



# Eastern Creek Recycling Ecology Park Recycling Infrastructure Optimisation Project

## Appendix J Noise and Vibration Impact Assessment



June 2022

## EASTERN CREEK RECYCLING ECOLOGY PARK

EASTERN CREEK, NSW

NOISE AND VIBRATION IMPACT ASSESSMENT

RWDI # 2102770

21 February 2022

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## EXECUTIVE SUMMARY

Dial-A-Dump (EC) (DADEC) Pty Ltd, (the Applicant) (as owned by Bingo Industries Pty Ltd (Bingo) operate the Eastern Creek Recycling Ecology Park (REP), located at 1 Kangaroo Avenue, Eastern Creek (formerly known as the Genesis Waste Management Facility) ('the Proposal Site'). The current approval allows for a total throughput of two million tonnes per annum (Mtpa), of which up to 1 Mtpa may be landfilled (excluding residual chute waste) with the remaining 1 Mtpa processed for resource recovery. The Eastern Creek REP comprises of a number of resource recovery facilities and activities including:

- Two materials processing centres known as Materials Processing Centre 1 (MPC1) and Materials Processing Centre 2 (MPC2) which predominantly process dry construction and demolition (C&D) and commercial and industrial (C&I) waste; and
- A Segregated Materials Area (SMA) which is principally used for the receipt, processing dispatch and stockpiling of inert construction and demolition materials, such as sand, dirt, aggregate, concrete, bricks and asphalt.

The Eastern Creek REP is approaching the current 2 Mtpa throughput limit, with this limit to be reached within the next few years. The Applicant is therefore proposing to increase the total throughput of the Eastern Creek REP by 950,000 tonnes per annum (tpa) over two stages to a total 2.95 Mtpa and carry out minor infrastructure upgrades works across the Proposal Site (the Proposal). The Proposal aims to further unlock the potential of the strategically significant Eastern Creek REP, with benefits of scale and optimal location within the Sydney transport network to respond to market demand and the policies of both the NSW and Commonwealth governments for expanded and enhanced resource recovery infrastructure. The Proposal would consist of predominantly dry C&D and C&I waste, consistent with existing waste streams received at the Eastern Creek REP.

The Proposal is considered as State Significant Development (SSD) under Clause 23 (waste and resource management facilities) of Schedule 1 of the *State Environmental Planning Policy 2021*. As a result, this environmental impact statement (EIS) is seeking approval, under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of the proposed throughput increase and required supporting infrastructure. The Noise and Vibration Impact Assessment has been prepared By RWDI support the preparation of the EIS and assess the Proposal's impact on the acoustic amenity of nearby sensitive receivers.

### Proposal Overview

The Proposal would include the upgrade and construction of supporting infrastructure to optimise the current operation at Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site. It is proposed to develop the Proposal Site in three stages:

- **Stage 1: Initial throughput:** Stage 1 would comprise 500,000 tpa of additional throughput to be received at the Eastern Creek REP to enhance resource recovery outcomes by increasing utilisation of onsite processing capabilities.

- **Stage 2: Internal site optimisation:** Stage 2 would facilitate the remaining throughput increase (an additional 450,000 tpa of the total 950,000 tpa proposed) to be received and processed across the Eastern Creek REP and operation of one of two proposed new exit connections. Stage 2 would include:
  - The construction and operation of a new exit connection to the Honeycomb Drive Extension and installation of two associated outbound weighbridges and dedicated weighbridge office
  - The construction and operation of a new exit connection to Kangaroo Avenue in the north east of the Proposal Site and the installation of two associated outbound weighbridges and a dedicated weighbridge office
  - Upgrade of existing internal roads as required
  - Earthworks for Stage 3 site establishment
  - Additional carparking and amenities.
- **Stage 3: Installation of supporting infrastructure:** Stage 3 would comprise the redevelopment of the north-eastern corner of the Proposal Site. This would comprise:
  - Construction and operation of a Site Workshop (relocating this activity from elsewhere within the Proposal Site to a dedicated enclosed facility)
  - Construction and operation of a skip bin Maintenance and Manufacturing Workshop
  - Installation of landscaping, signage, security fencing and finishing works.

## Purpose of this Assessment

This Noise and Vibration Impact Assessment has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) as they relate to noise and vibration including:

- A quantitative assessment of potential construction, operational and transport noise and vibration impacts in accordance with relevant Environment Protection Authority (EPA) guidelines
- The identification of impacts associated with site emission and traffic generation at noise affected sensitive receivers
- Details of noise monitoring surveys, background noise levels and noise emission levels of proposed activities
- Consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area
- A cumulative impact assessment of operation and construction

## Noise and Vibration Impact Assessment

RWDI has been commissioned to prepare a Noise and Vibration Impact Assessment to support the preparation of the SSD EIS for the upgrade and construction of supporting infrastructure to optimise the current operation at Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site.

The assessment was conducted for operations, construction, vibration and road traffic in accordance with the relevant guidelines, standards and policies. Assessment was made using a number of conservative assumptions as outlined in the report.

A noise model was developed to compare noise levels from existing approved and proposed operations. The model adopted sound power levels of key acoustically significant plant and equipment derived from attended measurements and a database of similar equipment.

The construction noise and vibration assessment indicated the following:

- Predicted noise levels indicate that compliance would be achieved during standard hours at all residential and industrial receiver locations
- Best practice noise and vibration management measures are recommended to assist in the prevention of impacts

For the assessment of proposed operations existing operational hours were considered. The findings of the assessment are summarised below:

- Operational noise levels were assessed for the daytime, evening, night-time periods during calm and noise-enhancing meteorological conditions. The assessment found that operating noise from the Proposal Site during all stages of operation satisfies relevant NPfI project noise trigger levels for all periods at all assessment locations. No additional specific operational noise mitigation measures beyond those already in place have been identified as being required given the predicted compliance with the assessed operational noise criteria resulting from detailed project planning aimed at minimising potential impacts and the existing mitigation already in place. The Proposal Site has been successfully operating for many years with the existing mitigation measures as detailed in the approved Environmental Management Strategy and these measures will remain in effect for the Proposal and are considered adequate and appropriate.
- The potential for sleep disturbance from the Proposal Site during the night-time period has been assessed. The highest predicted external maximum noise level from site is  $L_{Amax}$  47 dB in Minchinbury and  $L_{Amax}$  34 dB in Erskine Park which is below the noise levels likely to cause sleep disturbance affects. Hence, it is unlikely that night-time operations from the project will cause sleep disturbance at the residential assessment locations.
- The potential for low frequency noise impacts from the Proposal Site has been assessed. The results indicated no exceedance of 15 dB for the difference between C- and A- weighting levels. Indicating that it is unlikely that there is a low frequency noise impact.

Road traffic generated by the proposal travels directly between the Proposal Site and the arterial road network via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive. There are no residential assessment locations located along nearby roads and, therefore, the potential for the road traffic noise criteria to be exceeded is highly unlikely.

As construction and operation would occur together on the Proposal Site an assessment of cumulative industrial noise and construction noise has been conducted. The assessment found that operational noise and construction noise from the Proposal Site during all stages of operation and construction satisfies relevant NPfI project noise trigger levels for all periods at all assessment locations.

## GLOSSARY OF TERMS

Key Terms	Definition
<b>The Applicant</b>	Dial-A-Dump (EC) (DADEC) Pty Ltd, a fully owned subsidiary of Bingo Industries Pty Limited (Bingo).
<b>Eastern Creek REP</b>	The Eastern Creek Recycling Ecology Park (REP) to be developed across three stages. The key operational area comprises two parcels of land totalling around 54 hectares (ha) at 1 Kangaroo Avenue, Eastern Creek (Lot 1 DP 1145808 and Lot 2 DP 1247691).
<b>Existing Eastern Creek REP operations</b>	<p>The Proposal Site operational area is around 54 hectares and is currently authorised for the following activities:</p> <ul style="list-style-type: none"> <li>Accept up to two million tonnes per annum (Mtpa) of C&amp;D (construction and demolition) and C&amp;I (commercial and industrial) waste and landfilling of the quarry void of up to 1 Mtpa of non-putrescible waste (including asbestos and other non-recyclable waste), excluding residual chute waste from the materials processing centre;</li> <li>Operation of two advanced materials processing centres (MPC1 and MPC2) which recover recyclable material from construction and demolition (C&amp;D) and commercial and industrial (C&amp;I) waste streams as well as utilisation of a landfill disposal chute and maintenance activities;</li> <li>Crushing, grinding and separating works to process waste masonry material located in an area earmarked as the Segregated Materials Area (SMA);</li> <li>Stockpile up to 50 tonnes of waste tyres;</li> <li>Stockpile up to 20,000 tonnes of green waste.</li> </ul>
<b>The Proposal</b>	<p>The Proposal would include the upgrade and construction of supporting infrastructure to optimise the current operation at Eastern Creek REP and facilitate the increased throughput of 950,000 tpa proposed to be received at the Proposal Site. It is proposed to develop the Proposal Site in three stages:</p> <ul style="list-style-type: none"> <li>Stage 1: Initial throughput and onsite upgrades</li> <li>Stage 2: Internal site optimisation</li> <li>Stage 3: Installation of supporting infrastructure</li> </ul>
<b>The Proposal Site</b>	<p>The total 54 ha area of 1 Kangaroo Avenue, Eastern Creek (Lot 1 DP 1145808 and Lot 2 DP 1247691). The key features of the Eastern Creek REP are:          The landfill (former quarry void)          Resource recovery facilities:</p> <ul style="list-style-type: none"> <li>Materials Processing Centre 1 (MPC1)</li> <li>Materials Processing Centre 2 (MPC2)</li> <li>Segregated Materials Area (SMA)</li> </ul>

**STUDY TYPE: NOISE AND VIBRATION IMPACT ASSESSMENT**  
**EASTERN CREEK RECYCLING ECOLOGY PARK**

RWDI#2102770  
 21 February 2022

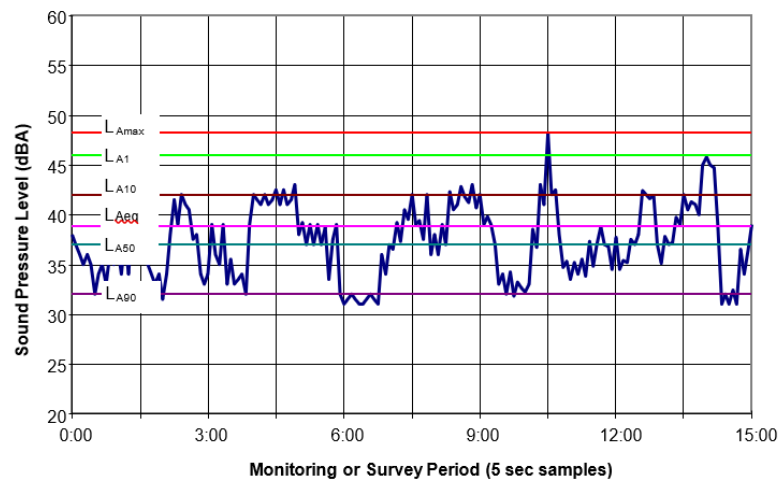


Term	Definition
<b>Bingo</b>	Bingo Industries Pty Limited
<b>C&amp;D</b>	Construction and demolition
<b>C&amp;I</b>	Commercial and industrial
<b>CEMP</b>	Construction Environmental Management Plan
<b>Council</b>	Blacktown City Council
<b>DA</b>	Development Application
<b>DP</b>	Deposited Plan
<b>DPE</b>	Department of Planning and Environment
<b>e.g.</b>	for example
<b>EIS</b>	Environmental Impact Statement
<b>EP&amp;A Act</b>	Environmental Planning and Assessment Act 1979
<b>EP&amp;A Regulation</b>	Environmental Planning and Assessment Regulation 2021
<b>EPA</b>	Environment Protection Authority
<b>EPL</b>	Environmental Protection Licence
<b>ha</b>	Hectares
<b>i.e.</b>	that is
<b>km</b>	Kilometre
<b>LGA</b>	Local Government Area
<b>m</b>	Metres
<b>m<sup>2</sup></b>	square metres
<b>MPC</b>	Materials Processing Centre
<b>MSW</b>	Municipal solid waste
<b>NML</b>	Noise Manage Level
<b>OEH</b>	Office of Environment and Heritage
<b>PEF</b>	Processed Engineered Fuel
<b>REP</b>	Recycling Ecology Park
<b>RPF</b>	Resource Processing Facility
<b>RRC</b>	Resource Recovery Centre
<b>SEARs</b>	Secretary's Environmental Assessment Requirements
<b>SSD</b>	State Significant Development
<b>tpa</b>	tonnes per annum
<b>Mtpa</b>	Million tonnes per annum



Term	Definition
<b>Maximum Noise Level (<math>L_{Amax}</math>)</b>	The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.
<b><math>L_{A1}</math></b>	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.
<b><math>L_{A10}</math></b>	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.
<b><math>L_{A90}</math></b>	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.
<b><math>L_{Aeq}</math></b>	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.
<b>ABL</b>	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.
<b>RBL</b>	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.

Typical Graph of Sound Pressure Level vs Time



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# 1 INTRODUCTION

Dial-A-Dump (EC) (DADEC) Pty Ltd, (the Applicant) (as owned by Bingo Industries Pty Ltd (Bingo) operate the Eastern Creek Recycling Ecology Park (REP), located at 1 Kangaroo Avenue, Eastern Creek (formerly known as the Genesis Waste Management Facility) ('the Proposal Site'). The current approval allows for a total throughput of two million tonnes per annum (Mtpa), of which up to 1 Mtpa may be landfilled (excluding residual chute waste) with the remaining 1 Mtpa processed for resource recovery. The Eastern Creek REP comprises of a number of resource recovery facilities and activities including:

- Two materials processing centres known as Materials Processing Centre 1 (MPC1) and Materials Processing Centre 2 (MPC2) which predominantly process dry construction and demolition (C&D) and commercial and industrial (C&I) waste
- A Segregated Materials Area (SMA) which is principally used for the receipt, processing dispatch and stockpiling of inert construction and demolition materials, such as sand, dirt, aggregate, concrete, bricks and asphalt.

The Eastern Creek REP is approaching the current 2 Mtpa throughput limit, with this limit to be reached within the next few years. The Applicant is therefore proposing to increase the total throughput of the Eastern Creek REP by 950,000 tonnes per annum (tpa) and carry out minor infrastructure upgrades works across the Proposal Site (the Proposal). The Proposal aims to further unlock the potential of the strategically significant Eastern Creek REP, with benefits of scale and optimal location within the Sydney transport network to respond to market demand and the policies of both the NSW and Commonwealth governments for expanded and enhanced resource recovery infrastructure. The Proposal would consist of predominantly dry C&D and C&I waste, consistent with existing waste streams received at the Eastern Creek REP.

The Proposal is considered as State Significant Development (SSD) under Clause 23 (waste and resource management facilities) of Schedule 1 of the *State Environmental Planning Policy (Planning Systems) 2021*. As a result, this environmental impact statement (EIS) is seeking approval, under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of the proposed throughput increase and required supporting infrastructure. This Noise and Vibration Impact Assessment has been prepared by RWDI to support the preparation of the EIS and assess the Proposal's impact on impact on the acoustic amenity of nearby sensitive receivers.

## 1.1 Proposal Overview

Bingo is proposing to enhance resource recovery outcomes across the Greater Sydney area by increasing throughput at the Eastern Creek REP to capitalise on the underutilised state-of-the-art processing facilities (namely MPC2), and plant and equipment within the Eastern Creek REP. The Proposal would include the upgrade and construction of supporting infrastructure to optimise the current operation at Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site. It is proposed to develop the Proposal Site in three stages:

- **Stage 1: Initial throughput:** Stage 1 would comprise 500,000 tpa of additional throughput to be received at the Eastern Creek REP to enhance resource recovery outcomes by increasing utilisation of onsite processing capabilities.



- **Stage 2: Internal site optimisation:** Stage 2 would facilitate the remaining throughput increase (an additional 450,000 tpa of the total 950,000 tpa proposed) to be received and processed across the Eastern Creek REP and operation of one of two proposed new exit connections. Stage 2 would include:
  - The construction and operation of a new exit connection to the Honeycomb Drive extension and installation of two associated outbound weighbridges and dedicated weighbridge office
  - The construction and operation of a new exit connection to Kangaroo Avenue in the north east of the Proposal Site and the installation of two associated outbound weighbridges and a dedicated weighbridge office
  - Upgrade of existing internal roads as required
  - Earthworks for Stage 3 site establishment
  - Additional carparking and amenities.
- **Stage 3: Installation of supporting infrastructure:** Stage 3 would comprise the redevelopment of the north-eastern corner of the Proposal Site. This would comprise:
  - Construction and operation of a Site Workshop (relocating this activity from elsewhere within the Proposal Site to a dedicated enclosed facility)
  - Construction and operation of a skip bin Maintenance and Manufacturing Workshop
  - Installation of landscaping, signage, security fencing and finishing works.



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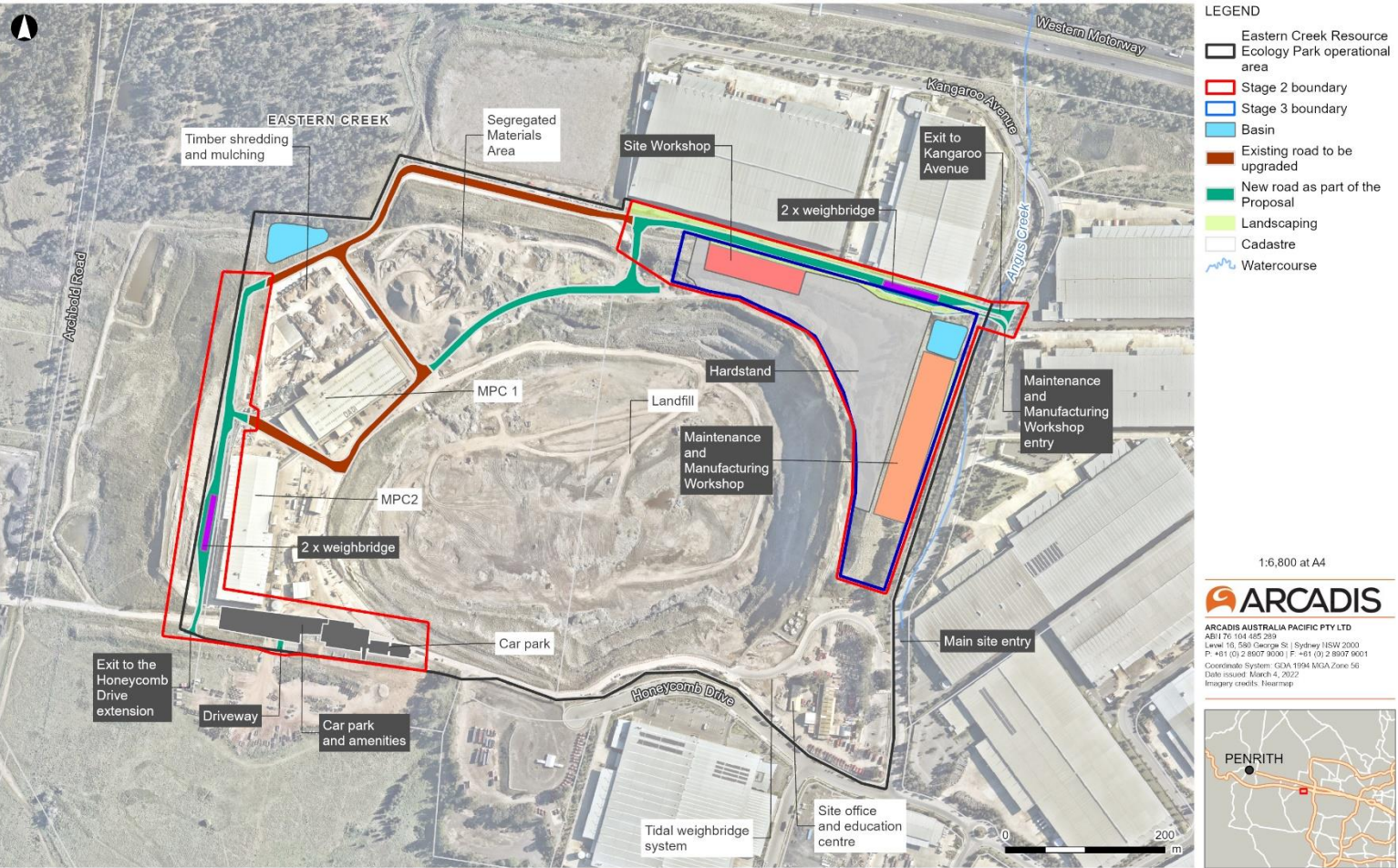


Figure 1-1 : The Proposal

## 1.2 Site Location

The Eastern Creek REP key operational area comprises two parcels of land totalling around 54 hectares (ha) at 1 Kangaroo Avenue, Eastern Creek (Lot 1 DP1145808 and Lot 2 DP1247691), shown in **Figure 1-1**. The Proposal Site is located within the Blacktown Local Government Area (LGA), however, is not zoned under the Blacktown Local Environmental Plan 2015 (Blacktown LEP) as it falls within the boundary of the *State Environmental Planning Policy (Industry and Employment) 2021*. The Eastern Creek REP falls under the requirements of the Eastern Creek Precinct – Employment Lands Precinct Plan (Precinct Plan) prepared under the repealed *State Environmental Planning Policy No 59-Central Western Sydney Economic and Employment Area* (SEPP 59).

