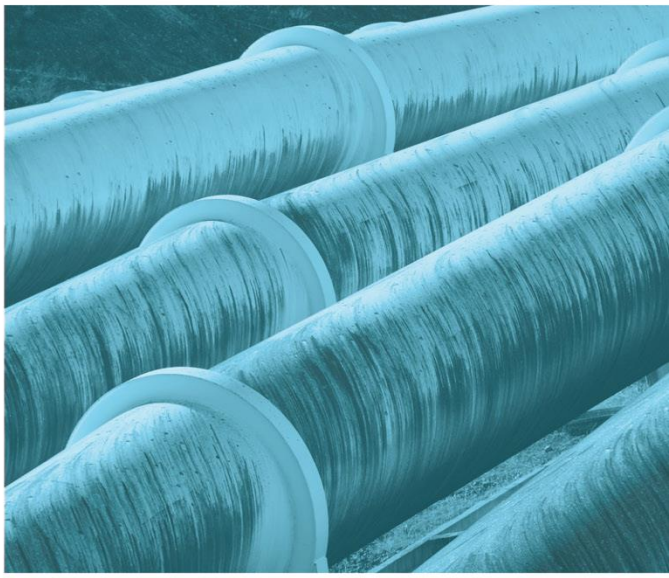



# Luddenham Advanced Resource Recovery Centre

## Responses to Request for Information

Prepared for Coombes Property Group & KLF Holdings
December 2021

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Responses to Request for Information

**Report Number**

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**Client**

Coombes Property Group & KLF Holdings

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v2 Final

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14 December 2021

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14 December 2021

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# Table of Contents

## Appendices



## Tables

# 1 Introduction

## 1.1 Overview

This report provides a response to comments or requests for additional information in relation to the Luddenham Advanced Resource Recovery Centre (ARRC) application (SSD 104446) from the following agencies:

- NSW Department of Planning, Industry and Environment (DPIE) (22 July 2021 and 16 August 2021);
- Western Sydney Planning Partnership (WSPP) (15 July 2021);
- Liverpool City Council (LCC) (29 June 2021);
- Environmental Projection Authority (EPA) (18 June 2021);
- EPA (12 July 2021); and
- Western Sydney Airport (WSA) (30 June 2021).

## 1.2 Updates since previous submission of this report

An earlier version of this report was submitted to DPIE in September 2021. Since submission, DPIE and the EPA have been further consulted regarding noise matters and the applicable operational noise criteria. DPIE has advised that rural amenity levels -5 dB are to be applied to the project. CPG and KLF respectfully maintain that this is unreasonably restrictive in view of the permissible uses under the new SEPP. CPG and KLF however, seek to resolve this matter and have accordingly updated the noise assessment, applying rural amenity -5 dB levels.

The updates to the noise assessment, accounting for the update of amenity levels result in the following (refer to Section 2.5 and Appendix D):

- significant exceedances at R3 and R6 during all periods;
- no other exceedances are predicted during the day;
- a moderate exceedance of +4 dB at R2 during evening operations;
- no other exceedances are predicted during the evening period; and
- exceedances between +1 dB and +8 dB would occur at R1, R2, R4, R5 and R7 during night-time operations.

To mitigate the impact of predicted noise exceedances at surrounding residences during the evening and night-time period, CPG and KLF have agreed to operate the ARRC during daytime hours only until WSA operations are properly underway. While not directly relevant to the ARRC application, it is noted that operating the ARRC during daytime hours only during this period would reduce the available amount of infill material and would lengthen the 15 years CPG/KLF previously proposed to fill the void.

To mitigate the impact of daytime exceedances on R6 and R3 (unoccupied), CPG and KLF have offered negotiated agreements to R6, while asking R3 to agree to the impacts with consideration of their plans to commercially develop their property. Prior to the commencement of evening and night-time operations, CPG and KLF will offer negotiated agreements to additional residences if required. CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as the noise criteria specified in the development consent, to allow the ARRC to

operate if agreements with residents cannot be reached - noting DPIE would need to be satisfied 'all best endeavours' to reach agreement have first been made.

DPIE has also requested further information in relation to:

- providing direct responses to matters raised in agency submissions on the Submissions Report (EMM 2021);
- consultation with LCC and WSA regarding matters raised in their respective submissions;
- heavy vehicle sound power levels; and
- a comparative analysis of the typical operating hours, traffic generation and pollution emission rates for specific agribusiness uses and the proposed ARRC.

To respond to DPIE's additional requests for information, and to account for the application of rural amenity levels - 5 dB the follow updates have been made to this report:

- direct responses to matters raised in agency submissions are provided in Appendix E, noting that responses to matters raised in these submissions have also been predominately addressed on an issues basis in the main report;
- a summary of further consultation with agencies since the lodgement of the Submissions Report is provided in Section1.3 with consultation materials contained in Appendix F;
- the Addendum Noise and Vibration Impact Assessment (NVIA) (Appendix D) and Sections 2.3 and 2.5 of this report have been revised to account for DPIE and EPA's direction regarding noise criteria;
- further justification for the suitability of adopted sound power levels for heavy vehicles is provided in Section 2.5.3; and
- a comparative analysis has been carried out and is provided in Appendix G.

## 1.3 Agency consultation

Engagement carried out with agency stakeholders since the original submission of this response report is outlined in Table 1.1.

**Table 1.1 Agency consultation**

| Stakeholder | Engagement method | Description |
|---|---|---|
| LCC | Email correspondence with Lina Kakish Manager City Planning October 2021.<br>Meeting held 27/10/21 via Teams<br>Attendees:<br>• Charles Wiafe - Manager Transport Management.<br>• Ian Stendara - Executive Planner | Email correspondence requested a meeting to discuss CPG and KLF's responses to matters raised in LCC's submission on the ARRC's Submission Report. A briefing letter was also provided to LCC outlining CPG and KLF's response to matters raised in LCC's submission. This briefing letter is contained in Appendix F.<br>Council did not raise any additional issues during the meeting and were satisfied with the responses to matters raised contained in the briefing letter.<br>Requested electronic copies of SiDRA analyses have since been provided to LCC. |

## Table 1.1 Agency consultation

| Stakeholder | Engagement method | Description |
|---|---|---|
| EPA | Briefing letter provided to DPIE and EPA 19/10/21<br>Meeting held 21/10/21 via zoom. | Briefing letter provided to DPIE and the EPA providing a summary of CPG and KLF's responses to EPA's request for additional information on the ARRC Submission Report (this briefing letter is contained in Appendix F).<br>The meeting with DPIE and the EPA centred predominantly around the applicable noise criteria for the project with DPIE and EPA confirming that the project should be assessed under rural amenity levels -5 dB.<br>As discussed above, while CPG and KLF respectfully maintain that application of rural amenity levels -5 dB is unreasonably restrictive in view of the permissible uses under the new SEPP. However, o resolve this matter, the Addendum NVIA and Section 2.5 of this response report has been updated to address criteria based on rural amenity levels -5 dB (refer Appendix D).<br>The methodology adopted for the road noise assessment and the progress of consultation with residences regarding negotiated agreements was also discussed with additional information provided to the EPA on these matters following the meeting. |
| WSA | Email correspondence with WSA September/October 2021<br>Meeting with WSA 28/10/21 | Email correspondence regarding the proposed Adams Road/Anton Road intersection treatment and timing of upgrade works (refer Section 2.4).<br>Meeting with WSA to provide an update of the progress of the ARRC application and the proposed deed between DPIE and the applicants which will provide WSA with more certainty around infill of the quarry void. A copy of the presentation shared with WSA is contained in Appendix F. |

# 2 Additional information

## 2.1 Site suitability

### 2.1.1 Planning approval pathway

#### i Information request

DPIE request that a planning approval pathway must be established and confirmed with the consent authority to backfill the quarry void using non-recyclables to ensure the stated purpose and objective of the present development proposal can be achieved.

#### ii Additional information

As summarised in the Executive Summary of the Environmental Impact Statement (EIS) (EMM 2020a) and discussed further in subsequent documents, the stated purpose and objectives of the ARRC to develop a commercial enterprise that provides the following benefits:

- **Addresses the need for waste and resource recovery infrastructure** – the NSW Government paper *Cleaning Up Our Act: The Future for Waste and Resource Recovery* (DPIE 2020) identifies a critical need to plan and prepare early for all types of waste and resource recovery infrastructure. Direction 3 of the paper is to 'Plan for future infrastructure' and notes the challenges in finding appropriate lands for waste and resource recovery land. The ARRC will provide:
  - an environmentally beneficial means of dealing with non-putrescible solid wastes by recycling up to 90% of the waste received, contributing to meeting of NSW government recycling targets; and
  - 20% of the required additional processing capacity required in the Sydney Metropolitan Area.
- **Strategic location** – the subject property, being located at the northern end of the future Western Sydney Airport and readily accessible from major transport links including Elizabeth Drive, M4 Motorway, M7 Motorway the Northern Road and the future M12 Motorway, is strategically located to provide recycling service to meet the projected demand associated with future development activities within the Aerotropolis and surrounding areas.
- **Shovel ready** – the ARRC will be developed as soon as all legislative requirements are met and will employ about 30 people (full-time equivalent, FTE) for about 18 months during construction and the ongoing employment of about 70 people (FTE) once at full production. Employees will be sourced from the local area where possible, to provide local job opportunities consistent with current Government objectives.
- **Economic benefits** Operations will provide a range of economic benefits for the Western Sydney economy including:
  - a total of 178 direct and indirect ongoing jobs;
  - $14 million in annual wage generation ($143 million over a 20-year period); and
  - $56 million in annual local area value added economic activity ($596 million over a 20-year period).

- **Economically viable means to fill the Luddenham Quarry void** – without a practical and economically viable method of rehabilitating the quarry site, the void will remain. The void will prevent the realisation of the draft Aerotropolis SEPP's vision at the subject property as about half of the property would be sterilised from future land uses compatible with the WSA and the proposed agribusiness land zoning. Instead, the void will remain a liability to future generations.

- **Realisation of Aerotropolis vision** – the project is integral to achieving the intended future agribusiness/industrial land use for the subject property as the project provides a commercially viable means to fill the quarry void (following approval of quarry rehabilitation activities). This vision is aligned with the long-term vision of the draft Western Sydney Aerotropolis Plan (draft Aerotropolis Plan) (Western Sydney Planning Partnership 2019) and the proposed Western Sydney Aerotropolis State Environmental Planning Policy (draft Aerotropolis SEPP).

As noted by DPIE, provision of an economically viable means to fill the Luddenham Quarry void, thereby allowing the full use of the site for uses that are in accordance with the vision for the Aerotropolis, requires an approval pathway that will allow the void to be filled.

The original Luddenham Quarry EIS (Douglas Nicolaisen & Associates 2003) described the infilling of the quarry void with inert waste. The Department of Infrastructure, Planning and Natural Resources Assessment Report (DIPNR 2004) noted this, but given uncertainties filling the void in 20 years' time noted that a separate application would need to be lodged for the infilling. It is therefore proposed to submit a separate application to modify the quarry's consent (DA 315-7-2003) to allow infilling with inert waste.

The suitability of this planning pathway is described in the attached legal advice prepared by John Whitehouse, Legal Consultant, MinterEllison.

As noted in the DPIE *Assessment Report, Luddenham Quarry Modification 5 Quarry Re-activation* (DPIE 2021), issued prior to approving MOD 5 to the quarry approval:

> "The Department also accepts that CPG's approach to lodging a separate development application to fill the void in future would be consistent with the original rehabilitation strategy. In this regard, the Department notes that CPG has lodged a separate SSD application for an ARRC, which is currently under assessment by the Department. Impacts associated with filling the void, as well as cumulative impacts associated with the concurrent operation of the quarry and the proposed ARRC are matters beyond the scope of this modification and will be considered as part of the separate SSD application.
>
> The Department is not able to require CPG to fill the void as part of the modification application, as this would not be consistent with the original proposal in the EIS, and the approved development consent. Notwithstanding, the Department is cognisant of the separate application to fill the void via the Stage 2 ARRC, and the need to ensure rehabilitation under the quarry's consent is consistent with this proposal. [emphasis added]"

Since the submission of the EIS, CPG/KLF have proposed to fill the void within 15 years of the commencement of ARRC operations and approval to infill the void.

Finally, it is noted that in the absence of an approval pathway to allow the void to be filled, it will remain as a void with a void lake in the base. This would leave a permanent water body within 250 m of Runway 05L/23R. This will mean that there will be a permanent water body with the attendant risk of attracting wildlife. It would also prevent the land from being capable of development for the purposes of agribusiness as envisaged in the Western Sydney Aerotropolis State Environmental Planning Policy.

If a new or currently unavailable approval pathway become available in future decades and this is pursued, infilling of the quarry would occur within the context of an increasingly developed (or completed developed) area with

more neighbours and greater congestion the roads. This will be avoided by CPG and KFL's proposal to fill the void within 15 years of the commencement of ARRC operations and of receiving approval to fill the void.

### 2.1.2 Filling options

#### i Information request

DPIE request a description of the different filling options and a cost-benefit assessment considering engineering, environmental (including but not limited to bird-strike risk, traffic, and noise), aviation safeguarding and financial factors. The examples given by DPIE for the SWOT analysis were uses as the basis for the strategies assessed.

#### ii Background information

A cost benefit analysis that compares the costs and benefits of the ARRC compared to a 'no project' scenario is presented in the economic impact assessment prepared by Gillespie Economics (2020) (Appendix M of the ARRC EIS).

The incremental costs and benefits are summarised in Table 3.1 of Gillespie Economics (2020) and is replicated in Table 2.1below.

**Table 2.1 Incremental costs and benefits of the Project**

| | Costs | Benefits |
|---|---|---|
| **Production** | Environmental impacts of project after mitigation, compensation and offset – refer to the full EIS for a detailed assessment | Producer surplus (revenue less opportunity cost of land, capital costs and operating costs, including mitigation, compensation and offset). |
| **Other externalities** | | Increased resource recovery and hence reduced financial and environmental costs of land fill.<br>Reduction in financial and externality costs of road transport arising from a centrally located ARRC. |

Source: Gillespie Economics (2020).

Gillespie Economics (2020) found that "based on the above it is evident that provided the environmental impacts of the project are minimised, mitigated, and managed, and the project is financially viable, there are likely to be net benefits to the local and wider economy, particularly Western Sydney."

The ARRC is projected to increase local area value-added economic activity generation in the order of $56 million per annum for ongoing operations (net present value of $596 million) and $11 million per annum during construction (net present value of $17 million).

The 'do nothing option' would forgo the estimated $141 million in annual direct and indirect output or business turnover contribution of the project to the Western Sydney economy.

The ARRC will create 70 direct jobs and project's contribution to the Western Sydney economy will create an estimated 108 indirect jobs to create a total of 178 direct and indirect jobs. Employees will be sourced from the local area where possible, to provide local job opportunities consistent with current Government objectives.

Part of the ARRC's contribution to the Western Sydney economy will be as a result of the infilling of the void with unrecyclable material and cover material, and the subsequent development of the land currently occupied by the void.

### iii Cost-benefit assessment

As for the operation of the ARRC as whole, the costs and benefits of alternative infilling strategies can be determined by comparison to a base case scenario: infilling the void with inert non-putrescible waste/cover material over 15 years.

The earliest that infilling of the void will commence is 2025 (subject to a modification to the quarry's consent be approved). Airport operations will commence in 2026. This would provide 1 to 2 years to fill the void if infilling was to be completed before the start of airport operations. This would require an infilling rate of between 0.75 and 1.5 million tonnes per annum. This is not economically feasible for the applicants. Therefore, infilling the void with inert non-putrescible waste/cover material over 5 years was assessed. This would result in some overlap between infilling activities and airport operations.

The changes to the environmental costs, airport safeguarding, capital costs, operational costs, financial benefits and opportunity costs of alternative infilling strategies, compared to the base case are provided in Table 2.2. Which compares the base case to the following alternative infilling strategies:

- no infilling – leaving the void so that it is safe, stable and non-polluting;
- infilling the void with inert non-putrescible waste/cover material over 5 years; and
- infilling with virgin excavated natural material (VENM)/excavated natural material (ENM) over 15 years.

In each case, it is assumed that the ARRC will be operating on the site.

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | **Description** | **Description** | **Change from base case** | **Description** | **Change from base case** | **Description** | **Change from base case** |
| **Environmental costs** | | | | | | | |
| Air quality | Environmental cost of air quality impacts will be low as criteria will be met at sensitive receivers. | No infilling activities to create dust. | Marginal increase or decrease in env. cost ⇧⇩ | Increased filling rates will require increased equipment operations and associated dust emissions. Impacts at sensitive receivers are expected to increase due to intensification of activities. | Increased env. cost ⇧ | Similar equipment needed for infill with inert waste. Dust emissions likely to similar to infill with inert waste, ie low as criteria will be met at sensitive receivers. | Minimal change in env. cost |
| Noise | Environmental cost of noise impacts to adjacent receivers from infilling activities will be low as infilling will use equivalent equipment to quarry activities so noise levels from infilling will be similar to approved noise levels from approved Quarry operations. | Noise impacts - no noise from infilling activities | Decreased env. cost ⇩ | Increased filling rates will require increased equipment operations and associated noise emissions. Impacts at sensitive receivers have not been modelled but will increase due to intensification of activities. | Increased env. cost ⇧ | Similar equipment needed for infill with inert waste. Noise emissions are likely to be similar to base case. | Minimal change in env. cost |

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | Description | Description | Change from base case | Description | Change from base case | Description | Change from base case |
| Surface and groundwater | Water will be removed from the base of the void to allow infilling, an impermeable barrier will be installed lining the void and a leachate collection and treatment system will be installed and operated. Collected and treated water will be reused on site. If water needs to be discharged, it will be treated prior to discharge to ensure that water quality objectives are met. Therefore, the environmental cost will be low. | The pit will remain an aquifer interference.<br>A void lake will remain in the base of the pit with the water level controlled by the balance of groundwater inflows/outflows, rainfall and evaporation. The water will be saline. It is predicted that no water discharges will occur. | Increased env. cost ⇧ | As for base case. | No change | As for base case (ENM leachate is likely to require capture and treatment). | No change |

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | Description | Description | Change from base case | Description | Change from base case | Description | Change from base case |
| Traffic and transport | Traffic generated by the ARRC, including material imported for cover material has been assessed - including the periods when there would be no infilling (during quarry extraction and after infilling is completed). The road network is predicted to operate at a similar level of service with or without the ARRC/infilling activities. The environmental cost will therefore be low. | No requirement to transport cover material to the site so there will be lower overall environmental costs. | Decreased env. cost ⇩ | Intensified trucking operations to bring material to site over a shorter period | Increased env. cost ⇧ | During the infilling period, unrecyclable material will be transport offsite for disposal (as opposed to being used as infill material).<br>Additional ENM/VENM material will need to be transported to the site to make up the shortfall. | Increased env. cost ⇧ |
| Biodiversity | Some low impacts to biodiversity due to the removal of water from the void.<br>Riparian corridor along Oaky Creek will be preserved. | Benefits to biodiversity due to the aquatic habitat formed by water in the void and fringing vegetation.<br>Riparian corridor along Oaky Creek will be preserved. | Decreased env. cost ⇩ | As for base case. | No change | As for base case. | No change |
| Visual | Infilling activities over 15 years will not be visible from public viewpoints, including from planes on Runway 05L/23R. | Void and lake will not be visible from public viewpoints, including from planes on Runway 05L/23R. | No change | Infilling activities over 5 years will not be visible from public viewpoints, including from planes on Runway 05L/23R | Similar impact over a shorter period | As for base case | No change |

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | Description | Description | Change from base case | Description | Change from base case | Description | Change from base case |
| **Airport safeguarding** | | | | | | | |
| Dust | No impacts to airport operations from infilling activities dust emissions. | No infilling activities to create dust.<br>There may be some wind-generated dust from walls of the void. | Marginal increase or decrease to hazard<br>⇧ ⇩ | Increased filling rates will require increased equipment operations and will increase associated dust emissions.<br>Impacts to airport operations have not been assessed. | Increased env. cost<br>⇧ | As for base case. | No change |
| Birdstrike | Infilling the void will remove the void lake, removing potential aquatic/avian fauna habitat from with 250 m of Runaway 05L/23R. This will reduce the birdstrike risk. | A void lake will remain in-perpetuity in the base of the pit forming aquatic/avian fauna habitat. This will increase the risk of birdstrike. | Increased hazard<br>⇧ | As for base case. | No change | As for base case. | No change |
| **Capital costs** | | | | | | | |
| Engineering | The infilling activities will require lining the void; construction of a leachate collection and treatment system; void infilling and capping in a manner that provides a geotechnically stable landform. | Some engineering will be required to ensure that the void is left in a safe, stable and non-polluting state | Decreased capital cost<br>⇩ | Similar to base case but increased fleet costs to allow faster infilling. | Increased capital cost<br>⇧ | Similar to base case. | Marginal increase or decrease in capital cost<br>⇧ ⇩ |

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | **Description** | **Description** | **Change from base case** | **Description** | **Change from base case** | **Description** | **Change from base case** |
| **Operational costs** | | | | | | | |
| Material handling costs | Material to fill the void (unrecyclable material and cover material) will need to be handled during filling of the void using a range of equipment | Unrecyclable material will need to be loaded to trucks for offsite disposal.<br>There will be no need to handle cover material.<br>There will be some costs in maintaining the void in a safe, stable and non-polluting state in-perpetuity. | Lower operating cost ⇩ | Similar to base case but increased fleet costs to allow faster infilling over a shorter period | Increase or decrease in operating cost ⇧ ⇩ | Additional material will need to be imported to fill the void (replacing unrecycled material) will require additional handling | Increased operating cost ⇧ |
| Export of unrecyclable material for disposal | Unrecyclable material will not need to be exported during the infill period (15 years). Unrecyclable material will need be exported outside of this period. | All unrecyclable material will need to be exported. | Increased operating cost ⇧ | Unrecyclable material will not need to be exported during the infill period (only 5 years). Unrecyclable material will need be exported outside of this period. | Increased operating cost ⇧ | All unrecyclable material will need to be exported | Increased operating cost ⇧ |
| Import of ENM/VENM | Some ENM/VNEM will need to be imported as cover material. | Not required. | Lower operating cost ⇩ | As for base case. | No change | Additional material will need to be imported to fill the void (replacing unrecycled material) | Increased operating cost ⇧ |
| Waste levy | Waste levy will apply for disposal of unrecyclable material regardless of location (to void or offsite locations). | As for base case. | No change | As for base case. | No change | As for base case. | No change |

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | Description | Description | Change from base case | Description | Change from base case | Description | Change from base case |
| **Financial and opportunity costs** | | | | | | | |
| Industrial/ commercial development of the site | Will allow the majority of the 19 ha site, with the exception of the Environment and Recreation zoned portion, to be developed for industrial/commercial uses in the medium-long term. | Void will permanently sterilise approximately half of the site from future development | Greatly increased (missed) opportunity cost ⇧ | Similar to base case but industrial/commercial development of the entire site could commence about 10 years sooner. | Minimal change (but benefit realised sooner) | As for base case. | No change |
| C&D waste recycling fee charged to customers | The fee received from customers to deliver C&D waste will not be affected by whether the quarry is infilled. | As for base case. | No change | As for base case. | No change | As for base case. | No change |
| ENM recycling fee charged to customers | Fee for ENM will be about 10% of the fee charged for C&D waste. Often, there is no fee charged for accepting VENM. ENM/VENM will used as cover material. | All ENM received by the ARRC will be exported from the site. | No change | As for base case. | No change | The recycling fee charged to customers would be substantially reduced if a greater portion of ENM/VENM was received. | Increased (missed) opportunity cost ⇧ |
| Employment | Quarry infill will provide employment for approximately 3–5 people over 15 years. | No employment for in fill activities. | Increased employm't (missed) opportunity cost ⇧ | Quarry infill will provide employment for approximately 5-8 people (based on the use of larger infill equipment) over 5 years. | Decreased employm't (missed) opportunity cost ⇩ | As for base case. | No change. |

## Table 2.2 Costs and benefits from of alternative infilling strategies

| Cost/benefit | Base case: 15-year inert waste infill with unrecyclable/cover material) | No infill | | 5-year inert waste infill (unrecyclable/cover material) | | 15-year infill with VENM/ENM | |
|---|---|---|---|---|---|---|---|
| | Description | Description | Change from base case | Description | Change from base case | Description | Change from base case |
| Preservation of existing Greater Sydney non-putrescible landfill capacity | Greater Sydney's current non-putrescible landfill capacity is forecast to be exhausted by 2028 so Greater Sydney requires an "Additional non-putrescible landfill capacity to accept >3 million tpa" (DPIE 2021b).<br>The disposal of unrecyclable materials in the void (with a total capacity of about 3 million tonnes) will not use Greater Sydney's limited non-putrescible landfill capacity. | The offsite disposal of unrecyclable materials will decrease Greater Sydney's limited non-putrescible landfill capacity. | Increased (missed) opportunity cost ⇧ | As for base case | No change | The offsite disposal of unrecyclable materials will decrease Greater Sydney's limited non-putrescible landfill capacity. | Increased (missed) opportunity cost ⇧ |

The change in costs and benefits from the base case (infilling the void with inert non-putrescible waste/cover material over 15 years) compared to the alternative strategies (Table 2.2) indicates that the following costs will increase or decrease:

- leaving the quarry unfilled would **reduce some environmental costs** (ie provide environmental benefits), most notably from the aquatic/avian fauna habitat that will form in the void lake, and would not increase any environmental costs;

- filling the void with inert waste over 5 years or filling the void with ENM/VNEM waste over 15 years would **increase some environmental costs** and will not decrease any environmental costs;

- filling the void with ENM/VNEM waste would **increase opportunity costs (ie reduce benefits)** due to reduced recycling fees – a primary ARRC revenue – from ENM/VNEM such that is unlikely that the ARRC would be commercially viable;

- filling the void with inert waste over 5 years will **increase airport hazards** and would not decrease any environmental hazards;

- leaving the quarry unfilled and filling the void with inert waste over 5 years would **increase some airport hazards** and would not decrease any environmental hazards;

- leaving the quarry unfilled will **decrease capital costs**, while filling the void with inert waste over 5 years would **increase capital costs**;

- leaving the quarry unfilled would **decrease some operating costs** and **increase** others, while filling the void with inert waste over 5 years or filling the void with inert waste over 15 years would **increase some operating costs**;

- leaving the quarry unfilled will **increase opportunity costs (ie reduce benefits)**, in particular would forego the economic benefits that would be derived the use of the land made available by infilling the quarry for commercial/industrial uses; and

- leaving the quarry unfilled or filling the void with ENM/VNEM would **increase opportunity costs (ie reduce benefits)**, that would be derived from diverting unrecyclable material from non-putrescible landfills, in Greater Sydney, reducing their capacity to accept waste from other sources.

Leaving the quarry unfilled would increase some costs and decrease others. Therefore, the analysis cannot determine whether the net benefits would be increased or decreased for this strategy. However, it is noted that this strategy would increase hazards to airport operations due to the presence of the permanent void lake within with 250 m of Runaway 05L/23R and would forego the benefits of the development of the entire site for commercial/industrial uses.

Infilling the void with inert waste over 5 years or infilling the void with ENM/VNEM waste over 15 years would increase some costs, but not increase any benefits. Therefore, each of these strategies would have a reduced net benefit compared to the base case. As the ARRC operations not related to the void would remain unchanged for all infilling strategies, the reduction in net benefits for these strategies would reduce the total net benefit of the ARRC.

Therefore, infilling the void with inert waste over 15 years provides the highest net benefits of the strategies considered. Whilst a useful analysis, this is purely illustrative as all options, other than that proposed by the applicants, are not viable.

### 2.1.3 SWOT analysis

#### i Information request

DPIE request a strengths-weaknesses-opportunities-threats (SWOT) analyses of the different options at different filling rates (e.g. completion of infilling before the commencement of airport operations, 5-year filling strategy, 15-year infilling strategy, etc).

#### ii Additional information

SWOT analyses for the base case and three alternative infilling strategies considered in Section 2.1.1 are provided in the following tables:

- Table 2.3: infilling the void with inert non-putrescible waste/cover material over 15 years;
- Table 2.4: no infilling – leaving the void so that it is safe, stable and non-polluting;
- Table 2.5: infilling the void with inert non-putrescible waste/cover material over 5 years; and
- Table 2.6: infilling with virgin excavated natural material (VENM)/excavated natural material (ENM) over 5–15 years.

In each case, it is assumed that the ARRC will be operating on the site. The strengths, weaknesses, opportunities and threats of ARRC operations that are not related to infilling the void are not considered.

**Table 2.3 Infilling the void with inert non-putrescible waste/cover material over 15 years (200,000 tpa)**

| | **Helpful** | **Harmful** |
|---|---|---|
| **Internal origin** | Strengths<br>Revenue from C&D waste recycling fee charged to customers will be used to pay infilling operational costs, including engineering works (eg compaction) to provide a stable landform for future development.<br>Provides an economically feasible method to allow the use of the majority of the 19-ha site for commercial/industrial uses following completion of infilling.<br>The void would be infilled with inert non-putrescible waste that will not attract wildlife.<br>Provides 15 years to source the approximately 1.5 million tonnes of material required to fill the void. Including ramp-up period for ARRC operations.<br>Encourages the efficient recycling of waste received by the ARRC, with 80–90% recovery of materials (ie 10–20% unrecyclable materials) to slow the rate of infilling.<br>No in-perpetuity management would be required following completion of infilling and settling. | Weaknesses<br>Only provides an inert waste disposal opportunity for 15 years.<br>Infilling would be concurrent with airport operations. Active management during infilling would be required, including daily use of cover material, compaction, leachate management and dust suppression.<br>Would require capping of the infilled void to allow development of the land. |

### Table 2.3 Infilling the void with inert non-putrescible waste/cover material over 15 years (200,000 tpa)

| | Helpful | Harmful |
|---|---|---|
| **External origin** | Opportunities<br>Avoids any long-term safety or environmental risks from leaving a void.<br>Assists to meet Greater Sydney's identified short-fall for non-putrescible waste disposal facilities.<br>During infilling (15 years), avoids the need to transport unrecyclable materials offsite for disposal/use of other inert waste disposal facilities.<br>Infilling activities would not be visible from public viewpoints, including from planes on Runway 05L/23R.<br>No impacts to airport operations identified by technical assessments. | Threats<br>Overlap of infilling activities with airport operations. If managed without appropriate controls, could result in visible dust plumes during infilling.<br>Requires trucks to deliver material to the site for recycling/disposal of unrecyclable material and cover material. |

### Table 2.4 No infilling – leaving the void so that it is safe, stable and non-polluting

| | Helpful | Harmful |
|---|---|---|
| **Internal origin** | Strengths<br>Addresses current consent (DA No 315-7-2003) and Mining Licence requirements.<br>No planning consent required to leave void.<br>Avoids the capital costs (eg leachate collection and management system) and operational costs associated will infilling the void. | Weaknesses<br>Sterilises over 50% of the 19 ha site from future development.<br>Requires ongoing management and monitoring of the void.<br>Provides no economic benefit.<br>Requires unrecyclable materials from the ARRC to be transported offsite for disposal for all stages or operation.<br>Requires installation of permanent measures to prevent unauthorised access to the void (eg security fencing) and management of these measures. |
| **External origin** | Opportunities<br>Void lake would provide habitat for species, including frogs and water birds, in perpetuity.<br>Avoids the need for trucks to deliver material to the site to fill the void.<br>Void lake and void would not be visible from public viewpoints, including from planes on Runway 05L/23R. | Threats<br>Wildlife attracted to void lake would be a hazard to airport operations.<br>Poor water quality may develop in the void lake.<br>Does not assist to meet Greater Sydney's identified short-fall for non-putrescible waste disposal facilities.<br>Potential for dust emissions from the sides of the void. |

## Table 2.5 Infilling the void with inert non-putrescible waste/cover material over 5 years (600,000 tpa)

| | Helpful | Harmful |
|---|---|---|
| **Internal origin** | Strengths<br>The void would be infilled with inert non-putrescible waste that would not attract wildlife.<br>No in-perpetuity management would be required following completion of infilling and settling. | Weaknesses<br>Only provides an inert waste disposal opportunity for 5 years.<br>Infilling would be concurrent with airport operations. Active management during infilling would be required, including daily use of cover material, compaction, leachate management and dust suppression.<br>Would require capping to allow development of the land.<br>Only 5 years available to source the approximately 1.5 million tonnes of material required to fill the void. Lower volumes of unrecyclable materials in first years of ARRC operations, during ramp up, would provide less unrecyclable material for infilling the void.<br>A greater portion of ENM/VENM would be required for void infill material. As the facility would receive greatly reduced or no revenue from accepting far larger volumes of VENM/ENM – filling the void would be not economically feasible.<br>Increased fleet required to allow faster infilling.<br>Decreasing the recycling recovery rate to less than 80% would increase the amount of material to fill the void but would not meet NSW Government recycling targets.<br>Potential impacts to airport operations from infilling rate of 600,000 tpa have not been assessed. |
| **External origin** | Opportunities<br>Avoids any long-term safety or environmental risks from leaving a void.<br>Assists to meet Greater Sydney's identified short-fall for non-putrescible waste disposal facilities (but not in critical period, post-2028).<br>During infilling (5 years), avoids the need to transport unrecyclable materials offsite for disposal/use of other inert waste disposal facilities.<br>Infilling activities would not be visible from public viewpoints, including from planes on Runway 05L/23R. | Threats<br>Overlap of infilling activities with airport operations. If managed without appropriate controls, could result in visible dust plumes during infilling. Activities more intense, with greater emissions, than for infilling over 15 years.<br>Requires increased trucks to deliver material to the site for fill to replace some of the unrecyclable material. |

### Table 2.6 Infilling with VENM/ENM over 5–15 years (200,000–600,000 tpa)

| | Helpful | Harmful |
|---|---|---|
| **Internal origin** | Strengths<br>The void would be infilled with inert non-putrescible waste (ENM is classified as a waste) that will not attract wildlife.<br>No in-perpetuity management would be required following completion of infilling and settling.<br>No impacts to airport operations identified by technical assessments for a filling rate of 200,000 tpa.<br>Infilling activities would not be visible from public viewpoints, including from planes on Runway 05L/23R. | Weaknesses<br>The facility would receive greatly reduced or no revenue from accepting VENM/ENM – this would mean that filling the void would be not economically feasible.<br>Infilling would be concurrent with airport operations. Active management during infilling would be required, including daily use of cover material, compaction and dust suppression.<br>A leachate management system may still be required as excavated natural material (eg tunnel spoil) may generate leachate if it contains potentially acid forming material or any contaminants.<br>Increased costs for handling the additional material that will need to be imported to fill the void (replacing unrecycled material).<br>Requires unrecyclable materials from the ARRC to be transported offsite for disposal. |
| **External origin** | Opportunities<br>Avoids any long-term safety or environmental risks from leaving a void. | Threats<br>Overlap of infilling activities with airport operations, if managed without appropriate controls, could result in visible dust plumes during infilling.<br>Requires trucks to deliver material to the site solely for the purpose of filling the void (as opposed unrecyclable material generated by the ARRC forming a large part of the fill). |

#### iii Summary

The SWOT tables indicate that leaving the void unfilled would have strengths and opportunities that would not occur for the infilling scenarios, in particular that no further development approval is required to leave the void unfilled and the void lake would provide aquatic and avian fauna habitat. However, it would prevent the long-term commercial/industrial development of the subject site.

All three infilling strategies all have the following strengths/opportunities:

- the void would be infilled with inert non-putrescible waste that will not attract wildlife;
- avoids any long-term safety or environmental risks from leaving a void;
- no in-perpetuity management would be required following completion of infilling and settling; and
- infilling activities would not be visible from public viewpoints, including from planes on Runway 05L/23R.

The three infilling strategies would all be concurrent with airport operations and will require active management during infilling (eg dust suppression). In all cases, the management required to prevent impacts to airport operations are expected to be feasible.

Infilling the void with inert non-putrescible waste/cover material over 5 years (600,000 tpa) or infilling with void with VENM/ENM will require additional material to be transported by trucked to the site to fill the void in the place of unrecyclable material generated by the ARRC. They will reduce (infill of inert waste over 5 years) or remove (infill with VENM/ENM) the opportunity for quarry infilling to assist to meet Greater Sydney's identified short-fall for non-putrescible waste disposal facilities.

Infilling the void with inert non-putrescible waste/cover material over 15 years (200,000 tpa) will allow revenue from the C&D waste recycling fee charged to customers to be used to pay for infilling costs to provide a stable landform for future development. It will therefore provide an economically feasible method to allow the use of the majority of the 19-ha site for commercial/industrial uses following completion of infilling. This strategy will provide an inert waste disposal opportunity for 15 years, assisting to meet Greater Sydney's identified short-fall for non-putrescible waste disposal facilities (particularly after 2028).

Infilling the void with inert non-putrescible waste/cover material over 15 years (200,000 tpa) provides strengths and opportunities that alternative infilling strategies (infilling over 5 years with inert waste and infilling with VENM/ENM) do not provide. It is therefore the preferred (and only economically feasible) alternative for infilling the void.

## 2.2 Consistency with the Western Sydney Aerotropolis planning framework

DPIE, WSPP and WSA request further consideration of the project's consistency against the objectives and provisions of the Aerotropolis planning package. The following sections provide further details regarding the specific requests of these agencies and a full assessment of the project against the relevant objectives, provisions and strategic outcomes of the Aerotropolis SEPP, Aerotropolis Plan, Aerotropolis draft Precinct Plan and the Aerotropolis Development Control Plan (DCP).

### 2.2.1 Western Sydney Aerotropolis SEPP

#### i Information request

DPIE request a detailed assessment of how the project aligns in the short- and longer-term with the planning and development outcomes proposed in the Aerotropolis SEPP. DPIE further request that where objectives and outcomes cannot be met, a discussion is provided on why the benefits of the project outweigh the inconsistencies with the strategic vision of the Aerotropolis.

DPIE also request an identification of the specific agribusiness uses under the Aerotropolis SEPP which may be compatible with the ARRC.

WSPP request that consideration should be given to the following provisions of the Aerotropolis SEPP:

- objectives of the respective zones in which the project is located and whether the project satisfies these;
- the relevant land use tables in terms of permissibility;
- Part 3: Airport safeguard controls;
- Clause 27: Preservation of trees and vegetation in the Environment and Recreation zone; and
- Clause 42: Development prior to a precinct plan.

WSA request a full assessment of the project against the objectives and provisions of the Aerotropolis SEPP.

### ii Additional information

#### a Aims of the Aerotropolis SEPP

A detailed consideration of the project's consistency against the aims of the Aerotropolis SEPP is provided in Table 2.7 below.

**Table 2.7 Consistency of project with the aims of the Aerotropolis SEPP**

| Aims of Policy | Consideration |
|---|---|
| (a) to facilitate development in the Western Sydney Aerotropolis in accordance with the objectives and principles of the Western Sydney Aerotropolis Plan | Consideration of the consistency of the ARRC with regard to the objectives and principles of the Western Sydney Aerotropolis Plan is considered in Table 2.13 |
| (b) to promote sustainable, orderly and transformational development in the Western Sydney Aerotropolis | The ARRC will become part of the Aerotropolis' circular economy, recycling waste materials that would otherwise be sent to landfill, extending the benefits provided by existing landfills for current and future generations. The recycled materials will largely be reused in construction projects in the Aerotropolis that will benefit current and future generations. The substitution of recycled materials for new materials also reduces the impacts from the production of the new materials and retains resources for the use of future generations.<br>The ARRC is considered an enabling development that will facilitate the transformation of the Aerotropolis through the provision of sustainable building materials and resource recovery services. |
| (c) to ensure development is compatible with the long-term growth and development of the Western Sydney Airport (including in relation to the operation of the Airport 24 hours a day) and other critical transport infrastructure | The ARRC is considered compatible with the long-term growth and development of the WSA as the ARRC:<br>• does not represent a noise sensitive land-use;<br>• does not impact adversely on the operation of the WSA as demonstrated by the Aeronautical Impact Assessment (Landrum and Brown 2020);<br>• it provides inert waste recovery services to the WSA and nearby critical transport infrastructure projects (such as the M12, Sydney Metro); and<br>• the subject property is centrally located to access existing and future major transport corridors. |
| (d) to promote employment and world-class innovation and provide for residential development in suitable locations | The ARRC will be an early generator of employment in the Aerotropolis. During operation it will provide locally 70 local direct jobs and a further 108 indirect jobs.<br>Using principles of the circular economy, the ARRC in collaboration with the University of NSW Material Sciences seeks to explore research opportunities to divert construction and demolition waste from fill to create building products to support the sustainable development of the Aerotropolis using advanced manufacturing processes.<br>It will also accept construction and demolition waste from residential development in the applicable zones within the Western Sydney Aerotropolis. |
| (e) to recognise the physical and cultural connection of the local Aboriginal community to the land and to incorporate local Aboriginal knowledge, culture and tradition into development | Consultation with the local Aboriginal community was carried out as part of the Aboriginal cultural heritage assessment (ACHA) which informed the EIS.<br>The ACHA identified the distribution of the artefacts identified during the test excavation program were 'sparse' and 'random' and therefore suggests the area was occupied occasionally with nearby creeks providing more reliable water sources than the ARRC site. Artefacts identified will be kept at the Gandangara Local Aboriginal Land Council Keeping Place. |

### Table 2.7 Consistency of project with the aims of the Aerotropolis SEPP

| Aims of Policy | Consideration |
|---|---|
| (f) to preserve land for future infrastructure development | The subject property is a single lot owned by the applicants. It shares its eastern and southern boundary with the WSA site. The layout of the WSA site does not show any transport access points through the subject property. The subject property is also not in the immediate vicinity of any planned transport corridors shown in the Western Sydney Infrastructure Plan.<br>While it is acknowledged the draft Agribusiness Precinct Plan released post submission of the development application shows a local collector road (ie a road that will connect local destinations) through the subject property, this precinct plan is still in draft form with the built form layouts in the precinct plan are highly conceptualised and may not represent the actual future demand for development types and size in the Agribusiness precinct.<br>The proposed concept masterplan of the subject property (refer Figure 4.3 of the Submissions Report) shows an alternative internal road network which would service the proposed final land use of the site development. |
| (g) to protect, maintain and enhance, and to minimise the impact of development on, trees and vegetation, soil quality and the health of waterways and to contribute to the conservation of biodiversity | Impacts to biodiversity have been minimised, through the avoidance of the Oaky Creek riparian zone and the minimisation of the ARRC site located within Environment and Recreation zoned land (only internal road and water management infrastructure will be located in land zoned Environment and Recreation). |
| (h) to recognise and protect the ecological and cultural value of Wianamatta–South Creek. | The project is not located in the Wianamatta–South Creek precinct however, like the vast majority of land within the Aerotropolis, is located within the broader Wianamatta–South Creek catchment. The ARRC has been designed to minimise impacts to receiving waterways with the storage, processing and handling of waste material proposed within a fully enclosed warehouse and the containment, treatment and reuse of water that has potentially come into contact with waste material. This will prevent any material change or degradation of the water quality of Oaky Creek due to discharges and therefore the broader Wianamatta–South Creek catchment. |

### b Agribusiness zone - objectives and land use table

A detailed consideration of the project's consistency against the objectives of the Agribusiness zone is provided in Table 2.8. A discussion regarding the compatibility of the ARRC with desirable land uses in the Agribusiness zone is provided below.

## Table 2.8 Objectives of agribusiness zone

| Objectives of zone | Consideration |
|---|---|
| To encourage diversity in agribusiness, including related supply chain industries and food production and processing that are appropriate for the area. | As noted in Section 6.2 of the Submission Report (EMM 2021a), the subject property, with a substantial, unrehabilitated quarry, presents a unique situation which is not envisaged in the Aerotropolis SEPP. In its current state, the subject property does not meet the Aerotropolis vision or Agribusiness zone objectives.<br>While the ARRC does not explicitly meet the objective "to encourage diversity in agribusiness", it provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate future agribusiness land use on the subject property.<br>The design of the ARRC, as a fully enclosed warehouse, is in keeping with the warehouses that are envisaged for the agribusiness zone and will not preclude the use of the remaining subject property or surrounding land parcels for agribusiness land use.<br>There will be extensive development within the Aerotropolis over the coming decades to realise the Aerotropolis vision of the respective precincts. The ARRC will be a vital local service for these construction projects.<br>It is noted that while food production and processing within the Agribusiness Zone will generate large volumes of putrescible wastes, these wastes will not be accepted by the ARRC. |
| To encourage sustainable and high technology agribusiness, including agricultural produce industries. | As above, while the ARRC does not explicitly meet this objective, it provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate the development of sustainable and high technology agribusiness on the subject property.<br>As a fully enclosed warehouse, the ARRC would not preclude the development of sustainable and high technological agribusiness on the subject property or surrounding areas.<br>The location of the subject property on the boundary of the agribusiness precinct approximately 350 m from Enterprise zoned land is also noted. |
| To enable sustainable agritourism. | The ARRC will not meet this objective directly. Notwithstanding, the ARRC site is located within the 20–30 ANEC contours. The development of the subject property for agritourism land uses in these contours may be constrained.<br>The ARRC will indirectly meet this objective through the local provision of sustainable building materials to support the development of sustainable agritourism developments in more appropriate locations within the agribusiness precinct. |
| To encourage development that is consistent with the character of Luddenham village. | The project will not impact the character of the Luddenham Village. ARRC traffic will generally not travel through Luddenham Village apart from traffic arising from businesses or construction projects within Luddenham Village. |
| To maintain the rural landscape character and biodiversity of the area. | The rural landscape character of the subject property has been substantially changed by the quarry void and construction of the WSA on two sides. The WSA fuel farm is being constructed to the south of the subject site.<br>The ARRC has been designed to protect the landscape character of the riparian corridor of Oaky Creek. |

The Agribusiness Land Use table outlines all land uses are permissible with consent with the exception of land uses not requiring consent (home based occupations) and prohibited land uses which include waste or resource management facilities as well as centre-based childcare, residential accommodation and recreational facilities.

