wilkinson Murray, there is no indication of a significant change in the noise environment of the area.

The Sydney Metro-Western Sydney Airport line is the new metro railway line which will service Greater Western Sydney and the new Western Sydney International (Nancy-Bird Walton) Airport. It is currently under construction and is to be operated to the east of the PLRRC. The stabling and maintenance facility is also to be located in close proximity to the site (see **Figure 2-4**). It is expected that the acoustic amenity level in this area is likely to increase over time due to the rail operation.

The potentially most affected noise sensitive receivers have been listed in Table 2-1.

Receiver ID	Address	Receiver category ¹	Approximate distance from the Site (m)	X co-ordinate² (m)	Y co-ordinate² (m)
R1	9 Verdelho Way, Orchard Hills	Residential (rural)	850	291270.4	6257741.5
R2	3 Chablis Pl, Orchard Hills	Residential (rural)	487	290972.8	6257399.9
R3	15 Cabernet Circuit, Orchard Hills	Residential (rural)	494	291254	6257366
R4	11 Cabernet Circuit, Orchard Hills	Residential (rural)	479	291369	6257353.1
R5	10 Bordeaux Pl, Orchard Hills	Residential (rural)	636	291525	6257501
R6	Bates Residence " Glenholme Farm", 117- 199 Luddenham Rd, Orchard Hills	Residential (rural)	600	292215.2	6256523.8

Table 2-1 Noise sensitive receiver locations

RWDI#2205770 19 December 2022



Receiver ID	Address	Receiver category ¹	Approximate distance from the Site (m)	X co-ordinate² (m)	Y co-ordinate² (m)
R7	Newham Residence "Roughwood Park", 43A Luddenham Rd, Orchard Hills	Residential (rural)	525	292159.1	6256851.9
R8	202 Luddenham Road, Orchard Hills	Residential (rural)	1261	292736.7	6255735.2
R9	216 Luddenham Road, Orchard Hills	Residential (rural)	1300	292752.8	6255644.1
R10	230 Luddenham Road, Orchard Hills	Residential (rural)	1350	292767.7	6255514.1
R11	262 Luddenham Road, Orchard Hills	Residential (rural)	1550	292819.3	6255204.1
R12	residence next to CCA 229-231 Luddenham Road, Orchard Hills	Residential (rural)	1180	292562.8	6255452.8
C12a	CCA 229A Luddenham Rd, Orchard Hills	Commercial	1110	292491.4	6255442.4
R13	211-227 Luddenham Rd, Orchard Hills	Residential (rural)	1170	292596.7	6255590.1
R14	251 Luddenham Road, Orchard Hills	Residential (rural)	1350	292646	6255259.9

Note 1 Receiver categories have been assigned as per the table 2.3 of the Noise Policy for Industry to assist in the selection of the appropriate amenity noise levels

Note 2 Co-ordinates are in GDA 2020/MGA zone 56 format



RWDI#2205770 19 December 2022



Figure 2-3 Noise sensitive receivers

RWDI#2205770 19 December 2022







RWDI#2205770 19 December 2022



3 ENVIRONMENTAL OBLIGATIONS

The site has two NSW Environment Protection Licenses (EPL) - 21259 for the Resource Recovery Operation and 20814 for the extractive and landfill disposal activities. Note that only the EPL for the extractive and landfill disposal activity has noise limits imposed.

Environment Protection License (EPL) 20814 was granted to the Site by NSW EPA on 8 November 2016 to carry out extractive activities and waste disposal.

The conditions relevant to noise in the EPL 20814 are as follows:

L5 Noise limits

L5.1 The noise from the premises must not exceed the sound pressure noise level limits presented in the table below.

Receiver	Day site establishment limit L _{Aeq} 15min dB	Day Operation Limit L _{Aeq 15min} dB
3 Chablis Place	41	38
Newham residence "Roughwood Park", Luddenham Road, Orchard Hills	39	39
Bates residence "Glenholme Farm", Luddenham road, Orchard Hills	39	39
210 Luddenham Road	35	38
Residence & Hall at the Croatian Cultural Association	37	39
11 Cabernet Place	43	39

L5.2 For the purposes of condition L5.1, day is defined as period from 7am to 5pm Monday to Friday, and 8am to 2pm on Saturday.

Schedule 4 - Specific Environmental Conditions within the *Land & Environment Court Proceedings No. 10928 of 2010* prescribes a number of relevant environmental conditions including:

- Condition 21 operational noise limits,
- Condition 23 operating hours, and
- Condition 27 operational noise management plan content requirements.

21 The Proponent shall ensure that the noise generated by the Project does not exceed the limits in Table 7. Noise is to be measured in accordance with the relevant modifying/correction factors and meteorological conditions in the NSW Industrial Noise Policy. RWDI#2205770 19 December 2022



Receiver	Day site establishment limit L _{Aeq 15min} dB	Day Operation Limit L _{Aeq 15min} dB
11 Cabernet Place	43	39
3 Chablis Place	41	38
Newham residence "Roughwood Park", Luddenham Road, Orchard Hills	39	39
Bates residence "Glenholme Farm", Luddenham road, Orchard Hills	39	39
210 Luddenham Road	35	38
Residence & Hall at the Croatian Cultural Association	37	39

Table 7 Noise impact assessment criteria dB(A)

23 The Proponent shall comply with the operating hours in Table 8.

Activity	Day	Hours	
	Monday - Friday	7am – 6pm	
Site establishment	Saturday	8am – 1pm	
	Sunday & Public Holidays	Nil	
	Monday - Friday	7am – 5pm	
Operation	Saturday	8am – 2pm	
	Sunday & Public Holidays	Nil	

Table 8 – Operating Hours

Condition 27 has been addressed in the Patons Lane Resource Recovery Centre Operational Noise Management Plan, dated 11 July 2019 prepared by Arcadis.

Considering that the noise limits specified in the condition 5.1 of EPL 20814 and also the conditions of consent No. 21 prescribed within Appeal no 10928 of 2010 are based on background noise levels conducted more than 10 years ago (i.e., June 2009 and July 2011), it is proposed to consider updated noise criteria based on recent background noise levels measured between 2021 and 2022. The noise criteria for the Site operations with the modification proposal are discussed in **section 6.1**.

RWDI#2205770 19 December 2022



4 COMPLIANCE NOISE MONITORING

In accordance with the *Patons Lane Resource Recovery Centre Operational Noise Management Plan, dated 11 July 2019* prepared by Arcadis, a noise monitoring program has been conducted at the PLRRC to fulfil the environmental obligations of the site establishment and existing operations. Unattended noise monitoring for site activities was conducted at three (3) locations BG1, BG2 & BG3 (note that location ID numbering has been altered) for a period of four (4) years between 1 June 2018 and 17 June 2022. In addition, monthly attended monitoring has also been conducted at a further five (5) monitoring locations. Details of these measurements are provided in the compliance monitoring reports (RWDI report reference No. 16261-M-AN) and also available on the <u>Patons Lane website</u>.

A review of the attended monitoring results indicate that the site activities are mainly inaudible (typically less than L_{Aeq} 30 dB) for majority of the sample period. Where the site was audible, it was only audible occasionally at a low level of noise. Also, measurements don't indicate the presence of any low frequency, tonality or other NPfl noise modification factors.



Figure 4-1 Compliance noise monitoring locations

RWDI#2205770 19 December 2022



5 BACKGROUND NOISE LEVELS

Since the site noise was mainly inaudible during the measurement period, the monitoring data from the unattended monitors has been utilised to obtain the background noise levels in the area. The period of June 2021 to May 2022 was chosen. This period is considered to be representative of the current noise environment in the area surrounding the PLRRC.

The noise monitoring equipment used for these measurements consisted of environmental noise loggers set to A-weighted, fast response continuously monitoring over 15-minute sampling periods. This equipment is capable of remotely monitoring and storing noise level descriptors for later detailed analysis. These noise loggers conform to Australian Standard *AS/NZS IEC 61672.2-2019 Electroacoustics – Sound level meters Pattern evaluation tests* and also AS/NZS IEC 61672.3:2019 *Electroacoustics - Sound level meters Partern evaluation sound level meter which has an accuracy suitable for field and laboratory use.*

The logger determines L_{A1} , L_{A10} , L_{A90} and L_{Aeq} levels of the existing noise environment. The L_{A1} , L_{A10} and L_{A90} levels are the levels exceeded for 1%, 10% and 90% of the sample time respectively. The L_{A1} is indicative of maximum noise levels due to individual noise events such as the occasional pass-by of a heavy vehicle. The L_{A90} level is normally taken as the background noise level. The L_{Aeq} level is the Equivalent Continuous Sound Level and has the same sound energy over the sampling period as the actual noise environment with its fluctuating sound levels. Whilst the L_{A10} has in the past been used as a descriptor for traffic noise, the L_{Aeq} is now the standard descriptor for traffic noise.

Measurements were conducted at a height of 1.5 m above ground and in free field. Serial numbers of all noise monitors are presented in **Table 5-1.** All loggers were calibrated at the start and end of the monitoring period and also at regular intervals during the monitoring period. No significant drift was noted. All loggers have been NATA calibrated within the entire monitoring period in accordance with RWDI's Quality Assurance procedures. A summary of logger data has been presented in **Appendix B.**

Location	Address	Monitoring period for assessment purposes	Logger Make	Logger S/N
BG1	117 Luddenham Road, Orchard Hills	31/05/2022 - 01/06/2022	Rion NL52 EX	00186654
BG2	Roughwood Park	31/05/2022 - 01/06/2022	Rion NL-52EX	00186655
BG3	Site Access Corridor	31/05/2022 - 01/06/2022	Rion NL52 EX	01276566

Table 5-1 Noise logger details

The measured data was analysed in accordance with the Factsheet B *Measurement procedures for determining background noise* of the NPfl to obtain the rating background levels for each location. Accordingly seasonal variations have been accounted for, and also noise due to activities that are not a usual feature of the area have been excluded. These are summarised in **Table 5-2**. The RBLs indicate the background level in the area while the L_{eq} represents the average noise levels at that location for the time period.

RWDI#2205770 19 December 2022



Poskaround Monitor ID	Saaran	Applicable	RBL dB			LAeq, period dB		
Background Monitor ID	Season	Receivers	D	E	N	D	E	N
	Winter	-	34	36	33	53	46	45
BG1 117 Luddonbam Boad	Spring	D7 and D6	34	36	32	51	48	46
Orchard Hills	Summer		35	38	38	53	54	49
	Autumn		35	43	38	53	52	47
	Winter		32	35	32	47	43	41
BG2	Spring	R1, R2, R3, R4 & R5	32	36	32	46	47	43
Roughwood Park	Summer		34	38	39	49	41	49
	Autumn ¹	-	-	-	-	-	-	-
	Winter		33	35	32	48	42	42
BG3 Site Access Corridor	Spring	R8, R9, R10, R11,	35	35	32	49	43	44
	Summer	R12, R13 & R14	35	42	37	49	50	47
	Autumn		36	40	36	47	45	43

Table 5-2 Noise monitoring summary

Note 1 Sufficient data was not available to obtain reliable RBLs due to localised flooding during the monitoring period

Note 2 D: daytime 7.00am - 6.00pm (Monday to Saturday) and 8am to 6pm (Sundays and public holidays)

E: evening time 6.00pm - 10.00pm

N: night-time 10.00pm - 7.00am (Monday to Saturday) and 10pm to 8am (Sundays and public holidays

In comparison to the 2009/2011 noise monitoring conducted for the original assessment (detailed in the consolidated acoustic report No.09154-FM-CAR prepared by Wilkinson Murray dated 14 February 2012), the RBLs calculated are similar in value. Also it is noted that the original assessment was conducted in accordance with the Industrial Noise Policy (2000), however the current assessment is conducted in accordance with the Noise Policy for Industry (2017). Hence there are minor differences in the method to obtain the noise trigger levels.



RWDI#2205770 19 December 2022



Figure 5-1 Noise monitoring locations

RWDI#2205770 19 December 2022



6 OPERATIONAL NOISE & VIBRATION ASSESSMENT

6.1 Operational noise criteria

The *NSW Noise Policy for Industry 2017 (NPfl)* provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in the state of New South Wales. Whilst specifically aimed at assessment and control of noise from industrial premises regulated by the EPA, the policy is also appropriate for use by the Department of Planning & Environment (DPE) when assessing major development proposals and also by local councils when assessing development applications.

The NPfI documents a procedure for assessment and management of industrial noise which involves the following steps:

- Determining the project noise trigger levels for a development;
- Predicting or measuring noise produced by the development (having regard to any associated annoying characteristics and prevailing meteorological effects);
- Comparing the predicted or measured noise levels with the project noise trigger level and assessing impacts and the need for noise mitigation and management measures;
- Considering any residual noise impacts following the application of feasible and reasonable noise mitigation measures;
- Setting statutory compliance levels that reflect the best achievable and agreed noise limits for development; and
- Monitoring and reporting environmental noise levels from the development.

The above steps are summarised in **Figure 6-1**.

The **project noise trigger level** represents the level that, if exceeded, may indicate a potential noise impact upon a community. It is a benchmark or objective and is not intended for use as a mandatory requirement. The project noise trigger level is the lower of the intrusiveness noise levels and the amenity noise levels for each receiver discussed in **section 6.1.1** & **section 6.1.2**.





Project noise trigger level is the lowest value of intrusiveness or

amenity noise level after

conversion to LAeq.15minute dB(A)

equivalent level

Note RBL is the Rating Background noise level that provides a single figure that represents the background noise level for assessment purposes

6.1.1 Intrusive noise level

Where project noise trigger levels are not exceeded exceeded, consider feasible and reasonable noise mitigation and re-evaluate impacts

Determine best

achievable noise leve

and implications of

any residual noise levels above project noise trigger levels. Set license limits.

Monitor performance

The **intrusiveness noise level** represents short term changes in the noise level and is derived from measurements of existing background noise levels at locations representative of a receiver. The intrusiveness noise is aimed at limiting the degree of change a new noise source introduces to an existing environment.

The intrusiveness noise level (INL) is the noise level 5 dBA above the background noise level for each time period (AM shoulder, daytime, evening or night-time) of interest at a residential receiver. The background noise level is derived from the measured L_{A90} noise levels.

L_{Aeq, 15min} = Rating Background Noise Level + 5 dB

Where the rating background noise level (RBL) is the background level to be used for assessment purposes, as determined by the method outlined in Fact Sheets A and B of the NPfl.

Note that the minimum RBLs apply in the NPfl. Thus, in cases where the background noise is below the minimum RBLs i.e., 35 dBA (Day) and 30 dBA (Evening/Night), the intrusiveness criteria for that period will be based upon the minimum RBL.

RWDI#2205770 19 December 2022



6.1.2 Amenity noise level

As the number of industries in an area increases over a long term, the background levels in the area tend to increase. The recommended **amenity noise level (ANL)** is aimed at limiting continuing increases in noise levels from the application of intrusiveness level alone. This approach limits the ambient noise within an area from all industrial noise sources combined below the recommended amenity noise levels as specified in Table 2.2 of the NPfI. The recommended amenity levels have been selected based on numerous studies as described in the NPfI and are aimed at protecting 90% of the community from being highly annoyed by industrial noise.

The recommended amenity noise levels represent the objective for total industrial noise at a receiver location, whereas the **project amenity noise level (PANL)** represents the objective for 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 ANL for industrial developments = Recommended ANL - 5dB(A)

The recommended amenity noise levels specified in the NPfI are defined as a L_{Aeq, period} noise descriptor. Due to different averaging periods for the L_{Aeq,15min} and L_{Aeq, period} noise descriptors, to enable direct comparison between descriptors, the project ANL is calculated as a L_{Aeq,15min} to be equal to the **L_{Aeq, period} level plus 3dB** in accordance with the NPfI.

6.1.3 Summary of project noise trigger levels

Based on the procedures described in **section 6.1.1 & section 6.1.2**, the project noise trigger levels have been calculated. **Table 6-1** summarises the project noise trigger levels highlighted in **bold**. In comparison to the approved limits, the project trigger levels indicate a 1 to 2 dB increase in the background levels over the past decade.

Receiver ID	lntr L	Intrusive Criteria L _{Aeq,15 min} dBA		Amenity (LAeq, 15 mi		eria BA	Projec L	c t Trigger Aeq,15 min dE	Levels BA
	D	E	N	D	E	N	D	E	N
Residential ¹	40	40	37	48	43	38	40	40	37
Commercial	_2	_2	_2		63			63	

Table 6-1 Noise trigger levels applicable for the project

Note 1 This is obtained after calculating minimum RBLs for each monitoring location for each season. Where appropriate,, the minimum RBLs set in the NPfl have been utilised. Also where exceeded above the day time intrusiveness levels, the evening project intrusiveness levels have been set to not exceed the day time intrusiveness levels.