The Proposal Site is located within the Eastern Creek industrial precinct / M7 business hub and is surrounded by a large range of industrial developments, primarily to the east. These industrial developments include Techtronic Industries, H&M distribution warehouse, Kuehne + Nagel (Australia) Pty Ltd warehouse, Kmart distribution centre, Bunnings distribution centre and DB Schenker warehouse. Immediately to the west of the operational area of the Eastern Creek REP is vacant land that forms part of the broader Eastern Creek REP. Further to the west of the Eastern Creek REP is the Fulton Hogan asphalt batching plant and a vacant area of undeveloped land.

The Eastern Creek REP is bounded by the Western Motorway (M4) to the north, Kangaroo Avenue to the east and Honeycomb Drive to the south. The planned future Archbold Road extension will run parallel to the western boundary of the Proposal Site (Transport for NSW (TfNSW), 2019). The Eastern Creek REP is enclosed by commercial and industrial buildings to the immediate north, east and south. The closest residential receivers are located across the M4 Motorway approximately 400 m to the north in the suburb of Minchinbury and approximately 1.2 km west in the suburb of Erskine Park. Nearby sensitive receivers are shown on **Figure 2-1**.

Existing access to the Eastern Creek REP is from Kangaroo Avenue, which connects to Honeycomb Drive and then Wonderland Drive and Wallgrove Road to the south and provides access to the broader arterial road network including the M4 and M7 motorways.

The surrounding area has generally low relief with no major hills or ridgelines, other than amenity berms adjacent to the landfill that were created from quarry overburden. Angus Creek, a small ephemeral drainage line is located immediately east of the Eastern Creek REP (between the landfill area and Kangaroo Avenue) which drains to the north into Eastern Creek. There are several other ephemeral drainage lines west of the Eastern Creek REP which drain towards Ropes Creek, which is approximately 580 m west of the Eastern Creek REP.

## 1.3 Site History

During the 1800s, the Eastern Creek REP site was used for both agricultural and breccia quarrying purposes. The quarrying activities had expanded by the 1930s and were then operated by the Ray Fitzpatrick Quarriers in the 1950s. Quarrying activities continued until September 2006, with the final quarry void estimated to be 12 million cubic metres (m<sup>3</sup>).

In November 2009, Dial-A-Dump Industries (DADI) acquired the Eastern Creek REP site and gained approval for the construction and operation of the Genesis Xero Waste Management Facility (WMF) (now named the Eastern Creek REP) (MP 06\_0139), comprising a resource recovery facility and non-putrescible landfill with a material handling capacity of 700,000 tpa. This facility commenced operations in 2012.

Bingo acquired DADI in February 2019, including all its NSW waste and recycling assets. Bingo took over the operation of the Eastern Creek REP following completion of the acquisition process.

The Eastern Creek REP was originally approved (MP 06\_0139) under Part 3A (now repealed) of the EP&A Act in 2009 and commenced operations in 2012 (Project Approval). Following the repeal of Part 3A of the EP&A Act on 1 October 2011, the project was subject to the transitional arrangements provided by the *Environmental Planning and Assessment Regulations 2000* (EP&A Regs). The transitional arrangements provided by EP&A Regs have now ceased, and the Project Approval was transitioned to a State Significant Development (SSD) approval on 2 October 2020.

Since the approval of MP 06\_0139 in 2009, eight modification applications have been submitted and approved (most recently in March 2022) and one was withdrawn. The most recent modification was for the installation of a permanent landfill gas flare to provide a permanent solution to managing landfill gas at the Eastern Creek REP (Modification 10 MP 06-013). One further modification is currently being sought comprising a modification to expand the operational area of the Eastern Creek REP into part Lot 2 DP1145808 (Mod 9 MP 06-0139) and relocation of existing approved activities.

The Proposal would constitute a standalone SSD application.

## Purpose of this Report

This Noise and Vibration Impact Assessment (NVIA) supports the EIS for the Proposal and has been prepared as part of an SSD Application for which approval is sought under Part 4, Division 4.7 of the EP&A Act.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) (SSD 11606719) for the Proposal, issued by NSW Department of Planning and Environment (DPE) in October 2021.

Table 1-1 provides a summary of the relevant SEARs which relate to noise and vibration, and where these have been addressed in this report.

**Table 1-1 : SEARs**

SEARs	Where Addressed
<b>The EIS must address the following specific matters:</b> <b>Noise and Vibration – including:</b>	
A quantitative noise and vibration impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines which includes:	
<ul style="list-style-type: none"> <li>the identification of impacts associated with site emission and traffic generation at noise affected sensitive receivers</li> </ul>	Section 0 Section 6
<ul style="list-style-type: none"> <li>details of noise monitoring surveys, background noise levels and noise emission levels of proposed activities</li> </ul>	Section 2.3
<ul style="list-style-type: none"> <li>consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area</li> </ul>	Section 2.5.1
<ul style="list-style-type: none"> <li>a cumulative impact assessment inclusive of impacts from other developments</li> </ul>	Section 2.6.3 Section 7
<ul style="list-style-type: none"> <li>details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration following application of mitigation these measures and details of any proposed compliance monitoring programs</li> </ul>	Section 8

Further to the above, the Environment Protection Authority (EPA) stated the following requirements as indicated in Table 1-2.

**Table 1-2 : EPA Requirements**

Noise	Where Addressed
The impact of noise and vibration must be managed to protect the amenity and wellbeing of the community. Potential impacts should be minimised through the implementation of all feasible and reasonable mitigation measures. The scoping report commits to '[a] detailed noise and vibration assessment ... undertaken as part of the EIS to determine the potential impacts of the Proposal on the surrounding sensitive receivers, for both construction and operation.'	Noise and Vibration Impact Assessment  Section 8 presents operational and construction noise mitigation measures.

Technical standards and guidelines related to noise and vibration are linked as follows:

- *Noise Policy for Industry* (NSW, 2017)
- *Interim Construction Noise Guideline* (NSW, 2017)
- *Assessing Vibration: a technical guideline* (DEC, 2006)
- *Road Noise Policy and Application Notes* (DECCW, 2011)



## 2 METHODOLOGY

### 2.1 Guidelines and Policy Context

The guidelines used in this assessment and where they have been applied are listed in **Table 2-1** below.

**Table 2-1 : Noise and Vibration Guidelines used in this Assessment**

Guideline/Policy Name	Where it has been used in this Assessment
<b><i>Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change, 2009</i></b>	Assessment of airborne construction noise impacts on sensitive noise receivers
<b><i>Assessing Vibration: a technical guideline, Department of Environment and Conservation (NSW), 2009</i></b>	Assessment of vibration noise impacts
<b><i>NSW Road Noise Policy, Department of Environment, Climate Change and Water, 2011</i></b>	Assessment of traffic noise impacts
<b><i>Noise Policy for Industry, Environment Protection Authority, 2017</i></b>	Assessment of operational noise impacts

### 2.2 Study Area

The Eastern Creek REP is bounded by industrial developments which border the Western Motorway (M4) to the north, Kangaroo Avenue to the east and Honeycomb Drive to the south. The Eastern Creek REP is bounded by commercial and industrial buildings to the immediate north, east and south. The closest residential receivers are located across the M4 Motorway approximately 400 m to the north in the suburb of Minchinbury and approximately 1.2 km west in the suburb of Erskine Park.

The Proposal Site is located within an established industrial and commercial precinct. The nearest, and most potentially affected, sensitive residential receivers are located to the north of the Proposal Site in Minchinbury and to the west in Erskine Park. Industrial receivers are located immediately north, east and south of the Proposal Site in Eastern Creek.

The nearest representative noise sensitive residential and industrial receivers to the Proposal Site have been identified and are provided in **Table 2-2**. These receivers are herein referred to in this report as assessment locations. The assessment locations are shown in **Figure 2-1**.

**Table 2-2 : Sensitive Receivers**

ID	Assessment Area	Type	Description
R0	Minchinbury	Residential	11 Glazier Place, Minchinbury
R1		Residential	1-7 Tod Place, Minchinbury
R2		Residential	3-21 Cobbler Crescent, Minchinbury
R3		Residential	1-6 Eber Place, Minchinbury
R4		Residential	3-11 Rookin Place, Minchinbury
R5		Residential	1-10 Bergin Place, Minchinbury
R6		Residential	2-22 Barossa Drive, Minchinbury
R7		Residential	3-11 Rookin Place, Minchinbury
R8		Residential	1-20 Rutherglen Place, Minchinbury
R9		Residential	6-16, Ann Minchin, Minchinbury
R10	Erskine Park	Residential	13 Miner Glen, Erskine Park
R11		Residential	40-46 Warbler, Erskine Park
R12		Residential	Blackbird Glen, Erskine Park
R13		Residential	43-53 Fantail Crescent, Erskine Park
I1	Eastern Creek	Industrial	Proposed Warehouse Kangaroo Avenue, Eastern Creek
I2		Industrial	Techtronics Industries 21 Kangaroo Avenue, Eastern Creek
I3		Industrial	Fisher & Paykel 17 Kangaroo Avenue, Eastern Creek
I4		Industrial	16 Kangaroo Avenue, Eastern Creek
I5		Industrial	12 Kangaroo Avenue, Eastern Creek
I6		Industrial	4 Kangaroo Avenue, Eastern Creek
I7		Industrial	1 Eucalyptus Place Eastern Creek
I8		Industrial	2 Grevillea Street Eastern Creek
I9		Industrial	1 Hansen Place, Eastern Creek
I10		Industrial	2 Hanson Place, Eastern Creek
I11		Industrial	Fulton Hogan Facility Eastern Creek



Figure 2-1 : Assessment Areas and Representative Noise-Sensitive Residential and Industrial Receivers

## 2.3 Noise Surveys and Monitoring Locations

Background noise levels for the residential areas to the north (Minchinbury) and west (Erskine Park) of the Proposal Site have previously been measured to support other development assessments at/nearby to the Eastern Creek REP, as follows:

- Noise monitoring was carried out in March and April 2014 to support the Energy from Waste Facility, Eastern Creek (SSD6236) – Noise Impact assessment prepared by Pacific Environment (October 2016). The previous unattended noise monitoring locations are shown in **Figure 2-2**.
- Additional noise monitoring, requested by the Department of Planning & Environment (DPE) and the EPA, was conducted to support the Modification 6 noise assessment for the Project Approval (MP06\_0139). The additional noise monitoring was conducted in August and September of 2019 at the same monitoring locations as the previous monitoring.

The rating background noise levels (RBL) established from the 2014 and 2019 data are presented in **Table 2-3**.

As can be seen from **Table 2-3**, no significant acoustical changes have occurred in the area that have impacted on the ambient noise environment between 2014 and 2019. To be conservative for this assessment the lowest measured level (shown in bold in **Table 2-3**) have been used for developing noise criteria for this Proposal.

**Table 2-3 : Rating Background Noise Levels**

Monitoring Location	RBL (dBA) <sup>1</sup>		
	Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
<b>Measured in 2014</b>			
<b>BG1 – Minchinbury</b>	<b>43</b>	48	41
<b>BG2 – Erskine Park</b>	<b>37</b>	<b>44</b>	<b>35</b>
<b>Measured in 2019</b>			
<b>BG1 – Minchinbury</b>	46	<b>44</b>	<b>40</b>
<b>BG2 – Erskine Park</b>	37	37	37

Note: (1) Genesis Waste Management Facility (06\_0139 MOD 6) | Modification Assessment Report.





Figure 2-2 : Background Noise Monitoring Locations



## 2.4 Noise Management levels

### 2.4.1 Construction Noise

#### 2.4.1.1 Construction Airborne Noise

The *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) recommends noise management levels (NML) to reduce the likelihood of noise impacts arising from construction activities. The ICNG NML for residential receivers are shown in **Table 2-4**.

The ICNG recommends an NML of 75 dBA for industrial land uses. It is expected that all construction activities would be conducted within standard construction hours.

**Table 2-4 : Construction NMLs at Residential Residences**

Time of Day	NML ( $L_{Aeq,15min}$ )	How to Apply
<b>Recommended Standard Hours:</b> Monday to Friday: 7am to 6pm Saturday: 8am to 1pm No work on Sundays or Public Holidays	Noise affected RBL + 10 dBA	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <p>Where the predicted or measured <math>L_{Aeq,15min}</math> is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise.</p> <p>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.</p>
	Highly noise affected 75 dBA	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <p>Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level.</p> <p>If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.</p>
Outside Recommended Standard Hours	Noise affected RBL + 5 dBA	<p>A strong justification would typically be required for works outside the recommended standard hours.</p> <p>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community.</p> <p>For guidance on negotiating agreements see ICNG section 7.2.2</p>

#### 2.4.1.2 Project-Specific Construction Noise Management Levels

The project-specific construction NML for noise sensitive receivers near the Proposal Site are presented in **Table 2-5**. These NMLs have been derived using the results of unattended noise monitoring, as detailed in **Table 2-3**.

**Table 2-5 : Project-specific NML,  $L_{Aeq,15min}$**

Receiver	Noise-affected Level Standard Hours	Noise-affected Level Outside Standard Hours	Highly Noise-affected Level
<b>Minchinbury Residential Receivers (R0-R9)</b>	53	45	75
<b>Erskine Park Residential Receivers (R10-R13)</b>	47	40	75
<b>Eastern Creek Industrial Receivers (I1-I12)</b>	75	-	-

#### 2.4.1.3 Construction Vibration

When assessing vibration there are two components that require consideration:

- Human exposure to vibration
- The potential for building damage from vibration.

Construction work is generally considered an intermittent source of vibration.

##### Human Exposure to Vibration

The DEC's *Assessing Vibration: a technical guideline* (2006) provides guidance for assessing human exposure to vibration. The publication is based on British Standard BS6472:1992. Intermittent vibration is best assessed by the Vibration Dose Value (VDV) which is based on the weighted root mean quartic acceleration. However, for simplicity of assessment and monitoring, a peak particle velocity (PPV) goal is preferred.

**Table 2-6** sets out PPV values for continuous and impulsive vibration as specified by *Assessing Vibration: a technical guideline* (2006). The impulsive vibration goals are shown in brackets.

**Table 2-6 : Human Comfort Vibration Goals – PPV (mm/s)**

Place	Day (7am–10pm)	
	Preferred	Maximum
<b>Residences</b>	0.28 (8.6)	0.56 (17.0)
<b>Offices</b>	0.56 (18.0)	1.1 (36.0)
<b>Workshops</b>	1.1 (18.0)	2.2 (36.0)

Note: Impulsive goals are shown in brackets – These are most relevant to activities that create up to three distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading.

### Building Damage from Vibration

There are currently no Australian Standards or guidelines to provide guidance on assessing the potential for building damage from vibration. It is common practice to derive goal levels from international standards such as British Standard BS7385:1993 “Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration”.

The recommended limits (guide values from BS7385) for transient vibration to ensure minimal risk of cosmetic damage to residential and industrial buildings are presented in **Table 2-7**.

**Table 2-7 : Transient Vibration Guide Values – Minimal Risk of Cosmetic Damage**

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
<b>Reinforced or framed structures</b> <b>Industrial and heavy commercial buildings</b>	50mm/s at 4 Hz and above	N/A
<b>Unreinforced or light framed structures</b> <b>Residential or light commercial type buildings</b>	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz	20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above

For general construction vibration, the dominant frequency of vibration is typically in the range 31.5 – 100Hz. Because the dominant frequency of vibration cannot be determined with certainty, conservative goals of 20 mm/s for residential buildings and 50 mm/s for commercial and industrial buildings have been adopted.

## 2.4.2 Operational Noise

The *Noise Policy for Industry* (NPfI) (EPA, 2017) provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in New South Wales (NSW).

The NPfI recommends the development of project noise trigger levels, which provide a benchmark for assessing a proposal or site. The project noise trigger levels should not be interpreted as mandatory noise criteria but, rather, as noise levels that, if exceeded, would indicate a potential noise impact on the community.

The project noise trigger level is the lower value of the project intrusiveness noise level and the project amenity noise level; each explained further below. The project intrusiveness noise level assesses the likelihood of noise being intrusive above the ambient noise level and is applied to residential receivers only. The project amenity noise level ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

### 2.4.2.1 Project Intrusiveness Noise Levels

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

The NPfI stipulates that project intrusiveness noise levels should not be set below 40 dBA during the daytime and 35 dBA in the evening and night time. Additionally, the NPfI recommends that the project intrusiveness noise level for the evening is set at no greater than that for the daytime, and that the project intrusiveness level for night time is set at no greater than that for the evening and daytime.

Intrusiveness noise levels for the project are calculated from the RBLs in Section 2.3 of this report and are presented in **Table 2-8**.

**Table 2-8 : Project Intrusiveness Noise Levels**

Receiver	Time of Day <sup>a</sup>	RBL (dBA)	Project Intrusiveness Noise Level (dBA)
<b>Minchinbury Residential Receivers (R0-R9)</b>	Day	43	48
	Evening	48	46
	Night	41	46
<b>Erskine Park Residential Receivers (R10-R13)</b>	Day	37	42
	Evening	37	42
	Night	37	40

Note: (a) Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7:00am



#### *2.4.2.2 Project Amenity Noise Levels*

Project amenity noise levels aim to set a limit on continuing increases in noise levels from all industrial noise sources affecting a variety of receiver types; that is, the ambient noise level in an area from all industrial noise sources remains below recommended amenity noise levels.

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise (when on public transport corridors), noise from motor sport, construction noise, community noise, blasting, shooting ranges, occupational workplace noise, wind farms, amplified music/patron noise.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

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

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5dBA below the recommended amenity noise level.

The following exceptions apply to determining the project amenity noise level:

- For high-traffic areas the amenity criterion for industrial noise becomes the  $L_{Aeq,period (traffic)}$  minus 15dBA.
- In proposed developments in major industrial clusters.
- If the resulting project amenity noise level is 10dB or more, lower than the existing industrial noise level, the project amenity noise level can be set at 10dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.
- Where cumulative industrial noise is not a consideration because no other industries are present in, or likely to be introduced into the area, the relevant amenity noise level is assigned as the project amenity noise level for the development.

Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess mitigation options and determine achievable noise requirements.