Section 7.4 of the Aerotropolis Plan outlines desirable land uses within the Agribusiness precinct which include high technology industry, commercial offices, small and medium enterprises, urban services, warehousing and logistics, food technology and research, food production and processing, agribusiness and fresh food produce markets. The ARRC, which in itself represents the desirable land use of an urban service, is considered compatible with the majority of these identified desirable land uses. Constraints to the compatibility of the ARRC with land uses such as commercial offices are associated with the proximity to the WSA and existing land use rather than the nature of the ARRC development.

While it is acknowledged that resource recovery facilities are not permissible in the Agribusiness zone under the Aerotropolis SEPP, the ARRC is located on the eastern boundary of the Agribusiness precinct, within 360 m of Enterprise zones land (wherein resource recovery centres are permissible). As outlined in Table 2.8 above, the ARRC as a fully enclosed warehouse is in keeping with the warehouses that are envisaged for the Agribusiness zone and will not preclude the use of the remaining subject property, surrounding land parcels or broader Agribusiness precinct for agribusiness land use.

As noted in Section 3.4 of the Submissions Report, pursuant to Clause 53(1) of the Aerotropolis SEPP, the proposed ARRC continues to be permissible development as:

> a development application for development on land to which this Policy applies that was lodged and not finally determined before the commencement of this Policy is to be determined as if this Policy had not commenced.

Accordingly, under the former zoning, the site was zoned RU1 primary production. Clause 121 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) provides that development for the purpose of waste or resource management facilities (which includes resource recovery facilities), may be carried out by any person with consent on land in a prescribed zone. A prescribed zone includes RU1 Primary Production. Thus the Aerotropolis SEPP specifically provided for savings and transitional provisions to enable DAs lodged but not determined when the SEPP was made to be determined and approved as if the SEPP had not commenced. It was possible for the SEPP to have not included such as savings and transitional provision. The fact that such a provision was included indicates a clear intention that any such DAs could be approved.

### c Environment and Recreation zone - objectives

A detailed consideration of the project's consistency against the objectives of the Environment and Recreation zone is provided in Table 2.9. Resource recovery facilities are not permissible in the Environment and Recreation zone. As noted above, pursuant to Clause 53(1) of the Aerotropolis SEPP, the proposed ARRC continues to be permissible development. Notwithstanding it is noted the ARRC has been designed to avoid the riparian corridor of Oaky Creek with the portion of environment and recreation zoned land within the ARRC site already disturbed by the approved quarry land use with internal access road and a decommissioned water management dam located in this portion of the site.

### Table 2.9 Objective of the environment and recreation zone

| Objectives of zone | Consideration |
|---|---|
| To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values. | The ARRC has been designed to avoid the riparian corridor of Oaky Creek with only small portion of the ARRC site (internal road and water management infrastructure) located within the Environment and Recreation portions of the site.<br>It is noted the portion of environment and recreation zoned land within the ARRC site has already been disturbed by the existing quarry land use with internal access road and a decommissioned water management dam located in this portion of the site.<br>The Oaky Creek riparian corridor would be maintained and enhanced during the development of the ARRC, infilling of the quarry (pending separate planning approval) and final commercial/industrial land uses of the subject property. |
| To protect the ecological, scenic and recreation values of waterways, including Wianamatta–South Creek and its tributaries. | The ARRC has been designed to protect the ecological values of Oaky Creek, a tributary of South Creek.<br>Oaky Creek, which forms the boundary between the subject property and the WSA is considered to have no recreational value to the broader Aerotropolis. |
| To provide a range of recreational settings and activities and compatible land uses. | This objective is not considered relevant to the environment and recreation zoned land within the subject property. |
| To protect and conserve the environment, including threatened and other species of native fauna and flora and their habitats, areas of high biodiversity significance and ecological communities. | As above, the ARRC has been designed to avoid the riparian corridor of Oaky Creek.<br>The Oaky Creek riparian corridor will be maintained and enhanced during the development of the ARRC, infilling of the quarry (pending separate planning approval) and final commercial/industrial land uses on the subject property.<br>It is acknowledged that infilling the quarry will remove potential aquatic fauna habitat in the form a void lake, which are a potential food source for birds. However, this needs to be balanced by the potential hazard from having this habitat within 250 m of Runway 05L/23R. |

### d Airport Safeguards

An assessment against each of the airport safeguard planning requirements outlined in the draft Aerotropolis Plan was provided in Table 3.1 of the EIS. These safeguard requirements were also considered in the Aeronautical Impact Assessment (Landrum and Brown 2020).

As requested, an assessment of the project against Part 3 Development Controls - Airport Safeguards of the Aerotropolis SEPP is provided in Table 2.10. As outlined in Table 2.10, the project is considered consistent with the objectives of this clause.

### Table 2.10 Development controls – airport safeguards

| Objectives of clause | Consideration |
|---|---|
| **Aircraft noise** | |
| (1) The objectives of this clause are— | |
| (a) to prevent certain noise sensitive development on land near the Airport, and | The ARRC will not be a noise sensitive land use. |
| (b) to minimise the impact of aircraft noise for other noise sensitive development, and | As above, the ARRC will not be a noise sensitive land use. |

## Table 2.10 Development controls – airport safeguards

| Objectives of clause | Consideration |
|---|---|
| (c) to ensure that land use and development near the Airport do not hinder or have other adverse impacts on the ongoing, safe and efficient 24 hours a day operation of the Airport. | The Aeronautical Impact Assessment (Landrum and Brown 2020); found that the ARRC will not impact adversely on the ongoing, safe and efficient 24 hours a day operation of WSA. |
| **Building wind shear and turbulence** | |
| (1) The objective of this clause is to safeguard Airport operations from wind shear and turbulence generated by buildings. | The ARRC is located outside of the assessment trigger area, therefore the warehouse would not be considered to create wind shear or turbulence (Landrum and Brown 2020) |
| **Wildlife hazards** | |
| (1) The objective of this clause is to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport. | The ARRC will not attract wildlife as it is a fully enclosed warehouse with only non-putrescible waste permitted to be accepted on site. A Wildlife strike and Birdstrike risk review found the subject property posed an extremely low wildlife and birdstrike risk to WSA (EMM 2020b).<br>The ARRC will also enable an economically viable means to fill the quarry void which will otherwise contain a void lake forming aquatic/avian fauna habitat. |
| (2) Development consent must not be granted to relevant development on land in the 13 km wildlife buffer zone unless the consent authority—<br>(a) has consulted the relevant Commonwealth body, and | CPG/KLF have consulted Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) regarding the proposed ARRC and the approved quarry on the subject property and will continue to consult with DITRDC. |
| (b) has considered a written assessment of the wildlife that is likely to be present on the land and the risk of the wildlife to the operation of the Airport provided by the applicant, which includes— | A Wildlife Strike and Birdstrike Risk Review (EMM 2020b) was appended to the Aeronautical Impact Assessment submitted with the EIS. This assessment considered the overall proposed development on the subject property, including reactivation of the quarry, development of the ARRC, infilling of the quarry void and concluded that the subject property posed an extremely low wildlife and birdstrike risk to WSA. |

## Table 2.10 Development controls – airport safeguards

| Objectives of clause | Consideration |
|---|---|
| (i) species, size, quantity, flock behaviour and the particular times of day or year when the wildlife is likely to be present, and | While the Wildlife Strike and Birdstrike Risk Review did not include a species survey, bird species were recorded during the fieldwork carried out to inform the Biodiversity Development Assessment Report (BDAR) (EMM 2021b). Species recorded over three days of field visit included:<br>• Australian Wood Duck;<br>• Pacific Black Duck;<br>• Grey Teal;<br>• Eurasian Coot;<br>• Australasian Swamphen;<br>• Great Cormorant;<br>• Brown Goshawk;<br>• Sacred Kingfisher;<br>• Superb Fairywren;<br>• Grey Shrikethrush;<br>• Grey Butcherbird;<br>• Magpie-lark;<br>• Australian Raven;<br>• Red-whiskered Bulbul; and<br>• Red-browed Finch.<br>Although some of these species are associated with flocks, they were not observed in flocks at the time of the field work.<br>As noted in the Wildlife Strike and Birdstrike Risk Review (EMM 2020), recommencement of activities on the subject property and the development of the ARRC, including infilling the void and transformation of the existing grassland paddock to the ARRC site is likely to reduce the subject property's attractiveness to wildlife and birds. |
| (ii) whether any of the wildlife is a threatened species, and | No threatened bird species were identified during the fieldwork carried out to inform the BDAR. Southern Myotis was recorded foraging around the main water bodies and two were observed roosting underneath the bridge that crosses Oaky Creek located just out of the subject property to the south-east. The ARRC will slightly reduce the available habitat for this species (this impact will be offset through the biodiversity offset scheme). |
| (iii) a description of how the assessment was carried out. | Section 3 of the Wildlife Strike and Birdstrike Risk Review outlined the approach to the assessment. |

## Table 2.10 Development controls – airport safeguards

| Objectives of clause | Consideration |
|---|---|
| (c) is satisfied that the development will mitigate the risk of wildlife to the operation of the Airport, including, for example, measures relating to—<br>(i) waste management, landscaping, grass, fencing, stormwater or water areas, or<br>(ii) the dispersal of wildlife from the land by the removal of food or the use of spikes, wire or nets. | As outlined in the EIS and reiterated in the Submissions Report, all waste will be accepted, stored, processed and dispatched within the ARRC warehouse.<br>A guiding principle of the Landscape Concept Design presented in Appendix T of the EIS is to minimise bird and wildlife attraction.<br>The Wildlife Strike and Birdstrike Risk Review recommended the following measures that will be incorporated as relevant into the operational environmental management plan (OEMP) for the ARRC:<br>• No new planting (eg for landscaping) should occur on the subject property that produces fruit or flowers that are likely to attract birds and wildlife.<br>• Any new water features (such as the onsite water detention basin) should either be netted or have lines across it with moving flags on them to deter birds using it.<br>• The existing water management dam should be netted or have lines for flags across it to deter birds from utilising it.<br>• The building designs, including on fences and lighting, should ensure that they minimise areas for wildlife, especially birds, to use for breeding, roosting, or perching. This could include:<br>– having no eaves or ensuring there is no access to the roof through the eaves; and<br>– using 'bird-spikes' on roof edges, fences and lighting.<br>• Should birds or other wildlife start using the site, particularly in numbers of concern, the operator of the ARRC and/or quarry will engage specialists to survey/monitor the species utilising the site to remedy the situation. |
| (3) Despite subclause (2), development for the following purposes is prohibited on land in the 3 km wildlife buffer zone—<br>(a) livestock processing industries, | Not applicable. |
| (b) turf farming, | Not applicable. |
| (c) waste or resource management facilities that consist of outdoor processing, storage or handling of organic or putrescible waste. | The ARRC will not accept organic or putrescible waste and will not include outdoor processing, storage or handling of any waste material. |
| **Lighting** | |
| (1) The objective of this clause is to safeguard Airport operations from the risk of lighting and reflectivity distractions for pilots. | It is noted that this clause is not triggered by the development as it is not development for the purposes outlined in subclause 2(a). Notwithstanding, while 24-hour operations are proposed, lighting will be designed to comply with lighting requirements for the WSA. |
| 2(b) installation and operation of external lighting in connection with construction works that is likely to be obtrusive or create light spill outside the land on which the construction works are carried out. | Construction activities will only occur during standard daytime construction hours and therefore lighting will not be required during the construction phase. |

### Table 2.10 Development controls – airport safeguards

| Objectives of clause | Consideration |
|---|---|
| **Airspace operations** | |
| (1) The objectives of this clause are—<br>(a) to provide for the effective and ongoing operation of the Airport by ensuring that its operation is not compromised by development that penetrates the prescribed airspace for the Airport | The ARRC will not penetrate into prescribed airspace. |

## e Preservation of trees and vegetation in the Environment and Recreation zone

As requested, an assessment of the project against Part 4 Development Controls - General, Clause 27 Preservation of trees and vegetation in Environment and Recreation Zone and Cumberland Plain is provided in Table 2.11. As outlined in Table 2.11, the project is considered consistent with the objectives of this clause.

### Table 2.11 Preservation of trees and vegetation in environment and recreation zone and Cumberland Plain

| Objectives of clause | Consideration |
|---|---|
| (1) The objectives of this clause are—<br>(a) to preserve the amenity of the Western Sydney Aerotropolis through the preservation of trees and vegetation, and<br>(b) to promote the conservation of, and minimise the impact of development on, native vegetation. | The ARRC has been designed to minimise impact on existing native vegetation on the subject property, avoiding impact on the Oaky Creek riparian corridor.<br>It is noted the portion of environment and recreation zoned land within the ARRC site has already been disturbed by the existing quarry land use with an internal access road and a decommissioned water management dam located in this portion of the site. |
| (4) Development consent under subclause (3) must not be granted unless the consent authority is satisfied that, in relation to the disturbance of native vegetation caused by the clearing— | |
| (a) there is no reasonable alternative available to the disturbance of the native vegetation, and<br>(b) any impact of the proposed clearing on biodiversity values is avoided or minimised, and | As noted in the Submissions Report and revised BDAR (EMM 2021b), following the implementation of avoidance and minimisation measures, the ARRC will remove approximately 0.42 hectares of native vegetation. The loss of this vegetation will be offset through the biodiversity offset scheme (BOS). |
| (c) the disturbance of the native vegetation will not increase salinity, and | The minor removal of native vegetation required for construction of the ARRC is not considered likely to increase salinity of the soil. |
| (d) native vegetation inadvertently disturbed for the purposes of construction will be re-instated where possible on completion of construction, and | Native vegetation either directly or indirectly impacted by the construction of the ARRC will be offset through the BOS. |
| (e) the loss of remnant native vegetation caused by the disturbance will be compensated by revegetation on or near the land to avoid a net loss of remnant native vegetation, and | As stated above, native vegetation either directly or indirectly impacted by the construction of the ARRC will be offset through the BOS, landscaping on the subject property will use endemic native species which will be selected with reference to WSA and Aerotropolis specific guidance material on preferred species will be made prior to the selection of species. |

### Table 2.11 Preservation of trees and vegetation in environment and recreation zone and Cumberland Plain

| Objectives of clause | Consideration |
|---|---|
| (f) the clearing of the vegetation is unlikely to cause or increase soil erosion, salination, land slip, flooding, pollution or other adverse land or water impacts. | The management measures outlined in Appendix B of the Submission Report will be documented in a Construction Environmental Management Plan, to ensure there is no soil erosion, salination or other adverse land or water impact. |

## f Development prior to the commencement of a precinct plan

As requested, an assessment of the project against Part 7 Precinct plans and master plans, Clause 40 Precinct Plans is provided in Table 2.12. As outlined in Table 2.12, the project is generally consistent with this provision.

### Table 2.12 Development prior to a precinct plan

| Objectives of clause | Consideration |
|---|---|
| (1) This clause applies to development on land in the Western Sydney Aerotropolis if there is no precinct plan in force for the land. | The consistency of the project with the key considerations and strategic outcomes of the draft Agribusiness Precinct Plan are considered in Table 2.14 and Table 2.15 below. |
| (2) However, this clause does not apply to development that has a capital investment value of less than $1 million and relates to an existing or permitted use. | Notwithstanding that the development application for the ARRC was submitted prior to the commencement of the Aerotropolis SEPP, the ARRC has a capital investment value of more than $1 million and accordingly a consideration of this clause has been carried out below. |
| (3) Development consent must not be granted to development to which this clause applies, unless the consent authority has considered whether the development—<br>(a) is consistent with the aims of this Policy, and | A consideration of the ARRC's consistency with the aims of the Aerotropolis SEPP is provided in Table 2.7. |
| (b) will result in further fragmentation of land holdings, and | The project will not result in fragmentation of landholdings. |
| (c) will hinder the orderly and co-ordinated provision of infrastructure that is planned for the land to which this Policy applies, and | The project will not hinder the orderly and co-ordinated provision of infrastructure. The applicants have been liaising with service providers, Liverpool Council and TfNSW throughout the project development and assessment process.<br>The project will involve the upgrade of Adams Road between Elizabeth Drive and Anton Road and an interim upgrade to the which will improve the local road provide benefits for surrounding developments. |
| (d) is incompatible with, or will adversely affect, the long-term operations and development of the Airport, and | As outlined in Table 2.10 above, the project is not incompatible, and will not adversely affect the short-term or long-term operations of the WSA or the development of the WSA. |

**Table 2.12 Development prior to a precinct plan**

| Objectives of clause | Consideration |
|---|---|
| (e) appropriately takes into account the development and infrastructure in areas adjacent to the development, and | The ARRC has been designed with consideration to the existing and predicted land use.<br>As noted above, the ARRC will not adversely affect the construction or operation of the WSA. While noise exceedances are predicted at some existing rural residential receivers (refer Section 2.5below), these exceedances should be viewed in the context of 24-hour WSA operations commencing in 2026 and the location of the subject property and adjacent land uses within the 25-30 ANEC contours. The applicants are open to progressing negotiated agreements with affected land holders to mitigate noise exceedances prior to the start of 24-hour airport operations.<br>As shown in the draft Agribusiness Precinct Plan, these isolated residences are expected to transition to a land use more consistent with the objectives of the Agribusiness including safeguarding on WSA operations from noise sensitive land uses.<br>As noted in Section 3.5 of the Submissions Report, the ARRC is considered generally consistent with the vision of the draft Precinct Plan with the ARRC warehouse design consistent with the bulk and scale of the warehouse developments depicted in the draft Precinct Plan with the ARRC site being located close to areas identified for employment generation. |
| (f) will be adequately serviced by public utility infrastructure. | A Servicing Strategy report was prepared by Indesco Pty Ltd (2020) for the project (Appendix S of the EIS). This details the infrastructure requirements for operation of the ARRC. This report was prepared in consultation with Sydney Water and Endeavour Energy.<br>While services augmentations, lead-ins and service connections to the site will be required to support the ARRC. Some temporary services for water and wastewater are proposed until appropriate connections are available. |

### 2.2.2 Western Sydney Aerotropolis Plan

#### i Information Request

DPIE request that a detailed assessment be carried out which addresses how the project aligns in the short and longer-term with the planning and development outcomes proposed in the Aerotropolis Plan. DPIE further request that where objectives and outcomes cannot be met, provide discussion on why the benefits of the project outweigh the inconsistencies with the strategic vision of the Aerotropolis.

#### ii Additional information regarding the project's consistency with Aerotropolis Plan

The development application for the project was submitted prior to the finalisation of the Western Sydney Aerotropolis Plan (Aerotropolis Plan). Section 3.5 of the EIS considered the consistency of the project against objectives of the draft Aerotropolis Plan, particularly compatibility with the requirements to safeguard the WSA and the proposed agribusiness zoning of the site. The Aerotropolis Plan was finalised in September 2020, with the Aerotropolis objectives and key considerations and strategic outcomes for the Agribusiness zone outlined in the final plan, generally consistent with those considered in the EIS. Notwithstanding, the following sections provide further detailed consideration of the ARRC's alignment with the finalised Aerotropolis Plan.

### a Objectives of the Aerotropolis Plan

The project's consistency with the objectives of the Aerotropolis Plan is considered in Table 2.13.

**Table 2.13 Consistency with the objectives of the Aerotropolis Plan**

| Objective | Consideration |
|---|---|
| Objective 1 An accessible and well connected Aerotropolis | The ARRC location at the northern end of the future Western Sydney Airport and readily accessible from major transport links including Elizabeth Drive, M4 Motorway, M7 Motorway the Northern Road and the future M12 Motorway, is strategically located to provide recycling service to meet the projected demand associated with future development activities within the Aerotropolis and surrounding areas. |
| Objective 2 High-value jobs growth is enabled, and existing employment enhanced | As noted in Section 2.1.2ii, the ARRC will be an early generator of employment in the Aerotropolis. During operation it will provide locally 70 local direct jobs and a further 108 indirect jobs.<br>A component of this job growth will be high-value jobs, developing recycled products to support the sustainable development of the Aerotropolis using advanced manufacturing processes. |
| Objective 3 Safeguard airport operations | As detailed in Table 2.10, the ARRC meets this objective. It will not impact adversely on the ongoing 24 hours a day operation of WSA and is not a noise sensitive land use. |
| Objective 4 A landscape-led approach to urban design and planning | The ARRC warehouse has been architecturally designed, with the ARRC sited to avoid impact on the important landscape feature of the riparian zone of Oaky Creek.<br>A landscape concept design was included as Appendix T of the EIS. |
| Objective 5 A sustainable, low carbon Aerotropolis that embeds the circular economy | As noted in Table 2.7, the ARRC will become part of the Aerotropolis' circular economy, recycling waste materials that would otherwise be sent to landfill, extending the benefits provided by existing landfills for current and future generations. The recycled materials will largely be reused in construction projects in the Western Parkland City that will benefit current and future generations. The substitution of recycled materials for new materials also reduces the impacts from the production of the new materials and retains resources for the use of future generations. |
| Objective 6 A resilient and adaptable Aerotropolis | The ARRC is considered an enabling development that will facilitate the transformation of the Aerotropolis through the provision of sustainable building materials and resource recovery services.<br>The ARRC will use leading technology for processing operations and adapt to later technologies during the life of the ARRC to continue to support the waste and resource recovery needs of the Aerotropolis into the future. |
| Objective 7 Infrastructure that connects and services the Western Parkland City as it grows | The ARRC will become part of the Aerotropolis' circular economy, recycling waste materials that would otherwise be sent to landfill, extending the benefits provided by existing landfills for current and future generations. The recycled materials will largely be reused in construction projects in the Western Parkland City that will benefit current and future generations. |
| Objective 8 A collaborative approach to planning and delivery | The applicants have consulted extensively with relevant agencies through the project development and assessment phase and look forward to working with these agencies. |
| Objective 9 Diverse, affordable, healthy, resilient and well-located housing | While not meeting this objective directly, the ARRC will provide affordable, sustainable locally sourced building materials for use in residential development in the broader Western Parkland City. |

### Table 2.13 Consistency with the objectives of the Aerotropolis Plan

| Objective | Consideration |
|---|---|
| Objective 10 Social and cultural infrastructure that strengthens communities | While not meeting this objective directly, the ARRC will provide affordable, sustainable locally sourced building materials for use in developing such infrastructure across the Western Parkland City. |
| Objective 11 Great places that celebrate local character and bring people together | As above, while not meeting this objective directly, the ARRC will provide affordable, sustainable locally sourced building materials for use in developing such infrastructure across the Western Parkland City. |

## b Agribusiness precinct

The consistency of the project against the then draft key considerations and strategic outcomes of the Agribusiness precinct as detailed in the draft Aerotropolis Plan was outlined in Section 3.5.1 (iii) of the EIS.

In response to DPIE's RFI and the submissions received from WSA and WSPP, the project's consistency with the key considerations and strategic outcomes of the Agribusiness precinct, as outlined in the final Aerotropolis Plan, have been re-considered in Table 2.14 and Table 2.15.

### Table 2.14 Key considerations Agribusiness precinct

| Key considerations | Comment |
|---|---|
| Aircraft noise | The ARRC is not a noise sensitive land use and is therefore considered an appropriate land use for land within the ANEC 25–30 contours. |
| Safeguarding for Airport operations | The ARRC will not adversely impact on WSA operations (refer Table 2.10). |
| Supporting existing rural industry to minimise land use conflicts | The subject property, as the site of an approved quarry, does not currently support a rural industry. There are also no agricultural land uses on the properties immediately adjacent to the subject property.<br>The closest agricultural enterprise to the ARRC is the poultry farm at 2510 Elizabeth Drive. The residence on this property is noise and air quality assessment location R8. All air quality and noise criteria will be met on this property and no impacts to this agricultural enterprise are predicted.<br>Accordingly, the ARRC is considered compatible with existing rural industries. It is also noted, there is the potential for the ARRC to support existing rural industries through the provision of locally sourced, sustainable recycled products (ie road base, shredded timber). |
| Incorporating existing rural landscape, sustainability and biodiversity values | As noted in Table 2.8, the rural landscape character of the subject property has been substantially changed by previous quarrying activities and construction of the WSA on two sides. The WSA fuel farm is being constructed to the south of the subject site.<br>The ARRC has been designed to avoid and protect the landscape character of the riparian corridor of Oaky Creek. |
| Recognition of existing communities, such as Luddenham | The project will support existing communities such as Luddenham, through the creation of direct and indirect employment opportunities and through the positive contribution to the local economy. |
| Wildlife attraction | ARRC operations will not attract wildlife refer Table 2.10. |

## Table 2.14 Key considerations Agribusiness precinct

| Key considerations | Comment |
|---|---|
| Biosecurity | The project will not impact on biosecurity within the Agribusiness precinct. The ARRC will accept general solid waste (non-putrescible) as defined in the *NSW Protection of the Environment Operations Act 1997* (POAO Act) and the *Waste Classification Guidelines Part 1: Classifying Waste.* The ARRC will be fully enclosed with all waste accepted, processed, stored and dispatched within a warehouse.<br>All vehicles accessing the ARRC warehouse will leave via the outbound weighbridge which will be fitted with a self-contained wheel wash to further minimise potential risks to local biosecurity. |
| Heritage values | Aboriginal cultural and historic heritage values were assessed during the preparation of the EIS. The project will not impact on any items of historic heritage significance within the Agribusiness Precinct.<br>While all land within the Agribusiness Precinct and broader Aerotropolis is of high cultural significance to the local Aboriginal community, the ACHA (EMM 2020c) identified a low number of stone artefacts during the test excavation program, with the distribution of artefacts identified as being 'sparse' and 'random' and therefore suggesting the area was occupied occasionally with nearby creeks providing more reliable water sources than the ARRC site. Artefacts identified will be kept at the Gandangara Local Aboriginal Land Council Keeping Place. |

## Table 2.15 Strategic outcomes Agribusiness precinct

| Strategic outcomes | Comment |
|---|---|
| Provide a world-class agriculture and agribusiness precinct that will deliver fresh and value-added Australian food production from farm gate to the global market | As noted throughout this response, the subject property is not currently compatible with the Agribusiness Precinct and the subject property's agribusiness zoning due to the presence of the quarry void.<br>While the ARRC does not explicitly meet this strategic outcome, it provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate future agribusiness land use on the subject property which could contribute to the outcome.<br>The design of the ARRC as a fully enclosed warehouse is in keeping with the warehouses that are envisaged for the agribusiness zone and will not preclude the remaining subject property or surrounding land parcels from contributing to this strategic outcome.<br>There will be extensive development within the Aerotropolis to over the coming decades to realise the Aerotropolis vision of the respective precincts. The ARRC will be a vital local service for these construction projects. |
| Provide an integrated intensive production hub and state of the art integrated logistics hub to deliver a multi-modal supply chain solution for agricultural products to Greater Sydney, NSW and Australia | As noted above and Table 2.8, while the ARRC does not explicitly meet this outcome, it will indirectly support this outcome through the provision of waste recovery services and sustainable construction materials to support the development of integrated production and logistic hubs and will provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate future agribusiness land use on the subject property.<br>The ARRC will not preclude the remaining subject property or surrounding land parcels from contributing to this strategic outcome. |

## Table 2.15 Strategic outcomes Agribusiness precinct

| Strategic outcomes | Comment |
|---|---|
| Enable smart city and digital integration into research, education and logistics | The ARRC will incorporate opportunities for research and development into new technologies and processes will arises from the applicant's collaboration with NSW Circular. A formal letter from NSW Circular Economy acknowledging this collaboration is contained in Appendix B. |
| Protect and celebrate the character and history of the Luddenham Village | As noted in Table 2.8, the project will not impact the character of the Luddenham Village. ARRC traffic will generally not travel through Luddenham Village apart from traffic arising from businesses or construction projects within Luddenham Village. |
| Accommodate agricultural value added industries and freight and logistics facilities that benefit from access to the proposed Outer Sydney Orbital and air-side access to the Airport. | In its current state, the subject property is not compatible with the Agribusiness Precinct and the subject property's agribusiness zoning.<br>The ARRC provides an economically viable mechanism to infill the quarry void with non-recyclable inert waste, thereby achieving in the medium to long term a stable developable landform close to the WSA and proposed Outer Sydney Orbital for agribusiness land use. |
| Integrate sustainable energy, waste and water as well as circular economy design principles into development and operations | As noted in Table 2.7, the proposed resource recovery centre will contribute to the realisation of a circular economy.<br>The ARRC will assist waste from development within the Aerotropolis and Western Sydney to be recycled locally. |
| Support and add value to the effective ongoing agricultural industry operations and viability across the Western Parkland City and beyond (across NSW) | The ARRC will not adversely impact on the effective ongoing agricultural industry operations and viability in the Agribusiness precinct. The ARRC is compatible with existing agricultural enterprises and will support the development of new agricultural and agribusiness development across the Agribusiness Precinct through the provision of sustainable locally sourced, recycled building materials. |
| Provide for the movement and storage of agricultural commodities that should be connected to the commercial entrance of the Airport. | As noted above, while the ARRC does not explicitly meet this outcome, it will indirectly support this outcome through the provision of waste recovery services and sustainable construction materials to facilitate the development of infrastructure to support this outcome.<br>It also it provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate the development of sustainable and high technology agribusiness on the subject property.<br>The ARRC will not preclude the remaining subject property or surrounding land parcels from contributing to this strategic outcome. |
| Allow for the development of integrated food supply chain related industries particularly those that rely on the skills of and proximity to a growing population in the Western Parkland City | The ARRC does not directly meet this outcome, however development of the ARRC will not preclude the remaining subject property or surrounding land parcels from contributing to this strategic outcome. |
| Facilitate education, research and development and high technology land uses associated with food production and processing | The ARRC does not explicitly meet this outcome, however it is noted, that there is the potential for the ARRC to support the development of high technology land uses associated with food production through the provision of locally sourced, sustainable recycled products.<br>As above, the design of the ARRC as a fully enclosed warehouse is in keeping with the warehouses that are envisaged for the agribusiness zone and will not preclude the use of the remaining areas of the subject property or surrounding land parcels for land uses that will meet this outcome. |
| Capitalise on the increasing domestic and international demand for high quality fresh food and value-added pre-prepared meals. | See above response. |

## Table 2.15 Strategic outcomes Agribusiness precinct

| Strategic outcomes | Comment |
|---|---|
| Enable a road layout and subdivision pattern that supports the movement, storage and processing of agricultural goods and produce into and out of the Western Parkland City. | As noted in Table 2.7. The subject property is a single lot owned by the applicants. It shares its eastern and southern boundary with the WSA site. The layout of the WSA site does not show any transport access points through the subject property. The subject property is also not in the immediate vicinity of any planned transport corridors shown in the Western Sydney Infrastructure Plan.<br>While it is acknowledged the draft Agribusiness Precinct Plan (WSPP 2020b), released post submission of the development application, shows a local collector road (ie a road that will connect local destinations) through the subject property, this precinct plan is still in draft form with the built form layouts in the precinct plan highly conceptualised and may not represent the actual future demand for development types and size in the Agribusiness precinct.<br>The proposed concept masterplan of the subject property (refer Figure 4.3 of the Submissions Report) shows an alternative internal road network which would service the proposed final land use of the site development. |
| Allow for limited residential development that is ancillary to Agricultural and Agribusiness operations outside of the ANEC/ANEF 20 and above contours. | The ARRC is located within the ANEC/ANEF 20 and above contours and therefore this strategic outcome is not relevant to the project. |
| Address any potential for land use conflict between adjoining land uses as a result of future development, including airport operations. | As noted above, the ARRC will not adversely affect the construction or operation of the WSA. While noise exceedances are predicted at some existing rural residential receivers (refer Section 2.5 below), these exceedances should be viewed in the context of 24-hour WSA operations commencing in 2026 and the location of the subject property and adjacent land uses within the 25–30 ANEC contours. The applicants are open to progressing negotiated agreements with affected land holders to mitigate noise exceedances prior to the start of 24-hour airport operations.<br>As shown in the draft Agribusiness Precinct Plan, these isolated residences are expected to transition to a land use more consistent with the objectives of the Agribusiness including safeguarding on WSA operations from noise sensitive land uses.<br>As noted in Section 3.5 of the Submissions Report, the ARRC is considered generally consistent with the vision of the draft Precinct Plan with the ARRC warehouse design consistent with the bulk and scale of the warehouse developments depicted in the draft Precinct Plan with the ARRC site being located close to areas identified for employment generation. |
| Deliver an urban tree canopy along important corridors to contribute to the amenity of the area. | The ARRC will avoid the riparian zone of Oaky Creek. Areas of the ARRC site within Environment and Recreation Zoned land has been previously disturbed by the existing approved quarrying land use (ie water management infrastructure and internal roads). |
| Enable innovative approaches to sustainability outcomes including water sensitive design, resource and liquid and solid waste management and adaptable and durable credentials as a key driver for the design and function of the precinct. | The ARRC will contribute to the realisation of a sustainable circular economy. The applicants are actively engaging with NSW Circular to explore opportunities to innovate and pioneer new processes to support circular economy principles (refer Appendix B).<br>The ARRC will assist waste from development within the Aerotropolis and Western Sydney to be recycled locally.<br>Rain will be harvested from the warehouse roof for use within the ARRC and treated in a water treatment plant for reuse of process water preventing it from being discharged to the environment. |

**Table 2.15 Strategic outcomes Agribusiness precinct**

| Strategic outcomes | Comment |
|---|---|
| Allow for the sustainable and holistic development of agritourism product and experiences within the precinct. | The ARRC will not meet this outcome directly. Notwithstanding, the ARRC site is located within the 20–30 ANEC contours. The development of the subject property for agritourism land uses in these contours may be constrained.<br>The ARRC will indirectly meet this objective through the local provision of sustainable building materials to support the development of sustainable agritourism developments in more appropriate locations within the agribusiness precinct. |
| Early protection of transport corridors to minimise possible land use conflict with adjacent areas and ensure the orderly and timely provision of infrastructure. | As noted above, the subject property is a single lot owned by the applicants. It shares its eastern and southern boundary with the WSA site. The layout of the WSA site does not show any transport access points through the subject property. The subject property is also not in the immediate vicinity of any planned transport corridors shown in the Western Sydney Infrastructure Plan. |
| Produce food for the Greater Sydney area. | As above, while the ARRC does not explicitly meet this outcome, it will indirectly support this outcome through the provision of waste recovery services (non-putrescible only) and sustainable construction materials to facilitate the development of infrastructure to support this outcome. |

Moreover, as noted in Section 3.4 of the Submissions Report, pursuant to Clause 53(1) of the Aerotropolis SEPP, the proposed ARRC continues to be permissible development as:

> a development application for development on land to which this Policy applies that was lodged and not finally determined before the commencement of this Policy is to be determined as if this Policy had not commenced.

The Aerotropolis SEPP specifically provided for savings and transitional provisions to enable DAs lodged but not determined when the SEPP was made to be determined and approved as if the SEPP had not commenced. It was possible for the SEPP to have not included such as savings and transitional provision. The fact that such a provision was included indicates a clear intention that any such DAs could be approved.

### 2.2.3 Western Sydney Aerotropolis Draft Precinct Plan

#### i Information request

DPIE request that a detailed assessment be carried out which addresses how the project aligns in the short and longer-term with the planning and development outcomes proposed in the Aerotropolis Draft Precinct Plan. DPIE further request that where objectives and outcomes cannot be met, provide discussion on why the benefits of the project outweigh the inconsistencies with the strategic vision of the Aerotropolis.

DPIE note that the draft Precinct Plan identifies Adams Road between Elizabeth Drive and Anton Road as a local collector road for which the consideration of environment and local life predominate. DPIE note that neighbourhood hubs are designated in areas of high amenity and public transport according to the Draft Precinct Plan and may include childcare facilities and other retail and social infrastructure.

DPIE also note the Luddenham Landowners Consortium raises concerns regarding the suitability of Adams Road for ARRC traffic movements.

DPIE request a compatibility assessment of the proposed ARRC and its heavy vehicle operations with the Northern Gateway precinct open space and employment area as well as the Agribusiness precinct local collector road network, open space and neighbourhood hub near the Anton Road and Adams Road intersection.

### ii Additional information

#### a Compatibility with the objectives of the Agribusiness Precinct

The ARRC's compatibility with the objectives of the Agribusiness Precinct, as outlined in the draft Precinct Plan, were considered in Section 3.5, Table 3.7 of the Submissions Report. This table has been reproduced and updated as relevant below.

**Table 2.16 ARRC's compatibility with the draft objectives of the Agribusiness precinct**

| | Objective | Consideration |
|---|---|---|
| 1 | Provide an Agribusiness Precinct that will deliver fresh and value-added Australian food production from farm gate to the global market, and support Australia's value-add agribusiness export industries | The subject property, with a substantial, unrehabilitated quarry, presents a unique situation which is not envisaged in the Aerotropolis SEPP. In its current state, the subject property is not compatible with the Agribusiness Precinct and the subject property's agribusiness zoning.<br>The project, as the second step in CPG's vision for the overall development of the site (refer Section 1.1 of the Submission Report) provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate future agribusiness land use on the subject property.<br>The design of the ARRC as a fully enclosed warehouse is in keeping with the warehouses that are envisaged for this portion of the Agribusiness Precinct (as shown in the draft Precinct Plan) and will not preclude the use of the remaining subject property or surrounding land parcels for commercial/industrial agribusiness land use.<br>There will be extensive development within the Aerotropolis to over the coming decades to deliver these outcomes. The ARRC will be a vital local service for these construction projects. |
| 2 | Provide an integrated intensive production and state-of-the-art integrated logistics hub to deliver a supply chain solution for Greater Sydney, NSW and Australia. | The project, as the second step in CPG's vision for the overall development of the site (refer Section 1.1 of the Submission Report) provides a pathway for a viable future agribusiness land use on the subject property.<br>Separate to the ARRC project, the applicant has formed a memorandum of understanding with ACFS Port Logistics to use other areas within the subject property, including the rehabilitated quarry as a logistics and freight distribution centre. |
| 3 | Appropriately locate agricultural value-added industries and freight and logistics facilities that potentially benefit from access to the Outer Sydney Orbital and air-side access to the Airport. | As noted above, the subject property, with a substantial, unrehabilitated quarry, presents a unique situation which is not envisaged in the Aerotropolis SEPP. In its current state, the subject property is not compatible with the Agribusiness Precinct and the subject property's agribusiness zoning.<br>The ARRC provides an economically viable mechanism to infill the quarry void with non-recyclable inert waste, thereby achieving in the medium to long term a stable developable landform close to the WSA and proposed Outer Sydney Orbital for agribusiness land use. |

## Table 2.16 ARRC's compatibility with the draft objectives of the Agribusiness precinct

| | Objective | Consideration |
|---|---|---|
| 4 | Integrate sustainable energy, waste and water as well as a circular economy into development and operations. | The ARRC will contribute to the realisation of a circular economy.<br>The NSW Government issues paper *Cleaning Up Our Act: The Future for Waste and Resource Recovery* released in 2020 (DPIE 2020) identifies a critical need to plan and prepare early for all types of waste and resource recovery infrastructure. Direction 3 of the issues paper is to 'Plan for future infrastructure' and notes the challenges in finding appropriate lands for waste and resource recovery land.<br>The majority, around 60%, of wastes currently generated in NSW come from the construction sector (DPIE 2020). The ARRC is ideally located to meet this rapidly growing demand for construction and demolition waste, and commercial and industrial waste in the Aerotropolis and the South West Growth Area and provide sustainable recycled building materials to support the growth of the Agribusiness Precinct.<br>Given the commitment to undertake all waste handling, processing and stockpiling with an enclosed building, a warehouse with sufficient capacity has been proposed to allow the ARRC to meet this demand for recycling services over many years. Space has also been allowed for the development of new and innovative recycling technologies<br>Sustainable energy and water use has also been incorporated into the design of the ARRC, with rain harvested from the warehouse roof for use within the ARRC and the water treatment plant will allow the reuse of process water preventing it from being discharged to the environment. |
| 5 | Protect and celebrate the rural, agricultural village character of Luddenham Village and promote its role in providing services to support growth of the Precinct. | The project will not impact the character and history of the Luddenham Village. ARRC traffic will generally not travel through Luddenham Village apart from traffic arising from businesses or construction projects within Luddenham Village. |
| 6 | Encourage education opportunities related to agriculture and agribusiness. | The ARRC will complement the recently announced Aerotropolis' Advanced Manufacturing Research Facility. Education opportunities relating to agribusiness logistics may be further explored as an extension to the proposed collaboration with NSW Circular (refer Section 4.1.17 of the Submissions Report). |
| 7 | Embrace tourism opportunities presented by the development of the Airport. | The ARRC will not meet this objective directly. Notwithstanding, the ARRC site is located within the 20–30 ANEC contours. The development of the subject property for agritourism land uses in these contours may be constrained.<br>The ARRC will indirectly meet this objective through the local provision of sustainable building materials to support the development of sustainable agritourism developments in more appropriate locations within the agribusiness precinct. |
| 8 | Protect the operations of the Airport, including 24-hour operations and provide appropriate protection for the community. | The revised Aeronautical impact assessment confirms the ARRC will not impact on WSA operations (refer Table 2.10 above) |
| 9 | Support connectivity and staging throughout the Precinct, such that the Precinct can support temporary uses and develop over time in a manner that minimises the potential for isolated parts of the Precinct. | The overall staged approach to the land use transformation and development of the subject property, as outlined in Section 1.1 of the Submissions Report will contributes to this objective.<br>The development of the ARRC will not impact overall connectivity in the Agribusiness precinct or result in the sterilisation of land within the precinct. |

### Table 2.16 ARRC's compatibility with the draft objectives of the Agribusiness precinct

| | Objective | Consideration |
|---|---|---|
| 10 | Support efficient operations of export-related industries and operations around the Aerotropolis through integrated and intelligent logistics design. | While the ARRC does not explicitly meet this objective, it provides an economically viable pathway to infill the quarry void (subject to approval to infill the void) to facilitate the development of export-related industries and operations on the subject property.<br>Separate to the ARRC project, the applicant has formed a memorandum of understanding with ACFS Port Logistics to use other areas within the subject property, including the rehabilitated quarry as a logistics distribution centre. |
| 11 | Facilitate the potential future alignment of the Outer Sydney Orbital to connect to the Precinct. | The ARRC site is centrally located to access existing and future major transport corridors. |
| 12 | Preserve and enhance significant landscaped vistas within and from the Precinct towards the Blue Mountains, Cosgroves Creek and Wianamatta-South Creek Corridor. | While this objective is not directly relevant to the subject property, the ARRC has been designed to avoid the landscape values of the riparian corridor of Oaky Creek. |
| 13 | Promote the role of water within Wianamatta-South Creek and Nepean Corridors to support healthy, liveable and sustainable communities. | The project like, the vast majority of land within the Aerotropolis, is located within the broader Wianamatta–South Creek catchment.<br>The ARRC has been designed to minimise impacts to receiving waterways with the storage, processing and handling of waste material proposed within a fully enclosed warehouse and the containment, treatment and reuse of water that has potentially come into contact with waste material (which would only occur within the warehouse as no material will be handled or stored outside).<br>This will prevent any material change or degradation of the water quality of Oaky Creek due to discharges and therefore the broader Wianamatta–South Creek catchment. |
| 14 | Identify and protect remnant vegetation, tree canopy and other areas of significant vegetation to develop within the Agribusiness Precinct to be built around landscape elements. | Impacts to biodiversity have been minimised as far as practical, through the avoidance of the Oaky Creek riparian zone. |

#### b Draft Agribusiness Precinct Plan - road network

Pending finalisation of the draft Precinct Plan, ARRC development traffic would travel on Adams Road, a local collector road surrounded by industrial streets, north for approximately 220 m before accessing Elizabeth Drive, a primary arterial road or alternatively travel south on Adams Road for approximately 700 m to the intersection of Adams Road and Anton Road where Adams Road becomes a primary arterial road, and subsequently to The Northern Road (also a primary arterial road).

Adams Road both north of the subject property, to the Elizabeth Drive/Adams Road intersection, and south of the subject property, to The Northern Road/Adams Road intersection, are within the ANEC 20-25 contours for the WSA and accordingly potentially noise sensitive land uses such childcare facilities and other potentially noise sensitive social infrastructure are not considered appropriate land uses in this area (consistent with the Aerotropolis SEPP). It is noted that Figure 22 of the draft Precinct Plan shows industrial streets, connecting to the local connector portion of Adams Road.

The project, which includes road upgrades on Adams Road between Elizabeth Drive and Anton Road as well as an interim upgrade to the Elizabeth Drive/Adams Road intersection, will improve this portion of the road network for all road users, including members of the Luddenham Landowners Consortium, and for public transport.

### 2.2.4 Western Sydney Aerotropolis Development Control Plan

Section 5.1.8 of the Western Sydney Aerotropolis Development Control Plan (Aerotropolis DCP) outlines design requirements for new or upgraded resource management facilities. The performance outcomes to ensure resource management facilities deliver best practice environmental performance controls are outlined in Table 2.17 with an assessment of the ARRC's consistency with the respective requirements also provided.