Note 2 Intrusive criteria are applicable only to residential receivers

Note 3 **D**: daytime (7.00am - 6.00pm)

E: evening time (6.00pm - 10.00pm)

N: night-time (10.00pm - 7.00am)

6.1.4 Maximum Noise level event assessment (MNLEA)

The approved limits do not have a sleep disturbance limit as the site is currently approved for day-time operations. However, since the proposed LTP has plant operational 24/7, sleep disturbance criteria needs to be established. For this purpose, noise sources of short duration and high level that may cause disturbance to sleep

RWDI#2205770 19 December 2022



if occurring during the night-time need to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.

The approach recommended by the NPfl is to apply initial screening noise levels. Where the subject development/premises night-time noise levels at a residential location exceed:

- LAeq,15min 40 dB(A) or the prevailing RBL + 5dB, whichever is the greater; and/or
- LAFmax 52 dB(A) or the prevailing RBL + 15dB, whichever is the greater,

a detailed maximum noise level event assessment should be undertaken.

The sleep disturbance screening noise levels apply outside bedroom windows during the night. If required the detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Table 6-2 presents the initial screening noise level sleep disturbance criteria relevant for the project for applicable receivers. These criteria apply to residential receivers only.

Table 6-2 Project maximum noise level event level screening criteria

Applicable receivers	L _{Aeq,15min} dB	L _{Amax} dB
All residences	42	52

6.1.5 Meteorological Effects

At relatively large distances from a source, the resultant noise levels at receivers can be influenced by meteorological conditions, particularly temperature inversions and gradient winds. Where these factors are a feature of an area their effect on resultant noise levels should be considered.

The *NPfl* defines standard meteorological conditions and noise-enhancing meteorological conditions to be considered for the assessment. The definition of those conditions is provided in Table D1 of Fact Sheet D, which is reproduced in **Table 6-3**.

Meteorological Conditions	Meteorological Parameters
Standard	Day/evening/night: stability categories A-D with wind speed up to 0.5 m/s at 10 m AGL.
Adverse	Daytime/evening: stability categories A-D with light winds (up to 3 m/s at 10 m AGL). Night time: stability categories A-D with light winds (up to 3 m/s at 10 m AGL) and/or stability category F with winds up to 2 m/s at 10 m AGL.

Notes: m/s = metres per second; m = metres; AGL = above ground level; where a range of conditions is nominated, the meteorological condition delivering the highest predicted noise level should be adopted for assessment purposes. However, feasible and reasonable noise limits in consents and licences derived from this process would apply under the full range of meteorological conditions nominated under standard or noise-enhancing conditions as relevant. All wind speeds are referenced to 10 m AGL. Stability categories are based on the Pasquill-Gifford stability classification scheme.

The *NPfI* provides two options when considering meteorological effects:

RWDI#2205770 19 December 2022



- 1. Conservatively adopt noise-enhancing meteorological conditions without processing meteorological data local to the site; or
- 2. Determine the significance of noise-enhancing meteorological conditions based on meteorological data local to the site and adopt significant noise-enhancing conditions for the assessment. Where noise-enhancing meteorological conditions are deemed non-significant, standard meteorological conditions may be adopted.

The first option has been adopted for this assessment.

6.1.6 Noise Modification Factors – Annoying Noise Characteristics

Section C1 of the NPfl outlines *modifying factor* adjustments to account for potential greater annoyance of a noise source due to certain characteristics, such as:

- Tonality
- Intermittency
- Irregularity
- Dominant Low Frequency Content

Modifying factors are applicable for predicted or measured levels at the receiver after consideration of reasonable and feasible mitigation. These are considered in this assessment.

6.2 Noise model

The noise at sensitive receivers was predicted using noise modelling/prediction software.

Since the landfill is currently not operational and is forecast to operate in July 2023, noise scenarios have been prepared with and without the landfill activities. For the purposes of the noise assessment, the following scenarios have been utilised to predict the noise levels at the receivers:

- Validation Model Existing approved Resource Recovery Centre Operations Only without mobile plant: This model represents the existing Patons Lane Resource Recovery Centre and its associated noise sources excluding mobile plant. Validation of this model involves comparison of short-term operator attended noise measurements of the existing operations with the predicted levels from this model. If required, this model will be adjusted to be representative of measurements.
- Scenario A: Existing Approved Resource Recovery Centre operations without landfill and extraction activities - This model represents the validated noise model with the approved operations (i.e. includes mobile plant) and without the landfill based activities.
- 3. Scenario B: Existing Approved Resource Recovery Centre operations with landfill and extraction **activities –** This model represents the combination of Scenario A along with the landfill based activities.
- 4. Scenario C: Modification proposal and all approved operations resource recovery, landfill and extraction This model is a combination of Scenario B and the Modification Proposal.
- 5. **Scenario D: Approved resource recovery operations and modification proposal only** This model is a combination of Scenario A and the Modification Proposal.

RWDI#2205770 19 December 2022



The models account for the following factors:

- Source sound power levels;
- Source directivity, tonality, and orientation;
- Distance attenuation, including source and receptor heights;
- Barrier effects due to fences, structures, and other buildings;
- Ground effects;
- Atmospheric attenuation; and
- Meteorological effects.

The data for the noise models have been obtained from various sources as presented in **Table 6-4** below.

Table 6-4 Variables used for operational noise modelling

Parameter	Comment			
Noise Model	The model was implemented in CadnaA software (Version 2022 MR1) using the CONCAWE prediction algorithm			
Terrain	Off-site 5m contours extracted from the Digital Elevation Model available from <u>Geoscience Australia</u> via Elvis Elevation and Depth.			
	For contours within the site boundary, data provided by JEP in DWG file <i>"35579 LIC 20814"</i> dated December 2021 has been utilised.			
Buildings	Building information such as addresses, outlines and the heights were obtained from Geovision by Precisely.			
Ground Absorption	Ground absorption factor was set to 50% for compacted soil and grass. Ground absorption factor for Dams were set to 0% due to the higher reflections from water surfaces.			
Sound Power levels	 Sound power level data for operational noise sources were obtained from onsite measurement for the existing plant. The data for the proposed plant were obtained from manufacturer measurement data. The sound power levels adopted are presented in Table 6-6. 			
Source heights	Presented in Table 6-6.			
Receiver heights	1.5 m for single storey buildings and 4.5 m for 2 storey buildings. Receivers are located at the most affected point where possible and at least 1 m from the façade.			
Reflection for buildings	2.5 dB reflection loss with 3 orders of reflection			
Period of operation/assessment	Operations: Site operations are day period (7am to 5pm Monday to Friday, and 8am to 2pm on Saturday) for the RRC, RWTP and landfill activities. Leachate treatment plant (LTP) is proposed to operate 24/7.			

RWDI#2205770 19 December 2022



Parameter	Comment
	The worst case 15-minute period has been assessed for day, evening & night period.
	A conservative approach has been taken by adopting standard and noise enhancing meteorological conditions for all assessment periods. Source-to- receiver wind vectors have been considered for all receivers with the following stability category and wind speed:
	Standard meteorological conditions:
	Day/evening/night: stability categories A–D with wind speed up to 0.5 m/s at 10
Meteorological	m AGL.
conditions	Noise enhancing meteorological conditions Day / evening – stability category D with light winds - up to 3m/s at 10m above ground level (AGL) Night – Stability category F with winds up to 2 m/s at 10m AGL
	Humidity 70%
	Temperature 20°C
	Air Pressure 101.3 kPa
Note: AGL = Above Ground Level	

Note: AGL= Above Ground Level

RWDI#2205770 19 December 2022



6.3 Modelled scenarios for site operation

Table 6-5 presents the reasonable worst-case operational scenarios that have been developed to bestrepresent the operations of the site. All sources are modelled assuming a typical worst case 15-minute period.Schematics of the noise sources for each scenario are presented in **Appendix C**.

The Scenario A and B are based on the approved activities for the Model 1 of the Further Modified Preferred Project report titled *Consolidated Acoustic Report for the Land & Environment Court Proceedings No. 10928 of 2010 (Report No. 09154-FM-CAR)* dated 14 February 2012. Model 1 was chosen as it was predicted to have the worstcase noise levels in the 2012 assessment.

Scenario C represents the worst-case scenario under the current study as it assumes that approved resource recovery, landfill, extraction and the Modification Proposal are all operating at the same time.

Note that based on the weighbridge data provided by Bingo Industries between July 2020 to March 2022, truck movements vary significantly from day-to-day basis ranging from 1 up to 183 truck movements per day. For the assessment, the peak traffic of 183 truck movements on a busy day is considered most relevant as it represents the worst case. This traffic translates to an average of approximately 18 truck movements per hour during a 10-hour period (the period of site operation).

Use	Day period	Evening/Night period
Existing approved Resource Recovery Centre Operations Only -without mobile plant (Validation model)	 Continuous operation of all plant associated with the Resource Recovery Centre building simultaneously Breakout from roller door (West) & roller door (South)- One excavator, loader and one screener operational inside the building – continuous 15 minute operation Breakout from roller door (South West) - One excavator, loader and one screener operational inside - continuous 15 minute operation Breakout from two (2) roller doors (East) – plant for sorting operations - continuous 15 minute operation Conveyors and shakers on northern side of the building - continuous 15 minute operation Air compressor – continuous 15 minute operation 	No operation
Scenario A – Existing Approved Resource Recovery Centre operations without	 All activities in Validation noise model One (1) front end loader outside the RRC building – continuous 15 minute operation One (1) backhoe loader -continuous 15 minute operation 	No operation

Table 6-5 Modelling assumptions for site related operational noise sources
RWDI#2205770 19 December 2022



Use	Day period	Evening/Night period
landfill and extraction activities	 Delivery of wastes by trucks to recycling and re-processing area – Tr1 & Tr4 – 18 movements an hour 	
Scenario B - Existing Approved Resource Recovery Centre operations with landfill and extraction activities	 All Activities in Validation noise model One (1) front end loader outside the RRC building - continuous 15 minute operation One (1) backhoe loader -continuous 15 minute operation Landfill activities: Delivery of wastes by truck to recycling and re-processing area - Tr₁ & Tr₄ - 18 movements an hour. Delivery of wastes by truck to active waste cell - Tr₂ and Tr₃ - 16 movements an hour Compaction of wastes in active waste cell with one (1) compactor - continuous 15 minute operation Ripping and excavation of material from Cell 2A and delivery to stockpile area with one (1) bulldozer and one (1) scraper - continuous 15 minute operation Excavation with one (1) excavator and loading clay at ground level in Cell 2B into trucks for despatch offsite. One (1) truck Tr₁ idling and one (1) mobile truck (Tr₂) with 18 movements per hour Dust suppression and road maintenance - one (1) water truck entering cell 2A - 1 movement per hour Loading clay or shale from stockpile area and nearby stationary truck (Tr₅) idling only - continuous 15 minute operation Loading or recycling products into truck (Tr) within the recycling and reprocessing area. One (1) front end 	No operation

RWDI#2205770 19 December 2022



Use	Day period	Evening/Night period
	loader and nearby stationary truck (Tr₀) idling only - continuous 15 minute operation	
Scenario C – Modification proposal and all approved operations - resource recovery, landfill and extraction	 All activities as described in Scenario B above Modification Proposal: RWTP - all plant have a continuous 15 minute operation a. One (1) MWS trash screen 12 x 5 - continuous 15 minute operation b. One (1) DAF c. Two (2) filter press units d. One (1) filter pumping system e. One (1) air compressor f. Three (3) sand filters LTP plant – all plant have a continuous 15 minute operation a. Four (4) rotary lobe blowers operational 	Four (4) rotary lobe blowers operational - continuous 15 minute operation
Scenario D - Approved resource recovery operations and modification proposal only	 All activities in Scenario A Modification Proposal: RWTP - all plant have a continuous 15 minute operation a. One (1) MWS trash screen 12 x 5 - continuous 15 minute operation b. One (1) DAF c. Two (2) filter press units d. One (1) filter pumping system e. One (1) air compressor f. Three (3) sand filters LTP plant – all plant have a continuous 15 minute operation a. Four (4) rotary lobe blowers operational 	Four (4) rotary lobe blowers operational - continuous 15 minute operation

Note 1 movement is equivalent to 1 vehicle in or out i.e. a one-way journey



6.4 Equipment sound power levels

Table 6-6 presents a summary of sound power levels for the equipment used at the site and also the proposed equipment. The sound power levels used are based on site measurements conducted on 1st September and 15 September 2022 for the existing PLRRC plant items. The noise levels for the modification proposal has been obtained from manufacturer data. The noise levels for the landfill sources are the same as the Further Modified Preferred Project report.

Heavy vehicle traffic movements are represented as line sources travelling at 10 km/hr on the private road and within the site.

Noise Source	Noise Characteristic	Sound Power Level SWL, dBA	Source height in noise model m	Source type
Noise breakout from western roller door	Quasi-steady L _{Aeq}	97	-	Vertical area source
Noise breakout from southern opening	Quasi-steady L _{Aeq}	84	-	Vertical area source
Noise breakout from south- eastern roller door	Quasi-steady L _{Aeq}	98	-	Vertical area source
Noise breakout from compressor room	Quasi-steady L _{Aeq}	84	-	Vertical area source
Noise breakout from eastern roller door 1	Quasi-steady L _{Aeq}	93	-	Vertical area source
Noise breakout from eastern roller door 2	Quasi-steady L _{Aeq}	97	-	Vertical area source
Conveyor and shaker units (northern end) – combined sound power level	Quasi-steady L _{Aeq}	106	3.5	Point source
Truck in motion	Quasi-steady L_{Aeq}	107	1.5	Line source
Water truck in motion	Quasi-steady L _{Aeq}	104	1.5	Line source
Compactor	Quasi-steady L_{Aeq}	106	1.5	Point source
Front end loader	Quasi-steady L _{Aeq}	108	1.5	Line source
Scraper	Quasi-steady L_{Aeq}	104	1.5	Point source
Excavator	Quasi-steady L _{Aeq}	102	1.5	Point source
Bulldozer	Quasi-steady L _{Aeq}	112	1.5	Point source
DAF	Quasi-steady L _{Aeq}	70	1.5	Point source

Table 6-6 Adopted sound power levels for operational noise sources

RWDI#2205770 19 December 2022



Noise Source	Noise Characteristic	Sound Power Level SWL, dBA	Source height in noise model m	Source type
Filter press	Quasi-steady L _{Aeq}	93	7.5	Point source
Filter pumping system	Quasi-steady L _{Aeq}	93	0.5	Point source
Air compressor	Quasi-steady L _{Aeq}	100	1.5	Point source
MWS trash screen	Quasi-steady L _{Aeq}	94	6.5	Point source
Rotary lobe blower	Quasi-steady L _{Aeq}	93	1.5	Point source
Circulation of water in existing leachate Dam	Quasi-steady L _{Aeq}	98	0.5	Point source
Sand filter	Quasi-steady L _{Aeq}	100	1.5	Point source

RWDI#2205770 19 December 2022



6.5 Validation Noise Model & calibration

Noise impact assessment and noise mitigation design are based on noise models of existing and/or future situations. Confidence in the outcomes of those processes is increased by validation of the noise model by satisfactory prediction of the known existing situation. This is achieved by simultaneously measuring noise and observing the activities taking place on site. If the noise model can predict the measured noise based on the observations to within ±2dB, it is considered *valid*. In cases where the difference exceeds ±2dB, the model will need a suitable adjustment and will be considered *calibrated* after the adjustment.

It is likely that there may be differences between predicted and measured noise levels due to variations in operating conditions, plant in operation during the measurement and also the location of the plant equipment.

The validation measurements were performed at seventeen (17) locations to validate the noise model, see **Figure 6-2.** The validation points were chosen at distances sufficient enough for sources from the site to be clearly audible. Locations A to H are located at the top of the bund. All locations had a clear line-of-sight of the site operations.



Figure 6-2 Validation points

RWDI#2205770 19 December 2022



Table 6-7 provides a summary of the site measurements at the validation points along with the predictedvalues post-calibration. A negative value indicates an underprediction of the noise levels. Appropriateadjustments have been made to the source sound power levels to calibrate the model where required. Sincethe predictions are within +/- 2dB of the measurements, no further adjustments are required and the model isconsidered to be of a satisfactory accuracy.