The project amenity noise levels for the Proposal have been based on the recommended amenity noise levels presented in **Table 2-9**.



**Table 2-9 : Recommended Amenity Noise Levels**

Receiver	Noise Amenity Area	Time of Day <sup>a</sup>	Recommended Amenity Noise Level (L <sub>Aeq,period</sub> dBA)
<b>Residential</b>	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45
<b>Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks</b>	See column 4	See column 4	5dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day.
<b>School classroom-internal</b>	All	Noisiest 1-hour period when in use	5.35
<b>Hospital ward internal</b>	All	Noisiest 1-hour	35
<b>Hospital ward external</b>	All	Noisiest 1-hour	50
<b>Place of worship-internal</b>	All	When in use	40
<b>Area specifically reserved for passive recreation (e.g. national park)</b>	All	When in use	50
<b>Active recreation area (e.g. school playground, golf course)</b>	All	When in use	55
<b>Commercial premises</b>	All	When in use	65
<b>Industrial premises</b>	All	When in use	70
<b>Industrial interface (applicable only to residential noise amenity areas)</b>	All	All	Add 5dB(A) to recommended noise amenity area

Note: (a) Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7.00am

Recommended amenity noise levels presented in **Table 2-9** represent the objective for total industrial noise at a receiver location. In the case of a single new noise source being proposed, the project amenity noise level represents the objective for noise from a single industrial development at the receiver location. This is calculated as the recommended amenity noise level minus 5 dBA.

Due to different averaging periods for the  $L_{Aeq,15min}$  and  $L_{Aeq,period}$  noise descriptors, the values of project intrusiveness and amenity noise levels cannot be compared directly when identifying noise trigger levels i.e.; the most stringent values of each category. In order to make a comparison between descriptors, the *NPfI* assumes that the  $L_{Aeq,15min}$  equivalent of an  $L_{Aeq,period}$  noise level is equal to the  $L_{Aeq,15min}$  level plus 3 dB.

Project amenity noise levels for sensitive receivers near the Proposal are presented in Table 2-10.. Minchinbury is considered urban as it is next to a freeway and the existing background noise levels reflect that of an urban environment as recommended in the *NPfI*. Erskine Park is considered suburban because it is zoned R2 low density residential and the existing background noise levels reflect that of a suburban environment as recommended in the *NPfI*.

**Table 2-10 : Project Amenity Noise Levels**

Receiver	Noise Amenity Area	Time of Day <sup>a</sup>	Recommended Amenity Noise Level ( $L_{Aeq,period}$ )	Project Amenity Noise Level ( $L_{Aeq,15min}$ )
<b>Minchinbury Residential Receivers (R0-R9)</b>	Urban	Day	60	58
		Evening	50	48
		Night	45	43
<b>Erskine Park Residential Receivers (R10-R13)</b>	Suburban	Day	55	53
		Evening	45	43
		Night	40	38
<b>Eastern Creek Industrial Receivers (I1 – I12)</b>	Industrial	When in use	70	68

Note: (a) Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7:00am

#### 2.4.2.3 Project Noise Trigger Levels

The project noise trigger levels for sensitive receivers for a project are the lowest criteria developed from the project intrusive noise levels and the project amenity levels.

**Table 2-11** shows the project noise trigger levels for sensitive receivers for the Proposal, with the project noise trigger levels shown in **bold**.

**Table 2-11 : Project Noise Trigger Levels**

Receiver	Time of Day <sup>a</sup>	Project Intrusiveness Noise Levels (L <sub>Aeq,15min</sub> )	Project Amenity Noise Levels (L <sub>Aeq,period</sub> )
<b>Minchinbury Residential Receivers (R0-R9)</b>	Day	<b>48</b>	58
	Evening	<b>46</b>	48
	Night	46	<b>43</b>
<b>Erskine Park Residential Receivers (R10-R13)</b>	Day	<b>42</b>	53
	Evening	<b>42</b>	43
	Night	40	<b>38</b>

Note: (a) Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7:00am

The project noise trigger levels are similar to the current site consent noise limits and EPA licence limits (Refer to Section 3.3). The daytime project noise trigger levels are the same as the site consent noise limits and EPA licence limits for both Minchinbury and Erskine Park. For evening the project noise trigger level for Minchinbury is 1 dB less than the site consent noise limits and EPA licence limits and the same for Erskine Park. The night time project noise trigger level is 1 dB below the Minchinbury and Erskine Park site consent noise limits and EPA licence limits. If project noise trigger levels are met compliance with the site consent noise limits and EPA licence limits would also be achieved.

#### 2.4.2.4 Modifying Factor Adjustments

Where a noise source contains certain characteristics, such as tonality, intermittency, irregularity or dominant low-frequency content, the noise may cause greater annoyance. The *NPfI* refers to these potentially annoying characteristics as “modifying factors”. The *NPfI* recommends correction factors to be applied to the source noise level at the receiver before comparison with the criteria to account for the additional annoyance caused by these modifying factors.

From review of monitoring reported at the Eastern Creek REP, the only potentially relevant characteristic for noise from the Proposal Site is the potential for dominant low-frequency content.

The *NPfI* recommends investigating whether a modifying factor for low-frequency noise is applicable based on an analysis of third-octave band levels where there is a difference between C- and A- weighting levels of more than 15 dB. The factor to be applied depends on comparison of the third octave spectrum of the noise against the threshold spectrum in **Table 2-12** (Table C2 from *NPfI*).

**Table 2-12 : Low Frequency Noise Thresholds (Table C2 from *NPfI*)**

Hz/dBZ	One-third Octave L <sub>Zeq,15minute</sub> Threshold												
f (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dBZ	92	89	86	77	69	61	54	50	50	48	48	46	44

Note: Hz = Hertz.

The following corrections apply where the measured dBC minus dBA level is 15 dB or more:

- Where any of the one-third-octave noise levels in *NPfI* Table C2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2 dBA positive adjustment to measured/predicted A-weighted levels applies for the evening/night period.
- Where any of the one-third-octave noise levels in *NPfI* Table C2 are exceeded by more than 5 dB and cannot be mitigated, a 5 dBA positive adjustment to measured/predicted A-weighted levels applies for the evening/night period and a 2 dBA positive adjustment applies for the daytime period.

A low-frequency operational noise assessment for the Proposal is provided in Section 6.2. This assessment concludes no modifying factor correction for low-frequency noise is warranted for the Proposal.

#### 2.4.2.5 Maximum Noise Trigger Levels – Sleep Disturbance

Noise sources at night occurring over a short duration have the potential to cause sleep disturbance despite complying with project noise trigger levels. Approval is sought for the Proposal to operate on a 24-hour basis as required. Therefore, maximum noise level events need to be considered for potential sleep disturbance.

The *NPfI* recommends that, where the night time  $L_{Amax}$  receiver noise levels from a development exceeds 52 dBA or the RBL plus 15 dBA, whichever is the greater, then a more detailed assessment of potential sleep disturbance impacts is warranted. **Table 2-13** presents the maximum noise trigger levels for the receivers identified in this assessment.

**Table 2-13 : Maximum Noise Trigger Levels**

Receiver	RBL	RBL + 15 dBA	Maximum Noise Trigger Level
Minchinbury Residential Receivers (R0-R9)	40	55	55
Erskine Park Residential Receivers (R10-R13)	35	50	52

### 2.4.3 Operational and Construction Road Traffic Noise

The NSW *Road Noise Policy* (RNP) (DECCW, 2011) sets out criteria for assessment of noise from traffic on public roads. The *RNP* sets out noise assessment criteria for “freeways”, “arterial”, “sub-arterial” and “local roads”.

The *RNP* impact assessment criteria for residential land uses impacted by additional traffic on freeways, arterial and sub-arterial roads are presented in **Table 2-14**.



**Table 2-14 : RNP Impact Assessment Criteria**

Category	Impact Assessment Criteria (dBA)	
	Day <sup>a</sup>	Night <sup>a</sup>
<b>Freeways, arterial, sub- arterial</b>	L <sub>Aeq,15hour</sub> 60	L <sub>Aeq,9 hour</sub> 55

Note: (a) Day = 7.00am – 10.00pm; Night = 10.00pm – 7.00am

With regard to the permissible increase in road traffic noise from a land use development the RNP states:

*“For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding ‘no build option’.”*

Road traffic generated by the proposal travels directly between the Proposal Site and the arterial road network (M4 and M7 motorways) via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive. There are no residential or other noise sensitive assessment locations located along Kangaroo Avenue, Honeycomb or Wonderland Drive. The proportion of site traffic on the M4 and M7 are inconsequential to average noise levels. Therefore, road traffic noise has not been considered any further in this assessment.



## 2.5 Noise Modelling Methodology

Operational and construction noise emissions associated with the Proposal were modelled using the CadnaA acoustic noise prediction software and the CONCAWE noise prediction algorithm. The CONCAWE noise propagation model is used around the world and is widely accepted as an appropriate model for predicting noise over significant distances. Factors addressed in the noise modelling are:

- Equipment noise level emissions and locations
- Shielding from structures
- Noise attenuation due to geometric spreading
- Meteorological conditions
- Ground absorption
- Atmospheric absorption.

Modelling has considered earthworks to remove amenity berms at the Proposal Site, in a staged manner. Modelling for Stage 1 Operations considers the amenity berms as they currently exist, scenarios for both Stage 2 and Stage 3 Operations are considered with the relevant sections of amenity berms removed. With the partial removal of amenity berms being considered as part of the Stage 2 Construction modelling scenario.

To validate the noise predictions in this report the existing operation were compared to the measured levels in **Table 3-6**. It was found that the noise model provided comparable results to **Table 3-6**.

### 2.5.1 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 taken into account.

In accordance with the *NPfI*, the following default conditions have been modelled:

#### **Standard Meteorological Conditions (Calm)**

- Day/ Evening/ Night - Stability category D with 0.5 m/s source-to-receiver winds

#### **Noise-enhancing Meteorological Conditions (NE)**

- Day/ Evening - Stability category D with 3.0 m/s source-to-receiver winds during the daytime and evening
- Night - Stability category F with 2.0 m/s source-to-receiver winds during the night time.

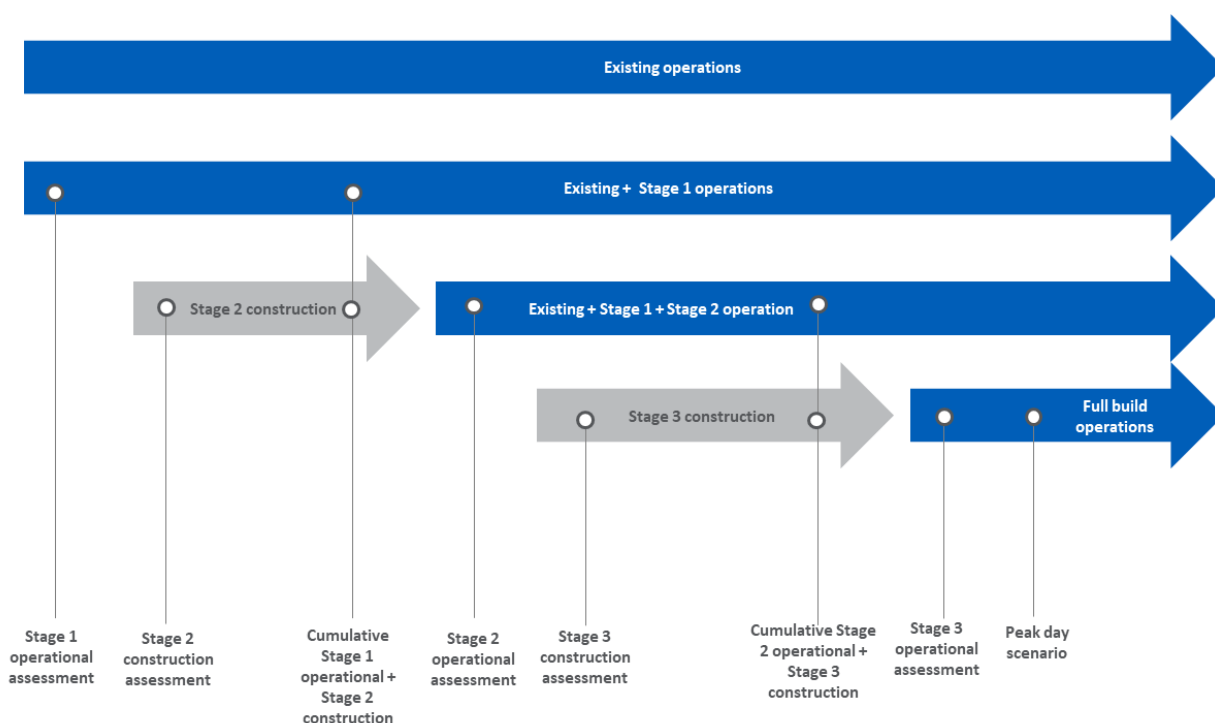
The CadnaA noise modelling software includes a feature that allows the model to be run with the “worst-case wind direction”. This option produces the highest noise level for each receiver due to noise-enhancing winds and has been used in the modelling.

Predicted noise levels associated with both standard meteorological conditions ( “calm” ) and noise enhancing ( “NE” ) meteorological conditions are presented in this assessment.



## 2.6 Noise Modelling Scenarios

Potential noise impacts have been modelled for each of the construction and operational phases of the Proposal individually to confirm their respective noise levels and identify any potential exceedances of the relevant criteria. Where a construction and operational phase overlaps, a 'cumulative' scenario considering the two concurrent activities has also been considered as shown in **Figure 2-3**.



**Figure 2-3 : Modelling Scenarios**

Noise modelling has been conducted for day, evening and night time periods as recommended by the NPfI. Considering the approved operations in **Table 3-3** the operations in **Table 2-15** have been included in the modelling for day, evening and night time.

**Table 2-15: Noise Modelling Assumptions Regarding Operating Hours**

Operation	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)
Construction	✓		
MPC – operation, waste receipt, chute use and maintenance	✓	✓	✓
SMA – crushing and screening	✓		✓
SMA – receipt of segregated materials	✓	✓	✓
Landfill – truck deliveries	✓	✓	✓

## 2.6.1 Construction Noise Modelling Scenarios

Construction noise (not including operational noise) has been modelled for each individual construction phase within Stage 2 and Stage 3 of the Proposal (refer Section 4.5). The highest levels of construction noise would occur where multiple construction phases and activities occur concurrently (which would be contingent on internal operational needs and final construction details). Indicative peak construction phases for each Stage are presented in **Table 2-16**. This is considered to be the 'worst case' construction scenario for each construction stage. More detailed information on construction stages and phases within each stage is provided in Section 4.5.1.

**Table 2-16 : Peak Construction Phases**

Stage	Peak Construction Phase/s
Stage 2	Concurrent construction of: <ul style="list-style-type: none"> <li>Phase 2a</li> <li>Phase 2b</li> <li>Phase 2c</li> <li>Phase 2d</li> </ul>
Stage 3	Concurrent construction of: <ul style="list-style-type: none"> <li>Phase 3b</li> <li>Phase 3c</li> </ul>

Note: Phase 2e: Installation of weighbridges and wheel wash facilities and Phase 2f: Line marking and commissioning have not been specifically modelled as they would be similar to or of lesser impact than the previous phases.

## 2.6.2 Operational Noise Modelling Scenarios

As presented in **Figure 2-3** each Stage of the Proposal has been modelled to understand their respective potential operational impacts. The following scenarios have been modelled for operations:

- Stage 1 operations (including existing operations) (Peak and average vehicle movements)
- Stage 2 operations (Peak and average vehicle movements)
- Stage 3 operations (i.e. existing operations + Stage 1 operations + Stage 2 operations + Stage 3 operations) (Peak and average vehicle movements)

Additionally for a full build scenario (Stage 3) a maximum noise level assessment and a low frequency noise has been conducted as Stage 3 would represent the maximum impact for the site.

## 2.6.3 Cumulative Noise Modelling Scenarios

As presented in **Figure 2-3** noise modelling has been carried out to understand the cumulative impacts of concurrent construction and operational activities, as follows:

- Stage 1 operation + Stage 2 construction
- Stage 2 operation + Stage 3 construction

## 3 EXISTING ENVIRONMENT

### 3.1 Existing Site Features and Built Form

The Eastern Creek REP is presented in **Figure 1-1**. The key features of the Eastern Creek REP are:

- The landfill (former quarry void)
- Resource recovery facilities:
  - Materials Processing Centre 1 (MPC1)
  - Materials Processing Centre 2 (MPC2)
- Segregated Materials Area (SMA)

In addition to the waste management infrastructure across the Eastern Creek REP, operations are supported by a range of ancillary / supporting features including other buildings such as a maintenance shed, internal road network and water management infrastructure.

The central portion of the Eastern Creek REP comprises the landfill (the former quarry void). The landfill has a total void area of more than 12 million m<sup>3</sup> with over half of this void space estimated to be remaining.

The Eastern Creek REP contains two key resource recovery facilities; namely MPC1 and, the newly constructed, MPC2. MPC1 and MPC2 are located on the western side of the landfill, in the south-western corner of the Eastern Creek REP.

The SMA is located in the north-western corner of the Eastern Creek REP and covers an area of approximately five hectares. The SMA has minimal built form, and the area largely comprises stockpiles of C&D materials. Fixed and mobile equipment are also located within the SMA (e.g. crushing, sorting, and mixing equipment). All stockpile heights are limited to within the height of the amenity berms as required by the Project Approval (MP 06\_0139) and are maintained in accordance with all current legislative and regulatory requirements.

In addition to the waste management infrastructure across the Eastern Creek REP, site operations are supported by a range of ancillary features including other buildings (such as a workshop and maintenance shed, site office), the internal road network, and water management infrastructure.

#### 3.1.1 Site Access, Weighbridges and Internal Road Network

The Eastern Creek REP is accessed via a private access road off Kangaroo Avenue (known as DADI Drive), approximately 150 m north of the intersection of Kangaroo Avenue and Honeycomb Drive.

Approximately 185 m from the Eastern Creek REP entrance, the access road widens and six tidal weighbridges (i.e. they can be designated as weigh-in or weigh-out bridges pending operational needs) provide access into the broader operational area. A passing lane is provided around the weighbridges to allow light vehicles and vehicles passing through the Eastern Creek REP to bypass the weighbridges (predominantly comprising vehicles accessing the Fulton Hogan asphalt batching plant located to the west of the Eastern Creek REP).



Currently an entry road is provided into the landfill area to the north of MPC1. Internal roads provide access in and around the SMA and timber storage area.

Vehicles movements would be typically directed as follows (refer **Figure 3-1** and **Figure 3-2**):

- Waste disposal vehicles for the landfill would be typically directed as follows:
  - Vehicles disposing of waste to the landfill will be directed to the landfill access road and traverse down into the landfill pit itself.
  - Multiple vehicles can tip simultaneously at the active face of the landfill.
  - Once vehicles have tipped, they exit via the landfill access road and traverse the wheel wash located at the exit of the landfill egress road (to the east of MPC1).
  - Vehicles then travel the southern extent of DADI Drive in an easterly direction before weighing out at the weighbridge and exiting via a right-hand movement onto Kangaroo Avenue.
- Waste drop-off at MPC1 would be typically directed as follows:
  - Vehicles dropping off waste into MPC1 are directed to the eastern entrance of MPC1 where they enter and unload onto the tip floor.
  - Once vehicles have tipped, they exit and travel the southern extent of DADI Drive in an easterly direction before weighing out at the tidal weighbridge system and exiting, via a right-hand movement onto Kangaroo Avenue.
- Waste drop-off at MPC2 would be typically directed as follows:
  - Vehicles dropping off waste into MPC2 are directed either to the northern entrance doors (for walking-floor trailers coming from a transfer station or resource recovery facility) or through the eastern doors into the main tip floor. Vehicles reverse and tip either into the northern pit (for vehicles access from the north) or onto the main tip floor.
  - Once vehicles have tipped, they exit and travel the southern extent of DADI Drive in an easterly direction before weighing out at the weighbridge system and exiting, via a right-hand movement onto Kangaroo Avenue.
- Waste drop-off at the SMA would be typically directed as follows:
  - Vehicles dropping off waste at the SMA are directed through the internal access roads between MPC1 and MPC2 around the western side of MPC1. Vehicles enter and drop off waste into the SMA before continuing in a single direction and joining DADI Drive at the exit point of the landfill.
  - Vehicles then travel the southern extent of DADI Drive in an easterly direction before weighing out at the tidal weighbridge system and exiting via a right-hand movement onto Kangaroo Avenue.
- Product collection from MPC1:
  - The majority of product generated by MPC1 is directed via conveyor either to the timber stockpiling yard or the SMA. Residual waste would be directed straight into the landfill pit via the chute.
  - Some products would be collected from within MPC1. Collection vehicles would follow the same route as waste drop off vehicles to access MPC1 and would be loaded from within the shed.
  - Vehicles would then travel the southern extent of DADI Drive in an easterly direction before weighing out at the tidal weighbridge system and exiting via a right-hand movement onto Kangaroo Avenue.