**Table 2.17 Requirements for new or upgraded resource management facilities**

| Requirement | Consideration |
|---|---|
| Any wastes received, processed, handled and stockpiled must be undertaken in an enclosed building. | The ARRC will meet this requirement. All wastes will be received, handled, processed, stockpiled and dispatched within the ARRC warehouse. |
| No waste or finished waste products are to be stored outside of the building to prevent land pollution. | The ARRC will meet this requirement. No recycled product will be stored outside of the ARRC warehouse. |
| Outside surfaces must be sealed hardstand or vegetated. | The ARRC will meet this requirement. All internal and external surfaces will be sealed hardstand with the exception of landscaped areas as shown on the Project overview figure (Figure 1.2 of the Submissions Report). |
| There is no pollution of waters (including surface and groundwater) except in accordance with an Environment Protection Licence issued under the Protection of the Environment Operations Act 1997. | The ARRC will meet this requirement. All water that has potentially come into contact with waste or recycled product within the ARRC warehouse will be contained, treated and reused. This water will not be discharged to Oaky Creek to prevent any material change or degradation of the water quality of Oaky Creek |
| Polluted water (including process waters, wash down waters, polluted stormwater or sewage) is captured on the site and directed to reticulated sewer where available or else collected, treated and beneficially reused, where this is safe and practicable to do so and will not harm the environment. | The ARRC will meet this requirement. As above, water will be used within the ARRC warehouse for dust suppression, washdown of operational areas and soil washing. This water will be collected and treated in the water treatment plant for reuse on site. |
| Bunding is designed and installed in accordance with relevant Australian Standards and the *Dangerous Goods Act 1975*. | The ARRC will meet this requirement. Hazardous materials will be stored in a designated area on the eastern internal wall of the ARRC warehouse as shown on Figure 1.2. Fuel and hazardous materials will be stored and bunded in accordance with relevant government legislation and guidelines and Australian Standard 1940:2004. |
| Emissions do not cause adverse impact upon human health or the environment | The ARRC will meet this requirement. The Addendum Air Quality Impact Assessment (EMM 2021c) included in Appendix F of the Submissions Report found that with the exception of receptor R3 (located immediately adjacent to the internal ARRC access road), air quality criteria are predicted to be met at all assessment locations. As noted in the Submissions Report, R3 has been unoccupied for over 12 months and the property owner intends to develop the property for commercial purposes in line with the rezoning to Agribusiness under the Aerotropolis SEPP.<br>Modelling predictions for a number of future airport receptors indicate that there would be no air quality impact for the operation of the WSA, with exceedances of the impact assessment criteria limited to the boundary between the fuel farm and the subject property where exposure risk will be minimal |

## Table 2.17 Requirements for new or upgraded resource management facilities

| Requirement | Consideration |
|---|---|
| No offensive odour beyond the boundary of the premises. | The ARRC will meet this requirement. Odorous waste will not be accepted at the ARRC. The odour modelling carried out to inform the Addendum Air Quality Assessment (Appendix F of the Submissions Report) predicts that all assessment locations are below the adopted odour goal of 5 odour units (OU), with all sensitive locations (ie residential or recreational receivers) at or below 1 OU (the theoretical level at which no odour would occur). |
| Measures to ensure air quality impacts and dust emissions are prevented from activities from the premises. | The ARRC will meet this requirement. The ARRC warehouse will be fully enclosed with all waste accepted, processed, stored and dispatched within the warehouse.<br>Each entrance will be installed with a water misting system to minimise dust emissions from the ARRC warehouse. Misters will also be installed within the ARRC warehouse.<br>It is a legal requirement for trucks operating on public roads in NSW to have their loads covered to prevent fugitive dust emissions from loaded trucks.<br>In line with current standard industry practice, a wheel wash will be installed after the outgoing weighbridge and will be maintained for the life of the development. |
| The protection of amenity from adverse impacts due to noise from operations and activities associated with the development. | While noise exceedances are predicted at some existing rural residential receivers (refer Section 2.5.3 below), these exceedances should be viewed in the context of 24-hour WSA operations commencing in 2026 and the location of the subject property and adjacent land uses within the 25–30 ANEC contours.<br>As shown in the draft Agribusiness Precinct Plan, these isolated residences are expected to transition to a land use more consistent with the objectives of the Agribusiness including safeguarding on WSA operations from noise sensitive land uses.<br>The applicants are open to progressing negotiated agreements with affected land holders to mitigate noise exceedances prior to the start of 24-hour airport operations. |
| Any storage, treatment and disposal of waste is done in accordance with Environment Protection Licencing issued under the Protection of the *Environment Operations Act 1997* where required. | The ARRC will meet this requirement. An application for an EPL will be submitted following approval of the project and all operational activities will be conducted in accordance with the EPL. |

**Table 2.17 Requirements for new or upgraded resource management facilities**

| Requirement | Consideration |
|---|---|
| Satisfying the requirements of the NSW Fire and Rescues NSW's Fire safety guideline: Fire safety in waste facilities. | The ARRC has been designed and will be operated to meet requirement. The ARRC fire protection will include:<br>• a ring main of attack hydrants along the access road that surrounds the building;<br>• a high-hazard sprinkler system will be throughout the ARRC warehouse;<br>• fire extinguishers;<br>• fire hose reels;<br>• a 2.6-ML underground firefighting water supply tank;<br>• a kerb around the base of the warehouse to contain fire water; and<br>• a 2.6-ML underground fire water containment tank.<br>In addition, the walls of the recycled product bays (11 m) have been designed to be 1 m higher than the maximum stockpile height (10 m) within these product bays in accordance with FRNSW (2020). The walls will be concrete.<br>Intermediate bays and temporary stockpiles will be limited to a maximum stockpile size of 1,000 $m^3$ in accordance with FRNSW (2020). All stockpile areas and product bays will be directly accessible to a fire appliance. |
| Demonstrating consistency with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021. | The ARRC will meet this requirement. As outlined in Section 3.6 of the EIS, the project addresses 'Key Result Area 2: Increase recycling' and 'Key Result Area 3: Divert more waste from landfill'.<br>The project contributes to the targets set in *NSW Waste Avoidance and Resource Recovery Strategy 2014–21* including:<br>• increasing recycling rates across all waste streams; and<br>• increasing the proportion of waste diverted from landfill to 75%. |

### 2.2.5 Summary of the project's strategic and statutory alignment with Aerotropolis Planning Package

As outlined in Section 6.2 of the Submissions Report, the subject property, with a substantial, unrehabilitated quarry, presents a unique situation which is not envisaged in the Aerotropolis SEPP. In its current state, the subject property is not compatible with the Aerotropolis vision or that of the draft Precinct Plan for the Agribusiness Precinct.

As outlined, with the exception of permissibility (had the application not been lodged before the Aerotropolis SEPP was gazetted), the project is considered consistent with the aims, provisions and outcomes of the Aerotropolis Planning Package. As noted in Section 3.4 of the Submissions Report, pursuant to Clause 53(1) of the Aerotropolis SEPP, the proposed ARRC continues to be permissible development as:

> a development application for development on land to which this Policy applies that was lodged and not finally determined before the commencement of this Policy is to be determined as if this Policy had not commenced.

The Aerotropolis SEPP specifically provided for savings and transitional provisions to enable DAs lodged but not determined when the SEPP was made to be determined and approved as if the SEPP had not commenced. It was possible for the SEPP to have not included such as savings and transitional provision. The fact that such a provision was included indicates a clear intention that any such DAs could be approved.

The subject property is on the eastern boundary of the agribusiness precinct, approximately 350 m from Enterprise zoned land (wherein the project would be a permissible land use). The design of the ARRC, as a fully enclosed warehouse consistent with the bulk and scale of the warehouses envisaged in the draft Precinct Plan, will not preclude the use of the remaining subject property or surrounding land parcels for agribusiness land use or the broader development of the Agribusiness precinct.

The ARRC will become part of the Aerotropolis' circular economy, recycling waste materials that would otherwise be sent to landfill, extending the benefits provided by existing landfills for current and future generations. The recycled materials will largely be reused in construction projects in the Aerotropolis that will benefit current and future generations. The substitution of recycled materials for new materials also reduces the impacts from the production of the new materials and retains resources for the use of future generations.

In the short- to medium-term, the ARRC will be an enabling development that will facilitate the transformation of the Aerotropolis through the provision of sustainable building materials and resource recovery services. In the long-term the ARRC will continue to address the need for waste and resource recovery infrastructure for the Greater Sydney Area in line with the NSW Government paper *Cleaning Up Our Act: The Future for Waste and Resource Recovery* (DPIE 2020).

## 2.3 Negotiated agreement and engagement with noise-affected community

### 2.3.1 Community engagement report

#### i Information request

DPIE request a community engagement report, including feedback from owners/occupants of noise-affected dwellings and identification of any refinement required to the option/process/method for future engagement.

#### ii Additional information

Community engagement from April 2020 to June 2020 is described in Section 5.1 of EIS (EMM 2020a). Community engagement from July 2020 to May 2021 is described in Section 3.2 of the *Luddenham Advanced Resource Recovery Centre Submissions Report* (EMM 2021a).

As noted in Table 3.1 of the Submissions Report, consultation with DPIE during preparation of the Submissions Report indicated that rural criteria should be applied in the assessment of noise levels at residential receptors (see further discussion in Section 2.5 below) and that negotiated agreements to be offered to R2, R3 and R6. Letters were subsequently sent to R2 and R6 describing the potential impacts of the ARRC and offering negotiated agreements. A letter was sent to R3, describing the potential impacts of the ARRC but did not offer a negotiated agreements given the landowner's intension to develop his property to commercial/industrial uses.

In April 2021, CPG/KLF provided the contact details for R2, R3 and R6 to DPIE to allow DPIE to seek the views of these residents.

A community engagement report is provided in Table 2.18. This summarises consultation with surrounding properties as part of the ARRC application process.

## Table 2.18 Community engagement report

| Address | Consultation method | Description |
|---|---|---|
| **Residential properties** | | |
| 2161–2177 Elizabeth Drive, Luddenham (R1) | Letter sent on 17 April 2020 | Letter contained project information, including an overview figure.<br>No response received. |
| 2111–2141 Elizabeth Drive, Luddenham (R2) | Letter sent on 17 April 2020 | Letter contained project information, including an overview figure sent to the resident on 17 April 2020.<br>No response received. |
| | Letter sent on 13 May 2021<br>Follow-up text messages<br>Telephone conversation on 7 June 2021 | The letter sent on 13 May 2021 outlined the predicted impacts of the ARRC with the objective of engaging with the landowner regarding a negotiated agreement offering improvements to the residence to reduce noise impacts.<br>In a telephone conversation with a representative of KLF on 7 June 2021, the landowner:<br>• confirmed he had received the 13 May 2020 letter and a letter sent by DPIE;<br>• noted that he had more pressing concerns than the proposed activities at the quarry site;<br>• his primary concern is the rezoning of his property to ENZ - Environment and Recreation, with an increase in rates/levies but no increase in value due to the zoning issue;<br>• is consulting with DPIEs Community Commissioner over this issue; and<br>• was aware of CPG/KLFs obligations regarding mitigation and would be in touch should they need to – however at this stage no intent to do so. |
| 285 Adams Road, Luddenham (R3) | Letter sent on 17 April 2020<br>Phone calls and face to face meeting with Director of KLF on 5 May 2020. | Letter contained project information, including an overview figure.<br>The landowner noted that while there is a residential dwelling on the property that is leased from time to time (currently unoccupied) on the property, he plans to develop the property for commercial/industrial purposes. |

## Table 2.18 Community engagement report

| Address | Consultation method | Description |
|---|---|---|
| | Letter sent on 18 March 2021<br>Letter sent on 9 April 2021<br>Follow-up text messages<br>Telephone conversation on 7 June 2021 | Attempts have been made to re-engage with the landowner of R3 since the exhibition of the EIS<br>A letter was posted to the landowner's business address on 18 March 2021 requesting a meeting. A follow up text message was sent to confirm receipt of the letter.<br>The letter sent on 9 April 2021 described the potential impacts of the ARRC but did not offer a negotiated agreements given the landowner's intension to develop his property to commercial/industrial uses.<br>In response to a follow-up text message on 14 April 2021, the landowner sent a text message confirming receipt of the most recent letter and stating that he would not be providing any responses in writing and he did not take up CPG/KLF's offer to discuss the ARRC. |
| | Letter sent on 23 June 2021 | The letter sent on 23 June 2021 advised that the landowner is entitled to request noise mitigation to the residence on the property under Conditions 12A and 12B of the Development Consent (DA No 315-7-2003) for the quarry.<br>No response has been received. |
| | Letter sent on 25 June 2021 | The letter sent on 25 June 2021 advised that it was proposed to upgrade the northern section of Adams Road (between the quarry entrance and Elizabeth Drive) and for the 3 tonne load limit to be lifted on this section of road.<br>No response has been received. |
| 5 Anton Road, Luddenham (R4) | Letter sent on 17 April 2020<br>Phone calls and face to face meeting with Director of KLF on 11 June 2020. | Letter contained project information, including an overview figure.<br>No concerns raised by the landowner.<br>Landowner expressed interest in the establishment of the ARRC as have business interests in the construction demolition industry.<br>Property owner was happy to be informed the ARRC access road would be sealed and expressed potential amenity impacts were not of concern in the context of the adjacent construction and operation of the WSA. |
| 185 Adams Road, Luddenham (R5) | Letter sent on 17 April 2020<br>Phone call and follow up face to face meeting with the long-term tenant on 11 June 2020 (property owner lives abroad). | Letter contained project information, including an overview figure.<br>No concerns raised by the landowner.<br>The property occupier had queries relating to potential odorous and/or asbestos waste streams. They were pleased that the ARRC would not accept either asbestos or odorous waste. |

## Table 2.18 Community engagement report

| Address | Consultation method | Description |
|---|---|---|
| 225 Adams Road, Luddenham (R6) | Letter sent on 17 April 2020<br>Phone call on 24 April 2020.<br>Phone call and face to face meeting on 30 May 2020. | Letter contained project information, including an overview figure.<br>Property owner expressed appreciation being contacted directly by the Director of KLF and pleased that the site access road would be sealed.<br>Property owner asked whether consideration had been given to constructing noise bunds along site access road.<br>Enclosing the AARC activities will substantially reduce noise levels at the neighbouring properties – see Section 2.5 below for further discussion regarding noise matters. |
| | Letter sent on 18 March 2021<br>Letter sent on 9 April 2021<br>Follow-up text messages | Attempts have been made to re-engage with the landowner of R6 since the exhibition of the EIS.<br>A letter was posted to the landowner's business address on 18 March 2021 requesting a meeting. A follow up text message was sent to confirm receipt of the letter.<br>The letter sent on 9 April 2021 outlined the predicted impacts of the ARRC with the objective of engaging with the landowner regarding a negotiated agreement offering improvements to the residence to reduce noise impacts and landscaping/screening to minimise visual impacts.<br>No responses have been received to the letters or text messages.<br>We understand that DPIE have also attempted to engage with this landowner. |
| | Letter sent on 23 June 2021 | The letter sent on 23 June 2021 advised that the landowner is entitled to request noise mitigation to the residence on the property under Conditions 12A and 12B of the Development Consent (DA No 315-7-2003) for the quarry.<br>No response has been received. |
| | Letter sent on 25 June 2021 | The letter sent on 25 June 2021 advised that it was proposed to upgrade the northern section of Adams Road (between the quarry entrance and Elizabeth Drive) and for the 3-tonne load limit to be lifted on this section of road.<br>No response has been received. |
| 161 Adams Road, Luddenham (R7) | Letter sent on 17 April 2020 | Letter contained project information, including an overview figure.<br>No response received. |

## Table 2.18 Community engagement report

| Address | Consultation method | Description |
|---|---|---|
| 2510–2550 Elizabeth Drive, Luddenham (R8) | Letter sent on 17 April 2020 | Letter contained project information, including an overview figure.<br>Email received acknowledging receipt of letter. Property owner communicated intention of lodging a submission during the EIS exhibition. Follow up email enquiring whether the property owner had specific concerns in relation to the project, no further response was received. |
| **Commercial/active recreation** | | |
| Hubertus Club (C1/AR1) | Consultation letter containing project information and overview figure sent to the resident on 17 April 2020.<br>Phone calls and follow up face to face meeting on 11 June 2020 with Hubertus Country Club Event Manager. | Event Manager expressed that the Club owners would view the project favourably as would support business at the Hubertus Club.<br>Enquired about waste streams and pleased that no odorous waste would be accepted.<br>Concerned that noise and visual bund along western edge of the subject property associated with quarry operations on the subject property may be removed. Pleased that it would be retained until the final rehabilitation of the quarry.<br>Requested the KLF communicate to their construction and operational employees that the Club would welcome them for meals and to consider the club for events. |

As summarised in the Table 2.18, CPG/KLF have used a range of methods to engage landowners. We do not believe that the lack of response is due to the "option/process/method" used for engagement. Given that responses were received from landowners, there is no indication that attempts to engage with unresponsive landowners was unsuccessful because CPG/KLF's communications were not received. We understand that DPIE has had success engaging with some landowners but not others in a manner that reflects CPG/KLF's successes.

Information regarding the development of the site has been widely available and landowners of properties in the surrounding area have been contacted by CPG/KLF and DPIE regarding the availability of this information. Notwithstanding, there has been a low level of community interest in the site developments, including the ARRC.

CPG/KLF have made exhaustive efforts to consult with landowners potentially impacted by the ARRC, particularly due to elevated noise levels compared to the currently quiet noise environment. Offers to discuss additional mitigation measures or negotiated agreements have not been taken up by the landowners.

### 2.3.2 Noise-sensitive receivers

#### i Information request

Identification of all noise-sensitive receivers that warrants for negotiated agreement.

#### ii Additional information

DPIE requested during a meeting with the applicants on the 11 May 2021 that offers of negotiated agreements be extended to R2, R3 and R6.

Accordingly, the owners of R2 and R6 have been contacted regarding a negotiated agreement to mitigate noise impacts. The R3 residence is currently in a poor state of repair and is unoccupied. The property is likely to be redeveloped for commercial or industrial use. It is noted the new zoning of the R3 land parcel prohibits the development of a new residence. CPG and KLF have previously asked R3 in writing to agree to the impacts with consideration of their plans to commercially develop their property.

The Addendum Noise and Vibration Impact Assessment (ANVIA) has been revised as requested by DPIE and is provided in Appendix D of this response report (see Section 2.5).

As outlined in the ANVIA and Section 2.5, with the application of rural amenity levels -5 dB, additional residences are predicted to experience noise exceedances during ARRC operations as summarised in Table 2.19.

**Table 2.19 Summary of predicted exceedances**

| | ARRC (Rural amenity levels -5 dB) | | | ARRC + quarry (rural amenity levels -5 dB) |
|---|---|---|---|---|
| | Day | Evening | Night | Day |
| R1 | - | - | +4 | - |
| R2 | - | +4 | +8 | - |
| R3 | +18 | +18 | +23 | +18 |
| R4 | - | - | +3 | +5 |
| R5 | - | - | +2 | +4 |
| R6 | +10 | +10 | +14 | +13 |
| R7 | - | - | - | +1 |

**Table 2.19 Summary of predicted exceedances**

| | ARRC (Rural amenity levels -5 dB) | | | ARRC + quarry (rural amenity levels -5 dB) |
|---|---|---|---|---|
| | Day | Evening | Night | Day |
| R8 | - | - | - | - |

To address predicted evening and night-time exceedances, CPG and KLF will restrict evening and daytime operations until operations at WSA are properly underway as determined by DPIE. CPG and KLF suggest six months following the commencement of operations at WSA would be an appropriate time to commence evening and night-time operations at the ARRC.

To mitigate the impact of daytime exceedances on R6 and R3 (unoccupied), CPG and KLF have offered negotiated agreements to R6, while asking R3 to agree to the impacts with consideration of their plans to commercially develop their property. Prior to the commencement of evening and night-time operations, CPG and KLF will offer negotiated agreements to additional residences if required. CPG and KLF are committed to use all best endeavours to reach negotiated agreements.

Notwithstanding, as discussed further in Section 2.5, CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as noise criteria to allow the development to proceed if agreements with all residents cannot be reached – noting DPIE would need to be satisfied 'all best endeavours' have first been to reach agreement.

### 2.3.3 On-site and off-site generated noise impacts

#### i Information request

DPIE request characterisation of on-site and off-site generated noise impacts and potential noise management options.

#### ii Additional information

The onsite noise emissions from the construction and operation of the ARRC are described in Sections 4.3 and 4.2, respectively, of the EIS NVIA (EMM 2020d). Additional onsite noise emissions information is provided in Section 4.2 of the ANVIA (EMM 2021d).

The only off-site operational noise emissions will be associated with vehicles travelling to and from the ARRC site as described in Section 5.4 of the NVIA and Section 4.4 of the ANVIA. The only off-site construction noise emissions will be associated with road upgrade construction vehicles. These are described in Section 4.3 of the ANVIA.

Updated assessments of the impacts of on-site operational noise, road traffic noise and road upgrade construction are provided in Sections 5.1, 5.3 and 5.2, respectively, of the ANVIA and in Section 2.5 below.

The proposed construction and operations noise management measures are described in Sections 6.2 and 6.1, respectively, of the NVIA. An assessment of whether the operational noise levels are the best achievable noise levels is presented in Section 5.1.3 of the ANVIA and further considered in Section 2.5 below.

### 2.3.4 Negotiated agreements

#### i Information request

DPIE request details of the process and methodology for establishing negotiated agreement and dispute resolution.

#### ii Additional information

As described in Section 2.3.1, CPG and KLF have continued in their endeavours to consult with the landowners of R3 and R6, including offering to negotiate agreements. As outlined above, CPG and KLF are committed to use all best endeavours to reach agreements with these residents.

It is noted R3 and R6 have not responded to the recent attempts to consult with them (R6); or intend to develop their property for commercial/industrial uses (R3). These locations (R3 and R6) are currently afforded the right to request 'mitigation upon request' as a result of activities on the site. We therefore believe that it would be reasonable for Development Consent Conditions for the ARRC to include the same 'mitigation upon request' condition as provided in Development Consent (DA No 315-7-2003):

**Additional Mitigation Upon Request**

12A. Upon receiving a written request from the owner of any land listed in Table 5A, the Applicant must implement additional noise mitigation measures at the residence in consultation with the landowner.

These measures must be reasonable and feasible, consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (2018), proportionate to the level of predicted impacts and directed towards reducing the noise impacts from the development.

*Table 5A: Land subject to additional mitigation upon request*

| Mitigation basis | Land |
|---|---|
| Noise | R3 – 285 Adams Road, Luddenham |
| Noise | R6 – 225 Adams Road, Luddenham |

12B. If within 3 months of receiving this request from the landowner, the Applicant and the landowner cannot agree on the measures to be implemented, or there is dispute about the implementation of these measures, then either party may refer the matter to the Planning Secretary for resolution.

As outlined in Section 2.3.1 above, CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as the noise criteria specified in the development consent, to allow the ARRC to operate if agreements with all residents cannot be reached – noting DPIE would need to be satisfied 'all best endeavours' have first been made. This approach of setting noise criteria based on predicted noise levels has been adopted in the Development Consent for the quarry (DA No 315-7-2003) on the site.

## 2.4 Traffic and transport

### 2.4.1 Distribution of ARRC development traffic

#### i Information request

DPIE request updated haulage route options be provided, further requesting that haulage route options be developed in consultation with Transport for NSW (TfNSW), LCC and WSA including but not limited to where:

- 100% of exiting vehicles from the proposed ARRC travel south towards The Northern Road or north towards Elizabeth Drive; and

- the southern portion of Adams Road is not upgraded prior to the operation of the proposed ARRC.

WSA request in their submission that scenarios regarding the Adams Road upgrade should be explored further, including contingencies where the southern portion of the Adams Road is not upgraded prior to the operation of the proposed facility, or where the future filling of the void is not given consent.

LCC also request a haulage route plan be confirmed for the proposed ARRC development.

### ii Additional information

#### a Proposed transport strategy and consultation with TfNSW and LCC

The nature of resource recovery facilities is that the source of material being accepted, and the destination of recycled product being sold by facilities, is governed by the location of customers using the facility. These customers are expected to primarily be in Western Sydney but may be further afield. The exact locations of customers will vary from week to week and evolve over the years according to the evolution of development in Western Sydney. Accordingly, with the exception of movements between other recycling facilities owned by KLF, the applicants cannot identify fixed haulage routes for the movement of ARRC development traffic and also have limited control over the route which customers will use to access the ARRC.

Accordingly, to demonstrate that the local road network can accommodate the maximum vehicle movements that will occur during peak ARRC operations, the Addendum traffic impact assessment (Addendum TIA) (EMM 2021e) is based on conservative assumptions regarding the breakdown of incoming and outgoing traffic. This approach to assessment has been applied to the traffic impact assessment of many now approved resource recovery centres.

Cognisant of the changing traffic environment due to the development of the WSA and broader Aerotropolis, the applicants have consulted closely with TfNSW and Council throughout the EIS and Response to Submissions phases of the project to confirm assessment requirements, including future background traffic volumes to incorporate in the traffic assessment. A record of consultation with these agencies is provided in Table 2.20.

**Table 2.20 Summary of consultation with TfNSW and LCC**

| Stakeholder | Consultation method | Purpose | Key outcome |
|---|---|---|---|
| TfNSW | Meeting held 4 February 2020 | CPG, KLF and EMM met with TfNSW on to confirm the assessment scope for the traffic impact assessment in consideration of the broader changes in terms of project increased traffic volumes and road upgrade projects associated with the developing Aerotropolis. | TfNSW advised traffic impact assessment was to be carried out with consideration of the existing road network and TfNSW's forecast model (STFM). |
| | Agency consultation letter 12 June 2020 | Consultation letter notifying TfNSW of the revised project design and inviting further comment. | A response to the consultation letter was received on 16 June 2020 acknowledging receipt of the consultation letter. |
| | Emails and phone correspondence with F. Liu – Land Use Planner Sydney Roads | Ongoing engagement regarding the preparation of the EIS Traffic Impact Assessment. | Feedback received incorporated into EIS Traffic Impact Assessment. |

## Table 2.20 Summary of consultation with TfNSW and LCC

| Stakeholder | Consultation method | Purpose | Key outcome |
|---|---|---|---|
| | Meeting 12 February 2021 | Meeting to discuss proposed MOD 5 (now approved) and ARRC road upgrades – particularly with respect to the Elizabeth Drive/Adams Road intersection. | ARRC related traffic will not be permitted to turn right into Adams Road from Elizabeth Drive due to the existing culvert constraint on Elizabeth Drive west.<br>TfNSW requested the TIA be revised to account for a new version of the TfNSW forecast model (STFM version 18). |
| | Combined meeting with DPIE and LCC 25 March 2021 | Meeting to discuss ARRC route options and road upgrade options. | The revised transport strategy presented in Section 3.1.1 was the key outcome of this meeting. |
| | Email and phone correspondence with F. Liu – Land Use Planner Sydney Roads – June- July 2021 | Correspondence sought clarification on TfNSW's submission on the Submission Report and request for additional sensitivity testing (SiDRA analysis) on TfNSW's preliminary concept design for Elizabeth Drive/Adams Road intersection upgrade. | Feedback received incorporated into Response to TfNSW RFI letter to DPIE (dated 16 July 2021). |
| | Phone correspondence with F. Liu – Land Use Planner Sydney Roads – August – September 2021 | Correspondence sought TfNSW's feedback on the previous Response to TfNSW's RFI with reference to DPIE's current request for the applicant to develop haulage routes in consultation with TfNSW. | Mr F. Liu noted TfNSW had provided DPIE with a further submission in response to the Response to TfNSW RFI letter. This letter, subsequently requested from DPIE, notes TfNSW's concurrence to the proposed road works at Elizabeth Drive/Adams Road intersection and did not request further SiDRA analyses or consideration of alternative ARRC traffic distribution as provided in ARRC Submissions Report and Addendum ARRC. |
| LCC | Meeting with LCC, DPIE, WSA and WSPP 18 February 2020 | To introduce the project and discuss key aspects to be addressed in EIS. | Council noted that a range of impacts, such as transport- and noise- related impacts, would need to be addressed in the EIS. |
| | Agency consultation letter 12 June 2020 | Consultation letter notifying TfNSW of the revised project design and inviting further comment. | No response received. |
| | Meeting on 17 July 2020 | To provide a status briefing and to discuss the potential impacts on Adams Road. | Council noted that sections of Adams Road would need to be upgraded prior to the lifting of the 3-tonne load limit on all or part of Adams Road, allowing the applicable sections to be used by heavy vehicles. |
| | Meetings 18 December 2020 and 10 February 2021 | Meetings to discuss scope of MOD 5 (now approved) and ARRC road upgrades required to facilitate the lifting of the existing load limit on Adams Road. | Council communicated a separate application will be required to lift the load limit for the ARRC in addition to the application lodged for the approved quarry.<br>Confirmed need for ongoing consultation. |
| | Combined meeting with DPIE and LCC 25 March 2021 | Meeting to discuss ARRC route options and road upgrade options. | The revised transport strategy presented in Section 3.1.1 was the key outcome of this meeting. |

### Table 2.20 Summary of consultation with TfNSW and LCC

| Stakeholder | Consultation method | Purpose | Key outcome |
|---|---|---|---|
| | Phone correspondence with S. Qu Transport Planner – August 2021 | Correspondence sought information regarding the timing and design details of the proposed upgrades to Adams Road between Anton Road and The Northern Road and the proposed upgrade treatment to the Anton Road/Adams Road intersection. | Ms S. Qu directed EMM to LCC's Traffic Committee meeting minutes noting other information was not publicly available.<br>A review of these minutes identified that on 19 May 2021, LCC adopted the Traffic committee's recommendation to approve the full road closure of the affected road sections of Adams Road and Anton Road during the six months construction period, with conditions including sign posted detour route and placement of variable message signboards. The minutes did not provide information regarding the commencement of construction activities or the design details of the proposed intersection upgrade. |
| | Email correspondence to Stella Qu and Charles Wiafe | Email correspondence provided Council with the applicant's Response to TfNSW RFI letter and subsequent response from TfNSW. Email also sought additional information regarding the design and timing for the Adams Road/Anton Road upgrades. | No response has been received to date. |

A key outcome of consultation with both TfNSW and Council has been the update in the proposed ARRC transport strategy as presented in the Submission Report and Addendum TIA (EMM 2021e). The revised strategy addressed the evolving traffic context of the project compared to the transport strategy presented in the EIS.

The Traffic Impact Assessment prepared for the EIS (EIS TIA) presented two traffic distribution scenarios for the ARRC development. The first scenario accounted for ARRC-related vehicles (that are greater 3 tonnes) accessing the ARRC via Elizabeth Drive only. This scenario assumed the existing load limit on Adams Road would remain south of the site access pending future upgrades. The second traffic distribution scenario accounted for ARRC traffic accessing the site with an even distribution from Elizabeth Drive and The Northern Road following the upgrade and subsequent lifting of the load limit of Adams Road south of the site access.

TfNSW raised safety concerns in relation to the right hand turn for heavy vehicles into Adams Road from Elizabeth Drive and communicated a preference for ARRC development traffic to use Adams Road south and The Northern Road/Adams Road intersection to access the broader road network. In response to TfNSW's concerns, CPG and KLF updated their approach to ARRC access and developed a revised transport strategy for the ARRC. The revised transport strategy was discussed at a meeting with TfNSW, Liverpool City Council and DPIE on 25 March 2021.

As outlined in Section 3.1.1 of the Submissions Report, the revised transport strategy proposes heavy vehicle and light vehicle access via Elizabeth Drive with the exception that no vehicles will access the site via Elizabeth Drive west. Access would also be provided via The Northern Road. Lifting the load limit on Adams Road south of the site would be enabled by CPG and KLF upgrading the pavement between the site access and Anton Road and upgrading the pavement between south of Anton Road by other parties.

As noted above, the applicants have limited to control over the routes which customers will use to access the ARRC with existing or proposed road layout and restrictions (ie the existing load limit on Adams Road or proposed restriction on the right hand turn into Adams Road from Elizabeth Drive) representing the main driver behind the distribution of ARRC development traffic.

It is not possible to further define haulage routes further from the ARRC in the context of the development waste from a wide range of customers and similarly delivering recycled materials to a wide range of sites. It is further noted that TfNSW has not raised further matters in relation to the traffic assessment and that they concur with the proposed road work works on Elizabeth Drive.

### b Contingency in the event upgrades to Adams Road south are delayed

Assuming approval of the ARRC in late 2021, the ARRC would be scheduled to commence operations in 2024. Accordingly, it is considered unlikely that operation of the ARRC would coincide with the upgrade of Anton Road and Adams Road and any potential closure of Adams Road as it is assumed these works would be carried out sometime in 2022 or 2023. It is noted that an email was sent to WSA seeking further information around the timing and design details of the Adams Road/Anton Road upgrade works, WSA responded that timing of the upgrade work is subject to various factors and is unknown at this point and hence WSA's request that CPG and KLF consider the scenarios where this upgrade has not occurred prior to the commencement of ARRC operations.

To address WSA's concern regarding the potential scenario where the southern portion of Adams Road is not upgraded prior to the start of ARRC operations, a contingency traffic distribution scenario was modelled which assumed all ARRC traffic would access the site via the Elizabeth Drive/Adams Road intersection.

This scenario assumed the retention of the restriction of the right hand turn into Adams Road from Elizabeth Drive with the assumption that potential customers approaching from Elizabeth Drive west would either find an appropriate detour in the road network to approach from Elizabeth Drive east or find a more accessible resource recovery centre. The following assumptions were also included in the SIDRA modelling of this scenario:

- Adams Road will be closed at Anton Road, all ARRC related traffic (light and heavy vehicles) will travel to the Elizabeth Drive/Adams Road intersection;
- there will be no right turn from Elizabeth Drive into Adams Road for ARRC-related light and heavy vehicles, as well as background heavy vehicles. However, the right turn movement will be permitted for the background light vehicles; and
- baseline heavy vehicle traffic turning right into Adams Road from Elizabeth Drive has been redistributed so that the overall intersection volume (base case in various years) has not been changed.

The Addendum TIA appended to the Submissions Report assessed 2024 and 2029 scenarios in consultation with TfNSW due to the uncertainties regarding the future road network and traffic volumes beyond 2029. While it is noted, due to a later than anticipated expected approval of the project, the ARRC is unlikely to start operations until 2024. Notwithstanding, for consistency, the additional modelled scenario of all ARRC development traffic accessing the site from the Elizabeth Drive/Adams Road intersection has used modelled the same 2024 and 2029 scenarios. As per the Addendum TIA, this contingency scenario assesses a "ramp up period" for the ARRC for the 2024 as the facility will only just have commenced operations and therefore is expected to accept up to 300,000 tpa.

**Baseline traffic volumes**

Baseline traffic volumes for the 2024 and 2029 scenarios, as shown in Figure 2.1 and Figure 2.2 have been informed by latest TfNSW Strategic Travel Forecasting Model (STFM) outputs for the AM and PM peak periods provided by TfNSW in March 2021 (ie the same traffic volume data informing the Addendum TIA).

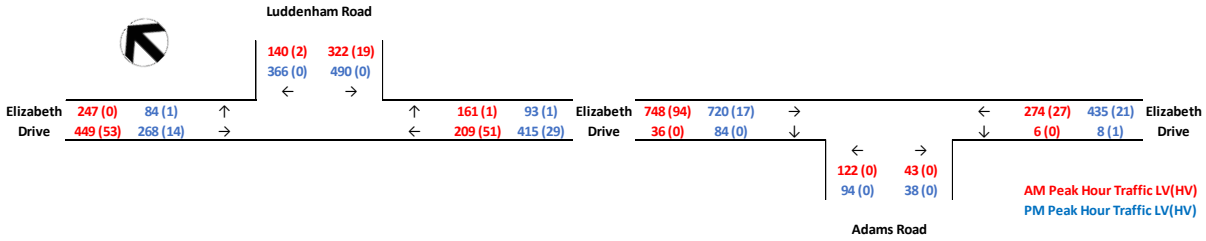


**Figure 2.1 2024 baseline traffic volumes**

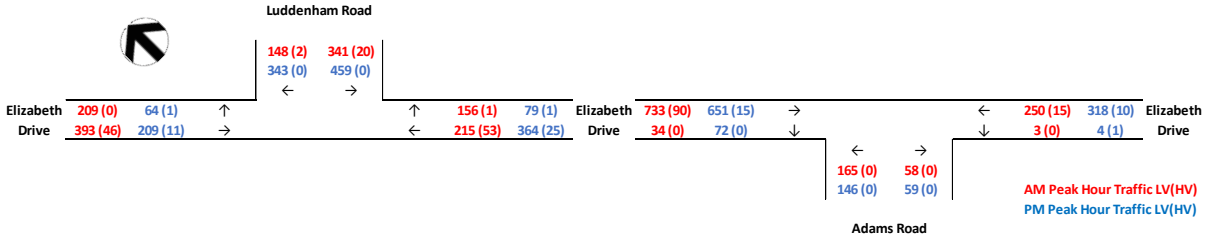


**Figure 2.2 2029 baseline traffic volumes**

## Development traffic

ARRC development traffic volumes and distribution, combined with other site development traffic (ie quarry extraction in 2024 scenario and quarry infilling 2029 scenario) are presented for 2024 and 2029 respectively in Figure 2.3 and Figure 2.4.

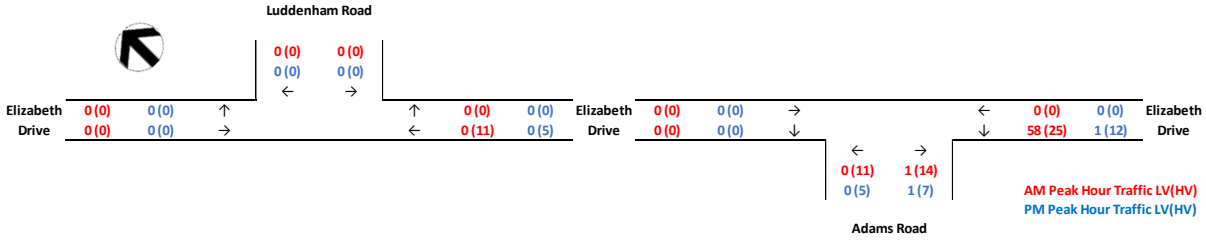


**Figure 2.3 2024 total site development traffic volumes**

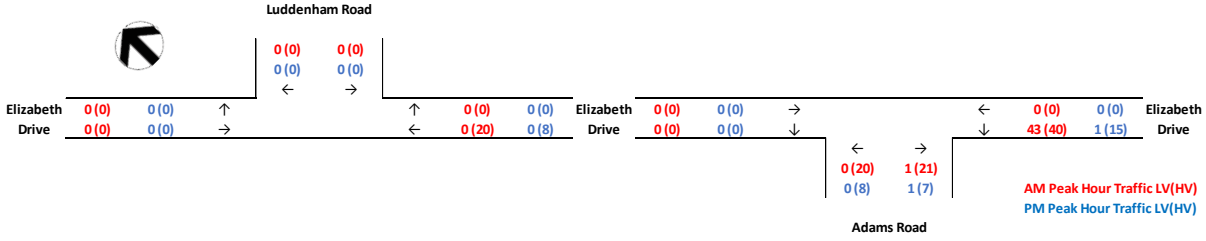


**Figure 2.4 2029 total site development traffic volumes**

## Cumulative traffic

Cumulative traffic volumes and distribution, consisting of the predicted baseline traffic volumes and total development site traffic are presented in Figure 2.5 and Figure 2.6.

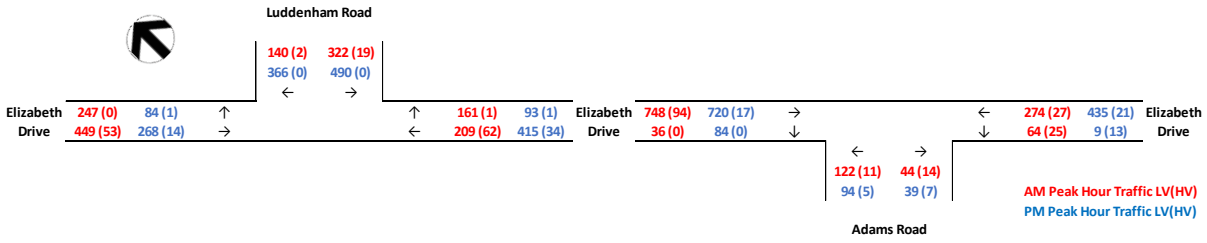


**Figure 2.5 2024 baseline with development and cumulative traffic volumes**

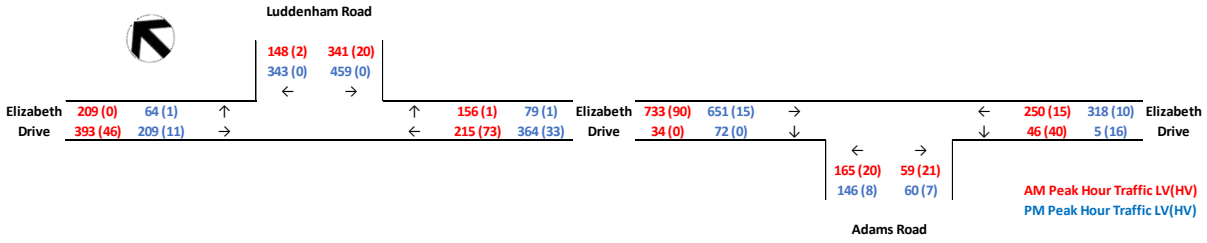


**Figure 2.6 2029 baseline with development and cumulative traffic volumes**

## Intersection performance of contingency scenario

The SIDRA results for the two key intersections affected by the contingency scenario, the Elizabeth Drive/Adams Road intersection the Elizabeth Drive/Luddenham Road intersection, are presented in Table 2.21 and Table 2.22. The tables present the average delay for the most delayed movement (usually the longest delay occurs for the right turning movement from the minor road).

### Table 2.21 SIDRA results for Elizabeth Drive/Adams Road intersection (no traffic signals)

| Model year[1] | Peak hour | DOS | | LOS | | DEL (seconds) | | Q95 (metres) | |
|---|---|---|---|---|---|---|---|---|---|
| | | baseline | development | baseline | development | baseline | development | baseline | development |
| 2024 | AM | 0.499 | 0.502 | B | B | 15.4 (RT from Adams Road) | 21.8 (RT from Adams Road) | 5.3 (TH and RT from Elizabeth Drive west) | 6.7 (RT from Adams Road) |
| | PM | 0.472 | 0.474 | B | B | 15.7 (RT from Adams Road) | 18.8 (RT from Adams Road) | 13.0 (TH and RT from Elizabeth Drive west) | 13.4 (TH and RT from Elizabeth Drive west) |
| 2029 | AM | 0.485 | 0.488 | A | B | 14.5 (RT from Adams Road) | 21.4 (RT from Adams Road) | 4.4 (TH and RT from Elizabeth Drive west) | 9.2 (RT from Adams Road) |
| | PM | 0.412 | 0.414 | A | A | 12.8 (RT from Adams Road) | 14.1 (RT from Adams Road) | 7.7 (TH and RT from Elizabeth Drive west) | 8.1 (TH and RT from Elizabeth Drive west) |

1. Assuming that the intersection is not upgraded.

With the additional forecast TfNSW locality growth, the intersection will continue to operate at LOS A or B in 2024, 2029, without the ARRC traffic. Project-related traffic will decrease the intersection performance in the AM peak hour in 2029 and 2034 from LOS A to a LOS B. The average delay for the right turning vehicles would be approximately 22 seconds in the future AM peak which is considered acceptable. The 95$^{th}$ percentile queuing will be about two to three vehicles.In all the modelled years, there will be approximately 50% spare capacity at the intersection.

### Table 2.22 SIDRA results for Elizabeth Drive/Luddenham Road intersection (no traffic signals)

| Model year[1] | Peak hour | DOS | | LOS | | DEL (seconds) | | Q95 (metres) | |
|---|---|---|---|---|---|---|---|---|---|
| | | baseline | development | baseline | development | baseline | development | baseline | development |
| 2024 | AM | 0.416 | 0.425 | B | B | 18.5 (RT from Luddenham Road) | 18.9 (RT from Luddenham Road) | 16.5 (LT from Luddenham Road) | 16.5 (LT from Luddenham Road) |
| | PM | 0.780 | 0.789 | B | B | 21.4 (RT from Luddenham Road) | 21.9 (RT from Luddenham Road) | 40.6 (RT from Luddenham Road) | 41.7 (RT from Luddenham Road) |
| 2029 | AM | 0.391 | 0.400 | B | B | 16.5 (RT from Luddenham Road) | 17.1 (RT from Luddenham Road) | 16.1 (LT from Luddenham Road) | 16.1 (LT from Luddenham Road) |
| | PM | 0.607 | 0.617 | B | B | 15.1 (RT from Luddenham Road) | 15.4 (RT from Luddenham Road) | 25.4 (RT from Luddenham Road) | 26.0 (RT from Luddenham Road) |

2. Assuming that the intersection is not upgraded.

The Elizabeth Drive/Luddenham Road intersection will operate at a LOS B in the peak hours, with or without the development traffic, across all analysed years.

In all the modelled years, there will be approximately 20% spare capacity at the intersection.

In summary, the SIDRA results show that the project will not significantly impact on the performance or capacity of the Elizabeth Drive/Adams Road intersection or the Elizabeth Drive/Luddenham Road intersection in the scenario where all ARRC traffic accesses the project via Elizabeth Drive.

### 2.4.2 Timing and responsibility of road upgrades

#### i Information request

DPIE request the nature of all associated road upgrades, including indicative timing and responsibility for the delivery of work be provided.

#### ii Additional information

The required road upgrades to facilitate the ARRC development are outlined in Section 3.1.1(ii) of the Submissions Report. These are reproduced in Table 2.23 along with indicative timing and responsibility. It is noted, the timeframes presented assume approval of the project would occur in late 2021 with ARRC operations expected to commence in 2024.