Table 6-7	Summary	/ of calibration measurements and post-calibration results

			Difference		
Location	Measured L _{Aeq} dB	(calibrated)	Predicted - Measured dB		
А	53.6	52.4	-1.2		
В	56.3	57	0.7		
с	53.4	54.8	1.4		
D	55.6	53.8	-1.8		
E	55.8	54.5	-1.3		
F	58.8	60.7	1.9		
G	51.7	50.8	-0.9		
н	52.3	53.8	1.5		
I	66.5	67.5	1		
J	74.2	75	0.8		
К	61.3	62.3	1		
L	76.9	76.4	-0.5		
М	59.2	60.4	1.2		
Ν	75.2	74.6	-0.6		
0	56.9	55.9	-1		
Р	52.4	52.4	0		
Q	77.9	76.4	-1.5		
		Median	0.0		
		Standard Deviation	1.17		



6.6 Predicted continuous operational noise levels

To assist in determining the NPfI modifying factors for tonality & low frequency at the receivers, third-octave sound power levels were utilised for most equipment. Where this data was not available, octave band data was utilised. The predicted noise was analysed at each receiver and modifying factors were determined quantitatively in accordance with the NPfI factsheet C.

Tonality (T): Narrow band analysis using the reference method in *ISO 1996-2007, Annex C* indicated no presence of significant tonal noise under both standard and adverse meteorological conditions.

Low frequency (LF): Low frequency analysis using the method outlined in NPfI factsheet C indicates no requirement for a low frequency modification factor under both standard and adverse meteorological conditions.

Intermittency (I): We note that there are no site sources at night which attract the intermittent correction, which is meant to apply to repeated sudden and periodic step changes in noise that might occur from loud equipment that regularly cycles on and off.

Duration (D): No duration factors were applied since there are no one-off and unusual events occurring on site.

Table 6-8 summarises the predicted noise levels for continuous operation of the site for the scenarios A, B, C & D. Noise contour plots are presented in **Appendix D** for all scenarios for the relevant time periods. Analysis indicates that the site sources are compliant with project noise trigger levels at all receiver locations for all scenarios and meteorological conditions modelled.

A comparison of scenarios B (Existing Approved Resource Recovery Centre operations with landfill and extraction activities) and C (Modification proposal and all approved operations - resource recovery, landfill and extraction) indicate that the modifications increase the noise levels by no more than 0.2 dB for the day period under both standard and adverse meteorological conditions. Similarly, a comparison of scenarios A (Existing Approved Resource Recovery Centre operations without landfill and extraction activities) and D (Approved resource recovery operations and modification proposal only) indicate that the modifications increase noise levels by no more than 0.6 dB. These differences are considered imperceptible to people and hence it is unlikely that the modifications will have any impacts on the nearest receivers.

RWDI#2205770 19 December 2022

Table 6-8 Predicted noise levels for continuous operation

Receiver ID	Criteria L _{Aeq} 15min dB	NPfl modifying factors (total)		Scenario A L _{Aeq} 15min dB	3		Scenario B L _{Aeq} 15min dB			Scenario C L _{Aeq 15min} dB			Scenario D L _{Aeq 15min} dB		Compliance Yes (Y)/No(N)
	D/E/N	(0000)	Day	Evening	Night										
R1		0	21(22)	-	-	28(29)	-	-	28(31)	<20	<20	22(22)	<20	<20	Y
R2		0	24(24)	-	-	32(33)	-	-	32(33)	<20	<20	24(24)	<20	<20	Y
R3		0	24(25)	-	-	33(34)	-	-	33(34)	<20	<20	24(24)	<20	<20	Y
R4		0	23(24)	-	-	34(34)	-	-	34(35)	<20	<20	24(24)	<20	<20	Y
R5		0	22(22)	-	-	29(30)	-	-	30(31)	<20	<20	22(22)	<20	<20	Y
R6		0	25(25)	-	-	31(32)	-	-	31(32)	<20	<20	25(25)	<20	<20	Y
R7	40/40/37	0	24(25)	-	-	32(32)	-	-	32(33)	<20	<20	24(24)	<20	<20	Y
R8		0	21(22)	-	-	27(27)	-	-	27(28)	<20	<20	22(22)	<20	<20	Y
R9		0	21(22)	-	-	26(27)	-	-	26(28)	<20	<20	21(21)	<20	<20	Y
R10		0	18(19)	-	-	24(24)	-	-	24(25)	<20	<20	19(19)	<20	<20	Y
R11		0	17(18)	-	-	23(23)	-	-	23(23)	<20	<20	18(18)	<20	<20	Y
R12		0	24(25)	-	-	29(30)	-	-	29(31)	<20	<20	24(24)	<20	<20	Y
C12a	63/63/63	0	24(25)	-	-	30(30)	-	-	30(30)	<20	<20	25(25)	<20	<20	Y
R13	40/40/27	0	21(22)	-	-	27(28)	-	-	27(29)	<20	<20	22(22)	<20	<20	Y
R14	40/40/37	0	20(21)	-	-	26(26)	-	-	26(27)	<20	<20	21(21)	<20	<20	Y

Note Predictions for adverse meteorological conditions are within brackets





6.7 Predicted Maximum level noise event assessment

An assessment of potential sleep disturbance has been undertaken considering the proposed operation of rotary lobe blowers 24/7.

Table 6-9 identifies the night-time L_{Aeq,15min} and L_{Amax} typical maximum operational noise predictions in comparison with the adopted sleep disturbance screening level criteria. Note that the predictions for scenario C and D are the same since there is no difference in the operations during the night time period. Analysis indicates that the potential for sleep disturbance due to site operations at night time is very low.

Table 6-9	Maximum noise	leve	l event	assessment

Receiver ID	Screening Criteria dBA		Predicted Standard Meteor cond	levels dBA & Adverse ological itions	Criteria met?
	LAeq 15min	L _{Amax}	LAeq 15min	LAmax	Yes (Y)/No (N)
R1			<20	<20	Y
R2			<20	<20	Y
R3			<20	<20	Y
R4		52	<20	<20	Y
R5	42		<20	<20	Y
R6			<20	<20	Y
R7			<20	<20	Y
R8			<20	<20	Y
R9			<20	<20	Υ
R10			<20	<20	Υ
R11			<20	<20	Y
R12			<20	<20	Y
R13			<20	<20	Y
R14			<20	<20	Y



6.8 Operational Vibration

The modification proposal primarily involves the use of fixed plant such as shakers and mobile plant such as excavators, skid steers, forklift, front end loaders etc. Among these sources, shakers are likely to generate vibration if inadequately isolated for vibration, however, given the distance between the nearest receivers and the sources are in the order of 500 to 1000 m, the vibration would have insufficient energy to travel such large distances. Given these factors, further assessment of vibration is not required.

RWDI#2205770 19 December 2022



7 CONSTRUCTION NOISE ASSESSMENT

7.1 Construction noise criteria

The NSW EPA released the *Interim Construction Noise Guideline* (ICNG) in July 2009 for the management of construction works noise (Statse of NSW and Department of Environment & Climate Change NSW, 2009).

The ICNG promotes a best practice approach to the management of noise emissions from construction to allow works to proceed during recommended standard hours. Additional constraints apply to minimise potential impacts upon sensitive receivers where works are proposed outside these standard hours.

The ICNG recommends the following approaches to mitigating adverse noise impacts from construction sites. The ICNG recognises that people are usually annoyed more by noise from longer-term works than by the same type of works occurring for only a few days. For this reason, the ICNG identifies two methods of assessing noise from construction:

- The quantitative assessment method which applies to long-term duration work; and
- The qualitative assessment method which applies to short-term duration work.

The quantitative assessment method is considered appropriate for this project, since the construction works are likely to occur for more than 3 weeks.

Further, the ICNG states that the five categories of works that might be undertaken outside the recommended standard hours are:

- 1. the delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads;
- 2. emergency work to avoid the loss of life or damage to property, or to prevent environmental harm;
- 3. maintenance and repair of public infrastructure where disruption to essential services and/or considerations of worker safety do not allow work within standard hours;
- 4. public infrastructure works that shorten the length of the project and are supported by the affected community; and
- 5. works where a proponent demonstrates and justifies a need to operate outside the recommended standard hours.

In the last two categories, the proponent should provide the relevant authority with clear justification for reasons other than convenience, such as to sustain operational integrity of road, rail and utility networks. In general, only works undertaken on public infrastructure need to be undertaken outside the recommended standard hours.

For this project, construction will be assumed to be undertaken during standard construction hours only.

The ICNG recommends that the L_{Aeq,15min} noise levels arising from a construction project, measured within the curtilage of an occupied noise-sensitive premises i.e., at boundary or within 30 m of the residence, whichever is the lesser, should not exceed the levels indicated in **Table 7-1** & **Table 7-2**.



Type of receiver	Period of Noise Exposure	LAeq,15min CNML	How to Apply	
Residential		Noise affected ¹ RBL ² + 10 dBA	 The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured L_{Aeq 15 min} is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details. 	
	Recommended Standard Hours	Highly noise affected ³ 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.	
	Outside Recommended Standard Hours	Noise affected ¹ RBL + 5 dBA	A strong justification would typically be required for works outside the recommended standard hours.	
	Sleep disturbance criteria	L _{Aeq,15min} 40 dBA or the prevailing RBL + 5dB , whichever is the greater, and/or L _{AFmax} 52 dBA or the prevailing RBL + 15dB ,	Where construction works are planned to extend over more than two consecutive nights, and a quantitative assessment method is used, the analysis should cover the maximum noise level, and the extent and the number of times that the maximum noise level exceeds the RBL.	

Table 7-1 Construction Noise Management Levels (CNMLs)

RWDI#2205770 19 December 2022



Typ rece	Type ofPeriod of NoisereceiverExposure		LAeq,15min CNML	How to Apply			
			whichever is the greater				
Comn	Commercial All periods		70 dBA external	The proponent should assess construction noise levels for the project, and consult with occupants of commercial and industrial premises prior to lodging an application where required			
Note 1	The noise a	affected level represents the	point above which there may be	some community reaction to noise.			
Note 2	Refer to Gl	ossary of Acoustic Terms.					
Note 3	3 The highly noise affected level represents the point above which there may be strong community reaction to noise.						
Note 4	For normal construction (works other than blasting), where possible, the ICNG recommends confining work times to the following:						
	Monday to Friday 7.00 am to 6.						
	Saturdays		8.00 am to 1.00 pm				
	Sundays o	r Public Holidays	No construction				

Where predicted or measured levels exceed the recommended Noise Management Levels, the ICNG recommends that the proponent apply all feasible and reasonable work practices to minimise noise.

Where L_{Aeq,15min} construction noise levels are predicted to exceed the **highly noise affected** level (i.e., 75 dBA) the relevant authority (consent, determining or regulatory) may require respite periods to be observed. This may include restricting the hours that the noise-generating activities can occur, considering:

- Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences); and
- If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

The implementation of an effective community consultation and liaison programme is emphasised as being a critical tool in successfully handling adverse noise impacts from construction works.

7.1.1 Construction noise management levels for the modification proposal

Construction for the site modification is proposed to take place during standard work hours only. Hence the Construction noise management levels (CNMLs) have been based upon the Day time RBLs for the residential receivers. **Table 7-2** summarises the construction noise management levels for the project.

Receiver ID	Type of receiver	Period of Noise Exposure	Project CNMLs L _{Aeq,15min} dBA
All residential R1 to R14	Residential	Recommended Standard Hours	Noise affected 45 dBA Highly noise affected 75 dBA
Croatian Cultural Association C12a	Commercial	All periods	70 dBA external

 Table 7-2
 Project Construction Noise Management Levels (CNMLs)



7.2 Methodology and assumptions

Construction is proposed to only occur during the standard hours and so only daytime predictions have been completed.

The data for the noise model has been obtained from various sources as presented in Table 7-3 below.

Table 7-3 Variables used for construction noise modelling

Parameter	Comment									
Noise Model	The model was implemented in CadnaA software (Version 2022 MR1) using the CONCAWE prediction algorithm									
Terrain	Off-site 5m contours extracted from the Digital Elevation Model available from <u>Geoscience Australia</u> via Elvis Elevation and Depth.									
	dated December 2021 has been utilised.									
Buildings	Building information such as addresses, outlines and the heights were obtained from Geovision by Precisely.									
Ground Absorption	Ground absorption factor was set to 50% for compacted soil and grass. Ground absorption factor for Dams were set to 0% due to the higher reflections from water surfaces.									
Sound Power levels	Detailed in Table 7-4									
Source heights	All sources have been modelled at 1.5m									
Receiver heights	1.5 m for single storey buildings and 4.5 m for 2 storey buildings. Receivers are located at the most affected point where possible and at least 1 m from the façade.									
Reflection for buildings	2.5 dB reflection loss with 3 orders of reflection									
Period of assessment	Worst case 15-minute period has been assessed for construction during the day period									
	A conservative approach has been taken by adopting standard and noise enhancing meteorological conditions for all assessment periods. Source-to-receiver wind vectors have been considered for all receivers with the following stability category and wind speed:									
Meteorological conditions	Standard meteorological conditions: Day/evening/night: stability categories A–D with wind speed up to 0.5 m/s at 10 m AGL.									
	 Noise enhancing meteorological conditions Day / evening – stability category D with light winds - up to 3m/s at 10m above ground level (AGL) Night – Stability category F with winds up to 2 m/s at 10m AGL 									

RWDI#2205770 19 December 2022



Parameter	Comment
	Humidity 70%
	Temperature 20°C
	Air Pressure 101.3 kPa

7.3 Sound Power Levels

The potential construction noise impacts at sensitive receivers were predicted using a noise model representative of the construction stages for the proposed development.

Given the early stage of the Modification Proposal, preliminary assumptions to provide noise predictions have been made. These assumptions can be revisited at the detailed design stage and once a construction contractor has been appointed.

A list of equipment likely to be used during the construction project was provided by JEP. The construction stages for the RWTP, LTP and the Leachate/Contact Water Dams involve civil works and installation. In our experience, considering the distance between the site and the nearest receivers, civil works are found to have the most noise impact in comparison to installation works. Hence, stages involving installation works have not been modelled. It has been assumed that all equipment operate simultaneously during a 15-minute period. **Table 7-4** presents the construction noise scenarios.

Table 7-4	Construction	noise	scenarios
	construction	110136	SCENALIOS

Construction Scenario	Main works	Activity description	Typical equipment – SWL dBA
RWTP Civils	Site mobilisation	 Services search; Establishment of environmental management measures including erosion and sediment controls; Establish site access, laydown areas; and Establishment of stockpile sites. 	One (1) Crane 99 dBA Eight (8) Delivery truck movement per hour 107 dBA
	Grading & civil works:	 Site stripping; Cut and fill earthworks for wash water treatment plant; Cut and fill earthworks for RRC sump/tanks; Construction of stormwater drainage piping and systems; 	One (1) Excavator & One (1) Front end loader 117 dBA (combined) Eight (8) Delivery truck movement per hour 107 dBA
	Access works	Construction of access and paving; and	One (1) Grader & One (1) Roller

RWDI#2205770 19 December 2022



Construction Scenario	Main works	Activity description	Typical equipment – SWL dBA
		 Construction of truck turning area and internal access. 	113 dBA (combined) Eight (8) Delivery truck movement per hour 107 dBA
	Site mobilisation	 Services search; Establishment of environmental management measures including erosion and sediment controls; Establish site access, laydown areas; and Establishment of stockpile sites. 	One (1) Crane 99 dBA Eight (8) Delivery truck movement per hour 107 dBA
LTP Civil	Grading & civil works:	 Site stripping; Cut and fill earthworks for leachate treatment plant; Construction of stormwater drainage piping and systems; 	One (1) Excavator & One (1) Front end loader 117 dBA (combined) Eight (8) Delivery truck movement per hour 107 dBA
	Access works	 Construction of access and paving; and Construction of truck turning area and internal access. 	One (1) Grader & One (1) Roller 113 dBA (combined) Eight (8) Delivery truck movement per hour 107 dBA
Leachate & Contact Water Dam Upgrade	Site mobilisation	 Services search; Establishment of environmental management measures including erosion and sediment controls; Establish site access, laydown areas; and Establishment of stockpile sites. 	One (1) Crane 99 dBA Eight (8) Delivery truck movement per hour 107 dBA

SN

RWDI#2205770 19 December 2022

Construction Scenario	Main works	Activity description	Typical equipment – SWL dBA
	Grading & civil works:	 Site stripping; Cut and fill earthworks for leachate and contact water dams; Construction of stormwater drainage piping and systems; 	One (1) Excavator & One (1) Front end loader 117 dBA (combined) Eight (8) Delivery truck movement per hour 107 dBA
	Access works	 Construction of access and paving; and Construction of truck turning area and internal access. 	One (1) Grader & One (1) Roller 113 dBA (combined) Eight (8) Delivery truck movement per hour 107 dBA
	New plant/equipment works	• Construction of leachate and contact water dams;	One (1) Crane 99 dBA Eight (8) Delivery truck movement per hour 107 dBA
	Plumbing and on- site water management system installation.	• Trench, backfill site services.	One (1) Excavator 115 dBA Eight (8) Delivery truck movement per hour 107 dBA

7.4 Predicted Construction Noise Levels

Table 7-5 details predicted construction noise levels for each scenario. The predictions are considered to be in the upper range of noise levels likely to be experienced by the receives. Based on these predictions, it can be concluded that construction noise is unlikely to cause any impacts to nearby receivers and is highly likely to be within the CNML at all receiver locations. The *ICNG* describes strategies for construction noise mitigation and control that are applicable to the modification proposal. The strategies are designed to minimise, to the fullest extent practicable, noise during construction. These predictions should be reviewed prior to an issue of a construction certificate.