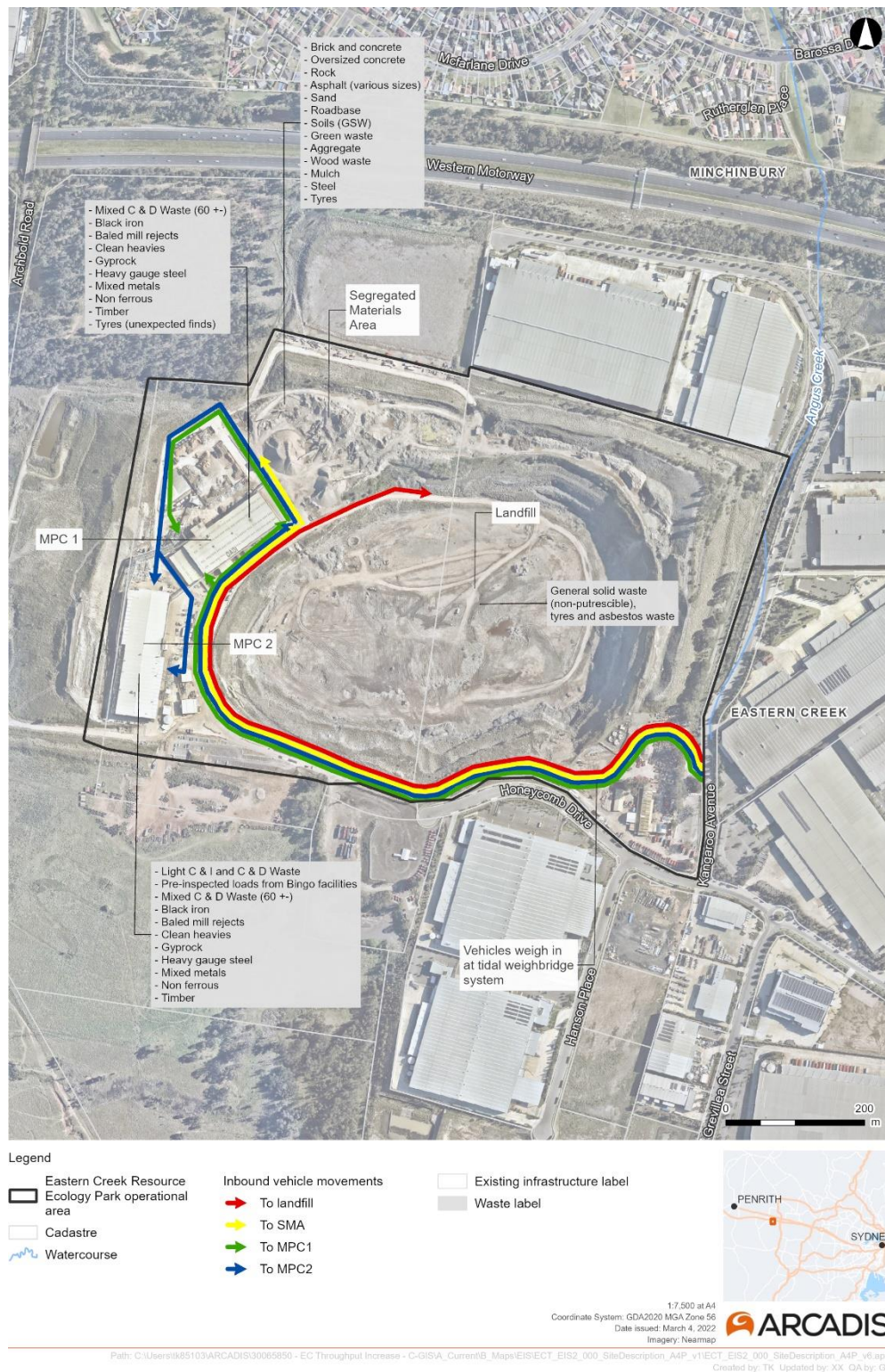


- Product collection from MPC2:
  - Some of product generated by MPC2 is directed via conveyor either to the timber stockpiling yard or the SMA. Residual waste would be directed straight into the landfill pit via the chute.
  - Some products such as non-ferrous metals are directed via conveyor to the bays on the eastern side of MPC2 where they are collected via third party collection vehicles.
  - Vehicles then travel from the SMA and the bays adjacent to MPC2, to the southern extent of DADI Drive in an easterly direction before weighing out at the tidal weighbridge system and exiting via a right-hand movement onto Kangaroo Avenue.
- Product collection from SMA
  - Product collection vehicles collecting from the SMA follow the same path as waste drop off vehicles to this area (both on the way in and the way out of the Eastern Creek REP).



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**Figure 3-1 : Existing Inbound Movements**



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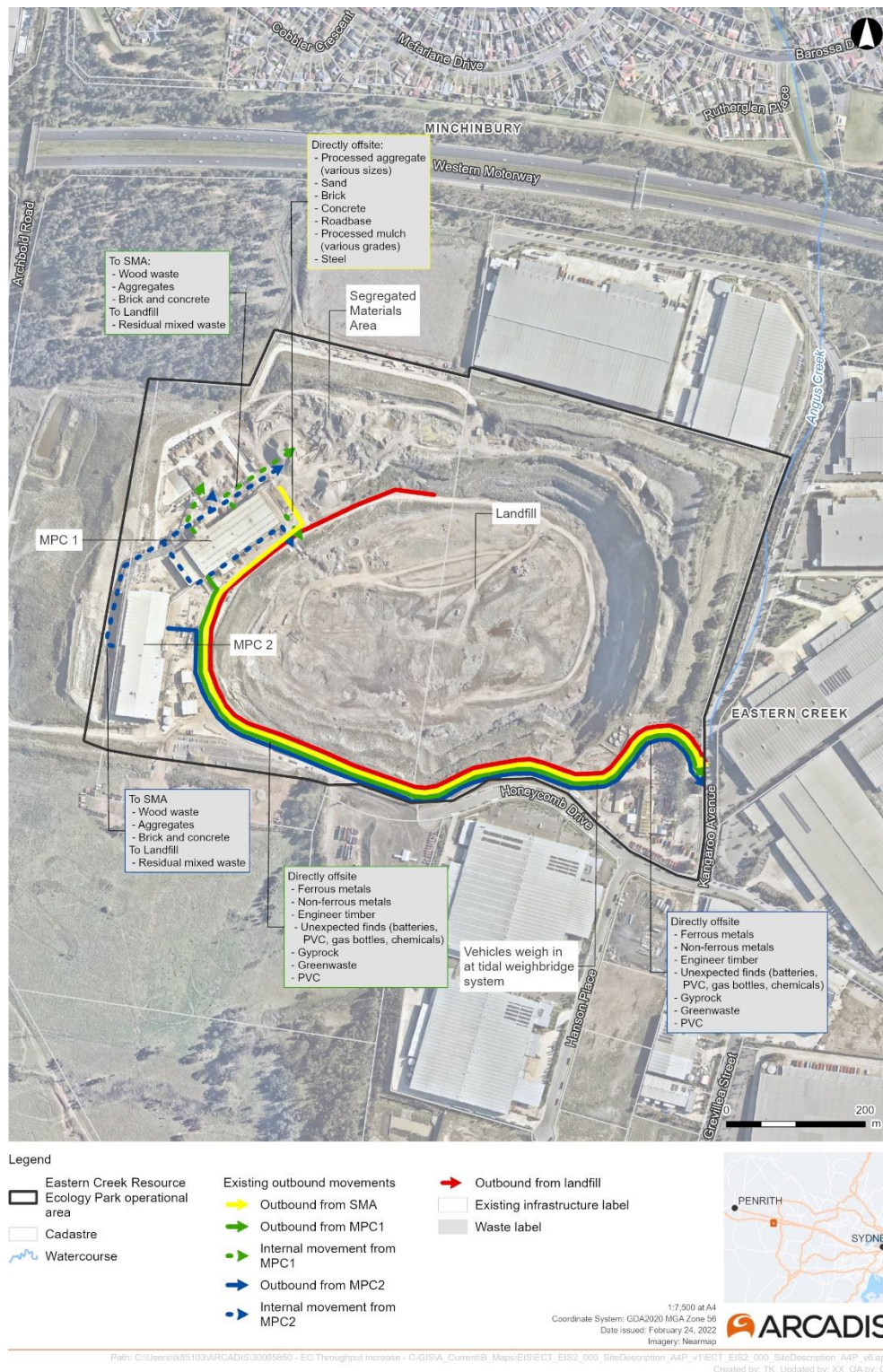


Figure 3-2 : Existing Outbound Movements

### 3.1.2 Vehicle Types

A number of vehicle types currently access the Eastern Creek REP. **Table 3-1** provides an overview of existing vehicle types and typical loads delivered to the Eastern Creek REP (based on historical weighbridge data).

**Table 3-1: Existing Vehicle Types**

Vehicle Type	Average Load (t)	GVM
Light vehicles (cars/utes, with trailers)	1.6	-
Small rigid vehicles (up to 6.4m in length) (2 axle-rigid trucks)	3.0	15 tonnes
Medium rigid vehicles (up to 8.8m in length) (3 axle-rigid trucks)	5.8	22.5 tonnes
Heavy rigid vehicles (up to 12.5m in length) (4 axle-rigid trucks)	8.3	26.5 tonnes
Articulated – 19m semi-trailer (6-axle semi-trailer)	10.9	42.5 tonnes
Articulated – 19m truck and dog	28.5	42.5 tonnes
Articulated – 25m B-double (9-axle B-double)	29.1	62.5 tonnes

Outbound product collection vehicles consist primarily of heavy vehicles. Product collection vehicles consist of the following composition of heavy vehicles (refer to **Table 3-2**).

**Table 3-2: Existing composition of product collection vehicles**

Type of Truck	Proportion of all Product Collection Vehicles
Quad and Quin dog	27%
Tandem	21%
Truck and dog	19%
Dump truck	9%
Walking floor	9%
Others	6%

In addition to vehicles dropping of waste and collecting product, light vehicles would also access the Eastern Creek REP due to staff and on-site personnel movements.

## 3.2 Existing Operational Hours

The current operational hours for the Eastern Creek REP are presented in **Table 3-3**. No changes are proposed to the current operational hours as a result of the Proposal.

**Table 3-3: Operating Hours**

Operation	Day	Time
<b>Construction</b>	Monday – Friday	7am-6pm
	Saturday	8am-4pm
	Sunday and Public Holidays	Nil
<b>MPC - operation, waste receipt, chute use and maintenance</b>	Monday – Friday	24 hours
	Saturday	
	Sunday and Public Holidays	
<b>SMA - crushing and screening</b>	Monday – Friday	6am-6pm
	Saturday	8am-4pm
	Sunday and Public Holidays	
<b>SMA - receipt of segregated materials</b>	Monday – Friday	24 hours
	Saturday	8am-4pm
	Sunday and Public Holidays	
<b>Landfill - truck deliveries</b>	Monday – Friday	5am-9pm
	Saturday	
	Sunday and Public Holidays	

## 3.3 Existing Approvals on the Proposal Site and Noise Limits

Under the existing approvals on the Proposal Site (up to and including Modification 8 of MP 06\_0139 (approved March 2021)), the Eastern Creek REP is now authorised for the following activities:

- Accept up to two Mtpa of C&D and C&I waste and landfilling of the quarry void of up to 1 Mtpa of non-putrescible waste (including asbestos and other non-recyclable waste), excluding residual chute waste from the materials processing centres
- Operation of MPC1 and MPC2 which recover recyclable material from C&D waste and C&I waste streams as well as utilisation of a landfill disposal chute and maintenance activities
- Crushing, grinding and separating works to process waste masonry material located in an area earmarked as the SMA
- Stockpile up to 50 tonnes of waste tyres

- Stockpile up to 20,000 tonnes of green waste.

Modification 6 of MP 06\_0139 (approved March 2021) modified the noise limits from the Eastern Creek REP site based on contemporaneous background noise levels. The existing noise limits for the Eastern Creek REP are presented in **Table 3-4**. The noise limits for activities undertaken under the existing Approval are reflected in the Eastern Creek REP's Environment Protection Licences (EPL) (#13426) and #20121).

**Table 3-4 : Noise Limits**

Location	Noise Limits dBA						
	Day	Evening	Night			Morning Shoulder	
	L <sub>Aeq,15min</sub>	L <sub>Aeq,15min</sub>	L <sub>Aeq,15min</sub>	L <sub>Aeq,period</sub>	L <sub>Aeq,1min</sub>	L <sub>Aeq,15min</sub>	L <sub>Aeq,15min</sub>
<b>1-6 Eber Place, Minchinbury</b>	48	47	44	41	53	47	53
<b>2-44 Warbler Street, Erskine Park</b>	42	42	39	N/A	44	39	44

### 3.4 Noise Monitoring and Compliance Reporting

Noise monitoring was carried out to validate the noise predictions of the noise impact assessment submitted to support Modification 6 to MP06 0139. This verification assessment was conducted consistent with condition 38 of the Approval and submitted to the Planning Secretary. The noise monitoring was conducted by RWDI.

**Table 3-6** summarises the resultant noise levels measured at the representative receiver locations and any relevant observations. Noise from the Proposal Site was inaudible during the entire monitoring period at all identified residential receivers. No modifying factors were attributable to the site like low frequency noise or intermittency.

The Eastern Creek REP is subject to an additional maximum noise level for the morning shoulder and night time periods. The results of the attended measurements addressing the L<sub>A1,(1min)</sub> noise criteria for the morning shoulder and night period is shown below in **Table 3-5**.

The conclusion of the noise validation assessment was that the measured noise contributions at all receivers (L<sub>Aeq,15 min</sub> and L<sub>A1,min</sub>) complied with the identified noise limits during all time periods monitored.

**Table 3-5 : Measured  $L_{A1,(1min)}$  Noise Levels**

Time of Measurement / Period	Location	Estimated $L_{A1,(1min)}$ (dBA) Noise Contribution at Receiver	Noise Limit(s) $L_{A1,(1min)}$ (dBA)	Complies with Noise Limit? Yes/No
<b>13/10/2020 22:03 (Night)</b>	2-44 Warbler Street, Erskine Park	<42	44	Yes
<b>13/10/2020 22:35 (Night)</b>	1-6 Eber Place, Minchinbury	<44	53	Yes
<b>15/10/2020 04:39 (Night)</b>	1-6 Eber Place, Minchinbury	<47	53	Yes
<b>15/10/2020 05:10 (Morning Shoulder)</b>	2-44 Warbler Street, Erskine Park	<44	44	Yes

Additionally, compliance noise monitoring has been conducted consistent with the Eastern Creek REP Environmental Management Strategy on a six-monthly basis by Consulting Earth Scientists since 2016. A review of the compliance noise monitoring by RWDI indicates that noise from the site is continually inaudible at the two nearest residential receiver locations at Minchinbury and Erskine Park. As such, the compliance noise monitoring is consistent with the noise monitoring carried out to validate the noise predictions of the noise impact assessment prepared to support Modification 6 to MP 06\_0139).



**Table 3-6 : Measured  $L_{Aeq}$  Noise Levels**

Time of Measurement / Period	Location	Measured Ambient $L_{Aeq}$	Measured Ambient $L_{A90}$	Measured Ambient $L_{Amin}$	Observation Is the noise from the site audible?	Noise Contribution at Receiver $L_{Aeq,15min}$ (dBA)	Noise Limit(s) (dBA)	Complies with Noise Limit? Yes/No
13/10/2020 13:06 (Day)	1-6 Eber Place, Minchinbury	54.4	49.8	44.1	Inaudible in a 50 dBA background noise environment made up of traffic and industrial noise	<40	48	Yes
13/10/2020 14:32 (Day)	2-44 Warbler Street, Erskine Park	45.9	42.7	40.3	Inaudible in a 43 dBA background noise environment made up of traffic and industrial noise	<33	42	Yes
13/10/2020 22:03 (Night)	2-44 Warbler Street, Erskine Park	46.7	44.4	42.5	Inaudible in a 44 dBA background noise environment made up of traffic and industrial noise	<34	39	Yes
13/10/2020 22:35 (Night)	1-6 Eber Place, Minchinbury	47.6	44.7	42.9	Inaudible in a 45 dBA background noise environment made up of traffic and industrial noise	<35	44	Yes
14/10/2020 17:25 (Day)	1-6 Eber Place, Minchinbury	57	53.9	51.4	Inaudible in a 54 dBA background noise environment made up of traffic and industrial noise	<44	48	Yes
14/10/2020 18:00 (Eve)	2-44 Warbler Street, Erskine Park	51.5	48.7	46.9	Inaudible in a 49 dBA background noise environment made up of traffic and industrial noise	<42	42	Yes
14/10/2020 18:49 (Eve)	1-6 Eber Place, Minchinbury	54.6	51.2	48.7	Inaudible in a 51 dBA background noise environment made up of traffic and industrial noise	<41	47	Yes



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Time of Measurement / Period	Location	Measured Ambient $L_{Aeq}$	Measured Ambient $L_{A90}$	Measured Ambient $L_{Amin}$	Observation Is the noise from the site audible?	Noise Contribution at Receiver $L_{Aeq,15min}$ (dBA)	Noise Limit(s) (dBA)	Complies with Noise Limit? Yes/No
15/10/2020 05:39 (Night)	1-6 Eber Place, Minchinbury	51.3	46.4	43.7	Inaudible in a 46 dBA background noise environment made up of traffic and industrial noise	<36	44	Yes
15/10/2020 05:10 (Morning Shoulder)	2-44 Warbler Street, Erskine Park	50.7	49.1	47.7	Inaudible in a 49 dBA background noise environment made up of traffic and industrial noise	<39	39	Yes
21/10/2020 14:23 (Day)	2-44 Warbler Street, Erskine Park	56.4	50.5	48.5	Inaudible in a 51 dBA background noise environment made up of traffic and industrial noise	<41	42	Yes
21/10/2020 21:08 (Eve)	2-44 Warbler Street, Erskine Park	53.3	49.4	44.3	Inaudible in a 49 dBA background noise environment made up of traffic and industrial noise	<39	42	Yes
21/10/2020 21:38 (Eve)	1-6 Eber Place, Minchinbury	51.3	49	46.8	Inaudible in a 49 dBA background noise environment made up of traffic and industrial noise	<39	47	Yes

## 4 PROPOSAL DESCRIPTION

### 4.1 Overview of Proposal Staging

The Proposal includes the upgrade and construction of supporting infrastructure to optimise the current operation at the Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site. It is proposed to develop the Proposal Site in three stages:

- **Stage 1: Initial throughput:** Stage 1 would comprise 500,000 tpa of additional throughput to be received at the Eastern Creek REP to enhance resource recovery outcomes by increasing utilisation of onsite processing capabilities
- **Stage 2: Internal site optimisation:** Stage 2 would facilitate the remaining throughput increase (an additional 450,000 tpa of the total 950,000 tpa proposed) to be received and processed across the Eastern Creek REP and operation of one of two proposed new exit connections. Stage 2 would include:
  - The construction and operation of a new exit connection the Honeycomb Drive extension and installation of two associated outbound weighbridges and dedicated weighbridge office
  - The construction and operation of a new exit connection to Kangaroo Avenue in the northeast of the Proposal Site and the installation of two associated outbound weighbridges and a dedicated weighbridge office
  - Upgrade of existing internal roads as required
  - Earthworks for Stage 3 site establishment
  - Additional carparking and amenities
- **Stage 3: Installation of supporting infrastructure:** Stage 3 would comprise the redevelopment of the north-eastern corner of the Proposal Site. This would comprise:
  - Construction and operation of a Site Workshop (relocating this activity from elsewhere within the Proposal Site to a dedicated enclosed facility)
  - Construction and operation of a skip bin Maintenance and Manufacturing Workshop
  - Installation of landscaping, signage, security fencing and finishing works.