**Table 2.23 Road upgrades – timing and responsibility**

| Road upgrade | Timing | Responsibility |
|---|---|---|
| Upgrade of turn treatments at the Elizabeth Drive/Adams Road intersection and restriction of the right- hand turn from Elizabeth Drive west into Adams Road as follows:<br>• provision of a 120 m deceleration left-hand turn lane into Adams Road to meet the Austroads guidelines;<br>• provision of short left hand turn lane on Adams Road into Elizabeth Drive to minimise queuing on Adams Road;<br>• widening of existing Elizabeth Drive/Adams Road intersection to accommodate B-double swept paths; and<br>• prohibiting the right-hand turn from Elizabeth Drive west into Adams Road for inbound ARRC vehicles.<br>It is noted the upgrade is considered an interim upgrade and TfNSW will make further upgrades to this intersection at some point in the future as part of the overall road network upgrades for the Aerotropolis. | During early construction phase of the ARRC (Sept 2022 to March 2023) | CPG/KLF in consultation with LCC and TfNSW |
| Pavement upgrades on Adams Road between Elizabeth Drive and Anton Road to enable the existing road load limit to be lifted.<br>Pavement upgrades between site access and Elizabeth Drive will be carried out as part of the approved quarry reactivation.<br>Pavement upgrades between site access and Anton Road. | Between site access and Elizabeth Drive – late 2021 (as part of road upgrades for approved quarry)<br>Between site access and Anton Road – During construction phase of the ARRC (Sept 2022 to December 2023) | CPG/KLF in consultation with LCC |
| Pavement upgrades on Adams Road between The Northern Road and Anton Road will be carried out as part of road upgrades required for the WSA | A review of LCC minutes indicates the upgrades will result in the closure of Adams Road for 6 months. No indicative timing provided of when this 6-months closure would occur. | Third party (ie LCC and WSA) |

**Table 2.23 Road upgrades – timing and responsibility**

| Road upgrade | Timing | Responsibility |
|---|---|---|
| Road widening will also be required at the site access/Adams Road intersection to allow B-doubles to turn into the ARRC site without encroachment. | During early construction phase of the ARRC (Sept 2022 to March 2023) | CPG/KLF in consultation with LCC |

### 2.4.3 No-right-turn restriction

#### i Information request

DPIE and WSA both request further information be provided on how the proposed no-right-turn restriction into Adams Road from Elizabeth Drive will be enforced.

#### ii Additional information

As discussed with DPIE, TfNSW and LCC at the traffic meeting on the 25 March 2021 (refer Table 2.19 above), TfNSW has safety concerns in relation to the right hand turn for heavy vehicles into Adams Road from Elizabeth Drive.

The applicants propose to prepare sign and line marking plan for TfNSW approval which will restrict the right hand turn for all vehicles greater than 6 metres-in-length heavy into Adams Road (ie not just ARRC development traffic). This will still allow local light vehicle traffic to access existing rural residential properties and the Hubertus Country Club via Elizabeth Drive west.

As outlined in the Submissions Report, while light vehicles (ie utility vehicles and car and trailers) will access the ARRC, the numbers of these vehicles will be low due to the ARRC's location in the vicinity of existing and developing commercial and industrial areas rather than large residential developments. KLF's operational experiences at its other facilities also note a generally low patronage of light vehicles. Around 10 light vehicles a day are expected to delivery waste (around one light vehicle an hour). Signage will be placed at the weighbridge and included in the visitor site induction requesting customers avoid using the right-hand-turn into Adams Road.

In addition, there will be around 42 light vehicle movements a day associated with ARRC staff. ARRC staff will be, as a condition of their employment, prohibited from accessing the site from Elizabeth Drive west.

### 2.4.4 ARRC traffic types

#### i Information request

DPIE request details of all traffic types (such as light vehicles, 4.4-t load capacity trucks and 30-t load capacity trucks) and daily/nightly volumes likely to be generated along each transport route during operation be provided.

#### ii Additional information

As noted above, the nature of resource recovery facilities is that the source of material being accepted, and the destination of recycled product being sold by facilities, is governed by the location of customers using the facility. Similarly, the breakdown of vehicle types (ie skip bins, 12 t tip trucks, small rigid trucks, 30 t load capacity B-double and truck and dog heavy vehicles) will depend on type of customers accessing the ARRC. As outlined in the Addendum TIA the following assumptions regarding incoming waste has informed the Addendum TIA:

- approximately 150,000–200,000 tpa bulk waste transfer from other facilities within the KLF group and other recycling facilities that do not have the ability to recycle to level that will be achieved by the ARRC (assumed to arrive in 30-t loads);
- approximately 100,000–200,000 tpa waste from construction, industrial and commercial sites logistically close to the ARRC (conservatively assumed to arrive in 4.4-t loads);
- approximately 100,000–200,000 tpa bulk general solid waste/excavated materials from projects logistically close to the facility (assumed to arrive in 30-t loads).

Outgoing recycled product and non-recyclable residues is assumed to leave the ARRC in bulk loads of 30 t. Figures showing the predicted distribution of ARRC traffic on the road network for the proposed transport strategy presented in the Submissions Report and Addendum TIA (refer Figure 2.3 and 2.4).

Evening and night-time operations (ie between 6 pm and 6 am) are expected to be much less than day time operations. Notwithstanding, they have been conservatively assessed in the air quality assessment to account for 20% of daily traffic movements (ie of the daily average 525 heavy vehicle movements, 105 movements have been assumed to occur between the hours of 6pm and 6am. The noise assessment adopts a more conservative worst-case evening and night movements of 16 and 8 movements respectively per 15 minutes.

During the evening and night-time period, heavy vehicle types are expected to be larger truck and dog and B-double as night-time operations will primarily service large 24-hour infrastructure developments. The assessed evening and night-time movements are considered a worst-case scenario in terms of potential noise and traffic impacts during the night-time period. This is particularly the case considering the ARRC is unlikely to operate at full capacity during the day or night-time period prior to some level of upgrade to the broader road network as part of the development of the Aerotropolis and the start of 24-hour WSA operations.

### 2.4.5 Road network as shown in draft Aerotropolis Precinct Plan

#### i Information request

DPIE note it is unclear how the new sub-arterial road connecting Elizabeth Drive and Adams Road at the junction of Anton Road as identified in the Draft Aerotropolis Precinct Plan has been factored into the Addendum TIA.

#### ii Additional information

As requested by TfNSW, the Addendum TIA assessed the project in the context of the existing road network and therefore does not consider the proposed new sub-arterial road connecting Elizabeth Drive and Adams Road at the junction of Anton Road as identified in the Draft Aerotropolis Precinct Plan. This approach, discussed with TfNSW, is considered appropriate and a worst-case assessment as it demonstrates that the existing road network can accommodate peak ARRC development traffic and predicted baseline traffic volumes. ARRC development traffic will not preclude the future upgrades to the road network, such as the preliminary layout shown in draft form in the precinct plan, or significantly impact on capacity of the road network.

It is noted that this proposed new sub-arterial road connecting Elizabeth Drive and Adams Road at the junction of Anton Road, pending further TfNSW design and assessment, could potentially form an alternate access to the ARRC if constructed in the event TfNSW progresses its preliminary design to upgrade the Elizabeth Drive/Adams Road to a left into Adams Road only layout.

## 2.5 Operational noise assessment

An Addendum Noise and Vibration Impact Assessment (May 2021) was appended to the Luddenham Advanced Resource Recovery Centre Submissions Report (EMM 2021a). The ANVIA was revised as requested by DPIE and appended to the original submission of this report. The ANVIA has been subsequently revised to adopt DPIE and EPA's direction that rural amenity levels -5 dB be applied to the project. This revised ANVIA assessment is provided in Appendix D of this response report. Unless otherwise specified, refences to the 'ANVIA' below refer to ANVIA provided in Appendix D.

### 2.5.1 Operational noise assessment criteria

#### i Information request

DPIE and EPA request that residential receivers affected by noise from the proposed development be afforded rural zoning for noise assessment purposes. DPIE request the Addendum Noise and Vibration Impact Assessment (NVIA) submitted in May 2021 be updated to assess on-site operational noise emissions against the night-time project amenity noise level of $L_{Aeq,15min}$ 38 dB(A) for rural residential receivers in accordance with Section 2.4 of the Noise Policy for Industry (NPfI).

#### ii Additional information

The ANVIA has been revised to adopt DPIE and EPA's direction that rural amenity levels -5 dB be applied to the noise assessment for the ARRC.

ANVIA Section 3.1.2 addresses the application of amenity noise levels for the ARRC development and updated project trigger noise levels (PTNLs).

### 2.5.2 Road traffic noise criteria

#### i Information request

DPIE request that the cumulative traffic noise impact assessment adopt the new road criteria of $L_{Aeq,15h}$ 55 dB(A) for daytime and $L_{Aeq,9h}$ 50 dB(A) for night-time at residential receivers affected by traffic noise from Adams Road.

#### ii Additional information

ANVIA Sections 3.4, 4.3 and 5.2 address cumulative noise impacts of road traffic noise from the proposal.

The assessment adopted NSW RNP criteria for arterial and sub-arterial roads of 60 dB $L_{Aeq15hour}$ day and 55 dB $L_{Aeq9hour}$ night, and also considered the DPIE request for assessment against the NCG criteria for new roads of 55 dB $L_{Aeq15hour}$ day and 50 dB $L_{Aeq9hour}$ night.

The results of the updated road traffic noise assessment are described in Section 2.5.4 below.

### 2.5.3 Operational noise modelling

#### i Information request

DPIE requests the following information regarding the operational noise model:

- All operational modelling assumptions be clearly identified and justified in the Addendum NVIA, including but not limited to source height, vehicle speed profile, duration of noise emission and representative frequency spectrum.

- The operational noise model developed to support the proposed development must consider each distinct outdoor operation including heavy vehicles idling, passing by, accelerating and reversing (if applicable). Noise generated by heavy vehicles during acceleration and by the use of air brakes and engine compression brakes need to be considered in the Addendum NVIA for assessment against both the $L_{Aeq}$ and $L_{Amax}$ noise criteria.

- The assumption that 103 dB(A) is a representative value of sound power level for large truck prime movers be substantiated with reference to verifiable data.

- The Addendum NVIA be updated to include a revised noise emission inventory that accurately describe how noise would be generated by the operation of the development.

- Specification of the revised noise emission inventory that accurately describe how noise would be generated by the operation of the development.

- Clarification on how noise egress through ARRC warehouse entrances has been accounted for in the model.

- Clarification on the maximum number of heavy vehicles on site during the night-time period.

- Clarification on the sound power level for source locations and input levels identified in Appendix A of the Addendum NVIA.

### ii Additional information

ANVIA Sections 4.2, 5.1 and Appendix A address the items outlined by DPIE in terms of noise modelling inputs for operational noise from the ARRC as summarised in Table 2.24.

**Table 2.24 Model updates**

| DPIE request | ANVIA update | ANVIA section |
|---|---|---|
| All operational modelling assumptions be clearly identified and justified in the Addendum NVIA. | Confirmation of source data and modelling assumptions for all noise sources provided. | Section 4.2 |
| The operational noise model developed to support the proposed development must consider each distinct outdoor operation including heavy vehicles idling, passing by, accelerating and reversing (if applicable). Noise generated by heavy vehicles during acceleration and by the use of air brakes and engine compression brakes need to be considered in the Addendum NVIA for assessment against both the $L_{Aeq}$ and $L_{Amax}$ noise criteria. | Base noise level for trucks for site was amended to included small/medium and large trucks. Further amendments were adopted to address potential for truck acceleration, deceleration and pass by activities.<br>Airbrake release was considered in the assessment of sleep disturbance impacts at night. | Section 4.2.2 |

## Table 2.24 Model updates

| DPIE request | ANVIA update | ANVIA section |
|---|---|---|
| The assumption that 103 dB(A) is a representative value of sound power level for large truck prime movers be substantiated with reference to verifiable data.<br>In a subsequent email from DPIE (J Peng, 3 November 2021), DPIE noted the sound power levels assumed by EMM for heavy trucks are notably lower than measured levels of heavy vehicles submitted with a recent SSD application for Woolworths WDC Wetherill Park. As such, DPIE reiterated that the assumed operational noise emission inputs must be substantiated with reference to verifiable data which is local and representative of current operational equipment and heavy vehicle fleet from the NSW C&D waste industry. | Base truck noise levels were amened in accordance with noise data from EMM measurements of truck and dog operations and additional information from DEFRA database for 39-t road trucks.<br>Amended data includes consideration of acceleration, deceleration and pass by activities.<br>It is noted the heavy vehicle sound power levels identified in the Woolworths WDC Wetherill Park application are not comparable to the ARRC. The Woolworths WDC Wetherill Park heavy vehicle sound power levels presented in Table 5-9 of the Noise and Vibration Impact Assessment (Renzo Tonin & Associates (2021), which are 1–2 dB higher than used for the ARRC, are for heavy vehicles with refrigeration units and generally apply to moving up or down a ramp – neither of which will occur at the ARRC.<br>Comparable NSW C&D operations include the following projects that have been approved by DPIE: Girraween Waste Recycling Transfer Facility (SSD-9766), Penrith Waste Recycling and Transfer Facility (SSD-7733), Smeaton Grange Waste Recycling Transfer Facility (SSD 7424), Mayfield West Waste Facility (SSD-7698) and spoil haul heavy vehicles for WCX M4-M5 (SSI-7485). These assessments all used haul truck sound power levels of 103–105 dB. The heavy truck sound power levels used in the ARRC Addendum Noise assessment were generally higher (104–108 dB) than those used for these previously approved developments. | Section 4.2.2 |
| Include a revised noise emission inventory that accurately describe how noise would be generated by the operation of the development. | All fixed and mobile plant and equipment envisaged for the site have been listed and incorporated into the noise model. | Section 4.2 |
| Specification of the revised noise emission inventory that accurately describe how noise would be generated by the operation of the development. | All fixed and mobile plant and equipment envisaged for the site have been listed and incorporated into the noise model. | Section 4.2 |
| Clarification on how noise egress through ARRC warehouse entrances has been accounted for in the model. | Describes the construction of the building including building openings. Openings considered the internal space averaged noise level of the building and surface area opening in the noise model calculations. | Section 4.2.1 |
| Clarification on the maximum number of heavy vehicles on site during the night-time period. | Considering 8 movements, 4 trucks per 15 minutes, there could be up to 144 trucks per night. However, this number of trucks assumes peak movements throughout the night which will not occur. A review of the traffic projections confirms up to 69 trucks for the whole night period.<br>As outlined above, CPG and KLF propose to operate the ARRC during daytime hours only until WSA operations are properly underway. | Section 4.2.2 |

**Table 2.24 Model updates**

| DPIE request | ANVIA update | ANVIA section |
|---|---|---|
| Clarification on the sound power level for source locations and input levels identified in Appendix A of the Addendum NVIA. | Appendix A has been updated in accordance with the assumptions of noise emissions from the ARRC as outlined in Section 4.2 | Appendix A and Section 4.2 |
| All operational modelling assumptions be clearly identified and justified in the Addendum NVIA, including but not limited to source height, vehicle speed profile, duration of noise emission and representative frequency spectrum. | Details provided in Section 4.1 and Appendix A | Section 4.2 and Appendix A |

The amendments described in Table 2.24, including inclusion of increased sound power levels and consideration of acceleration, deceleration and pass by noise levels, has amounted to 1 dB or less change in predicted noise levels at the residential assessment locations comparted to those reported in the May 2021 ANVIA.

### 2.5.4 Road traffic noise modelling

#### i Information request

DPIE request that the traffic noise modelling method be selected in line with the advice given in Appendix B4 of the NSW Road Noise Policy and its use justified according to the circumstances of the proposal. DPIE request that unless otherwise justified, consideration should be given to methods listed in the NSW Road Noise Policy, including but not limited to the US FHWA STAMINA and TNM models. DPIE note how noise emissions under accelerating and decelerating conditions have been modelled should form the justification for this particular project in the selection of an appropriate traffic noise calculation method.

#### ii Additional information

ANVIA Sections 4.3 and 5.2 address road traffic noise impacts from the proposal.

Road traffic noise levels were predicted utilising the calculation procedures of US EPA Federal Highways (FHWA) Method (1996) spreadsheet calculation. This is considered appropriate for the assessment of road traffic noise due to low traffic flows (<200 vehicles per hour) as the FHWA calculation procedure is more sensitive to low traffic volumes compared to other methods. This method has been consistently utilised for other developments, including Dubbo Quarry, Girraween Recycling Facility, Snowy 2.0 and Gunlake extension project where the development is not a road project but rather a development with the potential to increase road traffic noise levels as a result of additional traffic on the existing road network.

Following on from discussions with DPIE, additional adjustments were considered in the traffic noise modelling to account for potential increased noise levels for trucks accelerating from the site access onto Adams Road. The assessment has utilised an adjustment of +2.1 dB for moderate acceleration for heavy vehicles established from *UK Noise Association – Speed and Road Traffic Noise* (Paige Mitchell - UK Noise Association 2009).

The updated road traffic noise assessment also considers the potential for acceleration of vehicles for specified road segments and potential for a roundabout at the junction of Adams Road and Anton Road.

The road traffic noise assessment has been conservative in terms of considering all trucks (day/evening/night) are heavy trucks. It is expected that 58% of all truck movements during the day and evening periods will be light or medium trucks (which are quieter). Assumptions used in the noise modelling are provided in ANVIA Section 4.3.

The NSW RNP and RMS NCG <2 dB relative increase allowance criterion is satisfied for all road segments and assessment locations. Where baseline levels are exceeded, the assessment has demonstrated that the relative noise increase is less than 2 dB and hence satisfies the NSW RNP and RMS NCG.

### 2.5.5 Sleep disturbance assessment

#### i Information request

DPIE and EPA request the addendum NVIA be revised to include a detailed maximum noise level event and sleep disturbance assessment. DPIE further requests that this assessment considers the current scientific literature regarding the impact of maximum noise level events at night in line with the advice provided in the *Noise Policy for Industry*. Specifically, DPIE requests the Addendum NVIA considers the WHO's *Night Noise Guidelines for Europe* (2009) and the *Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep* (2018).

#### ii Additional information

ANVIA Sections 3.2, 4.2.4 and 5.1.2 provide updated sleep disturbance screening criteria and considers both $L_{Aeq,15min}$ and $L_{Amax}$ noise levels. Potential for these events were considered at the north and south weighbridges, northern waiting area west of weighbridge and each of the building openings and were predicted to the identified residential assessment locations. Results of modelling confirm compliance with the $L_{Amax}$ sleep disturbance screening level (52–54 dB) for most residential assessment locations with the exception of R3 and R6. The exceedance at R6 is negligible (+2 dB).

A review of predicted noise levels confirm compliance with the $L_{Aeq,15min}$ sleep disturbance screening level (40–44 dB) for R1, R5, R7 and R8 residential assessment locations. Negligible exceedances (2 dB or less) are predicted for R1, R2 and R4, whilst significant exceedances are predicted for R3 (+21 dB) and R6 (+12 dB).

R3 is currently in a poor state of repair and is unoccupied. The property is likely to be redeveloped for commercial or industrial use. It is noted the new zoning of the R3 land parcel would prohibit the development of a new residence.

The owners of R6 have been contacted regarding a negotiated agreement to mitigate noise impacts, including sleep disturbance.

As outlined above, CPF and KLF will restrict evening and daytime operations until operations at WSA are properly underway.

### 2.5.6 Intermittent noise

#### i Information request

DPIE considers the application of a +5 dB modifying correction for intermittent noise to be warranted for the project unless otherwise justified. DPIE further requests a feasible and reasonable mitigation decision-making matrix be included within the ANVIA in line with the advice provided in Section 3.4 of the NPfI.

#### ii Additional information

ANVIA Sections 3.2, 4.2.4 and 5.1.2 provide an updated consideration of intermittent characteristics from the ARRC site noise. The assessment conducted a review of the truck activities and relative noise contributions against the noise contributions from the ARRC building for each assessment location. Review of the predicted noise levels

confirmed that there is less than a 5 dB difference in the relative noise contributions during the night-time period, accordingly a 5 dB penalty for intermittency at night has not been applied to the site noise emissions.

### 2.5.7 Best-achievable noise level and mitigation measures

#### i Information request

DPIE request that the best-achievable noise levels from the project be presented in the ANVIA after all feasible and reasonable source and pathway controls have been considered in the operational noise assessment. DPIE also request the ANVIA provide an outline of all noise control options considered in the design process including a discussion of what is feasible for the project.

#### ii Additional information

ANVIA Section 5.1.3 provides a summary of the feasible and reasonable mitigation steps considered for further reducing noise from the operation of the ARRC whilst Section 5.1.4 outlines the best achievable noise levels as a result of the consideration of the potential mitigation options. A key aspect of the noise modelling is the consideration of worst-case operations, with peak truck movements and all processing plant and equipment operating simultaneously. Actual operations with processing of specific feedstock and/or on a campaigned basis would result in actual noise levels lower than those predicted in the ANVIA.

## 2.6 Other matters

### 2.6.1 On-site sewerage management system (OSMS)

#### i Information request

LCC note that Section 15, Part 1 of the Liverpool Development Control Plan 2008 states development or subdivision proposals relying on pump-out sewerage systems will not be approved by council.

#### ii Additional information

As outlined in Section 4.2 of the Servicing Strategy report (Appendix S of the EIS), Sydney Water currently has new wastewater infrastructure planned over the next 5 years for the area around the ARRC site, including the WSA. As noted in the servicing strategy, it is understood that a new regional centralised wastewater treatment plant servicing the Upper South Creek catchment (which includes the ARRC site) will be delivered by Sydney Water by 2026.

The applicants acknowledge approval will be required under Section 68 of the *Local Government Act 1993* for the operation of an onsite sewerage management system in the event the proposed Sydney Water wastewater infrastructure is not operational by the time the ARRC commences operations.

The Servicing Strategy Report proposed a sewerage treatment plan (STP) located in the water management infrastructure area to the south of the ARRC warehouse indicatively consisting of an eloywater oxyfix treatment system which would treat effluent for either pump out or use for onsite irrigation of landscaped areas. The final design and specification of the STP would be identified in the wastewater report prepared a part of the Section 68 application.

### 2.6.2 Landscaping

#### i Information request

LCC recommend an alternative species to *Acacia longifolia,* better suited to site conditions and offering greater longevity is selected for use in landscaping around the ARRC site.

#### ii Additional information

A landscape plan will be prepared prior to the commencement of construction of the ARRC, this plan will be prepared with consideration to WSA and Aerotropolis specific guidance material on preferred landscape species to minimise wildlife attraction and also Appendix 2 of Part 1 of LCC's preferred list of species.

# References


DIPNR 2004, *Assessment Report, Proposed Clay/Shale Extraction Operation, Lot 3 – 275 Adams Road Luddenham*. Department of Infrastructure, Planning and Natural Resources Assessment.

DPIE 2021a, *Assessment Report, Luddenham Quarry Modification 5 Quarry Re-activation.* Department of Planning, Industry and Environment

DPIE 2021b, *NSW Waste and Sustainable Materials Strategy, A Guide to Future Infrastructure Needs*. Department of Planning, Industry and Environment.

DPIE 2020, *Cleaning Up Our Act: The Future for Waste and Resource Recovery* released in 2020. Department of Planning, Industry and Environment.

Douglas Nicolaisen & Associates Pty Ltd 2003, *Environmental Impact Statement – Proposed Clay/Shale Extraction Operation – Lot 3 - 272 Adams Road Luddenham NSW*, prepared for Badger Mining Company Pty Limited 275 Adams Road Luddenham NSW.

EMM 2021a, *Luddenham Resource Recovery Centre, Submissions Report,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd

EMM 2021b, *Luddenham Resource Recovery Centre, Biodiversity Development Assessment Report,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd.

EMM 2021c, *Luddenham Resource Recovery Centre, Addendum Air Quality Impact Assessment,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd.

EMM 2021d, *Luddenham Advanced Resource Recovery Centre Addendum Noise and Vibration Impact Assessment*, prepared for Coombes Property Group/KLF Holdings Pty Ltd by EMM Consulting Pty Limited

EMM 2021e, *Luddenham Resource Recovery Centre, Addendum Traffic Impact Assessment,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd.

EMM 2020a, *Luddenham Resource Recovery Centre, Responses to Request for Information,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd

EMM 2020b, *Luddenham Advanced Resource Recover Centre, Wildlife Strike and Birdstrike Risk Review*. Prepared for Coombes Property Group and KLF Holdings Pty Ltd by EMM Consulting Pty Limited

EMM 2020c, *Luddenham Resource Recovery Centre, Aboriginal Cultural Heritage Assessment,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd.

EMM 2020d, *Luddenham Advanced Resource Recovery Centre Noise and Vibration Impact Assessment*, prepared for Coombes Property Group/KLF Holdings Pty Ltd by EMM Consulting Pty Limited.

EMM 2020e, *Luddenham Quarry Modification 5 - Noise and vibration impact assessment,* prepared for Coombes Property Group and KLF Holdings Pty Ltd, EMM Consulting Pty Ltd.

FRNSW 2020, *Fire Safety Guideline: Fire Safety in Waste Facilities, Version 02.02*, Fire and Rescue NSW, Community Safety Directorate, Fire Safety Branch, issued 27 February 2020.

Gillespie Economics 2020, *High-Level Economic Impact Assessment of the Luddenham Advanced Resource Recovery Centre*, prepared for Coombes Property Group/KLF Holdings Pty Ltd .

Indesco Pty Ltd 2020, Servicing Strategy report was prepared for Coombes Property Group/KLF Holdings Pty Ltd

Paige Mitchell - UK Noise Association 2009, *UK Noise Association – Speed and Road Traffic Noise.*

Landrum and Brown 2020, *Aeronautical Impact Assessment V4,* prepared by Landrum & Brown Worldwide (Aust) Pty Ltd for Coombes Property Group and EMM Consulting Pty Ltd.

WHO 2018, *Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep*.

WHO 2009, *Night Noise Guidelines for Europe.*

WSPP 2019a, *Western Sydney Aerotropolis Plan Draft - for public comment,* NSW Western Sydney Planning Partnership.

WSPP 2020a, *Western Sydney Aerotropolis Plan,* NSW Western Sydney Planning Partnership.

WSPP 2020b, *Draft Aerotropolis Precinct Plan*, Western Sydney Planning Partnership.

Appendix A

# Legal advice regarding filling of the quarry void

MinterEllison

26 November 2020

**BY EMAIL**

Pascal Bobilier
Coombes Property Group
5/2 Grosvenor St
Bondi Junction NSW 2022

Dear Mr Bobilier

**Modification of Development Consent for Clay-Shale Quarry at Lot 3, 275 Adams Road, Luddenham to rehabilitate site.**

**1. Introduction.**

1.1 Reference is made for your request for advice as to whether a modification can lawfully be made and approved to the Development Consent granted by the then Minister for Infrastructure, Planning and Natural Resources in 2004 for a clay / shale quarry at 275 Adams Road, Luddenham to rehabilitate the quarry on completion of extraction by the infilling of the quarry void with construction and demolition waste.

**1.2** The power to modify a development consent is provided for in s 4.55 of the *Environmental Planning and Assessment Act, 1979* (**EPA Act**).

**1.3** The development when approved was State significant development under the EPA Act, with the Minister as the consent authority. At that time, the development was permissible with consent under the *Liverpool Local Environmental Plan 1997*.

**1.4** The original development application envisaged that on completion of extraction, the quarry void would be rehabilitated with inert waste. While the environmental impact statement (**EIS**) accompanying the original DA canvassed issues associated with the emplacement of inert waste in the void, it indicated that a separate approval would be sought later for the rehabilitation phase and the DA was assessed and consent granted on this basis.

**1.5** The statutory planning framework for the site has subsequently been altered with the making of the *State Environmental Planning Policy (Western Sydney Aerotropolis) 2020* (**Aerotropolis SEPP**) on 1 October 2020.

**2. State Environmental Planning Policy (Western Sydney Aerotropolis).**

**2.1** Under the Aerotropolis SEPP, the site is zoned 'Agribusiness'. For lands in the Agribusiness zone, development for the purposes of extractive industries and waste or resource management facilities is prohibited under cl 14 and the Land Use Table.

**2.2** The definition of "*waste or resource management facilities*" for the SEPP is that in the standard local environmental planning instrument prescribed by the *Standard Instrument (Local Environmental Plans) Order 2006* (per cl 4 of the Aerotropolis SEPP). This definition is as follows:

"***waste or resource management facility*** *means any of the following—*

*(a) a resource recovery facility,*

*(b) a waste disposal facility,*

*(c) a waste or resource transfer station,*

*(d) a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).*"

**2.3** The definition of "*extractive industries*" for the SEPP is that in the standard local environmental planning instrument prescribed by the *Standard Instrument (Local Environmental Plans) Order 2006* (Clause 4 of the SEPP). This definition is as follows:

"***extractive industry*** *means the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating, but does not include turf farming.*"

2.4 Given these prohibitions in the Aerotropolis SEPP, no new development application can be approved for development for the purposes of either extractive industries or waste or resource management facilities on the site (see ss 4.3 and 4.38 of the EPA Act).

**3. Power to Modify a Development Consent.**

3.1 Section 4.55 of the EPA Act provides:

"*A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:*

*(a) it is satisfied that the development to which the consent as modified relates is* ***substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified*** *(if at all)…*".

3.2 The only limitations on the power to modify a development consent are those found in s 4.55. The requirement to take into consideration the heads of consideration is directory and does not prevent a consent authority from granting a modification which may be in breach of an EPI or a development standard therein (see *Lido Real Estate Pty Ltd v Woollahra Council (1997) 98 LGERA 1; North Sydney Council v Michael Standley & Associates Pty Ltd (1998) 97 LGERA 433*). Thus, where a development consent is operative, it may be modified under s. 4.55 despite the fact that the use for which the modification relates is otherwise prohibited, even though a new DA for that prohibited use could not be granted.

3.3 The approval authority for a modification is the consent authority who granted the original consent, even if that person or body would not be the consent authority if the original DA was lodged today. This can be discerned from the prefatory words of s 4.55 which provide that a "*consent authority may, on application being made by the applicant or any other person entitled to act on a consent* ***granted by the consent authority****…*" (emphasis added). Thus, the approval authority for any modification to the subject consent would be the Minister, although the Minister may delegate that responsibility.

3.4 Section 4.55 of the EPA Act also provides a key test as to whether the consent authority has the power to modify a consent. That test is that the consent authority needs to be satisfied that the development as proposed to be modified is substantially the same development as the development for which consent was originally granted.

3.5 The reference point for the test of substantially the same development is "*the development for which the consent was originally granted and before that consent as originally granted was modified (if at all)*" (see s 4.55(1A)(b) of the EPA Act).

3.6 It is important to note that there have been three modifications granted to the subject consent and a fourth has been lodged, but none of the modifications already granted or lodged are material in undertaking the comparative test of substantially the same development for the current purposes.

3.7 In the current instance, the fundamental issue is whether a modification to rehabilitate the quarry on completion of extraction by the infilling of the quarry void with construction and demolition waste is substantially the same development as that which was originally approved.

**4. Legal Consideration of the Meaning of "Substantially the same development."**

4.1 The leading authorities on the substantially the same test are *Vacik v Penrith City Council* [1992] NSWLEC 8 (**Vacik**) and *Moto Projects (No 2) Pty Ltd v North Sydney Council* (1999) 106 LGERA 298 (**Moto**).

4.2 In Vacik, Stein J held that the term "*substantially*" means "*essentially have the same essence*". If a development as modified involves an additional and distinct use it is not substantially the same development. On this point, Stein J held:

"*…substantially when used in the section means essentially or materially or having the same essence.*"

4.3 In Moto, Bignold J set out the following principles for consideration in satisfying the precondition of substantially the same:

(a) "*The requisite factual finding obviously requires a comparison between the development, as currently approved, and the development as proposed to be modified…*" (at [55]).

(b) "*The result of the comparison must be a finding that the modified development is 'essentially or materially' the same as the (currently) approved development*" (at [55]).

(c) The comparative task involves a quantitative as well as qualitative appreciation of the differences - a numeric or quantitative evaluation of the modification when compared to the original consent absent any qualitative assessment will be "legally flawed" (at [52]).

(d) "*The comparative task does not merely involve a comparison of the physical features or components of the development as currently approved and modified where that comparative exercise is undertaken in some type of sterile vacuum. Rather, the comparison involves an appreciation, qualitative, as well as quantitative, of the developments being compared in their proper contexts (including the circumstances in which the development consent was granted)*" (at [56]).

(e) The comparative task needs to assess the physical features as well as the environmental impacts of the changes (at [57]-[62]).

(f) Consideration should be given to any feature of the development which is important, material or essential. A change to such a feature is likely to mean that it is not substantially the same development (at [64]).

4.4 The term "*substantially*" in "*substantially the same development*" means "*essentially or materially or having the same essence*". The applicant is responsible for demonstrating that a modification is substantially the same development. To assess whether a consent is modified will be substantially the same development requires a comparison of the before and after situations. Differences may involve differences of the result or outcome, as well as differences of the process of implementation which have environmental implications or differences in outcomes.

4.5 A development, as modified, is not substantially the same development as originally approved simply because it is for the same use. But if the development, as modified, involves an additional and distinct use, it is not substantially the same development as originally approved (*Vacik*).

4.6 The requirement for the consent authority to be satisfied in relation to the test of substantially the same development is a pre-requisite for the exercise of power and hence, the existence or otherwise of the state of satisfaction is a jurisdictional fact, capable of review by the courts. However, the conclusion actually reached by a consent authority on the question of substantially the same development is a conclusion of fact and not a jurisdictional fact and is reviewable by the courts only if it is not an opinion reasonably open for the consent authority to make (see *Fernance Family Holdings Pty Ltd v Newcastle City Council* [2000] NSWLEC 190; *Wolgan Action Group*

*Incorporated v Lithgow City Council* [2001] NSWLEC 199 at [37]; *King, Marwick, Taylor & Ors v Bathurst Regional Council* [2006] NSWLEC 505 at paragraphs [56]–[57]).

4.7 Thus in the current instance to ascertain whether the proposed modification is substantially the same development as originally approved requires a consideration of three aspects:

(a) Is the modification for the same or a different use to the development as originally approved?

(b) Is the modification quantitative similar to development as originally approved?

(c) Is the modification qualitatively similar to development as originally approved?

4.8 Each of these three aspects will be considered in turn. However prior to this consideration needs to be given to the nature of the development as originally approved as it contains some unusual features.

**5. Nature of the Development Originally Approved.**

5.1 The EIS for the original DA is entitled "*Environmental Impact Statement. Proposed Clay / Shale Extraction Operation. Lot 3, 275 Adams Road Luddenham NSW, prepared for Badger Mining Company*" prepared by Douglass Nicolaisen and dated 30 May 2003. The EIS was for a proposed clay / shale quarry (Section 1) with three phases: establishment phase, extraction phase and rehabilitation phase (Section 1.3). The EIS provided in relation to the rehabilitation phase as follows:

*"Rehabilitation material will be sourced from selected and controlled locations such that it satisfies the criteria for Inert Waste Class 2 specified by the NSW EPA. This decision allows the site to be rehabilitated without it becoming a 'rubbish dump' with all the attendant environmental and management problems….. Because of the time span between commencement of extraction operations and the commencement of rehabilitation activity and the resultant uncertainty of source and tonnage of acceptable materials, it is proposed that a separate application be lodged for the rehabilitation development closer to the time of such work being possible."* (Section 1.3.3).

5.2 Nonetheless the EIS provided an assessment of the filling operations at Section 4.2 and 4.5.

5.3 The Department of Infrastructure, Planning and Natural Resources in its assessment report on the proposed development prepared by Colin Phillips and approved by the Manager, Mining and Extractive Industries and the Deputy Director General noted as follows:

*"Most rehabilitation works will not be able to occur until excavation of the clay / shale resource is complete. The final rehabilitation of the excavation is not a component of the current development proposal. A separate development application for the bulk of rehabilitation works is required to be submitted at a time when the likely source, composition and transport arrangements are known with a high degree of certainty.*

*The EIS indicated that it is the Applicant's intention, at an appropriate future time, to seek development consent to allow the importation of selected inert material to fill the void created by the excavation of the clay / shale.*

*…Although it is the Applicant's ultimate intention to rehabilitate the site by the infilling of the final void, there are no provisions in the current development application to allow that to occur. In the absence of imported material for final rehabilitation, the development will conform to the requirements of the "Rehabilitation" section of the Planning Report for the Sydney [Regional sic.] Environmental Plan No. 9 – Extractive industry (No. 2 – 1995). The requirements include the establishment of a stable and safe landform and the protection of streams from sedimentation."* (page 7).

5.4 The Department's assessment report recognised that the filling of the void did not form part of the current proposal. However, the Department's report recognised that the infilling of the void could constitute one of the approaches to the rehabilitation of the quarry void.

5.5 In the Development Consent granted by the Minister in 2004 (as amended but such amendments were not substantive), the following conditions were included:

*"33. Prior to carrying out any development on the site, the Applicant shall prepare a Site Rehabilitation Plan in accordance with the rehabilitation guidelines in the document titled "Sydney Regional Environmental Plan No.9 – Extractive Industries (No. 2) – Planning Report", to the satisfaction of the Secretary. The Site Rehabilitation Plan shall include a Vegetation Management Plan.*

*……*

*36. Prior to 5 years of the estimated completion of extractive activities at the site, the Applicant shall submit a report to the Department identifying the final land use of the site and the method of treatment of the final void."*

5.6 Implicit in these conditions is a recognition that a Site Rehabilitation Plan as a stand-alone approach to rehabilitation was likely to be an interim approach pending the report 5 years prior to project completion and any subsequent application by the Applicant to fill the void. This is reflected in the Site Rehabilitation Plan prepared by Conacher Environmental Group in April 2009, where the stand-alone rehabilitation approach was to be a stop gap outcome pending a later application to fill the void.

**6. Is the modification for the same or a different use to the development as originally approved?**

6.1 In essence, this question is whether the filling of the quarry void is development for the same purpose as the development as originally approved, namely extractive industries or whether it is development for a different purpose, namely waste or resource management facilities. If it is properly characterised as development for a different purpose it is unlikely to be substantially the same development. This question has been considered by Pepper J in the Land and Environment Court of NSW in *Sutherland Shire Council v Benedict Industries Pty Ltd (No 8)* [2017] NSWLEC 4. In *Benedict*, the Council asserted that the construction of a bund wall around an extractive industry constituted development for the purposes other than extractive industries. Pepper J. emphatically reject the Council's assertion, finding as follows:

"*120. Whether the bund is for the purpose of an extractive industry within the meaning of SREP 9 or ancillary to the primary legal use of a site for the purposes of SSLEP 2000, depends on the proper characterisation of the purpose of the bund.*

*…..*

*124. The council misunderstands the distinction between a use of part of an area of land and the purpose of that use, which is the end designed to be served by the use of a particular component. Thus in Chamwell, the land was not properly characterised as being used for the separate purposes of a car park, driveway, access ways and landscaped forecourt, but for the more general overall purpose of retail development (at [31]).*

*125. The quarry development, which includes the bund, the quarry face, the works compound, the access road, the internal access roads, the stockpiles, the machinery and equipment areas, the weighbridge and the truck washing area, constitutes one integrated and indivisible activity and is not capable of artificial subdivision into "the bund" and "the rest of the quarry". It would not be appropriate or correct, for example, to characterise the internal access roads or the works compound as for their specific purposes rather than for the overall quarry purpose.*

*126. The council submitted that the bund wall was not necessary for the carrying out of quarrying. However, this is not the test for determining what the bund's purpose is, and necessity is not determinative of whether a building or component of a land use serves a purpose. The bund serves the quarrys'* [sic] *purpose even though other means may have been available to address the security issue, such as signage or security guards.*

*.....*

*132. In respect of the concept of ancillary use, a use will be ancillary if it is use of part of land for a purpose that is subordinate to and subserves another dominant purpose (Foodbarn Pty Limited v Solicitor-General (1975) 32 LGRA 157 at 160-161 per Glass JA and Baulkham Hills Shire Council v O'Donnell (1990) 69 LGRA 404 at 409-410 per Meagher JA).*

*133. Where part of premises is used for a purpose which is subordinate to the purpose which inspires the use of another part, the former may be disregarded and treated as the dominant purpose for which the whole is being used (Foodbarn at 161 and Abret at [50]-[55] citing Chamwell). However, where the whole premises is used for two or more purposes, none of which subserve the other, it is irrelevant to enquire as to which is the dominant use (Foodbarn at 161 and Abret at [68]). That is, there is no relevant ancillary use where premises are used for two or more purposes, none of which subserves the others, if any one purpose which is independent is not incidental to the other purpose.*

*134. The bund is a structure that subserves the quarry and is part of that land use. It is not, contrary to the submission of the council, a wholly separate use of land. And in any event, under the SSLEP 2000, what is required is that the use be ancillary to the primary legal use.*

*135. I accept the submission of Benedict that, unlike the circumstances considered by Glass JA in Foodbarn at 161 where "the whole of the premises is used for two or more purposes none of which subserves the others", the present use is ancillary insofar as it is inspired by, and subserves, the larger or dominant purpose, namely, the quarrying activity on Lot 1, Lot 2, or both.*

*…..*

*148. In my opinion, the evidence demonstrates beyond reasonable doubt that the bund is subservient to the purpose of quarrying.*

*149. Therefore, given the evidence adduced in these proceedings, the council has not excluded the rational, and most likely, hypothesis that the bund was "a building, work or use which is used or carried out in conjunction with the primary legal use of a site", and hence, ancillary development under cl 28 of the SSLEP 2000.*

*150. Accordingly, I find beyond reasonable doubt that the bund was built for the purpose of the quarry and subserves the quarry because it provides or contributes to, amongst other things, securing the quarry.*

*151. Finally, it is noted that the concept of "ancillary development" in the SSLEP 2000 and SREP 9 would also include the clearing of vegetation and trees for the construction of the bund, a proposition ultimately accepted by the council. (Taggett v The Council of the Shire of Tweed [1993] NSWCA 260 and Dorrestijn v South Australian Planning Commission (1985) 59 ALJR 105 at 108 and 110).*"

6.2 In the current instance, the filling of the quarry void would clearly constitute development for the purposes of extractive industries in that it serves to rehabilitate the quarry, even though other means may exist to achieve site rehabilitation. In addition, the rehabilitation of the quarry void by infilling would, to borrow the words of Her Honour in *Benedict*, "*constitute…one integrated and indivisible activity and is not capable of artificial subdivision*" (at [127]). Hence, no new or different use is being proposed and the rehabilitation is a necessary element of development for the purpose of a quarry.

6.3 In addition, there is an alternative line of reasoning that there are two uses in the present scenario which are inextricable linked and incapable of being severed one from the other. This was the case in *University of Sydney v. South Sydney Council* (1998) 97 LGERA 186 and *Macquarie International Health Clinic Pty Ltd v. University of Sydney* (1998) 98 LGERA 218, where the development for a teaching hospital was found to be both development for the purposes of a hospital and development for the purpose of education with the two purposes inextricably linked and incapable of severance.

6.4 Further the reasoning in *C. B. Investments Pty Ltd v. Colo Shire Council* (1980) 41 LGRA 270 suggests that the character, extent and other features of an activity may lead to a conclusion of

fact that there are two successive purposes of development, namely a proximate purpose and an ultimate purpose, but in the Luddenham circumstances, an examination of what is involved in the proximate purpose (ie filling of the quarry void) can lead to a conclusion of fact that the proximate purpose may be subsumed within the ultimate purpose (ie the operation of the quarry), rather than there being two purposes of the development.

**7. Is the modification quantitative similar to development as originally approved?**

7.1 In a quantitative comparison, the proposed modification seeks to fill the void approved for excavation. Hence, in a quantitative comparison the emplacement of material in the void is the equivalent of the quantity of material removed and the annual infill rate would be the same or lower than the extraction rate permitted in the consent.. As a result, the modification proposed does not quantitatively differ from the original approval for the void.

**8. Is the modification qualitatively similar to development as originally approved?**

8.1 A qualitative comparison is less clear than a quantitative one. The rehabilitation of the quarry void by filling is the objective sought. In this regard the nature of the material to be emplaced needs consideration. The modification proposes to emplace construction and demolition waste in the quarry void, which is similar to the class of waste material contemplated by the EIS. The selection of the material for emplacement is based upon identifying material which meets two criteria:

(a) the type of material whose availability reduces the time taken to fill the void; and

(b) the type of material whose nature causes the least potential risk of environmental harm.

8.2 Meeting these two criteria provides the yardstick for making a qualitative comparison. It appears that utilising construction and demolition waste provides a greater available volume to enable less time to fill the void (rather than limiting the material to virgin excavated natural material which would not be able satisfy the first criterion), while at the same time ensuring the risks of environmental harm are minimised. Based on this assessment, the proposed modification would meet the qualitative aspect of being substantially the same development.

**9. Conclusion.**

9.1 The review of the proposed modification, based upon the principles set out in the relevant legislation and case law, establishes that a consent authority could properly conclude that the proposed modification to the Luddenham clay / share quarry to enable its rehabilitation by emplacing construction and demolition waste in the quarry void would be substantially the same development as that originally approved based upon:

(a) the modification does not involve a change of use;

(b) the modification is quantitatively similar to the development as originally approved; and

(c) the modification is qualitatively similar to the development as originally approved.

Yours sincerely

Yours faithfully
**MinterEllison**

John Whitehouse
Legal Consultant

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Appendix B

# Letter from NSW Circular

NSW Circular Economy
Innovation Network

**contact@nswcircular.org**

**nswcircular.org**

KLF Recycling Park is establishing a formal relationship with NSW Circular including membership of its Infrastructure Taskforce and supply chain work to better integrate circular opportunities in construction and building waste.