RWDI#2205770 19 December 2022

Table 7-5 Predicted Construction Noise Levels

CNMLs		VILs	RWTP			LTP		Dam upgrades				Criteria met?		
ID	L _{Aeq 15min}	Highly affected	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Yes (Y)/No (N)
R1	45	75	<20 (<20)	21 (22)	<20 (<20)	<20 (<20)	22 (23)	<20 (<20)	<20 (<20)	22 (22)	<20 (<20)	<20 (<20)	20 (21)	Y
R2	45	75	<20 (<20)	24 (25)	20 (21)	<20 (<20)	23 (24)	<20 (<20)	<20 (<20)	23 (24)	<20 (<20)	<20 (<20)	<20 (20)	Y
R3	45	75	<20 (<20)	24 (25)	21 (21)	<20 (<20)	24 (25)	<20 (21)	<20 (<20)	24 (25)	20 (21)	<20 (<20)	22 (22)	Y
R4	45	75	<20 (<20)	24 (25)	20 (21)	<20 (<20)	24 (25)	20 (21)	<20 (<20)	24 (24)	<20 (20)	<20 (<20)	21 (22)	Y
R5	45	75	<20 (<20)	22 (23)	<20 (<20)	<20 (<20)	23 (24)	<20 (<20)	<20 (<20)	22 (23)	<20 (<20)	<20 (<20)	20 (21)	Y
R6	45	75	<20 (<20)	24 (25)	21 (22)	<20 (<20)	29 (30)	25 (26)	<20 (<20)	28 (29)	25 (25)	<20 (<20)	27 (28)	Y
R7	45	75	<20 (<20)	23 (24)	20 (21)	<20 (<20)	29 (30)	25 (26)	<20 (<20)	25 (26)	21 (22)	<20 (<20)	23 (24)	Y
R8	45	75	<20 (<20)	<20 (20)	<20 (<20)	<20 (<20)	24 (25)	21 (22)	<20 (<20)	27 (27)	23 (24)	<20 (<20)	26 (26)	Y
R9	45	75	<20 (<20)	<20 (20)	<20 (<20)	<20 (<20)	24 (25)	21 (21)	<20 (<20)	27 (27)	24 (24)	<20 (<20)	25 (25)	Y
R10	45	75	<20 (<20)	<20 (<20)	<20 (<20)	<20 (<20)	22 (22)	<20 (<20)	<20 (<20)	23 (23)	<20 (<20)	<20 (<20)	21 (21)	Y
R11	45	75	<20 (<20)	<20 (<20)	<20 (<20)	<20 (<20)	21 (21)	<20 (<20)	<20 (<20)	21 (22)	<20 (<20)	<20 (<20)	<20 (20)	Y
R12	45	75	<20 (<20)	22 (22)	20 (21)	<20 (<20)	26 (27)	23 (24)	21 (21)	30 (30)	27 (27)	<20 (20)	29 (29)	Y
C12a	70	-	20 (21)	23 (23)	21 (22)	<20 (<20)	27 (28)	24 (25)	22 (22)	31 (31)	28 (28)	21 (21)	30 (30)	Y
R13	45	75	<20 (<20)	20 (21)	<20 (<20)	<20 (<20)	25 (25)	21 (22)	<20 (<20)	26 (27)	23 (23)	<20 (<20)	25 (25)	Y
R14	45	75	<20 (<20)	<20 (<20)	<20 (<20)	<20 (<20)	24 (24)	20 (21)	<20 (<20)	25 (26)	22 (22)	<20 (<20)	25 (26)	Y

Note Predictions for adverse meteorological conditions are within brackets

RWDI#2205770 19 December 2022



8 OPERATIONAL ROAD TRAFFIC NOISE

The site is currently approved to operate a maximum of 250 heavy vehicle movements per day. There is no proposed changes to the approved operational traffic movements for the Site. Hence an assessment of operational road traffic noise is deemed as not necessary.

RWDI#2205770 19 December 2022



9 CONCLUSION

RWDI has completed a noise and vibration impact assessment (NVIA) of a modification proposal for the Patons Lane resource recovery centre.

The NVIA has confirmed that noise emissions from operation and construction of the Modification Proposal will comply with relevant noise criteria. In fact, the increase in noise levels due to the modification would be very minor and is likely to be imperceptible.

It is expected that vibration generated from the operation and construction of the Modification Proposal will meet relevant standards.

The Modification Proposal will not result in additional road traffic and hence it will meet the relevant road traffic noise goals.

RWDI#2205770 19 December 2022



10 STATEMENT OF LIMITATIONS

This report entitled PATONS LANE RESOURCE RECOVERY Centre – INTEGRATED WATER AND LEACHATE PLANT MODIFICATIONS - 123-179 PATONS LANE, ORCHARD HILLS, NSW dated 19 December 2022 was prepared by RWDI Australia Pty Ltd ("RWDI") for Jackson Environment and Planning Pty Ltd ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.











		3 2		1
>				
				ſ
			\checkmark	
			\geq	, I
	/ / .			
			\searrow	\searrow
				E
/				
				•
				~
				C
/				
			$\langle \langle$	N
			\sim	
			5	\sim
	,			\sim
	7			
				E
				E
	CLIEN			/
		BINGO INDUSTRIES PATONS LANE		
	SIZE	DRAWING NUMBER	SHEET	REV
	A3	J22-PL-CV-0001	3/3	15





1	2	2	Λ	E	6	o	0	10	11	13
	Σ	5		J	0	0	9	10		12
A										A
						(3)				
						T V T				
						1 1 1 1000				_
5										B
							F C			
_								e		_
								A DE CONTRACTOR		
										С
									E .	
-										
							F			
										D
_			Store Contraction							
				Ĵ						
ε										E
_										
			T							
_			e e							
-			0							F
_										
3										G
					~					
1										H
1	2	3	Δ	ς	6	o 0	٥	10	11	17
	۷		T	022 ENVIROPACIFIC SERVICES PTY LIMITED		0	CONTRACT NO. DATE AN	PPR GENERAL NOTES:		12
				his drawing is subject of copyright nd must not be copied or therwise used without parmicing	ENVIROPACIFI	C	DRAWN A.A	DO NOT SCALE FROM THIS DRAWING. All dimensions in mm unless otherwise stated	Leachate Treatme	nt Plant 520 m³/day
				information and know-how herein is onfidential and must not be used r revealed to others without the			CHECKED S.A	Remove all burrs. All fillet radii 1mm UON. All chamfers 1x45° UON.		
15/09/2022 Issued for r	eview			xpress authority of Enviropacific ervices Pty Limited.			MECHANICAL DESIGN APPR A.A	DRAFTING STANDARD AS 1100	DRW NO. 1016-L01-0	01
EV DATE	REVISION DESCRIPTION	BY CHK	A A I I I I I I I I I I I I I I I I I I	ny reproduction in whole, or in part, cluding shop drawings derived om this material must bear or refer this stamp			ELECT & INSTR DESIGN APPR		SCALE Date Completed:	Sheet: 2/2 REV SIZE
			APPROVED				WEIGHTS CHECKED	THIRD ANGLE PROJECTION	19.1.0 15/09/2022	A AZ

APPENDIX B noise logger data

BG 1 - 117 LUDDENHAM ROAD

Dete		ABL		L _{aeq 15min}			
Date	Day	Evening	Night	Day	Evening	Night	
			Winter 2021				
01-06-21	35.1	38.4	35.0	48.7	43.6	44.2	
02-06-21	32.9	39.6	36.8	46.7	45.6	43.8	
03-06-21	40.5	26.1	27.9	47.4	41.3	40.6	
04-06-21	37.3	33.1	31.9	51.2	42.2	40.2	
05-06-21	33.6	36.1	31.0	44.4	42.2	40.7	
06-06-21	32.2	37.0	33.0	44.4	42.7	43.4	
07-06-21	39.3	38.9	34.4	47.5	45.0	44.8	
08-06-21	41.6	37.7	29.6	53.1	48.6	41.4	
09-06-21	38.2	36.5	32.3	55.2	42.4	45.1	
10-06-21	43.4	38.0	27.9	50.2	43.2	40.4	
11-06-21	33.5	31.0	29.2	46.3	42.7	39.9	
12-06-21	35.7	31.5	32.1	49.0	40.0	40.4	
13-06-21	31.3	30.9	31.6	44.8	39.9	38.0	
14-06-21	32.5	36.0	31.2	44.3	41.6	41.2	
15-06-21	32.2	39.5	35.6	45.7	43.5	42.4	
16-06-21	35.1	42.5	30.9	46.4	46.9	42.0	
17-06-21	38.2	32.6	30.9	58.2	40.5	43.9	
18-06-21	33.9	35.2	34.8	48.1	46.5	52.2	
19-06-21	44.5	38.8	36.5	63.4	46.1	48.9	
20-06-21	36.4	38.8	37.1	53.3	43.2	43.3	
21-06-21	35.0	39.4	38.2	44.8	44.9	44.8	
22-06-21	34.8	41.4	37.9	54.4	45.7	45.0	
23-06-21	39.9	38.5	35.4	51.4	44.4	44.8	
24-06-21	43.6	39.7	34.0	53.4	48.5	45.2	
25-06-21	38.0	36.2	33.9	47.9	45.8	43.5	
26-06-21	34.9	32.0	29.6	45.6	42.4	38.4	
27-06-21	27.8	30.5	30.2	49.0	41.2	42.2	
28-06-21	36.3	36.1	33.8	46.8	42.5	44.3	
29-06-21	35.0	37.2	33.6	45.3	44.2	46.8	
30-06-21	30.8	39.1	32.5	45.2	48.3	46.2	
01-07-21	32.2	43.8	32.8	44.9	51.5	46.9	
02-07-21	33.2	39.6	37.3	43.9	49.0	46.7	
03-07-21	30.4	35.7	29.1	45.5	44.9	39.0	
04-07-21	31.7	31.0	30.4	48.0	44.9	43.0	
05-07-21	35.4	31.1	31.3	50.5	44.1	43.3	

Data		ABL		Laeq 15min			
Date	Day	Evening	Night	Day	Evening	Night	
06-07-21	31.0	36.7	33.5	44.4	43.2	43.2	
07-07-21	33.2	38.9	35.9	46.2	43.7	42.9	
08-07-21	33.2	36.9	34.0	44.3	43.7	42.1	
09-07-21	38.6	32.3	33.4	43.9	43.9	48.7	
10-07-21	37.5	37.0	34.1	57.4	49.7	48.0	
11-07-21	28.9	37.7	34.7	44.7	49.2	45.9	
12-07-21	35.9	39.7	34.5	49.9	49.1	45.2	
13-07-21	35.5	36.1	34.6	48.6	46.4	45.6	
14-07-21	42.2	37.4	36.3	51.7	46.2	45.8	
15-07-21	33.0	36.1	35.2	53.1	52.5	47.7	
16-07-21	44.1	39.4	39.2	48.7	57.0	58.8	
17-07-21	36.2	32.8	28.2	63.0	45.8	46.3	
18-07-21	30.2	31.0	28.7	48.4	45.6	41.5	
19-07-21	29.5	29.7	29.2	44.8	43.5	40.5	
20-07-21	34.6	30.7	26.2	48.2	45.1	54.4	
21-07-21	34.2	30.3	28.7	59.9	41.7	41.7	
22-07-21	33.4	35.6	34.4	46.4	44.3	41.1	
23-07-21	35.8	33.9	32.1	46.6	40.2	40.7	
24-07-21	34.8	30.1		49.6	44.2	0.0	
25-07-21				0.0	0.0	0.0	
26-07-21			27.3	0.0	0.0	40.5	
27-07-21	34.7	36.2	32.8	48.1	46.7	45.4	
28-07-21	40.5		31.0	57.3	0.0	46.4	
29-07-21			31.4	0.0	0.0	43.3	
30-07-21	31.5	38.1	31.5	45.1	49.0	42.8	
31-07-21	37.4	31.9	30.0	49.1	43.7	41.4	
01-08-21	30.4	36.3	32.8	49.0	47.9	47.8	
02-08-21	34.5	36.4	36.7	46.4	47.7	49.1	
03-08-21				0.0	0.0	0.0	
04-08-21			27.7	0.0	0.0	44.1	
05-08-21	36.3	30.0	28.5	53.8	44.9	42.2	
06-08-21	32.5	29.5	28.1	47.0	43.0	39.1	
07-08-21	28.3	28.5	27.1	43.0	42.6	39.5	
08-08-21	33.5	32.0	30.5	44.8	42.6	45.1	
09-08-21	35.5	38.9	36.9	46.8	49.3	48.3	
10-08-21	32.8	36.4	33.3	49.7	49.9	45.4	
11-08-21	40.7	38.1	34.6	55.8	47.7	48.4	
12-08-21	34.9	33.5	32.1	52.8	47.7	45.8	
13-08-21	31.8	31.8	31.7	47.1	44.4	43.0	
14-08-21	31.3	32.9	30.3	45.8	42.2	37.6	

Data		ABL		Laeq 15min			
Date	Day	Evening	Night	Day	Evening	Night	
15-08-21	25.9	25.2	23.6	41.9	40.1	40.2	
16-08-21	31.6	31.2	28.1	49.1	48.7	42.1	
17-08-21	32.2	31.3	28.9	44.7	44.2	43.4	
18-08-21	32.0	36.2	33.9	47.0	44.6	43.9	
19-08-21	31.5	36.7	33.8	46.0	43.7	43.9	
20-08-21	32.4	32.1	31.9	46.1	44.0	44.2	
21-08-21	30.6	34.8	31.4	48.1	48.5	45.9	
22-08-21	33.8	33.7	30.5	51.1	46.6	45.8	
23-08-21	37.6	34.3	41.2	51.5	47.3	51.5	
24-08-21	50.1			66.1	0.0	0.0	
25-08-21			32.0	0.0	0.0	44.5	
26-08-21	35.7	37.9	36.1	49.4	48.9	46.1	
27-08-21	35.1	37.3	32.8	54.3	48.3	44.7	
28-08-21	31.1	39.6	34.5	52.2	49.1	44.0	
29-08-21	29.3	38.1	35.9	43.6	46.3	44.9	
30-08-21	34.8	40.1	34.8	66.3	49.1	49.5	
31-08-21	35.1	40.8	40.1	53.1	49.2	48.2	
ALL	33.5	36.2	32.8	53.0	46.1	45.2	
			Spring 2021				
01-09-21	36.9	42.1	40.0	48.8	50.7	46.9	
02-09-21	35.2	39.4	38.3	47.2	49.4	47.6	
03-09-21	36.2	43.2	36.7	51.9	49.3	46.9	
04-09-21	37.9	41.0		49.5	49.5	0.0	
05-09-21			36.0	0.0	0.0	46.6	
06-09-21	41.2	37.7	35.6	58.7	47.9	45.4	
07-09-21	36.0	36.9	32.7	53.7	45.2	43.8	
08-09-21	32.6	39.1	34.8	44.6	46.9	45.8	
09-09-21	32.3		33.5	47.5	0.0	47.6	
10-09-21			34.0	0.0	0.0	43.6	
11-09-21	35.1	36.8	29.5	48.3	47.9	43.5	
12-09-21	35.7			44.7	0.0	0.0	
13-09-21				0.0	0.0	0.0	
14-09-21			30.4	0.0	0.0	44.7	
15-09-21	37.2	32.8	29.1	53.5	43.4	42.5	
16-09-21	36.3	35.7	31.9	51.6	43.0	43.7	
17-09-21	38.3	36.9	31.4	50.9	45.3	43.8	
18-09-21	35.1			64.1	0.0	0.0	
19-09-21				0.0	0.0	0.0	
20-09-21				0.0	0.0	0.0	
21-09-21			26.2	0.0	0.0	45.7	