### 4.2 Built Form

**Figure 4-1** shows the Proposal and the existing infrastructure. **Table 4-1** denotes which stage of the Proposal each built element would be associated with. The existing Eastern Creek REP built elements would be utilised for all three stages of the Proposal.

**Table 4-1 : Key Built Elements of the Proposal**

Built Elements	Stage 1	Stage 2	Stage 3
Connection to Honeycomb Drive		✓	
Outbound weighbridges to the west of MPC2 (including wheel wash facilities) and weighbridge control office		✓	
Connection to Kangaroo Avenue		✓	
Outbound weighbridges (including wheel wash facilities) and weighbridge control office in the north-eastern corner		✓	
Upgrades to existing roads		✓	
Site Workshop			✓
Maintenance and manufacturing workshop			✓
Additional carparking adjacent to MPC2		✓	
Urban design and landscaping (including perimeter fencing)		✓	✓
Water management infrastructure		✓	✓

The Proposal would predominantly utilise existing built elements across the Eastern Creek REP. The key built elements that would be utilised by the Proposal are:

- Waste management infrastructure:
  - The landfill
  - Resource recovery facilities (MPC1 and MPC2)
  - SMA
- Ancillary infrastructure and features such as site access, weighbridges and the internal road network
- Car parking and amenity areas
- Water management infrastructure.

## 4.3 Operational Noise Sources, Plant and Equipment

**Table 4-2** summarises the operational noise sources and associated sound power levels used in the noise model. The equipment items and quantities are based on the current equipment inventory. The sound power levels are based on attended measurements at the site and an RWDI database of similar plant and equipment. A map of key on-site plant and equipment locations is presented in **Appendix A**.

**Table 4-2 : Operational Plant and Equipment Sound Power Levels**

										Sound Power Level
	Stage 1			Stage 2			Stage 3			
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	L <sub>Aeq</sub>
Vehicles										
Road Trucks	Vehicle numbers presented in Table 4-3 and Table 4-4									107 <sup>2</sup>
Materials Processing Centres										
MPC1	1	1	1	1	1	1	1	1	1	103 <sup>1</sup>
MPC1 Eastern	1	1	1	1	1	1	1	1	1	105 <sup>1</sup>
MPC2 (front of building including conveyors and shredder)	1	1	1	1	1	1	1	1	1	115 <sup>2</sup>
MPC2	1	1	1	1	1	1	1	1	1	110 <sup>2</sup>
MPC2 Tipping floor Doors open to the east and automatic rollers to the north	1	1	1	1	1	1	1	1	1	84 <sup>2</sup> Reverberant level
Timber Stockpile Area										
Primary Shredder	1		1	1		1	1		1	110 <sup>3</sup>
Secondary Shredder	1		1	1		1	1		1	110 <sup>3</sup>
Front End Loader	1		1	1		1	1		1	105 <sup>3</sup>
Haul Truck	1		1	1		1	1		1	110 <sup>3</sup>
Conveyors	1		1	1		1	1		1	75 dBA/m <sup>3</sup>

										Sound Power Level
	Stage 1			Stage 2			Stage 3			
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	L <sub>Aeq</sub>
SMA										
Crusher/ Screen Entire operation including truck excavator	3		3	3		3	3		3	112 <sup>2</sup>
Excavator	3		3	3		3	3		3	106 <sup>2</sup>
Haul Truck	1		1	1		1	1		1	110 <sup>2</sup>
Front End Loader	1		1	1		1	1		1	105 <sup>2</sup>
Landfill - Pit										
Flares	4	4	4	4	4	4	4	4	4	97 <sup>2</sup>
Front End Loader	1	1	1	1	1	1	1	1	1	105 <sup>2</sup>
TANA E520 Landfill Compactor	4	4	4	4	4	4	4	4	4	109 <sup>2</sup>
Haul Truck	1	1	1	1	1	1	1	1	1	110 <sup>2</sup>
Bulldozer CAT D8T	1	1	1	1	1	1	1	1	1	109 <sup>2</sup>
Excavator	3	3	3	3	3	3	3	3	3	106 <sup>2</sup>
Stage 3										
Workshop	1	1	1	1	1	1	1	1	1	105 <sup>3</sup>
Workhop South	1	1	1	1	1	1	1	1	1	105 <sup>3</sup>
Mainufacturing	1	1	1	1	1	1	1	1	1	105 <sup>3</sup>
Mainufacturing West	1	1	1	1	1	1	1	1	1	105 <sup>3</sup>

Note 1 – Noise and Vibration Impact Assessment, Modification 6, EMM, 2017

Note 2 - Based on site measurements conducted by RWDI.

Note 3 - RWDI Database

In addition to the sound power levels and quantities provided, main operating assumptions adopted for a worst-case 15 minute period are as follows:

- SMA operates Monday to Friday 6.00am to 6.00pm and Saturday/ Sunday/ Public Holidays 8.00am to 4.00pm. As the SMA operates between 6.00am and 7.00am, it is assessed during the day and night.

- MPC1 and MPC2 operates 24 hours
- Landfill operates Monday to Friday 5.00am to 9.00pm and Saturday/ Sunday/ Public Holidays 5.00am to 9.00pm. As the Landfill operates between 5.00am and 9.00pm it is assessed during the day, evening and night
- All equipment on-site is assumed to operate continuously in any 15 minutes during the assessment period
- Truck numbers are assessed consistent with those presented in **Table 4-3**
- All onsite vehicle movements are 20 kilometres per hour (km/hr) or less

The Site Workshop and the Maintenance and Manufacturing Workshop will undertake repair work on a vast array of equipment types and would use a number of different techniques to make the repairs. In addition to the repair of site-based equipment fabrication of new components may also be required. The equipment used in the workshop would include major items of noise generating tools and processes such as:

- Angle grinders;
- Air arc;
- Hammers;
- Truck revving and truck start ups;
- Drills; and
- Air compressors.

Testing of repaired equipment and vehicle start-ups may also occur within the workshops. Operations of the Site Workshop and the Maintenance and Manufacturing Workshop would occur 24 hours per day. It is estimated that the internal noise level within the Site Workshop and the Maintenance and Manufacturing Workshop would be conservatively 85 dB  $L_{Aeq}$ .

The noise predictions for the Site Workshop and the Maintenance and Manufacturing Workshop assumed that the works are conducted inside the and that the roller doors facing the landfill would be open.



## 4.4 Heavy Vehicle Movements during Operation

The proposed vehicle hourly average movements for the Proposed stages of operation are presented in **Table 4-3**. During the day it has been found that vehicle movement can vary from the average as presented in the **Table 4-4** which presents the peak hourly vehicle movements. As presented in the Traffic Impact Assessment a peak scenario has been derived from existing vehicle movements using verified weighbridge data. The peak is identifying as the percentage change between and average day and the 95<sup>th</sup> percentile day (busiest 5% of days). It was found that peak days have on average approximately 30% more vehicles movements. As such, a 30% increase in site activity has been used to assess the peak day scenario. The peak day has low probability of occur and would generally occur less than 5% of the time,

There is no specific peak vehicle movement data for the evening and night time period. To be conservative, the daytime movements have been used for noise modelling for evening and night time.

**Table 4-3 : Operational Heavy Vehicle Movements (Average hourly vehicle trips) Daytime/Evening/Night (in/out)**

Stages	Landfill	MPC1	MPC2 Incoming Raw Material	MPC2 Outgoing Raw Material	SMA	Toro Workshop Customers	Toro Workshop Deliveries	Total
Existing	12/12	21/21	-	-	4/4	-	-	37/37
Stage 1 - Operation (+500,000tpa)	12/12	21/21	5/5	2/2	4/4	-	-	44/44
Stage 2 Operation (+450,000 tpa in addition to +500,000 tpa in Stage 1)	12/12	21/21	9/9	4/4	4/4	-	-	50/50
Stage 3 Operation	12/12	21/21	9/9	4/4	4/4	1/1	1/1	52/52

**Table 4-4 : Operational Heavy Vehicle Movements (Peak hourly vehicle trips) (in/out) Daytime/Evening/Night**

Stages	Landfill	MPC1	MPC2 Incoming Raw Material	MPC2 Outgoing Raw Material	SMA	Toro Workshop Customers	Toro Workshop Deliveries	Total
<b>Existing</b>	17/17	28/28	-	-	6/6	-	-	51/51
<b>Stage 1 – Operation (+500,000tpa)</b>	17/17	28/28	7/7	3/3	6/6	-	-	61/61
<b>Stage 2 Operation (+450,000 tpa in addition to +500,000 tpa in Stage 1)</b>	17/17	28/28	12/12	6/6	6/6	-	-	69/69
<b>Stage 3 Operation</b>	17/17	28/28	12/12	6/6	6/6	1/1	1/1	71/71

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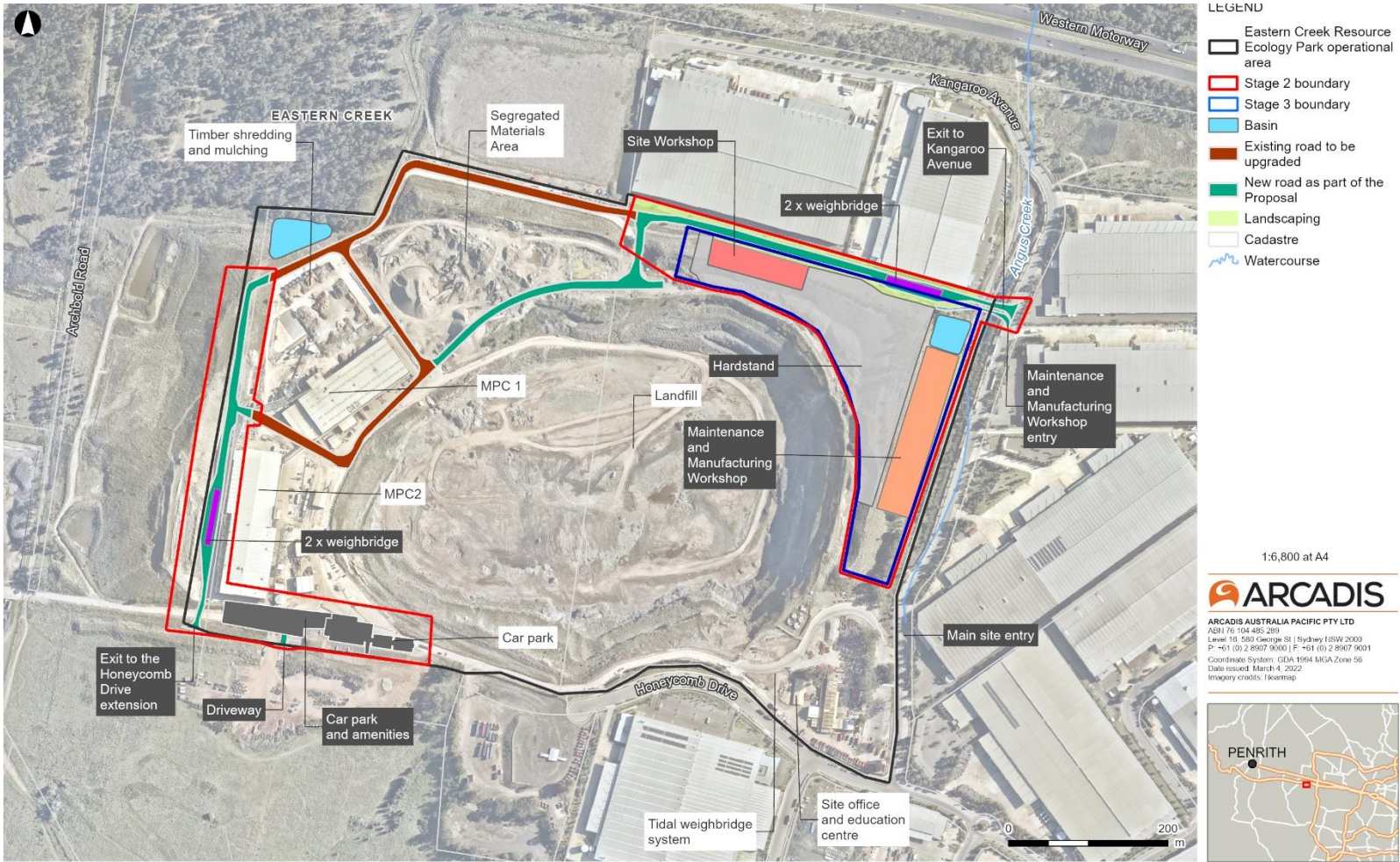


Figure 4-1 : The Proposal Site and Existing Infrastructure

## 4.5 Construction Works Description

### 4.5.1 Overview of Construction Program and staging

As noted above, each Stage of the Proposal would be constructed independently. The timing of each Stage would be contingent on a number of factors but are described indicatively below.

#### 4.5.1.1 Stage 1: Initial throughput Increase

No construction works are proposed as part of Stage 1.

#### 4.5.1.2 Stage 2: Internal Site Optimisation

As shown in **Table 4-1**, the key built form element proposed as part of Stage 2 would comprise the connection to the Honeycomb Drive extension and the connection to be established from the north-eastern corner of the Proposal Site onto Kangaroo Avenue as well as earthworks for Stage 3.

Honeycomb Drive is currently proposed to be extended from its western extent (currently a cul-de-sac located to approximately 420 m to the west of the intersection with Kangaroo Avenue) to a future arterial road being developed to the west of the Proposal Site. Construction of the connection at the Honeycomb Drive extension would therefore be contingent upon the completion of the construction of the Honeycomb Drive extension, scheduled for completion in 2022.

Construction of each connection would comprise:

- Phase 2a: Site establishment including removal of amenity berms as required
- Phase 2b: Establishment of pavement, road surface and kerbing
- Phase 2c: Other minor internal road works and construction of a carpark and amenities to the south of MPC2
- Phase 2d: Construction of the weighbridge control offices
- Phase 2e: Installation of weighbridges and wheel wash facilities
- Phase 2f: Signage, line marking and commissioning

**Table 4-5 : Stage 2 Construction Timing and Phasing (indicative)**

Month >	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Phase 2a																		
Phase 2b																		
Phase 2c																		
Phase 2d																		
Phase 2e																		
Phase 2f																		

#### 4.5.1.3 Stage 3: Installation of Supporting Infrastructure

As shown in **Table 4-1** the key built form element proposed as part of Stage 3 would comprise the Site Workshop and the Maintenance and manufacturing workshop. Stage 3 construction would be anticipated to take approximately 14 months to complete and would comprise:

- Phase 3a: Site establishment
- Phase 3b: Construction of the Site Workshop
- Phase 3c: Construction of the Maintenance and Manufacturing Workshop
- Phase 3d: Installation of perimeter fencing, landscaping and signage
- Phase 3e: Commissioning.

The individual timing of the above Phases would be subject to on site operational demands and may occur concurrently or as individual activities. **Table 4-6** provides a highly indicative breakdown of construction tasks associated with Stage 3.

**Table 4-6 : Stage 3 Construction Timing and Phasing (indicative)**

Month >	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Stage 3a														
Stage 3b														
Stage 3c														
Stage 3d														
Stage 3e														

## 4.5.2 Construction Activities and Construction Plant/ Equipment

**Table 4-7** presents key activities associated with the construction of the Proposal and the various types of plant and equipment required. The sound power levels for individual items of construction equipment and overall activity sound power levels are also presented in **Table 4-7**.

The activity sound power is considered to represent the typical worst-case level in a given 15-minute period. It is important to note that this sound power level is unlikely to be sustained at such a level for the duration of the activity. As a result, construction noise emissions during many 15-minute periods will be at lower levels.

**Table 4-7 : Indicative Construction Activities and Equipment for the Proposal with their Sound Power Level (SWL)**

Activity	Equipment	Qty	Individual SWL (dBA)	Activity SWL (dBA)
Phase 2a: Site Establishment				
<ul style="list-style-type: none"><li>Vegetation clearing, mulching and grubbing.</li><li>Earthworks, levelling and partial removal of amenity berms.</li><li>For the connection to the Honeycomb Drive extension material would be removed from the amenity berm to the west of MPC2, to level the area.</li><li>For the connection to Kangaroo material would be removed from the amenity berms to level the area.</li></ul>	Excavator	2	113	123
	Grader	2	113	
	Dump truck	4	112	
	Roller	2	106	
	Compactor	1	110	
	Dozer	2	113	
	Water truck	1	107	
	Mulcher	2	110	
Phase 2b: Establishment of Pavement, Road Surface and Kerbing				
<ul style="list-style-type: none"><li>Establishment of diversion drainage systems adjacent to internal road. Construction of culvert crossing Angus Creek. Intersection works. Establishment of pavement, road surface and kerbing. Pavement resurfacing of sealed roads.</li></ul>	Pavement laying machine	1	114	119
	Dump truck	1	112	
	Asphalt truck and sprayer	1	103	
	Concrete truck	1	109	
	Smooth drum roller	1	107	
	Water truck	1	107	
	Excavator	2	113	
	Hand tools	As required	105	
	Road truck	1	107	
Phase 2c: Other Minor Internal Road Works and Construction of Carpark to the south of MPC2				
<ul style="list-style-type: none"><li>Regrading, repaving and general maintenance of the existing road network.</li></ul>	Pavement laying machine	1	114	118
	Asphalt truck and sprayer	1	103	
	Excavator	1	113	



Activity	Equipment	Qty	Individual SWL (dBA)	Activity SWL (dBA)
• Regrading and establishment of pavement for a carpark to the south of MPC2.	Smooth drum roller	1	107	
	Road truck	1	107	
	Hand tools	As required	105	
Phase 2d: Installation of Weighbridges and Wheel Washing Facilities				
• Installation of weighbridges and wheel washing facilities.	Concrete truck	1	109	116
	Excavator	1	113	
	Hand tools	As required	105	
	Road truck	1	108	
	Forklifts	1	105	
	Mobile Crane	1	105	
Phase 2e: Construction of the Weighbridge Control Office				
• Erection of the weighbridge control offices. • Internal fit-out.	Concrete truck	1	109	112
	Hand tools	As required	105	
	Mobile Crane	1	105	
	Road truck	1	108	
Phase 2f: Signage, Line Marking and Commissioning				
• Signposting and line marking Installation of signage.	Line marking truck	1	108	111
	Mobile Crane	1	105	
	Cherry pickers	1	105	
Phase 3a: Site Establishment				
• Establishment of works boundary, construction compound and stockpiling area. • Establishment of levelled earthwork pads under the Site Workshop and Maintenance and Manufacturing Workshop areas.	Excavator	1	113	120
	Grader	1	113	
	Dump truck	1	112	
	Roller	1	106	
	Compactor	1	110	
	Dozer	1	113	
	Water truck	1	107	
Phase 3b: Construction of the Site Workshop				
	Concrete truck	1	109	112

Activity	Equipment	Qty	Individual SWL (dBA)	Activity SWL (dBA)
<ul style="list-style-type: none"><li>Laying of site services infrastructure.</li><li>Establishment of base slab and foundations.</li><li>Establishment of driveway access.</li><li>Erection of the Site Workshop structure.</li><li>Building fit-out.</li><li>Connection to key services.</li></ul>	Hand tools	As required	105	
	Mobile Crane	1	105	
	Road truck	1	108	
Phase 3c: Construction of the Maintenance and Manufacturing Workshop				
<ul style="list-style-type: none"><li>Laying of site services infrastructure.</li><li>Establishment of base slab and foundations.</li><li>Establishment of driveway access.</li><li>Erection of the Maintenance and Manufacturing Workshop structure.</li><li>Building fit-out.</li><li>Connection to key services.</li></ul>	Concrete truck	1	109	112
	Hand tools	As required	105	
	Mobile Crane	1	105	
	Road truck	1	108	
Phase 3d: Installation of Landscaping and Signage				
<ul style="list-style-type: none"><li>Installation of perimeter fencing</li><li>Installation of landscaping and signage.</li></ul>	Backhoe	1	108	110
	Hand tools	As required	105	
Phase 3e: Commissioning				
<ul style="list-style-type: none"><li>Demobilisation</li><li>Commissioning</li></ul>	Hand tools	As required	105	105

### 4.5.3 Construction Traffic Movements

Vehicles associated with construction would include heavy vehicles delivering construction plant and equipment, materials and removing waste from construction activities. Construction traffic would likely peak during periods where multiple construction phases and activities occur concurrently (which would be contingent on internal operational needs and final construction details). Indicative peak construction phases for each Stage, and their associated construction traffic volumes, are presented in **Table 4-8**.