Lisa McLean

Chief Executive Officer

NSW Circular

Appendix C

# SIDRA analysis

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Adams Rd AM (Site Folder: General)]

## Network: N201 [2024 baseline AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 6 | 0.0 | 6 | 0.0 | 0.003 | 6.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 22 | T1 | 317 | 9.0 | 317 | 9.0 | 0.166 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 323 | 8.8 | 323 | 8.8 | 0.166 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 79.2 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 886 | 11.2 | 886 | 11.2 | 0.499 | 0.2 | LOS A | 0.7 | 5.3 | 0.07 | 0.03 | 0.08 | 78.5 |
| 29 | R2 | 38 | 0.0 | 38 | 0.0 | 0.499 | 9.3 | LOS A | 0.7 | 5.3 | 0.07 | 0.03 | 0.08 | 66.7 |
| Approach | | 924 | 10.7 | 924 | 10.7 | 0.499 | 0.6 | NA | 0.7 | 5.3 | 0.07 | 0.03 | 0.08 | 77.9 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 128 | 0.0 | 128 | 0.0 | 0.080 | 7.2 | LOS A | 0.4 | 2.6 | 0.39 | 0.61 | 0.39 | 53.9 |
| 32 | R2 | 45 | 0.0 | 45 | 0.0 | 0.132 | 15.4 | LOS B | 0.4 | 2.7 | 0.79 | 0.92 | 0.79 | 54.0 |
| Approach | | 174 | 0.0 | 174 | 0.0 | 0.132 | 9.3 | LOS A | 0.4 | 2.7 | 0.49 | 0.69 | 0.49 | 53.9 |
| All Vehicles | | 1421 | 9.0 | 1421 | 9.0 | 0.499 | 1.6 | NA | 0.7 | 5.3 | 0.10 | 0.11 | 0.11 | 74.3 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Luddenham Rd AM (Site Folder: General)]

## Network: N201 [2024 baseline AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 274 | 19.6 | 274 | 19.6 | 0.154 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 171 | 0.6 | 171 | 0.6 | 0.226 | 11.3 | LOS A | 1.0 | 6.8 | 0.65 | 0.87 | 0.66 | 55.6 |
| Approach | | 444 | 12.3 | 444 | 12.3 | 0.226 | 4.4 | NA | 1.0 | 6.8 | 0.25 | 0.34 | 0.25 | 68.4 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 359 | 5.6 | 359 | 5.6 | 0.404 | 10.9 | LOS A | 2.2 | 16.5 | 0.61 | 0.91 | 0.80 | 54.5 |
| 26 | R2 | 149 | 1.4 | 149 | 1.4 | 0.416 | 18.5 | LOS B | 1.6 | 11.5 | 0.81 | 0.99 | 1.09 | 53.9 |
| Approach | | 508 | 4.3 | 508 | 4.3 | 0.416 | 13.1 | LOS A | 2.2 | 16.5 | 0.67 | 0.93 | 0.88 | 54.3 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 260 | 0.0 | 260 | 0.0 | 0.135 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 28 | T1 | 528 | 10.6 | 528 | 10.6 | 0.279 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 788 | 7.1 | 788 | 7.1 | 0.279 | 2.3 | NA | 0.0 | 0.0 | 0.00 | 0.21 | 0.00 | 72.0 |
| All Vehicles | | 1741 | 7.6 | 1741 | 7.6 | 0.416 | 6.0 | NA | 2.2 | 16.5 | 0.26 | 0.45 | 0.32 | 65.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Adams Rd PM (Site Folder: General)]

## Network: N201 [2024 baseline PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 9 | 11.1 | 9 | 11.1 | 0.005 | 7.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 61.8 |
| 22 | T1 | 480 | 4.6 | 480 | 4.6 | 0.245 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 489 | 4.7 | 489 | 4.7 | 0.245 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 79.0 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 776 | 2.3 | 776 | 2.3 | 0.472 | 0.8 | LOS A | 1.8 | 13.0 | 0.20 | 0.08 | 0.27 | 75.8 |
| 29 | R2 | 88 | 0.0 | 88 | 0.0 | 0.472 | 10.6 | LOS A | 1.8 | 13.0 | 0.20 | 0.08 | 0.27 | 64.8 |
| Approach | | 864 | 2.1 | 864 | 2.1 | 0.472 | 1.8 | NA | 1.8 | 13.0 | 0.20 | 0.08 | 0.27 | 74.5 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 99 | 0.0 | 99 | 0.0 | 0.072 | 7.8 | LOS A | 0.3 | 2.2 | 0.48 | 0.67 | 0.48 | 53.3 |
| 32 | R2 | 40 | 0.0 | 40 | 0.0 | 0.120 | 15.7 | LOS B | 0.4 | 2.5 | 0.79 | 0.92 | 0.79 | 53.7 |
| Approach | | 139 | 0.0 | 139 | 0.0 | 0.120 | 10.1 | LOS A | 0.4 | 2.5 | 0.57 | 0.74 | 0.57 | 53.5 |
| All Vehicles | | 1493 | 2.8 | 1493 | 2.8 | 0.472 | 2.1 | NA | 1.8 | 13.0 | 0.17 | 0.12 | 0.21 | 72.9 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Luddenham Rd PM (Site Folder: General)]

## Network: N201 [2024 baseline PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 467 | 6.5 | 467 | 6.5 | 0.242 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| 23 | R2 | 99 | 1.1 | 99 | 1.1 | 0.080 | 8.4 | LOS A | 0.4 | 2.5 | 0.45 | 0.66 | 0.45 | 58.5 |
| Approach | | 566 | 5.6 | 566 | 5.6 | 0.242 | 1.5 | NA | 0.4 | 2.5 | 0.08 | 0.12 | 0.08 | 75.1 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 516 | 0.0 | 516 | 0.0 | 0.415 | 8.7 | LOS A | 2.5 | 17.7 | 0.48 | 0.72 | 0.53 | 57.8 |
| 26 | R2 | 385 | 0.0 | 385 | 0.0 | 0.780 | 21.4 | LOS B | 5.8 | 40.6 | 0.88 | 1.24 | 2.12 | 52.0 |
| Approach | | 901 | 0.0 | 901 | 0.0 | 0.780 | 14.1 | LOS A | 5.8 | 40.6 | 0.65 | 0.94 | 1.21 | 54.2 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 89 | 1.2 | 89 | 1.2 | 0.047 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.0 |
| 28 | T1 | 297 | 5.0 | 297 | 5.0 | 0.152 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 386 | 4.1 | 386 | 4.1 | 0.152 | 1.6 | NA | 0.0 | 0.0 | 0.00 | 0.15 | 0.00 | 73.6 |
| All Vehicles | | 1854 | 2.6 | 1854 | 2.6 | 0.780 | 7.7 | NA | 5.8 | 40.6 | 0.34 | 0.52 | 0.61 | 62.8 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Adams Rd AM (Site Folder: General)]

## Network: N201 [2024 baseline AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 6 | 0.0 | 6 | 0.0 | 0.003 | 6.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 22 | T1 | 317 | 9.0 | 317 | 9.0 | 0.166 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 323 | 8.8 | 323 | 8.8 | 0.166 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 79.2 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 886 | 11.2 | 886 | 11.2 | 0.499 | 0.2 | LOS A | 0.7 | 5.3 | 0.07 | 0.03 | 0.08 | 78.5 |
| 29 | R2 | 38 | 0.0 | 38 | 0.0 | 0.499 | 9.3 | LOS A | 0.7 | 5.3 | 0.07 | 0.03 | 0.08 | 66.7 |
| Approach | | 924 | 10.7 | 924 | 10.7 | 0.499 | 0.6 | NA | 0.7 | 5.3 | 0.07 | 0.03 | 0.08 | 77.9 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 128 | 0.0 | 128 | 0.0 | 0.080 | 7.2 | LOS A | 0.4 | 2.6 | 0.39 | 0.61 | 0.39 | 53.9 |
| 32 | R2 | 45 | 0.0 | 45 | 0.0 | 0.132 | 15.4 | LOS B | 0.4 | 2.7 | 0.79 | 0.92 | 0.79 | 54.0 |
| Approach | | 174 | 0.0 | 174 | 0.0 | 0.132 | 9.3 | LOS A | 0.4 | 2.7 | 0.49 | 0.69 | 0.49 | 53.9 |
| All Vehicles | | 1421 | 9.0 | 1421 | 9.0 | 0.499 | 1.6 | NA | 0.7 | 5.3 | 0.10 | 0.11 | 0.11 | 74.3 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
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NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Luddenham Rd AM (Site Folder: General)]

## Network: N201 [2024 baseline AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 274 | 19.6 | 274 | 19.6 | 0.154 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 171 | 0.6 | 171 | 0.6 | 0.226 | 11.3 | LOS A | 1.0 | 6.8 | 0.65 | 0.87 | 0.66 | 55.6 |
| Approach | | 444 | 12.3 | 444 | 12.3 | 0.226 | 4.4 | NA | 1.0 | 6.8 | 0.25 | 0.34 | 0.25 | 68.4 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 359 | 5.6 | 359 | 5.6 | 0.404 | 10.9 | LOS A | 2.2 | 16.5 | 0.61 | 0.91 | 0.80 | 54.5 |
| 26 | R2 | 149 | 1.4 | 149 | 1.4 | 0.416 | 18.5 | LOS B | 1.6 | 11.5 | 0.81 | 0.99 | 1.09 | 53.9 |
| Approach | | 508 | 4.3 | 508 | 4.3 | 0.416 | 13.1 | LOS A | 2.2 | 16.5 | 0.67 | 0.93 | 0.88 | 54.3 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 260 | 0.0 | 260 | 0.0 | 0.135 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 28 | T1 | 528 | 10.6 | 528 | 10.6 | 0.279 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 788 | 7.1 | 788 | 7.1 | 0.279 | 2.3 | NA | 0.0 | 0.0 | 0.00 | 0.21 | 0.00 | 72.0 |
| All Vehicles | | 1741 | 7.6 | 1741 | 7.6 | 0.416 | 6.0 | NA | 2.2 | 16.5 | 0.26 | 0.45 | 0.32 | 65.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Adams Rd PM (Site Folder: General)]

## Network: N201 [2024 baseline PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 9 | 11.1 | 9 | 11.1 | 0.005 | 7.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 61.8 |
| 22 | T1 | 480 | 4.6 | 480 | 4.6 | 0.245 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 489 | 4.7 | 489 | 4.7 | 0.245 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 79.0 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 776 | 2.3 | 776 | 2.3 | 0.472 | 0.8 | LOS A | 1.8 | 13.0 | 0.20 | 0.08 | 0.27 | 75.8 |
| 29 | R2 | 88 | 0.0 | 88 | 0.0 | 0.472 | 10.6 | LOS A | 1.8 | 13.0 | 0.20 | 0.08 | 0.27 | 64.8 |
| Approach | | 864 | 2.1 | 864 | 2.1 | 0.472 | 1.8 | NA | 1.8 | 13.0 | 0.20 | 0.08 | 0.27 | 74.5 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 99 | 0.0 | 99 | 0.0 | 0.072 | 7.8 | LOS A | 0.3 | 2.2 | 0.48 | 0.67 | 0.48 | 53.3 |
| 32 | R2 | 40 | 0.0 | 40 | 0.0 | 0.120 | 15.7 | LOS B | 0.4 | 2.5 | 0.79 | 0.92 | 0.79 | 53.7 |
| Approach | | 139 | 0.0 | 139 | 0.0 | 0.120 | 10.1 | LOS A | 0.4 | 2.5 | 0.57 | 0.74 | 0.57 | 53.5 |
| All Vehicles | | 1493 | 2.8 | 1493 | 2.8 | 0.472 | 2.1 | NA | 1.8 | 13.0 | 0.17 | 0.12 | 0.21 | 72.9 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 baseline Elizabeth Dr/ Luddenham Rd PM (Site Folder: General)]

## Network: N201 [2024 baseline PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 467 | 6.5 | 467 | 6.5 | 0.242 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| 23 | R2 | 99 | 1.1 | 99 | 1.1 | 0.080 | 8.4 | LOS A | 0.4 | 2.5 | 0.45 | 0.66 | 0.45 | 58.5 |
| Approach | | 566 | 5.6 | 566 | 5.6 | 0.242 | 1.5 | NA | 0.4 | 2.5 | 0.08 | 0.12 | 0.08 | 75.1 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 516 | 0.0 | 516 | 0.0 | 0.415 | 8.7 | LOS A | 2.5 | 17.7 | 0.48 | 0.72 | 0.53 | 57.8 |
| 26 | R2 | 385 | 0.0 | 385 | 0.0 | 0.780 | 21.4 | LOS B | 5.8 | 40.6 | 0.88 | 1.24 | 2.12 | 52.0 |
| Approach | | 901 | 0.0 | 901 | 0.0 | 0.780 | 14.1 | LOS A | 5.8 | 40.6 | 0.65 | 0.94 | 1.21 | 54.2 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 89 | 1.2 | 89 | 1.2 | 0.047 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.0 |
| 28 | T1 | 297 | 5.0 | 297 | 5.0 | 0.152 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 386 | 4.1 | 386 | 4.1 | 0.152 | 1.6 | NA | 0.0 | 0.0 | 0.00 | 0.15 | 0.00 | 73.6 |
| All Vehicles | | 1854 | 2.6 | 1854 | 2.6 | 0.780 | 7.7 | NA | 5.8 | 40.6 | 0.34 | 0.52 | 0.61 | 62.8 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 dev Elizabeth Dr/ Adams Rd AM (Site Folder: General)]

## Network: N201 [2024 dev AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 94 | 28.1 | 94 | 28.1 | 0.058 | 7.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 56.9 |
| 22 | T1 | 317 | 9.0 | 317 | 9.0 | 0.166 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 411 | 13.3 | 411 | 13.3 | 0.166 | 1.7 | NA | 0.0 | 0.0 | 0.00 | 0.14 | 0.00 | 69.5 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 886 | 11.2 | 886 | 11.2 | 0.502 | 0.3 | LOS A | 0.8 | 6.2 | 0.08 | 0.03 | 0.11 | 78.3 |
| 29 | R2 | 38 | 0.0 | 38 | 0.0 | 0.502 | 10.1 | LOS A | 0.8 | 6.2 | 0.08 | 0.03 | 0.11 | 66.6 |
| Approach | | 924 | 10.7 | 924 | 10.7 | 0.502 | 0.7 | NA | 0.8 | 6.2 | 0.08 | 0.03 | 0.11 | 77.7 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 140 | 8.3 | 140 | 8.3 | 0.092 | 7.4 | LOS A | 0.4 | 3.2 | 0.40 | 0.62 | 0.40 | 53.8 |
| 32 | R2 | 61 | 24.1 | 61 | 24.1 | 0.255 | 21.8 | LOS B | 0.8 | 6.7 | 0.85 | 0.97 | 0.95 | 45.2 |
| Approach | | 201 | 13.1 | 201 | 13.1 | 0.255 | 11.8 | LOS A | 0.8 | 6.7 | 0.54 | 0.73 | 0.57 | 49.4 |
| All Vehicles | | 1536 | 11.7 | 1536 | 11.7 | 0.502 | 2.4 | NA | 0.8 | 6.7 | 0.12 | 0.15 | 0.14 | 70.7 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 dev Elizabeth Dr/ Luddenham Rd AM (Site Folder: General)]

## Network: N201 [2024 dev AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 285 | 22.9 | 285 | 22.9 | 0.163 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 171 | 0.6 | 171 | 0.6 | 0.226 | 11.3 | LOS A | 1.0 | 6.8 | 0.65 | 0.87 | 0.66 | 55.6 |
| Approach | | 456 | 14.5 | 456 | 14.5 | 0.226 | 4.3 | NA | 1.0 | 6.8 | 0.24 | 0.33 | 0.25 | 68.6 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 359 | 5.6 | 359 | 5.6 | 0.404 | 10.9 | LOS A | 2.2 | 16.5 | 0.61 | 0.91 | 0.80 | 54.5 |
| 26 | R2 | 149 | 1.4 | 149 | 1.4 | 0.425 | 18.9 | LOS B | 1.7 | 11.8 | 0.82 | 0.99 | 1.11 | 53.6 |
| Approach | | 508 | 4.3 | 508 | 4.3 | 0.425 | 13.3 | LOS A | 2.2 | 16.5 | 0.67 | 0.93 | 0.89 | 54.1 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 260 | 0.0 | 260 | 0.0 | 0.135 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 28 | T1 | 528 | 10.6 | 528 | 10.6 | 0.279 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 788 | 7.1 | 788 | 7.1 | 0.279 | 2.3 | NA | 0.0 | 0.0 | 0.00 | 0.21 | 0.00 | 72.0 |
| All Vehicles | | 1753 | 8.2 | 1753 | 8.2 | 0.425 | 6.0 | NA | 2.2 | 16.5 | 0.26 | 0.45 | 0.32 | 65.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 dev Elizabeth Dr/ Adams Rd PM (Site Folder: General)]

## Network: N201 [2024 dev PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 23 | 59.1 | 23 | 59.1 | 0.017 | 8.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 49.9 |
| 22 | T1 | 480 | 4.6 | 480 | 4.6 | 0.245 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 503 | 7.1 | 503 | 7.1 | 0.245 | 0.4 | NA | 0.0 | 0.0 | 0.00 | 0.03 | 0.00 | 75.9 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 776 | 2.3 | 776 | 2.3 | 0.474 | 0.9 | LOS A | 1.9 | 13.4 | 0.20 | 0.08 | 0.28 | 75.7 |
| 29 | R2 | 88 | 0.0 | 88 | 0.0 | 0.474 | 10.8 | LOS A | 1.9 | 13.4 | 0.20 | 0.08 | 0.28 | 64.7 |
| Approach | | 864 | 2.1 | 864 | 2.1 | 0.474 | 1.9 | NA | 1.9 | 13.4 | 0.20 | 0.08 | 0.28 | 74.4 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 104 | 5.1 | 104 | 5.1 | 0.079 | 7.9 | LOS A | 0.3 | 2.5 | 0.48 | 0.67 | 0.48 | 53.3 |
| 32 | R2 | 48 | 15.2 | 48 | 15.2 | 0.179 | 18.8 | LOS B | 0.5 | 4.2 | 0.83 | 0.94 | 0.85 | 48.5 |
| Approach | | 153 | 8.3 | 153 | 8.3 | 0.179 | 11.4 | LOS A | 0.5 | 4.2 | 0.59 | 0.76 | 0.60 | 50.9 |
| All Vehicles | | 1520 | 4.4 | 1520 | 4.4 | 0.474 | 2.4 | NA | 1.9 | 13.4 | 0.18 | 0.13 | 0.22 | 71.4 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2024 dev Elizabeth Dr/ Luddenham Rd PM (Site Folder: General)]

## Network: N201 [2024 dev PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 473 | 7.6 | 473 | 7.6 | 0.247 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| 23 | R2 | 99 | 1.1 | 99 | 1.1 | 0.080 | 8.4 | LOS A | 0.4 | 2.5 | 0.45 | 0.66 | 0.45 | 58.5 |
| Approach | | 572 | 6.4 | 572 | 6.4 | 0.247 | 1.5 | NA | 0.4 | 2.5 | 0.08 | 0.11 | 0.08 | 75.1 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 516 | 0.0 | 516 | 0.0 | 0.415 | 8.7 | LOS A | 2.5 | 17.7 | 0.48 | 0.72 | 0.53 | 57.8 |
| 26 | R2 | 385 | 0.0 | 385 | 0.0 | 0.789 | 21.9 | LOS B | 6.0 | 41.7 | 0.89 | 1.25 | 2.18 | 51.6 |
| Approach | | 901 | 0.0 | 901 | 0.0 | 0.789 | 14.4 | LOS A | 6.0 | 41.7 | 0.65 | 0.95 | 1.24 | 53.9 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 89 | 1.2 | 89 | 1.2 | 0.047 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.0 |
| 28 | T1 | 297 | 5.0 | 297 | 5.0 | 0.152 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 386 | 4.1 | 386 | 4.1 | 0.152 | 1.6 | NA | 0.0 | 0.0 | 0.00 | 0.15 | 0.00 | 73.6 |
| All Vehicles | | 1859 | 2.8 | 1859 | 2.8 | 0.789 | 7.8 | NA | 6.0 | 41.7 | 0.34 | 0.52 | 0.62 | 62.7 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 baseline Elizabeth Dr/ Adams Rd AM (Site Folder: General)]

## Network: N201 [2029 baseline AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 3 | 0.0 | 3 | 0.0 | 0.002 | 6.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 22 | T1 | 279 | 5.7 | 279 | 5.7 | 0.143 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 282 | 5.6 | 282 | 5.6 | 0.143 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 79.5 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 866 | 10.9 | 866 | 10.9 | 0.485 | 0.2 | LOS A | 0.6 | 4.4 | 0.06 | 0.03 | 0.07 | 78.6 |
| 29 | R2 | 36 | 0.0 | 36 | 0.0 | 0.485 | 8.8 | LOS A | 0.6 | 4.4 | 0.06 | 0.03 | 0.07 | 66.8 |
| Approach | | 902 | 10.5 | 902 | 10.5 | 0.485 | 0.5 | NA | 0.6 | 4.4 | 0.06 | 0.03 | 0.07 | 78.1 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 174 | 0.0 | 174 | 0.0 | 0.104 | 7.1 | LOS A | 0.5 | 3.4 | 0.37 | 0.61 | 0.37 | 54.0 |
| 32 | R2 | 61 | 0.0 | 61 | 0.0 | 0.160 | 14.5 | LOS A | 0.5 | 3.4 | 0.77 | 0.91 | 0.77 | 54.7 |
| Approach | | 235 | 0.0 | 235 | 0.0 | 0.160 | 9.0 | LOS A | 0.5 | 3.4 | 0.47 | 0.69 | 0.47 | 54.3 |
| All Vehicles | | 1419 | 7.8 | 1419 | 7.8 | 0.485 | 1.8 | NA | 0.6 | 4.4 | 0.11 | 0.13 | 0.12 | 73.3 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 baseline Elizabeth Dr/ Luddenham Rd AM (Site Folder: General)]

## Network: N201 [2029 baseline AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 282 | 19.8 | 282 | 19.8 | 0.159 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 165 | 0.6 | 165 | 0.6 | 0.190 | 10.4 | LOS A | 0.8 | 5.8 | 0.61 | 0.83 | 0.61 | 56.7 |
| Approach | | 447 | 12.7 | 447 | 12.7 | 0.190 | 3.8 | NA | 0.8 | 5.8 | 0.23 | 0.31 | 0.23 | 69.4 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 380 | 5.5 | 380 | 5.5 | 0.391 | 10.2 | LOS A | 2.2 | 16.1 | 0.58 | 0.86 | 0.72 | 55.7 |
| 26 | R2 | 158 | 1.3 | 158 | 1.3 | 0.385 | 16.5 | LOS B | 1.5 | 10.7 | 0.77 | 0.97 | 1.01 | 55.6 |
| Approach | | 538 | 4.3 | 538 | 4.3 | 0.391 | 12.1 | LOS A | 2.2 | 16.1 | 0.64 | 0.89 | 0.80 | 55.6 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 220 | 0.0 | 220 | 0.0 | 0.114 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 28 | T1 | 462 | 10.5 | 462 | 10.5 | 0.244 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 682 | 7.1 | 682 | 7.1 | 0.244 | 2.3 | NA | 0.0 | 0.0 | 0.00 | 0.20 | 0.00 | 72.1 |
| All Vehicles | | 1667 | 7.7 | 1667 | 7.7 | 0.391 | 5.9 | NA | 2.2 | 16.1 | 0.27 | 0.45 | 0.32 | 65.4 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 baseline Elizabeth Dr/ Adams Rd PM (Site Folder: General)]

## Network: N201 [2029 baseline PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 5 | 20.0 | 5 | 20.0 | 0.003 | 7.3 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 59.2 |
| 22 | T1 | 345 | 3.0 | 345 | 3.0 | 0.174 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 351 | 3.3 | 351 | 3.3 | 0.174 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 79.1 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 701 | 2.3 | 701 | 2.3 | 0.412 | 0.4 | LOS A | 1.1 | 7.7 | 0.14 | 0.07 | 0.16 | 76.8 |
| 29 | R2 | 76 | 0.0 | 76 | 0.0 | 0.412 | 9.0 | LOS A | 1.1 | 7.7 | 0.14 | 0.07 | 0.16 | 65.5 |
| Approach | | 777 | 2.0 | 777 | 2.0 | 0.412 | 1.2 | NA | 1.1 | 7.7 | 0.14 | 0.07 | 0.16 | 75.5 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 154 | 0.0 | 154 | 0.0 | 0.097 | 7.3 | LOS A | 0.4 | 3.1 | 0.41 | 0.63 | 0.41 | 53.8 |
| 32 | R2 | 62 | 0.0 | 62 | 0.0 | 0.136 | 12.8 | LOS A | 0.4 | 2.9 | 0.71 | 0.89 | 0.71 | 56.2 |
| Approach | | 216 | 0.0 | 216 | 0.0 | 0.136 | 8.9 | LOS A | 0.4 | 3.1 | 0.49 | 0.70 | 0.49 | 54.8 |
| All Vehicles | | 1343 | 2.0 | 1343 | 2.0 | 0.412 | 2.2 | NA | 1.1 | 7.7 | 0.16 | 0.15 | 0.17 | 71.9 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 baseline Elizabeth Dr/ Luddenham Rd PM (Site Folder: General)]

## Network: N201 [2029 baseline PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 409 | 6.4 | 409 | 6.4 | 0.213 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 84 | 1.3 | 84 | 1.3 | 0.062 | 8.0 | LOS A | 0.3 | 2.0 | 0.39 | 0.62 | 0.39 | 58.7 |
| Approach | | 494 | 5.5 | 494 | 5.5 | 0.213 | 1.4 | NA | 0.3 | 2.0 | 0.07 | 0.11 | 0.07 | 75.2 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 483 | 0.0 | 483 | 0.0 | 0.364 | 8.0 | LOS A | 1.9 | 13.1 | 0.41 | 0.66 | 0.41 | 58.4 |
| 26 | R2 | 361 | 0.0 | 361 | 0.0 | 0.607 | 15.1 | LOS B | 3.6 | 25.4 | 0.75 | 1.04 | 1.31 | 57.1 |
| Approach | | 844 | 0.0 | 844 | 0.0 | 0.607 | 11.1 | LOS A | 3.6 | 25.4 | 0.55 | 0.82 | 0.79 | 57.6 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 68 | 1.5 | 68 | 1.5 | 0.036 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 64.9 |
| 28 | T1 | 232 | 5.0 | 232 | 5.0 | 0.118 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 300 | 4.2 | 300 | 4.2 | 0.118 | 1.6 | NA | 0.0 | 0.0 | 0.00 | 0.14 | 0.00 | 73.6 |
| All Vehicles | | 1638 | 2.4 | 1638 | 2.4 | 0.607 | 6.4 | NA | 3.6 | 25.4 | 0.30 | 0.48 | 0.43 | 64.6 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 dev Elizabeth Dr/ Adams Rd AM (Site Folder: General)]

## Network: N201 [2029 dev AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 91 | 46.5 | 91 | 46.5 | 0.063 | 7.8 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 52.5 |
| 22 | T1 | 279 | 5.7 | 279 | 5.7 | 0.143 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 369 | 15.7 | 369 | 15.7 | 0.143 | 1.9 | NA | 0.0 | 0.0 | 0.00 | 0.15 | 0.00 | 66.4 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 866 | 10.9 | 866 | 10.9 | 0.488 | 0.2 | LOS A | 0.7 | 5.3 | 0.07 | 0.03 | 0.09 | 78.5 |
| 29 | R2 | 36 | 0.0 | 36 | 0.0 | 0.488 | 9.7 | LOS A | 0.7 | 5.3 | 0.07 | 0.03 | 0.09 | 66.7 |
| Approach | | 902 | 10.5 | 902 | 10.5 | 0.488 | 0.6 | NA | 0.7 | 5.3 | 0.07 | 0.03 | 0.09 | 77.9 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 195 | 10.8 | 195 | 10.8 | 0.124 | 7.4 | LOS A | 0.6 | 4.5 | 0.38 | 0.61 | 0.38 | 53.9 |
| 32 | R2 | 84 | 26.3 | 84 | 26.3 | 0.323 | 21.4 | LOS B | 1.1 | 9.2 | 0.85 | 0.98 | 1.02 | 45.1 |
| Approach | | 279 | 15.5 | 279 | 15.5 | 0.323 | 11.6 | LOS A | 1.1 | 9.2 | 0.52 | 0.73 | 0.57 | 49.4 |
| All Vehicles | | 1551 | 12.6 | 1551 | 12.6 | 0.488 | 2.9 | NA | 1.1 | 9.2 | 0.14 | 0.18 | 0.16 | 68.6 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 dev Elizabeth Dr/ Luddenham Rd AM (Site Folder: General)]

## Network: N201 [2029 dev AM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 303 | 25.3 | 303 | 25.3 | 0.176 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 165 | 0.6 | 165 | 0.6 | 0.190 | 10.4 | LOS A | 0.8 | 5.8 | 0.61 | 0.83 | 0.61 | 56.7 |
| Approach | | 468 | 16.6 | 468 | 16.6 | 0.190 | 3.7 | NA | 0.8 | 5.8 | 0.22 | 0.29 | 0.22 | 69.8 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 380 | 5.5 | 380 | 5.5 | 0.391 | 10.2 | LOS A | 2.2 | 16.1 | 0.58 | 0.86 | 0.72 | 55.7 |
| 26 | R2 | 158 | 1.3 | 158 | 1.3 | 0.400 | 17.1 | LOS B | 1.6 | 11.2 | 0.79 | 0.98 | 1.05 | 55.1 |
| Approach | | 538 | 4.3 | 538 | 4.3 | 0.400 | 12.2 | LOS A | 2.2 | 16.1 | 0.64 | 0.89 | 0.81 | 55.4 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 220 | 0.0 | 220 | 0.0 | 0.114 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 65.4 |
| 28 | T1 | 462 | 10.5 | 462 | 10.5 | 0.244 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.8 |
| Approach | | 682 | 7.1 | 682 | 7.1 | 0.244 | 2.3 | NA | 0.0 | 0.0 | 0.00 | 0.20 | 0.00 | 72.1 |
| All Vehicles | | 1688 | 8.9 | 1688 | 8.9 | 0.400 | 5.8 | NA | 2.2 | 16.1 | 0.26 | 0.45 | 0.32 | 65.4 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 dev Elizabeth Dr/ Adams Rd PM (Site Folder: General)]

## Network: N201 [2029 dev PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 21 | L2 | 22 | 76.2 | 22 | 76.2 | 0.018 | 8.3 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 46.6 |
| 22 | T1 | 345 | 3.0 | 345 | 3.0 | 0.174 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 367 | 7.4 | 367 | 7.4 | 0.174 | 0.5 | NA | 0.0 | 0.0 | 0.00 | 0.04 | 0.00 | 74.0 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 28 | T1 | 701 | 2.3 | 701 | 2.3 | 0.414 | 0.4 | LOS A | 1.1 | 8.1 | 0.15 | 0.07 | 0.17 | 76.7 |
| 29 | R2 | 76 | 0.0 | 76 | 0.0 | 0.414 | 9.2 | LOS A | 1.1 | 8.1 | 0.15 | 0.07 | 0.17 | 65.5 |
| Approach | | 777 | 2.0 | 777 | 2.0 | 0.414 | 1.3 | NA | 1.1 | 8.1 | 0.15 | 0.07 | 0.17 | 75.5 |
| SouthWest: Adams Road | | | | | | | | | | | | | | |
| 30 | L2 | 162 | 5.2 | 162 | 5.2 | 0.106 | 7.4 | LOS A | 0.5 | 3.6 | 0.41 | 0.63 | 0.41 | 53.7 |
| 32 | R2 | 71 | 10.4 | 71 | 10.4 | 0.175 | 14.1 | LOS A | 0.5 | 4.1 | 0.74 | 0.90 | 0.75 | 52.7 |
| Approach | | 233 | 6.8 | 233 | 6.8 | 0.175 | 9.5 | LOS A | 0.5 | 4.1 | 0.51 | 0.71 | 0.52 | 53.2 |
| All Vehicles | | 1377 | 4.3 | 1377 | 4.3 | 0.414 | 2.5 | NA | 1.1 | 8.1 | 0.17 | 0.17 | 0.19 | 70.3 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [2029 dev Elizabeth Dr/ Luddenham Rd PM (Site Folder: General)]

## Network: N201 [2029 dev PM (Network Folder: existing arrangement)]

Site Category: (None)
Give-Way (Two-Way)

**Vehicle Movement Performance**

| Mov ID | Turn | DEMAND FLOWS [ Total veh/h | HV ] % | ARRIVAL FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SouthEast: Elizabeth Drive | | | | | | | | | | | | | | |
| 22 | T1 | 418 | 8.3 | 418 | 8.3 | 0.220 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| 23 | R2 | 84 | 1.3 | 84 | 1.3 | 0.062 | 8.0 | LOS A | 0.3 | 2.0 | 0.39 | 0.62 | 0.39 | 58.7 |
| Approach | | 502 | 7.1 | 502 | 7.1 | 0.220 | 1.4 | NA | 0.3 | 2.0 | 0.06 | 0.10 | 0.06 | 75.3 |
| NorthEast: Luddenham Road | | | | | | | | | | | | | | |
| 24 | L2 | 483 | 0.0 | 483 | 0.0 | 0.364 | 8.0 | LOS A | 1.9 | 13.1 | 0.41 | 0.66 | 0.41 | 58.4 |
| 26 | R2 | 361 | 0.0 | 361 | 0.0 | 0.617 | 15.4 | LOS B | 3.7 | 26.0 | 0.76 | 1.05 | 1.35 | 56.8 |
| Approach | | 844 | 0.0 | 844 | 0.0 | 0.617 | 11.2 | LOS A | 3.7 | 26.0 | 0.56 | 0.83 | 0.81 | 57.4 |
| NorthWest: Elizabeth Drive | | | | | | | | | | | | | | |
| 27 | L2 | 68 | 1.5 | 68 | 1.5 | 0.036 | 7.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 64.9 |
| 28 | T1 | 232 | 5.0 | 232 | 5.0 | 0.118 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 79.9 |
| Approach | | 300 | 4.2 | 300 | 4.2 | 0.118 | 1.6 | NA | 0.0 | 0.0 | 0.00 | 0.14 | 0.00 | 73.6 |
| All Vehicles | | 1646 | 2.9 | 1646 | 2.9 | 0.617 | 6.4 | NA | 3.7 | 26.0 | 0.31 | 0.48 | 0.43 | 64.6 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

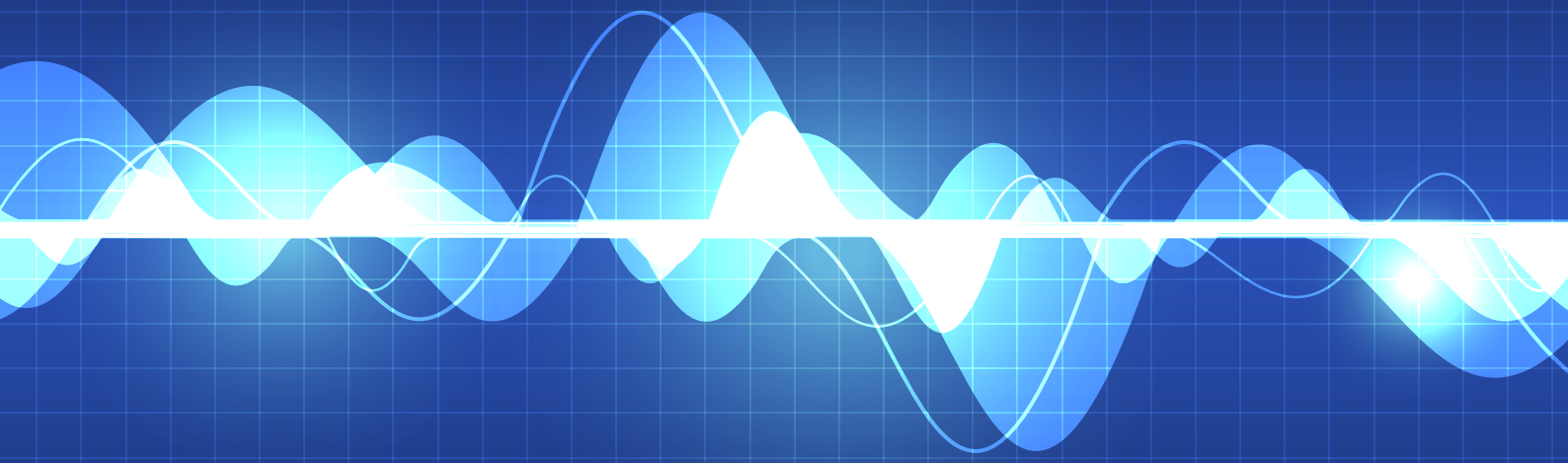
Appendix D

# Addendum NVIA

# Luddenham Advanced Resource Recovery Centre

## Addendum Noise and Vibration Impact Assessment

**Prepared for Coombes Property Group and KLF Holdings**
**December 2021**



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# Luddenham Advanced Resource Recovery Centre

Addendum Noise and Vibration Impact Assessment

Prepared for Coombes Property Group and KLF Holdings
December 2021

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# Luddenham Advanced Resource Recovery Centre

## Addendum Noise and Vibration Impact Assessment

**Report Number**

J190749 RP58

**Client**

Coombes Property Group and KLF Holdings

**Date**

14 December 2021

**Version**

v4 Final

**Prepared by**

**Carl Fokkema**
Associate - Acoustics
14 December 2021

**Approved by**

**Najah Ishac**
Director - Acoustics
14 December 2021

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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# Table of Contents

## Tables



## Figures

# 1 Introduction

## 1.1 Background

In late 2019, CFT No 13 Pty Ltd, a member of Coombes Property Group (CPG), acquired the property at 275 Adams Road, Luddenham New South Wales (NSW) (Lot 3 in DP 623799, 'the subject property') within the Liverpool City Council municipality. The subject property is host to an existing shale/clay quarry.

CPG in partnership with KLF (the applicant) are seeking to construct and operate an advanced resource recovery centre (the ARRC) on the subject property (the project). The project is classed as a State Significant Development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP).

A noise and vibration impact assessment (NVIA) was prepared by EMM Consulting Pty Limited (EMM) to support the Environmental Impact Statement (EIS) for the project. The NVIA addressed the Secretary's Environmental Assessment Requirements (SEARs) and assessed the potential noise and vibration impacts associated with the project.

Since the submission of the EIS, refinements have been made to the project in response to further detailed design, submissions received on the EIS and in response to further consultation with government agencies. A Submissions Report that responds to submissions made by agencies, organisations, and the community, has been prepared by EMM. The Submissions Report also describes the additional activities undertaken relating to the project since exhibition of the EIS, including a summary of project refinements, further technical studies undertaken, and stakeholder and community engagement activities.

This Addendum NVIA originally formed part of the Submissions Report and was prepared to assess the potential noise and vibration impacts of the refined project. This Addendum NVIA (version 4) has subsequently been updated to address matters raised by DPIE and the EPA.

Separate to the ARRC project, the applicant has submitted an application to modify the existing quarry consent to allow quarry operations on the subject property to recommence (Modification 5, also referred to as MOD 5). This application was approved by Department of Planning, Industry and Environment (DPIE) on 24 May 2021. The applicant also intends to lodge a future modification application (MOD 6) to modify the quarry consent to allow infilling of the quarry void with non-recyclable construction and demolition waste from the ARRC. Assuming approval of the ARRC, quarry extraction will be carried out concurrently with ARRC construction and operation until December 2024.

Assuming approval of the MOD 6 application, from January 2025 quarry infill will be carried out concurrently with the ARRC operations until such time as the quarry void is filled and rehabilitated ready for final industrial/commercial land use. Activities associated with the infilling and rehabilitation of the quarry void (MOD 6) are not considered in the Addendum NVIA and would be subject to a separate noise assessment and consideration of cumulative noise from concurrent ARRC and void rehabilitation activities.

## 1.2 Project overview

A detailed description of the project was provided in Chapter 2 of the EIS (EMM, 2020a). The key components of the ARRC project are as follows:

- construction and operation of an advanced construction and demolition resource recovery centre;
- accepting and processing up to 600,000 tonnes per annum (tpa) of building construction waste for recycling;

- despatch of approximately 540,000 tpa of recycled product;
- despatch of approximately 60,000 tpa of unrecyclable material either to an offsite licensed waste facility or to the adjacent quarry void (the later will be subject to separate approval);
- upgrade of the access road from the subject property to Adams Road;
- use of the access road from the subject property to Adams Road;
- the ARRC will not accept putrescibles, liquid or hazardous waste; and
- the ARRC will operate up to 24 hours a day, 7 days per week.

Since the submission of the Submissions Report and further discussions with DPIE and the EPA, CPG and KLF have agreed to operate the ARRC during daytime hours only until such time as Western Sydney Airport (WSA) operations are properly underway.

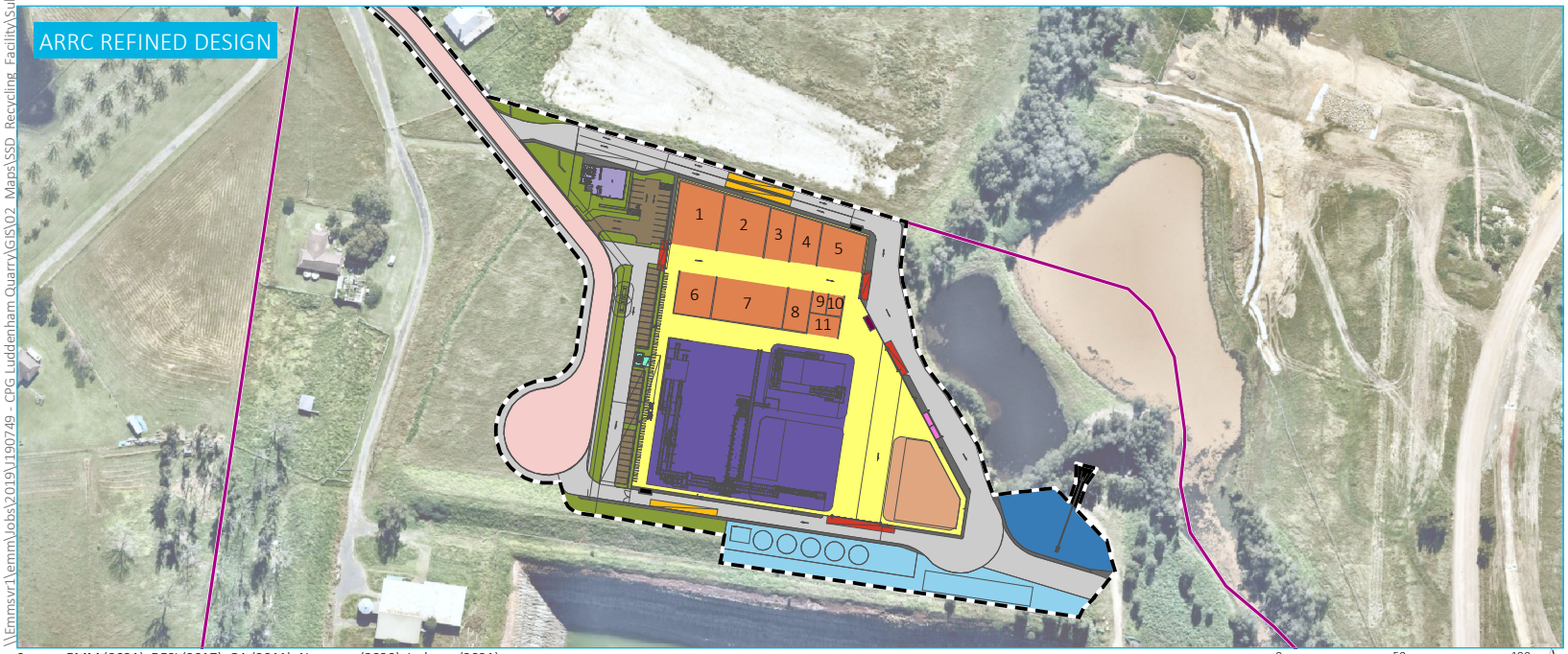
## 1.3 Purpose and scope of this report

This Addendum NVIA has been prepared to assess the potential noise and vibration impacts of the refined project including consideration of the revised ARRC transport strategy, revised site traffic numbers, proposed road upgrades and traffic movements within the ARRC site, as documented in the Addendum Traffic Impact Assessment (Addendum TIA), and minor amendments to site operations. The NVIA also addresses matters raised in submissions on the EIS and requests for information from DPIE.

Specifically, this Addendum NVIA includes:

- update on project noise trigger levels (PNTL's) to be adopted for the existing residential assessment locations based on advice from DPIE and the Environment Protection Authority (EPA);
- revised operational assessment further clarifying:
  - site plant and equipment;
  - truck movements including acceleration and deceleration activities;
  - building acoustic performance;
  - cumulative ARRC and quarry operations; and
  - other operational assumptions.
- road upgrade construction noise assessment (in addition to site construction noise addressed in EIS NVIA); and
- updated road traffic noise assessment taking into account amended traffic volumes and distribution documented in the Addendum TIA and acceleration and deceleration activities.

The refined project layout is shown in Figure 1.1 with reference to the EIS ARRC design.


KEY

- Subject property
- ARRC site
- Indicative detailed layout

Proposed element

- ARRC warehouse
- Awning
- Carpark
- Drainage outlet
- Fuel store
- Hand unloading area
- Hardstand
- Internal road
- Kerb/pedestrain area
- Landscaping
- Office over ground floor
- On-site detention
- Product bay
- Site office
- Ticketbooth
- Unloading/processing
- Water treatment infrastruture
- Weighbridge
- Workshop and hazardous materials storage

Product bays

1. Concrete/rubble masonry
2. Clean timber
3. Rigid plastics
4. Paper/cardboard/film
5. Stumps/asphalt/metal
6. Heavy residual
7. Fines screened
8. Soil audit
9. Ferrous
10. Non-ferrous
11. Non-recyclables

Source: EMM (2021); DFSI (2017); GA (2011); Nearmap (2020); Indesco (2021)

0 50 100 m

GDA 1994 MGA Zone 56

N

\\Emmsvr1\emm\Jobs\2019\J190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Submissions report\SUR004 DesignChange 20210325 02.mxd 25/05/2021

## Project overview

Luddenham Advanced Resource Recovery Centre
Addendum Noise and Vibration Impact Assessment
Figure 1.1

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# 2 Existing acoustic environment

## 2.1 Noise and vibration assessment locations

The nearest representative noise sensitive locations to the ARRC have been identified for the purpose of assessing potential noise and vibration impacts. These locations were selected to represent the range and extent of noise impacts from the ARRC. Details are provided in Table 2.1 and their locations are shown in Figure 2.1. They are referred to in this report as assessment locations.