Date	ABL			Laeq 15min			
Date	Day	Evening	Night	Day	Evening	Night	
22-09-21	33.5	35.6	32.0	49.4	43.1	45.4	
23-09-21	31.9	29.1	29.9	44.7	40.2	41.4	
24-09-21				0.0	0.0	0.0	
25-09-21			28.2	0.0	0.0	39.1	
26-09-21	34.2	31.9	30.6	50.3	42.5	43.6	
27-09-21	34.4	36.8	34.4	46.8	44.7	41.9	
28-09-21				0.0	0.0	0.0	
29-09-21				0.0	0.0	0.0	
30-09-21				0.0	0.0	0.0	
01-10-21			32.1	0.0	0.0	43.2	
02-10-21	31.2	36.2	34.0	46.4	45.9	43.6	
03-10-21	31.1	36.6	38.2	49.8	45.0	47.7	
04-10-21				0.0	0.0	0.0	
05-10-21	-		29.0	0.0	0.0	43.6	
06-10-21	32.7	36.7	34.0	44.8	41.6	43.4	
07-10-21	34.9		26.9	50.9	0.0	40.8	
08-10-21	33.5	38.6	34.0	47.3	45.4	43.1	
09-10-21	32.0	37.1	32.2	47.2	43.1	41.1	
10-10-21	35.6	34.6	32.0	45.3	43.4	48.4	
11-10-21	36.1	34.6	33.3	48.6	45.1	43.5	
12-10-21	36.6	37.6	36.3	47.8	53.9	43.4	
13-10-21	35.7	39.5	35.1	47.1	48.3	44.2	
14-10-21	34.7	45.5	38.8	54.4	48.9	46.3	
15-10-21				0.0	0.0	0.0	
16-10-21			28.8	0.0	0.0	41.2	
17-10-21	33.2	38.1	33.4	47.7	46.5	43.3	
18-10-21	32.5	37.8	34.8	43.8	47.8	44.4	
19-10-21	34.8	36.2	31.0	45.4	46.0	41.3	
20-10-21	38.0	37.7	31.0	55.4	47.7	42.5	
21-10-21	34.5	39.0	33.3	47.9	47.8	44.8	
22-10-21	33.0	38.8	33.8	50.6	46.9	42.9	
23-10-21	32.8	37.8	29.9	47.9	45.0	43.1	
24-10-21	33.2	36.1	30.6	52.4	50.0	43.2	
25-10-21	34.5	36.1	27.6	46.4	44.9	41.4	
26-10-21	34.8	33.3	25.5	50.9	47.6	41.9	
27-10-21	33.6	39.4	32.4	46.8	46.6	43.3	
28-10-21	31.9	36.5	36.0	44.3	45.6	42.1	
29-10-21			30.2	0.0	0.0	43.9	
30-10-21	38.3	32.0	25.1	55.2	45.2	41.4	
31-10-21	31.6	34.8	31.7	51.0	49.3	48.5	

Date	ABL			L _{aeq 15min}							
	Day	Evening	Night	Day	Evening	Night					
01-11-21	35.4	34.5	31.0	46.9	42.5	47.9					
02-11-21	36.3	36.4	33.0	55.7	56.3	54.4					
03-11-21	37.7	36.0	31.4	55.3	47.2	41.8					
04-11-21	43.2	40.5		48.0	45.7	0.0					
05-11-21			32.5	0.0	0.0	41.3					
06-11-21	31.9	37.0	38.0	48.1	46.2	45.0					
07-11-21				0.0	0.0	0.0					
08-11-21			33.5	0.0	0.0	41.9					
09-11-21	33.7	38.9	35.3	49.0	48.9	42.1					
10-11-21	34.3	37.9	33.6	50.1	50.1	42.7					
11-11-21	39.2			54.0	0.0	0.0					
12-11-21	34.7	37.3	36.2	49.0	41.5	51.9					
13-11-21				0.0	0.0	0.0					
14-11-21				0.0	0.0	0.0					
15-11-21			25.3	0.0	0.0	46.5					
16-11-21	35.2	34.4	29.2	54.1	57.4	53.0					
17-11-21	33.6	35.9	30.6	48.7	46.0	43.4					
18-11-21	35.0	38.3	35.6	49.3	47.3	46.7					
19-11-21	36.3	38.8	30.0	49.9	50.0	41.8					
20-11-21	36.6	35.3	35.0	49.4	44.6	45.0					
21-11-21	41.7	42.0	37.5	52.5	43.5	45.7					
22-11-21	40.9	41.4	37.1	53.0	49.1	42.2					
23-11-21	33.6	41.1	36.0	47.2	51.4	49.1					
24-11-21	32.9	40.4	39.8	46.0	52.1	48.9					
25-11-21	32.8	42.1	47.0	47.5	53.2	54.0					
26-11-21				0.0	0.0	0.0					
27-11-21			46.2	0.0	0.0	48.1					
28-11-21				0.0	0.0	0.0					
29-11-21			36.5	0.0	0.0	46.4					
30-11-21	34.0	39.3	47.3	47.3	48.6	49.3					
ALL	34.1	36.3	32.3	50.8	48.3	45.9					
Summer 2021											
01-12-21	35.9	38.3	40.2	47.8	48.3	46.7					
02-12-21	34.8	38.6	39.1	48.0	47.6	46.0					
03-12-21	35.8		32.9	46.1	0.0	42.8					
04-12-21	33.3	35.9	33.5	52.0	52.1	42.5					
05-12-21	35.8	34.4	38.0	50.1	41.0	43.5					
06-12-21	32.2	35.5	37.3	50.0	46.2	43.9					
07-12-21	34.7	41.3	37.9	45.5	44.5	45.3					
08-12-21	36.1		34.0	46.4	0.0	43.0					


Data		ABL		L _{aeq 15} min		
Date	Day	Evening	Night	Day	Evening	Night
09-12-21	34.1	41.6	41.8	47.2	44.4	48.0
10-12-21	38.1	40.9	37.7	45.9	47.7	47.3
11-12-21	37.9	39.2	35.7	52.6	48.7	48.1
12-12-21	35.1	44.0	46.5	54.1	66.8	66.8
13-12-21			36.5	0.0	0.0	45.5
14-12-21	37.4	38.6	37.5	50.7	53.3	45.6
15-12-21	34.2	40.9	34.8	49.9	53.7	46.9
16-12-21	36.1	36.6	33.6	57.3	48.2	43.2
17-12-21	33.9	39.1	36.3	53.7	46.8	46.4
18-12-21	30.2	30.0	37.0	46.1	44.5	46.7
19-12-21	34.5	45.1	36.0	51.8	52.0	44.3
20-12-21	31.9	42.5	34.4	45.3	46.5	45.0
21-12-21	33.3	37.9	33.2	47.3	48.1	41.5
22-12-21	35.6	36.5	33.4	53.6	50.6	44.0
23-12-21	32.3	35.5	36.0	45.2	45.3	43.4
24-12-21	31.0	36.5	32.5	47.9	50.2	41.9
25-12-21	30.1	32.8	32.3	46.1	44.3	42.4
26-12-21	33.7	33.6	33.6	51.2	46.4	47.4
27-12-21	35.3	35.8	31.5	51.6	48.3	42.4
28-12-21	37.3	34.8	30.4	52.9	49.3	41.0
29-12-21	32.5	35.3	32.3	45.1	42.8	42.3
30-12-21	33.4	35.0	33.9	46.9	42.6	42.1
31-12-21	32.5	34.6	34.6	47.5	45.5	41.6
01-01-22	32.8	33.5	32.8	46.0	46.2	40.1
02-01-22	30.6	33.6	33.2	47.8	45.7	45.1
03-01-22	30.6	35.3	33.6	51.0	58.4	42.2
04-01-22	36.4	35.2	35.8	54.9	49.8	41.2
05-01-22	36.9	40.8	39.4	48.5	51.8	45.2
06-01-22	40.0	39.3	38.0	52.6	48.6	43.2
07-01-22	36.2	37.6	37.9	48.7	46.1	47.0
08-01-22	31.1		38.9	43.1	0.0	50.1
09-01-22	33.3	32.1	41.3	44.6	37.8	46.9
10-01-22	31.9	37.6	39.1	46.4	45.3	44.6
11-01-22	35.7	33.6	38.5	45.5	54.3	50.6
12-01-22	37.2	38.1	36.7	49.7	51.9	45.9
13-01-22	37.3	36.4	39.9	52.5	46.1	48.5
14-01-22	32.6	31.9	38.4	45.9	49.3	44.6
15-01-22	32.9	34.2	36.5	46.3	46.9	44.7
16-01-22	36.8	38.7	39.7	46.6	52.4	45.0
17-01-22	36.1	36.1	38.9	46.1	46.3	45.4



Data	ABL			L _{aeq} 15min		
Date	Day	Evening	Night	Day	Evening	Night
18-01-22	36.7	48.9	43.2	46.9	49.6	47.8
19-01-22	40.9	39.2	44.9	56.4	51.5	48.4
20-01-22			43.7	0.0	0.0	48.3
21-01-22	40.8		37.4	46.3	0.0	46.8
22-01-22	40.0	40.5	35.7	54.5	51.2	46.4
23-01-22	35.5	42.1	36.4	51.3	53.6	46.7
24-01-22	32.1	42.0	38.3	56.9	50.3	46.7
25-01-22	35.7	39.0	39.2	48.7	45.9	46.9
26-01-22	34.2	36.8	38.9	50.6	45.6	50.3
27-01-22	37.3	38.3	39.3	47.3	46.1	51.5
28-01-22	37.8	37.3	40.1	45.6	51.5	46.9
29-01-22	40.1	37.6	42.3	49.4	43.9	48.7
30-01-22	36.6	38.8	44.8	62.7	64.4	60.2
31-01-22	39.3	36.9	44.8	62.6	49.0	51.0
01-02-22	38.0	45.3	45.5	48.8	52.5	52.4
02-02-22	38.5	47.5	46.8	48.7	54.3	51.9
03-02-22	41.3	48.0	44.8	54.8	57.6	52.7
04-02-22	43.0	44.1	42.1	59.2	58.1	47.2
05-02-22	41.4	49.0	46.5	57.7	56.8	50.6
06-02-22	40.2	47.8	46.3	57.6	53.6	48.8
07-02-22			41.4	0.0	0.0	46.6
08-02-22	35.9	45.2	48.8	50.5	48.6	53.6
09-02-22	36.3	40.8	47.6	51.1	47.8	51.6
10-02-22	34.8	39.3	47.2	49.1	50.9	52.8
11-02-22	39.5	40.7	43.7	56.0	51.0	50.5
12-02-22				0.0	0.0	0.0
13-02-22			42.9	0.0	0.0	48.1
14-02-22	36.4	42.0	47.9	50.7	49.1	52.4
15-02-22	35.1	44.6	49.9	48.8	53.8	54.0
16-02-22	36.3	44.6	50.1	49.9	52.7	53.3
17-02-22	35.0	48.6	50.2	48.9	55.2	53.4
18-02-22				0.0	0.0	0.0
19-02-22				0.0	0.0	0.0
20-02-22				0.0	0.0	0.0
21-02-22			55.7	0.0	0.0	60.9
22-02-22	44.8	50.0	49.9	53.4	53.2	56.1
23-02-22	40.0	47.8	49.5	52.6	56.1	58.7
24-02-22			54.3	0.0	0.0	59.3
25-02-22	43.2		51.9	51.4	0.0	58.6
26-02-22	40.4	43.0	49.9	52.2	51.9	53.5



Data		ABL		L _{aeq} 15min					
Date	Day	Evening	Night	Day	Evening	Night			
27-02-22	36.7	52.4	53.7	50.1	59.5	59.1			
28-02-22	38.7	49.6	51.5	54.6	56.9	53.5			
ALL	35.4	38.3	37.8	52.7	54.0	49.2			
Autumn 2022									
01-03-22	42.5	51.6	48.2	53.9	55.7	54.8			
02-03-22			49.0	0.0	0.0	57.5			
03-03-22	42.0	48.1	55.5	58.1	59.8	63.5			
04-03-22	44.1	45.9	54.4	54.0	56.4	58.6			
05-03-22				0.0	0.0	0.0			
06-03-22			48.8	0.0	0.0	58.3			
07-03-22	42.2	50.6	50.5	52.4	58.1	61.5			
08-03-22		47.2	52.5	0.0	54.2	64.1			
09-03-22	45.6	49.7	55.7	61.2	58.1	60.4			
10-03-22	37.4	48.8		53.6	55.1	0.0			
11-03-22	35.2	49.7	56.1	49.1	56.1	60.8			
12-03-22	35.2	49.7	56.5	50.2	57.2	60.0			
13-03-22	33.4	46.6		51.4	51.9	0.0			
14-03-22	35.6	44.6	57.1	51.5	56.1	59.1			
15-03-22	37.7	45.3	61.7	53.2	54.5	62.6			
16-03-22	35.9	43.0		64.7	52.6	0.0			
17-03-22	34.0	42.4		49.5	48.0	0.0			
18-03-22	33.8	44.7	44.8	49.3	50.3	47.9			
19-03-22	43.0	49.0	48.8	53.7	53.2	52.2			
20-03-22	33.7	47.5		50.5	51.1	0.0			
21-03-22	36.2	45.6	55.4	47.7	49.3	56.8			
22-03-22	33.8	43.2		48.0	47.1	0.0			
23-03-22	35.7	41.3	42.2	53.3	46.9	43.8			
24-03-22	41.2	47.7	41.6	51.8	51.7	50.5			
25-03-22	38.0	44.1	44.4	51.0	48.3	57.4			
26-03-22	38.3	45.9	47.2	52.6	48.7	56.3			
27-03-22	35.0		51.8	46.7	0.0	54.5			
28-03-22	36.8		55.4	59.7	0.0	63.6			
29-03-22	41.4	53.8	56.9	59.2	57.8	58.0			
30-03-22	38.8			51.6	0.0	0.0			
31-03-22	44.7	49.6	47.9	59.9	56.2	55.8			
01-04-22	47.2	47.4	45.4	64.2	57.0	54.3			
02-04-22	44.3	49.6	38.9	59.2	54.2	48.6			
03-04-22	37.6		43.6	54.8	0.0	49.2			
04-04-22	34.8		44.6	51.0	0.0	51.7			
05-04-22	33.9			52.1	0.0	0.0			



Data		ABL			L _{aeq 15min}	
Date	Day	Evening	Night	Day	Evening	Night
06-04-22	44.4	45.9	46.4	53.6	50.4	50.7
07-04-22	43.6		50.8	51.0	0.0	54.4
08-04-22	39.7	55.8	47.3	55.0	57.7	55.6
09-04-22	35.9		41.2	48.9	0.0	52.1
10-04-22	32.8			50.3	0.0	0.0
11-04-22	36.4			48.3	0.0	0.0
12-04-22	36.6			51.6	0.0	0.0
13-04-22	40.5	49.2	50.2	54.7	52.5	53.3
14-04-22	35.2		40.4	48.9	0.0	47.3
15-04-22	33.7		38.8	46.5	0.0	48.8
16-04-22	30.5		37.8	49.7	0.0	48.2
17-04-22	31.8		39.0	49.9	0.0	48.5
18-04-22	33.5		45.4	51.7	0.0	50.8
19-04-22	35.9	48.9	44.5	49.6	54.3	51.3
20-04-22	33.8		42.6	49.5	0.0	47.8
21-04-22	38.9	50.3	47.0	52.0	52.9	51.4
22-04-22	39.6	51.4	46.8	50.6	53.1	51.5
23-04-22	32.1		38.6	47.0	0.0	47.7
24-04-22	34.8		40.5	50.7	0.0	51.0
25-04-22	32.8		42.5	55.8	0.0	49.1
26-04-22	34.4		41.8	52.5	0.0	46.2
27-04-22	36.4		41.3	47.4	0.0	50.3
28-04-22	41.5		41.6	49.1	0.0	51.5
29-04-22	34.2		43.0	45.9	0.0	50.8
30-04-22	36.0			62.7	0.0	0.0
01-05-22	33.2			48.0	0.0	0.0
02-05-22	34.0		43.3	48.7	0.0	48.6
03-05-22	36.2		42.3	51.4	0.0	47.5
04-05-22	32.4		43.5	48.6	0.0	50.2
05-05-22	33.7		38.8	47.8	0.0	46.7
06-05-22	33.5	43.4	37.5	48.4	47.2	44.0
07-05-22	33.2	36.3	33.4	47.5	42.6	39.8
08-05-22	34.6	37.8	37.6	47.9	43.7	43.0
09-05-22	38.5	41.7	38.6	46.4	45.9	44.4
10-05-22	37.5	46.6	40.4	49.9	49.1	46.7
11-05-22	38.5	45.3	41.0	49.1	50.2	46.5
12-05-22	41.4	52.3	44.4	46.4	53.9	50.3
13-05-22	33.8		36.5	48.3	0.0	47.3
14-05-22	33.1		36.9	47.6	0.0	45.5