**Table 4-8 : Peak Construction Phases and Construction Truck Movements**

Stage	Peak Construction Phase/s	Peak Hour Construction Traffic Movements (two-way)
<b>Stage 2</b>	Concurrent construction of: <ul style="list-style-type: none"> <li>• Phase 2a</li> <li>• Phase 2b</li> <li>• Phase 2c</li> <li>• Phase 2d</li> </ul>	6 medium and/or heavy vehicle movements per hour
<b>Stage 3</b>	Concurrent construction of: <ul style="list-style-type: none"> <li>• Phase 3b</li> <li>• Phase 3c</li> </ul>	2 medium and/or heavy vehicle movements per hour

#### 4.5.4 Construction Workforce and Hours

For each construction Stage, works would be undertaken during standard construction hours, as follows:

- 7.00am to 6.00pm Monday to Friday
- 8.00am to 1.00pm Saturday
- No works on Sundays or Public Holidays.



## 5 CONSTRUCTION NOISE ASSESSMENT

### 5.1 Predicted Construction Noise Levels

Based on the construction activities and plant SWL presented in section 4.5.2, the predicted  $L_{Aeq,15min}$  construction noise levels at sensitive receivers from the various construction activities during the ICNG's standard recommended hours are presented in **Table 5-1** for calm meteorological conditions and noise enhancing meteorological conditions in **Table 5-2**.

The results in **Table 5-1** and **Table 5-2** indicate that noise impacts from the listed construction activities would comply with the noise-affected and highly noise-affected NML at the nearest receivers.



**Table 5-1 : Predicted Construction Noise Levels during Standard Construction Hours –  $L_{Aeq,15min}$  dBA – Calm Meteorological Conditions**

Receiver	Stage 2 Construction							Stage 3 Construction						NML	Complies Yes/No
	a	b	c	d	e	f	Concurrent Construction a+b+c+d	a	b	c	d	e	Concurrent Construction b+c		
R0	30	37	21	21	17	23	38	24	17	10	10	10	18	53	Yes
R1	29	32	20	20	16	21	34	23	16	9	<10	<10	17	53	Yes
R2	30	33	20	21	17	21	35	23	16	10	<10	10	17	53	Yes
R3	30	32	21	20	16	21	34	23	17	10	<10	10	18	53	Yes
R4	35	38	23	25	21	24	40	26	20	13	12	15	21	53	Yes
R5	31	30	21	22	18	20	34	25	20	13	11	13	21	53	Yes
R6	29	26	17	20	16	20	31	26	17	11	10	11	18	53	Yes
R7	35	29	22	22	18	20	36	27	21	13	12	15	22	53	Yes
R8	33	26	19	23	19	20	34	27	19	13	12	14	20	53	Yes
R9	28	28	22	18	14	22	32	23	15	13	25	12	17	53	Yes
R10	27	17	20	15	11	<10	28	15	12	<10	<10	<10	12	47	Yes
R11	27	14	22	<10	<10	<10	28	12	7	<10	<10	<10	<10	47	Yes
R12	26	9	21	<10	<10	<10	27	11	<10	<10	<10	<10	<10	47	Yes
R13	26	10	23	<10	<10	<10	28	13	<10	<10	<10	<10	<10	47	Yes
I1	53	66	24	51	47	52	66	40	36	30	30	31	37	75	Yes
I2	47	67	23	51	47	61	67	56	53	45	45	48	54	75	Yes

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Receiver	Stage 2 Construction							Stage 3 Construction						NML	Complies Yes/No
	a	b	c	d	e	f	Concurrent Construction a+b+c+d	a	b	c	d	e	Concurrent Construction b+c		
I3	46	66	36	63	59	62	68	47	45	46	56	48	49	75	Yes
I4	45	59	36	37	33	52	59	40	36	39	46	41	41	75	Yes
I5	48	57	41	36	32	49	58	44	34	47	55	45	47	75	Yes
I6	50	50	64	49	45	49	64	50	42	45	61	42	47	75	Yes
I7	42	41	56	41	37	41	56	46	34	34	48	34	37	75	Yes
I8	39	37	52	37	33	37	52	45	32	36	42	32	37	75	Yes
I9	40	39	53	38	34	38	53	45	32	36	38	31	37	75	Yes
I10	44	43	58	43	39	43	58	40	36	36	35	35	39	75	Yes
I11	44	17	32	13	<10	13	44	15	<10	<10	<10	<10	11	75	Yes





**Table 5-2 : Predicted Construction Noise Levels during Standard Construction Hours –  $L_{Aeq,15min}$  dBA – Noise Enhancing Meteorological Condition**

Receiver	Stage 2						Concurrent Construction a+b+c+d	Stage 3						NML	Complies Yes/No
	a	b	c	d	e	f		a	b	c	d	e	Concurrent Construction b+c		
R0	35	43	27	26	22	28	44	29	22	15	15	15	23	53	Yes
R1	34	37	25	24	20	25	39	28	21	14	14	14	22	53	Yes
R2	35	38	25	26	22	26	40	28	21	15	14	15	22	53	Yes
R3	35	37	26	25	21	25	39	27	22	15	14	15	23	53	Yes
R4	40	43	28	30	26	29	45	31	25	18	17	19	26	53	Yes
R5	36	35	26	26	22	24	39	30	24	18	15	18	25	53	Yes
R6	34	31	22	25	21	25	36	31	21	16	15	16	22	53	Yes
R7	40	34	27	26	22	25	41	32	26	18	17	20	27	53	Yes
R8	37	31	24	27	23	24	38	32	24	18	16	18	25	53	Yes
R9	33	33	27	22	18	27	37	28	20	18	30	17	22	53	Yes
R10	33	22	26	21	17	14	34	21	18	<10	<10	<10	18	47	Yes
R11	33	19	27	12	<10	12	34	18	13	<10	<10	7	14	47	Yes
R12	32	15	26	10	<10	10	33	17	<10	<10	<10	<10	11	47	Yes
R13	31	15	29	12	<10	12	33	19	<10	11	<10	<10	13	47	Yes
I1	54	67	29	52	48	54	67	45	41	34	34	36	42	75	Yes

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Receiver	Stage 2						Concurrent Construction a+b+c+d	Stage 3						NML	Complies Yes/No
	a	b	c	d	e	f		a	b	c	d	e	Concurrent Construction b+c		
I2	49	68	27	52	48	62	68	58	55	46	46	49	56	75	Yes
I3	48	66	41	63	59	62	68	48	46	47	58	50	50	75	Yes
I4	48	60	41	40	36	53	60	43	38	41	49	45	43	75	Yes
I5	51	59	46	39	35	51	60	48	36	49	57	48	49	75	Yes
I6	51	51	65	50	46	50	65	53	43	48	62	44	49	75	Yes
I7	45	44	59	44	40	44	59	51	38	37	51	37	41	75	Yes
I8	44	42	56	42	38	42	57	50	37	41	47	37	42	75	Yes
I9	44	44	57	42	38	43	58	50	37	41	42	36	42	75	Yes
I10	47	45	60	45	41	45	60	45	39	39	37	37	42	75	Yes
I11	48	22	37	18	14	18	48	20	14	12	11	11	16	75	Yes

## 5.2 Construction Vibration

The following section presents an assessment of potential vibration impacts associated with general construction activities for the Proposal. Vibratory rollers would be the most likely potential source of potential vibration impacts associated with the Proposal.

The recommended safe working distances for vibration intensive plant suggested in the Transport for New South Wales *Construction Noise Strategy* have been adopted in this assessment to evaluate the potential for vibration impacts from the proposed works.

The safe working distances are quoted for both “cosmetic” damage (refer BS 7385) and human comfort (refer DEC’s Assessing Vibration - a technical guideline). The safe working distances are the typical distances that are required from plant/ equipment to meet the vibration criteria in BS 7385 and DEC’s Assessing Vibration - a technical guideline presented in Section 2.4.1.3.

**Table 5-3** sets out the recommended safe working distances for vibratory rollers of various sizes.

**Table 5-3 : Recommended Safe Working Distances for Vibration Intensive Plant**

Item	Description	Safe Working Distance	
		Cosmetic Damage	Human Comfort
<b>Vibratory Roller</b>	<50 kN (typically 1-2 tonnes)	5 m	15 m to 20 m
	<100 kN (typically 2-4 tonnes)	6 m	20 m
	<200 kN (typically 4-6 tonnes)	12 m	40 m
	<300 kN (typically 7-13 tonnes)	15 m	100 m
	>300 kN (typically 13-18 tonnes)	20 m	100 m
	>300 kN (>18 tonnes)	25 m	100 m
<b>Small Hydraulic Hammer</b>	300 kg (5 to 12t excavator)	2 m	7 m
<b>Medium Hydraulic Hammer</b>	900 kg (12 to 18t excavator)	7 m	23 m
<b>Jackhammer</b>	Hand held	1 m (nominal)	Avoid contact with structure

Review of the information in **Table 5-3** indicates that the safe working distances for building damage and human comfort applicable to the largest vibratory roller are 25 m and 100 m, respectively and 5 m and 20 m for smaller vibratory rollers.



The closest location where vibratory rollers may be used on the Proposal Site during the construction is at the northern side of the Proposal Site during the construction of the new exit onto Kangaroo Avenue. It is unlikely that vibratory rollers would operate within 25 meters from the off-site industrial buildings when the northern exit is constructed. However, it may be possible that vibratory rollers could be operated within 100m from the off-site industrial buildings. As such, it is unlikely that any vibration impacts would occur such as cosmetic damage, notwithstanding the potential for low levels of vibration being felt in the off-site industrial buildings.

Measures to manage and mitigate any potential impacts from vibration during construction of the Proposal are included in Section 8 of this report.

## 6 OPERATIONAL NOISE ASSESSMENT

### 6.1 Potential Operational Noise Impacts from the Proposal

Noise levels associated with the three operational stages have been predicted using the same modelling approach outlined in Section 2.5.

In assessing the operation of stage 2 and 3 modelling has considered the removal of relevant sections of the amenity berms. It should be noted that the existing amenity berms provide very little noise amelioration benefit for the surrounding residential receivers.

Based on the activities and plant SWL presented in **Table 4-2**, the predicted  $L_{Aeq,15min}$  noise levels at sensitive receivers are presented in the following tables, namely:

- **Table 6-1** for calm meteorological conditions for average vehicle movements
- **Table 6-2** for calm meteorological conditions for peak vehicle movements
- **Table 6-3** for noise enhancing meteorological conditions for average vehicle movements
- **Table 6-4** for noise enhancing meteorological conditions for peak vehicle movements

The results in **Table 6-1**, **Table 6-2**, **Table 6-3** and **Table 6-4** indicate that noise impacts from the Proposal Site will comply with the noise trigger levels at the nearest receivers.

It should be noted that operational noise from the Proposal Site complies comfortably for the peak heavy vehicle movement scenario which has a very low probability of occurrence under noise enhancing meteorological conditions.

Day and night time noise contour plots for stages 1, 2 and the full build scenario (Stage 3) under noise enhancing meteorological condition is presented in Appendix B showing the greatest extent of noise impact from the site.

The noise enhancing day and night time scenarios were modelled using the CONCAWE noise model with the following meteorological conditions:

- Day - Stability category D with 3.0 m/s source-to-receiver winds during the daytime and evening
- Night - Stability category F with 2.0 m/s source-to-receiver winds during the night time

The modelling results between the scenarios were very similar as can be seen in the noise contours.



**Table 6-1 : Predicted Operational Noise Levels –  $L_{Aeq,15min}$  dBA – Calm Meteorological Conditions – Average Vehicle Movements**

Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night	
<b>R0</b>	34	29	34	34	31	34	35	31	35	48	46	43	Yes
<b>R1</b>	33	28	33	33	29	33	33	29	33	48	46	43	Yes
<b>R2</b>	33	29	33	34	30	34	34	30	34	48	46	43	Yes
<b>R3</b>	31	27	31	32	28	32	32	28	32	48	46	43	Yes
<b>R4</b>	33	27	33	35	31	35	36	33	36	48	46	43	Yes
<b>R5</b>	29	25	29	30	26	30	30	27	30	48	46	43	Yes
<b>R6</b>	22	19	22	23	20	23	24	23	24	48	46	43	Yes
<b>R7</b>	29	26	29	29	27	29	33	32	33	48	46	43	Yes
<b>R8</b>	24	21	24	24	22	24	27	25	27	48	46	43	Yes
<b>R9</b>	21	19	21	23	21	23	25	24	25	48	46	43	Yes
<b>R10</b>	23	22	23	24	22	24	24	23	24	42	42	38	Yes
<b>R11</b>	24	24	24	24	24	24	24	24	24	42	42	38	Yes
<b>R12</b>	23	23	23	24	23	24	24	23	24	42	42	38	Yes
<b>R13</b>	23	23	23	24	23	24	24	23	24	42	42	38	Yes
<b>I1</b>	47	30	47	57	57	57	57	57	57	68	68	68	Yes
<b>I2</b>	44	31	44	58	58	58	59	58	59	68	68	68	Yes
<b>I3</b>	30	31	30	58	58	58	58	58	58	68	68	68	Yes



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Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night	
<b>I4</b>	29	30	29	48	48	48	48	48	48	68	68	68	Yes
<b>I5</b>	34	35	34	45	45	45	46	46	46	68	68	68	Yes
<b>I6</b>	56	56	56	56	56	56	56	56	56	68	68	68	Yes
<b>I7</b>	49	49	49	49	49	49	49	49	49	68	68	68	Yes
<b>I8</b>	45	47	45	45	45	45	45	45	45	68	68	68	Yes
<b>I9</b>	46	48	46	46	46	46	46	46	46	68	68	68	Yes
<b>I10</b>	50	50	50	50	50	50	50	50	50	68	68	68	Yes
<b>I11</b>	37	37	37	37	37	37	37	37	37	68	68	68	Yes

Note 1 - Day/ Evening - Stability category D with 3.0 m/s source-to-receiver winds

Note 2 - Night - Stability category F with 2.0 m/s source-to-receiver winds



**Table 6-2 : Predicted Operational Noise Levels –  $L_{Aeq,15min}$  dBA – Noise Enhancing Meteorological Conditions – Average Vehicle Movements**

Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day	Evening	Night	
R0	39	34	39	40	36	40	40	36	40	48	46	43	Yes
R1	38	33	38	38	34	38	38	35	38	48	46	43	Yes
R2	39	34	39	39	35	39	39	35	39	48	46	43	Yes
R3	37	32	37	37	33	37	37	33	37	48	46	43	Yes
R4	39	32	39	40	36	40	41	38	41	48	46	43	Yes
R5	34	30	34	35	31	35	35	33	35	48	46	43	Yes
R6	27	24	27	28	25	28	29	28	29	48	46	43	Yes
R7	34	31	34	34	32	34	38	37	38	48	46	43	Yes
R8	29	26	29	29	27	29	32	30	32	48	46	43	Yes
R9	27	25	27	28	26	28	30	29	30	48	46	43	Yes
R10	29	27	29	29	28	29	29	28	29	42	42	38	Yes
R11	29	29	29	30	29	30	30	29	30	42	42	38	Yes
R12	29	29	29	29	29	29	29	29	29	42	42	38	Yes
R13	29	29	29	29	29	29	29	29	29	42	42	38	Yes
I1	49	34	49	58	58	58	58	58	58	68	68	68	Yes
I2	49	36	49	60	59	60	60	59	60	68	68	68	Yes
I3	36	37	36	58	58	58	58	58	58	68	68	68	Yes

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**EASTERN CREEK RECYCLING ECOLOGY PARK**

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Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day	Evening	Night	
<b>I4</b>	36	37	36	49	49	49	50	50	50	68	68	68	Yes
<b>I5</b>	40	41	40	47	47	47	48	48	48	68	68	68	Yes
<b>I6</b>	58	58	58	57	57	57	57	57	57	68	68	68	Yes
<b>I7</b>	53	53	53	51	51	51	52	51	52	68	68	68	Yes
<b>I8</b>	51	52	51	49	49	49	50	49	50	68	68	68	Yes
<b>I9</b>	51	53	51	50	50	50	51	50	51	68	68	68	Yes
<b>I10</b>	54	54	54	52	52	52	53	53	53	68	68	68	Yes
<b>I11</b>	41	41	41	42	41	42	42	41	42	68	68	68	Yes

Note 1 - Day/ Evening - Stability category D with 3.0 m/s source-to-receiver winds

Note 2 - Night - Stability category F with 2.0 m/s source-to-receiver winds



**Table 6-3 : Predicted Operational Noise Levels –  $L_{Aeq,15min}$  dBA – Calm Meteorological Conditions – Peak Vehicle Movements**

Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger Levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day	Evening	Night	
<b>R0</b>	35	29	35	35	31	35	35	32	35	48	46	43	Yes
<b>R1</b>	34	28	34	34	29	34	34	30	34	48	46	43	Yes
<b>R2</b>	35	29	35	35	30	35	35	30	35	48	46	43	Yes
<b>R3</b>	33	27	33	33	28	33	33	29	33	48	46	43	Yes
<b>R4</b>	34	27	34	35	32	35	36	34	36	48	46	43	Yes
<b>R5</b>	30	25	30	30	27	30	31	28	31	48	46	43	Yes
<b>R6</b>	23	19	23	23	21	23	25	23	25	48	46	43	Yes
<b>R7</b>	30	26	30	30	27	30	33	32	33	48	46	43	Yes
<b>R8</b>	25	21	25	25	22	25	27	26	27	48	46	43	Yes
<b>R9</b>	23	21	23	24	22	24	25	24	25	48	46	43	Yes
<b>R10</b>	24	22	24	24	23	24	24	23	24	42	42	38	Yes
<b>R11</b>	25	24	25	25	24	25	25	24	25	42	42	38	Yes
<b>R12</b>	24	24	24	24	24	24	24	24	24	42	42	38	Yes
<b>R13</b>	24	24	24	24	23	24	24	23	24	42	42	38	Yes
<b>I1</b>	47	30	47	59	58	59	59	58	59	68	68	68	Yes
<b>I2</b>	45	31	45	60	60	60	60	60	60	68	68	68	Yes
<b>I3</b>	34	33	34	58	58	58	59	59	59	68	68	68	Yes