**Table 2.1 Noise assessment locations**

| ID | Address | Classification (currently) | Easting | Northing |
|---|---|---|---|---|
| R1 | 21612177 Elizabeth Drive, Luddenham | Residential | 288775 | 6250213 |
| R2 | 21112141 Elizabeth Drive, Luddenham | Residential | 289113 | 6250041 |
| R3 | 285 Adams Road, Luddenham (currently unoccupied)[1] | Residential | 288931 | 6249685 |
| R4 | 5 Anton Road, Luddenham | Residential | 288390 | 6249272 |
| R5 | 185 Adams Road, Luddenham | Residential | 288317 | 6249178 |
| R6 | 225 Adams Road, Luddenham | Residential | 288751 | 6249563 |
| R7 | 161 Adams Road, Luddenham | Residential | 287971 | 6249090 |
| R8 | 25102550 Elizabeth Drive, Luddenham | Residential | 288373 | 6250229 |
| AR1 | Hubertus Club outdoor firing range | Active recreation | 288643 | 6249324 |
| C1 | Hubertus Club restaurant including outdoor facilities | Commercial | 288680 | 6249400 |

Note: 1. It is understood that the landowner intends to redevelop the property for non-residential uses but impacts at this residence have been assessed in full in this report for completeness.

## 2.2 Background noise survey

To establish the existing ambient noise environment of the area, unattended noise surveys and operator-attended aural observations were conducted at monitoring locations as guided by the procedures described in Australian Standard AS 1055-1997 - *Acoustics - Description and Measurement of Environmental Noise*. This has been detailed in the EIS NVIA.

A summary of existing background and ambient noise levels is given in Table 2.2.

## Table 2.2 Summary of existing background and ambient noise

| Monitoring location | Period[1] | Rating background level (RBL), dBA | Measured $L_{Aeq, period}$ noise level[2], dBA |
|---|---|---|---|
| NM1 (R2) – 2111-2141 Elizabeth Drive, Luddenham | Day | 46 | 60 |
| | Evening | 40 | 55 |
| | Night | 39 | 55 |
| NM2 (R3) – 275 Adams Road, Luddenham | Day | 39 | 50 |
| | Evening | 38 | 54 |
| | Night | 35 | 45 |
| NM3 (R6) – 225 Adams Road, Luddenham | Day | 37 | 49 |
| | Evening | 38 | 45 |
| | Night | 33 | 43 |

Notes: 1. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; Evening: 6 pm to 10 pm; Night: 10 pm to 7 am, Sunday to Friday and 10 pm to 8 am Saturday and public holidays.

2. The energy averaged noise level over the measurement period and representative of general ambient noise.


KEY

- Study area
- Cadastral boundary
- Noise measurement location

Assessment location

- Active recreation
- Commercial
- Residential

\\Emmsvr1\emm\Jobs\2019\I190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Addendum NVIA\ANV001 AssessmentLocations 20210525 01.mxd 25/05/2021

Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2020)

0 100 200 m

GDA 1994 MGA Zone 56

N

Noise monitoring and assessment locations

Luddenham Advanced Resource Recovery Centre
Addendum Noise and Vibration Impact Assessment
Figure 2.1

EMM
creating opportunities

# 3 Assessment criteria

## 3.1 Operational noise

Operational noise associated with the ARRC will be from fixed processing plant, and mobile plant and equipment including road trucks. However, the project involves the construction of a large warehouse building to contain the receipt, processing and dispatch of all materials. Containing the operations in this way is considered current best practice for the industry. Ancillary plant associated with the facility would include water treatment plant and roof ventilation fans.

Noise from development in NSW is regulated by the local council, DPIE and/or EPA. Sites generally have a licence and/or development consent conditions stipulating noise limits. These limits are typically derived from project specific trigger or operational noise levels predicted at assessment locations. They are based on EPA default criteria (eg from the *Noise Policy for Industry* (NPfI) 2017) or are specific-site noise levels that can be achieved following the application of all feasible and reasonable noise mitigation measures.

The objectives of noise trigger levels established in accordance with the NPfI are to protect the community from excessive intrusive noise and preserve amenity for specific land uses. It should be noted that the audibility of a noise source does not necessarily equate to disturbance at an assessment location.

To ensure these objectives are met, the EPA provides methods for determining project specific noise trigger levels, namely intrusiveness and amenity levels.

The application of the NPfI with consideration of the existing residential assessment locations is based on zoning and land use at the time of the development application. The zoning when the ARRC application was submitted was rural, however the land has now been rezoned with the area subject to a transitional phase as the surrounding land uses change to commercial/industrial in line with the Agribusiness Zoning and associated draft precinct plan.

The acoustic environment within the area surrounding the site will change significantly following the completion and commencement of operations at WSA, forecast for 2026. Future development of the land surrounding the site will need to consider the Australian Noise Exposure Concept/Australian Noise Exposure Forecast (ANEC/ANEF) contours for the Western Sydney Airport (WSA) to ensure there is no new residential development on land within the ANEC/ANEF 20 and above contours. The site and assessment locations R1 to R7 are within this contour and hence are expected to be impacted by future aircraft overflight noise, taxiing and ground running activities from the WSA.

### 3.1.1 Intrusiveness noise levels

The NPfI intrusiveness noise triggers require that $L_{Aeq,15min}$ noise levels (energy average noise level over a 15-minute period) from the site do not exceed the rated background level (RBL) by more than 5 dB during the relevant operational periods. The intrusiveness noise levels are only applicable at residential assessment locations.

Residences surrounding the site are on land currently zoned Agribusiness under the State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 (Aerotropolis SEPP). A review of permitted uses within this land use zone include earthworks, freight and transport facility, electricity generating works, intensive agriculture, light industry, rural industry, service station, warehouse or distribution centre and other similar uses. These land uses are consistent with uses adopted for industrial development as defined in the NPfI.

Notwithstanding, the rezoning of the land and isolated nature of residential properties potentially impacted from the site, EPA (letter from EPA to DPIE, 8 April 2021) and DPIE have advised the applicant that project noise trigger levels (PNTLs) for residential properties in rural zoned land is to be applied to existing residences given that the application was made before the land was rezoned.

Table 3.1 presents the project intrusiveness noise levels determined for the site based on the adopted RBLs. Where assessment locations have been grouped together in the following tables, it is expected that the ambient noise environment at these assessment locations is similar.

**Table 3.1 Project intrusiveness noise levels**

| Residential assessment location[1] | Assessment period[2] | Adopted RBL, dBA | Project intrusiveness noise level (RBL + 5 dB), $L_{Aeq,15min}$, dB |
|---|---|---|---|
| R1, R2 & R8 | Day | 46 | 51 |
| | Evening | 40 | 45 |
| | Night | 39 | 44 |
| R3[3] | Day | 39 | 44 |
| | Evening | 38 | 43 |
| | Night | 35 | 40 |
| R4 – R7 | Day | 37 | 42 |
| | Evening | 37[3] | 42 |
| | Night | 33 | 38 |

Notes: 1. Residential assessment locations only.

2. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; Evening: 6 pm to 10 pm; 6 am to 7 am Monday to Saturday, 6 am to 8 am Sundays and public holidays; Night: remaining periods.

3. Currently unoccupied.

### 3.1.2 Amenity noise levels

The assessment of amenity is based on noise levels specific to the land use. The noise levels relate only to industrial noise and exclude road or rail traffic noise. Where the measured existing industrial noise approaches recommended amenity noise levels, it needs to be demonstrated that noise levels from new developments will not contribute to existing industrial noise such that amenity noise levels are exceeded.

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, the project amenity noise level for a new industrial development is the recommended amenity noise level (outlined in Table 2.2 of the NPfI) minus 5 dB. It is noted that this approach is based on a receiver being impacted by multiple industrial sites (or noise sources).

The residential locations potentially exposed to noise from the ARRC and quarry are not exposed to any other industrial operations. This is not likely to change in future over the period the quarry will operate and then close (ie December 2024). There are no known development applications for industrial operations on adjoining properties. Furthermore, future WSA operations are reportedly five years away and at that time it is likely that baseline noise levels will increase, prompting a need to re-assess baseline noise levels and targets for residences, assuming residences are still present given the changing land use zoning to Agribusiness. Hence, the baseline amenity levels were adopted for cumulative noise from the ARRC and quarry. This is consistent with the approach outlined in NPfI Section 2.4 Item 4.

Notwithstanding the above, DPIE has advised that rural amenity levels -5 dB are to be applied to the project. CPG and KLF respectfully maintain that this is an inappropriate and unreasonably restrictive constraint on this project and the area in view of the permissible uses under the new SEPP. CPG and KLF however, have sought to resolve a way forward for the project and have accordingly updated this assessment to account for the application of rural amenity -5 dB levels.

Residential areas potentially affected by ARRC operational noise are located to the north, south and west of the ARRC site. The project amenity noise levels for the identified assessment locations are presented in Table 3.2 based on a rural noise amenity area.

**Table 3.2 Project amenity noise levels (based on rural zoning)**

| Assessment location | Time period[1] | Indicative area | Project amenity noise level[2] dB, $L_{Aeq,period}$ |
|---|---|---|---|
| R1 to R8 | Day | Rural | 45 |
| | Evening | | 40 |
| | Night | | 35 |
| AR1 | When in use | Active recreation | 50 |
| CP1 | When in use | Commercial | 60 |
| Agribusiness/Enterprise | When in use | Industrial | 65 |

Source: NPfI (EPA 2017).

Notes: 1. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; Evening: 6 pm to 10 pm; Night: 10 pm to 7 am Monday to Saturday; 10 pm to 8 am Sundays and public holidays.

2. Project amenity noise level is Amenity noise level (Table 2.2 of NPfI).

### 3.1.3 Project noise trigger level

The PNTL is the lower of the calculated intrusiveness or amenity noise levels. Taking account of the measured background noise levels, project intrusive noise levels and project amenity levels for residential assessment locations, a summary of the PNTLs for the assessment of noise from ARRC operations is presented in Table 3.3 based on historical rural zoning and land use. The project amenity $L_{Aeq,15min}$ noise level is the recommended amenity noise level $L_{Aeq,period}$ +3 dB as per the NPfI.

**Table 3.3 Project noise trigger levels (based on rural zoning)**

| Assessment location | Assessment period[1] | Intrusiveness noise level, $L_{Aeq,15min}$, dB | Amenity noise level[2], $L_{Aeq,15min}$, dB | PNTL[3], $L_{Aeq,15min}$, dB |
|---|---|---|---|---|
| R1, R2 & R8 | Day | 51 | 48 | 48 |
| | Evening | 45 | 43 | 43 |
| | Night | 44 | 38 | 38 |
| R3 | Day | 44 | 48 | 44 |
| | Evening | 43 | 43 | 43 |
| | Night | 40 | 38 | 38 |
| R4–R7 | Day | 42 | 48 | 42 |
| | Evening | 42 | 43 | 42 |
| | Night | 38 | 38 | 38 |
| AR1 | When in use | n/a | 53 | 53 |
| CP1 | When in use | n/a | 63 | 63 |
| Agribusiness/Enterprise | When in use | n/a | 68 | 68 |

Notes: 1. Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; Evening: 6 pm to 10 pm; 6 am to 7 am Monday to Saturday, 6 am to 8 am Sundays and public holidays; Night: remaining periods.

2. Project amenity $L_{Aeq,15min}$ noise level is the recommended amenity noise level $L_{Aeq,period}$ +3 dB as per the NPfI.

3. PNTL is the lower of the calculated intrusiveness or amenity noise levels.Sleep disturbance

The NPfI suggests that a detailed maximum noise level event assessment should be undertaken where night-time noise levels at a residential location exceed:

- $L_{Aeq,15\ minute}$ 40 dB or the prevailing RBL plus 5 dB (whichever is the greater); and/or
- $L_{Amax}$ 52 dB or the prevailing RBL plus 15 dB (whichever is the greater).

Additional information is outlined in *WHO* [World Health Organization] *Night Noise Guidelines for Europe* (WHO 2009) and the *Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep* (Basner and McGuire 2018). Further guidance is also provided in the NSW Road Noise Policy with reference to enHealth "as a rule for planning for short-term or transient noise events, for good sleep over 8 hours the indoor sound pressure level measured as a maximum instantaneous value should not exceed approximately 45 dB(A) $L_{Amax}$ more than 10 or 15 times per night". It is commonly accepted by acoustic practitioners and regulatory bodies (ie EPA) that a facade including a partially open window will reduce external noise levels by 10 dB. Therefore, external noise levels in the order of 55 dB calculated at the facade of a residence is unlikely to impact sleep according to the RNP.

Table 3.4 provides the noise level event screening criteria for the residential assessment locations.

**Table 3.4 Sleep disturbance screening criteria at residences**

| Assessment location | Adopted night RBL, dB | Night-time maximum noise level event screening criteria, dB | |
|---|---|---|---|
| | | $L_{Aeq,15\ minute}$ | $L_{Amax}$ |
| R1, R2 & R8 | 39 | 44 | 54 |
| R3 | 35 | 40 | 52 |
| R4–R7 | 33 | 40 | 52 |

## 3.2 Mitigating noise

Where noise levels above the PNTLs are predicted, all feasible and reasonable mitigation are to be considered for the project to reduce noise levels towards the PNTLs, before any residual impacts are determined and addressed.

The significance of the residual noise impacts is generally based around the human perception to changes in noise levels as explained in the glossary of the acoustic terms. For example, a change in noise level of 1 to 2 dB is typically indiscernible to the human ear. The characterisation of a residual noise impact of up to 2 dB above the PNTL is therefore considered negligible. The NPfI characterisation of residual noise impact is outlined further in Table 3.5.

**Table 3.5 Significance of residual noise impacts**

| If the predicted noise level minus the project noise trigger level is: | And the total cumulative industrial noise level is: | Then the significance of the residual noise level is: |
|---|---|---|
| ≤2 dB | Not applicable | Negligible |
| ≥3 but ≤5 dB | Less than recommended amenity noise level<br>or<br>Greater than recommended amenity noise level, but the increase in total cumulative industrial noise level resulting from development is ≤1 dB | Marginal |
| ≥ 3 but ≤5 dB | Greater than recommended amenity noise level and the increase in total cumulative industrial noise level resulting from the development is >1 dB | Moderate |
| >5 dB | Less than or equal to recommended amenity noise level | Moderate |
| >5 dB | Greater than recommended amenity noise level | Significant |

Source: NPfI (NSW Government, 2017).

## 3.3 Road traffic noise

Operational traffic require assessment for potential noise impacts. The principle guidance to assess the impact of the road traffic noise on assessment locations is in the *NSW Road Noise Policy* (RNP) (EPA 2011) Table 3.6 presents the road noise assessment criteria for residential land uses (ie assessment locations), reproduced from Table 3 of the RNP for road categories relevant to construction and use of the ARRC. Elizabeth Drive is an arterial road, whilst under the definitions of the NSW RNP, Adams Road with be a sub-arterial road.

**Table 3.6 Road traffic noise assessment criteria for residential land uses**

| Road category | Type of project/development | Assessment criteria – dBA | |
|---|---|---|---|
| | | Day (7 am to 10 pm) | Night (10 pm to 7 am) |
| Freeway/arterial/sub-arterial roads | Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments. | $L_{eq,15hr}$ 60 (external) | $L_{eq,9hr}$ 55 (external) |
| Local roads | Existing residences affected by additional traffic on existing local roads generated by land use developments. | $L_{eq,1hr}$ 55 (external) | $L_{eq,1hr}$ 50 (external) |

Additionally, the RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to an increase of up to 2 dB.

In addition to meeting the assessment criteria in Table 3.6 any significant increase in total traffic noise at the relevant residential assessment locations must be considered. Residential assessment locations experiencing increases in total traffic noise levels above those presented in Table 3.7 should be considered for mitigation.

**Table 3.7 Road traffic relative increase criteria for residential land uses**

| Road category | Type of project/development | Total traffic noise level increase – dBA | |
|---|---|---|---|
| | | Day (7 am to 10 pm) | Night (10 pm to 7 am) |
| Freeway/arterial/sub-arterial roads and transit ways | New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road. | Existing traffic $L_{eq(15\text{-}hr)}$+12 dB (external) | Existing traffic $L_{eq(9\text{-}hr)}$+ 12 dB (external) |

Appendix B of the RNP, states that noise levels shall be rounded to the nearest integer, whilst difference between two noise levels are to be rounded to a single decimal place.

DPIE requested consideration of the Roads and Maritime's Noise Criteria Guideline (NCG) for the road traffic noise assessment (RMS 2015), with Adams Road considered as a new road as a result of its change in functional class based on additional traffic projections from TfNSW. It is noted that the change in functional class is associated with road network changes by TfNSW and future traffic generation from the WSA and associated activities, and not a result of the proposed ARRC.

Consideration of the requirements of the NCG would result in the relevant road traffic noise criteria of 55 dB $L_{Aeq15hour}$ day and 50 dB $L_{Aeq9hour}$ night for Adams Road with the project-generated traffic. Consistent with the procedures of the RNP, the NCG states that additional increase in total traffic noise level should be limited to 2 dB or less.

# 4 Noise assessment approach

## 4.1 Overview

This section presents the methods and base parameters used to model operational and construction noise and vibration emissions from the operation of the ARRC. It also considers the cumulative impact of approved quarry operations.

Operational and construction noise levels were predicted using DGMR Software proprietary modelling software, iNoise 2021.1. The model allows prediction under the ISO9613-2 "*Acoustics – Attenuation of Sound during Propagation Outdoors – general method"* algorithm. This algorithm is accepted by the EPA. Features which affect the predicted noise level that are considered in the noise modelling include:

- equipment sound power levels and locations;
- screening from structures;
- receiver locations;
- ground topography;
- noise attenuation due to geometric spreading;
- ground absorption; and
- atmospheric absorption.

The model was populated with 3-D topography of the project and surrounding area, extending past the nearest assessment locations. Plant and equipment representing the range of proposed operation and construction scenarios was modelled at locations representing the worst-case noise levels for assessment locations.

## 4.2 Operational noise

The acoustic assessment of the ARRC has been based on proposed project layout (Figure 1.1), location of plant and equipment (Appendix A), and peak hour truck movements outlined in the Addendum TIA (EMM, 2021a). The assumption regarding truck noise emissions and building design are outlined in Sections 4.2.1 and 4.2.2.

### 4.2.1 Facility design

The assessment of noise emissions from within the building assumes the following:

- all receipt, processing and dispatch of recycling materials conducted within the proposed warehouse building on the central northern portion of the site, with the building structure comprising of:
  - 2.5 m lower portion of walls comprising 250–300 mm thick precast or in-situ concrete;
  - upper walls and roof comprising minimum 0.6 mm BMT metal cladding and minimum 150 mm medium duty thermofoil faced blanket;
  - eight roof ventilators/fans with a sound power level of $L_{Aeq}$ 78 dB each; and

- four building openings west (x1), east (x2) and south (x1) that were considered with spaced averaged internal noise level and surface area for opening in the noise model calculations;

### 4.2.2 Truck noise

The assessment of truck noise emissions from within the subject property assumes the following:

- road truck movements on the site access road and traversing on site including through the building as outlined in Appendix A comprising during peak 15 minutes, based on peak hour movements outlined in (EMM 2021a):
  - Day/Evening: 20 movements[1] per 15 minutes;
  - Day/Evening: 16 movements per 15 minutes; and
  - Night: 8 movements per 15 minutes;
- a travel speed of 20 km/h around the site and the site access road was used to determine the total sound power level for the relevant route segments (ie modelled as line sources);
- acceleration was considered for the first 80 m of the site access from Adams Road, with a corresponding deceleration component adopted;
- acceleration was also considered from the southern weighbridge onto the site access road for a distance of 160 m;
- adjustments from pass-by levels for acceleration (+4 dB) and deceleration (-2 dB) were adopted from *UK Noise Association – Speed and Road Traffic Noise December 2009*[2];
- the modelling has differentiated between a small/medium truck (<5 t) and large truck (30–35 t) and adopts the following range of sound power levels on site. These are based on EMM measurements of similar vehicles and reference $L_{Aeq}$ data contained in the DEFRA database for 39t road trucks:
  - 100 dB(A) for small/medium trucks (two axles) travelling at speeds of 20 km/h during normal pass-by;
  - 104 dB(A) for small/medium truck travelling at speeds of lower than 20 km/h during high acceleration;
  - 98 dB(A) for small/medium trucks (two axles) travelling at 20 km/h during deceleration;
  - 104 dB(A) for heavy trucks (three or more axles) travelling at 20 km/h during normal pass-by;
  - 108 dB(A) for heavy trucks travelling at speeds of lower than 20 km/h during high acceleration;
  - 102 dB(A) for heavy trucks (three or more axles) travelling at 20 km/h during deceleration;
- for day and evening modelling considered 42% large trucks and 58% small/medium trucks consistent with EMM TIA, whilst for night the model has conservatively assuming all large trucks;

[1] In keeping with the traffic impact assessment, each truck accessing the site has an inward and an outward movement (eg, 10 trucks accessing the site will have 20 movements).

[2] Speed and Road Traffic Noise – UK Noise Associate December 2009, - referenced to Ellebjerg, L. (2008a) 'Basic traffic - noise relations' in Ellebjerg, L. (ed.) (2008)

- source height of two metres and base truck spectrum (104 dB) adjusted in accordance with overall levels presented above:

**Table 4.1 Base truck level spectrum (104 dB) 1/1 octave band (Hz)**

| 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|
| 117 | 113 | 100 | 94 | 95 | 98 | 93 | 88 |

- trucks were considered along the site access and driveway routes throughout the site including weighbridge locations as line sources. The total sound power of the line sources was dictated by the peak 15 minute number of trucks for the day, evening and night modelling scenarios presented above. Potential for vehicle queuing would not adversely impact noise emissions from the site, as any stationary vehicles would be at idle; and

- that the use of truck horns will be prohibited on site except where they are required to prevent an accident – a rare event so not modelled.

### 4.2.3 Plant and equipment

Indicative plant and equipment and associated sound power levels for the ARRC are presented in Table 4.2. The list is based on information provided by the proposed site operator (KLF) and experience at similar resource recovery centres.

The sound power levels assigned to each item have been sourced from an EMM measurement database of similar equipment, Department of Environment, Food and Rural Affairs (DEFRA) 2005, *Update of Noise Database for Prediction of Noise on Construction and Open Sites*, manufacturer data and other equivalent facilities.

**Table 4.2 Operational noise sources**

| Noise source | No. of items | Sound power level per item ($L_{Aeq}$) dBA | Total sound power level ($L_{Aeq}$) dBA |
|---|---|---|---|
| Road trucks[1,2] | 4–10[3] | 100–108 | 110–118 |
| Primary screen[1] | 1 | 93 | 93 |
| Secondary screen[1] | 1 | 93 | 93 |
| Tertiary screen[1] | 1 | 93 | 93 |
| Shredder[1] | 1 | 117 | 117 |
| Excavator (14 t)[1] | 2 | 105 | 108 |
| Excavator (PC300 or equivalent – 30 t)[1] | 1 | 108 | 108 |
| Front end loader (CAT972, HL970 or equivalent)[1] | 2 | 105 | 108 |
| Mobile crusher + loader[1] | 1 | 116 | 116 |
| Density separators[1] | 2 | 93 | 96 |
| Ballistic separator[1] | 1 | 93 | 103 |
| Sand screening and wash plant[1] | 1 | 103 | 103 |

**Table 4.2 Operational noise sources**

| Noise source | No. of items | Sound power level per item ($L_{Aeq}$) dBA | Total sound power level ($L_{Aeq}$) dBA |
|---|---|---|---|
| Water treatment plant | 1 | 94 | 94 |
| Pump room | 1 | 82 | 82 |
| Generator | 1 | 94 | 94 |
| Roof fans/ventilators | 8 | 78 | 97 |

Notes: 1. Equipment located within building.
2. Trucks considered in building, traversing through site and site access/egress.
3. Depending on size, activity and time of day (see truck movements in Section 4.2.2).

The building will contain a range of sorting, screening, crushing and other plant to process received waste. The equipment used at any one time will be dependent on the waste received in the preceding days and may vary depending on the types of activities at customers' sites. Almost any combination of equipment could be operating simultaneously, and, at times, all plant and equipment may be operating simultaneously over a 15-minute period, processing different types of waste received (eg separating co-mingled waste; crushing and screening masonry; screening and washing fines and shredding timber). Accordingly, all plant and equipment were modelled with 100% utilisation with variations in site noise emissions of 5 dB or more is not considered likely, accordingly a correction for intermittency at night is not warranted in accordance with the procedures of Fact Sheet C in the NPfI.

Plant and equipment located within the building were considered with a space averaged reverberant level calculated for the warehouse space. Based on the sound power levels in Table 4.2, proposed construction materials and dimensions of the warehouse building, a space averaged $L_{Aeq}$ level of 86 dB was confirmed. This level was utilised with the surface area of the relevant building components (roof, walls, doors, etc.) to develop noise emitting facades for the building.

From experience, the type of heavy machinery listed in Table 4.2 would not present tonal characteristics as defined by the NPfI. A review of the A weighted and C weighted noise levels of the cumulative plant as an unattenuated level and attenuated level through the façade/roof confirmed level differenced of 8.6 dB and 13.2 dB respectively and are less than 15 dB threshold for assessment of low frequency noise (LFN). Accordingly tonal or low frequency corrections do not need to be applied to the sources. A summary of the 1/1 octave band levels and level differences is provided in Appendix A in accordance with the procedures of Fact Sheet C in the NPfI.

All mobile plant will use level varying broad band 'quacker' reversing alarms.

The assessment conducted a review of the truck activities and relative noise contributions against the noise contributions from the ARRC building for each assessment location. Review of the predicted noise levels confirmed that there is less than a 5 dB difference in the relative noise contributions during the night-time period, accordingly, in accordance with the NPfI, a 5 dB penalty for intermittency at night has not been applied to the site noise emissions.

### 4.2.4 Night-time maximum noise level events and sleep disturbance

The ARRC will operate 24 hours per day/7 days per week, hence assessment of intermittent noise and potential for sleep disturbance at residential assessment locations during the night-time hours (10 pm to 7 am) is required by the NPfI. For assessment of sleep disturbance, a sound power level of 115 dBA $L_{Amax}$ was considered for airbrake release of site trucks. The area on the site with the greatest potential for this activity to occur is the weighbridges on the northern and southern sides of the building and within the warehouse building. However, for assessment

purposes modelling has also considered these events at the northern waiting area west of the weighbridge and each of the building openings.

### 4.2.5 Noise predictions

Noise levels at the assessment locations identified in Table 2.1 were predicted based on the noise sources outlined in Table 4.2. The overall $L_{Aeq,15min}$ noise contribution was modelled for direct assessment against NPfI PNTLs.

### 4.2.6 Noise enhancing meteorology

The model utilised international standard ISO 9613-2:1996 'Acoustics – Attenuation of sound during propagation outdoors'. As per Section 1 of the standard:

> The method predicts the equivalent continuous A-weighted sound pressure level (as described in parts 1 to 3 of ISO 1996) under meteorological conditions favourable to propagation from sources of known sound emission.
>
> These conditions are for downwind propagation, as specified in 5.4.3.3 of ISO 1996-2:1987 or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.

## 4.3 Road upgrade construction noise and vibration assessment

### 4.3.1 Construction Noise

Principle construction activities for the site and new access road were addressed in the EIS NVIA and has not been considered further in this Addendum NVIA. However, additional construction work associated with any road upgrade works at Adams Road or Elizabeth Drive is anticipated and would be minor occurring over approximately four to six weeks. Typical plant and equipment associated with the works is expected to be similar to that utilised for the upgrade to the site road access as summarised in Table 4.3.

**Table 4.3 Road upgrades sound power levels**

| Equipment/Activity | Number of items (per 15 minutes) | SWL per item, LAeq | Total SWL, LAeq | Cumulative SWL per phase, LAeq |
|---|---|---|---|---|
| ***Road upgrade works (duration = 4-6 weeks)*** | | | | |
| Road trucks | 2 | 103 | 106 | 114 |
| Asphalt truck and tipper | 1 | 112 | 112 | |
| Grader | 1 | 107 | 107 | |
| Roller | 1 | 103 | 103 | |
| Water cart | 1 | 97 | 97 | |

The upgrade works will be principally at the site entry, the intersection of Adams Road and Elizabeth Drive and on Adams Road between Elizabeth Drive and Anton Road. A review of the EIS NVIA confirmed four assessment locations are potentially most exposed to the proposed construction works. They comprise:

- R1 - 2161–2177 Elizabeth Drive, Luddenham;
- R2 - 2111–2141 Elizabeth Drive, Luddenham;

- R3 - 285 Adams Road, Luddenham (unoccupied);
- R4 - 5 Anton Road, Luddenham;
- R5 - 185 Adams Road, Luddenham; and
- R6 - 225 Adams Road, Luddenham.

### 4.3.2 Construction vibration

Safe working distances for typical items of vibration intensive plant are listed in Table 4.4. The safe working distances are quoted for both "Cosmetic Damage" (refer British Standard BS 7385) and "Human Comfort" (refer British Standard BS 6472-1).

**Table 4.4 Recommended safe working distances for vibration intensive plant**

| Plant Item | Rating/Description | Safe working distance | |
|---|---|---|---|
| | | Cosmetic damage (BS 7385) | Human comfort (BS 6472) |
| Vibratory Rollers | <50 kN (typically 12 tonnes) | 5 m | 15 to 20 m |
| | <100 kN (typically 24 tonnes) | 6 m | 20 m |
| | <200 kN (typically 46 tonnes) | 12 m | 40 m |

Source: From Transport Infrastructure Development Corporation Construction's Construction Noise Strategy (Rail Projects), November 2007 – based on residential building.

Safe work distances relate to continuous vibration. For most construction activity, vibration emissions are intermittent in nature. The safe working distances are therefore conservative.

The safe working distances presented in Table 4.4 are indicative and will vary depending on the item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions.

The safe working distances have been used to assess the potential for construction vibration impacts based on proposed activities.

## 4.4 Revised road traffic noise assessment

Potential road traffic noise levels on Adams Road (classified as a sub-arterial road) and Elizabeth Drive (classified as an arterial road) were remodelled based on the changes to the proposed traffic generation from the site as described in the Addendum TIA (EMM 2021a), and a reassessment of when the traffic movements will occur (daytime versus night-time) and the updated background traffic projections provided by Transport for New South Wales (TfNSW).

Road traffic noise levels were predicted utilising the calculation procedures of US EPA Federal Highways (FHWA) Method (1996) spreadsheet calculation. This was considered in the assessment of road traffic noise due to low traffic flows (<200 vehicles per hour) as the FHWA calculation procedure is more sensitive to low traffic volumes compared to other methods. Following discussions with DPIE, additional adjustments were considered in the traffic noise modelling to account for potential increased noise levels for trucks accelerating from the site access onto

Adams Road. The assessment has utilised an adjustment of +2.1 dB for moderate acceleration for heavy vehicles established from *UK Noise Association – Speed and Road Traffic Noise December 2009*[3].

Road traffic noise levels from the project have been assessed by calculating TfNSW-projected traffic and TfNSW-projected plus project traffic, including potential for 50% of truck trips south on Adams Road at representative residential assessment locations. The following assumptions have been adopted:

- a vehicle sign-posted speed for Elizabeth Drive of 80 km/h;
- a vehicle sign posted speed limit on Adams Road of 70 km/h;
- no buildings or other intervening objects that will act as a noise barrier between the road and the noise assessment point are proposed;
- a facade reflection has been added to predicted noise levels of 2.5 dB consistent with the RNP;
- ground type absorption in the calculation allows for factors of hard = 0 and soft = 0.5. Considering the ground surrounding Adams Road and Elizabeth Drive is predominantly grassland between roadway and residential facades the assessment considered ground type values for specific assessment locations:
  - 0.5 for R2, R3 and R6;
  - 0.3 for R5; and
  - 0.2 for R4 and R7.
- calculations for R2 Elizabeth Drive and R3 Adams Road (north) considered full field of view to the roadway for the residential facade, and assumed project related trucks accelerating for these road segments;
- calculations for R4 and R5 Adams Road (south) considered full field of view to the roadway for the residential facade, and assumed all trucks (existing and project related) accelerating for this road segment with presence of roundabout (final design to be determined but assumed in central triangular reserve);
- calculations for R6 assumed that half of the field of view would encompass project related trucks accelerating, with the remainder utilising pass-by noise levels;
- calculations for R7 assumed that full field of view would utilise pass-by noise levels; and
- Noise measurements at 2111 Elizabeth Drive were reviewed in conjunction with the classified traffic counts and FHWA procedures for the purpose of calibrating noise predictions. The result of the calibration confirmed overprediction of the noise model reference to measured noise levels of 4.2 dB. Predicted noise levels were adjusted in accordance with the calibration factor.

[3] Speed and Road Traffic Noise – UK Noise Association December 2009, researched and written by Paige Mitchell - referenced to Ellebjerg, L. (2008a) 'Basic traffic - noise relations' in Ellebjerg, L. (ed.) (2008)

# 5 Impact assessment

## 5.1 Operational noise

### 5.1.1 Single point predictions

Predicted single point operational noise levels are provided in Table 5.1 for day, evening and night operations of the proposed ARRC. The daytime noise levels from the combined ARRC and approved quarry are also provided. The levels presented for each assessment location represents the energy-average noise level over a 15-minute period and assumes all plant and activities operating concurrently in accordance with scenarios outlined in Section 4.2 under noise enhancing conditions (ISO9613). The predictions have also considered cumulative noise associated with concurrent ARRC and quarry operations during day hours up to 2024 (when quarry operations will cease).

**Table 5.1 Predicted operational noise levels – ISO9613**

| Assessment location | Classification | Period | PNTL, dBL$_{Aeq,15min}$ | Predicted ARRC and (ARRC + quarry) noise level[1], dB L$_{Aeq,15min}$ |
|---|---|---|---|---|
| R1 | Residential | Day | 48 | 43 (45) |
| | | Evening | 43 | 43 |
| | | Night | 38 | **42** |
| R2 | Residential | Day | 48 | 47 (48) |
| | | Evening | 43 | **47** |
| | | Night | 38 | **46** |
| R3[2] | Residential | Day | 44 | **62 (62)** |
| | | Evening | 43 | **61** |
| | | Night | 38 | **61** |
| R4 | Residential | Day | 42 | 41 (**47**) |
| | | Evening | 42 | 42 |
| | | Night | 38 | **41** |
| R5 | Residential | Day | 42 | 40 (**46**) |
| | | Evening | 42 | 40 |
| | | Night | 38 | **40** |
| R6 | Residential | Day | 42 | **52 (55)** |
| | | Evening | 42 | **52** |
| | | Night | 38 | **52** |
| R7 | Residential | Day | 42 | 37 (**43**) |
| | | Evening | 42 | 37 |
| | | Night | 38 | 37 |

| Assessment location | Classification | Period | PNTL, dB$L_{Aeq,15min}$ | Predicted ARRC and (ARRC + quarry) noise level[1], dB $L_{Aeq,15min}$ |
|---|---|---|---|---|
| R8 | Residential | Day | 48 | 39 (43) |
| | | Evening | 43 | 39 |
| | | Night | 38 | 39 |
| AR1 | Active recreation | When is use | 53 | 45 (51) |
| C1 | Commercial | When is use | 63 | 48 (53) |

Notes: 1. Exceedances of the PNTL are shown in **bold**.
2. Currently unoccupied.
3. Calculated levels from cumulative approved quarry + ARRC operations are in brackets () for day-time operations up to 2024.

The predicted noise levels at assessment locations are up to 1 dB higher than predicted in the previous NVIA (Version 3, EMM 2020d) as a result of changes to the schedule of plant, truck sound power levels and incorporation of acceleration and deceleration.

With the application of rural amenity levels -5 dB, additional residences are predicted to experience noise exceedances during ARRC operations as summarised in Table 5.2.

### Table 5.2 Summary of predicted exceedances

| | Exceedances of PTNLs | | | ARRC + quarry |
|---|---|---|---|---|
| | Day | Evening | Night | Day |
| R1 | - | - | +4 | - |
| R2 | - | +4 | +8 | - |
| R3 | +18 | +18 | +23 | +18 |
| R4 | - | - | +3 | +5 |
| R5 | - | - | +2 | +4 |
| R6 | +10 | +10 | +14 | +13 |
| R7 | - | - | - | +1 |
| R8 | - | - | - | - |

Under the definitions of Section 4.2 of NPfI, the predicted noise exceedances of the PNTLs for the ARRC alone are summarised as follows:

- Daytime – significant for R3 (uninhabited) and R6;
- Evening – moderate for R2; and significant for R3 (uninhabited) and R6; and
- Night – negligible for R5, moderate for R1 and R4 and significant for R2, R3 (uninhabited) and R6.

To address predicted evening and night-time exceedances, CPG and KLF will restrict evening and night-time operations until operations at WSA are properly underway.

Noise exceedances were predicted for a number of residential assessment locations during the day under ISO9613 noise enhancing conditions for approved quarry operations (EMM 2020).

Residences R3 and R6 are eligible for at-receiver noise mitigation under *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (VLAMP) procedures associated with approved quarry operations (EMM 2020) consent conditions (DA No. 315-7-2003).

Daytime exceedances are limited to R3 and R6. Accordingly, CPG and KLF have offered negotiated agreements to R6, while asking R3 (unoccupied) to agree to the impacts with consideration of their plans to commercially develop their property.

Notwithstanding, CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as noise criteria to allow the development to proceed if agreements with all residents cannot be reached – noting DPIE would need to be satisfied 'all best endeavours' have first been exhausted to reach agreement.

The modelling predicts that the applicable amenity noise levels will be satisfied at the active recreation (AR1) and commercial (C1) components of the Hubertus Club for both ARRC and cumulative ARRC and approved quarry operations.

### 5.1.2 Intermittent noise events (sleep disturbance)

Modelling of intermittent maxima noise events at night considered a typical worst-case event for air brake release and a source sound power level of 115 dB $L_{Amax}$. Potential for these events were considered at the north and south weighbridges, northern waiting area west of weighbridge and each of the building openings and were predicted to the identified residential assessment locations. The results of the predictions under ISO9613 conditions are presented in Table 5.3.

**Table 5.3 Predicted intermittent noise levels – ISO9613**

| Assessment location | Classification | Period | $L_{Amax}$ Screening level, dB | Predicted intermittent noise level, dB $L_{Amax}$ |
|---|---|---|---|---|
| R1 | Residential | Night | 54 | 45 |
| R2 | Residential | Night | 54 | 50 |
| R3[1] | Residential | Night | 52 | **76** |
| R4 | Residential | Night | 52 | 44 |
| R5 | Residential | Night | 52 | 46 |
| R6 | Residential | Night | 52 | **54** |
| R7 | Residential | Night | 52 | 42 |
| R8 | Residential | Night | 54 | 41 |

Notes: 1. Currently unoccupied and in a poor state of repair.

Results of modelling confirm compliance with the $L_{Amax}$ sleep disturbance screening level (52–54 dB) for most residential assessment locations with the exception of R3 and R6. R3 is currently unoccupied and in a poor state of repair and is likely to be redeveloped for commercial or industrial use. It is noted the new zoning of the R3 land parcel would prohibit the development of a new residence. The exceedance at R6 is negligible (+2 dB).

A review of Table 5.1 noise levels confirm compliance with the $L_{Aeq,15min}$ sleep disturbance screening level (40–44 dB) for R1, R5, R7 and R8 residential assessment locations. Negligible exceedances (2 dB or less) are predicted for R1, R2 and R4, whilst significant exceedances are predicted for R3 and R6.

R3 is currently in a poor state of repair and is unoccupied. The property is likely to be redeveloped for commercial or industrial use. It is noted the new zoning of the R3 land parcel would prohibit the development of a new residence.

The owners of R6 have been contacted regarding a negotiated agreement to mitigate noise impacts, including sleep disturbance.

### 5.1.3 Feasible and reasonable mitigation

#### i Overview

A noise mitigation measure is considered feasible if it can be engineered and is practical to build and/or implement, given project constraints such as safety, maintenance and reliability requirements.

Reasonableness relates to the application of judgement in arriving at a decision, taking into account if the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the mitigation measure.

The following factors have been considered when evaluating the available noise mitigation options:

- Noise impacts:
  - existing and future noise levels, and projected changes in noise levels;
  - the amount by which the NPfI triggers are exceeded;
- Noise mitigation benefits:
  - amount of noise reduction expected;
  - number of people likely to benefit;
- Cost-effectiveness of noise mitigation:
  - total cost of mitigation measures (including capital and maintenance);
  - ongoing operational and maintenance cost borne by the community (eg running air conditioners if closing dwelling windows is required to improve noise);
- Community views:
  - aesthetic considerations; and
  - views of all potentially affected areas determined through community consultation.

#### ii Assessment of mitigation

Consideration of the feasibility and reasonableness of additional noise mitigation measures has been undertaken with reference to the guidance provided in Section 3.4 of the NPfI. Assessment locations R3 and R6 were identified as the key locations for noise mitigation.

Operational noise sources contributing to the exceedance of the PNTLs were associated with ARRC operational noise and truck movements throughout the site and site access road.

Mitigation options targeting these noise sources have been considered as provided in Table 5.4. Mitigation strategies have been considered in the following hierarchical approach:

1. control of noise at the source;

2. once the feasible and reasonable controls at the source are exhausted, controlling the transmission of noise; and

3. once source and transmission feasible and reasonable controls are exhausted, considering mitigation measures at the noise-sensitive receivers.

A key measure not outlined above is the application of land-use controls, that is separating noise generating development from other sensitive uses. This approach avoids conflict of noise and sensitive land-use and potential cost of short-term mitigation measures. The implementation of land use controls could also incorporate measures that restrict the operation of specific sites during more sensitive time periods like evening and night, when considering impacts at residential assessment locations.

### Table 5.4 Mitigation decision-making matrix

| Mitigation option | Feasible? | Reasonable? | Justification for adopting/disregarding and expected noise benefit |
|---|---|---|---|
| **At-source controls** | | | |
| **Option 1**<br>Only operate ARRC during day hours | Yes - short-term<br>No - long term | Yes - short term<br>No - long term | CPG and KLF agree to not operating the ARRC during the evening and night-time period prior to WSA operations establishing in 2026, to avoid evening and night time noise impacts on assessment locations. However, operating the ARRC during daytime hours only in the long term would significantly restrict ARRC operations and economic viability of the site.<br>This would prevent the direct delivery (ie without interim at-source stockpiles) of waste from infrastructure project sites which are approved/licensed to operate during the evening/night.<br>It would not provide opportunities to dispatch materials from the ARRC when the road network is least congested.<br>Operating only during the day is not considered reasonable following the proper establishment of WSA operations, in view of the permissible land uses under the Aerotropolis SEPP, combined with the location of the subject property and adjacent land uses within the 25-30 ANEC contours. |
| **Option 2**<br>Prohibit evening and night external truck movements. Processing fully operational. | Yes - short term<br>No - long term | Yes - short term<br>No - long term | As for Option 1, while this mitigation option would be feasible during the ramp up phase of the ARRC, the ongoing economic viability of the site requires materials to be received and distributed during evening and night periods.<br>As for Option 1, it would prevent the direct of waste from infrastructure project sites which are approved/licensed to operate during the evening/night and would not provide opportunities to dispatch materials from the ARRC when the road network is least congested.<br>As for Option 1, prohibiting evening and night external truck movements, following the establishment of WSA operations is not considered reasonable in the context of the permissible land uses under the Aerotropolis SEPP, combined with the location of the subject property and adjacent land uses within the 25-30 ANEC contours. |
| **Option 3**<br>Reduction in utilisation of plant and equipment | No | No | Plant and equipment schedules have already been paired down and selected as the minimum requirements for the ARRC to effectively recover materials to meet the NSW Government's targets by recycling up to 90% of the waste received. |
| **Control transmission of noise** | | | |

| Mitigation option | Feasible? | Reasonable? | Justification for adopting/disregarding and expected noise benefit |
|---|---|---|---|
| **Option 4**<br>Provision of fast acting doors to building openings. | Yes | No | Cost high, functionality of building and accommodating the moving of vehicles in and out of the building is compromised (inc. safety).<br>Benefits:<br>Reduction in noise contribution from building openings however overall levels would not reduce by more than 2 dB from ARRC for R3 and R6.<br>As per Option 1, this is not considered reasonable in the context of the ARRC commencing operations in 2024 and being in a ramp up phase leading up to the 24-hour WSA operations. |
| **Option 5**<br>Provision of additional acoustic mounds or walls adjacent the western boundary of the site and site access road | No | No | R6 already benefits from an acoustic mound located to the west of the site, any increase in the height of this mound would provide marginal acoustic benefits. Provision of mounding or acoustic walls along the site access road would not reduce the truck noise level. The cost to extend the existing western mound to potentially benefit one or two assessment locations would be unreasonably high and would sterilise areas of the property for future agribusiness land use..<br>Benefits:<br>• Marginal benefit for R6 but will still experience noise exceedances in the moderate classification that require further mitigation.<br>• R3 and R6 are already eligible for mitigation under the VLAMP procedures for quarry operations.<br>• the Applicant has offered a negotiated agreement to the owner/occupiers of the occupied residence, R6. |
| **Mitigation at the receptor** | | | |
| Receptor mitigation / negotiated agreements | Yes | Yes | At receiver mitigation or negotiated agreement is the key remaining mitigation strategy to be applied to the operation of the ARRC following a review of other options and acknowledging the transitional nature of the site and surrounding area as a result of the rezoning to agribusiness uses including commercial/industrial type operations. As outlined above CPG and KLF have offered negotiated agreements to R6, while asking R3 to agree to the impacts with consideration of their plans to commercially develop their property. |

### 5.1.4 Best-achievable noise levels

The applicant has selected the latest electrically-powered plant and equipment that can be utilised for the sorting and processing of waste materials in combination with conventional diesel-powered plant where alternatives are not currently available in order to minimise noise from the operation of the site. Furthermore receival, processing and dispatch of materials would be conducted wholly within a warehouse building to minimise noise emission and provide current best achievable noise levels.