Date	ABL			L _{aeq} 15min		
Date	Day	Evening	Night	Day	Evening	Night
15-05-22	32.5		41.0	46.3	0.0	46.8
16-05-22	33.1		40.9	46.2	0.0	46.0
17-05-22	32.2	41.0	38.6	45.7	45.2	47.3
18-05-22	35.5	35.5	34.9	49.6	40.8	42.8
19-05-22	35.4	39.1	36.0	48.7	43.3	41.7
20-05-22	36.7	36.4	35.2	46.4	43.8	42.7
21-05-22	37.6	43.9	39.0	48.3	48.3	44.7
22-05-22	38.1		42.5	48.1	0.0	48.9
23-05-22	38.6		39.7	49.8	0.0	47.9
24-05-22	39.1		44.4	48.9	0.0	49.0
25-05-22	35.9		40.0	49.0	0.0	45.0
26-05-22	35.5	42.6	37.9	49.5	47.2	43.7
27-05-22	35.3	41.3	36.0	47.3	44.8	42.0
28-05-22	32.9	35.3	32.4	54.1	41.3	39.9
29-05-22	36.2	33.3	30.2	52.1	40.1	48.3
30-05-22	41.5	34.5		49.5	46.8	0.0
31-05-22				0.0	0.0	0.0
ALL	35.2	42.6	37.5	53.1	51.6	46.8



BG 2 – ROUGHWOOD PARK

Data	ABL			L _{aeq} 15min		
Date	Day	Evening	Night	Day	Evening	Night
			Winter 2021			
01-06-21	32.3	36.1	33.3	44.8	40.3	41.8
02-06-21	31.4	37.2	35.6	44.2	42.5	41.9
03-06-21	38.6	28.0	28.8	44.0	39.5	37.3
04-06-21	34.9	31.4	31.0	43.9	37.4	36.0
05-06-21	27.6	34.4	29.7	39.8	39.4	37.8
06-06-21	25.7	34.9	31.0	42.5	41.2	40.9
07-06-21	31.0	37.6	34.0	53.2	42.2	42.8
08-06-21	39.4	35.2	26.2	46.7	45.9	40.6
09-06-21	33.9	32.9	31.3	45.3	41.3	44.9
10-06-21	42.2	34.3	25.0	49.9	39.9	37.9
11-06-21	30.8	28.5	27.5	44.3	40.8	35.2
12-06-21	33.8	26.6	28.8	43.7	35.0	36.2
13-06-21	25.4	27.4	29.1	41.4	37.5	35.0
14-06-21	26.2	33.4	27.9	39.3	38.8	37.7
15-06-21	29.1	36.0	33.4	41.2	41.0	39.9
16-06-21	33.7	39.5	30.1	44.9	44.8	38.9
17-06-21	35.4	32.5	31.7	43.7	38.5	40.5
18-06-21	30.5	37.4	34.7	45.9	41.0	41.4
19-06-21	39.2	36.2	36.4	52.3	40.1	40.8
20-06-21	32.3	38.2	38.1	46.8	42.2	42.2
21-06-21	32.1	41.1	38.9	45.1	45.3	44.1
22-06-21	30.5	41.3	37.9	43.9	44.7	44.0
23-06-21	39.2	40.8	38.7	46.4	44.7	43.9
24-06-21	42.1	40.2	39.4	53.6	43.9	43.2
25-06-21	36.2	38.3	38.2	43.6	43.4	42.9
26-06-21	34.7	35.3	32.7	43.7	41.3	37.5
27-06-21	30.1	35.8	32.0	46.2	41.5	39.9
28-06-21	33.0	36.6	36.1	42.4	42.5	40.2
29-06-21	34.2	38.9	36.1	41.2	43.0	41.2
30-06-21	29.4	40.1	35.9	41.9	43.7	42.8
01-07-21	30.6	44.4	37.3	41.4	47.5	42.0
02-07-21	32.7	44.1	41.6	42.3	47.6	45.1
03-07-21	32.2	38.6	33.6	43.7	45.0	39.8
04-07-21	32.7	36.1	32.3	41.2	42.5	40.4
05-07-21	32.2	34.5	31.9	42.5	42.3	40.6
06-07-21	31.5	35.7	32.2	44.0	41.9	41.8
07-07-21	30.8	38.4	35.5	45.0	43.2	40.9



Data	ABL			L _{aeq 15} min		
Date	Day	Evening	Night	Day	Evening	Night
08-07-21	31.5	37.0	33.8	41.8	42.4	41.8
09-07-21	35.3	32.3	32.9	40.9	38.6	38.6
10-07-21	34.1	40.7	41.1	47.0	44.1	44.0
11-07-21	30.6	42.4	37.9	45.5	46.2	42.9
12-07-21	35.1	42.3	37.1	46.3	46.5	44.2
13-07-21	35.2	38.3	37.2	47.9	44.4	45.3
14-07-21	39.1	38.9	36.2	47.4	43.6	44.2
15-07-21	33.4	38.6	38.4	43.2	44.2	43.4
16-07-21	36.6	36.5	37.0	53.1	46.1	47.5
17-07-21	36.5	34.2	31.7	52.1	44.4	39.4
18-07-21	30.6	33.7	31.7	40.1	40.2	38.6
19-07-21	30.5	32.8	32.1	40.3	40.7	38.9
20-07-21	34.3	30.0	26.4	48.7	41.5	41.3
21-07-21	28.9	28.8	28.1	46.4	40.2	39.7
22-07-21	32.2	35.3	33.9	40.9	40.9	39.8
23-07-21	34.5	32.9	31.4	44.8	39.0	39.4
24-07-21	41.7			44.6	0.0	0.0
25-07-21		25.8	25.8	0.0	34.5	35.4
26-07-21	33.9	29.2	27.4	42.2	35.4	36.3
27-07-21	33.1	35.9	31.4	41.3	39.8	38.3
28-07-21	38.7		26.2	46.5	0.0	36.6
29-07-21	30.4	27.8	30.4	42.3	39.4	39.3
30-07-21	30.5	36.4	30.7	42.6	40.8	40.3
31-07-21	36.5	31.9	30.2	46.9	36.9	36.0
01-08-21	29.5	30.3	30.8	44.0	36.3	39.8
02-08-21	33.3	35.1	33.2	44.4	39.8	42.5
03-08-21	35.1	29.3	27.0	47.4	35.0	36.0
04-08-21	32.1	27.4	26.2	48.8	35.1	38.8
05-08-21	31.3	28.0	27.3	44.0	34.7	38.7
06-08-21	30.3	26.5	25.7	47.6	33.5	33.4
07-08-21	26.6	25.2	25.2	38.0	35.0	33.3
08-08-21	29.6	29.1	28.2	43.8	34.6	36.4
09-08-21	34.2	37.5	35.8	60.2	41.5	41.0
10-08-21	33.6	35.2	32.7	48.2	39.9	44.4
11-08-21	37.0	34.8	30.4	47.4	39.6	41.7
12-08-21	30.0	31.7	31.4	44.5	37.4	39.9
13-08-21	29.6	30.5	31.3	44.6	36.5	41.2
14-08-21	30.2	33.5	31.1	42.0	37.3	35.7
15-08-21	23.8	22.4	23.5	35.7	31.6	42.7
16-08-21	28.3		26.7	48.4	0.0	38.8



Data	ABL			Laeq 15min			
Date	Day	Evening	Night	Day	Evening	Night	
17-08-21	28.0	29.0	27.5	40.0	37.3	38.7	
18-08-21	31.3	35.2	33.5	44.1	40.5	41.8	
19-08-21	29.6	34.1	31.2	44.3	39.6	40.7	
20-08-21	31.7	26.4	27.7	54.9	35.0	37.2	
21-08-21	27.9	29.2	28.7	42.2	35.8	37.3	
22-08-21	32.4	30.6	28.6	42.2	37.4	40.0	
23-08-21	36.0	32.6	30.6	49.5	45.3	37.2	
24-08-21	41.0		36.3	51.1	0.0	50.2	
25-08-21	34.3	38.2	36.3	53.7	42.5	41.9	
26-08-21	31.7	43.0	39.7	50.7	46.9	44.7	
27-08-21	33.7	43.9	37.8	49.9	52.6	43.8	
28-08-21	33.1	42.6	37.3	42.5	47.0	42.6	
29-08-21	30.9	40.6	37.7	46.6	45.6	42.5	
30-08-21	31.8	41.5	37.1	45.5	46.4	43.4	
31-08-21	34.9	42.8	40.7	44.0	46.7	44.5	
ALL	32.0	35.2	31.9	47.4	42.8	41.3	
Spring 2021							
01-09-21	28.9	41.5	39.6	55.1	45.6	44.2	
02-09-21	34.0	41.4	40.0	43.7	50.4	44.1	
03-09-21	34.9	43.2	38.6	47.5	51.0	43.8	
04-09-21	36.9	41.1	37.5	47.2	42.9	42.2	
05-09-21	35.0	41.2	37.0	49.9	45.1	43.0	
06-09-21	35.6	38.5	36.9	45.8	44.3	44.1	
07-09-21	33.6	37.6	35.4	46.1	41.3	42.0	
08-09-21	32.7	39.2	35.5	41.0	43.0	42.7	
09-09-21	32.2	32.9	32.2	45.1	38.7	38.1	
10-09-21	30.1	35.6	33.3	49.0	41.1	40.5	
11-09-21	33.8	31.0	29.0	48.4	42.4	35.8	
12-09-21	33.6	27.7	27.8	41.2	37.2	39.7	
13-09-21	29.1	29.8	32.2	44.3	35.9	38.3	
14-09-21	35.4	31.3	28.9	46.3	36.7	39.3	
15-09-21	32.3	31.1	29.4	43.9	37.6	37.9	
16-09-21	30.7	31.3	30.5	41.4	38.4	40.6	
17-09-21	36.6	34.8	31.4	44.1	39.0	45.4	
18-09-21	31.4	25.8	23.3	44.6	39.4	35.7	
19-09-21	30.3	27.1	27.0	44.7	36.3	41.7	
20-09-21	33.0	28.0	22.7	49.4	43.2	35.9	
21-09-21	31.7	28.6	22.5	47.9	37.5	36.0	
22-09-21	30.3	31.5	31.7	41.0	40.9	43.4	
23-09-21	30.6	27.3	26.7	49.1	41.1	39.7	



Date	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
24-09-21	34.0	30.7	23.3	47.6	35.5	37.6
25-09-21	32.5	25.0	25.3	45.3	36.4	31.5
26-09-21	29.0	29.1	27.5	37.9	40.5	38.9
27-09-21	33.6	33.9	34.2	40.8	42.1	41.7
28-09-21	30.9			49.1	0.0	0.0
29-09-21				0.0	0.0	0.0
30-09-21			31.4	0.0	0.0	39.6
01-10-21	35.6	32.0	30.0	44.7	39.2	35.2
02-10-21			35.4	0.0	0.0	40.9
03-10-21	29.6	45.1	40.5	43.5	50.9	45.1
04-10-21	29.8	43.2	35.5	45.3	48.2	41.0
05-10-21	36.4	34.3	33.6	50.8	45.8	38.8
06-10-21	30.1	36.7	33.2	46.7	42.7	43.3
07-10-21	34.1	32.3	28.9	48.3	44.8	37.7
08-10-21	32.7	35.3	34.4	42.2	46.3	40.8
09-10-21	30.8	34.3	29.6	44.2	43.9	37.0
10-10-21	32.5	34.8	33.6	44.7	38.0	44.8
11-10-21	30.0	32.1	33.1	40.4	41.8	39.1
12-10-21	35.4	34.9	35.3	43.5	40.8	40.2
13-10-21	34.7	42.9	40.7	44.4	47.3	45.3
14-10-21	32.5	49.6	41.7	47.8	54.5	46.4
15-10-21	36.3	43.0	37.3	48.0	45.6	42.8
16-10-21	35.7	36.6	30.9	50.1	42.5	39.5
17-10-21	29.9	36.7	33.4	41.4	43.4	39.6
18-10-21	30.5	39.9	34.0	43.3	48.4	41.2
19-10-21	31.6	34.7	29.7	44.5	40.4	39.1
20-10-21	33.1	35.7	30.2	43.5	42.5	38.8
21-10-21	30.0	37.9	32.3	49.5	41.6	40.3
22-10-21	29.6	38.8	33.1	43.1	42.8	40.2
23-10-21	27.8	38.8	31.5	42.5	47.7	40.3
24-10-21	29.5	35.7	30.4	42.6	39.7	39.7
25-10-21	31.0	34.7	26.6	41.6	38.2	37.8
26-10-21	29.7	32.8	28.0	43.5	39.4	40.4
27-10-21	31.6	37.3	32.7	40.7	42.3	40.4
28-10-21	30.6	37.2	36.6	45.3	43.5	44.0
29-10-21	38.6	33.2	28.9	53.9	45.4	46.4
30-10-21	33.7	29.4	23.3	45.5	36.0	35.0
31-10-21	29.2	33.2	30.6	44.6	39.1	44.2
01-11-21	34.4	33.8	30.4	46.0	39.6	48.3
02-11-21	32.6	37.1	32.3	47.3	42.7	43.3



Data		ABL		Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
03-11-21	34.2	35.1	31.5	44.5	41.3	39.4
04-11-21	39.7	39.5	34.1	44.4	44.9	35.8
05-11-21	37.1	39.3	33.9	47.0	46.7	40.0
06-11-21	29.9	40.3	33.8	46.0	46.2	40.9
07-11-21	30.0	46.7	45.6	47.1	49.2	47.0
08-11-21	32.2	44.6	41.3	45.5	51.8	45.6
09-11-21	33.1	41.9	39.2	44.6	49.7	44.6
10-11-21	34.5	42.9	41.0	46.9	50.2	46.9
11-11-21	35.5			42.1	0.0	0.0
12-11-21	35.3	48.5	42.3	46.2	52.2	48.2
13-11-21	39.4	36.9	35.2	51.8	42.8	42.4
14-11-21	35.0	37.4	31.7	53.9	44.2	40.1
15-11-21	37.5	36.4	29.3	49.4	42.1	40.5
16-11-21	31.4	38.3	29.2	45.5	42.0	39.1
17-11-21	31.7	39.3	35.1	43.9	45.7	42.9
18-11-21	33.1	39.9	39.8	43.8	46.4	46.3
19-11-21	34.3	38.7	38.6	46.8	44.7	45.6
20-11-21	33.6	35.8	37.4	43.6	43.1	42.5
21-11-21	38.8	44.5	42.5	43.6	52.2	46.7
22-11-21	36.8	50.2	43.7	49.4	57.1	51.7
23-11-21	30.3	48.8	42.9	43.6	60.9	47.7
24-11-21	32.3	43.1	47.6	50.0	52.6	51.6
25-11-21	34.3	46.2	53.0	46.5	58.1	55.3
26-11-21	42.7	47.3	53.8	50.5	53.9	55.1
27-11-21	39.3	41.0	41.4	47.5	46.2	47.2
28-11-21	34.8	39.9	40.5	45.6	47.2	47.4
29-11-21	33.0			49.2	0.0	0.0
30-11-21	33.3	42.1		46.7	48.3	0.0
ALL	32.3	35.7	32.3	46.4	46.6	42.6
			Summer 2021			
01-12-21	31.7	40.6		46.1	52.8	0.0
02-12-21	34.3	41.2		47.1	50.2	0.0
03-12-21	34.6			48.1	0.0	0.0
04-12-21	35.0	37.6	45.6	46.6	47.9	48.5
05-12-21	36.4	37.4	41.1	48.1	51.1	49.6
06-12-21	32.9			47.0	0.0	0.0
07-12-21	33.5			54.7	0.0	0.0
08-12-21	34.4	43.3		49.3	48.4	0.0
09-12-21	33.5	50.7		48.8	59.8	0.0
10-12-21	43.1			49.3	0.0	0.0