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Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger Levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day	Evening	Night	
<b>I4</b>	33	33	33	50	50	50	50	50	50	68	68	68	Yes
<b>I5</b>	38	38	38	47	47	47	47	47	47	68	68	68	Yes
<b>I6</b>	58	58	58	57	57	57	57	57	57	68	68	68	Yes
<b>I7</b>	52	52	52	50	50	50	50	50	50	68	68	68	Yes
<b>I8</b>	49	49	49	46	46	46	46	46	46	68	68	68	Yes
<b>I9</b>	50	50	50	47	47	47	47	47	47	68	68	68	Yes
<b>I10</b>	53	53	53	51	51	51	52	52	52	68	68	68	Yes
<b>I11</b>	37	37	37	37	37	37	37	37	37	68	68	68	Yes

Note 1 - Day/ Evening - Stability category D with 3.0 m/s source-to-receiver winds

Note 2 - Night - Stability category F with 2.0 m/s source-to-receiver winds



**Table 6-4 : Predicted Operational Noise Levels –  $L_{Aeq,15min}$  dBA – Noise Enhancing Meteorological Conditions – Peak Vehicle Movements**

Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger Levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day	Evening	Night	
<b>R0</b>	40	34	40	40	37	40	40	37	40	48	46	43	Yes
<b>R1</b>	39	34	39	39	35	39	39	35	39	48	46	43	Yes
<b>R2</b>	40	34	40	40	35	40	40	36	40	48	46	43	Yes
<b>R3</b>	38	32	38	38	33	38	38	34	38	48	46	43	Yes
<b>R4</b>	40	33	40	41	37	41	41	39	41	48	46	43	Yes
<b>R5</b>	35	30	35	35	32	35	36	33	36	48	46	43	Yes
<b>R6</b>	28	24	28	28	26	28	30	28	30	48	46	43	Yes
<b>R7</b>	35	32	35	35	32	35	38	37	38	48	46	43	Yes
<b>R8</b>	30	26	30	30	27	30	32	31	32	48	46	43	Yes
<b>R9</b>	28	26	28	29	27	29	30	29	30	48	46	43	Yes
<b>R10</b>	29	27	29	29	28	29	29	28	29	42	42	38	Yes
<b>R11</b>	30	29	30	30	29	30	30	29	30	42	42	38	Yes
<b>R12</b>	29	29	29	29	29	29	29	29	29	42	42	38	Yes
<b>R13</b>	29	29	29	29	29	29	29	29	29	42	42	38	Yes
<b>I1</b>	49	35	49	60	59	60	60	59	60	68	68	68	Yes
<b>I2</b>	51	36	51	61	61	61	61	61	61	68	68	68	Yes
<b>I3</b>	39	39	39	59	59	59	59	59	59	68	68	68	Yes



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Receiver	Stage 1			Stage 2			Stage 3			Noise Trigger Levels			Complies (Yes/No)
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>2</sup>	Day	Evening	Night	
<b>I4</b>	39	38	39	51	51	51	51	51	51	68	68	68	Yes
<b>I5</b>	43	43	43	49	49	49	49	49	49	68	68	68	Yes
<b>I6</b>	59	59	59	58	58	58	58	58	58	68	68	68	Yes
<b>I7</b>	55	55	55	53	53	53	53	53	53	68	68	68	Yes
<b>I8</b>	54	54	54	51	50	51	51	51	51	68	68	68	Yes
<b>I9</b>	54	54	54	51	51	51	52	51	52	68	68	68	Yes
<b>I10</b>	55	55	55	54	54	54	54	54	54	68	68	68	Yes
<b>I11</b>	42	42	42	42	41	42	42	41	42	68	68	68	Yes

Note 1 - Day/ Evening - Stability category D with 3.0 m/s source-to-receiver winds

Note 2 - Night - Stability category F with 2.0 m/s source-to-receiver winds

## 6.2 Potential Low Frequency Noise Impacts

To assess the potential noise impact from the Proposal Site present the C-weighted noise level minus A-weighted noise level have been calculated at the closest residential receiver in Minchinbury and Erskine Park.

**Table 6-5** summarises the C-weighted noise level minus A-weighted noise level assessment results for Stage 3.

The results indicated no exceedance of 15 dB for the difference between C- and A- weighting levels. Indicating that it is unlikely that there is a low frequency noise impact consistent with compliance noise monitoring conducted for the Proposal Site.

**Table 6-5 : Low Frequency Modifying Factor – Results**

Assessed Receiver	L <sub>Ceq,15min</sub> Noise Level – L <sub>Aeq,15min</sub> Noise Level (dB)
	Stage 3
R2	14.2
R11	11.7

## 6.3 Sleep Disturbance Assessment

The predicted L<sub>Amax</sub> noise levels from the Proposal Site at the nearest residential assessment locations are presented in **Table 6-6** for worst-case meteorological conditions (i.e. temperature inversions (F class) and 2 m/s wind). The predictions are for the night period only (10.00pm to 7.00am) coinciding with the typical sleep period in accordance with the *NPfI*.

The most likely potential source of maximum noise levels during site operations was observed and measured to be:

- Trucks dumping 115-125 dBA L<sub>Amax</sub>
- Excavator/ FEL scraping concrete 120-124 dBA L<sub>Amax</sub>
- Metal dropping <120 dBA L<sub>Amax</sub>
- Truck passbys <115 dBA L<sub>Amax</sub>

To be conservative, the upper level has been used for the noise predictions (i.e. 125 dBA L<sub>Amax</sub>) for the Stage 3 site operation which would be a worst case scenario. The predicted night time L<sub>Amax</sub> noise levels at receivers surrounding the Proposal Site are summarised in **Table 6-6**. The predicted L<sub>Amax</sub> noise levels in **Table 6-6** comply with the maximum noise trigger levels at all receivers.

The L<sub>Amax</sub> values were modelled at the building openings of MPC1, MPC2, Site Workshop and Maintenance and Manufacturing Workshop.

L<sub>Amax</sub> noise predictions are based on the relevant night time meteorological conditions determined in accordance with Fact Sheet D of the *NPfI*.



**Table 6-6 : Predicted  $L_{Amax}$  Noise Levels – Stage 3**

Receiver	Predicted Noise Level, $L_{Amax}$		Maximum Noise Trigger Level	Complies Yes/No
	Calm	NE		
<b>R0</b>	41	46	55	Yes
<b>R1</b>	42	47	55	Yes
<b>R2</b>	40	45	55	Yes
<b>R3</b>	40	44	55	Yes
<b>R4</b>	40	45	55	Yes
<b>R5</b>	40	45	55	Yes
<b>R6</b>	35	40	55	Yes
<b>R7</b>	41	46	55	Yes
<b>R8</b>	38	43	55	Yes
<b>R9</b>	35	40	55	Yes
<b>R10</b>	29	34	52	Yes
<b>R11</b>	24	29	52	Yes
<b>R12</b>	23	28	52	Yes
<b>R13</b>	23	29	52	Yes

## 7 CUMULATIVE NOISE ASSESSMENT

Section 2.6.3 outlines the cumulative assessment scenarios that have been considered for the Proposal, being:

- Stage 1 operation + Stage 2 construction
- Stage 2 operation + Stage 3 construction.

Operation and construction during the day would coincide. Therefore, the highest levels of noise from the Proposal Site would occur during the daytime when operation and construction occur concurrently.

Indicative cumulative operational and construction noise levels are presented in **Table 7-1**, **Table 7-2**, **Table 7-3** and **Table 7-4**.

The results in **Table 7-1**, **Table 7-2**, **Table 7-3** and **Table 7-4** indicate that cumulative noise impacts from Proposal Site would comply with the noise trigger levels at the nearest noise sensitive receivers.

**Table 7-1 : Cumulative Operational and Construction Noise Levels for Daytime – Calm Meteorological Conditions – Average Vehicle Movements**

Receiver	Stage 1 Operation + Stage 2 Construction			Stage 2 Operation + Stage 3 Construction			Daytime Trigger Levels
	Operational Noise Levels	Construction Noise Levels a+b+c+d	Total	Operational Noise Levels	Construction Noise Levels b+c	Total	
R0	34	38	39	34	18	34	48
R1	33	34	37	33	17	33	48
R2	33	35	37	34	17	34	48
R3	31	34	36	32	18	32	48
R4	33	40	41	35	21	35	48
R5	29	34	35	30	21	31	48
R6	22	31	32	23	18	24	48
R7	29	36	37	29	22	30	48
R8	24	34	34	24	20	25	48
R9	21	32	32	23	17	24	48
R10	23	28	29	24	12	24	42
R11	24	28	29	24	<10	24	42
R12	23	27	28	24	<10	24	42
R13	23	28	29	24	<10	24	42

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Receiver	Stage 1 Operation + Stage 2 Construction			Stage 2 Operation + Stage 3 Construction			Daytime Trigger Levels
	Operational Noise Levels	Construction Noise Levels a+b+c+d	Total	Operational Noise Levels	Construction Noise Levels b+c	Total	
I1	47	66	66	57	37	57	68
I2	44	67	67	58	54	59	68
I3	30	68	68	58	49	59	68
I4	29	59	59	48	41	49	68
I5	34	58	58	45	47	49	68
I6	56	64	65	56	47	57	68
I7	49	56	57	49	37	49	68
I8	45	52	53	45	37	46	68
I9	46	53	54	46	37	47	68
I10	50	58	59	50	39	50	68
I11	37	44	45	37	11	37	68

**Table 7-2 : Cumulative Operational and Construction Noise Levels for Daytime – Noise Enhancing Meteorological Conditions – Average Vehicle Movements**

Receiver	Stage 1 Operation + Stage 2 Construction			Stage 2 Operation + Stage 3 Construction			Daytime Trigger Levels
	Operational Noise Levels	Construction Noise Levels 2a+2b+2c+2d	Total	Operational Noise Levels	Construction Noise Levels b+c	Total	
R0	39	44	45	40	23	40	48
R1	38	39	42	38	22	38	48
R2	39	40	43	39	22	39	48
R3	37	39	41	37	23	37	48
R4	39	45	46	40	26	40	48
R5	34	39	40	35	25	35	48
R6	27	36	37	28	22	29	48
R7	34	41	42	34	27	35	48
R8	29	38	39	29	25	30	48
R9	27	37	37	28	22	29	48
R10	29	34	35	29	18	29	42
R11	29	34	35	30	14	30	42
R12	29	33	34	29	11	29	42
R13	29	33	34	29	13	29	42
I1	49	67	67	58	42	58	68
I2	49	68	68	60	56	61	68
I3	36	68	68	58	50	59	68
I4	36	60	60	49	43	50	68
I5	40	60	60	47	49	51	68
I6	58	65	66	57	49	58	68
I7	53	59	60	51	41	51	68
I8	51	57	58	49	42	50	68
I9	51	58	59	50	42	51	68
I10	54	60	61	52	42	52	68
I11	41	48	49	42	16	42	68

**Table 7-3 : Cumulative Operational and Construction Noise Levels for Daytime – Calm  
Meteorological Conditions - Peak Vehicle Movements**

Receiver	Stage 1 Operation + Stage 2 Construction			Stage 2 Operation + Stage 3 Construction			Daytime Trigger Levels
	Operational Noise levels	Construction Noise Levels 2a+2b+2c+2d	Total	Operational Noise levels	Construction Noise Levels b+c	Total	
R0	35	38	40	35	18	35	48
R1	34	34	37	34	17	34	48
R2	35	35	38	35	17	35	48
R3	33	34	37	33	18	33	48
R4	34	40	41	35	21	35	48
R5	30	34	35	30	21	31	48
R6	23	31	32	23	18	24	48
R7	30	36	37	30	22	31	48
R8	25	34	35	25	20	26	48
R9	23	32	33	24	17	25	42
R10	24	28	29	24	12	24	42
R11	25	28	30	25	<10	25	42
R12	24	27	29	24	<10	24	42
R13	24	28	29	24	<10	24	48
I1	47	66	66	59	37	59	68
I2	45	67	67	60	54	61	68
I3	34	68	68	58	49	59	68
I4	33	59	59	50	41	51	68
I5	38	58	58	47	47	50	68
I6	58	64	65	57	47	57	68
I7	52	56	57	50	37	50	68
I8	49	52	54	46	37	47	68
I9	50	53	55	47	37	47	68
I10	53	58	59	51	39	51	68
I11	37	44	45	37	11	37	68



**Table 7-4 : Cumulative Operational and Construction Noise Levels for Daytime – Noise Enhancing Meteorological Conditions – Peak Vehicle Movements**

Receiver	Stage 1 Operation + Stage 2 Construction			Stage 2 Operation + Stage 3 Construction			Daytime Trigger Levels
	Operational Noise levels	Construction Noise Levels	Total	Operational Noise levels	Construction Noise Levels	Total	
R0	40	44	45	40	23	40	48
R1	39	39	42	39	22	39	48
R2	40	40	43	40	22	40	48
R3	38	39	42	38	23	38	48
R4	40	45	46	41	26	41	48
R5	35	39	40	35	25	35	48
R6	28	36	37	28	22	29	48
R7	35	41	42	35	27	36	48
R8	30	38	39	30	25	31	48
R9	28	37	38	29	22	30	48
R10	29	34	35	29	18	29	42
R11	30	34	35	30	14	30	42
R12	29	33	34	29	11	29	42
R13	29	33	34	29	13	29	48
I1	49	67	67	60	42	60	68
I2	51	68	68	61	56	62	68
I3	39	68	68	59	50	60	68
I4	39	60	60	51	43	52	68
I5	43	60	60	49	49	52	68
I6	59	65	66	58	49	59	68
I7	55	59	60	53	41	53	68
I8	54	57	59	51	42	52	68
I9	54	58	59	51	42	52	68
I10	55	60	61	54	42	54	68
I11	42	48	49	42	16	42	68

## 8 MITIGATION MEASURES

### 8.1 Construction Noise and Vibration Mitigation

#### 8.1.1 Construction Noise

As outlined above, it is unlikely that noise levels associated with the construction of the Proposal would exceed the established NML. However, to ensure the best management strategies onsite the following measures should be documented in a CEMP and will include:

- Identification of nearby residences and other sensitive land uses
- Description and identification of construction activities, including work areas, equipment and duration
- Description of what work practices (generic and specific) will be applied to minimise noise and vibration
- Consider the selection of plant and processes with reduced noise emissions
- A complaint handling process
- Induction and training will be provided to relevant staff and sub- contractors outlining their responsibilities with regard to noise

#### 8.1.2 Construction Vibration

To manage vibration impacts, the following mitigation strategies are proposed:

- Undertake building dilapidation surveys on all buildings located within 100 m of the road construction prior to undertaking construction activities which have the potential to result in property damage.
- Use the smallest vibratory roller where feasible and reasonable
- Attended vibration measurements shall be undertaken at all buildings within 25 m of vibration generating activities when these activities commence to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.

### 8.2 Operational Noise and Vibration Mitigation

No specific operational noise mitigation measures have been identified as being required given the predicted compliance with the assessed operational noise criteria resulting from detailed project planning aimed at minimising potential impacts and the existing mitigation already in place. The Proposal Site has been successfully operating for many years with the existing mitigation measures as detailed in the approved Environmental Management System and these measures will remain and are considered adequate and appropriate.

## 9 CONCLUSIONS

RWDI has been commissioned to prepare a Noise and Vibration Impact Assessment to support the preparation of a State Significant Development (SSD) Environmental Impact Statement (EIS) under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) the upgrade and construction of supporting infrastructure to optimise the current operation at Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site.

Bingo is proposing to enhance resource recovery outcomes across the Greater Sydney area by increasing throughput at the Eastern Creek REP to capitalise on the underutilised state-of-the-art processing facilities (namely MPC2), and plant and equipment within the Eastern Creek REP. The Proposal would include the upgrade and construction of supporting infrastructure to optimise the current operation at the Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site. It is proposed to develop the Proposal Site in three stages:

- **Stage 1: Initial throughput:** Stage 1 would comprise 500,000 tpa of additional throughput to be received at the Eastern Creek REP to enhance resource recovery outcomes by increasing utilisation of onsite processing capabilities.
- **Stage 2: Internal site optimisation:** Stage 2 would facilitate the remaining throughput increase (an additional 450,000 tpa of the total 950,000 tpa proposed) to be received and processed across the Eastern Creek REP and operation of one of two proposed new exit connections. Stage 2 would include:
  - The construction and operation of a new exit connection to the Honeycomb Drive extension and installation of two associated outbound weighbridges and dedicated weighbridge office
  - The construction and operation of a new exit connection to Kangaroo Avenue in the north east of the Proposal Site and the installation of two associated outbound weighbridges and a dedicated weighbridge office
  - Upgrade of existing internal roads as required
  - Earthworks for Stage 3 site establishment
  - Additional carparking and amenities.
- **Stage 3: Installation of supporting infrastructure:** Stage 3 would comprise the redevelopment of the north-eastern corner of the Proposal Site. This would comprise:
  - Construction and operation of a Site Workshop (relocating this activity from elsewhere within the Proposal Site to a dedicated enclosed facility)
  - Construction and operation of a skip bin Maintenance and Manufacturing Workshop
  - Installation of landscaping, signage, security fencing and finishing works.

The assessment was conducted for operations, construction and road traffic in accordance with the relevant guidelines, standards and policies. Assessment was made using a number of conservative assumptions as outlined in the report.

A noise model was developed to compare noise levels from existing approved and proposed operations. The model adopted sound power levels of key acoustically significant plant and equipment derived from attended measurements and a database of similar equipment.

The construction noise and vibration assessment indicated the following:

- Predicted noise levels indicate that compliance would be achieved during standard hours at all residential and industrial receiver locations
- Best practice noise and vibration management measures are recommended to assist in the prevention of impacts

For the assessment of proposed operations existing operational hours were considered. The findings of the assessment are summarised below:

- Operational noise levels were assessed for the daytime, evening, night-time periods during calm and prevailing weather conditions. The assessment found that operating noise from the site during all stages of operation satisfies relevant NPfl project noise trigger levels for all periods at all assessment locations. No specific operational noise mitigation measures have been identified in this report primarily due to detailed project planning, the existing mitigation already in place and there are no exceedances of operational noise criteria. It should be noted that the Proposal Site has been operating for many years and measures have already been implemented at the Proposal Site and contained within the approved Environmental Management Systems which will remain and are considered adequate and appropriate.
- The potential for sleep disturbance from the Proposal Site during the night-time period has been assessed. The highest predicted external maximum noise level from site is L<sub>Amax</sub> 47 dB in Minchinbury and L<sub>Amax</sub> 34 dB in Erskine Park which is below the noise levels likely to cause sleep disturbance affects. Hence, it is unlikely that night-time operations from the project will cause sleep disturbance at the residential assessment locations.
- The potential for low frequency noise impacts from the Proposal Site has been assessed. The results indicated no exceedance of 15 dB for the difference between C- and A- weighting levels. Indicating that it is unlikely that there is a low frequency noise impact.

Road traffic generated by the proposal travels directly between the Proposal Site and the arterial road network via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive. There are no residential assessment locations located along nearby roads and, therefore, the potential for the road traffic noise criteria to be exceeded is highly unlikely.