The ARRC will implement a range of best practice noise management design and operational measures including:

- using quietest plant that can perform the required task including constant review of available technology;
- minimising number of plant and equipment operating simultaneously while still meeting processing requirements;

- switching off idle plant;
- consideration of using noisy plant (shredder and crusher) at least sensitive times of the day when incoming waste streams allow;
- implementing a regular maintenance schedule for all plant and equipment; and
- providing staff education and tool box talks on impacts of noise and best quiet work practices.

A primary operational objective will be to process waste and dispatch products as quickly as possible to minimise the size of stockpiles. This will require the flexibility to operate different types of plant and equipment to operate simultaneously depending on the waste streams received. Noise modelling considered a worst case with all plant and equipment operating simultaneously.

## 5.2 Road upgrade construction noise and vibration assessment

### 5.2.1 Construction noise

Preliminary assessment of the construction activities, considering only distance between source and assessment location and the cumulative sound power level of 114 dB $L_{Aeq}$ confirmed predicted noise levels of $L_{Aeq}$ 52–64 dB. The levels exceed the standard hours NMLs established in the NVIA by 217 dB, however they do not approach the government's highly affected noise level.

It is not uncommon for construction projects to exceed NMLs. For this reason, they are not considered as noise criteria, but as a trigger for all feasible and reasonable noise mitigation and management to be considered, once exceeded.

There is limited opportunity due to proximity of assessment locations, construction location, duration of works and local topography to provide significant noise mitigation. The main management measure will be restricting work to daytime hours wherever possible. Residents will be notified prior to works commencing.

Should works be required to be conducted outside of the standard ICNG hours, further assessment would need to be considered, suitable justification provided and an out of hours work permit obtained.

### 5.2.2 Construction vibration

The nearest residence to construction activity is assessment location R2 which is approximately 160 m away from closest potential construction activities. This assessment location is outside of the safe working distances of likely plant Table 4.4, required to maintain acceptable human response and structural vibration levels. Vibration impacts from construction at any residential assessment locations are therefore highly unlikely.

## 5.3 Revised road traffic noise assessment

A summary of the calculated existing and predicted future daytime and night-time road traffic noise levels are presented in Table 5.3 and Table 5.4 respectively, based on the ARRC at full production (EMM 2021a) and the traffic distribution based on the revised transport strategy (refer Section 3.1 of RtS and EMM 2021a) and intersection upgrades. There are changes to the noise levels presented as a result of revised offset distances for specific assessment locations, consideration of accelerating and pass-by truck noise levels and amendments to baseline vehicle volumes on the identified road segments.

### Table 5.5 Road traffic noise levels – Day (7 am to 10 pm)

| Road segment | Approximate distance of residential façade from nearest carriageway | Projected (non-ARRC) movements[1] | Projected (non-ARRC) plus project movements | RNP Criteria[2,3] LAeq, dB | Noise level increase due to the Project, $L_{Aeq,15hr}$, dB |
|---|---|---|---|---|---|
| | | Calculated level, $L_{Aeq,15hr}$, dB | Predicted level, $L_{Aeq,15hr}$, dB | | |
| **Operation - 2024** | | | | | |
| R2 Elizabeth Drive | 68 m | 60.9 | 61.4 | 60 | 0.5 |
| R3 Adams Road (north) | 205 m | 46.6 | 47.7 | 60/55 | 1.1 |
| R4 Adams Road (south) | 70-110 m | 58.7 | 59.7 | 60/55 | 1.0 |
| R6 Adams Road (north) | 197 m | 46.9 | 47.5 | 60/55 | 0.6 |
| R5 Adams Road (south) | 115 m | 56.3 | 57.3 | 60/55 | 1.0 |
| R7 Adams Road (south) | 35 m | 61.1 | 62.1 | 60/55 | 1.0 |
| **Operation - 2029** | | | | | |
| R2 Elizabeth Drive | 68 m | 59.6 | 60.1 | 60 | 0.5 |
| R3 Adams Road (north) | 205 m | 47.9 | 49.6 | 60/55 | 1.7 |
| R4 Adams Road (south) | 70-110 m | 59.7 | 61.0 | 60/55 | 1.3 |
| R6 Adams Road (north) | 197 m | 48.2 | 49.2 | 60/55 | 1.0 |
| R5 Adams Road (south) | 115 m | 57.3 | 58.6 | 60/55 | 1.3 |
| R7 Adams Road (south) | 35 m | 62.2 | 63.4 | 60/55 | 1.3 |

Notes: 1. Projected future traffic volumes 2024 and 2029 (EMM 2021a).
2. Adams Road is a sub-arterial road and is assessed as $L_{Aeq,15hr}$ 60 dB.
3. Elizabeth Drive is an arterial road and assessed as $L_{Aeq,15hr}$ 60 dB.

Daytime road traffic noise levels are predicted to comply with the RNP <2 dB allowance criterion where levels exceed the base 60 dB $L_{Aeq15hour}$ RNP target for Adams Road (south) and Elizabeth Drive (2024).

### Table 5.6 Road traffic noise levels – Night (10 pm to 7 am)

| Road segment | Approximate distance of residential façade from nearest carriageway | Projected (non-ARRC) movements[1] | Projected (non-ARRC) plus project movements | RNP Criteria[2,3] $L_{Aeq}$, dB | Noise level increase due to the Project, $L_{Aeq,9hr}$, dB |
|---|---|---|---|---|---|
| | | Calculated level, $L_{Aeq,9hr}$, dB | Predicted level, $L_{Aeq,9hr}$, dB | | |
| **Operation - 2024** | | | | | |
| R2 Elizabeth Drive | 68 m | 57.1 | 57.4 | 55 | 0.3 |
| R3 Adams Road (north) | 205 m | 42.8 | 43.9 | 55/50 | 1.1 |
| R4 Adams Road (south) | 70–110 m | 54.9 | 55.9 | 55/50 | 1.0 |
| R6 Adams Road (north) | 197 m | 43.1 | 43.7 | 55/50 | 0.6 |
| R5 Adams Road (south) | 115 m | 52.5 | 53.5 | 55/50 | 1.0 |
| R7 Adams Road (south) | 35 m | 57.3 | 58.3 | 55/50 | 1.0 |
| **Operation - 2029** | | | | | |
| R2 Elizabeth Drive | 68 m | 55.8 | 56.3 | 55 | 0.5 |
| R3 Adams Road (north) | 205 m | 44.1 | 45.9 | 55/50 | 1.8 |
| R4 Adams Road (south) | 70–110 m | 55.9 | 57.2 | 55/50 | 1.3 |
| R6 Adams Road (north) | 197 m | 44.4 | 45.4 | 55/50 | 1.0 |
| R5 Adams Road (south) | 115 m | 53.5 | 54.8 | 55/50 | 1.3 |
| R7 Adams Road (south) | 35 m | 58.4 | 59.7 | 55/50 | 1.3 |

Notes: 1. Projected future traffic volumes 2024 and 2029 (EMM 2021a).
2. Adams Road is a sub-arterial road and is assessed as $L_{Aeq,9hr}$ 55 dBA.
3. Elizabeth Drive is an arterial road and assessed as $L_{Aeq,9hr}$ 55 dBA.

Night-time road traffic noise levels are predicted to comply with the RNP <2 dB allowance criterion where levels exceed the base 55 dB $L_{Aeq9hour}$ RNP target for Adams Road (south) and Elizabeth Drive.

DPIE consideration of the requirements of the NCG results in road traffic noise criteria of 55 dB $L_{Aeq15hour}$ day and 50 dB $L_{Aeq9hour}$ night for Adams Road with the project-generated traffic. Notwithstanding the baseline criteria, the ARRC would not result in traffic noise level increases of more the 2 dB and hence will satisfy the NCG and RNP.

The calculations indicate that with the exception of Adams Road (north) R3 and R6 assessment locations, the baseline noise criteria of the RNP for additional traffic on sub arterial and arterial roads or the application of the NCG for new road classification are exceeded by the existing future road traffic volumes. Therefore the relative increase of <2 dB is the determining factor for assessing potential road traffic noise impacts of the proposal.

The revised assessment of road traffic noise has demonstrated that the <2 dB criteria or baseline road traffic noise levels are satisfied for all road segments assessed as a result of traffic from the proposal.

# 6 Conclusion

Changes to the operational assumptions and future traffic for the site has required updates to the noise and vibration modelling predictions presented in the EIS.

Revised modelling of operational noise confirmed noise emissions typically within 1 dB of those presented in the EIS NVIA (EMM 2020c). With the application of rural amenity levels -5 dB, additional residences are predicted to experience noise exceedances during ARRC operations during the evening and night. To address predicted evening and night-time exceedances, CPG and KLF will restrict evening and daytime operations until operations at WSA are properly underway.

Daytime exceedances are limited to R3 and R6. CPG and KLF have offered negotiated agreements to R6, while asking R3 to agree to the impacts with consideration of their plans to commercially develop their property. Notwithstanding, CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as noise criteria to allow the development to proceed if agreements with all residents cannot be reached – noting DPIE would need to be satisfied 'all best endeavours' have first been exhausted to reach agreement.

Assessment of construction activities associated with potential road and intersection upgrades confirmed predicted noise levels of $L_{Aeq}$ 52–64 dB. The levels exceed the standard hours NMLs established in the EIS NVIA (EMM 2020c) by 2–17 dB, however they do not approach the government's highly affected noise level. Vibration impacts from construction were considered highly unlikely as the closest residential assessment locations are well beyond the recommended safe working distances. The revised assessment of road traffic noise has demonstrated that the <2 dB criteria is satisfied for all road segments assessed as a result of traffic from the project.

# References


Australian Standard AS 1055-1997 - *Acoustics - Description and Measurement of Environmental Noise*.

Basner M and McGuire S 2018, WHO Noise Guidelines for Europe (WHO 2009) and the Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep. *Int J Environ Res Public Health*, 15(3):519.

Department of Environment, Food and Rural Affairs (DEFRA) 2005, *Update of Noise Database for Prediction of Noise on Construction and Open Sites*.

EMM (2020a) *Luddenham Quarry Modification 5 - Modification Report,* prepared by EMM Consulting Pty Ltd for Coombes Property Group and KLF Holdings Pty Ltd.

EMM (2020b) *Luddenham Advanced Resource Recovery Centre – Traffic Impact Assessment* prepared by EMM Consulting Pty Ltd for Coombes Property Group and KLF Holdings Pty Ltd.

EMM (2020c) *Luddenham Advanced Resource Recovery Centre – Noise and Vibration Impact Assessment* prepared by EMM Consulting Pty Ltd for Coombes Property Group and KLF Holdings Pty Ltd.

EMM (2021a) *Luddenham Advanced Resource Recovery Centre – Addendum Traffic Impact Assessment* prepared by EMM Consulting Pty Ltd for Coombes Property Group and KLF Holdings Pty Ltd.

EMM (2021b) *Luddenham Advanced Resource Recovery Centre – Addendum Noise and Vibration Impact Assessment* prepared by EMM Consulting Pty Ltd for Coombes Property Group and KLF Holdings Pty Ltd.

NSW Environment Protection Authority (EPA) 2000, *NSW Industrial Noise Policy* (INP).

NSW Environment Protection Authority (EPA) 2017, *Noise Policy for Industry* (NPfI).

NSW Department of Environment Climate Change and Water (DECCW) 2011, *Road Noise Policy* (RNP).

NSW Roads and Maritime's (RMS) 2015, *Noise Criteria Guideline* (NCG).

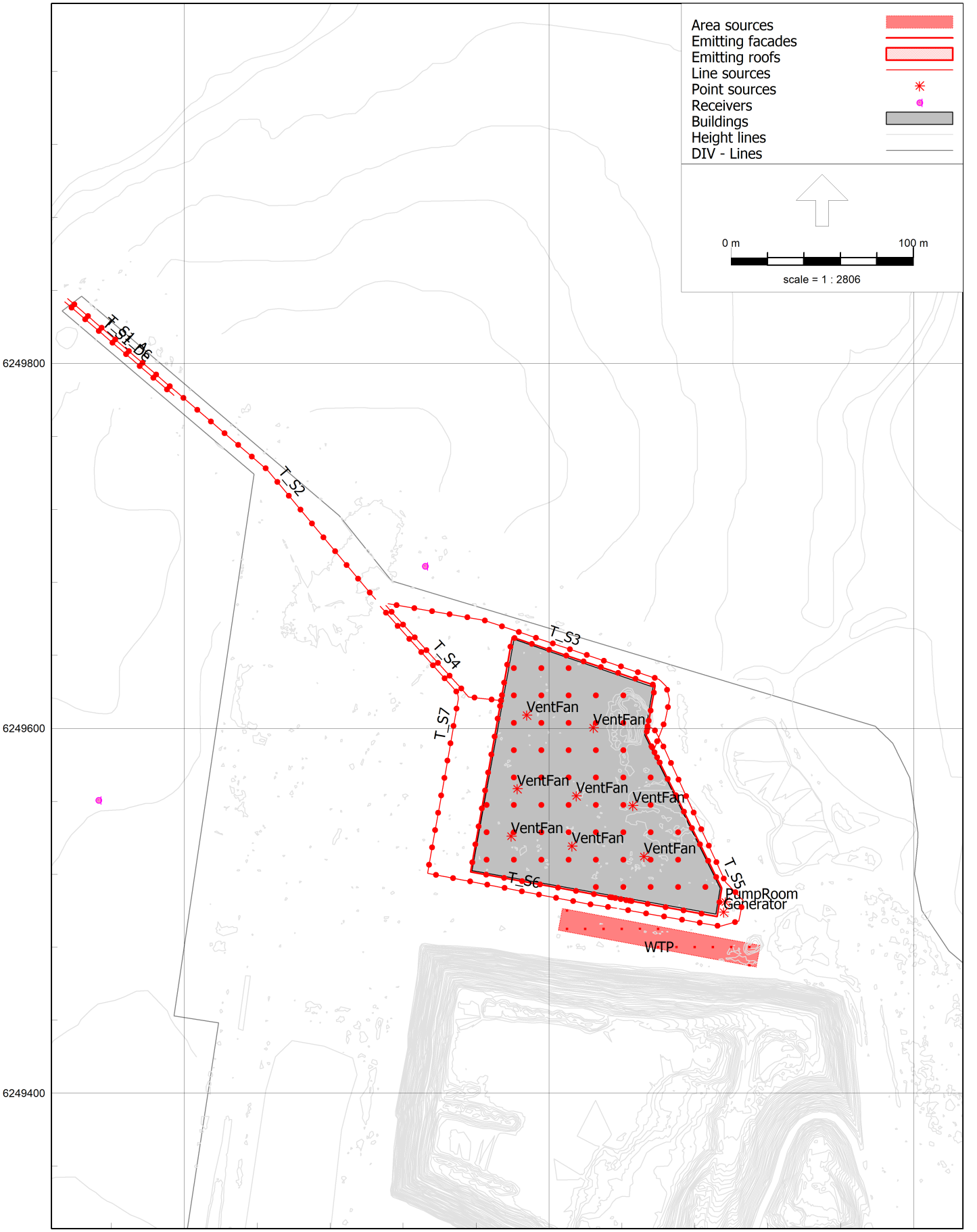
Paige Mitchell - UK Noise Association 2009, *Speed and Road Traffic Noise*, referenced to Ellebjerg L 2008, Basic traffic - noise relations.

# Appendix A

## Noise modelling – source locations and levels

Night - Calm

EMM Consulting Pty Limited - Australia




Industrial noise - ISO 9613.1/2, [SSD - 20210826_Night - Calm] , iNoise V2021.1 Enterprise Licensed to EMM Consulting Pty Limited - Australia

## Table A.1 ARRC source noise levels, $L_{Aeq,15min}$ dB

| Description | No. of plant | | | Factor for no. and route / Total Lw | Lw per Item | Octave band noise level, Hz (dB) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | Evening | Night | | dBA | 32 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| Road Trucks - access road | 20 | - | - | 13.0 | 117.7 | - | 131 | 127 | 114 | 108 | 109 | 112 | 107 | 102 |
| Road Trucks - access road | - | 10 | - | 10.0 | 114.6 | - | 128 | 124 | 111 | 105 | 106 | 109 | 104 | 99 |
| Road Trucks - access road | - | - | 8 | 9.0 | 113.7 | - | 127 | 123 | 110 | 104 | 105 | 108 | 103 | 98 |
| Primary Screen | 1 | 1 | 1 | 93.1 | 93.1 | - | 107 | 103 | 90 | 84 | 85 | 88 | 83 | 78 |
| Secondary Screen | 1 | 1 | 1 | 93.1 | 93.1 | - | 107 | 103 | 90 | 84 | 85 | 88 | 83 | 78 |
| Tertiary Screen | 1 | 1 | 1 | 93.1 | 93.1 | - | 107 | 103 | 90 | 84 | 85 | 88 | 83 | 78 |
| Shredder (Eggersmann Teuton) | 1 | 1 | 1 | 116.9 | 116.9 | 121 | 126 | 115 | 121 | 115 | 109 | 106 | 100 | 94 |
| Excavator 14t | 2 | 2 | 2 | 107.5 | 104.5 | - | 107 | 111 | 107 | 101 | 98 | 96 | 87 | 79 |
| Excavator 30t | 1 | 1 | 1 | 107.5 | 107.5 | 102 | 107 | 108 | 109 | 104 | 101 | 100 | 94 | 86 |
| Front End Loader (Hyundai HL960,CAT 972 or eq) | 2 | 2 | 2 | 108.2 | 105.2 | 99 | 114 | 110 | 106 | 100 | 100 | 98 | 92 | 85 |
| Mobile crusher and loader | 1 | 1 | 1 | 115.8 | 115.8 | 120 | 125 | 114 | 120 | 114 | 108 | 105 | 99 | 93 |
| Density Separators | 2 | 2 | 2 | 96.2 | 93.2 | - | 96 | 96 | 94 | 87 | 86 | 87 | 83 | 80 |
| Ballistic separator | 1 | 1 | 1 | 93.2 | 93.2 | - | 96 | 96 | 94 | 87 | 86 | 87 | 83 | 80 |
| WTP | 1 | 1 | 1 | 94.2 | 94.2 | - | 97 | 97 | 95 | 88 | 87 | 88 | 84 | 81 |
| Pump Room | 1 | 1 | 1 | 81.7 | 81.7 | 81 | 78 | 83 | 81 | 79 | 77 | 73 | 69 | 67 |

## Table A.1 ARRC source noise levels, $L_{Aeq,15min}$ dB

| Description | No. of plant Day | Evening | Night | Factor for no. and route / Total Lw | Lw per Item dBA | Octave band noise level, Hz (dB) 32 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Generator 500 kVA* (external) SE of building | 1 | 1 | 1 | 94.2 | 94.2 | - | 97 | 97 | 95 | 88 | 87 | 88 | 84 | 81 |
| Roof fans | 8 | 8 | 8 | 86.8 | 77.8 | 77 | 74 | 79 | 77 | 75 | 73 | 69 | 65 | 63 |
| TOTAL - Day | | | | 122.2 | 122.0 | 123.8 | 133.1 | 127.8 | 124.1 | 118.4 | 114.0 | 114.0 | 108.7 | 103.4 |
| TOTAL - Evening | | | | 121.3 | 121.1 | 123.8 | 131.5 | 125.4 | 123.9 | 118.2 | 113.3 | 112.4 | 106.9 | 101.4 |
| TOTAL - Night | | | | 121.1 | 120.9 | 123.8 | 131.1 | 124.7 | 123.9 | 118.2 | 113.1 | 111.9 | 106.4 | 100.8 |
| Internal reverberant noise level | | | | | 85.8 | 86 | 90 | 82 | 89 | 83 | 79 | 77 | 73 | 67 |

| | | | Difference Lin v A |
|---|---|---|---|
| **No LFN for source** | Lin | 94.4 | **8.6** |
| **Assess LFN for breakout from building** | | | |
| | Façade (TL) | 31.7 | 13 13 16 18 18 20 24 27 27 |
| | Resultant | 66.6 | 73 77 66 71 65 59 53 46 40 |
| **No LFN for façade** | Lin v A | 79.8 | **13.2** |

Appendix E

# Direct responses to agency submissions

## E.1 Direct responses to agency submissions

This appendix provides direct responses or cross references to the main report to matters raised in the respective agency submissions on the Submissions Report.

### E.1.1 Environment protection authority

Responses to matters raised in the EPA's letter to DPIE dated 18 June 2021 (EPA reference DOC21/449131-9) are provided in the following subsections.

#### i Project amenity noise levels

Due to several factors, not least the recent rezoning of land in this area to agribusiness, the EPA strongly disagrees with the Proponent's approach for deriving the amenity noise levels and views it as directly contradictory to the provision in the NPfI. Project amenity noise levels should be adjusted to reflect the NPfI prior to further determination of the application.

The noise specialists engaged to carry out the noise assessment for the ARRC are of the firm view that the rural amenity noise levels outlined in the Addendum Noise and Vibration Impact Assessment (NVIA) have been derived in accordance with the NPfI.

The residential locations potentially exposed to noise from the ARRC and quarry are not exposed to any other industrial operations. This is not likely to change in future over the period the quarry will operate and then close (ie December 2024). Putting aside the WSA, there are no known development applications for industrial operations on adjoining properties. Furthermore, future WSA operations are reportedly five years away and at that time it is likely that baseline noise levels will increase, prompting a need to re-assess baseline noise levels and targets for residences, assuming residences are still present given the changing land use zoning to Agribusiness. Hence, the baseline amenity levels were adopted for cumulative noise from the ARRC and quarry. This is consistent with the approach outlined in NPfI Section 2.4 Item 4.

Notwithstanding, DPIE and EPA DPIE have advised that rural amenity levels -5 dB are to be applied to the project. CPG and KLF respectfully maintain that this is unreasonably restrictive in view of the permissible uses under the new SEPP. However, in order to resolve matters and progress the application, the applicants have revised the Addendum Noise and Vibration Impact Assessment (ANVIA) to reflect rural amenity levels -5 dB (refer Appendix D of this response report).

As outlined in the ANVIA and Section 2.5, with the updated project trigger noise levels (PTNLs) a summary of predicted exceedances is provided in Table E.1.

**Table E.1 Summary of predicted exceedances**

| | ARRC (Rural amenity levels -5 dB) | | | ARRC + quarry (rural amenity levels -5 dB) |
|---|---|---|---|---|
| | Day | Evening | Night | Day |
| R1 | - | - | +4 | - |
| R2 | - | +4 | +8 | - |
| R3 | +18 | +18 | +23 | +18 |
| R4 | - | - | +3 | +5 |
| R5 | - | - | +2 | +4 |

**Table E.1 Summary of predicted exceedances**

| | ARRC (Rural amenity levels -5 dB) | | | ARRC + quarry (rural amenity levels -5 dB) |
|---|---|---|---|---|
| | Day | Evening | Night | Day |
| R6 | +10 | +10 | +14 | +13 |
| R7 | - | - | - | +1 |
| R8 | - | - | - | - |

Under the definitions of Section 4.2 of NPfI, the predicted noise exceedances of the PNTLs for the ARRC alone are summarised as follows:

- Daytime – significant for R3 (uninhabited) and R6;
- Evening – moderate for R2; and significant for R3 (uninhabited) and R6; and
- Night – negligible for R5, moderate for R1 and R4 and significant for R2, R3 (uninhabited) and R6.

To address predicted evening and night-time exceedances, CPG and KLF will restrict evening and night-time operations until operations at WSA are properly underway.

To mitigate the impact of daytime exceedances on R6 and R3 (unoccupied), CPG and KLF have offered negotiated agreements to R6, while asking R3 to agree to the impacts with consideration of their plans to commercially develop their property. Prior to the commencement of evening and night-time operations, CPG and KLF will offer negotiated agreements to additional residences if required. CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as the noise criteria specified in the development consent, to allow the ARRC to operate if agreements with residents cannot be reached - noting DPIE would need to be satisfied 'all best endeavours' to reach agreement have first been made.

CPG and KLF request that the predicted noise levels at modelled assessment locations are applied as noise criteria to allow the development to proceed if agreements with all residents cannot be reached - noting DPIE would need to be satisfied 'all best endeavours' have first been made otherwise.

### ii Truck sound power level

The Addendum NVIA reports that truck movements on the site have reduced compared to the assumptions presented in the '*Luddenham Advanced Resource Recovery Centre - Environmental Impact Statement*' EMM July 2020, with smaller 4.4 tonne trucks being replaced with larger 30 tonne vehicles. However the same power level has been used. The EPA requires that an assessment be undertaken with more appropriate sound power levels for the 30t trucks, taking into account acceleration, deceleration and air brakes.

The revised Addendum NVIA revised the assessment of truck noise emissions from the subject property. The revised assessment assumed the following:

- road truck movements on the site access road and traversing on site including through the building comprising during peak 15 minutes, based on peak hour movements outlined in the Submissions Report (EMM 2021):

Day/Evening: 20 movements[1] per 15 minutes;

Day/Evening: 16 movements per 15 minutes; and

Night: 8 movements per 15 minutes;

- a travel speed of 20 km/h around the site and the site access road was used to determine the total sound power level for the relevant route segments (ie modelled as line sources);
- acceleration was considered for the first 80 m of the site access from Adams Road, with a corresponding deceleration component adopted;
- acceleration was also considered from the southern weighbridge onto the site access road for a distance of 160 m;
- adjustments from pass-by levels for acceleration (+4 dB) and deceleration (-2 dB) were adopted from *UK Noise Association – Speed and Road Traffic Noise December 2009*[2];
- the modelling has differentiated between a small/medium truck (<5 t) and large truck (30–35 t) and adopts the following range of sound power levels on site. These are based on EMM measurements of similar vehicles and reference $L_{Aeq}$ data contained in the DEFRA database for 39t road trucks:

  100 dB(A) for small/medium trucks (two axles) travelling at speeds of 20 km/h during normal pass-by;

  104 dB(A) for small/medium truck travelling at speeds of lower than 20 km/h during high acceleration;

  98 dB(A) for small/medium trucks (two axles) travelling at 20 km/h during deceleration;

  104 dB(A) for heavy trucks (three or more axles) travelling at 20 km/h during normal pass-by;

  108 dB(A) for heavy trucks travelling at speeds of lower than 20 km/h during high acceleration;

  102 dB(A) for heavy trucks (three or more axles) travelling at 20 km/h during deceleration;

- for day and evening modelling considered 42% large trucks and 58% small/medium trucks consistent with EMM TIA, whilst for night the model has conservatively assuming all large trucks;
- source height of two metres and base truck spectrum (104 dB) adjusted in accordance with overall levels presented below:

**Table E.2 Base truck level spectrum (104 dB) 1/1 octave band (Hz)**

| 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|
| 117 | 113 | 100 | 94 | 95 | 98 | 93 | 88 |

[1] In keeping with the traffic impact assessment, each truck accessing the site has an inward and an outward movement (eg, 10 trucks accessing the site will have 20 movements).

[2] Speed and Road Traffic Noise – UK Noise Associate December 2009, - referenced to Ellebjerg, L. (2008a) 'Basic traffic - noise relations' in Ellebjerg, L. (ed.) (2008)

- trucks were considered along the site access and driveway routes throughout the site including weighbridge locations as line sources. The total sound power of the line sources was dictated by the peak 15 minute number of trucks for the day, evening and night modelling scenarios presented above. Potential for vehicle queuing would not adversely impact noise emissions from the site, as any stationary vehicles would be at idle; and

- that the use of truck horns will be prohibited on site except where they are required to prevent an accident – a rare event so not modelled.

The predicted noise levels at assessment locations are up to 1 dB higher than predicted in the previous Addendum NVIA as a result of changes to the schedule of plant, truck sound power levels and incorporation of acceleration and deceleration.

#### iii Sleep disturbance

A detailed assessment of maximum noise levels and sleep disturbance is to be undertaken in accordance with the NPfI

Addendum NVIA Sections 3.2, 4.2.4 and 5.1.2 (refer Attachment A) provide updated sleep disturbance screening criteria and considers both $L_{Aeq,15min}$ and $L_{Amax}$ noise levels. Potential for these events were considered at the north and south weighbridges, northern waiting area west of weighbridge and each of the building openings and were predicted to the identified residential assessment locations. Results of modelling confirm compliance with the $L_{Amax}$ sleep disturbance screening level (52–54 dB) for most residential assessment locations with the exception of R3 and R6. The exceedance at R6 is negligible (+2 dB).

A review of predicted noise levels confirm compliance with the $L_{Aeq,15min}$ sleep disturbance screening level (40–44 dB) for R1, R5, R7 and R8 residential assessment locations. Negligible exceedances (2 dB or less) are predicted for R1, R2 and R4, whilst significant exceedances are predicted for R3 (+21 dB) and R6 (+12 dB).

R3 is currently in a poor state of repair and is unoccupied. The property is likely to be redeveloped for commercial or industrial use. It is noted the new zoning of the R3 land parcel would prohibit the development of a new residence.

The owners of R6 have been contacted regarding a negotiated agreement to mitigate noise impacts, including sleep disturbance. As noted above, CPG and KLF have committed to delay the conducting of evening and night-time operations until WSA commences operations.

### E.1.2 Liverpool City Council

A summary of the matters raised in Council's submission with CPG and KLF's responses are provided in Table E.3 below.

## Table E.3 Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| Permissibility | Council staff note that the SEPP (Western Sydney Aerotropolis) 2020 and the precinct plans were not published when Liverpool City Council staff comments were made. As per the proponent's response to submissions, clause 53(1) clarifies that the SSD is to be assessed and determined as if the new SEPP has not commenced. Given that resource recovery facilities are permitted on RU4 land, as per the SEPP (Infrastructure) 2007, Council staff are of the opinion that the development is permissible.<br>Notwithstanding the permissibility of the use, Council would still refer to the objectives of the RU4 Primary Production Small Lots zone, as well as the objectives of the agribusiness zone, as per the Aerotropolis planning framework. The development application should be conditioned accordingly to ensure that negative external impacts are managed / mitigated appropriately, and that the site can be decommissioned in a manner that is consistent with the vision of the agribusiness zone. | <u>Project's consistency with Objectives of Agribusiness and former RU4 Primary Production Small Lots zones.</u><br>With reference to the objectives of the Agribusiness zone and the former RU4 zoning objectives, the design of the ARRC, as a fully enclosed warehouse, is in keeping with the warehouses that are envisaged for the agribusiness zone and will not preclude the use of the surrounding land parcels or broader Agribusiness Precinct for agribusiness land use. Development of the ARRC will also not preclude the continued use of surrounding land for primary industry and other compatible industry permissible under the former RU4 zoning.<br><u>Decommissioning of the ARRC</u><br>Following the infilling of the quarry void (subject to separate planning approval), CPG and KLF intend to continue operating the ARRC in perpetuity to provide resource recovery services to support the ongoing development of the Aerotropolis and the Western Parkland City.<br>In the event, market forces change in the future and the ARRC is closed, the internal processing equipment would be removed and the ARRC warehouse retrofitted for an alternative land use consistent with the objectives of the Agribusiness zone. |
| Adams Road upgrade and intersection | It is noted that the proposed intersection treatments at the Elizabeth Drive/Adams Road intersection include a 90 m deceleration left-hand turn lane into Adams Road, restricted right turn movements from Elizabeth Drive (westbound) into Adams Road and a short left turn lane on Adams Road into Elizabeth Drive.<br>Council raises road safety concern about the proposed right turn movements from Adams Road into Elizabeth Drive due to increasing traffic demands along Elizabeth Drive as well as additional time required to cross the proposed left turn deceleration lane.<br>Since Council provided its previous advice (dated 25 August 2020), the strategic design to upgrade Elizabeth Drive (prepared by Transport for NSW (TfNSW)) indicates the Elizabeth Drive/Adams Road intersection will be restricted to left in and out only, with a raised central median preventing right turn movements.<br>As such, Council's previous comments are no longer appropriate, as vehicles would, ultimately, need to travel south along Adams Road towards The Northern Road (in order | <u>ARRC transport strategy</u><br>The transport strategy for the ARRC has been developed in consultation with TfNSW and Council. ARRC development traffic will access the ARRC via both The Northern Road/Adams Road intersection and Elizabeth Drive/Adams Road intersection with the exception of the right hand turn into Adams Road from Elizabeth Drive west.<br>Further consultation has been carried out with Transport for NSW (TfNSW) since lodgement of the Submissions Report in May 2021. TfNSW continues to support this transport strategy in the short to medium term noting that the local and broader road network will be upgrades progressively as part of the development of the Aerotropolis.<br><u>Interim upgrade to Elizabeth Drive/Adams Road intersection</u> |

## Table E.3 Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| | to travel east on Elizabeth Drive). As such, Council recommends that the Adams Road / Elizabeth Drive intersection be restricted to left in and out only for ARRC operations. The alternative route is to be via the Northern Road/Adams Road intersection.<br>Provided that right turn movements would ultimately be restricted from Adams Road onto Elizabeth Drive, the developer is to improve pavement along the section of Adams Road between Elizabeth Drive and Anton Road and remove 3 tonnes restriction to permit heavy vehicle movements.<br>Elizabeth Drive is a state road, which is under the care and control of TfNSW. Hence, the proposed intersection upgrade should be referred to TfNSW for approval. The design of this intersection upgrade should be consistent with the strategic design plan prepared by TfNSW. | Due to the uncertainty regarding long term upgrades of Elizabeth Drive and the Elizabeth/Adams Road intersection, TfNSW requested CPG & KLF prepare a concept design for an interim upgrade to the Elizabeth Drive/Adams Road intersection to accommodate ARRC development traffic in the short to medium term. This interim concept design includes:<br>restriction of the right turn movement for vehicles greater than 6 m from Elizabeth Drive into Adams Road;<br>120 m left turn deceleration lane from Elizabeth Drive into Adams Road; and<br>40 m left turn lane from Adams Road into Elizabeth Drive.<br><br>TfNSW has provided concurrence in writing to the proposed interim upgrade of the Elizabeth Road/Adams Road intersection.<br>TfNSW's preliminary concept design for Elizabeth Drive/Adams Road intersection<br>It is understood TfNSW has prepared a preliminary concept design for a new Elizabeth Drive/Adams Road intersection as part of wider changes to Elizabeth Drive that are part of the broader road network upgrades required to support the development of the Western Sydney Aerotropolis. This preliminary concept design proposes to remove all turn movements for all road users at the Elizabeth Drive/Adams Road intersection, with the exception of the left in movement from Elizabeth Drive into Adams Road.<br>TfNSW requested CPG/KLF carry out sensitivity analysis on this preliminary design. This analyses showed the restriction of all turn movements except left into Adams Road at Elizabeth Drive/Adams Road intersection, would result in significant strain at the Northern Road/Adams Road intersection due to redirected baseline traffic. A LOS F was predicted for this intersection as a result in the change in baseline traffic flow, regardless of whether the ARRC proceeds.<br>Upgrade to Adams Road between Elizabeth Drive and Anton Road<br>CGP and KLF agrees to improving the Adams Road pavement between Elizabeth Drive and Anton Road to enable the lifting of the existing 3 tonne load restriction. |

## Table E.3 Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| SIDRA analysis | Intersection analysis is to be carried out at the intersection of Adams Road/the site access road. Electronic copies of SIDRA models for all the surrounding intersections are to be submitted to Council for review. | The following SIDRA analyses has been carried out for the ARRC development traffic volumes identified in the Submissions Report:<br>Project's transport strategy as presented in Section 3.1.1(i) of the Submissions Report (wherein ARRC development traffic will access the ARRC via both The Northern Road/Adams Road intersection and Elizabeth Drive/Adams Road intersection).<br>Sensitivity SIDRA analyses considering TfNSW's preliminary concept design of Elizabeth Drive/Adams Road upgrade<br>Sensitivity SIDRA analyses at the request of Western Sydney Airport directing 100% of ARRC development traffic to the Elizabeth Drive/Adams Road intersection.<br>Electronic copies of the above analyses have been provided to Council for review.<br>Due to the acceptable level of service (LoS) for the project's transport strategy for the Elizabeth Drive/Adams Road intersection (LoS B or better) and The Northern Road/Adams Road intersection (LoS C) additional intersection analysis of the Adams Road/ARRC site access has not been carried out at this time. |
| Site Access Road | A design plan showing the proposed intersection treatment at the intersection of the site and Adams Road is to be submitted to Council for approval. | Should the project be approved, CPG/KLF will submit certified civil design plans for the upgrade to the site access/Adams Road intersection to Council for approval as part of the Section 138 approval. |
| Haulage Route | The haulage route plan is to be confirmed for the proposed ARRC development prior to the determination of the subject development application | The nature of resource recovery facilities is that the source of material being accepted, and the destination of recycled product being sold by facilities, is governed by the location of customers using the facility. These customers are expected to primarily be in Western Sydney but may be further afield. The exact locations of customers will vary from week to week and evolve over the years according to the evolution of development in Western Sydney. Accordingly, with the exception of movements between other recycling facilities owned by KLF, the applicants cannot identify fixed haulage routes for the movement of ARRC development traffic and also have limited control over the route which customers will use to access the ARRC.<br>Accordingly, to demonstrate that the local road network can accommodate the maximum vehicle movements that will occur during peak ARRC operations, the Addendum traffic impact assessment has been based on conservative assumptions regarding the breakdown |

## Table E.3 Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| | | of incoming and outgoing traffic. This approach to assessment has been applied to the traffic impact assessment of many now approved resource recovery centres.<br>Cognisant of the changing traffic environment due to the development of the WSA and broader Aerotropolis, the applicants have consulted closely with TfNSW throughout the EIS and Response to Submissions phases of the project to confirm assessment requirements, including future background traffic volumes to incorporate in the traffic assessment. |
| On-site Sewerage Management system (OSMS) | The Submission Report prepared by EMM Consulting dated 27th May 2021 does not specifically address requirements for the on-site sewage management system. Despite the limited information available, Clause 4.1.6 of the document explains that the wastewater system will require pumping out on a monthly basis. Section 15, Part 1 of the Liverpool Development Control Plan 2008 states that 'development or subdivision proposals relying on pump-out systems will not be approved by Council.<br>In accordance with Section 68 of the Local Government Act 1993, approval is required to install, construct or alter a waste treatment device and operate a system of sewage management at the premises. "Operate a system of sewage management" means hold or process, or re-use or discharge, sewage or by-products of sewage (whether or not the sewage is generated on the premises on which the system of sewage management is operated).<br>Therefore, separate approval would be required under Section 68 of the Local Government Act 1993 if the proposal includes an on-site sewage management system or any other infrastructure to hold or process, or re-use or discharge, sewage or by products of sewage.<br>In accordance with the Liverpool Development Control Plan 2008, a new system must be installed where the existing system does not have adequate treatment capacity for all potential flows. Liverpool City Council previously requested the SEARs to require a wastewater report prepared by a suitably qualified and experienced environmental or wastewater consultant. | As outlined in Section 4.2 of the Servicing Strategy report (Appendix S of the EIS), Sydney Water currently has new wastewater infrastructure planned over the next 5 years for the area around the ARRC site, including the WSA. As noted in the servicing strategy, it is understood that a new regional centralised wastewater treatment plant servicing the Upper South Creek catchment (which includes the ARRC site) will be delivered by Sydney Water by 2026.<br>The applicants acknowledge approval will be required under Section 68 of the Local Government Act 1993 for the operation of an onsite sewerage management system in the event the proposed Sydney Water wastewater infrastructure is not operational by the time the ARRC commences operations.<br>The Servicing Strategy Report proposed a sewerage treatment plan (STP) located in the water management infrastructure area to the south of the ARRC warehouse indicatively consisting of an eloywater oxyfix treatment system which would treat effluent for either pump out or for use for onsite irrigation of landscaped areas. The final design and specification of the STP would be identified in the wastewater report prepared a part of the Section 68 application to Council. |
| Landscape Plans | Council staff recommend that DPIE works with the proponent to identify an alternative species to replace areas to be planted with Acacia longifolia. The replacement should | A landscape plan will be prepared prior to the commencement of construction of the ARRC, this plan will be prepared with consideration to WSA and Aerotropolis specific guidance |

## Table E.3 Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| | offer greater longevity and be suited to the conditions/environment in which these trees would be planted. Appendix 2 of Part 1 of Liverpool's DCP has a list of preferred species. | material on preferred landscape species to minimise wildlife attraction and also Appendix 2 of Part 1 of LCC's preferred list of species. |
| Operational Management Plans | Liverpool City Council staff recommended that an Operational Environmental Management Plan (OEMP) is prepared for the proposed facility for review by the consent authority.<br>The Plan shall be written by a suitably qualified and experienced environmental consultant and address means by which the commitment in the Environmental Impact Statement and other environmental assessment reports will be fully implemented. | CPG and KLF have committed to the preparation of an OEMP by a suitably qualified and experienced environmental consultant prior to the commencement of operations.<br>It is expected that the requirement for an OEMP would also be stipulated in the conditions of approval. |

### E.1.3 Western Sydney Planning Partnership

Comprehensive responses to matters raised in WSPP's email response to DPIE (dated 15 July 2021) are provided in Section 2.2 of the main report as outlined in Table E.4.

**Table E.4 WSPP's matters raised and where addressed in this report**

| Matter | Where addressed |
|---|---|
| The WSPP acknowledges the application was lodged prior to the WSA SEPP being in place.<br>Therefore, the relevant provisions of the Western Sydney Aerotropolis Plan (WSAP) apply as this document sets out the strategic objectives and land uses for the Aerotropolis. It is important to note that under the WSAP, the site is identified as part Agribusiness and part Environment and Recreation.<br>The WSPP is of the view the proposed development does not meet the strategic objectives of these zones, not does it meet the broader strategic objectives contained in the WSAP. Of particular note is that relating to Aviation Safeguarding. | The ARRC's consistency with objectives of the Aerotropolis Plan are outlined in Section2.2.2ii,a.<br>The ARRC's consistency with the Aerotropolis Plan's key considerations and strategic outcomes for the agribusiness precinct are outlined in Section 2.2.2ii,b.<br>The ARRC's consistency with the Aerotropolis Plan's strategic objectives relating to Airport safeguarding are addressed in Section 2.2.2ii,d |
| Notwithstanding at the time of DA lodgement, it is noted the WSA SEPP discussion paper was available. As such, due consideration should be given to the following with regard to the proposal: | |
| • Objectives of the respective zones and whether the proposal satisfies these, | Refer Section 2.2.1ii |
| • The relevant land use tables in terms of permissibility, | Refer Section 2.2.1ii,b and Section 2.2.1ii,c |
| • Part 3: Airport safeguard controls, | Refer Section 2.2.1ii,d |
| • Clause 27: trees and vegetation in the E&R zone, | Refer Section 2.2.1ii,e |
| • Clause 42: Development prior to a precinct plan and the criteria associated with this | Refer Section 2.2.1ii,f |

### E.1.4 Western Sydney Airport

Responses to matters raised in WSA's submission on the Submissions Report (dated 30 June 2021) are predominantly provided throughout the main report on an issues basis as outlined in Table E.5. Further detail is also provided in Table E.5 as appropriate.