Data		ABL		Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
11-12-21	37.8		41.8	49.3	0.0	47.3
12-12-21	29.9		42.3	46.3	0.0	49.4
13-12-21	31.4		41.3	43.7	0.0	46.1
14-12-21	33.5			44.8	0.0	0.0
15-12-21	32.8	42.9	47.9	44.3	52.6	51.2
16-12-21	33.8	42.3		46.1	46.7	0.0
17-12-21	35.5	42.2		45.6	46.9	0.0
18-12-21	30.1	36.1	48.6	46.1	47.5	53.7
19-12-21	36.9	41.5		53.8	48.7	0.0
20-12-21	31.8	40.0	43.2	44.3	47.9	49.8
21-12-21	30.8	37.5		42.7	42.1	0.0
22-12-21	34.9	37.7	43.1	51.6	58.0	45.7
23-12-21	34.2	39.2	43.1	46.1	47.6	45.4
24-12-21	32.2	36.1	41.2	43.2	50.0	44.6
25-12-21	29.0	35.2	42.1	54.4	41.1	45.1
26-12-21	29.8	34.1	39.5	46.3	40.7	45.3
27-12-21	32.6	34.5	39.3	47.1	42.1	42.7
28-12-21	33.1	37.6	35.8	53.4	41.4	42.1
29-12-21	30.3	_	37.9	45.3	0.0	42.1
30-12-21	29.8	37.4	39.0	41.5	41.2	42.7
31-12-21	29.3	38.9	39.4	44.8	48.5	43.6
01-01-22	28.2	35.8	40.0	44.7	44.0	43.2
02-01-22	27.7	35.1	40.7	42.6	44.6	44.0
03-01-22	28.9	34.5	40.2	45.2	47.6	43.2
04-01-22	32.0	35.5	40.7	46.0	45.4	43.6
05-01-22	36.9	38.6	38.1	47.1	52.6	48.5
06-01-22	40.9	43.0	45.1	49.5	48.8	47.7
07-01-22	35.7	37.9	47.0	46.4	46.1	53.8
08-01-22	29.9	43.4		48.6	49.0	0.0
09-01-22	34.9	44.6		47.6	52.1	0.0
10-01-22	33.4	40.2		44.4	49.6	0.0
11-01-22	33.6			44.2	0.0	0.0
12-01-22	36.1	38.8	43.7	47.6	46.4	50.0
13-01-22	34.5	_	46.2	48.4	0.0	52.8
14-01-22	34.5	37.0		48.1	44.3	0.0
15-01-22	33.9	34.3		47.8	40.9	0.0
16-01-22	32.8	39.3		52.4	44.3	0.0
17-01-22	33.1	36.0		46.0	44.0	0.0
18-01-22	37.9	53.0	44.8	46.7	53.6	47.8
19-01-22	40.2	42.4	57.1	49.4	52.7	58.2



Data		ABL		Laeq 15min			
Date	Day	Evening	Night	Day	Evening	Night	
20-01-22	39.1	43.3	46.1	50.7	51.5	51.2	
21-01-22	36.6	42.4	42.6	45.2	46.9	51.2	
22-01-22	35.1	40.0	40.2	44.1	44.5	45.2	
23-01-22	33.3	38.6	42.4	46.0	42.9	47.6	
24-01-22	34.7	39.0	44.0	44.8	44.7	47.9	
25-01-22	34.8	37.5	44.2	45.3	44.3	48.1	
26-01-22	35.1	40.9	44.3	54.0	46.8	50.9	
27-01-22	36.9	38.8	45.5	47.0	45.7	48.9	
28-01-22	34.3	37.7	46.4	47.2	45.2	51.4	
29-01-22	32.3	36.9		45.4	43.7	0.0	
30-01-22	34.3	38.5	45.6	50.0	44.6	49.3	
31-01-22	34.6	36.4		47.4	42.1	0.0	
01-02-22	36.0	43.0	45.7	47.5	56.8	54.3	
02-02-22	42.6	49.9		49.8	55.6	0.0	
03-02-22	37.3			48.9	0.0	0.0	
04-02-22	40.9		43.4	49.2	0.0	48.6	
05-02-22	38.8			50.2	0.0	0.0	
06-02-22	38.6	51.9	45.7	50.2	56.4	54.3	
07-02-22	41.1	_	45.4	48.6	0.0	48.1	
08-02-22	36.3	_		47.6	0.0	0.0	
09-02-22	35.7			47.5	0.0	0.0	
10-02-22	34.5			56.2	0.0	0.0	
11-02-22	41.2	52.1	49.3	52.7	59.4	58.1	
12-02-22	37.2	56.0	45.9	50.1	61.8	51.4	
13-02-22	37.3	_	43.4	47.7	0.0	50.5	
14-02-22	39.4	_		46.8	0.0	0.0	
15-02-22	36.6			51.6	0.0	0.0	
16-02-22	38.5	_		49.9	0.0	0.0	
17-02-22	36.9	_		47.1	0.0	0.0	
18-02-22	37.9		60.5	52.2	0.0	62.2	
19-02-22			48.1	0.0	0.0	53.9	
20-02-22	39.2		63.6	49.4	0.0	65.3	
21-02-22	38.3	54.5		53.3	60.9	0.0	
22-02-22	52.8		57.5	58.9	0.0	62.5	
23-02-22	44.9	63.6	63.5	59.5	66.6	65.1	
24-02-22				0.0	0.0	0.0	
25-02-22				0.0	0.0	0.0	
26-02-22				0.0	0.0	0.0	
27-02-22	40.0	54.9	52.8	55.6	59.0	55.8	
28-02-22				0.0	0.0	0.0	



Date		ABL		Laeq 15min					
Date	Day	Evening	Night	Day	Evening	Night			
ALL	34.3	37.6	39.2	49.0	41.4	48.7			
	Autumn 2022								
01-03-22	43.6	57.8	50.1	56.8	60.3	58.4			
02-03-22			48.1	0.0	0.0	52.5			
03-03-22	43.0	57.5	51.0	53.9	60.1	54.2			
04-03-22	40.3	54.8	53.8	53.6	61.3	62.2			
05-03-22	41.2	58.1		53.2	65.0	0.0			
06-03-22	44.8	55.3		55.8	60.1	0.0			
07-03-22				0.0	0.0	0.0			
08-03-22				0.0	0.0	0.0			
09-03-22				0.0	0.0	0.0			
10-03-22	_			0.0	0.0	0.0			
11-03-22				0.0	0.0	0.0			
12-03-22				0.0	0.0	0.0			
13-03-22				0.0	0.0	0.0			
14-03-22				0.0	0.0	0.0			
15-03-22	_			0.0	0.0	0.0			
16-03-22	-			0.0	0.0	0.0			
17-03-22	_			0.0	0.0	0.0			
18-03-22	_			0.0	0.0	0.0			
19-03-22	-			0.0	0.0	0.0			
20-03-22				0.0	0.0	0.0			
21-03-22	_			0.0	0.0	0.0			
22-03-22	-			0.0	0.0	0.0			
23-03-22	_			0.0	0.0	0.0			
24-03-22				0.0	0.0	0.0			
25-03-22			25.6	0.0	0.0	25.6			
26-03-22	-			0.0	0.0	0.0			
27-03-22				0.0	0.0	0.0			
28-03-22				0.0	0.0	0.0			
29-03-22	-			0.0	0.0	0.0			
30-03-22				0.0	0.0	0.0			
31-03-22				0.0	0.0	0.0			
01-04-22				0.0	0.0	0.0			
02-04-22				0.0	0.0	0.0			
03-04-22				0.0	0.0	0.0			
04-04-22				0.0	0.0	0.0			
05-04-22				0.0	0.0	0.0			
06-04-22				0.0	0.0	0.0			
07-04-22				0.0	0.0	0.0			



Date	ABL			L _{aeq} 15min		
Date	Day	Evening	Night	Day	Evening	Night
08-04-22				0.0	0.0	0.0
09-04-22				0.0	0.0	0.0
10-04-22				0.0	0.0	0.0
11-04-22				0.0	0.0	0.0
12-04-22				0.0	0.0	0.0
13-04-22				0.0	0.0	0.0
14-04-22				0.0	0.0	0.0
15-04-22				0.0	0.0	0.0
16-04-22				0.0		
ALL	43.0	55.3		54.7	60.1	0.0



BG 3 – SITE ACCESS CORRIDOR

Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
			Winter 2021			
01-06-21	34.2	37.7	33.9	48.4	43.3	44.6
02-06-21	32.9	39.5	36.0	47.4	45.3	44.1
03-06-21	41.1	24.2	26.1	48.4	41.5	40.6
04-06-21	34.5	30.3	28.8	49.3	38.5	38.3
05-06-21	31.3	36.4	29.4	45.1	43.0	39.5
06-06-21	29.2	36.4	31.8	57.9	41.6	44.4
07-06-21	35.9	38.9	34.9	49.7	44.7	45.3
08-06-21	43.4	38.2	27.8	51.2	49.8	41.8
09-06-21	37.1	37.0	31.8	48.6	42.8	44.5
10-06-21	45.3	35.3	25.7	50.1	40.8	40.5
11-06-21	33.2	31.2	28.0	47.4	42.4	40.2
12-06-21	35.1	28.4	30.2	45.4	38.8	39.4
13-06-21	28.8	28.8	29.2	42.7	40.1	38.1
14-06-21	29.2	34.2	28.3	41.0	40.8	41.4
15-06-21	30.5	37.9	34.1	46.9	43.5	43.8
16-06-21	36.0	41.2	28.6	47.8	45.7	43.1
17-06-21	36.1	31.8	30.5	48.1	41.3	44.9
18-06-21	33.0	35.2	32.2	47.4	40.6	41.2
19-06-21	40.4	34.3	32.6	51.4	37.2	37.4
20-06-21	32.5	33.7	32.5	42.0	36.6	39.0
21-06-21	32.2	36.5	36.0	46.5	42.3	43.1
22-06-21	31.9	39.0	36.3	47.9	45.5	44.2
23-06-21	41.0	39.4	35.9	48.4	45.5	43.8
24-06-21	43.7	39.3	34.7	53.4	45.3	42.8
25-06-21	36.4	36.5	34.3	47.9	44.1	41.5
26-06-21	33.9	33.0	29.5	47.1	39.2	38.5
27-06-21	27.3	31.8	30.9	42.5	37.5	43.0
28-06-21	32.6	34.6	33.1	48.5	40.5	40.8
29-06-21	33.8	35.9	32.7	46.9	41.2	41.0
30-06-21	31.4	38.6	34.7	46.9	43.2	40.0
01-07-21	31.3	38.2	34.0	46.2	44.2	38.5



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
02-07-21	34.1	39.1	36.4	45.0	42.7	42.4
03-07-21	29.3	34.9	29.3	45.0	40.0	36.5
04-07-21	30.6	30.9	29.6	41.4	38.5	43.7
05-07-21	31.8	31.4	31.1	46.7	39.4	44.3
06-07-21	30.5	36.2	33.0	45.2	42.4	44.1
07-07-21	31.7	38.9	36.1	46.5	43.9	44.5
08-07-21	35.2	36.8	33.7	47.9	42.4	42.7
09-07-21	35.6	29.8	29.3	47.2	37.1	38.1
10-07-21	34.9	30.6	30.4	43.4	39.7	34.5
11-07-21	27.6	35.1	33.1	38.6	39.2	42.0
12-07-21	39.2	38.2	34.4	47.9	43.9	43.7
13-07-21	34.2	35.5	34.4	47.2	42.8	44.3
14-07-21	42.2	37.1	34.9	50.1	43.2	44.5
15-07-21	34.9	36.6	35.4	45.8	41.3	42.6
16-07-21	37.7	34.6	34.7	51.1	43.0	44.2
17-07-21	35.5	32.6	29.6	50.4	42.0	39.8
18-07-21	28.7	31.0	30.0	43.0	36.1	41.0
19-07-21	28.7	33.0	30.9	44.9	39.9	41.8
20-07-21	34.0	31.0	26.9	46.6	37.8	41.2
21-07-21	32.3	29.3	28.1	45.2	40.6	41.5
22-07-21	34.8	35.9	34.6	46.4	42.0	42.4
23-07-21	37.4	35.0	33.0	45.6	40.2	37.7
24-07-21				0.0	0.0	0.0
25-07-21				0.0	0.0	0.0
26-07-21			29.3	0.0	0.0	41.6
27-07-21	36.0	35.8	32.9	44.0	40.8	41.8
28-07-21	38.3	32.3	30.6	49.1	40.0	36.5
29-07-21			31.8	0.0	0.0	43.1
30-07-21	32.3	36.2	31.3	43.5	41.6	40.4
31-07-21	36.9	31.3	30.3	44.3	38.6	36.8
01-08-21	29.1	30.1	30.5	41.0	36.2	41.9
02-08-21	35.9	36.7	33.5	47.5	41.8	44.1
03-08-21	34.7	31.1	30.5	48.8	37.8	38.5
04-08-21	33.4	29.0	28.2	49.7	37.7	43.4



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
05-08-21	32.9	31.4	29.3	47.5	38.5	43.6
06-08-21	30.2	30.0	28.0	46.1	38.7	38.3
07-08-21	27.6	28.3	27.5	39.6	35.4	35.2
08-08-21	30.5	30.0	29.3	39.7	37.4	41.4
09-08-21	36.6	37.4	35.5	44.4	42.4	43.5
10-08-21	33.4	35.3	33.9	47.5	42.8	43.2
11-08-21	37.7	36.2	33.9	46.7	41.1	39.5
12-08-21			30.7	0.0	0.0	43.3
13-08-21	29.4	31.9	31.5	43.4	38.6	41.4
14-08-21	31.1	33.8	30.7	43.2	39.6	36.8
15-08-21	24.4	24.4	24.6	40.2	34.3	34.3
16-08-21			28.3	0.0	0.0	42.5
17-08-21	29.8	29.9	27.5	47.8	38.7	42.2
18-08-21	32.8	36.5	34.1	47.8	42.4	44.3
19-08-21	33.0	36.4	32.8	48.2	41.2	43.7
20-08-21	32.9	29.7	30.8	45.7	36.9	39.1
21-08-21	28.4	33.3	31.4	42.0	38.9	37.9
22-08-21	34.4	34.2	32.7	44.1	39.5	44.8
23-08-21	40.8	34.6	32.4	51.4	40.6	38.0
24-08-21	42.9			55.1	0.0	0.0
25-08-21			34.2	0.0	0.0	44.4
26-08-21	33.0	37.7	37.6	50.8	42.6	44.8
27-08-21	32.2	38.1	37.8	46.1	41.6	41.1
28-08-21				0.0	0.0	0.0
29-08-21			34.2	0.0	0.0	44.4
30-08-21	31.4	36.9	35.2	45.0	42.7	44.4
31-08-21	36.5	38.6	38.8	48.2	42.7	41.6
ALL	33.0	35.0	31.5	47.6	41.6	42.3
			Spring 2021			
01-09-21	31.4	39.6	38.3	46.3	43.4	43.7
02-09-21	36.1	39.1	37.8	49.8	42.7	44.5
03-09-21	37.4	41.6	38.0	48.4	44.1	43.0
04-09-21	38.3	38.7	33.5	43.9	41.6	39.2



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
05-09-21	32.4	34.8	35.9	54.3	39.2	44.1
06-09-21	37.2	35.7	35.4	46.4	41.1	44.8
07-09-21	33.4	35.0	32.8	49.9	39.9	43.6
08-09-21	32.7	37.8	35.0	45.1	42.8	45.2
09-09-21	30.7	33.1	32.2	48.4	40.5	36.4
10-09-21			34.6	0.0	0.0	40.1
11-09-21	34.3	32.3	32.1	46.5	38.1	39.9
12-09-21			29.5	0.0	0.0	41.4
13-09-21	31.8	31.3	32.9	44.8	38.3	41.3
14-09-21	37.4	32.1	31.2	45.0	37.2	42.4
15-09-21	33.4	31.6	30.6	46.1	39.0	43.1
16-09-21	33.5	35.2	31.8	47.0	40.8	46.2
17-09-21	40.0	37.6	32.3	48.5	42.8	42.7
18-09-21	31.5	31.4	27.1	45.6	39.2	40.6
19-09-21	33.4	29.8	29.5	45.3	42.5	44.9
20-09-21	33.4	29.9	28.0	50.3	48.0	38.7
21-09-21	35.3	29.2	26.0	48.3	39.3	41.8
22-09-21	31.5	34.1	32.4	45.9	41.7	45.3
23-09-21	32.5	31.0	30.4	46.3	37.6	46.3
24-09-21	35.1	31.4	31.5	49.7	37.8	37.5
25-09-21			29.4	0.0	0.0	38.2
26-09-21	31.1	31.2	31.2	38.9	37.4	42.4
27-09-21	35.8	36.4	35.1	44.7	43.2	45.6
28-09-21	34.5			47.0	0.0	0.0
29-09-21			33.9	0.0	0.0	44.5
30-09-21	32.2	39.5	35.2	55.4	43.2	43.6
01-10-21	38.2	35.0	32.8	51.5	41.3	44.8
02-10-21	31.9	35.8	34.6	49.5	38.7	43.6
03-10-21	30.7	31.1	37.2	45.5	41.1	43.0
04-10-21	33.2	37.0	33.6	49.0	43.2	45.1
05-10-21	37.9	33.2	30.9	53.2	51.4	43.9
06-10-21	32.9	35.8	34.0	46.0	43.0	45.7
07-10-21	36.0		26.7	50.1	0.0	46.0
08-10-21	35.2	36.5	34.5	50.2	43.9	44.8