As construction and operation would occur together on the Proposal Site an assessment of cumulative industrial noise and construction noise has been conducted. The assessment found that operational noise and construction noise from the Proposal Site during all stages of operation and construction satisfies relevant NPfl project noise trigger levels for all periods at all assessment locations



## 10 REFERENCES

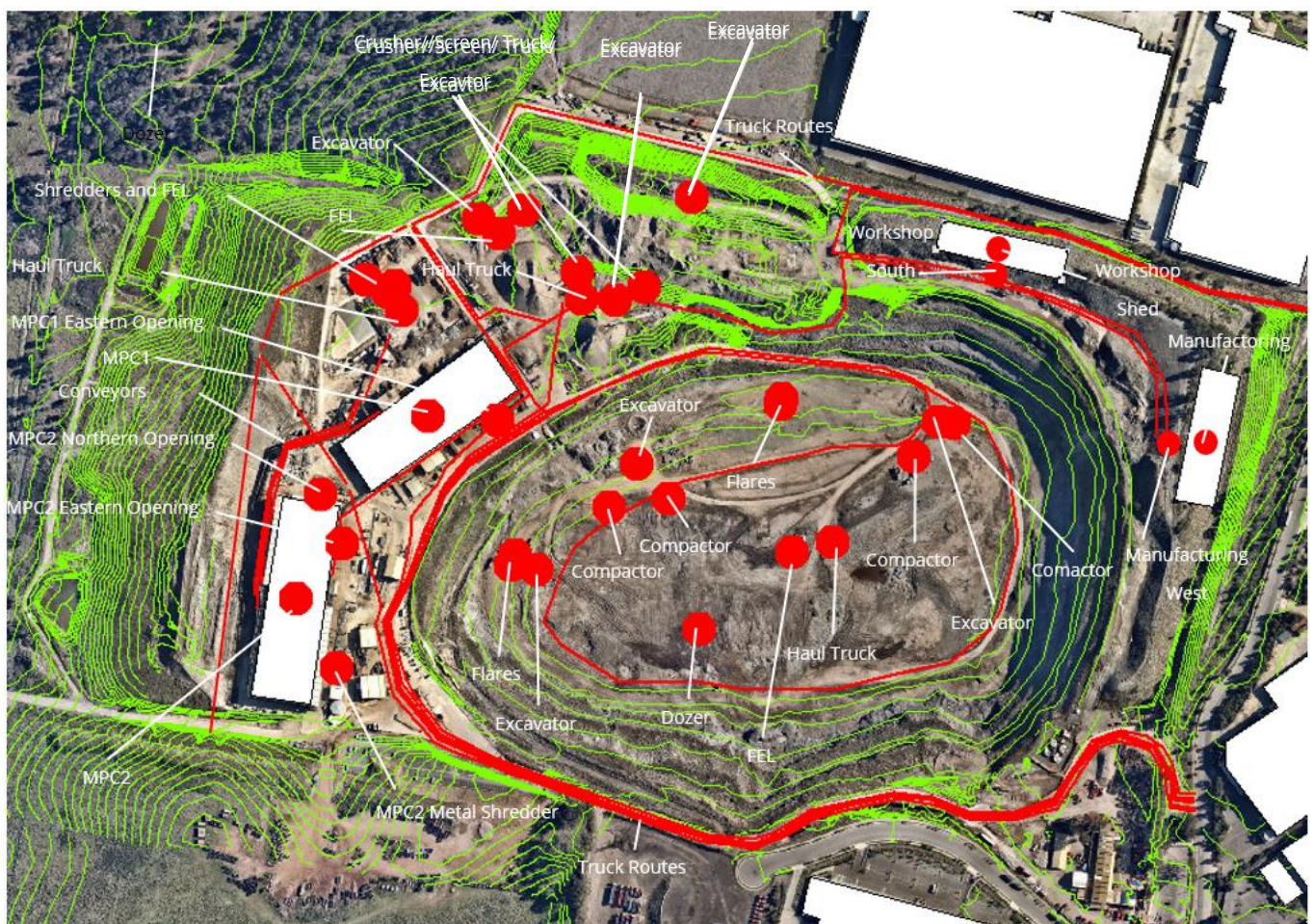
1. DEC (2006) *Assessing Vibration: a technical guideline*, Department of Environment and Conservation (NSW), February 2006.
2. DECC (2009) *Interim Construction Noise Guideline*, Department of Environment and Climate Change NSW, July 2009.
3. DECCW (2011) *NSW Road Noise Policy*, Department of Environment, Climate Change and Water NSW, March 2011.
4. EPA (2017) *Noise Policy for Industry*, Environment Protection Authority, October 2017.



# APPENDIX A

## EXAMPLE OF SOURCE LOCATIONS

### Stage 3

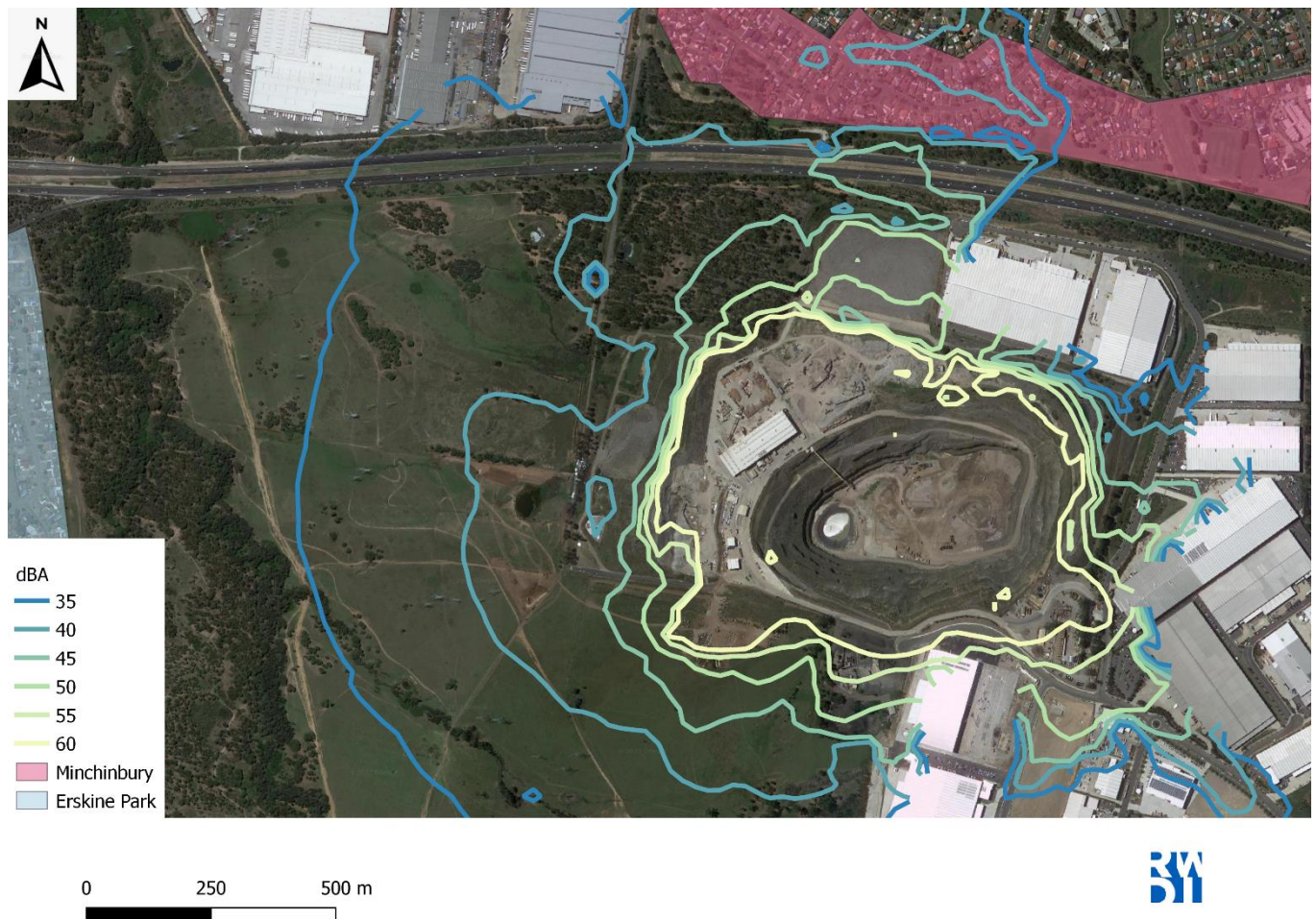




# APPENDIX B

## NOISE CONTOUR

### Stage 1 Noise Contour - Noise Enhancing Meteorological Conditions - Day

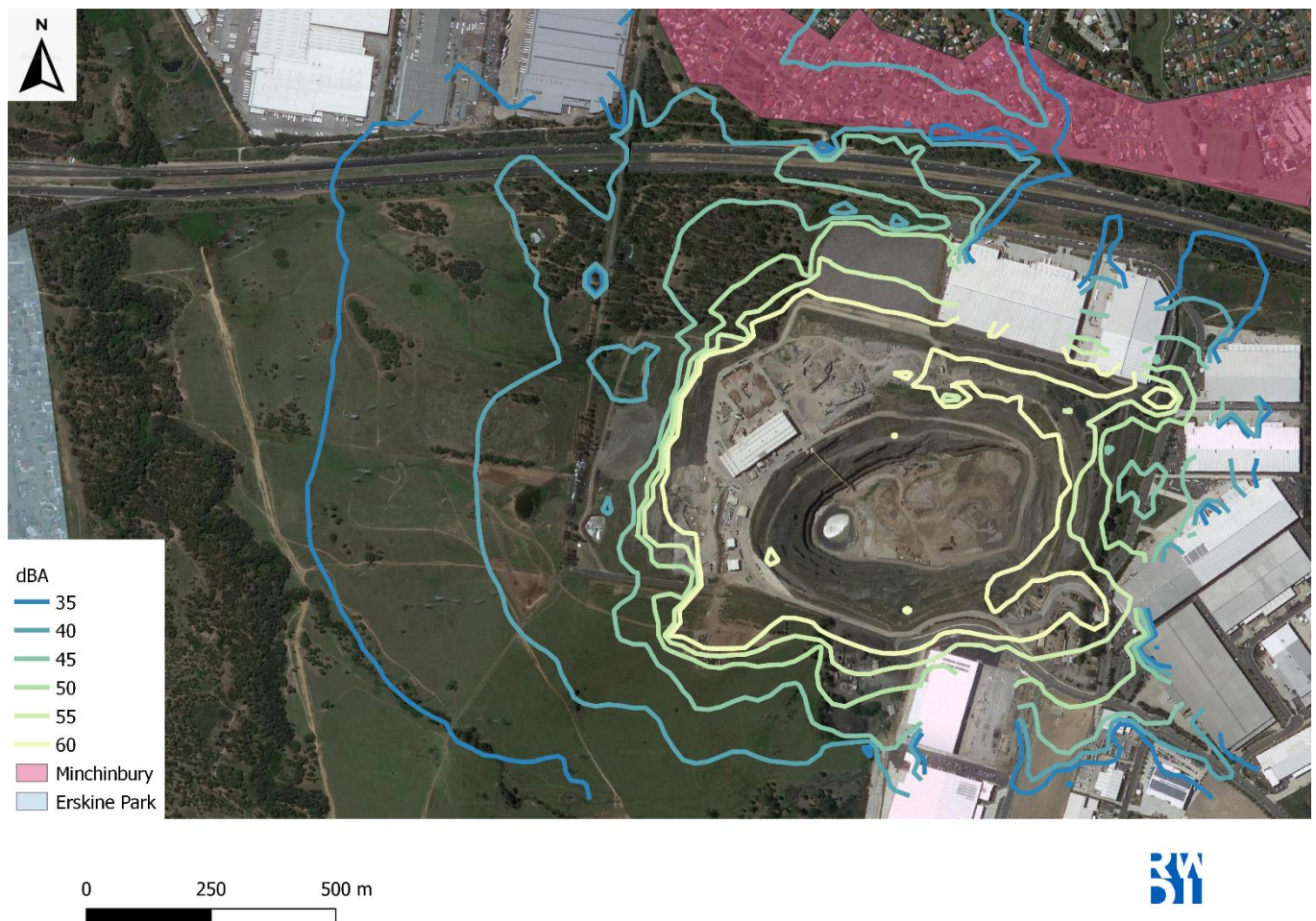




Stage 1 Noise Contour – Noise Enhancing Meteorological Conditions – Night

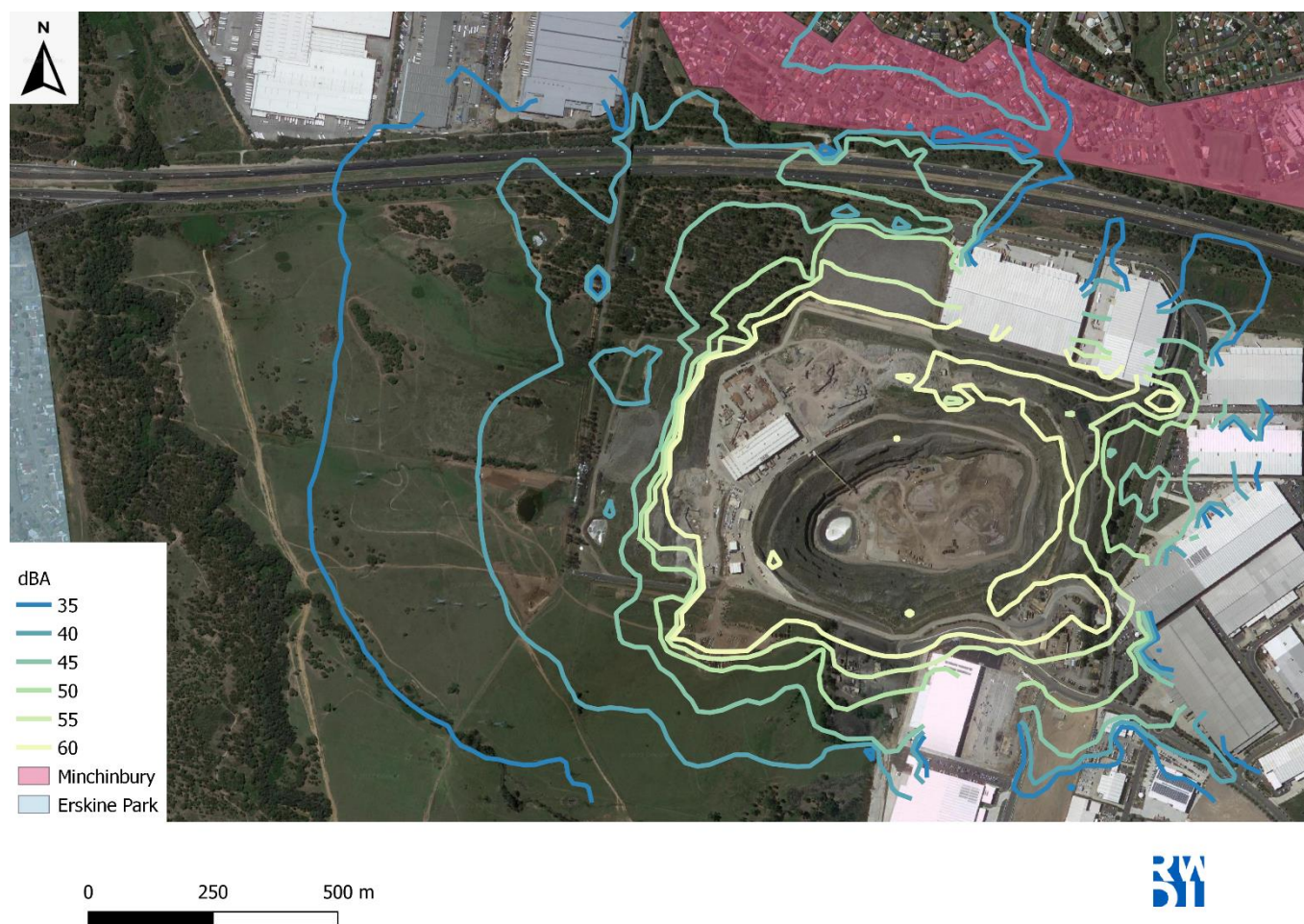


Stage 2 Noise Contour – Noise Enhancing Meteorological Conditions – Day

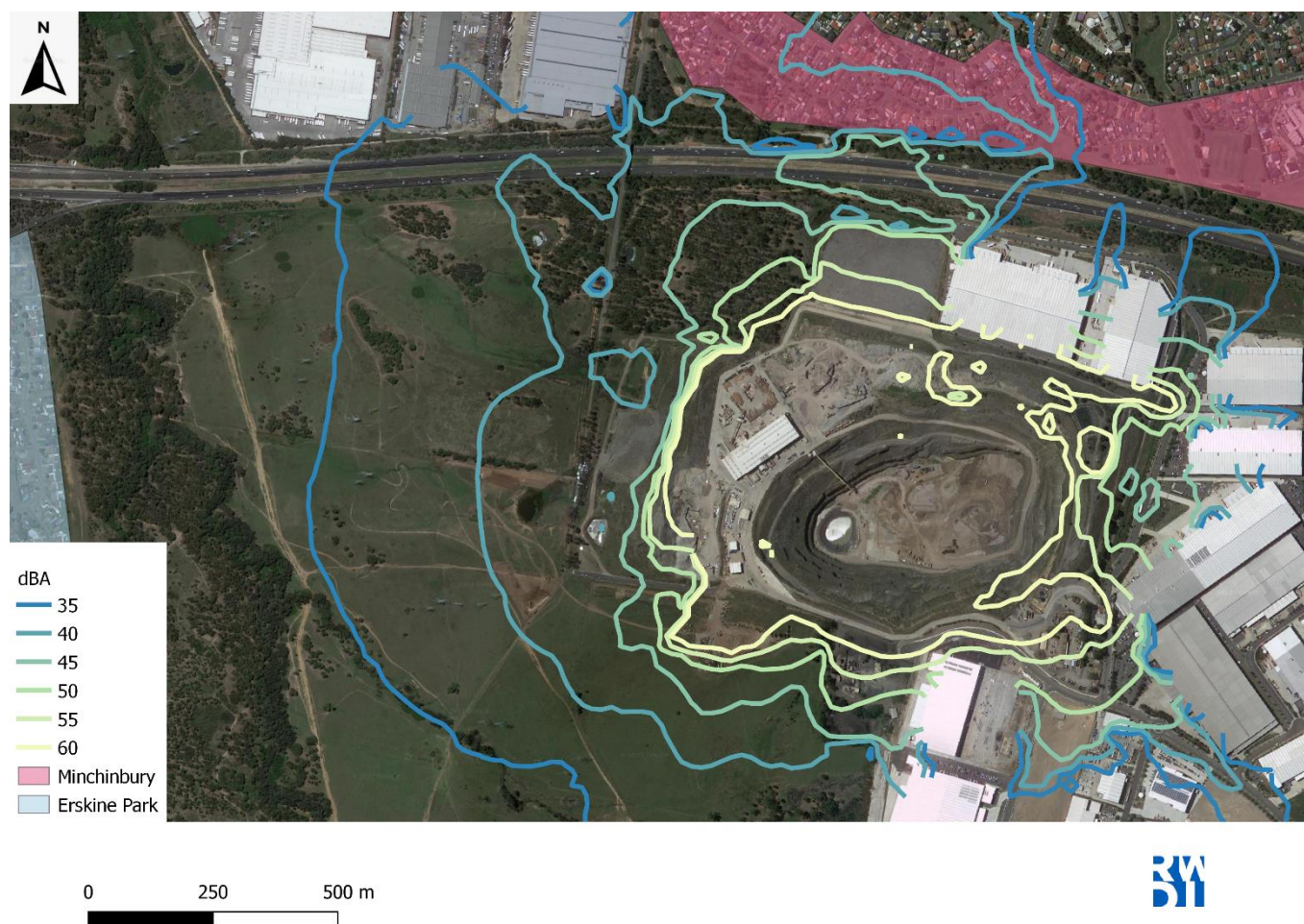




Stage 2 Noise Contour – Noise Enhancing Meteorological Conditions – Night



Stage 3 Noise Contour – Noise Enhancing Meteorological Conditions - Day





Stage 3 Noise Contour – Noise Enhancing Meteorological Conditions - Night