**Table E.5 WSA's matters raised, where addressed in this report and additional responses**

| Matter | Where addressed and additional responses |
|---|---|
| Consistency with SEPP (Western Sydney Aerotropolis) 2020<br>The lack of consideration given by the applicant to the (then) Aerotropolis SEPP Discussion Paper continues to be a significant concern to WSA. Section 3.4 of the Submissions Report identifies the response by the applicant to the statutory context of the proposal, however, limits the discussion to Clause 53(1) of State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 (Aerotropolis SEPP).<br>…<br>The applicant's response in regard to the application of the Aerotropolis SEPP is inadequate, and a full assessment of the proposal against the provisions of the SEPP is required. It remains WSA's view that a land use of this nature is inconsistent with the Aerotropolis SEPP and the strategic plans for the future development of the Western Sydney Aerotropolis, in particular the Agribusiness Precinct. | A detailed assessment of the project against the relevant provisions of the Aerotropolis SEPP is provided in Section 2.2.1 of the main report. |
| Relationship to Quarry Application and disposal of organic waste<br>It remains unclear what the relationship is between this application to the future envisaged quarry filling modification application which has been flagged by the applicant. The submissions report states that "small amounts of vegetative waste may be included [in fill to the quarry void], however this would be subject to separate modification application".<br>Given that there has not been assessment of the appropriateness of using the quarry pit for vegetative waste (or any other waste), if the Department is of a view to approve the application, a condition of consent should be imposed that no waste (including timber, organic or any other vegetative waste) must be disposed of on-site and waste should not be used to fill the quarry void. | A meeting was held with WSA on 28/10/2021 to clarify that while the ARRC provides a viable means to infill the void, the ARRC is a stand-alone application providing multiple benefits as outlined in Section 2.1.1ii.<br>This meeting also included indicative timing around the different site activities (refer presentation shared with WSA included in Appendix F).<br>As outlined in the Submissions Report, a modification of the existing quarry approval would be required to allow infilling of the void. This modification application would include comprehensive assessment of the potential impacts of infilling.<br>No waste from the ARRC would be disposed onsite until such time as the future application to modify the quarry consent is approved. |
| Site Rehabilitation<br>Rehabilitation of the site, which is one of the main concerns of WSA, continues to be unclear in the documentation provided. In the absence of a clear approach to the filing of the quarry void and site rehabilitation, if the Department is of a view to approve the application, it should be conditioned such that the on-site disposal of non-recyclable material (i.e. into the quarry void) is not permitted under this DA. In the current state, WSA's concerns regarding insufficient assessment regarding the filling of the quarry void and site rehabilitation remain. | As noted above, a meeting was held with WSA on 28/10/2021 to clarify the approach and indicative timing of site rehabilitation and infilling of the quarry void.<br>CPG and KLF will not dispose of non-recyclable material onsite until the future application to modify the quarry consent is approved. |

## Table E.5 WSA's matters raised, where addressed in this report and additional responses

| Matter | Where addressed and additional responses |
|---|---|
| Vertical emissions<br>The applicant provide further detail on the type of plant and equipment that would result in vertical emissions and the nature of activities that would result in emissions. | The proposed waste processing technology that will be used inside the ARRC warehouse is detailed in Section 4.1.9iv of the Submissions Report. None of the components of this processing system will produce an exhaust plume that will emit from the ARRC's ventilation system (refer Appendix I of the Submissions Report).<br>The applicants are committed to ensuring that all ventilation systems are designed such that any exhaust velocity is less than 4 m/s. |
| GBAS<br>That GBAS facilities in the north-east of the WSI site should be planned for in the design of the waste management facility. | As noted in Section 3.3.5 of the Submissions Report, the EIS aeronautical impact assessment identified that the ARRC may infringe the building restricted area (BRA) for the GBAS for the WSA Stage 2 airport development, if the GBAS is located adjacent to the ARRC site. It is understood that the proposed location is one of the options under consideration and that a GBAS in this location would need be raised to allow signal propagation to be clear of proposed terminal buildings, the fuel farm (adjacent to the ARRC), other airport infrastructure and potentially development within the Aerotropolis Agribusiness Zone (to the west) and Enterprise Zone (to the north). |
| Wildlife risk assessment<br>The wildlife risk assessment be updated to factor into account cumulative impacts of the quarry / waste management site, including the potential impacts of future fill.<br>The wildlife risk assessment be updated to factor into account cumulative impacts of the site against other wildlife attracting uses in the area. | The Wildlife Strike and Birdstrike Risk Review (EMM 2020b) contained as Appendix B of the Aeronautical Impact Assessment (Appendix H of the EIS) found that the ARRC development will reduce the wildlife risk and bird-strike risk of the subject property by reducing access to standing water on the property and developing a grass paddock into a fully enclosed warehouse.<br>It is noted that a wildlife hazard assessment will be prepared as part of the infill modification application of the approved quarry consent and if approved a Wildlife Management Plan would be developed to manage potential wildlife risks during the infilling phase. |
| Noise and vibration<br>That the Noise and Vibration Impact Assessment be updated to specifically assess potential impacts on the fuel farm at WSI. | Vibration generated by operational plant and equipment associated with the ARRC is significantly lower than generated by the vibratory rollers that will be used during construction. The construction vibration assessment found that there will be no vibration impacts above the relevant criteria for human comfort as defined by British Standard BS 6472-1 and will be well below the structural damage limit as defined in BS 7385 Part 2-1993. Accordingly vibration from the operation of the ARRC would not generate vibration at assessment locations or the fuel farm that exceed the levels. |

**Table E.5 WSA's matters raised, where addressed in this report and additional responses**

| Matter | Where addressed and additional responses |
|---|---|
| Adams Road upgrades<br>The following recommendations are noted:<br>• Scenarios regarding the Adams Road upgrade should be explored further, including contingencies where the southern portion of the Adams Road is not upgraded prior to the operation of the proposed facility, or where the future filling of the void is not given consent.<br>• TfNSW should confirm the accuracy of the traffic volume data assumed.<br>• The Applicant provide further information on how the proposed No Right Turn restriction into Adams Road from Elizabeth Drive will be enforced. | An additional contingency scenario has been assessed in the event the southern portion of the Adams Road is not upgraded prior to the operation of the proposed facility (refer Section 2.4.4ii,b).<br>It is noted that the Addendum TIA assesses 150,000 tpa of incoming waste in addition to ARRC throughput in the cumulative traffic assessment. Accordingly, the results of the SiDRA analysis show that the road network will be able to accommodate the additional 60,000 tpa of non-recyclable residues should the infilling of the void not be approved.<br>The applicants have consulted closely with TfNSW regarding appropriate future traffic volume data to use in the traffic assessment. As requested by TfNSW, the Addendum TIA uses data provided by TfNSW.<br>Section 2.4.3 of this report outlines how the proposed No Right Turn restriction into Adams Road from Elizabeth Drive will be enforced. |

### E.1.5 Department of Infrastructure, Transport, Regional Development and Communications

Responses to matters raised in DITRDC's submission on the Submissions Report (dated 30 June 2021) are predominantly provided throughout the main report on an issues basis as outlined in Table E.5. Further detail is also provided in Table E.5 as appropriate.

**Table E.5 DITRDC's matters raised, where addressed in this report and additional responses**

| Matter | Where addressed and additional responses |
|---|---|
| Planning Policy and Zoning<br>The Department maintains that the proposed development is not keeping with the objectives and desired outcomes of the agribusiness zone which prohibits the proposed land use under the Western Sydney Aerotropolis Planning Package.<br>Furthermore, it remains unclear to what extent the purpose and objectives of the proposed development, to fill and rehabilitate the void, are being met through this application, if the filling and rehabilitation of the void are subject to separate and future modification applications. | A detailed assessment of the project against the relevant provisions of the Aerotropolis SEPP is provided in Section 2.2.1 of the main report.<br>The stated purpose and objectives of the ARRC are outlined in Section 2.1.1ii. |

## Table E.5 DITRDC's matters raised, where addressed in this report and additional responses

| Matter | Where addressed and additional responses |
|---|---|
| Airport safeguarding<br>The rehabilitation and filling of the quarry void continues to remain a key area of concern for the department. The application does not include sufficient information or assessment of the risk of wildlife attraction as a result of waste being disposed into the quarry at the site, nor the cumulative impact of the site alongside other wildlife-attracting land uses that are located within the vicinity of the subject site. | The Wildlife Strike and Birdstrike Risk Review (EMM 2020b) contained as Appendix B of the Aeronautical Impact Assessment (Appendix H of the EIS) found that the ARRC development will reduce the wildlife risk and bird-strike risk of the subject property by reducing access to standing water on the property and developing a grass paddock into a fully enclosed warehouse.<br>It is noted that a wildlife hazard assessment in accordance with the National Airports Safeguarding Framework (NASF) Guideline C - Managing the Risk of Wildlife Strikes in the vicinity of Airports will be prepared as part of the modification application of the approved quarry consent to allow infilling and rehabilitation of the site. If approved a Wildlife Management Plan would be developed to manage potential wildlife risks during the infilling phase. |
| Airport infrastructure<br>The application does not appear to address the potential vibration impacts on the fuel farm that may result from crushing and compounding activities required to fill and rehabilitate the quarry void. | Vibration associated with infill and quarry rehabilitation activities will be comprehensively assessed in the noise and vibration assessment prepared to support the future application to modify the quarry consent.<br>Vibration generated by operational plant and equipment associated with the ARRC is significantly lower than generated by the vibratory rollers that will be used during construction. The construction vibration assessment found that there will be no vibration impacts above the relevant criteria for human comfort as defined by British Standard BS 6472-1 and will be well below the structural damage limit as defined in BS 7385 Part 2-1993. Accordingly, vibration from the operation of the ARRC would not generate vibration at assessment locations or the fuel farm that exceed the levels. |
| Ground transport system<br>Traffic from the construction and operations at the site will place additional pressure on the ground transport system surrounding the airport site. It is important that any strategy that is approved and implemented take into account the cumulative impact of other road and infrastructure project occurring in the vicinity.<br>The proposed transport strategy suggests restrictions for ARRC related vehicles, for example, '*vehicles accessing the ARRC will be restricted from right-hand turn into Adams Road from Elizabeth Drive west'.* However it is unclear how these restrictions will be enforced and regulated. | The applicants have consulted closely with TfNSW regarding appropriate future traffic volume data to use in the traffic assessment. As requested by TfNSW, the Addendum TIA uses data provided by TfNSW.<br>Section 2.4.3 of this report outlines how the proposed No Right Turn restriction into Adams Road from Elizabeth Drive will be enforced. |

Appendix F

# Consultation

# Luddenham Quarry – Update to WSA

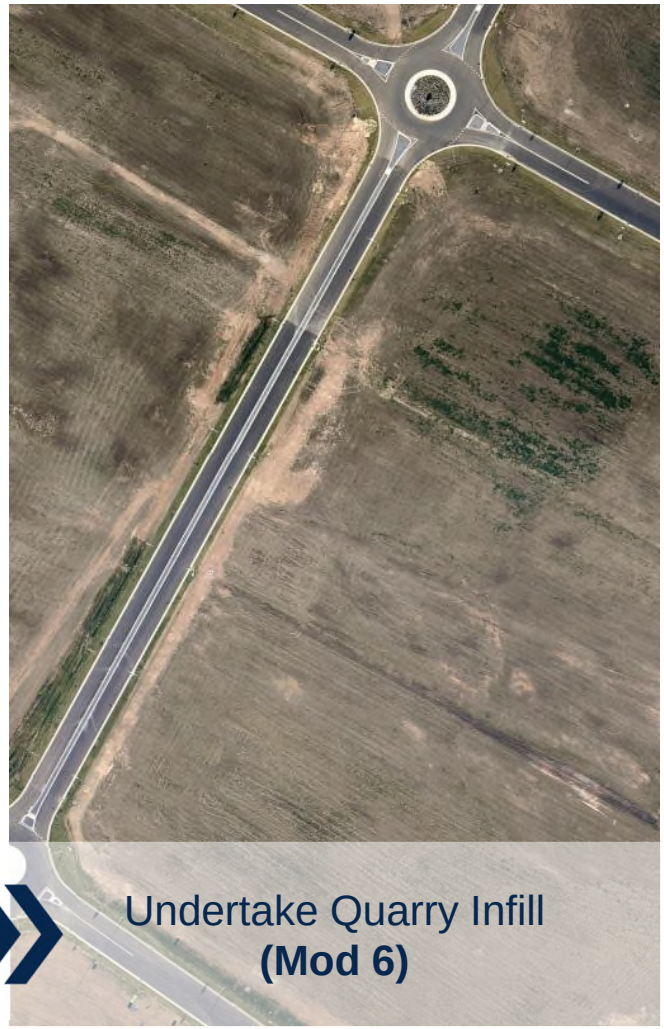


COOMBES PROPERTY GROUP

# Site Strategy


Complete Quarry Extraction
**(Mod 5)**


Establish ARRC
**(SSD)**



Undertake Quarry Infill
**(Mod 6)**



COOMBES PROPERTY GROUP

# Quarry Status – Mod 5

Quarry Status:

- ✓ Mod 5 approved
- ✓ Management Plans approved
- ✓ Mining Lease granted
- ★ Road Upgrades underway
- ★ Mining to recommence in Nov 2021
- ★ Mining to be complete by Dec 2024



COOMBES PROPERTY GROUP

# ARRC Status – SSD

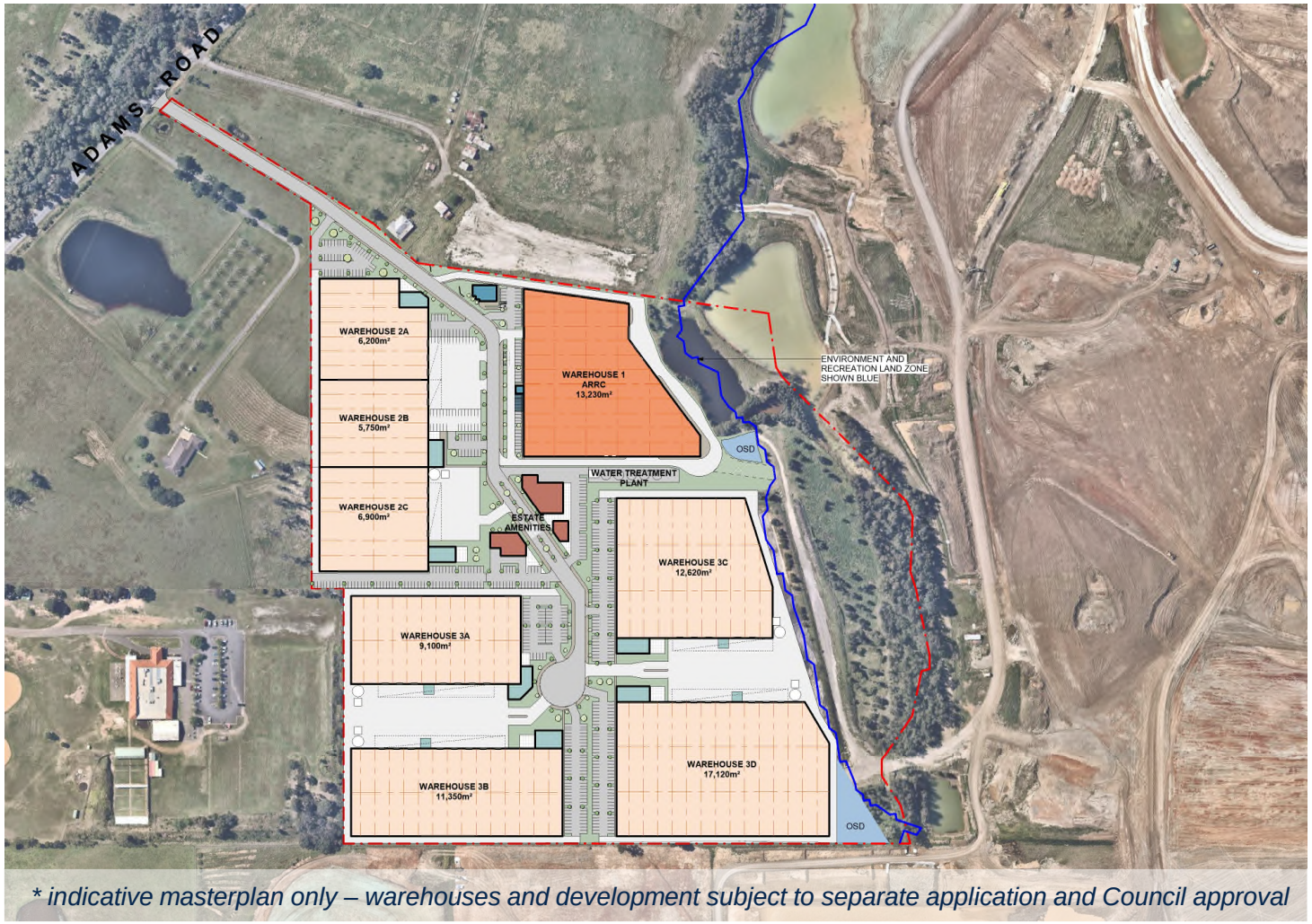

ARRC Status:

- ✓ SSD Application to build a fully enclosed shed to operate an ARRC
- ★ 3x rounds of RTS with DPIE
- ★ Close to determination



COOMBES PROPERTY GROUP

# Infill Status – Mod 6




** indicative masterplan only – warehouses and development subject to separate application and Council approval*

DPIE has confirmed:

- We have no obligation or consent to infill the void (other than leave it as an open and stable landform)

We have proposed:

- We lodge Mod 6 within 12 months of SSD consent granted for the ARRC
- Before the SSD consent is granted, we execute a Quarry Infill Deed (draft currently with DPIE) between us and DPIE for:
  - Void infill completion within approx. 15 years of ARRC being operational in Jan 2025
  - Void infill methodology must be safe and sensitive to airport operations
  - Consultation with WSA during both the preparation by us and the assessment by DPIE of the Mod 6 Application
- We commence infilling in Jan 2025



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19 October 2021

Elizabeth Watson
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**Re: Response to EPA's submission on the Luddenham Advanced Resource Recovery Centre Submissions Report (SSD-10446)**

Dear Elizabeth,

In preparation for our meeting with the NSW Environment Protection Authority (EPA) and the Department of Planning, Industry and Environment (EPA), this letter contains a summary of Coombes Property Group (CPG) and KLF Recycling (KLF)'s responses to EPA's request for additional information on the Luddenham Advanced Resource Recovery Centre (ARRC) Submissions Report (SSD-10446) (EPA reference DOC21/449131-9).

Matters raised in EPA's submission are provided verbatim in the boxes below, with CPG and KLF's response following. In response to matters raised by EPA and further matters raised by DPIE, the Addendum Noise and Vibration Impact Assessment (NVIA) has been revised and is attached to this letter.

# 1 Project amenity noise levels

Due to several factors, not least the recent rezoning of land in this area to agribusiness, the EPA strongly disagrees with the Proponent's approach for deriving the amenity noise levels and views it as directly contradictory to the provision in the NPfI. Project amenity noise levels should be adjusted to reflect the NPfI prior to further determination of the application.

The noise specialists engaged to carry out the noise assessment for the ARRC are of the firm view that the rural amenity noise levels outlined in the Addendum Noise and Vibration Impact Assessment (NVIA) have been derived in accordance with the NPfI.

The residential locations potentially exposed to noise from the ARRC and quarry are not exposed to any other industrial operations. This is not likely to change in future over the period the quarry will operate and then close (ie December 2024). Putting aside the WSA, there are no known development applications for industrial operations on adjoining properties. Furthermore, future WSA operations are reportedly five years away and at that time it is likely that baseline noise levels will increase, prompting a need to re-assess baseline noise levels and targets for residences, assuming residences are still present given the changing land use zoning to Agribusiness. Hence, the baseline amenity levels were adopted for cumulative noise from the ARRC and quarry. This is consistent with the approach outlined in NPfI Section 2.4 Item 4.

The predicted exceedances at assessment locations for the operation of the ARRC alone and for cumulative daytime exceedances for the ARRC and approved quarry are summarised in Table 1.1. It is noted, noise exceedances were predicted for a number of residential assessment locations during the day under ISO9613 noise enhancing conditions for approved quarry operations.

**Table 1.1 Exceedances based on rural amenity levels**

| | ARRC (rural amenity) | | | ARRC (sleep disturbance) | ARRC + quarry (rural amenity levels |
|---|---|---|---|---|---|
| | Day | Evening | Night | Predicted intermittent noise level dB $LA_{max}$ | Day |
| R1 | - | - | - | - | - |
| R2 | - | +2 | +3 | - | - |
| R3[1] | +18 | +18 | +21 | +24 | +18 |
| R4 | - | - | +3 | - | +5 |
| R5 | - | - | +2 | | +4 |
| R6 | +10 | +10 | +14 | +2 | +13 |
| R7 | - | - | - | - | +1 |
| R8 | - | - | - | - | - |

In acknowledgment of potential evening and night-time noise impacts on existing rural residences prior to the commencement of Western Sydney Airport (WSA) operations in 2026, CPG and KLF have committed to delay the conducting of evening and night-time operations until January 2026, the year WSA commences operations.

# 2 Truck sound power level

The Addendum NVIA reports that truck movements on the site have reduced compared to the assumptions presented in the '*Luddenham Advanced Resource Recovery Centre - Environmental Impact Statement'* EMM July 2020, with smaller 4.4 tonne trucks being replaced with larger 30 tonne vehicles. However the same power level has been used. The EPA requires that an assessment be undertaken with more appropriate sound power levels for the 30t trucks, taking into account acceleration, deceleration and air brakes.

The revised Addendum NVIA revised the assessment of truck noise emissions from the subject property. The revised assessment assumed the following:

- road truck movements on the site access road and traversing on site including through the building as outlined in **Error! Reference source not found.** comprising during peak 15 minutes, based on peak hour movements outlined in the Submissions Report (EMM 2021):
  - Day/Evening: 20 movements[2] per 15 minutes;
  - Day/Evening: 16 movements per 15 minutes; and
  - Night: 8 movements per 15 minutes;
- a travel speed of 20 km/h around the site and the site access road was used to determine the total sound power level for the relevant route segments (ie modelled as line sources);
- acceleration was considered for the first 80 m of the site access from Adams Road, with a corresponding deceleration component adopted;
- acceleration was also considered from the southern weighbridge onto the site access road for a distance of 160 m;

[1] R3 continues to be unoccupied and is not expected to be used for residential purposes again.

[2] In keeping with the traffic impact assessment, each truck accessing the site has an inward and an outward movement (eg, 10 trucks accessing the site will have 20 movements).

- adjustments from pass-by levels for acceleration (+4 dB) and deceleration (-2 dB) were adopted from *UK Noise Association – Speed and Road Traffic Noise December 2009*[3];

- the modelling has differentiated between a small/medium truck (<5 t) and large truck (30–35 t) and adopts the following range of sound power levels on site. These are based on EMM measurements of similar vehicles and reference $L_{Aeq}$ data contained in the DEFRA database for 39t road trucks:

    - 100 dB(A) for small/medium trucks (two axles) travelling at speeds of 20 km/h during normal pass-by;

    - 104 dB(A) for small/medium truck travelling at speeds of lower than 20 km/h during high acceleration;

    - 98 dB(A) for small/medium trucks (two axles) travelling at 20 km/h during deceleration;

    - 104 dB(A) for heavy trucks (three or more axles) travelling at 20 km/h during normal pass-by;

    - 108 dB(A) for heavy trucks travelling at speeds of lower than 20 km/h during high acceleration;

    - 102 dB(A) for heavy trucks (three or more axles) travelling at 20 km/h during deceleration;

- for day and evening modelling considered 42% large trucks and 58% small/medium trucks consistent with EMM TIA, whilst for night the model has conservatively assuming all large trucks;

- source height of two metres and base truck spectrum (104 dB) adjusted in accordance with overall levels presented below:

**Table 2.1 Base truck level spectrum (104 dB) 1/1 octave band (Hz)**

| 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|
| 117 | 113 | 100 | 94 | 95 | 98 | 93 | 88 |

- trucks were considered along the site access and driveway routes throughout the site including weighbridge locations as line sources. The total sound power of the line sources was dictated by the peak 15 minute number of trucks for the day, evening and night modelling scenarios presented above. Potential for vehicle queuing would not adversely impact noise emissions from the site, as any stationary vehicles would be at idle; and

- that the use of truck horns will be prohibited on site except where they are required to prevent an accident – a rare event so not modelled.

The predicted noise levels at assessment locations are up to 1 dB higher than predicted in the previous Addendum NVIA as a result of changes to the schedule of plant, truck sound power levels and incorporation of acceleration and deceleration.

# 3 Sleep disturbance

A detailed assessment of maximum noise levels and sleep disturbance is to be undertaken in accordance with the NPfI

[3] Speed and Road Traffic Noise – UK Noise Associate December 2009, - referenced to Ellebjerg, L. (2008a) 'Basic traffic - noise relations' in Ellebjerg, L. (ed.) (2008)

Addendum NVIA Sections 3.2, 4.2.4 and 5.1.2 (refer Attachment A) provide updated sleep disturbance screening criteria and considers both $L_{Aeq,15min}$ and $L_{Amax}$ noise levels. Potential for these events were considered at the north and south weighbridges, northern waiting area west of weighbridge and each of the building openings and were predicted to the identified residential assessment locations. Results of modelling confirm compliance with the $L_{Amax}$ sleep disturbance screening level (52–54 dB) for most residential assessment locations with the exception of R3 and R6. The exceedance at R6 is negligible (+2 dB).

A review of predicted noise levels confirm compliance with the $L_{Aeq,15min}$ sleep disturbance screening level (40–44 dB) for R1, R5, R7 and R8 residential assessment locations. Negligible exceedances (2 dB or less) are predicted for R1, R2 and R4, whilst significant exceedances are predicted for R3 (+21 dB) and R6 (+12 dB).

R3 is currently in a poor state of repair and is unoccupied. The property is likely to be redeveloped for commercial or industrial use. It is noted the new zoning of the R3 land parcel would prohibit the development of a new residence.

The owners of R6 have been contacted regarding a negotiated agreement to mitigate noise impacts, including sleep disturbance. As noted above, CPG and KLF have committed to delay the conducting of evening and night-time operations until January 2026, the year WSA commences operations.

# 4 Closing

We look forward to discussing with you these matters and the additional information provided this Thursday 21 October.

In the interim please do not hesitate to contact me on 0456 664 212.

Yours sincerely

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12 October 2021

Lina Kakish
Manager City Planning
Liverpool City Council
33 Moore Street
Liverpool, NSW 2170

**Re: Response to Liverpool City Council's submission on the Luddenham Advanced Resource Recovery Centre Submissions Report (SSD-10446)**

Dear Lina,

Further to your correspondence with Pascal Bobillier, this letter contains a summary of Coombes Property Group (CPG) and KLF Recycling (KLF)'s responses to Liverpool City Council (Council)'s request for additional information on the Luddenham Advanced Resource Recovery Centre (ARRC) Submissions Report (SSD-10446) (Council reference SSD1-18/2020/A).

As requested in Council's submission, we have provided the Department of Planning, Industry and Environment (DPIE) additional information on traffic matters including the proposed upgrade of Council/TfNSW roads to facilitate ARRC development traffic as well as further information on the proposed management of wastewater from the development.

DPIE has also requested CPG and KLF consult with Council regarding its submission, particularly regarding Council's comments concerning traffic and decommissioning of the ARRC.

A summary of the matters raised in Council's submission with CPG and KLF's response is provided in Attachment A.

We look forward to discussing with you these matters and the additional information provided in the near future.

In the interim please do not hesitate to contact me on 0456 664 212.

Yours sincerely

**Janet Krick**
Associate Environmental Planner
jkrick@emmconsulting.com.au

## Attachment A Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| Permissibility (including | Council staff note that the SEPP (Western Sydney Aerotropolis) 2020 and the precinct plans were not published when Liverpool City Council staff comments were made. As per the proponent's response to submissions, clause 53(1) clarifies that the SSD is to be assessed and determined as if the new SEPP has not commenced. Given that resource recovery facilities are permitted on RU4 land, as per the SEPP (Infrastructure) 2007, Council staff are of the opinion that the development is permissible.<br><br>Notwithstanding the permissibility of the use, Council would still refer to the objectives of the RU4 Primary Production Small Lots zone, as well as the objectives of the agribusiness zone, as per the Aerotropolis planning framework. The development application should be conditioned accordingly to ensure that negative external impacts are managed / mitigated appropriately, and that the site can be decommissioned in a manner that is consistent with the vision of the agribusiness zone. | Project's consistency with Objectives of Agribusiness and former RU4 Primary Production Small Lots zones.<br><br>With reference to the objectives of the Agribusiness zone and the former RU4 zoning objectives, the design of the ARRC, as a fully enclosed warehouse, is in keeping with the warehouses that are envisaged for the agribusiness zone and will not preclude the use of the surrounding land parcels or broader Agribusiness Precinct for agribusiness land use. Development of the ARRC will also not preclude the continued use of surrounding land for primary industry and other compatible industry permissible under the former RU4 zoning.<br><br>Decommissioning of the ARRC<br><br>Following the infilling of the quarry void (subject to separate planning approval), CPG and KLF intend to continue operating the ARRC in perpetuity to provide resource recovery services to support the ongoing development of the Aerotropolis and the Western Parkland City.<br><br>In the event, market forces change in the future and the ARRC is closed, the internal processing equipment would be removed and the ARRC warehouse retrofitted for an alternative land use consistent with the objectives of the Agribusiness zone. |

| | | |
|---|---|---|
| Adams Road upgrade and intersection | It is noted that the proposed intersection treatments at the Elizabeth Drive/Adams Road intersection include a 90 m deceleration left-hand turn lane into Adams Road, restricted right turn movements from Elizabeth Drive (westbound) into Adams Road and a short left turn lane on Adams Road into Elizabeth Drive.<br><br>Council raises road safety concern about the proposed right turn movements from Adams Road into Elizabeth Drive due to increasing traffic demands along Elizabeth Drive as well as additional time required to cross the proposed left turn deceleration lane.<br><br>Since Council provided its previous advice (dated 25 August 2020), the strategic design to upgrade Elizabeth Drive (prepared by Transport for NSW (TfNSW)) indicates the Elizabeth Drive/Adams Road intersection will be restricted to left in and out only, with a raised central median preventing right turn movements.<br><br>As such, Council's previous comments are no longer appropriate, as vehicles would, ultimately, need to travel south along Adams Road towards The Northern Road (in order to travel east on Elizabeth Drive). As such, Council recommends that the Adams Road / Elizabeth Drive intersection be restricted to left in and out only for ARRC operations. The alternative route is to be via the Northern Road/Adams Road intersection.<br><br>Provided that right turn movements would ultimately be restricted from Adams Road onto Elizabeth Drive, the developer is to improve pavement along the section of Adams Road between Elizabeth Drive and Anton Road and remove 3 tonnes restriction to permit heavy vehicle movements.<br><br>Elizabeth Drive is a state road, which is under the care and control of TfNSW. Hence, the proposed intersection upgrade should be referred to TfNSW for approval. The design of this intersection upgrade should be consistent with the strategic design plan prepared by TfNSW. | <u>ARRC transport strategy</u><br><br>The transport strategy for the ARRC has been developed in consultation with TfNSW and Council. ARRC development traffic will access the ARRC via both The Northern Road/Adams Road intersection and Elizabeth Drive/Adams Road intersection with the exception of the right hand turn into Adams Road from Elizabeth Drive west.<br>Further consultation has been carried out with Transport for NSW (TfNSW) since lodgement of the Submissions Report in May 2021. TfNSW continues to support this transport strategy in the short to medium term noting that the local and broader road network will be upgrades progressively as part of the development of the Aerotropolis.<br><br><u>Interim upgrade to Elizabeth Drive/Adams Road intersection</u><br>Due to the uncertainty regarding long term upgrades of Elizabeth Drive and the Elizabeth/Adams Road intersection, TfNSW requested CPG & KLF prepare a concept design for an interim upgrade to the Elizabeth Drive/Adams Road intersection to accommodate ARRC development traffic in the short to medium term. This interim concept design includes:<br>• restriction of the right turn movement for vehicles greater than 6 m from Elizabeth Drive into Adams Road;<br>• 120 m left turn deceleration lane from Elizabeth Drive into Adams Road; and<br>40 m left turn lane from Adams Road into Elizabeth Drive.<br><br>TfNSW has provided concurrence in writing to the proposed interim upgrade of the Elizabeth Road/Adams Road intersection.<br><br>TfNSW's <u>preliminary concept design for Elizabeth Drive/Adams Road intersection</u><br><br>It is understood TfNSW has prepared a preliminary concept design for a new Elizabeth Drive/Adams Road intersection as part of wider changes to Elizabeth Drive that are part of the broader road network upgrades required to support the development of the Western Sydney Aerotropolis. This preliminary concept design proposes to remove all turn movements for all road users at the Elizabeth Drive/Adams Road intersection, with the exception of the left in movement from Elizabeth Drive into Adams Road.<br><br>TfNSW requested CPG/KLF carry out sensitivity analysis on this preliminary design. This analyses showed the restriction of all turn movements except left into Adams Road at Elizabeth Drive/Adams Road intersection, would result in significant strain at the Northern Road/Adams Road intersection due to redirected baseline traffic. A LOS F was predicted for this intersection as a result in the change in baseline traffic flow, regardless of whether the ARRC proceeds.<br><br><u>Upgrade to Adams Road between Elizabeth Drive and Anton Road</u><br><br>CGP and KLF agrees to improving the Adams Road pavement between Elizabeth Drive and Anton Road to enable the lifting of the existing 3 tonne load restriction. |

## Attachment A Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| SIDRA analysis | Intersection analysis is to be carried out at the intersection of Adams Road/the site access road. Electronic copies of SIDRA models for all the surrounding intersections are to be submitted to Council for review. | The following SIDRA analyses has been carried out for the ARRC development traffic volumes identified in the Submissions Report:<br>• Project's transport strategy as presented in Section 3.1.1(i) of the Submissions Report (wherein ARRC development traffic will access the ARRC via both The Northern Road/Adams Road intersection and Elizabeth Drive/Adams Road intersection).<br>• Sensitivity SIDRA analyses considering TfNSW's preliminary concept design of Elizabeth Drive/Adams Road upgrade<br>• Sensitivity SIDRA analyses at the request of Western Sydney Airport directing 100% of ARRC development traffic to the Elizabeth Drive/Adams Road intersection.<br>CPG and KLF would be happy to submit the above SIDRA models for Council's review.<br>Due to the acceptable level of service (LoS) for the project's transport strategy for the Elizabeth Drive/Adams Road intersection (LoS B or better) and The Northern Road/Adams Road intersection (LoS C) additional intersection analysis of the Adams Road/ARRC site access has not been carried out at this time. |
| Site Access Road | A design plan showing the proposed intersection treatment at the intersection of the site and Adams Road is to be submitted to Council for approval. | Should the project be approved, CPG/KLF will submit certified civil design plans for the upgrade to the site access/Adams Road intersection to Council for approval as part of the Section 138 approval. |

## Attachment A Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| Haulage Route | The haulage route plan is to be confirmed for the proposed ARRC development prior to the determination of the subject development application | The nature of resource recovery facilities is that the source of material being accepted, and the destination of recycled product being sold by facilities, is governed by the location of customers using the facility. These customers are expected to primarily be in Western Sydney but may be further afield. The exact locations of customers will vary from week to week and evolve over the years according to the evolution of development in Western Sydney. Accordingly, with the exception of movements between other recycling facilities owned by KLF, the applicants cannot identify fixed haulage routes for the movement of ARRC development traffic and also have limited control over the route which customers will use to access the ARRC.<br><br>Accordingly, to demonstrate that the local road network can accommodate the maximum vehicle movements that will occur during peak ARRC operations, the Addendum traffic impact assessment has been based on conservative assumptions regarding the breakdown of incoming and outgoing traffic. This approach to assessment has been applied to the traffic impact assessment of many now approved resource recovery centres.<br><br>Cognisant of the changing traffic environment due to the development of the WSA and broader Aerotropolis, the applicants have consulted closely with TfNSW throughout the EIS and Response to Submissions phases of the project to confirm assessment requirements, including future background traffic volumes to incorporate in the traffic assessment |

## Attachment A Responses to matters raised in Council's submission

| Matter | Council's submission | Response |
|---|---|---|
| On-site Sewerage Management system (OSMS) | The Submission Report prepared by EMM Consulting dated 27th May 2021 does not specifically address requirements for the on-site sewage management system. Despite the limited information available, Clause 4.1.6 of the document explains that the wastewater system will require pumping out on a monthly basis. Section 15, Part 1 of the Liverpool Development Control Plan 2008 states that 'development or subdivision proposals relying on pump-out systems will not be approved by Council.<br>In accordance with Section 68 of the Local Government Act 1993, approval is required to install, construct or alter a waste treatment device and operate a system of sewage management at the premises. "Operate a system of sewage management" means hold or process, or re-use or discharge, sewage or by-products of sewage (whether or not the sewage is generated on the premises on which the system of sewage management is operated).<br>Therefore, separate approval would be required under Section 68 of the Local Government Act 1993 if the proposal includes an on-site sewage management system or any other infrastructure to hold or process, or re-use or discharge, sewage or by products of sewage.<br>In accordance with the Liverpool Development Control Plan 2008, a new system must be installed where the existing system does not have adequate treatment capacity for all potential flows. Liverpool City Council previously requested the SEARs to require a wastewater report prepared by a suitably qualified and experienced environmental or wastewater consultant. | As outlined in Section 4.2 of the Servicing Strategy report (Appendix S of the EIS), Sydney Water currently has new wastewater infrastructure planned over the next 5 years for the area around the ARRC site, including the WSA. As noted in the servicing strategy, it is understood that a new regional centralised wastewater treatment plant servicing the Upper South Creek catchment (which includes the ARRC site) will be delivered by Sydney Water by 2026.<br>The applicants acknowledge approval will be required under Section 68 of the Local Government Act 1993 for the operation of an onsite sewerage management system in the event the proposed Sydney Water wastewater infrastructure is not operational by the time the ARRC commences operations.<br>The Servicing Strategy Report proposed a sewerage treatment plan (STP) located in the water management infrastructure area to the south of the ARRC warehouse indicatively consisting of an eloywater oxyfix treatment system which would treat effluent for either pump out or for use for onsite irrigation of landscaped areas. The final design and specification of the STP would be identified in the wastewater report prepared a part of the Section 68 application to Council. |
| Landscape Plans | Council staff recommend that DPIE works with the proponent to identify an alternative species to replace areas to be planted with Acacia longifolia. The replacement should offer greater longevity and be suited to the conditions/environment in which these trees would be planted. Appendix 2 of Part 1 of Liverpool's DCP has a list of preferred species. | A landscape plan will be prepared prior to the commencement of construction of the ARRC, this plan will be prepared with consideration to WSA and Aerotropolis specific guidance material on preferred landscape species to minimise wildlife attraction and also Appendix 2 of Part 1 of LCC's preferred list of species. |
| Operational Management Plans | Liverpool City Council staff recommended that an Operational Environmental Management Plan (OEMP) is prepared for the proposed facility for review by the consent authority.<br>The Plan shall be written by a suitably qualified and experienced environmental consultant and address means by which the commitment in the Environmental Impact Statement and other environmental assessment reports will be fully implemented. | CPG and KLF have committed to the preparation of an OEMP by a suitably qualified and experienced environmental consultant prior to the commencement of operations.<br>It is expected that the requirement for an OEMP would also be stipulated in the conditions of approval. |

Appendix G

# Comparative analysis

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19 November 2021

Will Hodgkinson
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Department of Planning Industry & Environment
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**Re: Comparative analysis - ARRC and agribusiness land use**

Dear Will,

Further to your discussions with Michael Coombes, please find attached a comparison of permissible operations in a response to the Department of Planning, Industry and Environment (DPIE)'s request for a comparative analysis of typical operating hours, traffic generation and pollution (taken to be noise and air quality) emission rates for specific agribusiness uses under the Western Sydney Aerotropolis State Environmental Planning Policy (Aerotropolis SEPP) and the proposed Advance Resource Recovery Centre (ARRC) as outlined in Jeffrey Peng's email dated Wednesday 3 November 2021.

This comparative analysis has selected an approved State significant development (SSD) in the Western Sydney region as well as an SSD application in the Western Sydney region currently in the Response to Submissions Phase. Each of the selected developments would be permissible with consent in the Agribusiness zone and are considered consistent with the vision for area as outlined in the Draft Agribusiness Precinct Plan. The comparative analysis has compared these developments to the proposed ARRC in terms of operating hours, traffic generation, air quality and noise levels.

We believe that this information demonstrates that permissible alternative developments on the site could result in similar or higher traffic generation and noise emissions, particularly adjacent to the only possible access road to the site.

We trust that this information assists.

Yours sincerely

**Janet Krick**
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## Table 1 Comparative analysis of the ARRC with approved and proposed developments permissible in the agribusiness zone

| Development | Traffic generation | Noise aspects | Air quality aspects |
|---|---|---|---|
| **ARRC**<br>Construction and operation of a Resource Recovery Centre accepting up to 600,000 tpa of construction and demolition waste.<br>To assist in the comparative analysis, it is noted that the land available for development currently on the subject property is approximately 95,000 $m^2$.<br>The ARRC is permissible pursuant to the savings and transitional provisions in Clause 53(1) of the Aerotropolis SEPP. Approval sought for 24-hour operations, 7 days per week. Discussions in progress with DPIE and EPA re restricting evening and night operations until January 2026. | The ARRC would have:<br>• 525 daily heavy vehicle movements a day;<br>• 104 light vehicle movements daily movements<br>• 79 heavy vehicle movements in AM peak<br>• 27 heavy vehicle movements in PM peak | Operational noise sources consist of:<br>• heavy vehicles (100-108 dBA sound power level (SWL) per item)<br>• processing equipment (93 - 117 dBA SWL per item)<br>• water treatment plant (94 dBA SWL)<br>• roof fans/ventilator (97 dBA SWL per item).<br>Maximum of 11 heavy and light vehicles on site in a 15 minute period. | Quantitative air quality assessment carried out (EMM 2021).<br>This assessment predicted the ARRC would not adversely impact local air quality. Exceedances of the impact assessment criteria were limited to R3, an occupied property intended to be redeveloped for commercial purposes. The exceedances predicted at R3 were driven by ARRC heavy vehicle movements in the immediate vicinity of this residence. |
| **ESR Horsley Park Logistics centre (SSD-10436) – approved**<br>Construction, fit-out and operation of eight warehousing and distribution tenancies in four buildings with a total gross floor area of 95,679 $m^2$, loading docks, hardstand areas, truck and car parking spaces, landscaping, infrastructure and signage.<br>The size of this development (ie area) is comparable to the total land area on the subject property that can currently be developed.<br>The development would be permissible with consent within the agribusiness zone and is consistent with the agribusiness precinct vision as it would support agribusiness uses including freight and logistics.<br>Operations 24 hours, 7 days per week. | The Traffic Impact Assessment (Asongroup 2020) did not distinguish between heavy and light vehicles. Development would have:<br>• 2,975 daily vehicle movements<br>• 279 vehicle movements in AM peak<br>• 205 vehicle movements in PM peak | The Noise and Vibration Impact Assessment (SLR 2020) identified the following operational noise sources:<br>• heavy vehicles (103 dBA SWL per item)<br>• gas powered forklift (93 dBA SWL per item)<br>• external fixed mechanical plant on warehouse rooftops (90 dBA)<br>The NVIA did not consider noise sources within the respective warehouses stating that this would be confirmed during detailed design.<br>Therefore, quantitative comparison to the ARRC noise levels is not possible.<br>Given the comparison of 123 peak AM vehicle movements for the ARRC and the 279 peak AM vehicle movements for the ESR facility, it is reasonable to assume, adjacent to the access road noise levels from the ESR, if located on the subject site, would be in a similar range to those from the ARRC. | The qualitative, risk-based assessment of potential air quality impacts on sensitive receivers found the magnitude of potential impact on sensitive receivers negligible (DPIE 2020).<br>Due to the qualitative methodology (and the uncertainty regarding the future use of the warehouses, it is not possible to compare the ARRC with the ESR Logistics Centre in terms of potential air quality impacts.<br>Notwithstanding, given the higher number of vehicle movements, it is reasonable to assume that air quality criteria would also be exceeded at R3 for the ESR facility, if located on the subject site. |

## Table 1 Comparative analysis of the ARRC with approved and proposed developments permissible in the agribusiness zone

| Development | Traffic generation | Noise aspects | Air quality aspects |
|---|---|---|---|
| **Woolworths WDC Wetherill Park (SSD 15221509) - response to submission phase**<br>Construction and operation of a warehouse and distribution centre (WDC) in Wetherill Park for handling chilled and fresh products.<br>The proposed development would be developed on a site approximately 86,233 $m^2$ (WillowTree Planning 2021).<br>This WDC for chilled and fresh produce would be permissible within the agribusiness zone and would be consistent with the agribusiness zone objectives of supporting agribusiness supply chain industries.<br>Operations 24 hours, 7 days per week. | Colston Budd Rodgers & Kafes Pty Ltd (2021) outline that this distribution facility would have:<br>• 1,400 heavy vehicle movements a day<br>• 2,000 light vehicle movements a day<br>• 100 heavy vehicle movements in AM peak<br>• 100 light vehicle movements in AM peak<br>• 100 heavy vehicle movements in PM peak<br>• 220 light vehicle movements in PM peak | The Noise and Vibration Impact Assessment (NVIA) for this development (Renzo Tonin & Associates 2021) identified the following operational noise sources:<br>• Heavy vehicles moving around site (with refrigeration (99-112 dBA SWL), with 17 trucks moving around site in a 15-minute period.<br>• Heavy vehicles at loading dock (stationary cooling) (92-105 dBA SWL) through the night. With up to 35 trailers or ridged trucks cooling down on mains power prior to loading.<br>• Trailer loading activity will electric pallet trolley (90 - 115 dBA SWL)<br>• Forklift (96 dBA SWL)<br>• Truck washing activities (98 dBA SWL)<br>• Truck maintenance activities (105 dBA SWL).<br>Most of the above noise emissions will occur outside and/or under awnings (Renzo Tonn & Associates 2021).<br>Direct comparison of the noise levels with the ARRC is not possible without quantitative noise modelling of the WDC placed on the ARRC site. However, given the greater number of louder trucks (due to refrigeration units) and more external activities, it is likely, that this development would exceed noise criteria if it were located on the ARRC site. | Quantitative assessment carried out to support the EIS for the WDC. This assessment found the operation of the WDC would not result in any exceedances of air quality criteria (Willow Tree Planning 2021).<br>As for the ESR facility, it is reasonable to assume that air quality criteria would also be exceeded at R3 for the ESR facility, if located on the subject site due to the proximity of the site access road to this residence and the greater number of heavy vehicles associated with this development compared with the ARRC. |

# References


Asongroup (2020) *Transport Assessment ESR Horsley Logistics Park - SSD 10436 327-355 Burley Rd, Horsley Park.*

Bitzios Consulting 2019, *St Marys Freight Hub Traffic and Transport Assessment Post Exhibition Version.*

Colston Budd Rodgers & Kafes Pty Ltd 2021, *Traffic and Access Report for Proposed Woolsworths Warehouse and Distribution Centre 250 Victoria Street, Wetherill Park.*

DPIE 2021, *ESR Horsley Logistics Park, State Significant Development Assessment SSD-10436,* NSW Department of Planning, Industry and Environment March 2021.

EMM 2021, *Luddenham Advanced Resource Recovery Centre Addendum air quality impact assessment,* prepared for Coombes Property Group & KLF Holdings Pty Ltd, March 2021.

Renzo Tonin & Associates (2021) *Proposed Warehouse and Distribution Facilities (FP3) Wetherill Park: Noise and Vibration Impact Assessment*

SLR 2020, *Horsley Logistics Park, State Significant Development Application Noise and Vibration Impact Assessment V2.1,* prepared for ESR, November 2020.

Urbanco 2020 *St Marys Freight Hub Heavy Vehicle & Transport Analysis Summary Report* prepared for Pacific National January 2020.

Willow Tree Planning 2021, *Environmental Impact Statement Proposed Construction and Operation of a Warehouse and Distribution Facility SSD 15221509, 250 Victoria Street, Wetherill Park (Lots 1-4 DP781975).*