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
09-10-21	32.3	31.5	31.2	48.4	42.8	40.6
10-10-21	35.6	32.9	29.1	46.4	38.9	44.2
11-10-21	32.4	33.5	33.6	45.4	40.0	41.2
12-10-21	35.6	35.1	37.0	44.9	40.9	41.7
13-10-21	36.4	39.3	38.3	47.2	45.9	45.4
14-10-21	35.5	42.1	38.9	48.1	45.6	46.4
15-10-21	37.0	39.2	36.9	47.9	43.0	42.4
16-10-21	34.8	33.5	32.2	47.2	43.7	41.0
17-10-21	33.2	38.4	34.5	47.2	43.7	44.2
18-10-21	33.0	36.4	34.7	47.5	52.0	44.1
19-10-21	37.1	34.7	31.8	47.0	40.7	44.0
20-10-21	34.9	36.5	30.1	49.6	42.9	44.0
21-10-21	34.3	37.9	32.5	47.0	42.9	43.8
22-10-21	34.7	37.4	34.6	49.2	43.9	44.3
23-10-21	31.5	37.4	30.7	47.5	53.2	39.2
24-10-21	31.7	36.0	30.6	44.5	46.9	44.3
25-10-21	34.1	36.0	26.1	47.1	41.2	42.2
26-10-21	34.0	34.0	26.1	49.2	42.7	42.3
27-10-21	34.7	38.4	30.6	47.4	47.0	43.9
28-10-21	33.3	38.4	35.3	48.4	43.1	44.9
29-10-21	40.0	30.7	28.6	53.4	39.9	37.4
30-10-21	36.7	28.6	24.6	45.6	37.1	35.3
31-10-21	31.6	34.0	30.9	44.8	42.4	45.6
01-11-21	37.9	33.9	31.4	49.3	42.4	44.2
02-11-21	36.7	36.2	33.5	51.5	44.8	44.9
03-11-21	39.3	36.0	32.0	50.3	44.4	44.0
04-11-21	40.4	35.6	33.9	50.5	40.8	35.5
05-11-21	36.0	40.2	40.9	45.6	59.1	45.2
06-11-21			35.4	0.0	0.0	41.2
07-11-21	32.3	41.6	38.3	45.6	43.8	41.5
08-11-21	34.4	39.1	39.5	46.5	44.5	47.2
09-11-21	34.8	40.5	36.9	47.6	46.5	45.6
10-11-21	36.4	40.2	38.6	45.6	45.5	46.8
11-11-21	37.6			46.3	0.0	0.0



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
12-11-21	35.6	41.1	40.4	45.6	54.5	45.7
13-11-21	39.2	33.0	34.6	51.4	41.1	41.3
14-11-21	36.0	36.9	32.4	54.5	43.0	42.1
15-11-21	39.7	33.4	29.8	55.5	44.1	38.4
16-11-21			29.7	0.0	0.0	41.4
17-11-21	33.4		31.4	50.5	0.0	45.6
18-11-21	35.5		34.5	48.4	0.0	46.1
19-11-21	37.5	38.0	30.1	50.5	42.8	50.6
20-11-21	35.4	32.6	33.4	43.6	41.0	38.6
21-11-21	39.0	35.8	36.8	42.7	39.4	42.2
22-11-21	37.2	38.7	40.3	49.3	42.4	44.5
23-11-21	32.3	38.7	40.2	43.5	43.0	49.1
24-11-21	34.9	44.5	43.9	48.1	53.6	55.9
25-11-21	38.1	44.6	48.0	47.9	51.8	56.6
26-11-21	42.6	42.3	48.8	48.6	49.4	49.6
27-11-21	40.0	36.6	35.0	45.2	44.9	43.0
28-11-21	35.3	35.9	38.2	51.5	41.3	45.8
29-11-21	34.4	40.3	37.8	50.3	45.0	50.1
30-11-21	35.6	37.2		49.2	42.8	0.0
ALL	34.7	34.9	32.4	48.8	43.4	44.1
			Summer 2021			<u>.</u>
01-12-21	35.6	40.7	41.5	48.2	53.8	51.6
02-12-21	37.6	44.8	40.7	47.9	48.7	46.1
03-12-21	38.1	44.0	34.1	50.3	51.7	48.9
04-12-21	32.8	38.1	32.5	42.8	44.6	40.3
05-12-21	33.7	35.2	35.4	44.7	40.1	42.0
06-12-21	34.0	38.5	35.9	47.8	43.8	44.4
07-12-21	35.9	46.0	35.9	52.4	49.3	45.6
08-12-21	33.9	35.4	33.7	50.0	43.5	42.4
09-12-21	35.8	38.1	44.5	51.8	41.9	48.0
10-12-21	40.1	41.7	38.9	51.4	49.5	49.8
11-12-21	38.2	40.1	36.9	48.7	44.6	46.8
12-12-21	35.5	42.3	37.3	51.8	56.4	46.7



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
13-12-21	34.5	42.1	37.1	48.7	50.0	44.7
14-12-21	36.6	46.0	37.3	48.1	47.0	45.4
15-12-21	37.2	40.0	37.5	49.1	57.9	45.8
16-12-21	35.0	45.2	35.1	48.1	49.2	45.0
17-12-21	35.9	42.0	36.6	46.5	48.9	44.9
18-12-21	30.7	34.5	39.0	44.4	49.1	45.0
19-12-21	36.8	36.1	39.1	48.4	49.9	45.7
20-12-21	34.7	40.2	37.1	44.8	48.6	44.1
21-12-21	34.7		37.3	48.3	0.0	43.7
22-12-21	35.0	38.7	36.8	48.0	42.5	44.3
23-12-21	34.0	42.7	38.0	46.9	45.8	48.2
24-12-21	31.0	38.0	35.0	45.4	52.1	39.4
25-12-21	32.4	35.1	35.1	43.9	48.1	40.2
26-12-21	31.9	32.0	33.2	42.1	40.6	38.3
27-12-21	32.8	37.8	32.8	41.2	43.6	37.1
28-12-21	34.2	36.4	30.7	42.3	39.5	40.6
29-12-21	31.6	37.0	33.7	47.3	42.1	41.1
30-12-21	32.7	38.3	36.7	51.4	50.6	42.4
31-12-21	34.0	39.2	35.3	47.0	47.4	43.0
01-01-22	33.8	37.2		49.2	46.1	0.0
02-01-22			37.8	0.0	0.0	46.8
03-01-22	32.9	34.6	36.4	52.5	41.3	41.4
04-01-22	37.3	35.6	36.7	50.5	41.9	43.3
05-01-22	36.6	42.0	42.9	48.9	59.4	49.2
06-01-22	44.0	42.9	42.2	56.1	52.3	49.6
07-01-22	41.2	41.2	44.1	57.7	49.5	48.2
08-01-22	41.1		43.6	47.0	0.0	50.5
09-01-22	37.8	38.2	43.5	48.5	43.3	49.6
10-01-22				0.0	0.0	0.0
11-01-22				0.0	0.0	0.0
12-01-22	44.2	38.8	42.8	52.4	51.1	47.9
13-01-22				0.0	0.0	0.0
14-01-22				0.0	0.0	0.0
15-01-22				0.0	0.0	0.0



Date	ABL			L _{aeq} 15min		
Date	Day	Evening	Night	Day	Evening	Night
16-01-22				0.0	0.0	0.0
17-01-22				0.0	0.0	0.0
18-01-22			43.5	0.0	0.0	45.3
19-01-22	40.5			59.8	0.0	0.0
20-01-22				0.0	0.0	0.0
21-01-22				0.0	0.0	0.0
22-01-22			37.9	0.0	0.0	48.2
23-01-22			39.3	0.0	0.0	48.4
24-01-22			43.6	0.0	0.0	54.9
25-01-22			41.5	0.0	0.0	48.1
26-01-22	39.2		40.7	42.7	0.0	46.4
27-01-22			41.3	0.0	0.0	45.2
28-01-22			40.4	0.0	0.0	44.9
29-01-22			42.6	0.0	0.0	47.6
30-01-22			42.2	0.0	0.0	46.8
31-01-22			41.7	0.0	0.0	47.6
01-02-22			43.1	0.0	0.0	50.6
02-02-22	37.6	39.8	42.3	49.1	50.1	47.5
03-02-22	40.4	45.2	39.8	46.8	52.0	44.6
04-02-22	40.8	45.2	39.3	47.1	47.5	43.6
05-02-22	36.8		39.1	52.6	0.0	44.8
06-02-22	40.0	45.0	41.2	61.1	55.8	45.8
07-02-22	40.2	42.0	40.5	56.0	46.0	48.2
08-02-22	37.8		41.9	45.5	0.0	47.0
09-02-22	42.6		43.8	49.2	0.0	50.0
10-02-22	43.2		45.2	48.6	0.0	49.4
11-02-22	39.2	41.6	41.0	52.9	46.4	44.5
12-02-22	40.4	43.9	39.6	54.4	47.8	43.9
13-02-22	39.1	45.6	39.8	54.8	49.6	44.4
14-02-22	42.4	44.2	43.5	49.3	47.6	49.7
15-02-22	41.1		41.2	48.0	0.0	46.4
16-02-22	39.0		42.5	47.5	0.0	49.5
17-02-22	41.5		44.8	52.8	0.0	50.3
18-02-22	43.7	46.3	48.5	50.9	48.9	53.3



Dete	ABL			Laeq 15min		
Date	Day	Evening	Night	Day	Evening	Night
19-02-22	42.0	47.9	42.7	51.1	52.0	50.8
20-02-22	37.6		51.0	44.4	0.0	55.1
21-02-22	46.1	52.9	53.9	56.6	57.7	58.1
22-02-22	44.0	52.5	47.5	50.1	54.8	54.2
23-02-22	41.0	46.8	47.1	53.2	54.4	53.1
24-02-22	42.0	47.9	52.1	51.4	51.3	54.5
25-02-22	42.2		49.7	48.9	0.0	55.5
26-02-22	40.7	46.7	48.5	46.8	52.4	54.6
27-02-22	40.9	48.4	51.0	49.6	61.7	55.5
28-02-22	39.6	48.8	55.7	49.2	54.9	58.3
ALL	34.7	41.7	37.2	48.9	49.5	46.6
	1	1	Autumn 2021	1	1	1
01-03-22	42.4	49.2	50.4	49.0	50.9	56.6
02-03-22			49.2	0.0	0.0	55.1
03-03-22	42.3	47.0	54.8	49.3	57.4	57.8
04-03-22	41.3	48.0	52.9	47.4	58.3	59.6
05-03-22	41.2			48.5	0.0	0.0
06-03-22	43.9	46.7	46.6	48.3	52.5	49.0
07-03-22	44.8	47.9	48.4	48.9	48.9	54.1
08-03-22		46.0	49.3	0.0	48.7	50.5
09-03-22	43.5			49.1	0.0	0.0
10-03-22	40.5	-		48.7	0.0	0.0
11-03-22	38.5			46.0	0.0	0.0
12-03-22	37.9		40.4	45.5	0.0	48.2
13-03-22	36.8		42.2	47.2	0.0	48.7
14-03-22	37.9	53.0	41.6	46.9	54.4	48.2
15-03-22	39.4		43.8	46.4	0.0	49.8
16-03-22	38.9		53.5	46.8	0.0	54.6
17-03-22	39.8			47.7	0.0	0.0
18-03-22	35.1			46.9	0.0	0.0
19-03-22	43.5		36.4	51.8	0.0	42.5
20-03-22	35.5		39.8	42.7	0.0	46.5
21-03-22	37.4		42.5	46.1	0.0	49.0



Date	ABL			Laeq 15min		
Bate	Day	Evening	Night	Day	Evening	Night
22-03-22	37.2			45.5	0.0	0.0
23-03-22				0.0	0.0	0.0
24-03-22	45.8	53.9	42.0	54.6	56.8	47.6
25-03-22	41.7		43.5	49.3	0.0	50.1
26-03-22	40.9	44.2	38.9	51.2	47.7	45.2
27-03-22	39.2		43.9	48.6	0.0	45.9
28-03-22	38.2		47.4	47.2	0.0	52.6
29-03-22	43.4	48.0	49.3	50.1	53.2	51.2
30-03-22	39.7		53.0	47.4	0.0	55.3
31-03-22	43.4	56.2	42.1	50.7	60.0	45.3
01-04-22	42.7	43.8	38.7	52.2	50.6	43.1
02-04-22	40.3		34.0	49.2	0.0	40.8
03-04-22	37.9		36.4	45.6	0.0	44.9
04-04-22	36.6		36.2	47.9	0.0	44.1
05-04-22	35.6		43.0	47.3	0.0	45.8
06-04-22	42.8	40.3	40.3	49.8	45.0	44.5
07-04-22	45.9		41.6	51.0	0.0	46.5
08-04-22	43.2	46.7	43.1	50.0	50.4	45.9
09-04-22	39.4		40.0	47.0	0.0	45.6
10-04-22	36.9		44.0	45.0	0.0	46.7
11-04-22	35.8			46.1	0.0	0.0
12-04-22	39.1		40.9	49.9	0.0	43.3
13-04-22	38.2		39.6	47.5	0.0	44.1
14-04-22	35.6		36.5	46.7	0.0	41.5
15-04-22	35.5		34.7	43.2	0.0	39.7
16-04-22	34.6		33.8	43.0	0.0	39.6
17-04-22	35.3	45.3	36.1	45.8	48.9	40.9
18-04-22	36.6	45.1	37.8	45.9	49.2	43.5
19-04-22	37.4	45.4	37.8	47.0	54.3	44.7
20-04-22	35.6	40.1	37.4	47.5	46.7	44.8
21-04-22	36.5	40.2	37.9	48.6	43.7	41.4
22-04-22	38.6	40.3	36.2	45.7	45.0	39.5
23-04-22	34.8	44.0	35.4	44.4	46.2	41.0
24-04-22	35.0	39.8	33.2	45.2	45.5	41.7



Date	ABL			Laeq 15min		
	Day	Evening	Night	Day	Evening	Night
25-04-22	34.7	42.1	34.4	43.8	45.2	40.9
26-04-22	35.8	40.4	36.5	46.6	45.1	41.4
27-04-22	38.6	40.9	36.4	46.9	43.9	40.1
28-04-22	42.5	44.7	37.8	49.4	46.9	42.0
29-04-22	38.5		40.9	45.8	0.0	43.8
30-04-22	40.5	41.6	37.9	45.7	44.3	41.8
01-05-22	35.3	40.6	39.0	43.9	46.0	44.1
02-05-22	36.6	43.0	38.5	46.9	47.2	43.8
03-05-22	39.4	42.9	38.3	47.5	47.3	44.3
04-05-22	36.5	39.8	35.3	48.1	44.4	40.8
05-05-22	35.5	40.7	33.9	46.3	46.2	40.4
06-05-22	34.8	37.0	34.8	45.2	41.4	41.7
07-05-22	34.3	33.3	29.6	45.9	40.9	38.2
08-05-22	33.9	34.0	32.5	41.9	41.2	37.8
09-05-22	36.2	33.7	34.2	45.3	39.9	40.0
10-05-22	37.8	41.3	38.1	47.0	45.1	43.7
11-05-22	38.8	40.1	40.5	47.9	43.8	45.0
12-05-22	42.9	42.0	40.2	48.2	45.6	44.5
13-05-22	36.8	43.3	35.9	46.8	46.8	41.1
14-05-22	34.4	43.8	36.0	44.6	46.5	41.0
15-05-22	34.0	41.2	37.9	43.8	44.5	43.6
16-05-22	35.0	37.3	37.2	46.5	43.3	43.9
17-05-22	31.9	37.7	36.0	45.7	42.2	43.8
18-05-22	32.9	31.5	33.0	46.9	38.0	43.9
19-05-22	33.4	37.8	33.5	47.3	42.9	40.3
20-05-22	34.8	33.0	30.7	45.7	38.6	40.2
21-05-22	36.0	36.5	36.2	45.6	42.4	38.2
22-05-22	35.9	38.4	38.5	41.8	42.6	42.7
23-05-22	35.1	39.1	38.0	45.9	41.5	42.5
24-05-22	35.7	41.3	38.7	46.0	44.9	43.7
25-05-22	32.8	38.7	36.6	45.6	43.8	42.0
26-05-22	36.6	41.0	36.4	47.4	46.5	42.5
27-05-22	34.1	40.3	35.1	45.8	45.0	40.2
28-05-22	31.5	35.0	30.8	42.3	40.9	39.5



Date	ABL			Laeq 15min		
	Day	Evening	Night	Day	Evening	Night
29-05-22	33.4	33.2	28.9	44.4	41.0	44.3
30-05-22	41.8	34.9	30.3	48.5	42.3	41.9
31-05-22	38.8	30.9	30.4	52.2	43.4	42.0
ALL	36.2	40.3	36.4	46.6	45.3	42.8



APPENDIX C noise source layout









Map Projection: GDA2020 / MGA zone 56(EPSG:7856)

Date Revised: 27 Nov 2022





APPENDIX D noise contour plots
























